

ESTA REVISTA FOI
DIGITALIZADA A FIM DE
DIFUNDIR CONHECIMENTO E
PRESERVAR O MATERIAL.
É PROIBIDA A VENDA
DESTE MATERIAL E USO
PARA FINS LUCRATIVOS!



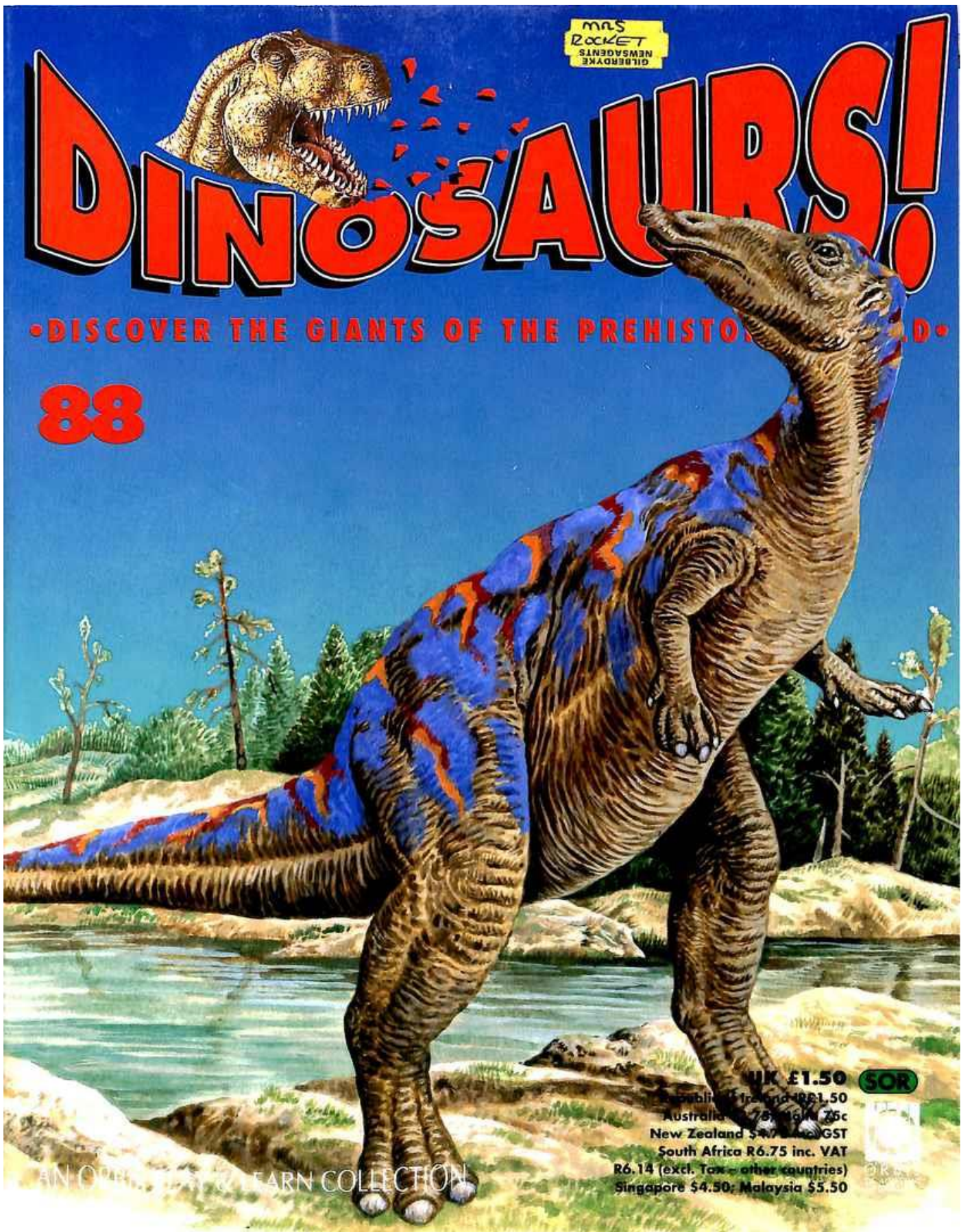
WWW.IKESSAURO.COM

MRS
ROCKET
NEWSAGENTS
GILBRIDGE

DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

88



UK £1.50

Republic of Ireland €1.50

Australia \$7.50 incl. GST

New Zealand \$4.75 incl. GST

South Africa R6.75 inc. VAT

R6.14 (excl. Tax - other countries)

Singapore \$4.50; Malaysia \$5.50

SOR



AN ORIGINAL PAPER & EARN COLLECTION

DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •



IDENTIKIT

Meet three amazing creatures from the land, the sea and the air

MANDSCHUROSAURUS 2089

PTERODAUSTRO 2092

EOGYRINUS 2093

PREHISTORIC WORLD

We take you PREHISTORIC

POND-DIPPING 2094



SPOTTER'S GUIDE

Find out how to start a dinosaur collection in DINOMANIA 2102

TIME DETECTIVE

Throughout history, people have been fascinated by the discovery of

FOSSIL TREASURE 2104



HISTORY IN PICTURES

GERTIE AND THE PETRIFIED FOREST 2108



HOW TO DRAW

Learn how to draw a spectacular

Scutellosaurus 2112

ASK THE EXPERT

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

PLUS

GIANTS OF THE PAST

A group of *Mandschurosaurus* wallow lazily in a swamp 2098

3-D Gallery

Exhausted *Muttaborrasaurus* can't escape a vicious *Allosaurus* 2100

FACT FILE

More fascinating trivia and the weekly quiz 2110

HOW TO CONTINUE YOUR COLLECTION

Most people collect their issues by placing a regular order with their newsagent. You can, however, also obtain your copies directly in the following ways:

UK and REPUBLIC OF IRELAND
If you have any difficulty obtaining your copies of DINOSAURI from your regular retailer, telephone Nicky Scott on 081 600 2000.
Subscriptions: Phone 0424 755755 (Mon-Fri, 9am-5pm). Credit card orders accepted. Or write to: Back Issues Department, DINOSAURI, PO Box 1, Hastings, TN35 4JL.
Back issue charges: Issue 1: 30p. All other issues: £1.50. Postage and packing: 50p per copy. When ordering, please enclose:
1. Your name, address and postcode.
2. The issue number(s) and number of copies of each issue you require.
3. Your payment. This can be by postal order or cheque made payable to Orbis Publishing Ltd. You can calculate the amount based on the charges shown above.

Binders:
UK: DINOSAURI binders are now available. Each binder holds 13 issues and costs just £4.95 (including £1 a.p.f.). You can order binders direct from: DINOSAURI, PO Box 1, Hastings, TN35 4JL. Please enclose payment for £4.95 for each binder. You can pay by cheque or postal order made payable to Orbis Publishing Limited, or phone 0424 755755. Telephone credit card orders are accepted.
Republic of Ireland: Binders are available through your newsagent, priced at £4.95.

AUSTRALIA
Back issues: Write to: Gordon & Gotch Ltd, P.O. Box 293, Burwood, Victoria 3125. Please enclose your payment of the cover price plus \$1 per issue p.a.
Binders: Details will be published in future issues. Or you can write to: DINOSAURI Binders, Bisset Magazine Service Pty Ltd, MC Box 460, Eastern Mail Centre, Victoria 33110.

NEW ZEALAND
Back issues: Write for details to: Gordon & Gotch Ltd, P.O. Box 584, Auckland.
Binders: Write for details to: Gordon & Gotch Ltd, P.O. Box 584, Auckland.

MALTA
Back issues: These can be ordered through your newsagent.
Binders: Write for details to: Miller (Malta) Ltd, Valetta.

SOUTH AFRICA
Back issues: Telephone 011 402 3816 for details. Or write to: Back Issues Department, Republican News Agency, PO Box 10039, Doornfontein, 2028. Please enclose your payment of the cover price plus 2 Rand per issue p.a.
Binders: These can be obtained at the shop where you bought this magazine.

SINGAPORE, MALAYSIA
Back issues and binders: These can be obtained at the shop where you bought this magazine.

DINOSAURI is published by Orbis Publishing Ltd
Griffin House
161 Hammersmith Rd
London W6 8SD
© 1994 Orbis Publishing

EDITORIAL & DESIGN by Tucker Slingsby
30 London House
66-68 Upper Richmond Rd
London SW15 2RP
N88 94 12 08
ISBN 0 7489 1688 1

Printed in Italy by Officine Grafiche De Agostini, Novara

IDENTIKIT



MANDSCHUROSAURUS

Herd of giant *Mandschurosaurus* roamed through the forests at the end of the Age of the Dinosaurs.

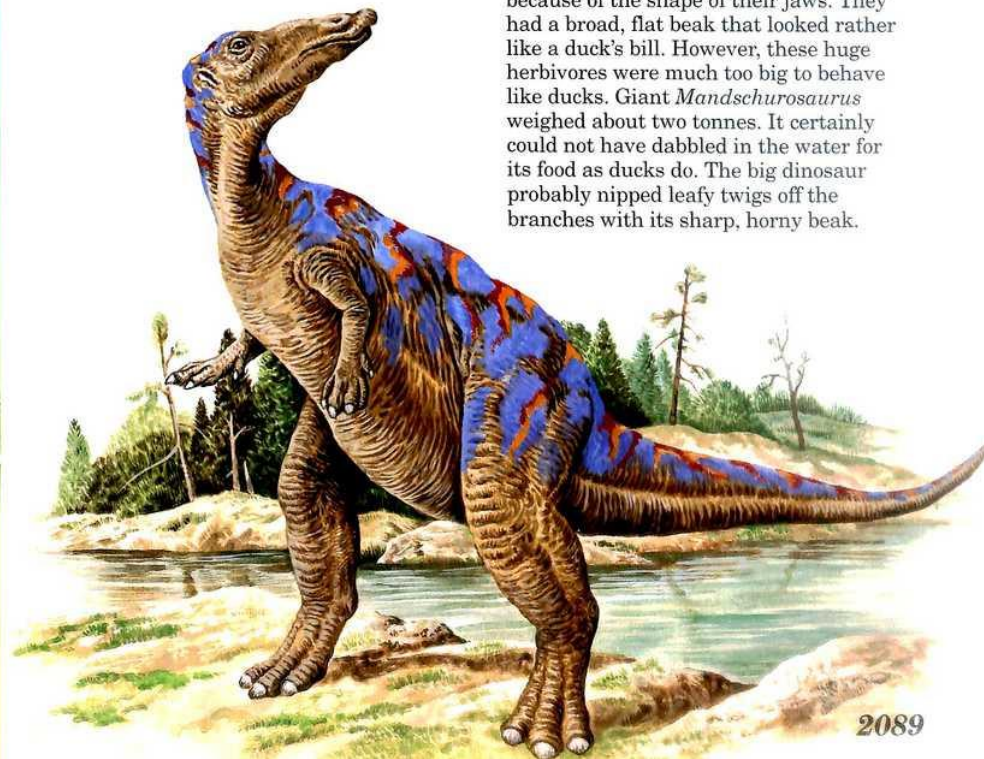
These huge dinosaurs were members of the most successful group of plant-eating dinosaurs – the hadrosaurs, or 'duckbills'. The hadrosaurs evolved in Central Asia. By the Late Cretaceous Period, they had spread right across the northern hemisphere.

UPS AND DOWNS

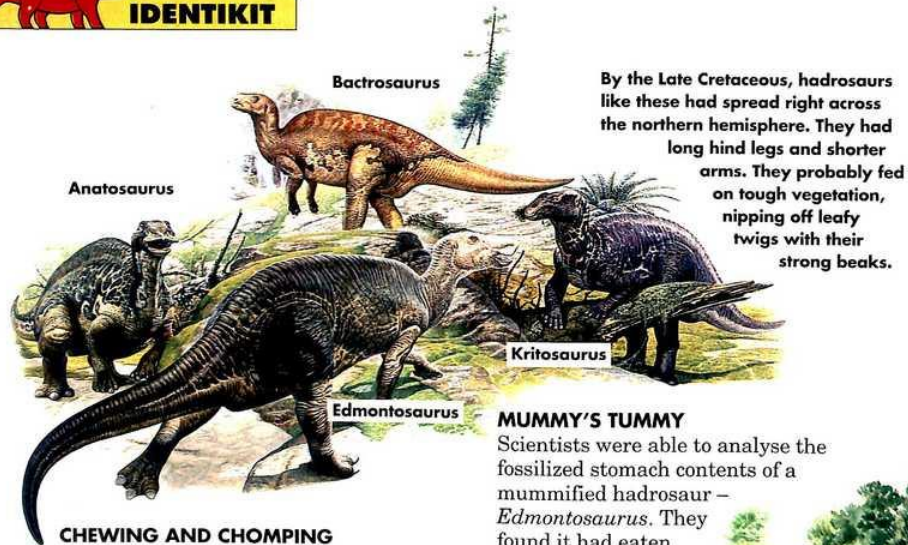
Hadrosaurs were divided into two families. They were called the hadrosaurine duckbills and the lambeosaurine duckbills. *Mandschurosaurus* was a hadrosaurine duckbill. Members of that family had flat heads, with crests or bumps of solid bone. The lambeosaurine duckbills looked much stranger. Their heads were topped with massive hollow crests.

DIPPING OR NIPPING

Hadrosaurs were nicknamed duckbills because of the shape of their jaws. They had a broad, flat beak that looked rather like a duck's bill. However, these huge herbivores were much too big to behave like ducks. Giant *Mandschurosaurus* weighed about two tonnes. It certainly could not have dabbled in the water for its food as ducks do. The big dinosaur probably nipped leafy twigs off the branches with its sharp, horny beak.



2089



By the Late Cretaceous, hadrosaurs like these had spread right across the northern hemisphere. They had long hind legs and shorter arms. They probably fed on tough vegetation, nipping off leafy twigs with their strong beaks.

CHEWING AND CHOMPING

Mandschurosaurus had hundreds of teeth in each jaw. They were arranged in long rows and set into strong bony tissue. This massive dinosaur could grind tough plants to pulp between these batteries of teeth. When the teeth wore down, new ones grew to replace them. Because hadrosaurs had self-sharpening teeth they were very efficient feeders. They could also tackle much tougher vegetation than most other plant-eaters.

MUMMY'S TUMMY

Scientists were able to analyse the fossilized stomach contents of a mummified hadrosaur – *Edmontosaurus*. They found it had eaten seeds, fruits, pine needles and twigs. *Mandschurosaurus* probably had a similar diet. Not only would it have munched the ferns and horsetails that flourished at the time, it probably also feasted on the many different flowering plants that were beginning to grow.

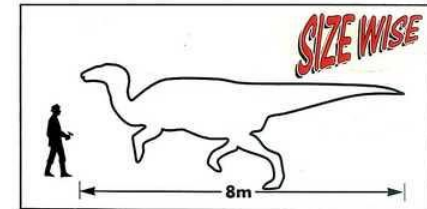
IT'S A FACT

FIRST FINDS

Mandschurosaurus was one of the earliest dinosaur fossils found in China. A well-preserved skeleton was excavated there by a Russian expedition between 1915 and 1917. It is now in St Petersburg.

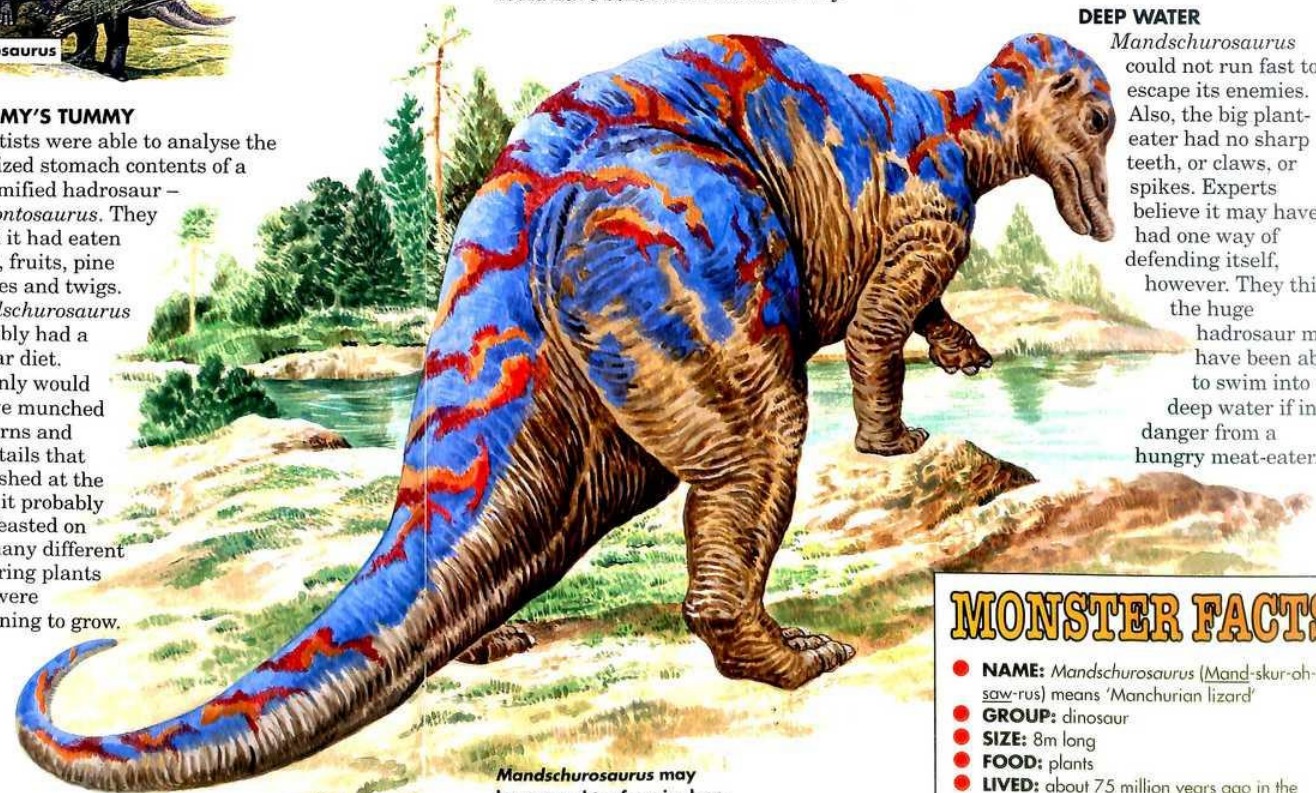
MASS MIGRATION

Like *Maiasaura*, whose name means 'good mother lizard', *Mandschurosaurus* may have lived in large herds. Experts have discovered hundreds of *Maiasaura* fossils together. They believe the hadrosaurs migrated north and south in search of fresh pastures, in huge groups numbering tens of thousands. *Mandschurosaurus* could have behaved in the same way.



DEEP WATER

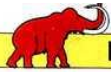
Mandschurosaurus could not run fast to escape its enemies. Also, the big plant-eater had no sharp teeth, or claws, or spikes. Experts believe it may have had one way of defending itself, however. They think the huge hadrosaur may have been able to swim into deep water if in danger from a hungry meat-eater.



Mandschurosaurus may have sought refuge in deep water if threatened by a meat-eater.

MONSTER FACTS

- **NAME:** *Mandschurosaurus* (Mand-skur-oh-saw-rus) means 'Manchurian lizard'
- **GROUP:** dinosaur
- **SIZE:** 8m long
- **FOOD:** plants
- **LIVED:** about 75 million years ago in the Late Cretaceous Period in northern China, Laos and Mongolia



PTERODAUSTRO

One of the most extraordinary pterosaurs that lived in the Cretaceous was *Pterodaustro*.

Not all pterosaurs had long, pointed jaws. *Pterodaustro* had a remarkable basket-shaped beak, which operated rather like a giant sieve.

JAWS

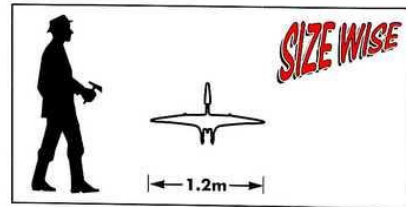
The jaws of *Pterodaustro* were 10 times longer than the rest of its skull. The upper jaw had a few short, blunt teeth. But the lower jaw had nearly 1,000 long, springy bristles, arranged like stiff hairs on a brush.

CHOP CHOP

Pterodaustro strained mouthfuls of water through these bristles. Tiny creatures caught in them were chopped up by the pterosaur's sharp back teeth.

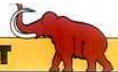
MONSTER FACTS

- **NAME:** *Pterodaustro* (ter-o-dow-stro) means 'southern wing'
- **GROUP:** pterosaur
- **SIZE:** 1.2m wingspan
- **FOOD:** shrimps
- **LIVED:** about 140 million years ago in the Cretaceous Period in South America



FLAMINGO FEEDER

Some experts believe that *Pterodaustro* flew low over the water and sieved for its food on the wing. But other experts disagree. They think the force of the water would have been too great. They believe that *Pterodaustro* probably stood in the shallows and scooped its food up in its beak, just as flamingos do today.



EOGYRINUS

Alligator-like *Eogyrinus* belonged to the amphibian group that may have been an ancestor of the reptiles.

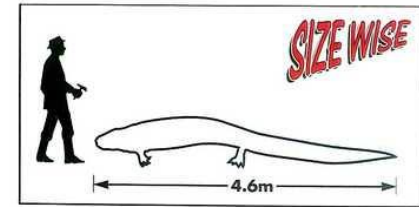
More than 300 million years ago, *Eogyrinus* hunted for fishes in the swamps of the coal forests. It was one of the larger labyrinthodonts. This group of animals flourished from about 180 to 350 million years ago. They were the first amphibians to live on dry land.

IN THE SWIM

Eogyrinus must have been a clumsy mover on land. Its legs were not long enough to lift its body off the ground. It probably dragged itself along. The big amphibian was really at home in the water. It would have swung its long, eel-like tail from side to side to power its way through the water.

BACK TO BACK

The first fossils of *Eogyrinus* were found in the coal mines of northern England in the 1870s. Scientists discovered that the labyrinthodont had an unusually long backbone. It had nearly twice as many vertebrae as most other amphibians.

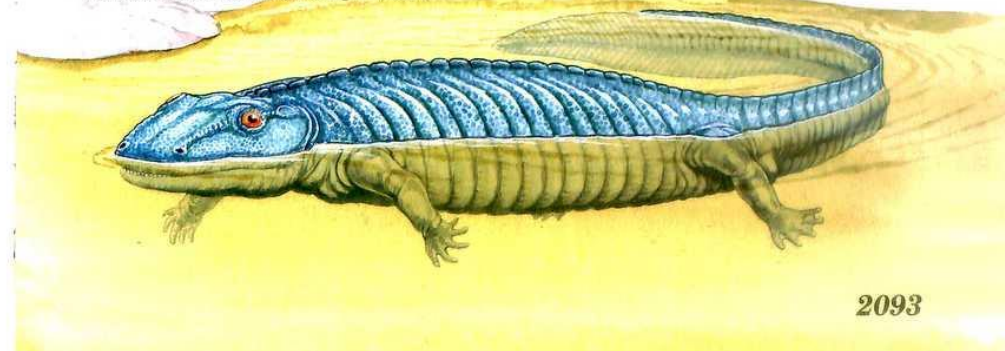


MONSTER FACTS

- **NAME:** *Eogyrinus* (ee-oh-ji-rine-us) means 'early frog'
- **GROUP:** amphibian
- **SIZE:** 4.6m long
- **FOOD:** fish
- **LIVED:** about 350 million years ago in the Late Carboniferous in England

BIG HEAD

Eogyrinus also had a much deeper skull than most other amphibians. It was closer to the shape of a crocodile's head. So it may have had a powerful crocodile-like bite.



Prehistoric pond-dipping

Let's take a trip back in time and go pond-dipping in the Age of the Dinosaurs. Would we recognise any of the creatures swimming there?



Have you ever been pond-dipping? You lie peacefully by the side of a pond, gently dip your net into the water and carefully tip the contents into a jar of water. As you study this mini-world of plants, prey and predators, think back to the Age of Dinosaurs. Amazingly, pond life then was not a great deal different from the plants and creatures you will collect in your jar today.

This prehistoric pond is full to the brim because the wet season has started. Creatures of all kinds are feeding and breeding here.

POND LIFE

In the wet season, prehistoric ponds teemed with life. Worms, such as *Spirorbis*, hid away in their stony tubes with just a tiny 'fan' of tentacles showing. These feathery tentacles trapped any food in the surrounding water. Strangely, today's *Spirorbis* live only in the sea and along the shoreline.

SHELLS GALORE

Many fossil molluscs have also been found. Pond snails, such as *Galba*, mated and laid ribbons of jelly-encased eggs on plant leaves, just as water snails do today. Ramshorn snails, like *Planorbina*, slithered along, eating their way through the vegetation. There were plenty of freshwater mussels, too. They filtered food from the water, as their relatives do today.

WATER FLEAS

The water flea *Cyzicus* rowed through the water with its long feelers. It strained tiny bits of food from the water with its legs. Like today's water fleas, such as *Daphnia*, it bred quickly, providing food for larger animals.

BREEDING GROUNDS

Amphibians, such as frogs, toads and the newts *Triassurus* and *Karaurus*, lived in the ponds that dinosaurs drank from. They laid their eggs in the water. Tadpoles hatched and fed on water plants, then on tiny animals. In turn, they were food for bigger hunters, like water beetles and fish.

UNDERWATER INSECTS

Many adult insects, such as mosquitoes, dragonflies, damselflies and caddis flies, probably laid their eggs in prehistoric ponds, as today. The eggs hatched into larvae, which lived and fed in the water. Caddis fly larvae made tubes out of vegetation and stones, to protect their bodies.

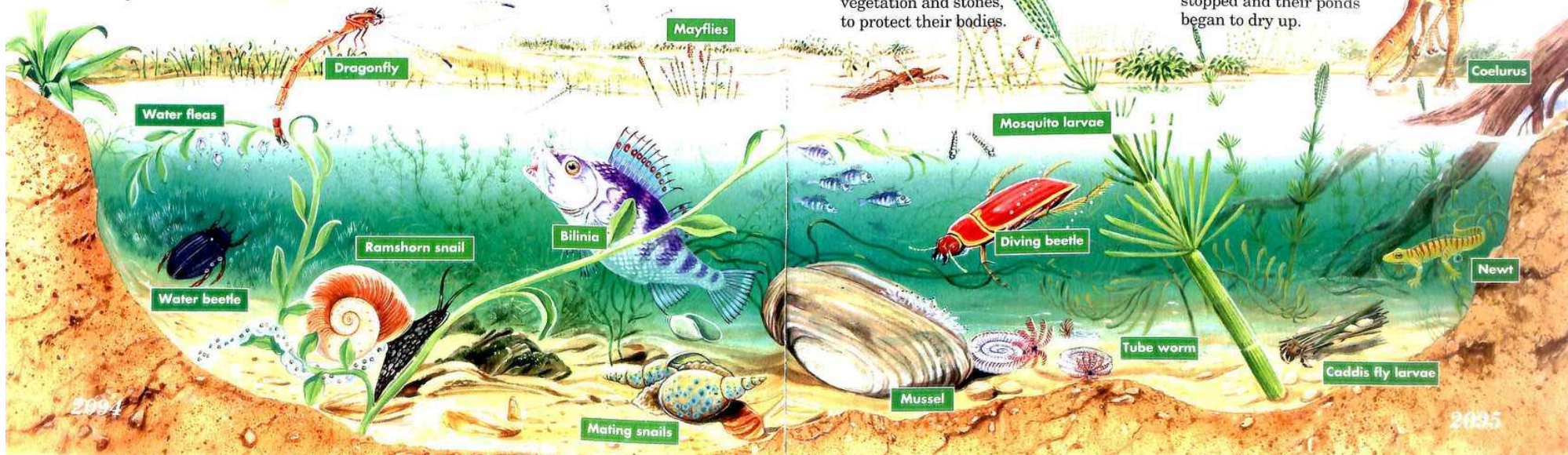
IT'S A FACT

MINIATURE FOSSILS

How do we know that pond life then was much the same as it is today? We can tell from the tiny fossils of water creatures that have been preserved in the same way as the bones of much larger animals such as dinosaurs. Their perfect details show that prehistoric pond animals were almost identical to their relatives today.

RULING THE PONDS

There were many pond fishes around in the Age of the Dinosaurs, such as the small perch-like *Bilinia*. These were the pond's top predators, and feared nothing. That is, until the rains suddenly stopped and their ponds began to dry up.



DRYING UP

When the dry season started, the prehistoric pools started shrinking and drying up. The pond animals learned to cope with this in many different ways.

STAYING PUT

Some animals, such as worms and mussels, burrowed into the mud or surrounded themselves with a slimy, protective cocoon. Others, like the pond snails, hid deep within the dark, damp vegetation at the bottom of the pools, waiting for the drought to end.

PROTECTIVE JELLY

Many, like frogs, toads and newts, produced eggs surrounded by jelly or protected by tough cases. These eggs hatched only when the dry season ended. Insects, such as the pond skater, took advantage of the drought and fed on any dying animal trapped in the pond.

When the dry season arrived, the pond started shrinking. The animals and plants coped with the changing seasons in different ways. Some lived on land instead of in the pond, others left to find a bigger pond, laid drought-resistant eggs, or just stayed put and tried to survive. As the pools dried up, dinosaurs moved off to look for new pastures.

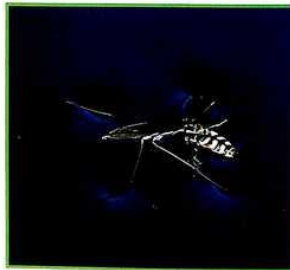
LET'S GO!

The tadpoles developed into frogs, toads or newts and crawled off into the undergrowth. Like today's amphibians, as adults they returned to the pond to mate and lay eggs.

UP, UP AND AWAY

Dragonfly and damselfly larvae crawled up the plant stems and split open their body cases. Out crawled the fully formed adults, ready to take to the air and escape.

Like the pond skaters of today (right), prehistoric pond skaters skimmed over the surface of the water, feeding on dying creatures.



FLYING OFF

The mayfly and caddis fly larvae also developed into free-flying adults. They were joined by the water beetle, as it flew away in search of a bigger, better pond.

Mosquito larvae (below) sweep food from the water with their brush-like mouthparts.



Like today's mussels (above), Cretaceous mussels held the two parts of their shells open and filtered the water for food.



NEVER-ENDING CYCLE

And so the pond's cycle of life was repeated, year after year. Dinosaurs came and went, but the mini-world of the pond carried on.

WATER WISE

Remember: water is dangerous. Always take an adult if you go pond-dipping.

Is it true that the pond is a world in itself – an ecosystem?

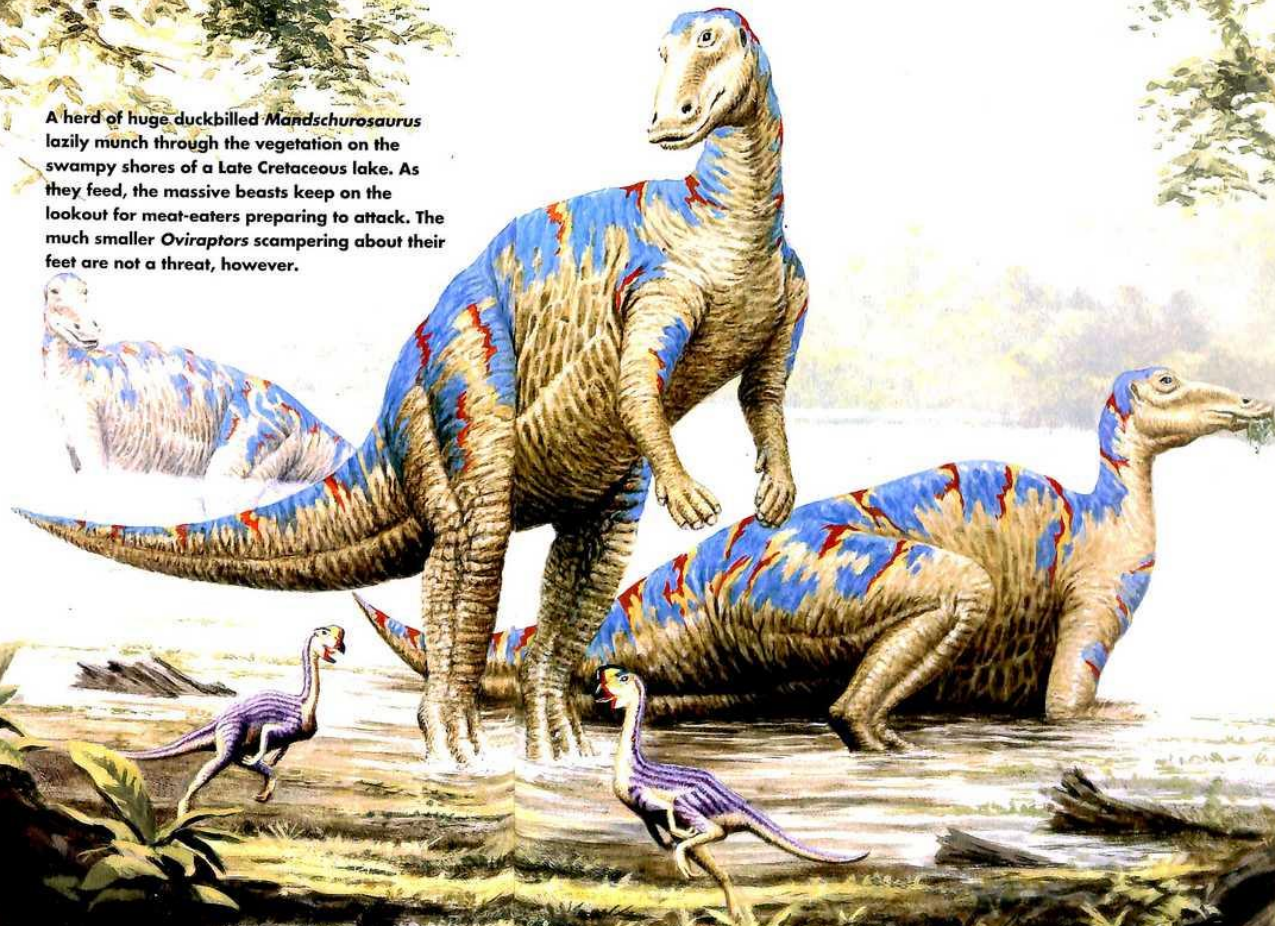
Yes, partly. Plants grow there, small herbivorous animals eat them, and predators eat the herbivores. It's a miniature watery jungle, with hunters just as fierce as in a real jungle. A group of living things growing and feeding together like this, in their surroundings, is called an ecosystem. But the pond is not completely self-contained. Frogs and newts come and go. Insect larvae grow up and fly away, then return to lay their eggs. Animals stand on the bank and eat the water plants, while tree leaves blow in and provide extra food. So the pond and the land around exchange nature's raw materials and nutrients.



GIANTS OF THE PAST

MANDSCHUROSOSAURUS

A herd of huge duckbilled *Mandschurosaurus* lazily munch through the vegetation on the swampy shores of a Late Cretaceous lake. As they feed, the massive beasts keep on the lookout for meat-eaters preparing to attack. The much smaller *Oviraptors* scampering about their feet are not a threat, however.



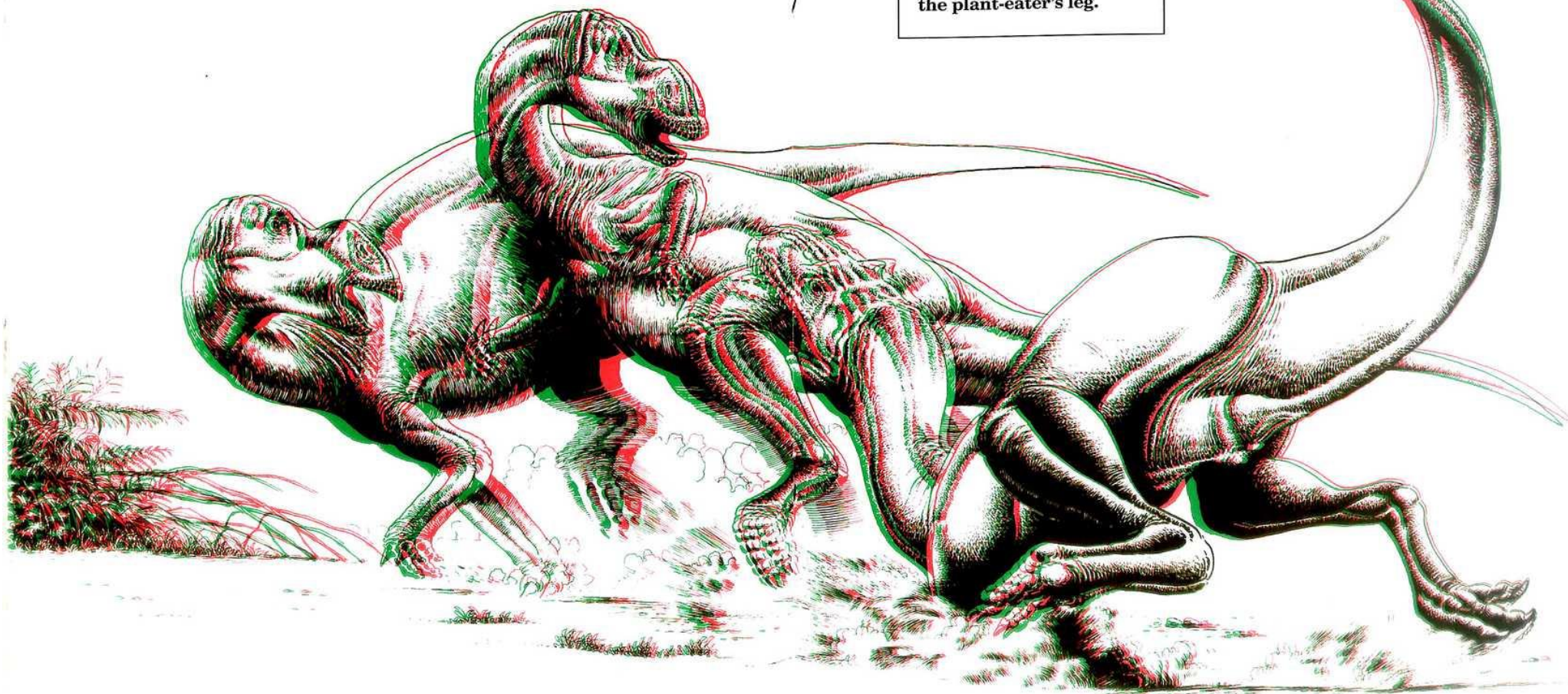
2098

2099

3-D Gallery 97

MUTTABURRASAUROS

An epic chase across the Mid Cretaceous Australian desert has finally come to an end. An exhausted *Muttaborrasaurus* shrieks out in terror and pain as *Allosaurus* sinks its razor-sharp teeth into the plant-eater's leg.



Dinomania

You may never own a dinosaur fossil, but you can still collect your own dinosaurs. Palaeontologist Mike Howgate has thousands of them.

When Mike Howgate was 10 years old, he made everyone in his family eat one brand of breakfast cereal for a whole year. This was so that Mike could collect the plastic models found in the bottom of each of the cereal boxes.

PREHISTORIC CEREAL

'There were 20 prehistoric creatures in the series,' he remembers. 'At one point I had about 40 or 50 *Dimetrodon*, but I never managed to collect the complete set.' Today, Mike has two or three thousand model dinosaurs. His 'dinomania' has made him into a serious collector, especially of models made in the 1950s, 1960s and 1970s. They range from small plastic toys that come free in cereal packets, to more expensive and very accurate dinosaur models. He often shows his collection at exhibitions.

PRIZED POSSESSION

Mike also has a vast collection of comics, stamps, postcards, cigarette cards and tea cards – all with dinosaurs on them. He even has one of the earliest-known illustrations of a dinosaur – a short, fat lizard-like *Megalosaurus*. This black-and-white print is probably the most valuable thing in his collection.

START A COLLECTION

There are plenty of dinosaur items to collect, from sweet wrappers and yoghurt pots, to rulers and pencils. If you want to start a collection of model dinosaurs, it's best to look for unusual ones. Most toy manufacturers make models of *T rex* and *Stegosaurus*, so try to find plastic models that aren't so common.

BARGAIN BUYS

Building up your dinosaur collection needn't be expensive. Mike recently paid very little for two unusual ones – a small *Psittacosaurus* and a *Saltasaurus* – in a local toy shop. Car boot sales, street markets and garage sales are also good places to begin dinosaur hunting. You never know what you might find.



2102

DINOSAUR RESCUE

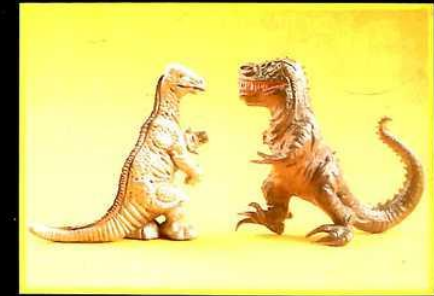
Mike has now started collecting old dinosaur models made from plaster. He rescues them from museums before they are thrown away and lost forever. 'Museums throw out these plaster models because they are no longer accurate,' says Mike. 'They are the original tail-dragging, swamp-dwelling monsters. But they are records of how we once thought those dinosaurs looked. They are part of dinosaur history.'

TREASURE TROVE

Mike has collected prehistoric things since he was six years old. He and his father used to search the local coal waste tips near his Yorkshire home for Carboniferous plant fossils. When the family went on holiday to Scarborough, Mike searched the beach for ammonites and belemnites. Then a local butcher gave him a 'treasure trove'. This was a box full of polished ammonites and other exciting finds. Mike was thrilled and this led to a lifelong interest. Mike decided to study geology and palaeontology when he grew up.

THE HUNT IS ON

Today, Mike is still collecting. About six years ago, the breakfast cereal dinosaurs were reissued and Mike managed, at last, to collect the full set. These little plastic dinosaurs have become the favourite items in his collection. But he hasn't finished yet; he is still hunting and hoping for a rare dinosaur to add to his unique collection.



These *T rex* and *Iguanodon* models (above) were produced in East Germany in the 1960s. They are now collector's items.

This superbly detailed 1992 model (below) shows a *Velociraptor* chasing some early mammals around a tree stump.



The colourful dinosaur models along the bottom of this page were given away with every eight gallons of petrol at garages across the USA during the 1950s.



2103

Fossil treasure

Ever since fossils were first discovered, people have collected them. Today, fossils are worth a lot of money. What problems has this caused and how can we deal with them?

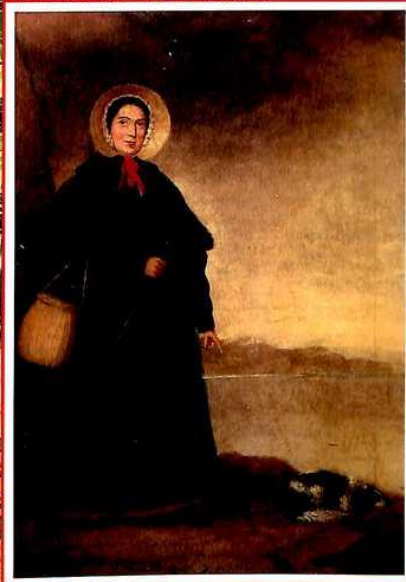
People have been collecting fossils for thousands of years. Throughout most of that time, fossilized bones and shells were seen as strange curiosities of nature. In the 1600s, wealthy families held social evenings displaying 'cabinets of curiosities', where fossils were objects of entertainment and amusement.

ANCIENT LIFE
Early scientists soon began to realise that fossils were not just curiosities, but were in fact the bones, teeth and shells of animals that lived on Earth many millions of years ago.

WORLDWIDE SEARCH
This sparked off a global treasure hunt. Scientists and collectors started searching quarries and cliffs for fossils. A great deal of what we know about the prehistoric world and the animals that lived there comes from finds made by the early fossil hunters.



Earl Douglass, the famous American dinosaur detective (left), with a Diplodocus skeleton being excavated in 1922. Millionaire businessman Andrew Carnegie presented plaster casts of Diplodocus to many museums.



Mary Anning (above) and her family sold their fossil collections for many hundreds of pounds. Without collectors like Anning, palaeontologists would not know so much about fossils. Many of the specimens she found can still be seen in museums.

Brachiosaurus (main picture) is as long as a tennis court and as high as a house. A nearly complete skeleton was found in eastern Africa in 1907. Finds like this were so exciting that more and more people became interested in fossils.

FOSSIL MANIA
About 150 years ago, the first dinosaurs were found in England by Gideon Mantell and William Buckland. Soon after, the great dinosaur hunt was on in the USA. Collectors, such as Edward Cope and Othniel Marsh, supplied museums with tonnes of dinosaur bones. By the early 1900s, dinosaurs had been found on every continent

RICH PICKINGS
Early collectors quickly realised there was money to be made from fossils. By 1820, Mary Anning and her family were collecting the skeletons of ichthyosaurs and other extinct sea reptiles from the Jurassic cliffs at Lyme Regis in England.

IT'S A FACT

SUNK WITHOUT TRACE
More and more people are buying rare fossils for their own private collections. Recently, a man bought a perfectly preserved Jurassic ichthyosaur fossil for thousands of pounds, just to build it into his swimming pool. What if it is a new species, or shows the fossilized remains of its last meal? Palaeontologists will never know. Museums always encourage fossil dealers to show them their specimens before they are sold.

Is it true that *T rex* was arrested?

Yes. In 1992, a *T rex* was arrested. The skeleton (named Sue by its discoverers) had been collected in American 'Indian territory', without the full permission of the local Native Americans. When the FBI started to investigate the case, they found out that the land belonged to the American government. Poor old Sue was boxed up and taken away. It is to be hoped that no harm will come to the fragile bones while her fate is being decided.

MARKET TRADE
Some of the stolen fossils disappear forever, probably into private collections. Others have been known to turn up on local market stalls.

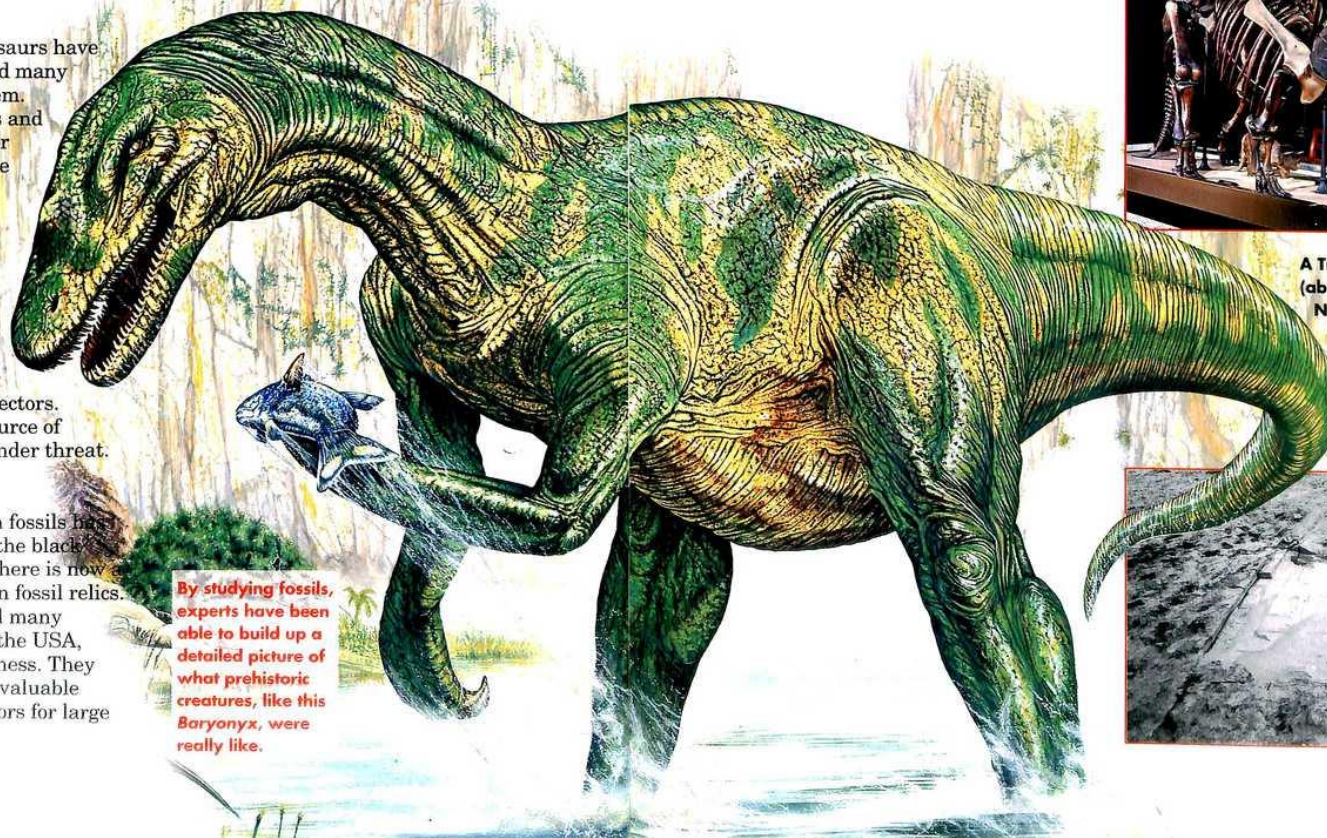
LOST AND GONE
Whether the specimens are sold or are taken for private collections, the outcome is the same. Fossils have been lost to science forever, and unique evidence is often destroyed when the fossil is removed.

SEEKING PERMISSION
In Britain, you usually have to ask the landowner before entering a private quarry or climbing a cliff to look for fossils. Landowners are worried about damage caused by fossil hunters digging away the rocks. Many now realise how much fossils can be worth and ask for money for those found on their land. Fossils can be gathered from seashores without permission, and these are often the best places anyway. In the USA, collecting has been banned in some areas to prevent further damage.

NEW RULES
Palaeontologists and collectors now agree that laws and rules are needed to stop damage to fossil sites, and illegal collecting. Special codes are currently being drawn up for many fossil sites, giving guidelines on how fossils should be collected. If everyone follows these basic rules, then there should be enough fossils for everyone to study and enjoy.

ANY OLD BONES
Over the past few years, dinosaurs have become even more popular, and many more people are collecting them. Because of this, fossil hunters and museums want more bones for their collections. Museums are still buying skeletons from professional collectors and dealers, but now they pay tens or even hundreds of thousands of pounds. Dinosaur bones are rare in most parts of the world. This means that the best places to find them are being visited by more and more collectors. Sites that were once a rich source of dinosaur fossils are coming under threat.

FOSSIL RAIDERS
This growing fascination with fossils has also led to a dramatic rise in the black market for these treasures. There is now thriving international trade in fossil relics. Fossil thieves have plundered many private sites in England and the USA, often under the cover of darkness. They have illegally removed many valuable fossils, selling them to collectors for large amounts of money.



By studying fossils, experts have been able to build up a detailed picture of what prehistoric creatures, like this *Baryonyx*, were really like.



A *Triceratops*' skeleton (above), on display at The Natural History Museum, London.

All that's left (below) after thieves removed an *Iguanodon* footprint from the Isle of Wight.



GERTIE AND THE PETRIFIED FOREST

JOHN MUIR WAS A CELEBRATED EXPLORER. IN 1906, WHEN HE WAS 70, HE BEGAN TO SPEND MORE AND MORE TIME IN THE PETRIFIED FOREST OF ARIZONA.

I LOVE THE DEEP SILENCE OF THESE ENCHANTED OLD FORESTS. THEY MUST NEVER BE DESTROYED.

MUIR DECIDED TO WRITE TO PRESIDENT THEODORE ROOSEVELT.

WHO IS THIS GUY MUIR, MR. PRESIDENT?

HE'S AN EXPLORER, AND A VERY PERSUASIVE WRITER. I PROPOSE TO MAKE THE AREA HE'S TELLING ME ABOUT A NATIONAL MONUMENT!

BY 1958, THE FOREST HAD BECOME POPULAR WITH AMATEUR PALAEOANTOLOGISTS. LATER, IN 1962, IT WAS NAMED THE PETRIFIED FOREST NATIONAL PARK.

WHAT IS IT, POP?

JUMPING JOHN WAYNE! LOOK AT THIS, SON!

WELL, I'LL BET YOU A DIME TO A DATE WITH DORIS DAY THAT IT'S A FOSSIL OF SOME OLD ANIMAL!

OVER THE YEARS, 200 SPECIES OF FOSSIL PLANTS AND 60 ANIMALS WERE FOUND IN THE PARK, BUT STILL THERE WAS NO CONCLUSIVE PROOF THAT DINOSAURS HAD LIVED THERE, UNTIL...

IN 1982, ANN AND ROBERT PRESTON WERE SEARCHING THE PARK FOR PROOF OF THEIR THEORY THAT PREHISTORIC MAN HAD CARVED ASTRONOMICAL OBSERVATIONS IN THE STONES...

NOTHING HERE, ROBBIE.

LET'S LOOK IN THOSE HILLS, OVER THERE!

TO THEIR ASTONISHMENT, THEY FOUND THAT THE HILLS WERE COVERED IN BITS OF FOSSILIZED REPTILE BONES.

WHAT ON EARTH ARE THESE?

HEAVEN KNOWS!

MIND IF WE LOOK AROUND HERE?

THE GROUP WERE ON A FIELD TRIP FROM THE CALIFORNIA MUSEUM OF PALAEOANTOLOGY.

WOW! THIS LOOKS LIKE A BIT OF A CROCODILE TO ME!

AND THIS IS SOME SORT OF AMPHIBIAN!

ALTHOUGH THERE WERE LITERALLY HUNDREDS OF THOUSANDS OF BITS OF BONE, THE TEAM EVENTUALLY FOUND THE ALMOST COMPLETE SKELETON OF A SMALL THERAPOD DINOSAUR.

THE TEAM MOVED ON TO A PART OF THE PARK CALLED LOT'S WIFE, AND DISCOVERED MORE EVIDENCE THAT DINOSAURS HAD ONCE LIVED THERE.

OVER HERE, SIR-LOOK AT THIS!

GOOD LORD! IT'S PART OF A COELOPHYSIS!

AND WHAT THE HECK IS THIS?

IT LOOKS LIKE SOME SORT OF STAUROKOSAUR!

COLBERT FOUND ONE IN SOUTH AMERICA IN 1970. IF I'M RIGHT, THIS IS THE FIRST ONE THAT'S EVER BEEN FOUND IN NORTH AMERICA!

THE TEAM FROM CALIFORNIA HAD, INDEED, UNEARTHED AN UNKNOWN SPECIES OF STAUROKOSAUR, THE FIRST TO BE FOUND IN NORTH AMERICA.

STILL OFFICIALLY UNNAMED, IT IS KNOWN AS 'GERTIE' - A CARTOON DINOSAUR THAT APPEARED IN AMERICAN CINEMA'S MANY YEARS AGO.

GERTIE

Improve and test your knowledge with...

FACT FILE

Fascinating facts to read and 10 fun questions to answer!

1 The dinosaur found in the petrified forest is known as:
a) Gertie
b) Dinah
c) Rocky

2 Caddis fly larvae make protective tubes out of:
a) mud
b) vegetation and stones
c) dead insects

3 Hadrosaurs had self-sharpening:
a) teeth
b) claws
c) horns

4 *Therizinosaurus*' claw was shaped like:
a) a dagger
b) a knitting needle
c) the blade of a sickle

5 *Charcharodontosaurus* was named after:
a) a great white shark
b) a Latin American dance
c) burnt tooth remains

6 *Pterodaustro* had a beak full of:
a) sharp teeth
b) poisonous spines
c) bristles

7 *Scutellosaurus* was the size of:
a) a mouse
b) a dog
c) a rabbit

8 *Cyzicus* rowed through water with:
a) small twigs
b) its long feelers
c) its back legs

9 The name *Eogyrinus* means:
a) 'huge rhinoceros'
b) 'early frog'
c) 'clumsy crocodile'

Jaws!

The *Megalosaurus*-like meat-eating dinosaur, *Charcharodontosaurus*, was named after the man-eating great white shark *Charcharodon*. This shows how vicious Dr E. Sromer believed it to be when he discovered it in 1931.

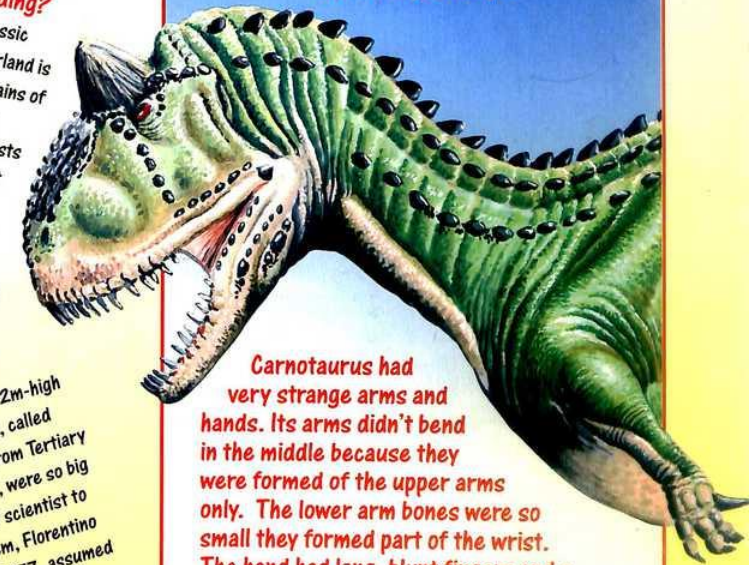
Breeding or feeding?

A skeleton of a Triassic nothosaur from Switzerland is surrounded by the remains of several very small nothosaurs. Some scientists think that this is a parent that died giving birth. Others think they are different species - the smaller ones feeding on the dead body of the larger.

Big bird

The remains of a 2m-high flightless bird, called *Phorusrachus*, from Tertiary South America, were so big that the first scientist to discover them, Florentino Ameghino in 1877, assumed that they belonged to some kind of mammal.

Arm mystery!

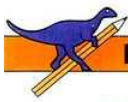


Carnotaurus had very strange arms and hands. Its arms didn't bend in the middle because they were formed of the upper arms only. The lower arm bones were so small they formed part of the wrist. The hand had long, blunt fingers and a thumb spike. Exactly how *Carnotaurus* used its well-muscled but tiny arms remains a mystery.

Colour clue

Holxmaden in Germany is famous for its ichthyosaur fossils. Around each skeleton in the rock is a black carbon shape, showing what the soft parts of the animal looked like. Scientists have even found traces of the original pigment cells, and these suggest that an ichthyosaur was a tortoiseshell colour.

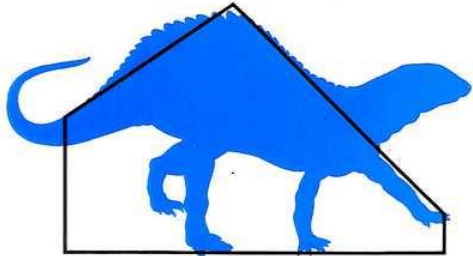
10 Andrew Carnegie had plaster casts of *Diplodocus* made to:
a) give to museums
b) display in his garden
c) frighten away burglars



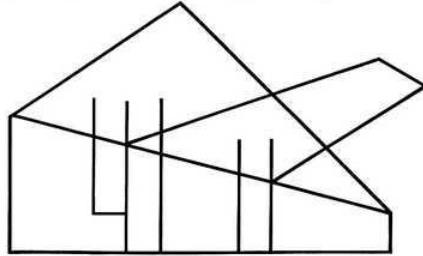
HOW TO DRAW

SCUTELLOSAURUS

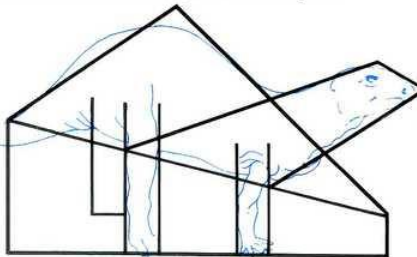
1 With a pencil, draw the basic shape of *Scutellosaurus*, using straight lines. Don't worry about any details yet.



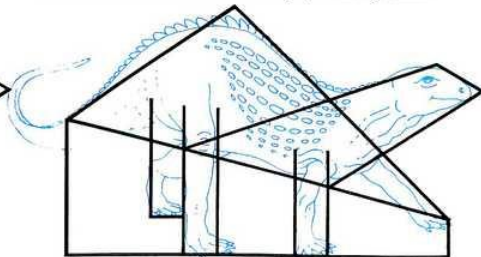
2 Draw shapes to mark the positions of the head and the main part of *Scutellosaurus'* body. Next, mark where the legs should go.



3 Using the basic outline you've created, begin drawing in the main details of the dinosaur's body, mouth and eyes.



4 Now finish off all the little details. Add lines and rows of scales to show the texture of the dinosaur's tough, wrinkly skin.



Fact box

Scutellosaurus was a dog-sized plant-eater with a lightly armoured back.

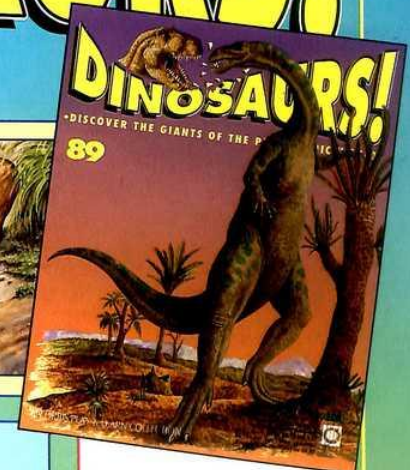
- **NAME:** *Scutellosaurus* (Skoo-tell-oh-saw-rus) means 'small-scaled reptile'
- **GROUP:** dinosaur
- **SIZE:** 1.3m long
- **FOOD:** low-lying plants
- **LIVED:** about 195 million years ago in the Early Jurassic Period in Arizona, North America

2112

COMING IN PART 89 OF

DINOSAURS!

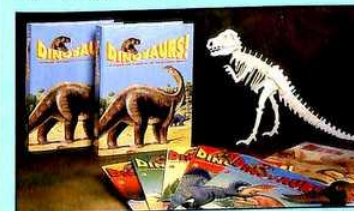
What does a palaeontologist do? Find out in **TIME DETECTIVE**. Read all about dinosaur digestion in **PREHISTORIC WORLD**.



Keep your DINOSAURS! safe

Keep your copies safe and neat with these fantastic binders.

Your binders have been designed to look good at home or at school. Each is sturdy and hardwearing – it even has a wipe-clean cover – and holds 13 issues. You'll want to use your **DINOSAURS!** collection again and again – for reference, for school projects, or just for fun. So don't let your copies go missing; keep them in your own set of binders.



DINOSAURS! binders are now available and cost just £4.95 (including £1 p&p). Please refer to the information on the inside front cover or telephone 0424 755755 for details.

PLUS

Three fascinating prehistoric creatures in **IDENTIKIT** and **SPOTTER'S GUIDE 3-D GALLERY HISTORY IN PICTURES**

PICTURE CREDITS: Front Cover: Philip Hood/WLAA; Raimund Cramm GDI/Bruce Coleman 2097R; Kim Taylor/Bruce Coleman 2096I, 2097 T; James Duncan 2102-3; Site of Wright Geological Museum 2107B; The Natural History Museum/London 2090T, 2103R, 2107R; J. Silbick/The Natural History Museum 2112B; Special Collections/University of Utah 2104B; Artwork: Mike Doney 2108-9; Ben Edwards 2094-95, 2096-97; Philip Hood/WLAA 2089, 2090-91; Neil Lloyd 2106-7; Bob Mathias 2112I; Deidre McHale BC; Andie Peck 2098-99; Graham Rosemore 2092, 2093; Chris West/Bloch Hat 2104-5; Steve White 100-2101, 2111R.

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



Dr David Norman of Cambridge University answers your dinosaur questions

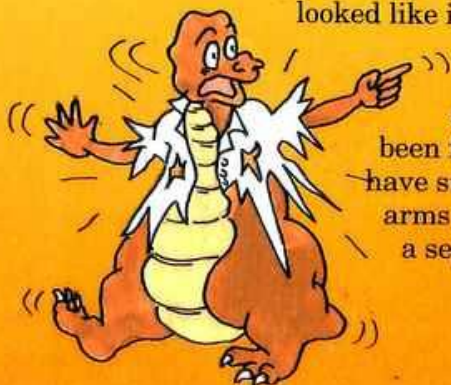
ASK THE EXPERT

What kind of animal was a phytosaur?

Phytosaurs lived during the Late Triassic. They looked like crocodiles and lived like them, too. The one really obvious difference between crocodiles and phytosaurs is the position of the nostrils. In crocodiles, the nostrils are on the tip of the snout, but in phytosaurs they are on top of a mound, which looks a little like a volcano, just in front of the eyes.

Which dinosaur had the biggest claw?

The largest claw that I have ever seen is in the Palaeontology Institute in Moscow. It belongs to a dinosaur named *Therizinosaurus*. The claw is shaped like the blade of a sickle and is about 50cm long. Quite what this animal



looked like is a puzzle, because only its arms have been found. Some have suggested the arms belonged to a segnosaur.

Is it true that the ancient Greeks found dinosaur bones?

No, almost certainly not. Greek philosophers, such as Aristotle, certainly knew of the existence of fossils, mostly sea shells, but they would not have been familiar with dinosaur bones. The Chinese were the earliest people likely to have seen dinosaur bones. Indeed, many thousands of years ago fossil bones were discovered in Sichuan Province. The Chinese thought they were parts of dragon skeletons, and collected the teeth because they were believed to possess magical powers. In fact, these skeletons probably belonged to dinosaurs.

