

## Interview with Peter Falkingham

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### Was the climate back then similar to any now?

At any time, the world has many different smaller climates, think of the ice at the poles, and the deserts at the equator. Overall though, the climate during the time of the dinosaurs was warmer. In fact, throughout most of the earth's history, the climate was warmer than today. Believe it or not, it's actually very rare to have ice naturally occurring all year round anywhere on the planet. That we have ice caps is actually unusual in the earth's history!

I think this question leads nicely onto:

### What was the climate like in the Triassic, Jurassic and Cretaceous periods?

Well, as I said above, it was generally warmer than today. If we take the evidence we have for the climate of the UK in those times, we see that the Triassic was almost desert like, whilst the Jurassic and Cretaceous were wetter periods, with more plants, though still warmer than today.

### Looking at the climate theory, how would have that made the Dinosaurs become extinct?

I'm not sure normal climate theory would have been responsible for the extinction of the dinosaurs. As a general rule, climate change occurs slowly enough for evolution to keep up, so as the climate changes, the types of animal evolve. However, when something affects the climate rapidly and suddenly, say an asteroid hitting the earth and throwing lots of dust into the atmosphere, or massive volcanoes erupting, then the climate can rapidly change. This may prove too extreme for some animals, which would become extinct if they cannot handle the cold for instance.

### Did climate change affect all the creatures living at the time?

Almost certainly, but not to the same extent. Whilst dinosaurs went extinct, sharks and crocodiles and turtles (which had been around since before the dinosaurs) stayed pretty much the same. Many types of insect were unharmed too. A general rule of thumb is that animals living in water were less affected by climate change, because water tends to 'buffer' the effects – if the climate gets cooler, water can keep an animal warm, whilst if the climate gets warmer, water can cool an animal down. Big animals living on land are affected more. Of course, that is only a general rule... the 'sea dragons' like plesiosaurs and ichthyosaurs went extinct with the dinosaurs.

### How did the Continents moving effect the Dinosaurs?

Continents move pretty slowly, so in and of itself continental drift doesn't really have much of an effect. Whilst a continent may move between climates, moving from the equator towards a pole, this happens over many millions of years. In this time, species of animal and plant will probably go extinct for other reasons. The time when continental drift really affects animals like the dinosaurs is when two continents collide. When this happens, two groups of animals that have previously been separated are suddenly able to mix with each other. In many cases, this causes a lot of animals to become extinct – perhaps from diseases that they have had no previous contact with, or from a new type of predator. The same works in reverse too... if a group of animals are living together, and then are separated when continents move apart, they become isolated and evolution acts differently to each group. After millions of years, we end up with two groups of very different animals. Much of dinosaur evolution occurred like this, so we get very different types of dinosaur in Africa than we do in Europe or America. We see this in modern animals too: Australia is the only place where marsupials exist, and this is because millions of years ago Australia moved away from other continents, and the mammals there started evolving differently.

### What was the best preserved Dinosaur found and where did it live?

This is a really hard question, and it has several answers depending on what you think is 'best.' Here at Manchester, we've been working on what many people call the best preserved dinosaur – a mummy called Dakota, found in the badlands of South Dakota, U.S.A. There was a National Geographic program about it in December, and another program to go out on channel 4 in March. This dinosaur has been mummified, and so we not only have the skeleton, but also all the skin around it. It is indeed a very nice fossil. At the same time though, there are a number of 'feathered dinosaurs' found in china since 1996, and many of these have an outline of skin, and also small feathers. Whilst these may be slightly less well preserved than something like Dakota, to me they are better fossils because they are a keystone in evolution.

### Where are the most fossils found? Is that because it was a popular area for Dinosaurs to live? Why?

Most dinosaur fossils have been reported from the U.S.A, with a lot also found in areas like the Mongolian desert and the South American Bad Lands. However, don't fall into the trap of thinking there were more dinosaurs there! We find so many fossils in these places because they are very desert-like, and so a lot

of rock is exposed. Here in the UK, there are lots of dinosaur fossils. You only need a walk along the beach on the Isle of Wight or the Yorkshire coast, and you can pick up dozens of dinosaur fossil fragments. The problem is that most of the rocks in this country are covered in grass! So it's not that the dinosaurs aren't here, but rather we can't get to the rocks they are in to find them. In fact, dinosaur fossils have been found on every continent, including Antarctica!

What was the last Dinosaur species alive?

A really good question. The common idea is that the dinosaurs died in a mass extinction at the end of the Cretaceous, 65 million years ago. This is true, and there was a mass extinction, so most of the species alive at the time all died out together. The last species of dinosaur here included such famous dinosaurs as *T. rex* and Triceratops. HOWEVER... we know now from lots and lots of fossils that birds evolved from dinosaurs. So in actual fact, birds are a type of dinosaur, so to the question "What was the last dinosaur species alive?" The answer really has to be that there are lots of species still alive today, from the pigeons in the street, to the robins in the garden to the flamingos in Africa to the penguins at the pole! All of them are types of dinosaur.