

Wading with dinosaurs

24 Apr 2023

Share: [Twitter](#) [Facebook](#) [LinkedIn](#) [Email](#)

As the Natural History Museum hosts the first European display of Patagotitan, Brian J Ford resurfaces to float his theory, first published a decade ago in Laboratory News, that the clue to the largest dinosaurs' size rests on water rather than land.



Argentinosaurus, another Titanosaur, Fernbank Museum in Atlanta, Georgia

Giant dinosaurs were never terrestrial – they evolved in water. The titanosaur at the Natural History Museum proves my point. Palaeontologists insist that these gigantic creatures were terrestrial, and illustrations show monstrous dinosaurs pirouetting on one foot. Yet research at Manchester university has demonstrated nothing so massive could have moved easily on land.

A decade ago in Laboratory News I published my theory that an aquatic habitat had impelled dinosaurs to their gigantic size. Five years ago my book Too Big to Walk was published in Britain and America by Harper-Collins. Both brought a torrent of abuse from the world of palaeontology – yet the latest evidence supports my view. The conventional theories have giant dinosaurs as terrestrial species, perhaps resting in shallow pools and browsing on forest trees. I believe they evolved in shallow water. The giant sauropods were scavenged by theropod meat-eaters as they died.

A tyrannosaur is essentially a crocodile the size of an elephant. A one-tonne crocodile can manage a short dash to seize prey, but palaeontologists insisted T. rex could run at 30 mph. They're wrong. Why did it evolve such tiny forelimbs? It was because of the buoyancy of water.

The largest sauropods (like Patagotitan at the Natural History Museum) weighed 120 tonnes, and for decades I was preoccupied by the intense labour of the muscle cells holding those extremities aloft. A terrestrial dinosaur would rest its tail on the ground, yet marks from dinosaur tails have rarely been found. The neck – far from being held erect – also rested in water. This is why large dinosaurs evolved hollow bones; they needed bodies that couldn't sink.

We know the huge mouth of a hippopotamus, living largely in water and subsisting on vegetation. A titanosaur weighed 50 times as much yet had a small head and a tiny mouth. Consuming the two tonnes of leaves it needed each day is absurd. Supported by buoyancy, the energy demand would be a small fraction of this. It is the obvious answer.

People gloss over dinosaur sex. The serious-sounding scientific BBC documentaries Walking with Dinosaurs demonstrated their version of Diplodocus copulating. The mating calls, sexual displays and rituals were all presented as facts, without a hint that it was pure invention. The commentary mentioned what a risky business copulation must be for the female Diplodocus, supporting the weight of the mounting male. It would also be risky for the male; a row of sharp upward-projecting spines runs down the back of these sauropods from head to tail. They would shred the male's genitals.

“ A tyrannosaur is essentially a crocodile the size of an elephant. A one-tonne crocodile can manage a short dash to seize prey, but palaeontologists insisted T. rex could run at 30 mph. They're wrong. Why did it evolve such tiny forelimbs? It was because of the buoyancy of water ”

No 100 tonne land animal can copulate. It's a physical impossibility, which is why palaeontologists skate over the subject. My theory solves the problem; the largest creature that can exist on land weighs about 10 tonnes; in water it is 100 tonnes (whether it's a whale or a dinosaur).

This problem of mass has continued to preoccupy palaeontologists. They are fixated on the power, the agility, intelligence and domination of these giants. Until my theory was published they liked to quote the greatest weights they could, just to show how massive and impressive a dinosaur could be.

That has now changed; the presumed mass of dinosaurs has been reduced in recent years. Look up the weight of Brachiosaurus and you will find it quoted at 180 tonnes; look elsewhere and it weighs no more than 32 tonnes. No creature of such size could, as the innumerable illustrations portray them, walk on the shore. When elephants try it, they sink deep in the mud. Yet all dinosaur footprints are a few inches deep, precisely what they'd be if the animal was buoyant in water and moving by pressing lightly on the mud at the bottom. That meteorite could not have caused their extinction. Other large reptiles survived. Crocodiles, alligators, caimans and turtles lived on. They all swim, so the depth of water is immaterial. The giant dinosaurs died out, not because of a catastrophe but due to habitat loss. The ancient supercontinent Pangea began to break up, the endless shallow lakes and seas disappeared into deeper oceans, so the entire habitat those early reptiles needed was destroyed. Indeed, my aquatic theory solved the outstanding problems faced by paleoclimatologists. The late Bill Hay, professor at Colorado and the authority on the subject, wrote that my remodelling of the Cretaceous resolved the outstanding issues they faced.

My theory also solves one of the greatest controversies about the giant dinosaurs: were they warm- or cold-blooded? They inhabited an aquatic environment, so their blood temperature was that of their surroundings – close to mammalian body temperature. This explains why they seem to have had warm-blooded metabolism, whereas no reptile ever evolved to be warm-blooded. It was their aquatic habitat that gave them warmth, as it had given them the impetus to evolve.



Professor Brian J Ford is an Honorary Fellow of the Royal Microscopical Society and the Linnean Society

Most Popular

Most Shared

- Wading with dinosaurs
- Synthetic affinity reagents: new possibilities for diagnostics
- Northumbria-led global polar team reveals shocking rise in ice sheet depletion
- #CHEMUK 2023: CIA's Innovation chief Lancaster is our keynote speaker
- CHEMUK 2023 Preview: Get in the zone

Most Popular

Most Shared

- Wading with dinosaurs
- Synthetic affinity reagents: new possibilities for diagnostics
- Northumbria-led global polar team reveals shocking rise in ice sheet depletion
- #CHEMUK 2023: CIA's Innovation chief Lancaster is our keynote speaker
- CHEMUK 2023 Preview: Get in the zone