



Fossil Detectives

The West Runton Elephant Story

Hermione Cockburn

One of the highlights of making Fossil Detectives, the series, for me, was to get to meet a hero of mine, David Attenborough. Now, he has had a lifelong interest in fossils, since being a child growing up in Leicester. And it was very exciting to get a chance to visit his house in Richmond, sit next to him on the sofa, and interview him about his love of fossils, and see some of the tremendous diversity of fossils that he has collected on his travels, from all over the world. He has a wonderful collection. And one of the questions I asked him was, 'if you could go back in time, when would you go to? What would you be looking for, in terms of wildlife, that we've identified from the fossil records?' And his initial response was that he would go back to see the beginnings of life on Earth, so perhaps, you know, some of those microbes that you see – the fossil evidence for microbes that you see up in Scotland, you know, he might go back and see some of those early microbial life. And then he quickly said, 'actually, no, I would go back to the Mesozoic, the geological era made up of the Triassic, the Jurassic and the Cretaceous, when dinosaurs roamed on the Earth.' And he said, 'to see the biggest things that have ever walked on Earth, you know, wouldn't you? Wouldn't you go back to see that?' So, perhaps that's a question for you at the end, when would you go back to in geological time?

Anyway, David Attenborough's interview was in the first two programmes and, for me, that is a great highlight of the series. But, going back to the talk, dinosaurs were, undoubtedly, the biggest creatures that have ever walked the planet. However, there have been some other very large animals in the past, as well, and you don't need to go back nearly as far into the dim distant past to see them.

Dinosaurs famously died out 65 million years ago, but fast-forwarding now to the recent geological past, just the last 2 million years are known as the Ice Age. This is when, at points in the past 2 million years, glaciers and ice sheets have covered parts of Britain, waxed and waned as climate has fluctuated over this time. And although it's known as the Ice Age, the Ice Age wasn't always icy. The glacial phases were interspersed with warmer periods called interglacials, that had climates rather similar to what we're experiencing today. And during the interglacials of the Ice Age, there have been some rather unusual and large animals that have lived in Britain. And, again, we have fossil evidence that reveals to us this kind of lost world of the Ice Age, what was living at that time.

Now, if we go back just 120,000 years, so we're talking much, much more recent than, say, when the dinosaurs were alive, to one of those warmer interglacial periods, we've got fossil evidence for animals, exotic animals, like lions, hyenas, elephants and particularly, hippos, living right across the south of England and stretching up into Yorkshire. And in the London programme of Fossil Detectives, one of my favourite stories – I haven't got it to show you here, but one of my favourite stories is about hippos that used to live in the Thames, and the kind of fossils that you can find in the Thames gravels, like large teeth belonging to hippos, things like that, I think that's another very exciting story. But if we go back to the previous warm interglacial period, 650,000 years ago, there's particularly good fossil evidence for the large mammals that lived at that time in the east of England, which is our next stop on the clips. So, I'm just going to show you –

Heading up to Norfolk now, and the east of England, to see the discovery of a creature called the West Runton elephant, and I'll let the clip speak for itself.

Clip from Fossil Detectives

Hermione Cockburn

This is West Runton Beach in Norfolk, home of one of Britain's most famous jumbo fossil finds. Stormy seas and tearing winds crash against the east coast today, and it was weather like this that led to the discovery of the largest mammoth skeleton ever found, the 650,000 year old West Runton elephant.

Nigel Larkin

In the storms of 1990, some bones were found at the bottom of the cliffs of West Runton, that turned out to be from a very large species of mammoth, the steppe mammoth.

Hermione Cockburn

Nigel Larkin is piecing together all the fossilised bones of the mammoth, which is an extinct type of elephant.

Nigel Larkin

What we have here is some fantastic bones for you to look at.

Hermione Cockburn

Oh, wow! Just a couple of very big bones.

Nigel Larkin

And these are just fragments of the large piece of bone.

Hermione Cockburn

So, this is actually a part of the famous West Runton elephant.

Nigel Larkin

That's right. And what we have here are the two knee areas, we've got the left and the right. If you can imagine the whole thigh bone going up, the bottom of the thigh bone would be about level with your eyes, the top of the thigh bone would be about three metres high, the shoulders would be about four metres high. If you can picture a really large Indian elephant or African elephant, bearing in mind that the adult males are about five tons in weight, this specimen would have been about ten tons in weight, so, twice the weight of the largest adult male African elephant at the moment. But moving towards the front of the animal, that's really where you get the big indicator that this is a mammoth rather than an elephant. The tusks are huge, not only are they much bigger than an African elephant but they're really curved. They plunge downwards in this big 'U' shape and come up again at the front, but they also curve outwards and then inwards at the same time, to give you that marvellous double curve of a classic mammoth tusk shape.

Hermione Cockburn

Now, these are just two of, what, dozens and dozens of bones you've found.

Nigel Larkin

Yeah, and these are only fragments of much larger bones, actually. You can see some of the large limb bones behind us here, the sort of scale of animal you're looking at.

Hermione Cockburn

They're just enormous.

Nigel Larkin

These are bones that are larger than most dinosaur bones. It's only the very biggest sauropod dinosaurs, the ones with the long necks and the long tails, that would have bones bigger than this.

Hermione Cockburn

So, how much of the animal have you got?

Nigel Larkin

We've got 85% of the skeleton, which is incredible. To put that into context, the only other two partial skeletons of this species known are about 10% and 15% complete, and so it's by far and away the best example of its species in the world.

Hermione Cockburn

And that final 15%, do you think that's still out there waiting to be found?

Nigel Larkin

Some of it might still be out there in the cliffs. But we do know that we have these guys around, the spotted hyenas, and they were much bigger than the African ones we have today, they were about 15% bigger, and they were definitely around chewing the bones. We didn't find any of their bones, because they're carnivores, and bones of carnivores are very rare, this is a modern skull, but we know they were around because they left us these. We've got dozens of these. This is the dropping, fossilised, of our spotted hyena.

Hermione Cockburn

Wow! So, do you have any idea what happened to this mammoth?

Nigel Larkin

We think we do. And, again, that's very unusual in the fossil record, when you only get a fragment of the bone, normally, to have such a complete skeleton. And we do have pathology in this skeleton, which is very exciting, it's very rare. What we have over here, on the back side of the knee, this bit here is broken and re-healed, it must have survived by a number of months or years. If you look, they should be perfectly symmetrical and they're clearly not - this was what was inside the body when it was alive – but it's completely different to the left side. And it must have taken at least 18 months or two years to get to that state, for it to be so different from this other bone.

Hermione Cockburn

So, this poor mammoth, this giant creature, was limping around.

Nigel Larkin

Yeah.

Hermione Cockburn

And then eventually, do you think, succumbed to its injury?

Nigel Larkin

We think so. It was severely disabled, so much so we can pick it up in the other bones, actually, in the pelvis and elsewhere. But we know that this major injury on the right hand side would have been very debilitating. And we find it in a riverbed, it looked as though the skeleton went over onto its right hand side, and that's its injured side, and it just couldn't get up again, and so it died there in the riverbed.

Hermione Cockburn

Gosh, that's such a vivid picture, it's so tragic in a way to think of such an –

Nigel Larkin

It is tragic for the elephant.

Hermione Cockburn

- impressive animal.

Nigel Larkin

But, for us, that was fantastic, because it died in the riverbed, so it got preserved. Had it died on the riverbank, maybe 20 or 50 metres either side, it would eventually be weathered and totally destroyed, but because it was in the river, because it was covered up fairly rapidly, after the hyena damage and the trampling by other mammoths and other injuries it sustained, it is still mostly preserved, and that wouldn't have happened if it died elsewhere.

End of clip

Hermione Cockburn

One thing that wasn't mentioned on that clip there is that the initial discovery of the West Runton elephant was made by some local amateurs, called Harold and Margaret Hems, who deserve the credit for first spotting a large part of the pelvis bone sticking out of the cliff at West Runton and alerting Norfolk Museums' services that this was potentially something that they should investigate. And I think that part of the story illustrates something that is really worth emphasising about palaeontology, because although, as a science, you need to study for a very long time, perhaps, to become a full-blown, bona fide palaeontologist, actually, a lot of big discoveries come from just amateur enthusiasts who, like you and me, walking along the beach, pick something up and go, 'now, that's intriguing, that's something potentially different from what I've seen before,' and pass it on to their local geology group or a local museum, and that's how some of the best discoveries have been made over the years. And there are several stories in the series that we feature, like that, and if there's time at the end I'll show you another one.