

March 11, 2013, 12:27 p.m.

How big were the biggest dinosaurs? Lost fossils tell a tantalising tale

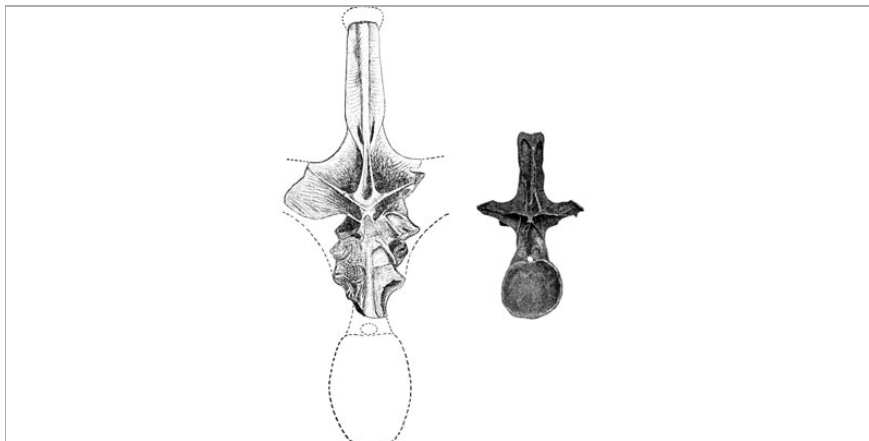


MIKE TAYLOR - I have a recurring nightmare of being in a pub quiz where one of the questions is 'what was the biggest dinosaur?' All my team-mates look to me for the answer, but I'm paralysed - what answer do the quiz masters want?

The heaviest dinosaur known from reasonable remains is probably *Argentinosaurus* at about 70 tonnes and 30 metres. But the lighter *Supersaurus* was probably longer, at maybe 35 metres. Problem is, these are known only from partial skeletons. Among dinosaurs known from complete skeletons, the heaviest is *Giraffatitan*, but it's not quite as long as the lighter *Diplodocus*.

And yet there are tantalising hints of bigger dinosaurs. Much bigger dinosaurs. These are "the ones that got away".

The longest dinosaur that we have evidence for was found 135 years ago. It was named by Edward Drinker Cope as *Amphicoelias fragillimus* in a brief note that included a drawing of the only bone (below, next to a *Diplodocus* vertebra) that was ever found from it: the top half of a vertebra from the back.



That doesn't seem like much to go on, but features of the vertebra indicate that it was from a sauropod in the same family as *Diplodocus*, and the size of the preserved part suggests it was about 1.9 times as big. If that's right, it would have come out at about 50 metres and 80 tonnes. But other published estimates have gone as high as 58 metres and 122 tonnes. It's just impossible to be sure when so much guesswork is needed even to figure out what the vertebra would have been like when complete.

The species of *Amphicoelias fragillimus* is that the one bone which is preserved, destroyed, or lost. Cope's

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March 11, 2013, 12:27 p.m.

How big were the biggest dinosaurs? Lost fossils tell a tantalising tale

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The tragedy of *Amphicoelias fragiimus* is that the one bone we had is gone - destroyed or lost. Cope's drawing was made out in the western badlands of the United States before the vertebra was shipped cross-country to the American Museum of Natural History.

It seems it never arrived. It might have been misrouted or stolen, but most likely it just crumbled into dust during the journey. I like to imagine it crated up and hidden away in a vast warehouse, like at the end of *Raiders of the Lost Ark*, waiting to be rediscovered. But there is another sauropod, discovered much more recently in India, that was probably even heavier: *Bruhathkayosaurus*.

The most important specimen was a tibia (shin bone) which it is claimed was two metres long. This compares with 112 cm for the tibia of *Giraffatitan*. If *Bruhathkayosaurus* was similarly proportioned it would have been 78% longer (about 43 metres) and 5.7 times heavier (perhaps 170 tonnes). But since *Bruhathkayosaurus* was probably a titanosaur, and so more heavily built than *Giraffatitan*, it could have topped 200 tonnes.

This is truly colossal – heavier than all but the biggest blue whales. The idea of an animal that size moving around on land is shocking, even to palaeontologists. Can it really be true? We may never know for sure because (stop me if you've heard this one) the one bone we had is gone. It was never moved inside a museum – perhaps understandable given its size – and got washed away in a flood. It really is a crying shame that all we have left of both of the biggest-ever dinosaurs is drawings.

At least the *Amphicoelias* drawing is a good one. Sad to say, the only published drawing of the *Bruhathkayosaurus* tibia is terrible – a mere scribbled outline that really tells us nothing about it. Its identity as a titanosaur tibia rests on second-hand information that can now never be verified. It might have been the distorted femur of a merely *Giraffatitan*-sized sauropod. Not all palaeontologists are even convinced that it was a bone at all, rather than a fossilised tree-trunk.

So how big did dinosaurs get? The honest answer is that we don't really know. My intuition, based mostly on Cope's pretty good *Amphicoelias* description, is that at some point, someone is going to find good remains of a sauropod that uncontroversially topped 100 tonnes, maybe much more. But who knows how long we'll have to wait?

- Dr. Mike Taylor is a computer programmer in his day-job, and a Research Associate at the University of Bristol. He has the luxury of working almost exclusively on sauropods, the most impressive and inspiring of all dinosaurs.

- Illustration of *Amphicoelias* by Matt Martyniuk

- Composite of *Amphicoelias* and *Diplodocus* vertebrae by Mike Taylor

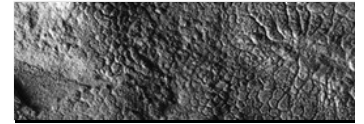


March 6, 2013, 5 p.m.

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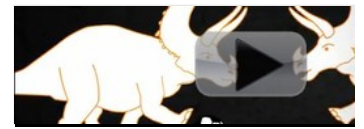


March 5, 2013, 12:11 p.m.

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