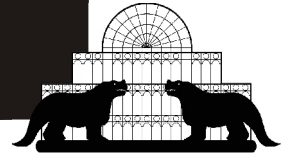
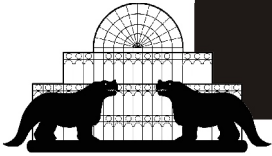


# Crystal Palace Park's PREHISTORIC MONSTER TRAIL



## The Makers of Monsters

**P**rofessor Richard Owen was the man responsible for placing the giant lizards as a new group of animals and naming them collectively as 'Dinosaurs'. In 1852, he was given the task of creating thirty-three life-size models of the known prehistoric animals, as well as a geological time trail and lead mine. The plan was to build the first ever Prehistoric Theme Park that would open at the same time as the Crystal Palace Park in 1854. The models would represent not only the dinosaurs, but also amphibians, crocodiles, marine reptiles, pterosaurs, and early mammals that had lived millions of years ago.

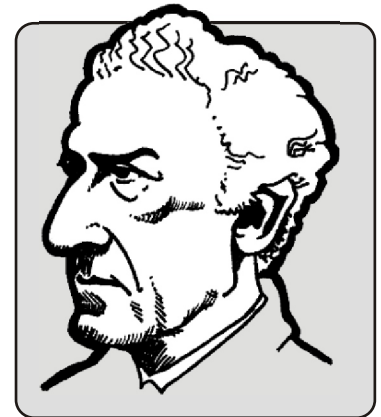
To create the models, Owen enlisted the expertise of *Benjamin Waterhouse-Hawkins*, the famous Victorian animal sculptor. Using fossils from the Natural History Museum, and by comparing them with the bones of modern day animals, both Owen and Hawkins constructed a display that, at the time, introduced the controversial theory that such animals once roamed the earth. All this predated *Charles Darwin's 'The Origin of Species'*, first published in 1859.



Hawkins had planned to complete his display by creating more models, such as the *Dodo*, *Mammoth* and *Sabre-toothed Tiger*. However, *The Crystal Palace Company*, who owned the park at the time, had run out of funds, and much to Hawkins disappointment, they ordered him to stop any further work on the display.

In 2007, the world-famous prehistoric monsters at Crystal Palace Park became officially recognised as Grade One listed buildings/structures.

*Professor Richard Owen*



*Benjamin Waterhouse-Hawkins*

## Frequently Asked Questions

### The Geological Strata and Time Trail

**T**o one side of the wooden bridge, Owen and Hawkins constructed a simulated coal measure within a limestone cliff. This provided a graphic illustration of the natural state of the geological resources, such as coal, iron and lead, which fuelled the industrial revolution ongoing in Britain at that time. In addition, a reconstructed cave was built to the left of the coal measures to represent a lead mine, complete with artificial stalactites and stalagmites. This has unfortunately had to be sealed off as it has become unsafe.

The prehistoric models are shown to be standing on or near the same type of rocks that their fossil remains were found. Lying behind the *Megalosaurus* can also be seen the actual fossilised remains of a 175 million year old tree. It represents the type of vegetation that would have existed alongside that dinosaur.

The creatures are displayed as a time trail, with the *Irish Elks (Megaloceros)* being the most recent animals to have died out (10,000 years ago), right back to the *Labyrinthodons* and the *Dicynodons*, who became extinct approximately 250 million years ago. So, whether you decide to go backwards or forwards in time, these fascinating prehistoric monsters will be giving you a glimpse into the early origins of life on Earth, just as the Victorians would have..

#### **Q. How were the models constructed?**

**A.** Originally, a full size mould of each creature was to be built and then this would be filled with solid concrete. The first and only creature to be made in this way was the *Megatherium*. This method proved far too costly. Thereafter, the moulds were still used but with layers of brick and concrete around an iron-skeleton framework. The moulds were created in a studio on the site where the Information Centre now stands.

#### **Q. Is it true that there was a celebratory meal inside one of the *Iguanodon* models?**

**A.** Yes and no. There was a meal but it was in the mould rather than the actual model; the finished dinosaur would have been too small. Once he'd completed his display, Hawkins showed off his work to some of the leading scientists of the day by holding a New Year's Eve dinner party inside the open-topped mould, complete with waiters and elaborate menu. A cartoon in an edition of *Punch* magazine depicted the meal as if it were held inside the actual dinosaur, and this is where the confusion started. Incidentally, the magazine was also responsible for light-heartedly naming Paxton's glass structure as '*The Crystal Palace*'.

#### **Q. Why are there not any of the well known dinosaurs, such as the *Tyrannosaurus Rex* or *Stegosaurus*?**

**A.** At the time the creatures in the Park were built, monsters such as the *T-Rex* and *Stegosaurus* had yet to be discovered. It was almost fifty years later that the first *T-Rex* fossil was found in the USA. Therefore, the Park creatures represent not only the main prehistoric animals known of at that time, but also how the early palaeontologists envisaged them.

**DICYNODON** (*die-sin-o-don*) means 'two dog teeth'. It lived during the late *Permian* and *Triassic* period about 250 million years ago (*mya*). *Dicynodon* was one of the first mammal-like land reptiles. Fossils have been discovered in South Africa and India. These herbivores lived up until the huge extinction that came at the end of the *Triassic* Period.



The two models shown are of the species *Dicynodon Lacerticeps* ('lizard-headed'). As Hawkins and Owen only had the fossil skull and a few other bones to work from, they wrongly depicted the *Dicynodon* as being turtle-like and gave it a shell on its back. It is now thought to have looked more like a small hippopotamus. (See below for contemporary view)

**ICHTHYOSAURUS** (*ik-thi-o-saw-rus*) means 'fish lizard (reptile)'. They emerged in the late *Triassic* period (220mya), and died out, along with the Dinosaurs, at the end of the *Cretaceous*. They were carnivorous predators, eating fish, shrimp and other sea creatures.

The models should have had a shark-like dorsal fin and tail. They didn't show up in the fossils available to Hawkins and Owen as they originally consisted of cartilage; a soft bony substance, similar to that in the human ear and nose. Cartilage very rarely, if ever, fossilises.



The creatures were also depicted as being able to come out on to the land. Unlike most reptiles, it was not known that the *Ichthyosaurus* gave birth to live young, and it was presumed it would have had to come on to land to lay its eggs. *Ichthyosaurs* were very well adapted to have their young at sea. (See below for contemporary view)

**TELEOSAURUS** (*tee-li-o-saw-rus*) Its name means 'end reptile'. It belonged to the successful group of crocodylians that emerged during the late *Triassic* period, and survived the mass extinctions during the *Cretaceous*.



The first *Teleosaurus* fossil was discovered in 1758 on the Yorkshire coast, but wasn't named until 1825. *Teleosaurs* lived in salt-water and fed on fish and other small reptiles.

Owen associated *Teleosaurs* with the modern-day crocodiles that still live in the River Ganges in India as they had a similarly long and slender jaw line.

**HYLAEOSAURUS** (*hi-lee-o-saw-rus*) means 'forest reptile'. Gideon Mantell named it after the Tilgate Forest in Southern England, where he found the first *Hylaeosaurus* bone in 1833. It was a large plant-eating dinosaur that lived during the early *Cretaceous* period. Not much is known about the *Hylaeosaurus* as, to this day, few fossil remains have ever been discovered.



The head of this model has been replaced with a fibreglass replica after the original had been damaged. The original head can now be found on the hill near to the farm entrance, inside of which can be found markings made by the Victorian sculptors.

**PTERODACTYLUS** (*terr-oh-dak-til-us*) means 'flight finger', and they belonged to the family group of *Pterosaurs*. It emerged during the beginning of the *Jurassic* period, and died out, along with the dinosaurs, around 65 million years ago.

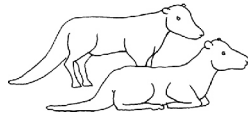


Early *Pterodactylus* ate flying insects and small lizards, whereas the later and larger ones would have eaten fish and scavenged on dead creatures.

Fossils have been discovered in Southern England, France and Germany, and as far away as Tanzania and Africa. Despite appearances, they are *not* related to birds or mammals (i.e. bats); they are flying reptiles. (See below for contemporary view)

**ANOPLOTHERIUM** (*an-o-plo-thyr-ree-um*) These early mammals lived during the *Tertiary* period, about 50 million years ago.

Hawkins' model of *Anoplotherium* was given a camel-like face and hoofed feet; it is now thought that these creatures were more closely related to pigs or hippos.



The three models of *Anoplotherium* represent two different species, *A. gracilis* (graceful), and *A. commune* (common). The model closest to the water is a fibre glass replica, which was recreated with the help of photographs.

**MEGATHERIUM** (*meg-a-thyr-ree-um*) means 'giant beast', and was a giant ground sloth that lived during the Ice Age. Their fossils are mainly found in North and South America. Preserved *Megatherium* dung has enabled scientists to discover that this huge beast was a herbivore (vegetation eater). Preserved skin and hair have been found which has identified the *Megatherium* as having long and shaggy, dark brown hair.



They used their considerable strength to pull up trees to eat the roots and leaves. The model of the *Megatherium* is holding the original Victorian tree that, whilst it continued to grow, eventually broke the left arm off. It now has a replica arm in its place. **DARWIN???**

**LABYRINTHODON** (*lab-e-rin-tho-don*) Their name derives from the unusual maze-like structure found in the cross-section of their teeth. These early amphibians lived during the late *Permian* and *Triassic* period, around 250 million years ago.



With only the fossil head to work on, Owen recognised the creature as having many frog-like characteristics, as well as the bony similarities of crocodiles and lizards.

The three models show two different species; the thick-jawed and the smooth-skinned. *Labyrinthodons* are now thought to have looked more like smaller crocodiles.

**PLESIOSAURUS** (*plee-ze-o-saw-rus*) means 'ribbon reptile'. It lived during the late *Triassic*, 200 mya, dominating the seas in the *Jurassic*, and died out in the early *Cretaceous* period. It was a carnivore, eating mainly fish and squid.

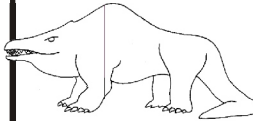


There are three types of *Plesiosaurs* on show; *Plesiosaur Macrocephalus* (long-headed); *Plesiosaur Dolichoderius* (long-necked); and *Plesiosaur Hawkinsii* (named after Thomas Hawkins, who discovered it).

Some scientists believe that if the 'Loch Ness Monster' does exist, the *Plesiosaur* could be a distant relative.

**MEGALOSAURUS** (*meg-a-los-a-rus*) means 'Great lizard'. It was the first dinosaur to be formally named and categorised. It lived during the *Jurassic* period, about 175 million years ago.

Their fossil bones have only been discovered in Europe, with the first recorded find being in England in the 17<sup>th</sup> century. It was originally thought to be a thighbone of a giant human being. This large carnivorous dinosaur preyed on smaller creatures and large plant-eating dinosaurs, such as the *Iguanodon*.



As no complete skeleton had been discovered in 1852, Hawkins and Owen compared the beast with similar meat-eaters from the *Jurassic* period, which were thought to walk on all fours, therefore Hawkins depicted the *Megalosaurus* as such. By 1858, it was considered more likely that they actually had smaller front limbs and walked on their hind legs. (See below for contemporary view)

**IGUANODON** (*ig-yew-ar-no-don*) The name means 'Iguana tooth'.

Their fossilized teeth have a similar structure to the modern day Iguana. They lived during the early *Cretaceous* period, around 120mya. Fossils have been found mainly in Europe and North America.

This herbivore is shown with its leg on a replica of an extinct plant called a *Cycad*. Fossils of this plant have been discovered near *Iguanodon* fossils, which suggest that this species of vegetation was around at the same time. Fossil tracks of *Iguanodon* have since been discovered that show it could walk on either two or four legs. When these models were made, however, such huge creatures were thought to have only been able to walk on four legs, therefore Owen and Hawkins depicted them as quadrupeds.



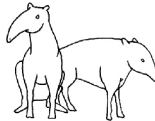
Another error was the 'horn' they placed on the nose. When Gideon Mantell first discovered a collection of *Iguanodon* fossils, only one horn-shaped fossil was found. He identified it as a nose horn, similar to the rhinoceros. Later fossil finds have shown that the horn was actually one of two thumb spikes that the *Iguanodon* had near each wrist. (See below for contemporary view)

**MOSASAURUS** (*mow-za-saw-rus*) is named after the Meuse river in Holland. It was here that the first fossil bones were discovered, over 200 years ago. *Mosasaurs* fossils have been found in Europe, Africa, North America and New Zealand. It first emerged towards the end of the *Cretaceous* and died out with the dinosaurs. This huge aquatic sea-reptile swam at great depths to catch its prey.



Hawkins only had the fossil head to work from, hence the 'unknown' tail end being submerged under the water. Complete skeletons revealed that the *Mosasaurs* had a serpent like body with about a hundred sections of backbone. (See below for contemporary view)

**PALEOTHERIUM** (*pay-lee-o-thyr-ree-um*) In the early 19th Century, Georges Cuvier, the famous Palaeontologist, first discovered *Palaeotherium* fossils in Paris, France. They had lived during the *Tertiary* period. They were forest dwellers that lived in herds and used their small trunks to dig for food.



Hawkins gave them the appearance of a tapir-like creature; today, these creatures are thought to be more closely linked to the horse family.

The *Anoplotherium* and the *Palaeotherium* models can now be seen back on their original site, having been moved when the original zoo was built there.

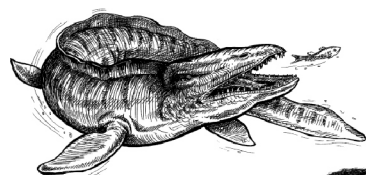
**MEGALOCEROS** (*meg-a-lo-sear-rus*) Their name means 'giant antler'. They emerged around 400,000 years ago, and died out during the Ice Age, 10,000 years ago. Fossils have been discovered all over Europe, and as far away as China. Some of the best come from the peat bogs of Ireland, which is why they are commonly referred to as *Irish Elks*. Their closest living relative is the Fallow Deer.



The male *Megaloceros* had to eat a huge amount of vegetation to sustain their gigantic antlers. This could have been a contributing factor in their downfall as, during the Ice Age, their food source would have been covered with a thick layer of snow. Many fossil antlers from Ireland show signs of malnutrition.

These models of the *Megaloceros* were the last to be constructed and depicted the most recent animals of the display to have become extinct.

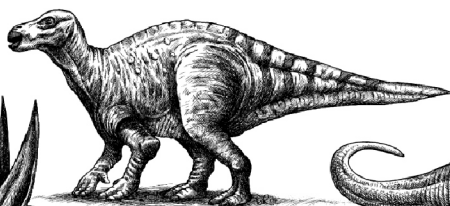
## Contemporary Views of the Crystal Palace Park Prehistoric Monsters



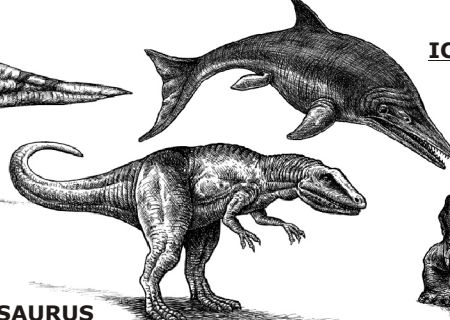
**MOSASAURUS**



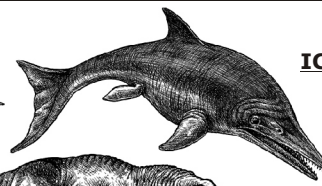
**PTERODACTYL**



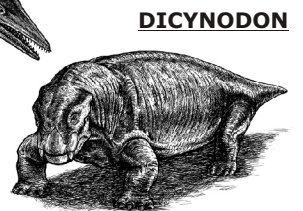
**IGUANODON**



**MEGALOSAURUS**



**ICHTHYOSAUR**



**DICYNODON**