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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD

80



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

EDITORIAL & DESIGN by
Tucker Slingsby
3G London House
66-68 Upper Richmond Rd
London SW15 2RP

N80 94 10 13
ISBN 0 7489 1680 6

Printed in Italy by Officine Grafiche De Agostini, Novara

DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •



IDENTIKIT

Meet three more amazing prehistoric creatures

AMEBELODON	1897
PROCERATOSAURUS	1900
DESMATOSUCHUS	1901

PREHISTORIC WORLD

Put dinosaurs on the map in
ATLAS OF FINDS: EUROPE 1902



SPOTTER'S GUIDE

Test your knowledge and see if
you can SPOT THE DINO 1910

TIME DETECTIVE

What did dinosaurs really look
like? Discover how opinions
differ in THE CHANGING
FACE OF STEGOSAURUS 1912



HISTORY IN PICTURES

A DAY IN THE LIFE OF
DILOPHOSAURUS 1916



HOW TO DRAW

Add to your dino drawing
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ASK THE EXPERT

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

PLUS

GIANTS OF THE PAST

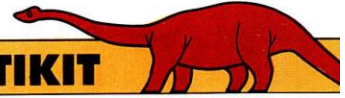
A baby *Amebelodon* is in danger
from a big cat 1907

3-D Gallery

Stegosaurus is ambushed by two
Allosaurus 1908

FACT FILE

More fascinating trivia and the
weekly quiz 1918



AMEBELODON

Amebelodon had the two tusks we see on elephants today, plus two massive shovel-shaped tusks.



Great areas of grass covered much of the world during the Late Miocene, 10 million years ago. These grassy plains were criss-crossed by broad rivers that teemed with a wide variety of plant life. *Amebelodon* was a 7m-long elephant that used its amazing tusks like the scoop of an earth-mover – to plough up the plants that lived in the shallow water.

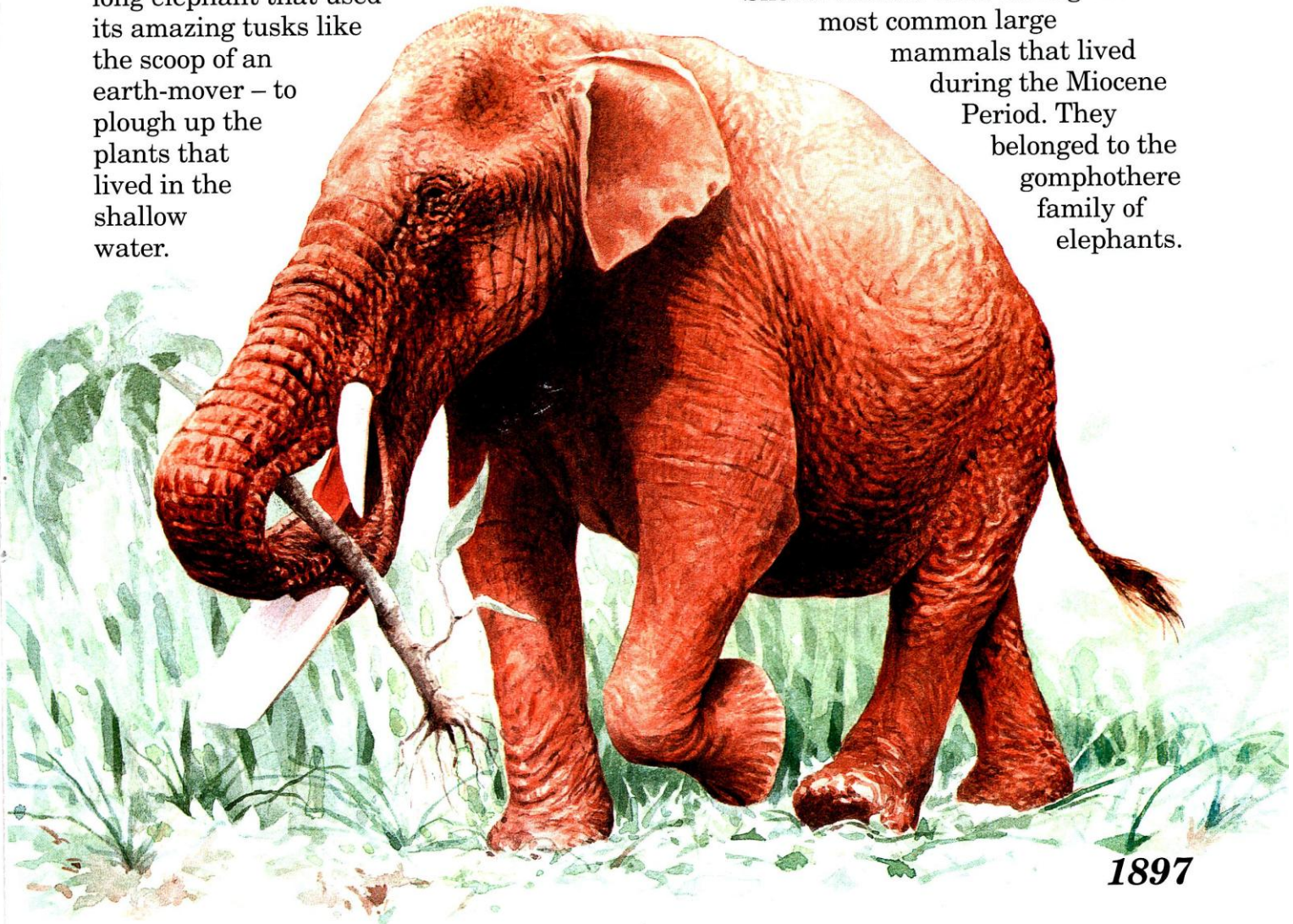
AGE OF THE ELEPHANTS

The first elephants lived in Africa. They looked more like today's pygmy hippopotamus than elephants. Later, elephants were much larger and had tusks. They fed on plants and became very successful. Soon they spread all over the world. By the Miocene there were dozens of different types roaming the plains.

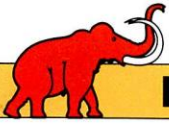
BIG TUSKER

Amebelodon was a 'shovel-tusker'.

Shovel-tuskers were among the most common large mammals that lived during the Miocene Period. They belonged to the gomphothere family of elephants.



1897



IDENTIKIT



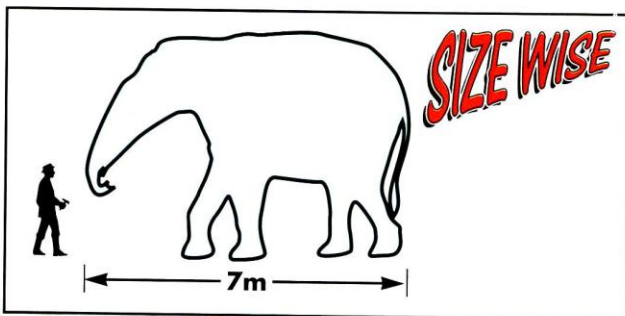
Amebelodon had a second set of tusks, which were shaped like shovels. It used them to scoop up food, just as an earth-mover scoops up earth.

SPADE BLADE

Amebelodon got its name because of its tusks – the name means ‘blunt weapon tooth’. The two strange tusks on the lower jaw of *Amebelodon* formed a wide cutting tool. Each flattened tusk looked rather like a spade and ended in a sharp blade. *Amebelodon* used its knife-like tusks to slice through large clumps of vegetation when it ate. It may also have used its tusks to dig up the ground to get to delicious plant roots.

TERRIFIC TRUNKS

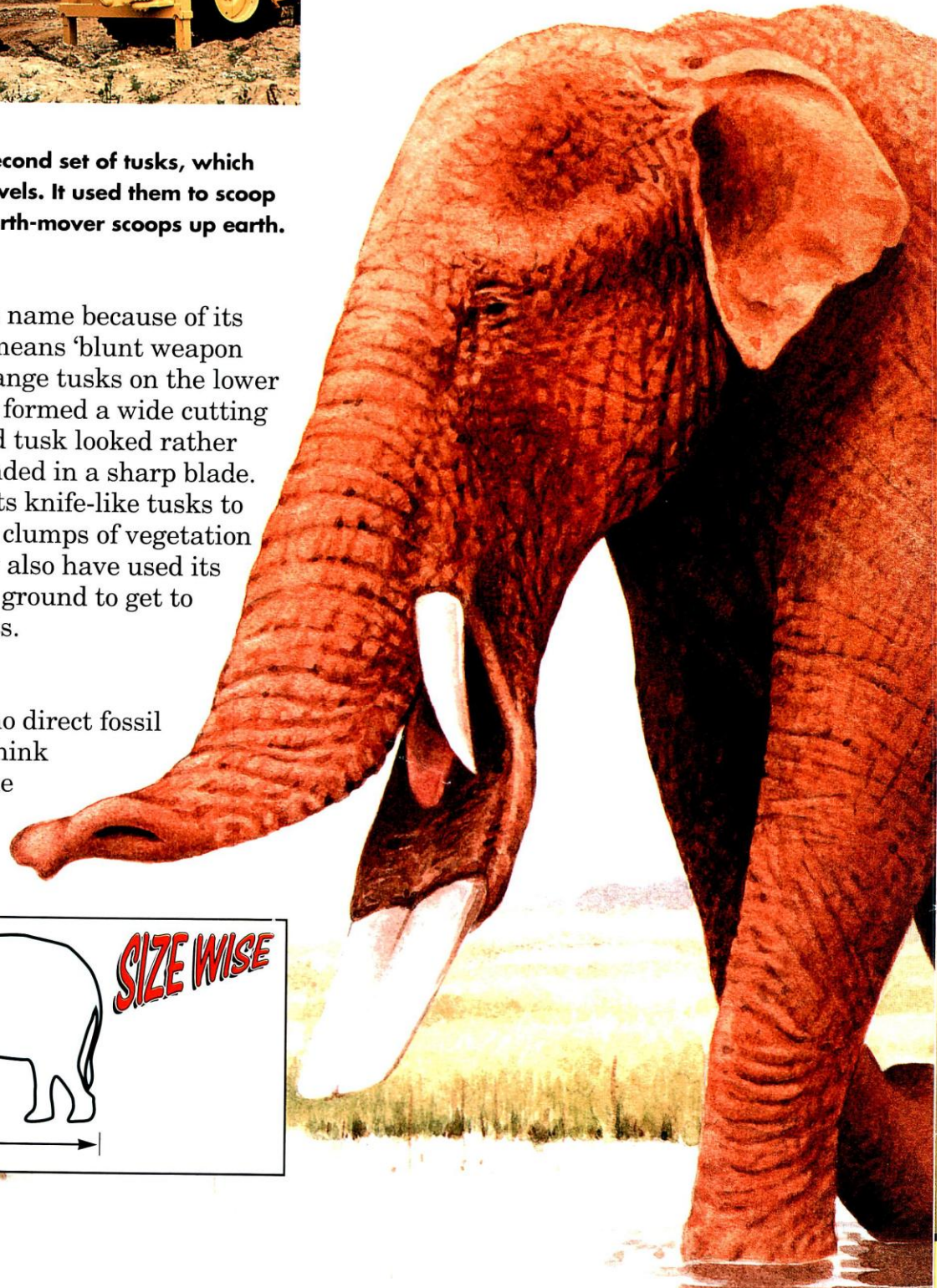
Although there is no direct fossil evidence, experts think *Amebelodon* had the same kind of flexible trunk as today’s elephant.

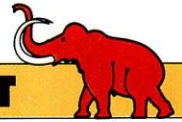


1898

PACK IT IN

After it had sliced off vegetation with its tusks, *Amebelodon* probably used its trunk to pick up clumps of plants and push them up into its mouth. *Amebelodon* may also have used its trunk to drink water, just like today’s elephants.





GENTLE GIANTS

Apart from its shovel tusk, *Amebelodon* was very much like today's elephant. It was about the same size and it had the same shaped body. The prehistoric mammal also had the same long, pillar-like legs to support its great weight.

Amebelodon was a peaceful grazer and, like today's elephants, it was probably a sociable animal and may well have lived in a herd. Family members probably stayed together all their lives.

MONSTER FACTS

- **NAME:** *Amebelodon* (am-eh-bel-oh-don) means 'blunt weapon tooth'
- **GROUP:** mammal
- **SIZE:** up to 7m long
- **FOOD:** water plants
- **LIVED:** about 10 million years ago in the Late Miocene in North America

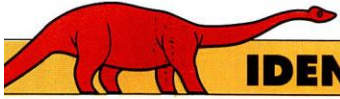
ALL CHANGE

Amebelodon's tusks were ideally suited to scooping up water plants. When the climate changed and the rivers dried up, *Amebelodon* was in trouble. The shovel-tuskers could not adapt to eat anything except plants and they died out, to be replaced by today's elephants.

A mother and baby *Amebelodon* stroll down to the river to feed on the succulent water plants. The baby's tusks are nowhere near full size, but they can scoop up enough food to satisfy his appetite.



1899



PROCERATOSAURUS

Proceratosaurus was a fierce meat-eater with strong jaws and teeth.



Proceratosaurus' skull was discovered in England in 1910. Experts disagree about which meat-eaters are its closest relatives. Some believe it is an ancestor of the ceratosaurs and some that it is one of the earliest tyrannosaurs.

MONSTER FACTS

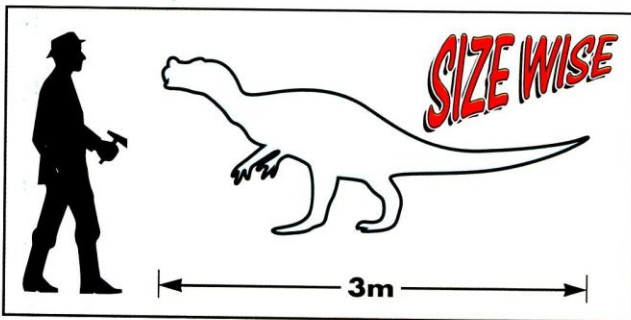
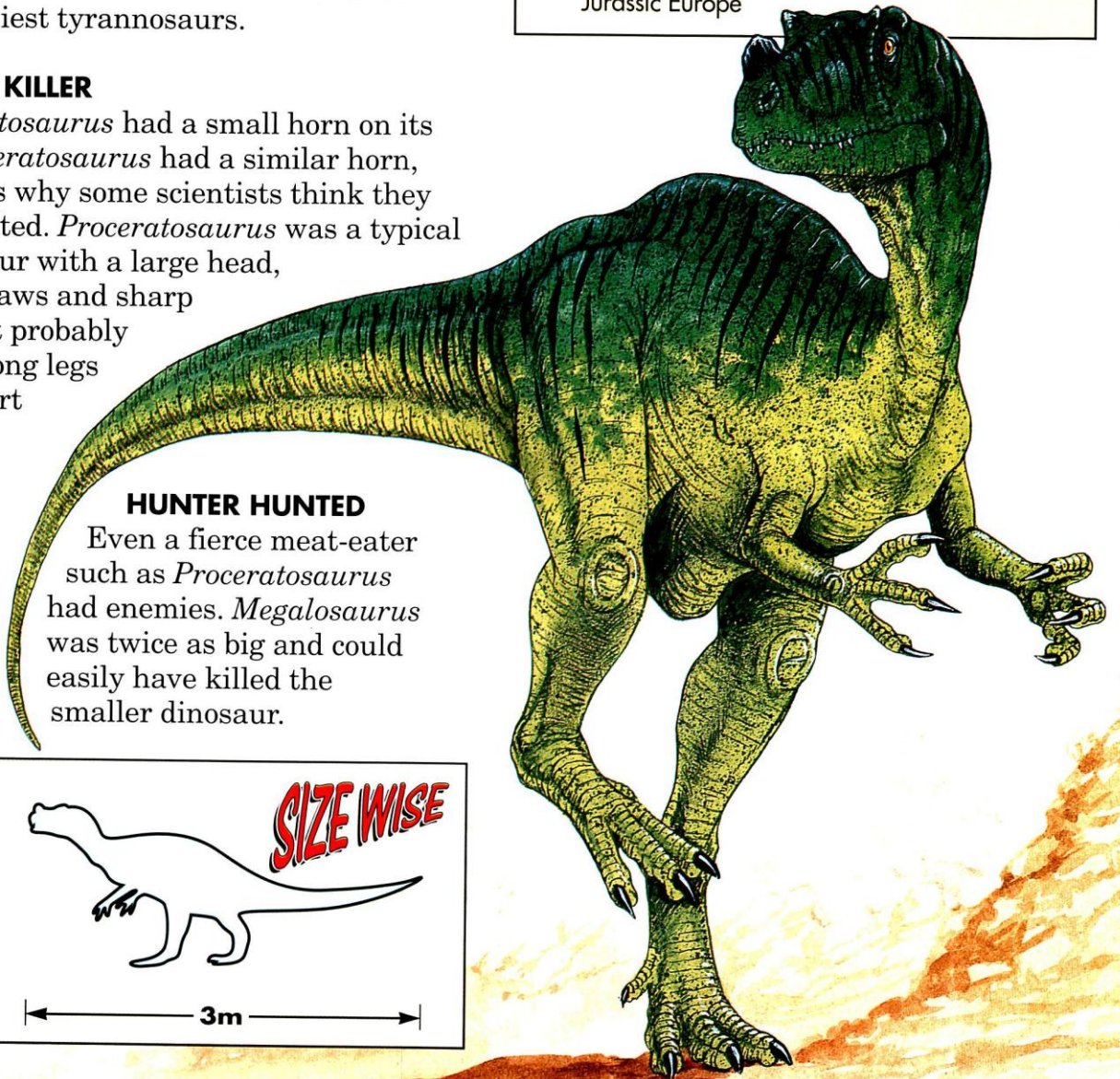
- *Proceratosaurus* (pro-ser-at-oh-saw-rus) means 'before Ceratosaurus'
- **GROUP:** dinosaur
- **SIZE:** up to 3m long
- **FOOD:** meat
- **LIVED:** 200 million years ago in Mid Jurassic Europe

NOSEY KILLER

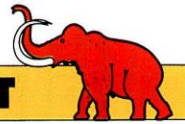
Proceratosaurus had a small horn on its nose. *Ceratosaurus* had a similar horn, which is why some scientists think they are related. *Proceratosaurus* was a typical carnosaur with a large head, strong jaws and sharp teeth. It probably had strong legs and short arms.

HUNTER HUNTED

Even a fierce meat-eater such as *Proceratosaurus* had enemies. *Megalosaurus* was twice as big and could easily have killed the smaller dinosaur.



1900



DESMATOSUCHUS

Millions of years ago, giant armoured reptiles roamed the land.



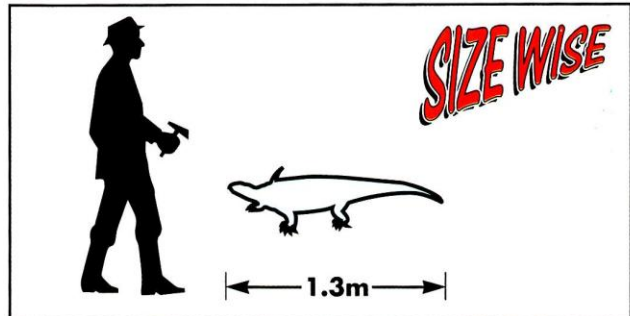
The two curved horns on its back made *Desmatosuchus* one of the fiercest looking plant eaters. This tank-like creature was an aetosaur. They were a group of armoured reptiles that lived in the Late Triassic Period.

SHELL SHOCK

Desmatosuchus had plates of bone covering its back, tail and part of its stomach. A pair of tusk-like spines jutted out from its shoulders. Its bony armour would have deterred larger carnivores, such as *Ornithosuchus*, from attacking it.

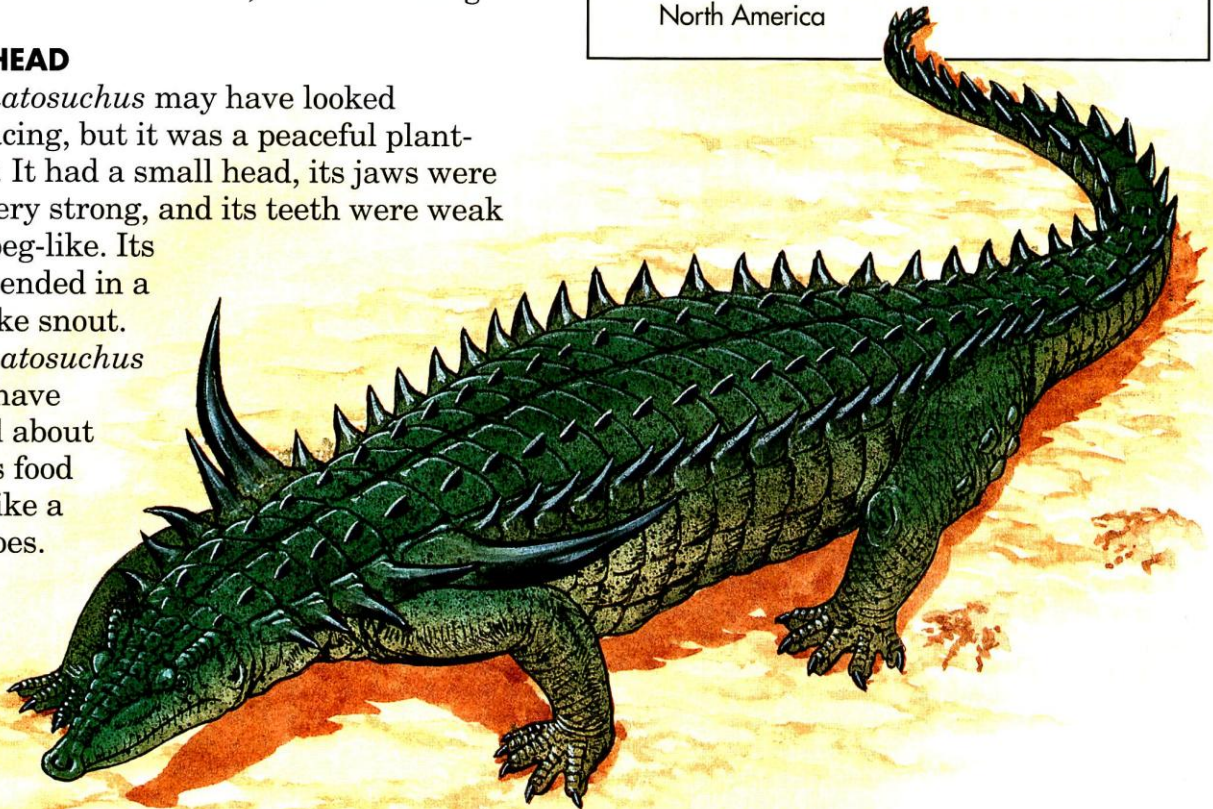
PIN HEAD

Desmatosuchus may have looked menacing, but it was a peaceful plant-eater. It had a small head, its jaws were not very strong, and its teeth were weak and peg-like. Its head ended in a pig-like snout. *Desmatosuchus* may have nosed about for its food just like a pig does.



MONSTER FACTS

- **NAME:** *Desmatosuchus* (des-mat-oh-soo-kus) means 'musk crocodile'
- **GROUP:** reptile
- **SIZE:** up to 1.3m long
- **FOOD:** plants
- **LIVED:** 220 million years ago in Late Triassic North America





Atlas of finds

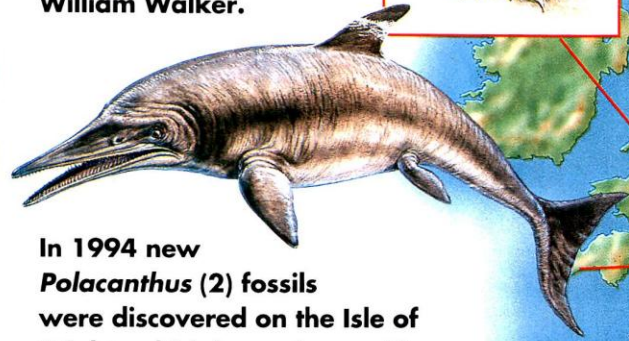
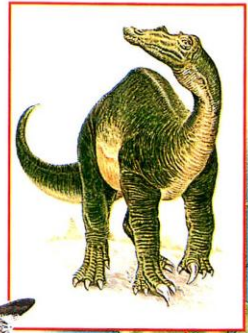
Europe

Dragons or giants? For years the identity of giant bones found in Europe remained a mystery.

We know what dinosaurs looked like and how they lived because scientists have studied their fossils. But until 1841 nobody had ever heard of the word 'dinosaur'. A few fossils of giant reptiles had been found, but no one knew what they were. Some people thought they were dragon bones, some thought they belonged to giants, and others that they were animals that had lived before Noah's flood. It was in Europe that scientists first began to study dinosaur fossils. They realised that the bones belonged to a special type of ancient reptile. This map shows some of the important fossil finds in Europe.

1902

GREAT BRITAIN
Many Early Cretaceous dinosaurs have been found in Britain. In 1983, a new giant flesh-eating dinosaur, *Baryonyx* (1), was discovered by amateur fossil hunter William Walker.



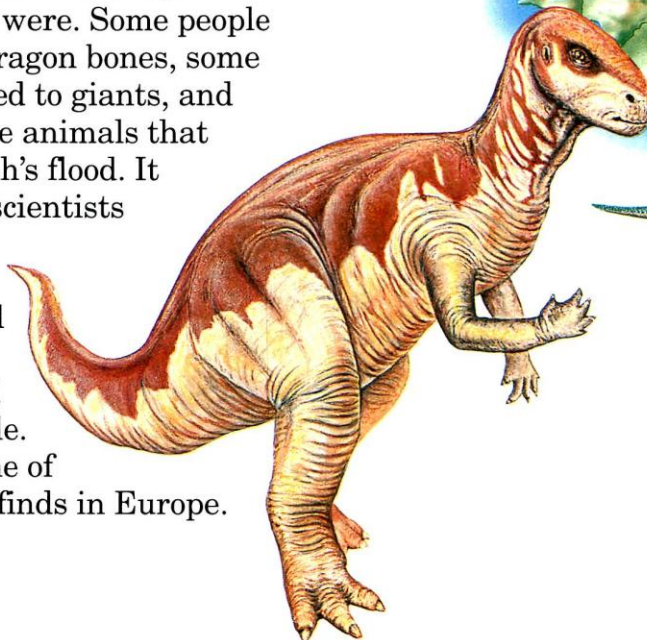
In 1994 new *Polacanthus* (2) fossils were discovered on the Isle of Wight, which have changed how we think it looks.

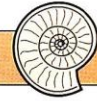
In 1811 in Dorset, Mary Anning and her brother found the first complete fossil *Icthyosaurus* (3).

PORTUGAL
Peaceful plant-eater *Camptosaurus* (4) was found in Torres Vedras.



SPAIN
Fossils of one of the longest surviving dinosaurs, *Hypsilophodon* (5), have been found in Spain.





HOLLAND

In 1770 giant prehistoric reptile bones were found in Maastricht. They belonged to the Cretaceous marine lizard *Mosasaurus* (7).

BELGIUM

In 1878 the first complete dinosaur skeletons were found in Bernissart, Belgium. They belonged to an Early Cretaceous *Iguanodon* (8).

GERMANY

Many fossils have been found in the limestone rocks around Solnhofen. One of the best finds was a perfect *Archaeopteryx* (9). Even the outline of its feathers has been preserved in the rock.



Some of the earliest European dinosaurs have been found in Halberstadt and Trossingen. Skeletons of *Plateosaurus* (10), are especially common.

ROMANIA

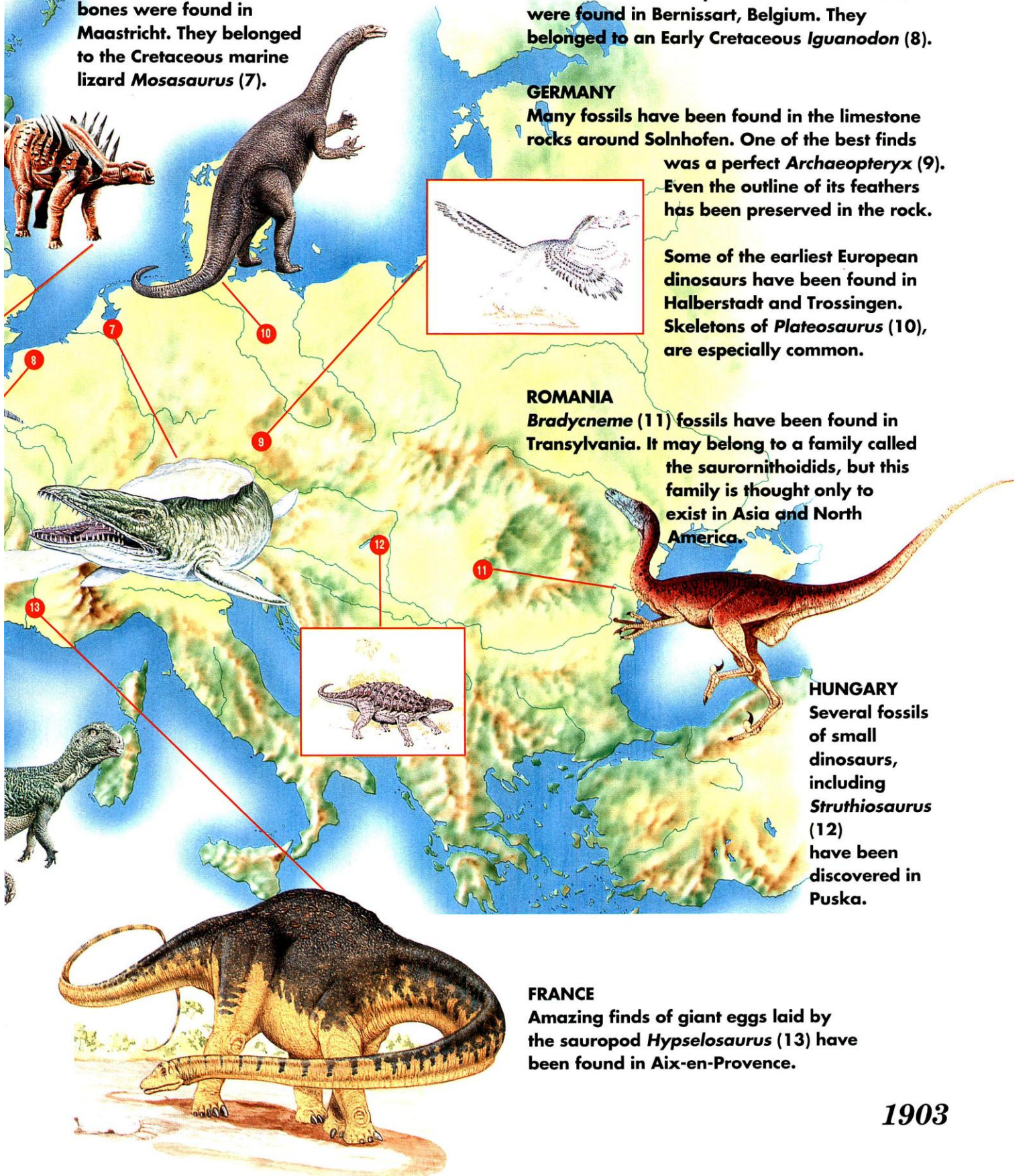
Bradycneme (11) fossils have been found in Transylvania. It may belong to a family called the saurornithoidids, but this family is thought only to exist in Asia and North America.

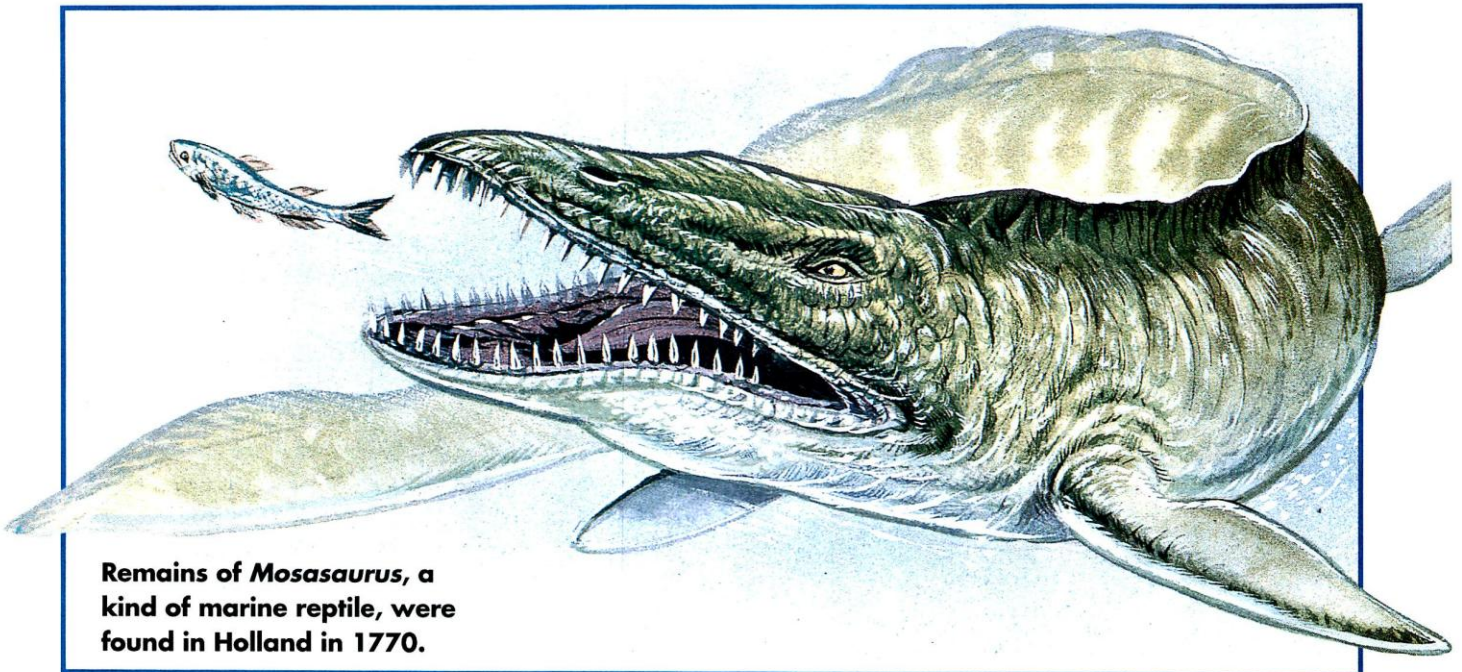
HUNGARY

Several fossils of small dinosaurs, including *Struthiosaurus* (12) have been discovered in Puska.

FRANCE

Amazing finds of giant eggs laid by the sauropod *Hypselosaurus* (13) have been found in Aix-en-Provence.





Remains of *Mosasaurus*, a kind of marine reptile, were found in Holland in 1770.

FIRST FOSSIL FIND

The first gigantic fossils from the time of the dinosaurs were found by workmen in Maastricht, Holland, in 1770. They sold the head and jaws to a local doctor, Dr Hoffman. We now know they were the remains of a giant sea reptile called *Mosasaurus*. But at that time, no one knew what the bones were.

A TROPHY OF WAR

The *Mosasaurus* fossils were put into the Maastricht Museum. In 1795 France invaded, and General Charles Pichegru took the fossils back to Paris where they remain today, a trophy of war!

FOSSILS IN THE COAL

In 1878 Belgian coal miners found a fossil bone. They dug it out and sent it to the Belgium Natural History Museum. A scientist, Louis Dollo, recognised it as a bone from an *Iguanodon*. Over the next 20 years he found a herd of about 30 *Iguanodon* in the same mine.

1904

These two illustrations show how experts have changed their ideas about what *Polacanthus* looked like. The new picture (below left) has more spikes and they point upwards rather than sideways, like the old picture (below right).





TOOTHY STONES

In the early 1800s an amateur fossil hunter from England, Gideon Mantell, was given some strange stones with large teeth embedded in them. He believed they belonged to a giant prehistoric reptile, but the experts disagreed. Years later, people realised Mantell was right. The teeth belonged to an *Iguanodon* that lived about 110 million years ago.

LATEST FINDS

In 1994 a complete *Polacanthus* skeleton was found on the Isle of Wight in England. The front half of the animal had been found 100 years earlier, but nobody knew what the whole thing looked like. The new fossils promise to reveal the truth about *Polacanthus* and we should soon know what it really looked like.



GIANT CLAWS

In 1983 an amateur fossil hunter called William Walker found a perfectly preserved claw in a clay pit in Surrey, England. The claw was huge - 31cm long and sharply curved. Mr Walker took his find to the Natural History Museum, which set up a dig immediately. They discovered an almost complete skeleton. After months of study, they named the new dinosaur *Baryonyx walkeri* in honour of William Walker.

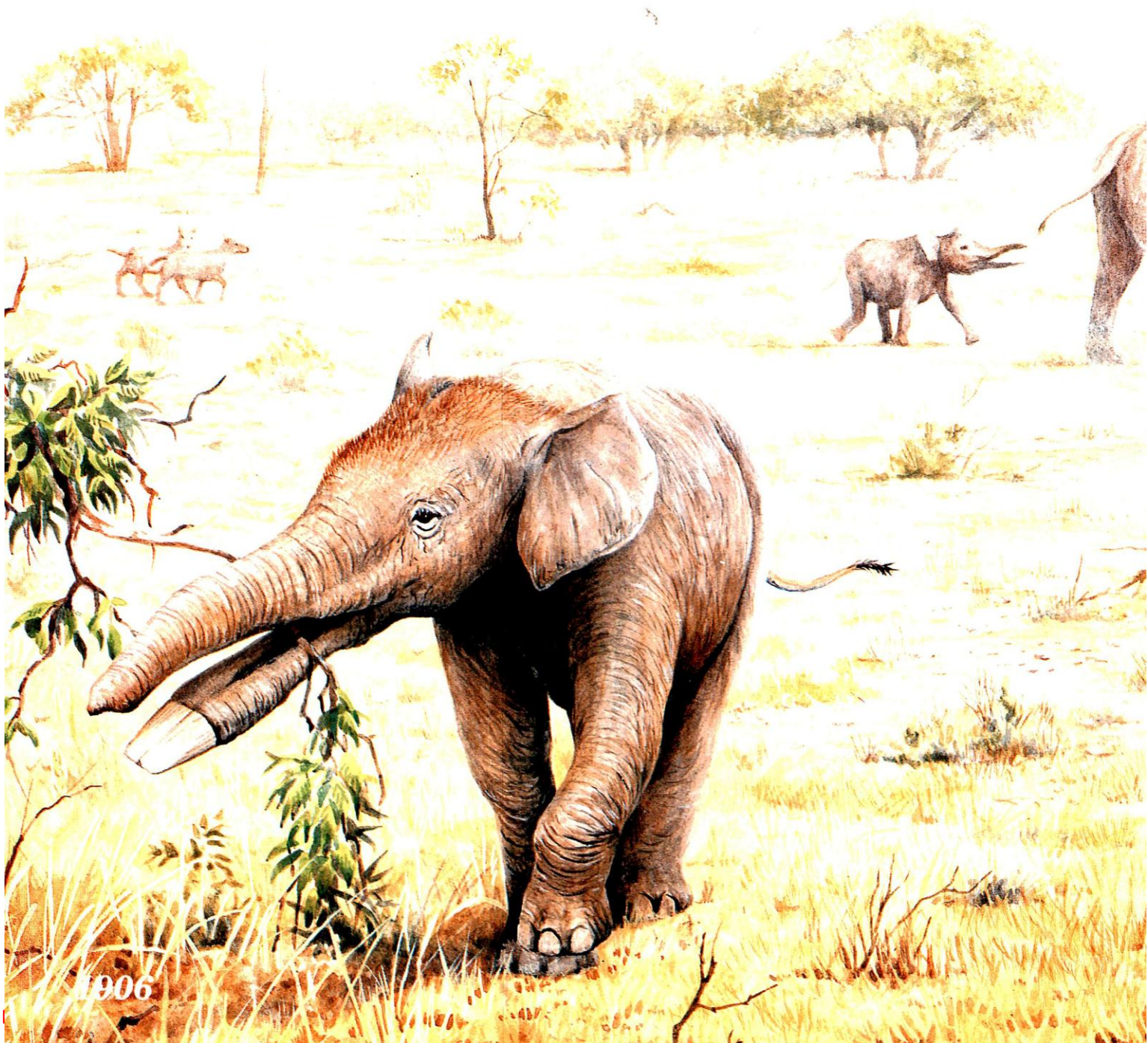


IT'S A FACT

MOST FOSSILS ARE FOUND BY ORDINARY PEOPLE

Fossils finders are not always scientists. Most fossils are found by ordinary people or amateur fossil hunters. It is the job of palaeontologists to study the finds and decide what the animal is, what it looked like and how it lived.

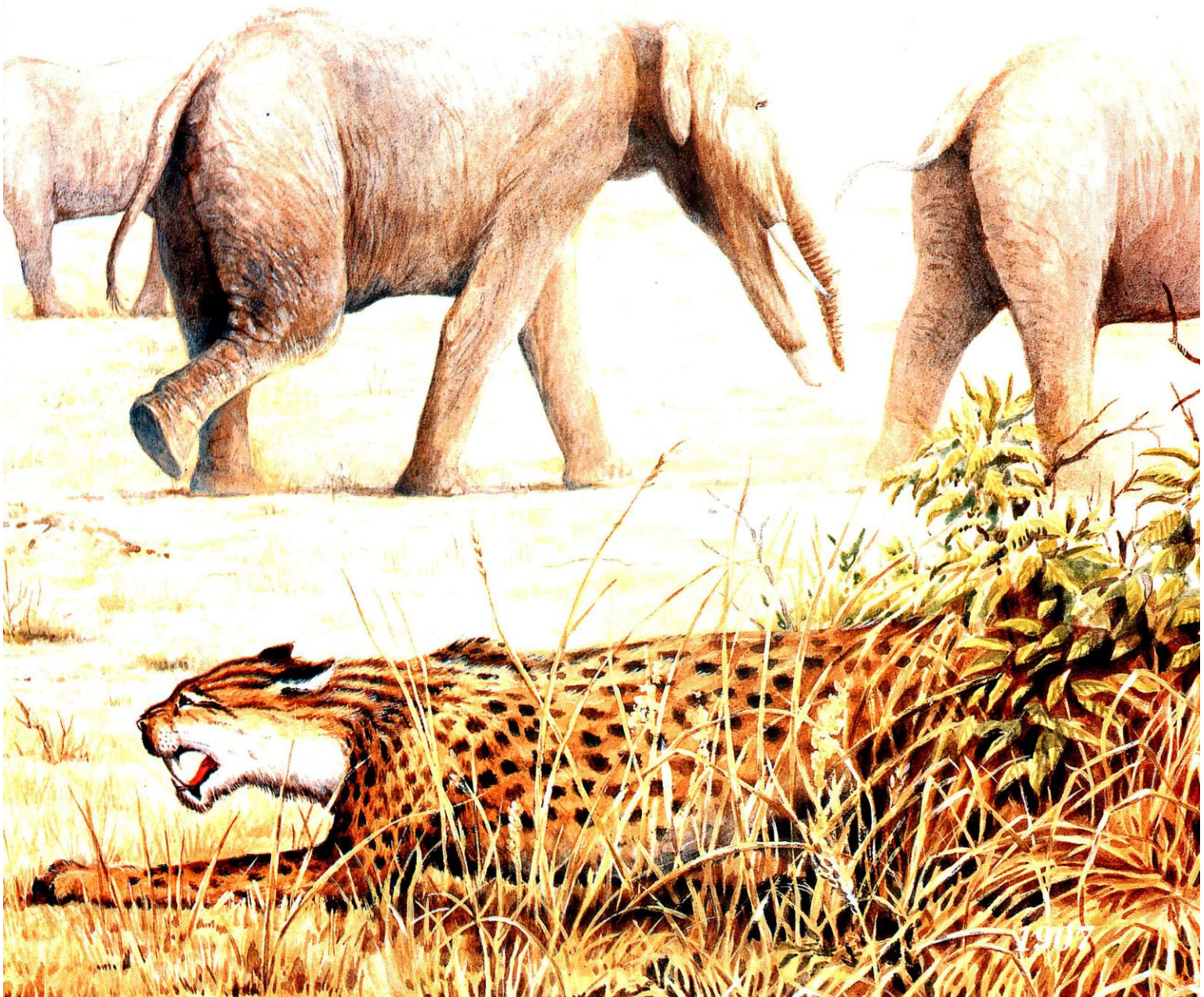
GIANTS OF THE PAST



1906

AMEBELODON

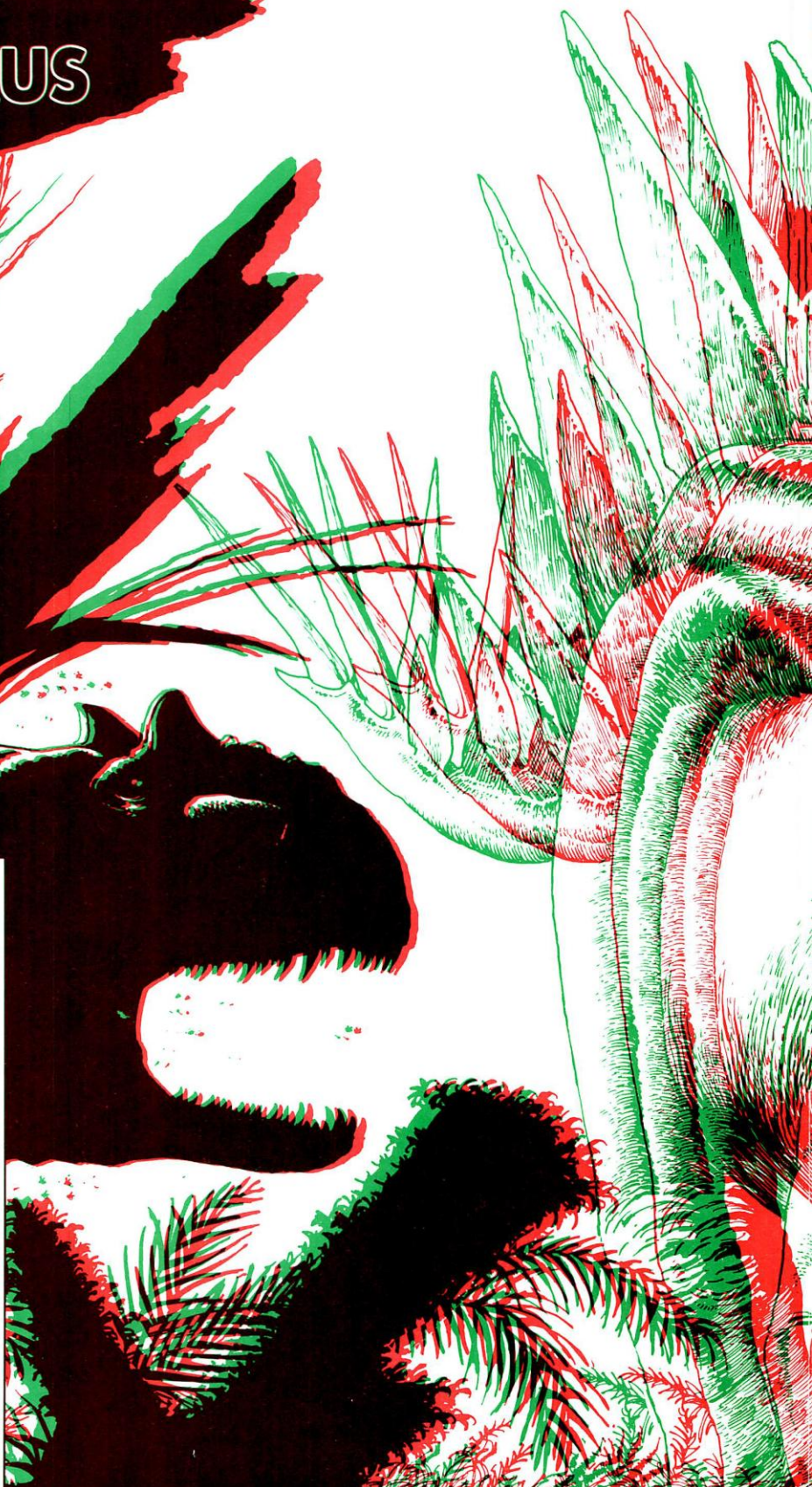
On the grassy plains of Late Miocene North America, a herd of *Amebelodon* are grazing peacefully. With their great bulk and massive tusks, adult *Amebelodon* are well equipped to protect themselves against predators. But the very young and very old are vulnerable to attack. A large stabbing cat has spotted a baby away from the rest of the herd and is about to pounce. It has to be quick to escape with its kill before the herd is alerted by the baby's cries.

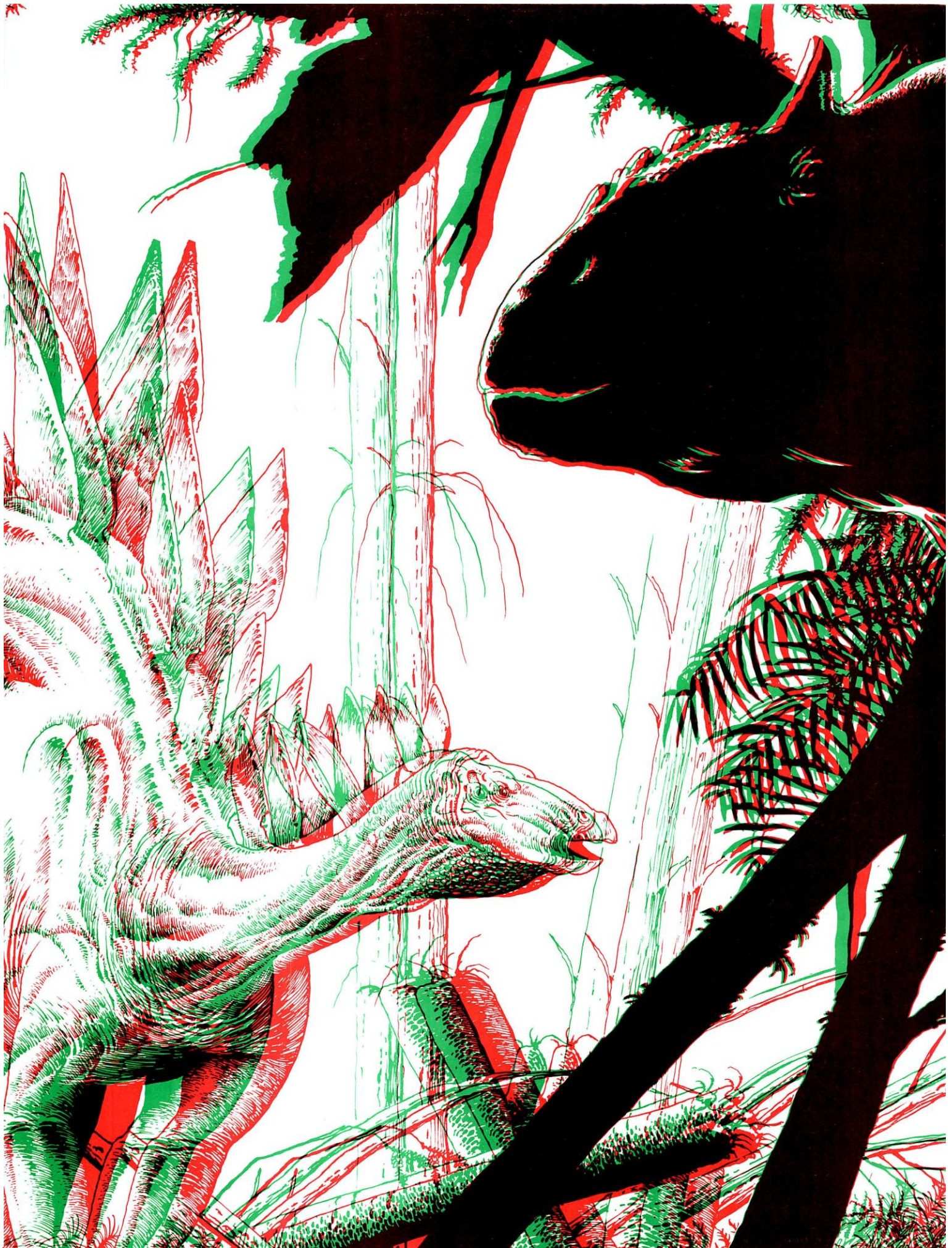


3-D Gallery 89

STEGOSAURUS

In the woodland of Late Jurassic North America, two *Allosaurus* are preparing to ambush a *Stegosaurus*. Taken unawares, *Stegosaurus* won't be able to use its main form of defence – its spiky tail. *Stegosaurus*' neck is protected by a pattern of bony studs, but this won't be enough to save it from the *Allosaurus*' sharp teeth.





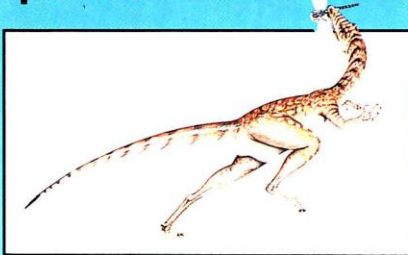


Spot the dinos!

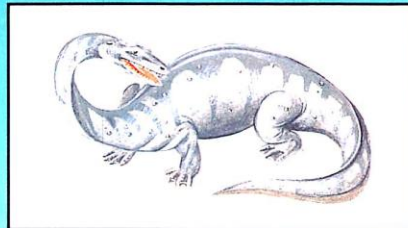
All these creatures lived millions of years ago. But not all of them were dinosaurs. Look at each animal carefully. See if you can name it and spot which are the dinosaurs!



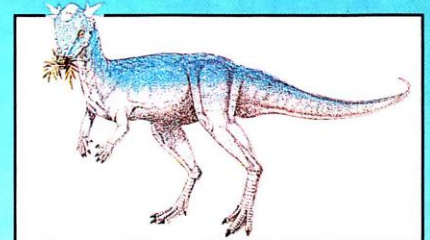
Clues to consider are: when did the creature live? Was it during the Age of the Dinosaurs? Does it look and behave like a dinosaur? Check the answers opposite to see how good a dinosaur spotter you are.



CREATURE 1
SIZE: 60cm long
LIVED: Late Triassic
CLUE: had five-fingered hands



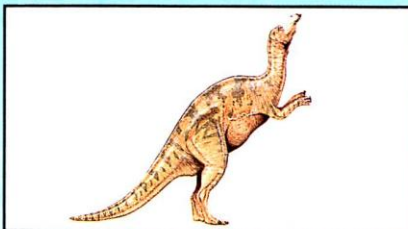
CREATURE 2
SIZE: up to 3m long
LIVED: Mid Triassic
CLUE: swam in the sea



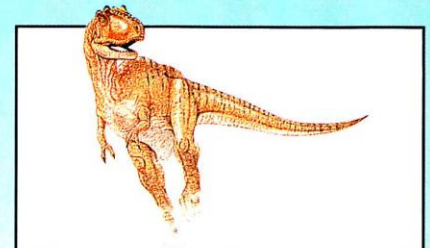
CREATURE 3
SIZE: 3m long
LIVED: Cretaceous
CLUE: held out tail when running



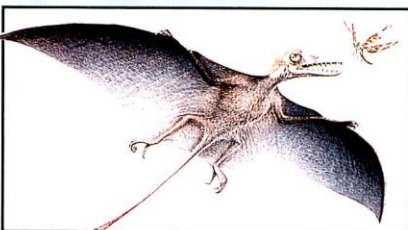
CREATURE 4
SIZE: 1.5m long
LIVED: Triassic
CLUE: crocodile-like creature



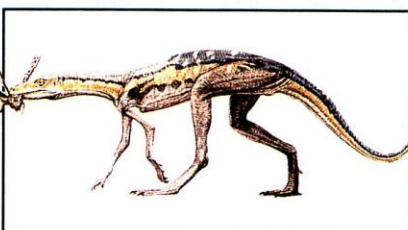
CREATURE 5
SIZE: 8-10m long
LIVED: Late Cretaceous
CLUE: had a toothless beak



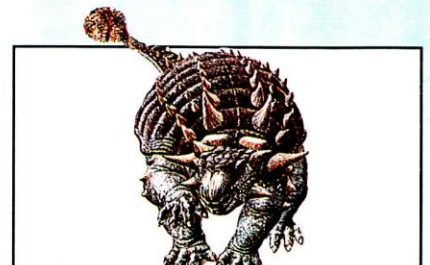
CREATURE 6
SIZE: 9m long
LIVED: Cretaceous
CLUE: ate dinosaurs



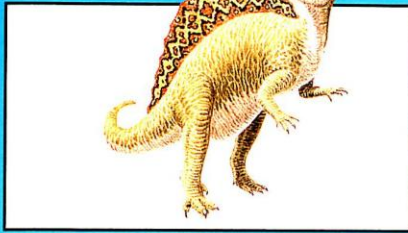
CREATURE 7
SIZE: wingspan over 63cm
LIVED: Late Jurassic
CLUE: had wings made of skin



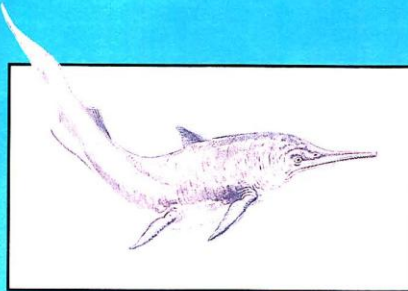
CREATURE 8
SIZE: 30cm long
LIVED: Mid Triassic
CLUE: agile hunter



CREATURE 9
SIZE: 10m long
LIVED: Late Cretaceous
CLUE: armoured body



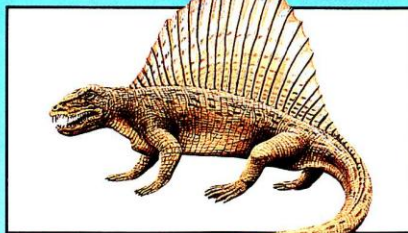
CREATURE 10
SIZE: 10–12m long
LIVED: Cretaceous
CLUE: sail of skin on back



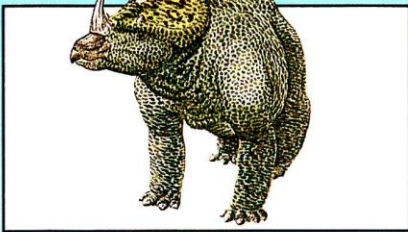
CREATURE 11
SIZE: 1m long
LIVED: Triassic
CLUE: gave birth to live young



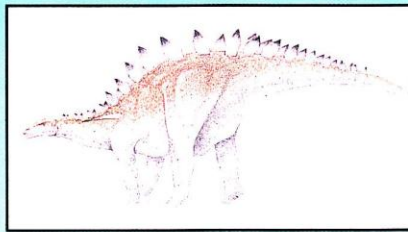
CREATURE 12
SIZE: up to 30m long
LIVED: Late Jurassic
CLUE: ate plants



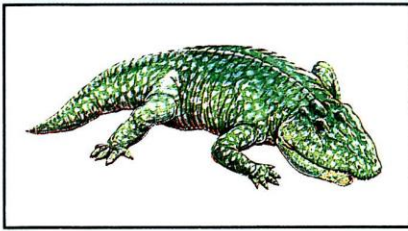
CREATURE 13
SIZE: 3m long
LIVED: Early Permian Period
CLUE: four sprawling legs



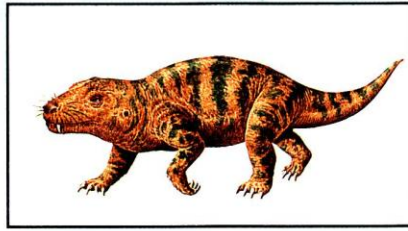
CREATURE 14
SIZE: up to 4m long
LIVED: Late Cretaceous
CLUE: had distinctive neck frill



CREATURE 15
SIZE: 4m long
LIVED: Middle Jurassic
CLUE: spikes on tail



CREATURE 16
SIZE: up to 2m long
LIVED: Early Permian
CLUE: ate fish and amphibians



CREATURE 17
SIZE: up to 2m long
LIVED: Early to Mid Triassic
CLUE: may have had whiskers

ANSWERS

- (1) *Saltopus* is a dinosaur
- (2) *Nothosaurus* is not a dinosaur
- (3) *Stygiomoloch* is a dinosaur
- (4) *Protosuchus* is not a dinosaur
- (5) *Hadrosaurus* is a dinosaur
- (6) *Albertosaurus* is a dinosaur
- (7) *Sordes* is not a dinosaur
- (8) *Lagosuchus* is not a dinosaur
- (9) *Ankylosaurus* is not a dinosaur
- (10) *Spinosaurus* is a dinosaur
- (11) *Mixosaurus* is not a dinosaur
- (12) *Ultrasaurus* is a dinosaur
- (13) *Dimetrodon* is not a dinosaur
- (14) *Brachyceratops* is a dinosaur
- (15) *Huayangosaurus* is a dinosaur
- (16) *Eryops* is a dinosaur
- (17) *Cynognathus* is not a dinosaur

KEY

- PERMIAN PERIOD
290-245 MYA
- TRIASSIC PERIOD
245-204MYA
- JURASSIC PERIOD
204-140 MYA
- CRETACEOUS PERIOD
140-66 MYA



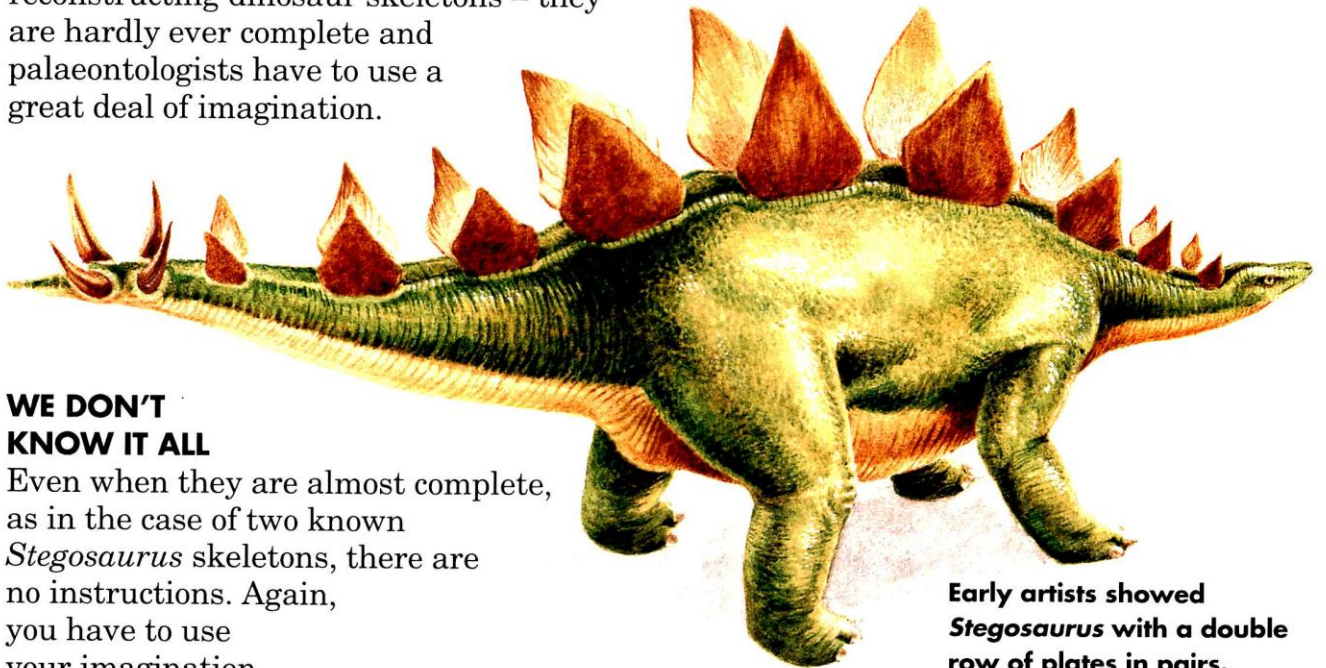
The changing face of Stegosaurus

Reconstructions of *Stegosaurus* have altered over the years. How and why have its looks changed?

Imagine you have a plastic construction kit of an aeroplane or a ship. Now imagine that half the pieces are missing, but you still have to build the model. You would just have to try to guess what the missing bits were like and make them out of modelling clay. This is just like reconstructing dinosaur skeletons – they are hardly ever complete and palaeontologists have to use a great deal of imagination.



Perhaps *Stegosaurus* used its plates as weapons. It may have been able to turn them to point towards an enemy, just like today's porcupine (left).



WE DON'T KNOW IT ALL

Even when they are almost complete, as in the case of two known *Stegosaurus* skeletons, there are no instructions. Again, you have to use your imagination.

Early artists showed *Stegosaurus* with a double row of plates in pairs.

1912

A CONFUSING JUMBLE

When they are found, *Stegosaurus* skeletons are usually lying on their sides. In life, the plates and spines were embedded in the skin rather than attached to the skeleton. Now they lie scattered around. It might be obvious how the bones of the skeleton fit together, but where do the plates and spines go? That is the question that has puzzled palaeontologists ever since this animal was first discovered by Othniel Charles Marsh back in 1877.

SLAP-DASH ARTISTS

When Marsh first described his ideas of what *Stegosaurus* looked like, he mentioned a double row of plates down its back. However, the diagram of the skeleton that he published only seemed to show a single row of plates. He may have drawn it this way to make the picture clearer. Artists who looked at the diagram without reading the paper then restored *Stegosaurus* with a single row of plates along its back.

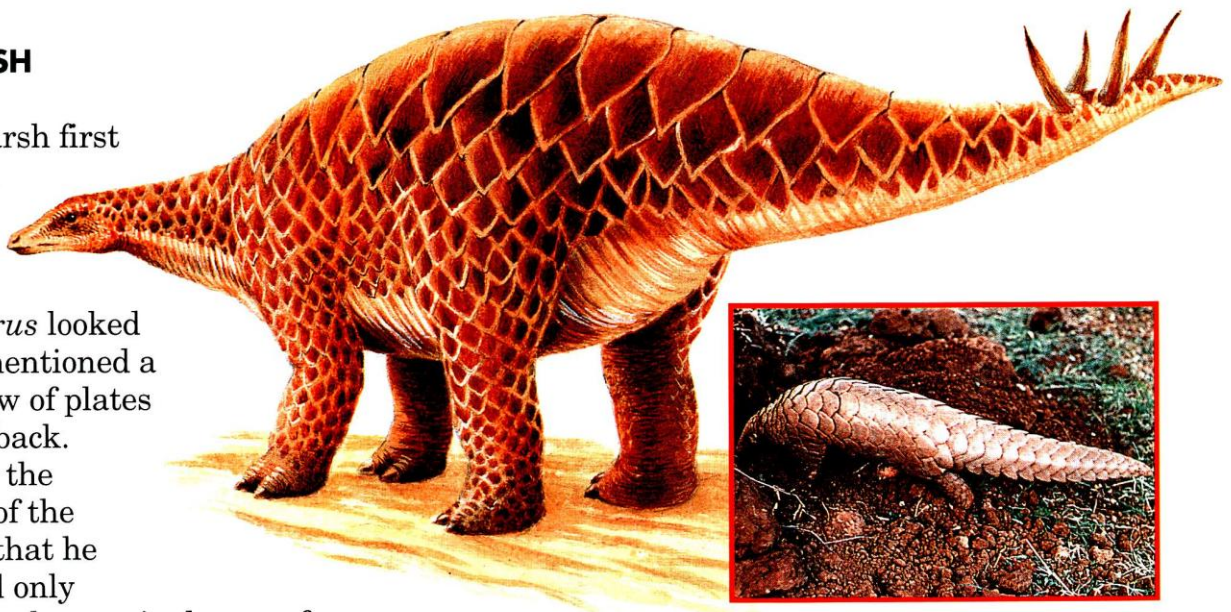
WHAT KIND OF PLATE RACK?

Later artists were more careful, painting *Stegosaurus* with a double row of plates. Usually, the plates were drawn arranged in pairs. During the 1920s more and more palaeontologists came to believe that the plates were arranged in a double row, but in an alternating pattern – a plate on the left being followed by one on the right followed by one on the left, and so on.

Is it true

that there's a difference between a reconstruction and a restoration?

Usually when a palaeontologist talks about a reconstruction, he or she means a fossilized skeleton put together from pieces and built up into a whole. A restoration, on the other hand, is a picture, or a model, of what the artist thinks the animal looked like when it was alive.



Some scientists believed that the plates of *Stegosaurus* lay flat. This would have given it a similar protection to today's pangolin (above).

NOVEL GUESS

One or two scientists thought that the plates did not stick up at all. They believed that they lay flat on the back of *Stegosaurus*. This would certainly have made the plates more useful as armour.

AND HOW MANY SPINES?

Most experts agreed that *Stegosaurus* had spines growing from the end of its tail, but were there two pairs, or were there four?

1913

A PUZZLING POINT

During the 1970s another puzzle cropped up. Scientists not only wondered how the plates were arranged, but they began to wonder what they had been used for.

CHINKED ARMOUR

Scientists had always assumed that the plates were armour of some sort. But there was still some doubt. Why did the plates stick up in the air – as most scientists were sure they did – when armour should really lie flat? Why were they not attached to the skeleton but only embedded in the skin, where they would have been easily wrenched out in a fierce fight?

TEMPERATURE REGULATORS

Jim Farlow, an American palaeontologist, came up with another idea. Maybe these plates were not armour at all. Maybe they were heat exchangers. If they were covered in skin, they could be held up to the sunlight to warm the animal's blood when it was cold.

VEIN EVIDENCE

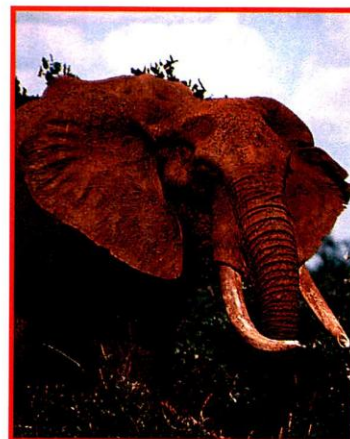
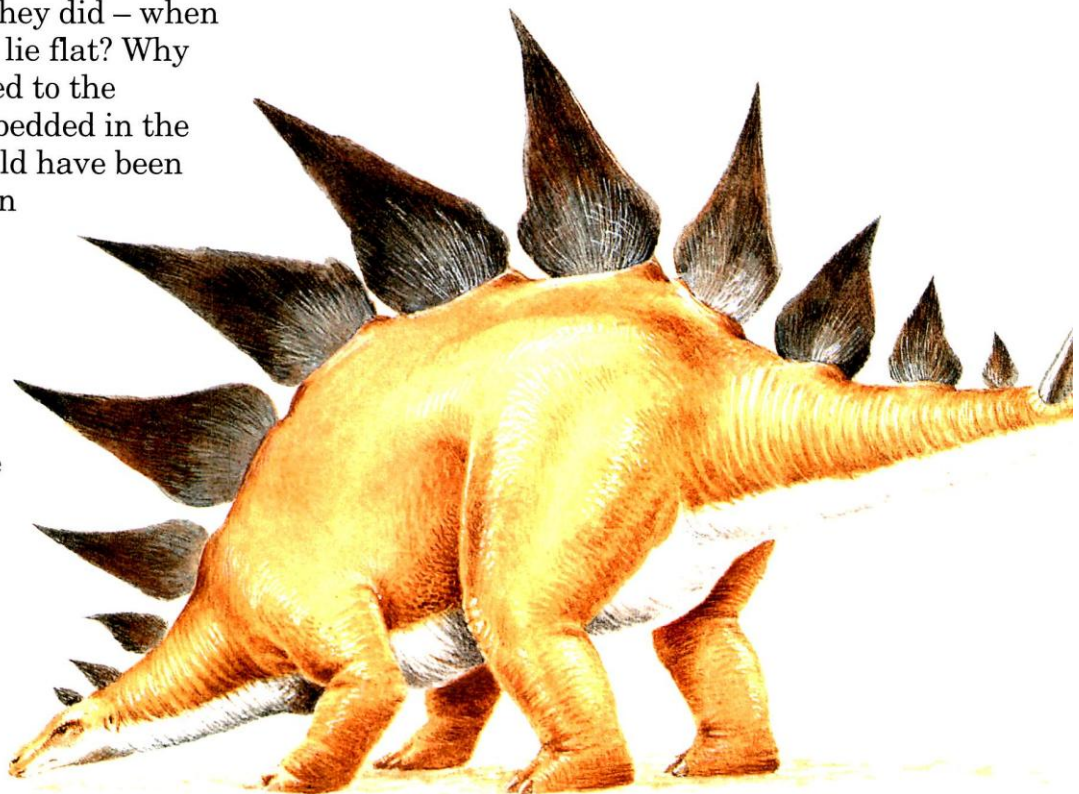
When the plates were cut across, scientists found that they were filled with blood vessels. Skin contains veins and arteries, so perhaps the plates were covered in skin. However, if the plates were for armour, they would have been covered in horn. Though the horn would have needed blood vessels, too!

1914

Is it true

that *Stegosaurus* may have had two brains?

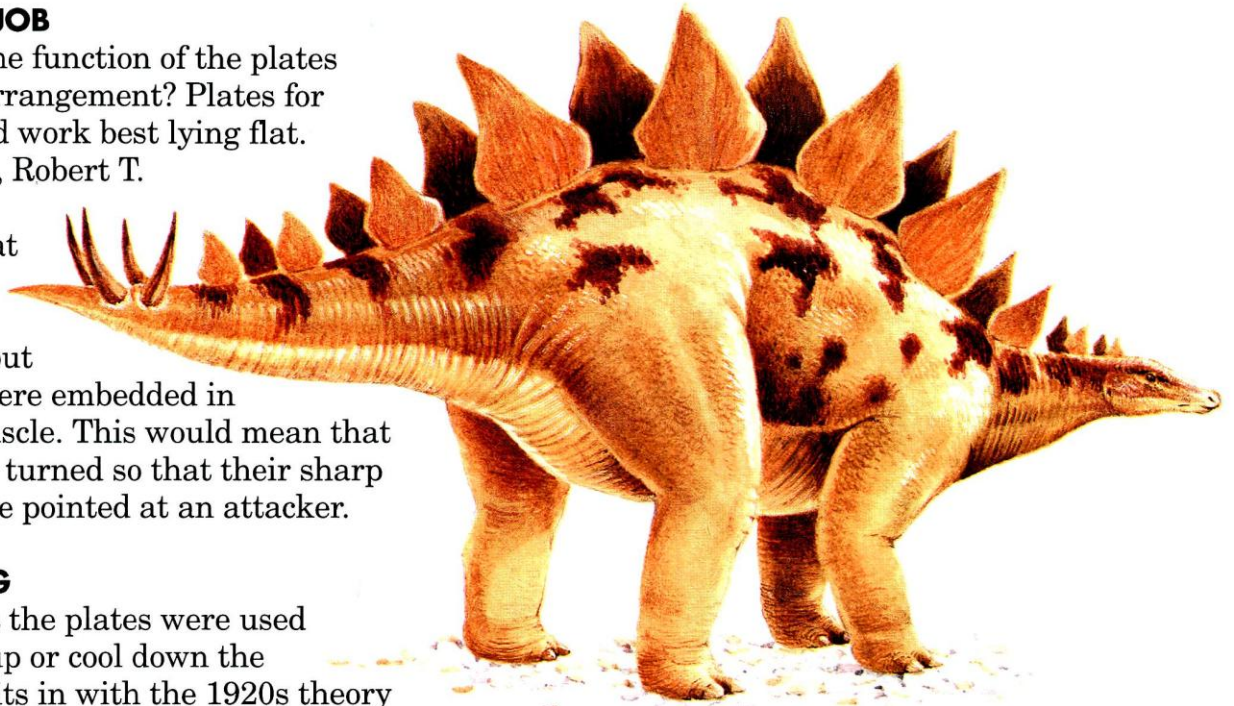
This is an old idea based on the fact that there is a big hole in *Stegosaurus*' hip bones, near the spine. This may have been where all the leg and tail nerves came together, or it may have held a gland of some sort. It didn't hold an extra brain!



African elephants use their broad ears to cool down. The wind passing over their large surfaces cools the blood. Perhaps *Stegosaurus* used its plates in the same way.

FIT FOR THE JOB

How would the function of the plates affect their arrangement? Plates for armour would work best lying flat. One scientist, Robert T. Bakker, has suggested that the armour plates stuck straight up, but their bases were embedded in masses of muscle. This would mean that they could be turned so that their sharp edges could be pointed at an attacker.



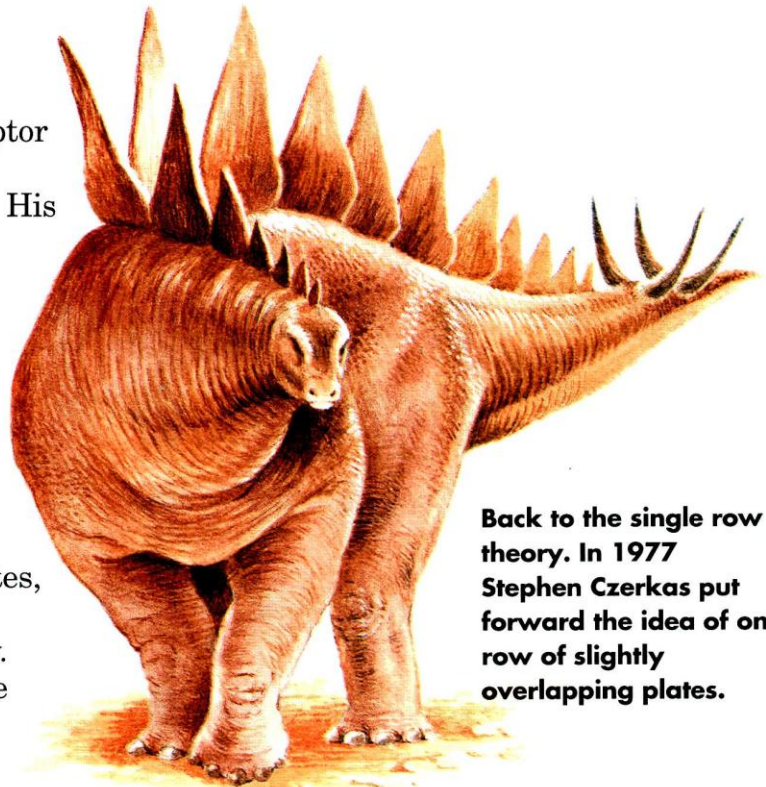
SUNBATHING

The idea that the plates were used to heat up or cool down the animal fits in with the 1920s theory that the plates were arranged in alternating rows. With this pattern, one plate would have had less chance of shading another. Also, the biggest area possible would be exposed to the sun or the wind.

If the plates were used to control *Stegosaurus*' temperature, then the most sensible pattern would be a double row of alternating plates.

OLD IDEA REVISED

In 1977 the palaeontologist and sculptor Stephen Czerkas suggested that the plates were arranged in a single row. His theory was different from the single-row theories that had gone before, because he believed the plates overlapped slightly.



Back to the single row theory. In 1977 Stephen Czerkas put forward the idea of one row of slightly overlapping plates.

WHAT NEXT?

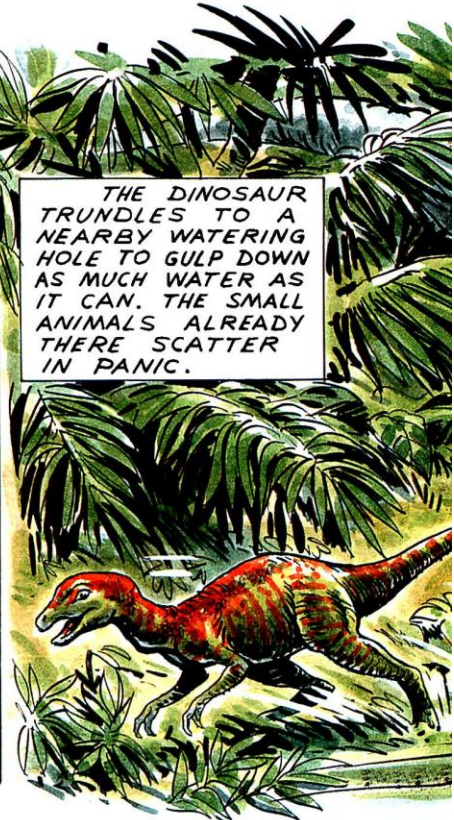
The latest ideas are based on a skeleton found in 1992 by palaeontologist Brian Small. This fossil seemed to suggest that the plates, whatever they were used for, were arranged in a double alternating row. However, the spines on the end of the tail pointed outwards. What will the next skeleton show?



A DAY IN THE LIFE OF DILOPHOSAURUS



FIRST LIGHT IN NORTHERN LAURASIA 180 MILLION YEARS AGO AT THE BEGINNING OF THE JURASSIC PERIOD - A DILOPHOSAURUS CLAMBERS TO ITS FEET AFTER A NIGHT'S SLEEP.

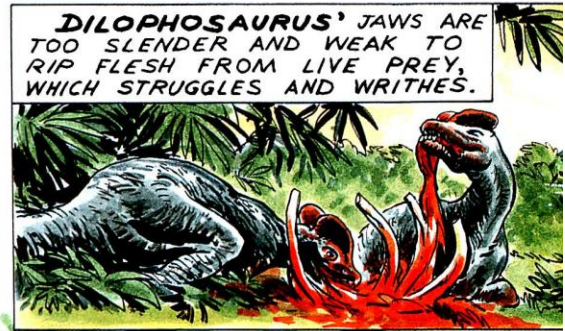


THE DINOSAUR TRUNDLES TO A NEARBY WATERING HOLE TO GULP DOWN AS MUCH WATER AS IT CAN. THE SMALL ANIMALS ALREADY THERE SCATTER IN PANIC.

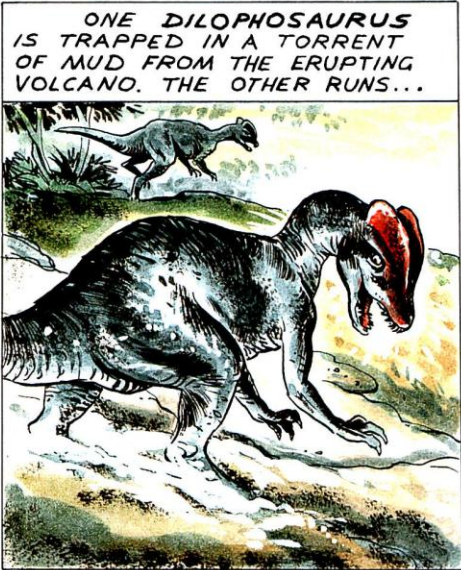


SENSING EASY PICKINGS, ANOTHER DILOPHOSAURUS APPEARS.

SNARLING AND SPITTING AT EACH OTHER, THE TWO BEASTS WAIT UNTIL THE KILLERS HAVE EATEN THEIR FILL BEFORE MOVING IN.



DILOPHOSAURUS' JAWS ARE TOO SLENDER AND WEAK TO RIP FLESH FROM LIVE PREY, WHICH STRUGGLES AND WRITHES.



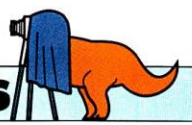
ONE DILOPHOSAURUS IS TRAPPED IN A TORRENT OF MUD FROM THE ERUPTING VOLCANO. THE OTHER RUNS...



... IN PANIC TO ESCAPE A HELLISH DEATH. BUT IT TRIPS OVER IN THE THICK UNDERGROWTH.

CRASHING TO THE GROUND IT SMASHES THE BONES IN ONE OF ITS BACK LEGS.

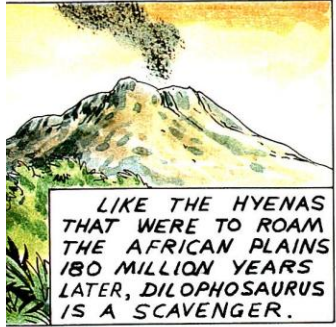
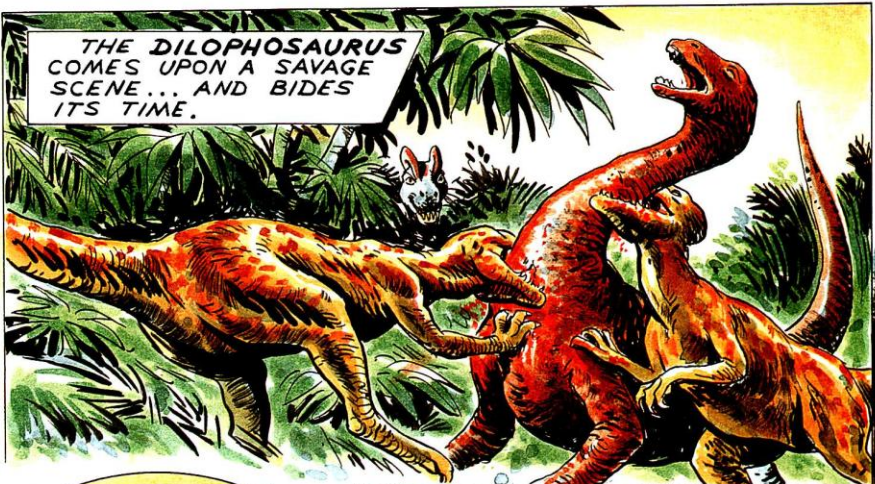
HISTORY IN PICTURES



AS SOON AS IT HAS QUENCHED ITS THIRST, THE HEAVY **DILOPHOSAURUS** STOMPS THROUGH THE THICK PLANTS LOOKING FOR SOMETHING TO EAT.

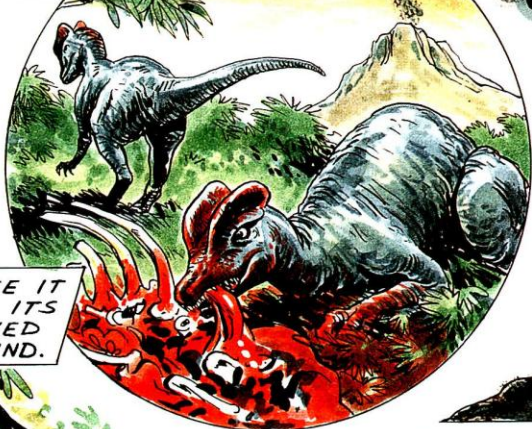


THE **DILOPHOSAURUS** COMES UPON A SAVAGE SCENE... AND BIDES ITS TIME.

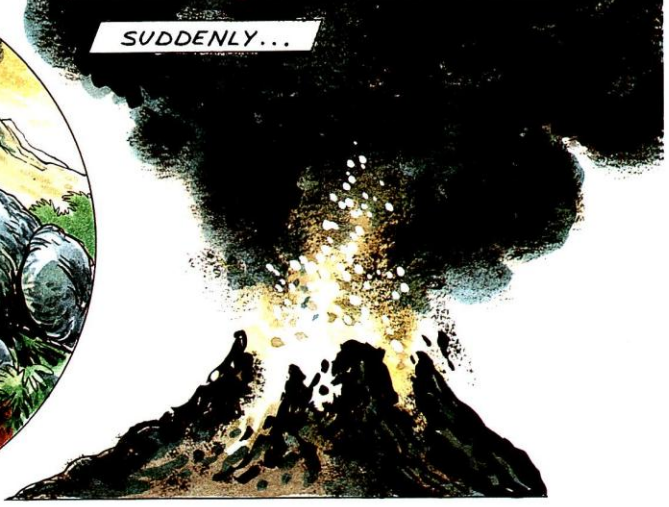


LIKE THE HYNAS THAT WERE TO ROAM THE AFRICAN PLAINS 180 MILLION YEARS LATER, **DILOPHOSAURUS** IS A SCAVENGER.

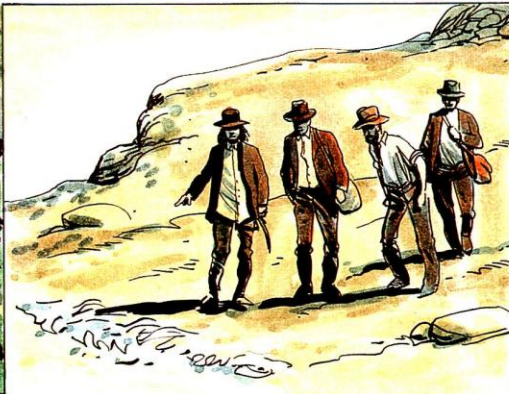
SCAVENGERS LIVE ON THE LEFT-OVERS FROM OTHER ANIMALS' KILLS.



SUDDENLY...



UNABLE TO RISE IT SOON DIES, LEAVING ITS REMAINS TO BE PICKED AT BY OTHERS OF ITS KIND.



NOT A TRACE WAS LEFT OF THESE TWO CREATURES. FORTUNATELY THE REMAINS OF OTHER **DILOPHOSAURUS** WERE PRESERVED AS FOSSILS. AND, IN 1942, A TEAM OF PALAEOLOGISTS FROM THE UNIVERSITY OF CALIFORNIA FOUND THE FIRST EVIDENCE THAT **DILOPHOSAURUS** HAD EXISTED MANY MILLIONS OF YEARS AGO.

Improve and test your knowledge with... **FACT FILE**

Fascinating facts to read and 10 fun questions to answer!

Keeps on growing

Dinosaurs probably kept growing throughout their lives, like other reptiles. They did not just grow until they reached adulthood and then stop, like we do.

1

The giant armoured reptile *Desmatosuchus* was:

- a) a fierce carnivore
- b) a peaceful plant-eater
- c) a scavenger

2

Baryonyx was found by:

- a) Mary Anning
- b) Torres Vedras
- c) William Walker

3

The giant eggs found in France were laid by:

- a) *Hypselosaurus*
- b) *Camptosaurus*
- c) *Iguanodon*

4

The huge elephant *Amebelodon* was:

- a) a shovel-tusker
- b) an earth-mover
- c) a big tusker

5

Bradycneme fossils have been found in:

- a) Transylvania
- b) Maastricht
- c) Bernissart

6

The biggest dinosaur bone found so far is:

- a) *Compsognathus*' claw
- b) *Stegosaurus*' plate
- c) *Supersaurus*' shoulder bone

7

Archaeopteryx probably nested:

- a) on the ground
- b) in trees
- c) in caves

8

Huayangosaurus' tail had:

- a) a club
- b) fur
- c) spikes

9

Proceratosaurus was found:

- a) in North America
- b) in Portugal
- c) in England

1918

Dead study

The science of taphonomy deals with what happens to dead things. Are the bodies torn up by scavengers? Is the flesh eaten by maggots? Is the skin dried to leather in the sun? This study is important to palaeontologists who need to know what happened to a dinosaur before it became a fossil.

On track for dinner

An interesting set of footprints has recently been found in Permian rocks in New Mexico. They represent all sorts of animals walking around a water hole. At one point an insect track disappears just as it meets the track of a Dimetrodon...

Jaw, jaw, jaw!



The jawbones and teeth of many mammoths are piled up on the shelves at the University of Nebraska State Museum. Most of these jaws belong to *Mammuthus columbi*. This was a giant species of mammoth that stood 4m high. Some of the jawbones weigh up to 30kg. *Mammuthus columbi* became extinct at the end of the last Ice Age.

Crash boom!

Dinosaur eggs on display in the Boston Museum of Science had a narrow escape in November 1993. A television lighting boom collapsed into the display case while a cameraman was filming them.

10

Sordes lived in the:

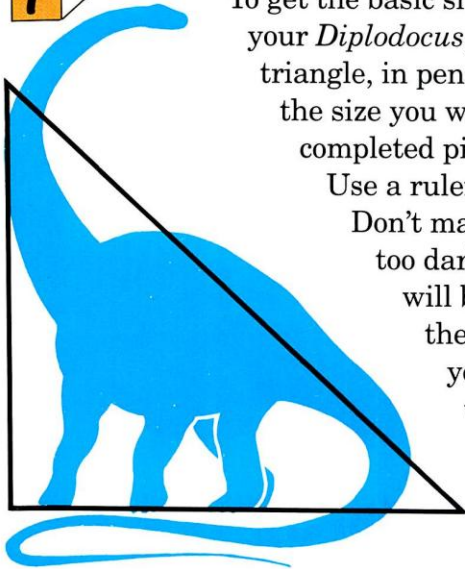
- a) Late Jurassic
- b) Early Permian
- c) Mid Cretaceous

Answers to the questions on inside back cover **1919**



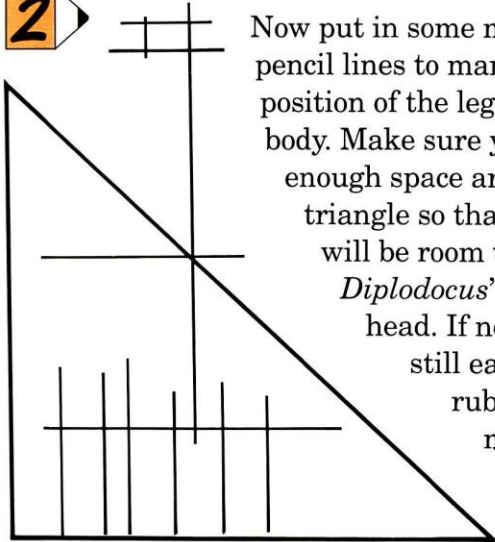
DIPLODOCUS

1



To get the basic shape of your *Diplodocus*, draw a triangle, in pencil, about the size you want your completed picture to be. Use a ruler to do this. Don't make the lines too dark, so that you will be able to rub them out when you are happy with your finished picture.

2

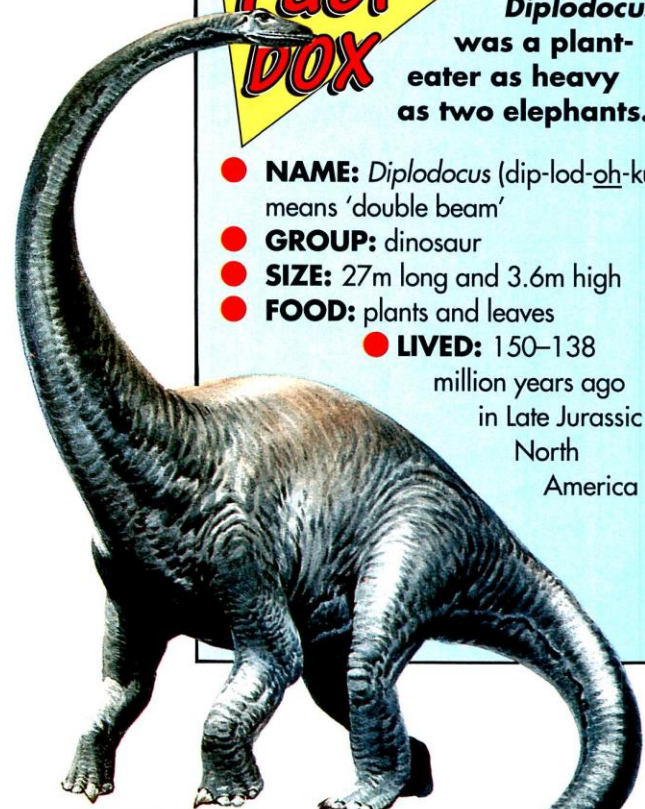


Now put in some more faint pencil lines to mark the position of the legs and body. Make sure you leave enough space around the triangle so that there will be room to fill in *Diplodocus*' tail and head. If not, it is still easy to rub out the marks and start again.

Fact DOX

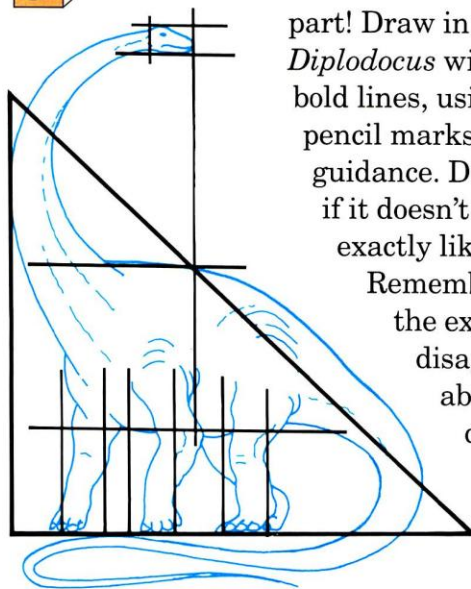
Diplodocus was a plant-eater as heavy as two elephants.

- **NAME:** *Diplodocus* (dip-lod-oh-kus) means 'double beam'
- **GROUP:** dinosaur
- **SIZE:** 27m long and 3.6m high
- **FOOD:** plants and leaves
- **LIVED:** 150-138 million years ago in Late Jurassic North America



1920

3



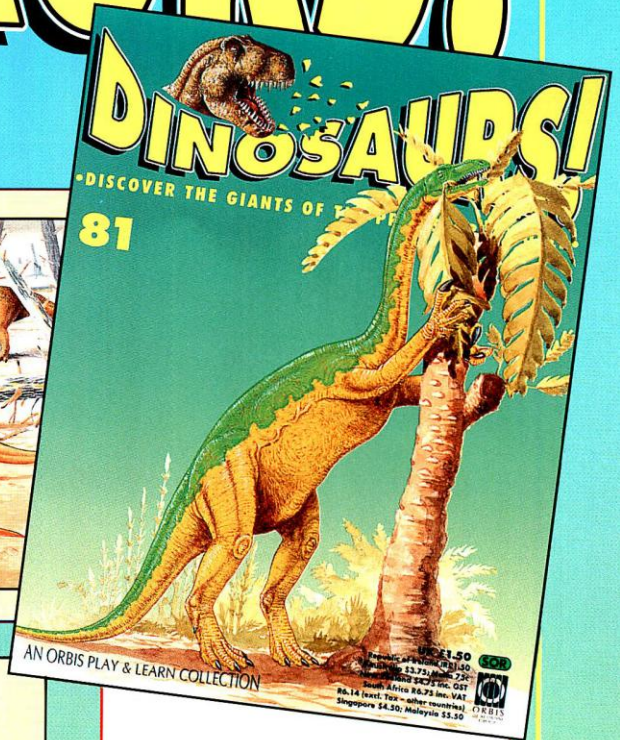
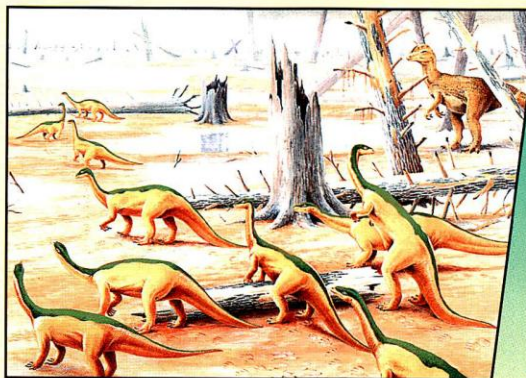
Now comes the exciting part! Draw in your *Diplodocus* with strong, bold lines, using the pencil marks for guidance. Don't worry if it doesn't look exactly like this one. Remember, even the experts disagree about how dinosaurs really looked!

If you look through your copies of *DINOSAURS!*, you will find that *Diplodocus*' skin is often painted to look like elephant skin – coloured grey-blue, with a wrinkled texture. If you find this difficult to copy, he'll look just as good all one colour!

COMING IN PART 81 OF

DINOSAURS!

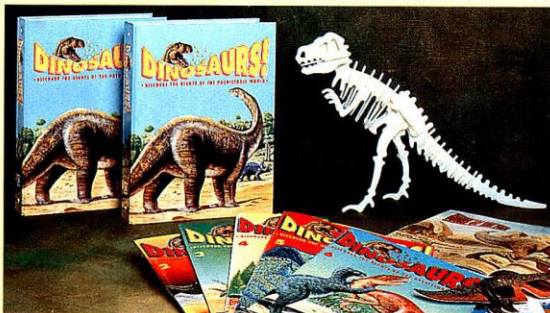
Take a walk through Jurassic North America in PREHISTORIC WORLD. Meet the dino scavengers in TIME DETECTIVE.



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PLUS

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

PICTURE CREDITS: Front cover: Graham Rosewarne. Jane Burton/Bruce Coleman 1914B; Silvestris/FLPA 1913CR; The Natural History Museum, London 1905TR, 1910BR; J. Sibbick/The Natural History Museum 1902BR, 1903TL, 1910BC; Richard Coomber/Planet Earth 1912C; Peter Menzel/Science Photo Library 1919TR; ZEFA 1898TL. **Artwork:** Robin Boulton/WLAA 1910BR; Barry Croucher/WLAA 1911TL, CBL; Mike Dorey 1916-17; Tony Gibbons 1902C; Edwina Goldstone/WLAA 1910CL, 1911BR; Tim Hayward 1902TL, 1903CL, 1904TL, 1910CR; Philip Hood/WLAA 1902TC, 1910TL; Kingfisher 1910TC; Neil Lloyd 1902BL James Marffy 1902-3; Deidre McHale BC; Paul Mitchell/Black Hat 1911BL; Robert Morton 1905BL; Nick Pike/WLAA 1912B 1913TL, 1914C, 1915T, B; Michael Rowe/WLAA 1897, 1898-99; Graham Rosewarne 1900, 1901, 1903TR, C, CR, BR, 1910TR, 1911TR, CTR, CBR; Peter David Scott/WLAA 1906-7, 1911CTL; Chris Turnbull/WLAA 1910C; Steve White 1902TR, 1904B, 1908-9.

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



Dr David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

Would Archaeopteryx have nested in trees or on the ground?



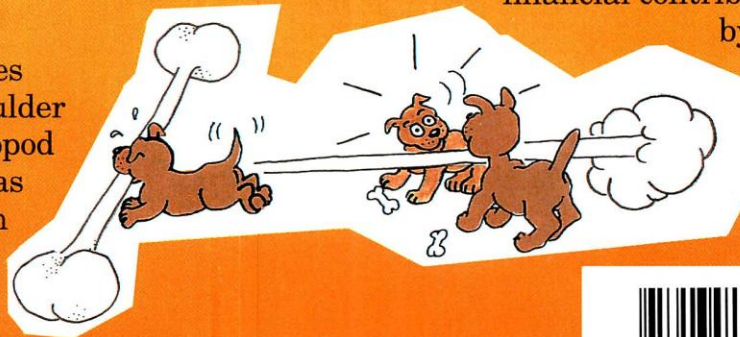
My answer is one based on common sense. Given the variety of small carnivorous dinosaurs, such as *Compsognathus*, and lizards, such as *Bavarisaurus*, that lived at the same time as *Archaeopteryx*, it is likely that *Archaeopteryx* would have chosen to build a nest up in the tree tops to stop its eggs being stolen.



Unfortunately, we have no proof that it did so because nests in trees do not stand much chance of being preserved as fossils.

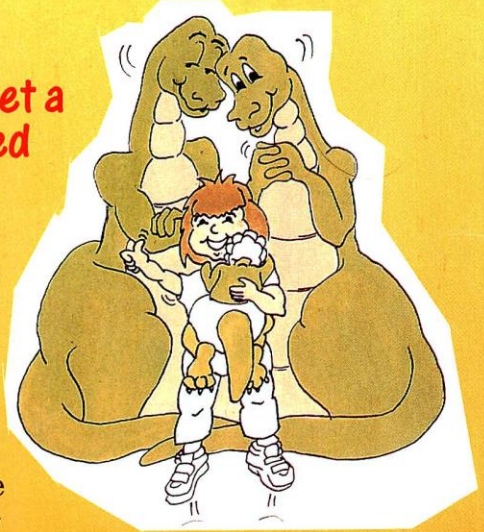
Which is the biggest dinosaur bone ever found?

One of the biggest bones found so far is the shoulder bone of the giant sauropod *Supersaurus*, which was found by Jim Jensen in America. It is nearly 3m long. It will be interesting to see how big the same bone is in the really giant dinosaur *Seismosaurus*, if it is ever found.



How can you get a dinosaur named after you?

If you discover a dinosaur that is new to science, it might be named after you. William Walker found the remains of a new dinosaur that was named *Baryonyx walkeri*. Sometimes dinosaurs are named after the scientist's friends or relatives. *Leaellynasaurus* was named after the daughter of the palaeontologists Pat and Tom Rich. Sometimes dinosaurs are named after people who sponsor expeditions or support research. The name *Diplodocus carnegii* marks the huge financial contribution made



by Andrew Carnegie to fossil research earlier this century.

