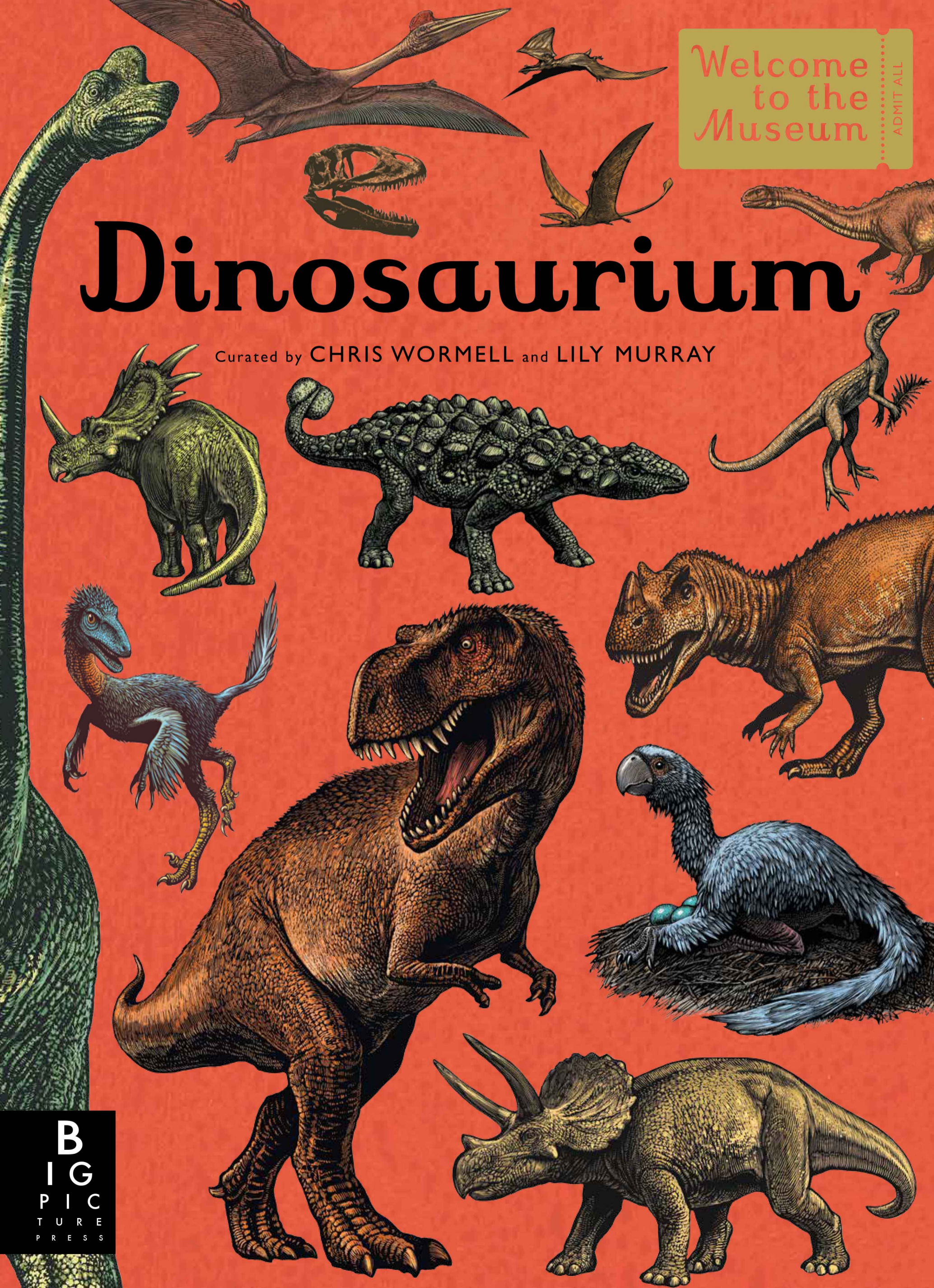


Welcome
to the
Museum

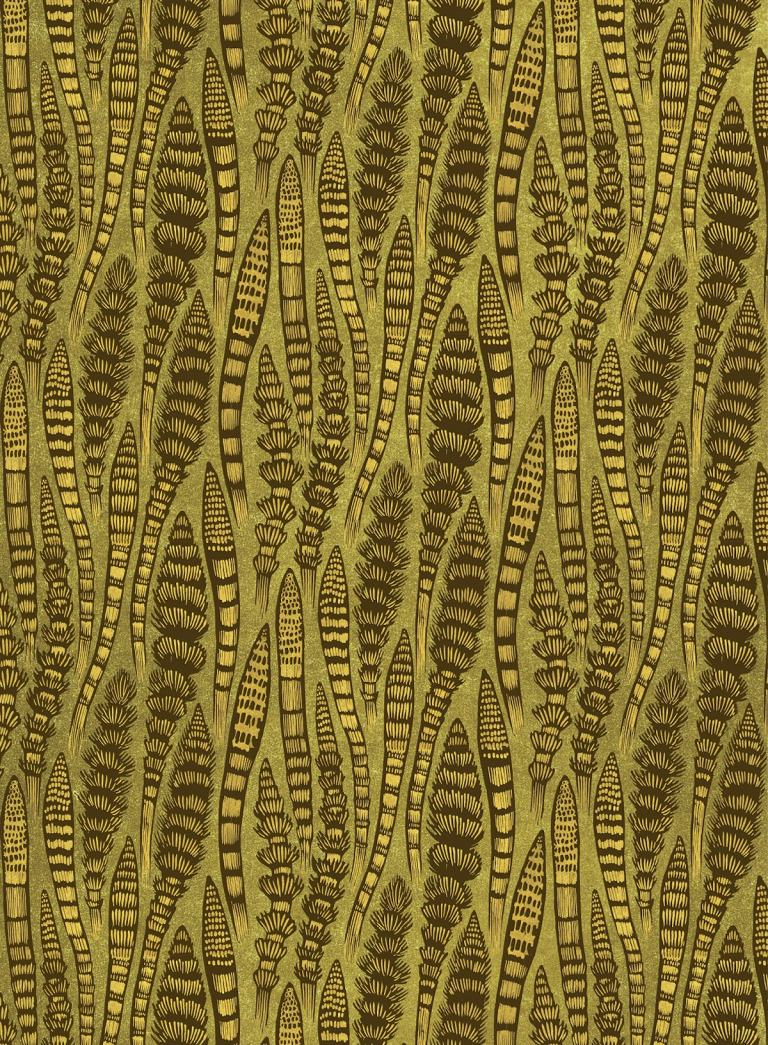
ADMIT ALL

Dinosaurium

Curated by CHRIS WORMELL and LILY MURRAY



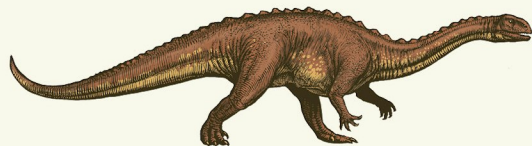
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DINOSAURIUM

Gallery 1

Sauropodomorpha



Sauropodomorpha
Primitive Sauropodomorpha
The Triassic Period
Sauropoda
Titanosauria

Sauropodomorpha

Very early in the evolution of the dinosaurs, a branch of saurischian dinosaurs, known as the sauropodomorphs, broke away from the predatory theropods and became plant eaters. This branch, which includes the sauropods and their ancestral relatives, lasted from the Late Triassic until the very end of the time of the dinosaurs.

To begin with, the sauropodomorphs were relatively small and walked on two legs. These early forms were most likely omnivorous. They had massive, clawed thumbs, probably used for defence as well as to pull down branches for feeding. Over time, however, they grew larger, and their increasing size forced them to spread their weight across four pillar-like legs. By 220 million years ago, the sauropods had become Earth's dominant large terrestrial herbivores.

The sauropodomorphs are characterised by their long necks, which they evolved in order to browse, giraffe-like, high in the treetops, accessing foliage other herbivores could not reach. In this they were aided by small, light skulls and a long counterbalancing tail.

Their leaf-shaped teeth could easily slice through tough stems but were unsuited to grinding up food. Instead, they had stomach stones, known as gastroliths, similar to the gizzard stones of modern birds, to help digest tough plant fibres. There is also evidence that the mouths of some species may have ended in a small beak.

Their fossils have been found across all continents and a range of environments, from swamps to deserts. The largest sauropodomorphs have come to symbolise the meaning of the word 'dinosaur' in the popular imagination – unimaginably vast animals that were taller than buildings, longer than buses and whose footsteps literally shook the ground as they walked.

Key to plate

1: *Brachiosaurus altithorax*

Late Jurassic, North America
Length: 25m; Weight: 28,000kg
When its fossils were discovered in 1900, *Brachiosaurus* took the record of the largest dinosaur. Although it has now been surpassed, it is still one of the tallest known dinosaurs.

Brachiosaurus had a giraffe-like body, with a long neck and unusually long front limbs that may have sprawled

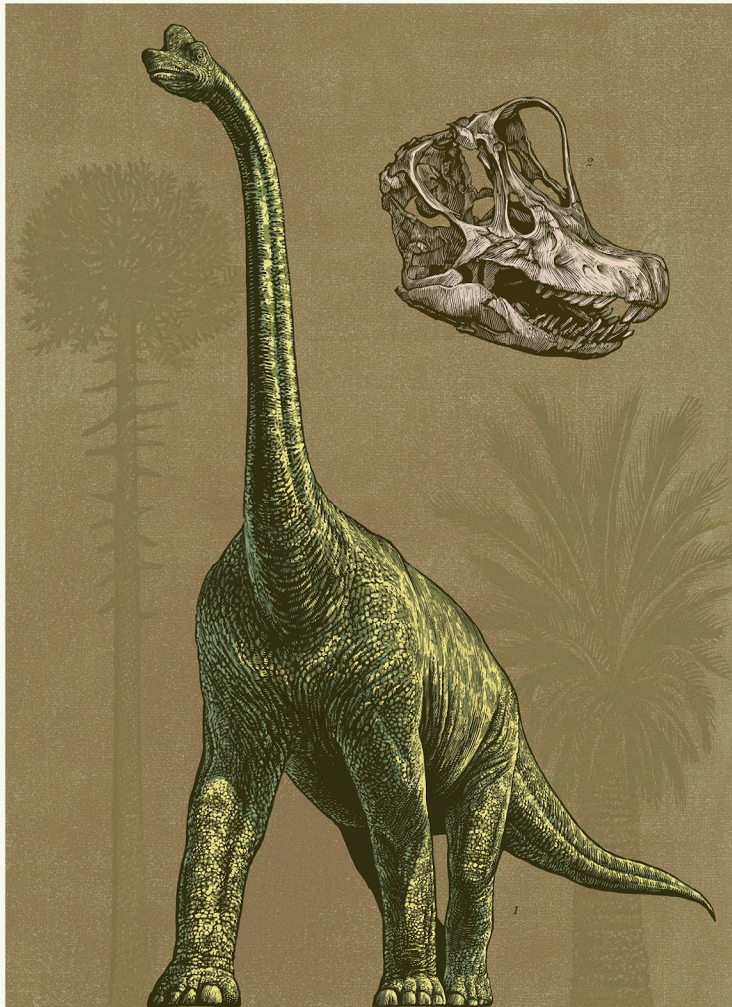
outwards. Its name actually means 'arm lizard'. This giant of a dinosaur could have been even larger than we think, as the lack of fusing in some *Brachiosaurus* bones suggest that the specimen wasn't even fully grown.

Brachiosaurus would have used its long neck to reach leaves, as it would have been unable to rear up on its hindlimbs. In order to sustain itself, it would have needed to eat up to

120kg of cycads (an ancient group of seed plants), conifer and ginkgo leaves every day.

2: *Brachiosaurus altithorax* skull

The dinosaur's skull had a wide muzzle and thick jawbones that housed 52 spoon-shaped teeth (26 in each jaw), which were perfectly suited for stripping vegetation. The large cavity at the top of its head housed its nostrils.





SAUROPODOMORPHA

Primitive sauropodomorpha

Once grouped together as the ancestors of the giant sauropods, these dinosaurs are now thought to be early relatives. They date from the very dawn of the dinosaurs – their fossils are some of the world's oldest discovered dinosaur bones, dating back to 200 to 225 million years.

From the Late Triassic to the Early Jurassic, these were the most common herbivores of their day, and the first group of dinosaurs to dominate their environment. Their fossils have been found all over the world, even in Antarctica, although most are known from northern Europe. They would have browsed for food among the high branches, rearing up on their back legs to reach the best foliage. However, by the mid-Jurassic they had disappeared from the fossil record, possibly dying out as their relatives, the sauropods, outcompeted them for food.

The evolution of the sauropodomorphs shows how they progressed towards larger body sizes, smaller heads, longer necks, and walking on four legs. This would have helped them reach higher into trees to feed and provided defence against the increasing size of their predators – the theropods.

Key to plate

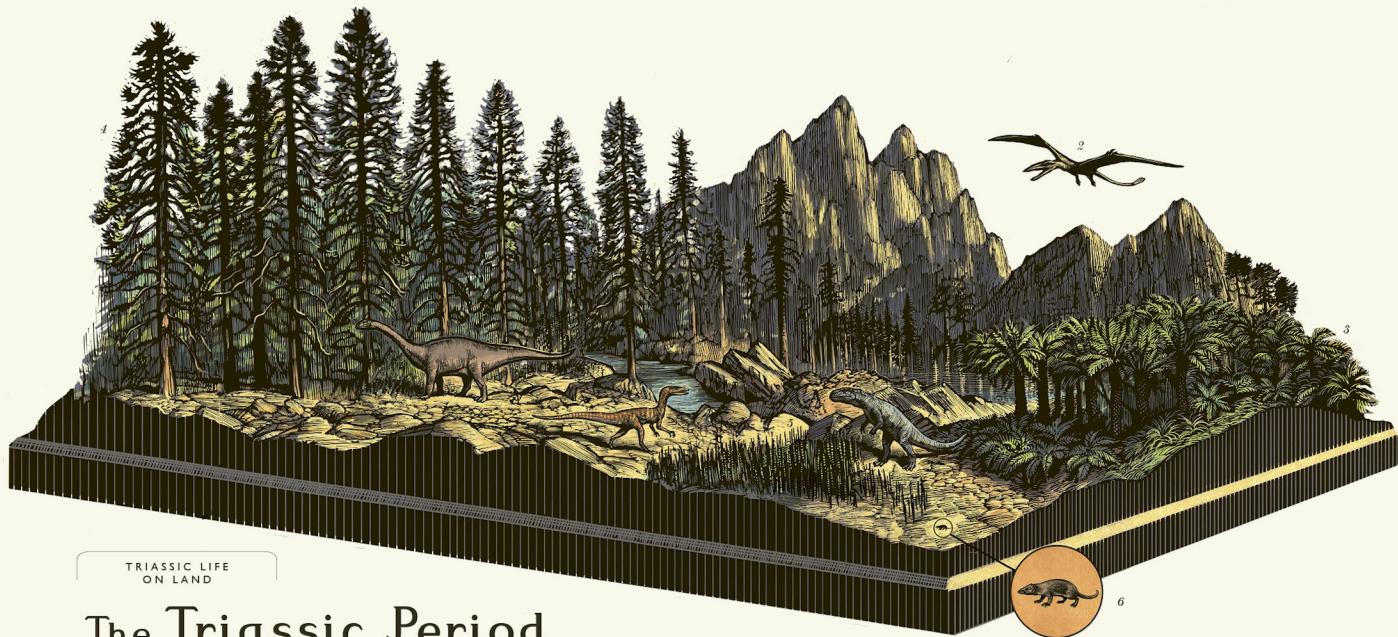
1: *Massospondylus carinatus*
 Early Jurassic, Zimbabwe and USA
 Length: 4m; Weight: 135kg
 This species had a longer neck than most other primitive sauropodomorphs. It also had massive thumb claws which it may have used to tear off branches or roots. *Massospondylus* eggs show that hatchlings had no teeth and were clumsy walkers, suggesting adults would have cared for their young.

2: *Plateosaurus engelhardti*
 Late Triassic, Germany, Switzerland and France
 Length: 10m; Weight: 4000kg
 One of the best known European dinosaurs. Hundreds of fossils have been found together in one place, suggesting they lived in herds.

3: *Thecodontosaurus antiquus*
 Late Triassic, England
 Length: 2.5m; Weight: 40kg

Far smaller than its near contemporary *Plateosaurus*, it is now thought to be a 'dwarf' island species. It was the fourth dinosaur to be named.

4: *Riojasaurus incertus*
 Late Triassic, Argentina
 Length: 6.6m; Weight: 800kg
 With its large body and bulky legs, *Riojasaurus* was a slow-moving animal that was probably unable to rear up on its back legs.



TRIASSIC LIFE
ON LAND

The Triassic Period

Around 251 million years ago, there was a mass extinction in which an incredible 96 per cent of all life forms died out. The Triassic period that followed saw a major growth of life on land, with both the early ancestors of mammals and dinosaurs appearing for the first time.

At the beginning of the Triassic, temperatures were warmer than they are today. There was no ice on the poles and a vast desert covered the interior of Pangaea. On higher, cooler ground, gymnosperms (plants with exposed seeds) could be found as well as coniferous forests.

The climate around the coast was now much wetter, and it was here that most life existed. There were mosses and ferns, spiders, scorpions, millipedes, centipedes and beetles. The Triassic also saw the appearance of the first grasshoppers.

The largest life forms on land were mammal-like reptiles, known as therapsids, and the archosaurs. By the mid-Triassic, the archosaurs had branched into the first dinosaurs, and by the Late Triassic, the winged pterosaurs, the first vertebrates capable of active flight.

The earliest mammal ancestors evolved at the very end of the Triassic, from the therapsids. These were tiny, shrew-like creatures that fed either on plants or insects.

Key to plate

1: Postosuchus
Length: 5m; Weight: 600kg
A top predator in North America, *Postosuchus* was an archosaur with pillar-like upright legs, making it a fast, agile hunter. It lived alongside the small dinosaurs of its time, like *Coelophysis*. Its forelimbs were much shorter than its hindlimbs, suggesting it may have walked on two legs.

2: Fanged pterosaur
Wingspan: 1.3m; Weight: uncertain
Triassic pterosaurs were still relatively small. This one, discovered in 2015 and as yet unnamed, had 110 teeth and four 2.5cm-long fangs. It would have been capable of short flights and preyed on insects and tiny ancient ancestors of crocodiles.

3: Bennettitales
These palm-like plants flourished during the Triassic. They had tough leaves and woody trunks, with short, barrel-shaped stems.

4: Araucarioxylon arizonicum
A species of conifer, forests of which covered North America in the Late Triassic. Its closest relative today is the monkey puzzle tree.

5: Horetails
These rull-like plants were an important food source for the herbivores of the time. They evolved new forms during the Triassic. They reproduced by spores rather than seeds, and were fast-growing and resilient, with underground stems.

6: Morganucodon
Length: 13cm; Weight: 27–89g
An early mammal ancestor, *Morganucodon* still had reptilian features, including the shape of its jaw. It laid eggs, which were probably small and leathery and was most likely nocturnal.