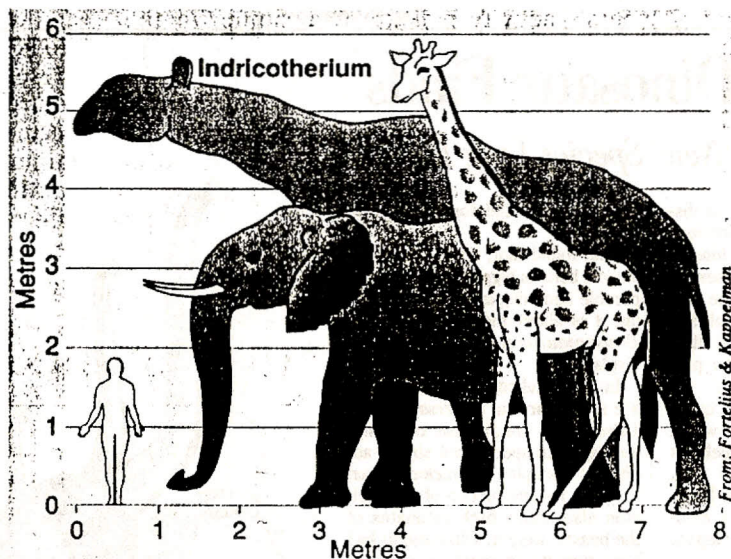


## Honey, I shrunk the giant mammals

THE largest mammal ever to walk on land was a lot less impressive than most people imagined. Indricotherium, a rhinoceros 5 metres high that lived in Asia about 30 million years ago, was thought to have weighed up to 30 tonnes. But, say two palaeontologists, the beast may have tipped the scales at only 11 tonnes—a little less than twice the weight of the heaviest recorded elephant.

Mikael Fortelius of the Finnish Museum of Natural History in Helsinki and John Kappelman of the University of Texas at Austin, say the very largest indricotherium, which is also known as the baluchitherium, may have weighed between 15 and 20 tonnes, making it about as heavy as the largest mammoth. Another researcher has produced a similar estimate. Gregory Paul, an independent palaeontologist in Baltimore, believes indricotherium weighed 16 tonnes.

It is not only giant mammals that are shrinking. Recent studies of dinosaurs have also indicated that they were less massive than had previously been thought. Nevertheless, there is still a discrepancy in average weight between



land animals and the biggest sauropod dinosaurs. Brachiosaurs could reach 45 tonnes, and some less well-known sauropods may have been more than twice this weight, says Paul.

Palaeontologists estimate the sizes of extinct animals by comparing known fossils with the bones of living animals. But because most fossils are fragmentary, this can lead to errors in estimating the dimensions of an extinct animal. The weight of an extinct animal is even

harder to estimate because it depends on the quantity of soft tissue the animal had—a material not preserved in fossils.

Usually, researchers estimate the mass of an animal by developing formulas based on bone size, or by building a plastic model of the animal and dipping it in water to see how much water is displaced. Extrapolations from living animals play a part in these processes, but may not be valid. For instance, the original high estimate of the mass of indricotherium was based on a comparison with the modern rhinoceros. But this animal has a skeleton which is far stockier than is necessary to support its weight (*New Scientist*, Science, 4 July 1992). Many early rhinos were built much more lightly. "Indricotheres were basically scaled-up workhorses," says Paul.

The weight revisions leave palaeontologists puzzling over why land mammals were smaller than the sauropod dinosaurs, while marine reptiles never approached the size of the largest marine mammals, modern blue whales, which can reach 200 tonnes.

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