

a giant awakes

For nearly 100 million years, a gargantuan creature – perhaps the largest ever to walk on Australian soil – has lain concealed in central Queensland, as if in hibernation. Now a sheep farmer has woken it up.

BY STEVEN SALISBURY

I LOOKED AROUND DESPERATELY for something the right size. I needed something big, but the tallest tree I'd seen all day was a straggly wattle we'd nearly run over with the four-wheel drive. Quickly, I counted the rungs on a nearby windmill. There were six, spaced about a metre-and-a-half apart, making the windmill's total height about 10 m. That meant the shed next to it must be about 20 m long. It'd have to do.

Turning to the other palaeontologists and colleagues from the Queensland Museum, I said: "From the pieces we've got, I'd say he was about 4 m high at the hips. That's just under half the height of the windmill." I paused and looked towards the shed. "It's hard to know how long his tail and neck were, but I reckon there's a good chance he would've stretched the length of the shed."

I thought about what I'd just said and tried to visualise an animal that size. This was a big one – a *really* big one. A prehistoric, ground-shaking road train that thundered through the ancient outback. I smiled to myself. No dinosaur of this size had ever before been found in Australia.

Two gigantic sauropods forage along the banks of a billabong. Coelurosaurs scurry around the sauropods' thumping feet, catching insects attracted to huge piles of dung, while on the opposite bank, a few MUTTABURRASAUROS pause to drink, watched by basking crocs. Bones of Australia's largest sauropod were recently discovered near Winton in central Queensland.

ILLUSTRATION: LAURIE BEERNE



Dinosaur Dreamtime

DRAW THREE LONG, straight lines in outback Queensland from Chillagoe in the north to Boulia in the west, then to Roma in the south and back to Chillagoe. This vast region is what I call the Dinosaur Triangle – the area in which nearly all of Queensland’s dinosaur fossils have been found.

Slap bang in the middle of this triangle, more than 15 hours drive from Brisbane, lies Winton and the nearby sheep station where the latest dinosaur remains were discovered.

The station is set in a seemingly endless expanse of semi-arid grassland, with gently rolling downs of drought-resistant Mitchell grasses. Few trees grow in the dense clay soils of the downs, but occasionally the grassy plains give way to hardy scrub and forest communities of gidgee, boree, lancewood and coolibah.

It was much different 98–95 million years ago. Back then – in the middle of what we call the Cretaceous Period – this was part of a great river plain, with sandy channels, swamps and lakes brimming with freshwater mussels, lungfish and crocodiles. Open, lowland forests covered much of the land, as revealed by numerous plant fossils found throughout the area, including the trunks and fronds

of tree ferns, pine cones, pieces of petrified wood, and leaves from some of the first flowering plants.

This ancient landscape was also home to a diverse range of dinosaurs. These are known mainly from fossilised tracks, the best examples of which are at Lark Quarry (Corroboree, AG 56), about 95 kilometres south-west of the town. There, footprints of a large carnivorous *Allosaurus*-like dinosaur run amok among those of chook-sized creatures called coelurosaurs, and slightly larger plant-eaters called ornithopods. A fourth set of prints may belong to one of Australia’s best-known dinosaurs, the 7 m long *Muttaburrasaurus*.

Nearly all of the Dinosaur Triangle is set on a thick sedimentary layer known as the Winton Formation. Up to 400 m thick in some places, this vast rock unit has produced the remains of at least 12 dinosaurs.

Most of the dinosaur bones found in the area are remnants of enormous plant-eaters called sauropods. Sauropods were a group of gigantic four-legged plant-eaters characterised by long necks and tails, legs thick as Greek pillars and disproportionately small heads.

When I was a kid, I used to love dreaming about enormous sauropods such as *Brontosaurus* – now known as *Apatosaurus* – *Diplodocus* and *Brachiosaurus*. The sauropod group includes the largest animals to have walked the earth: few other dinosaurs were larger than even the smallest sauropods, which were nearly 1.5 times the size of an African elephant.

We’ve known for more than a decade that Australia was home to sauropods as massive as Elliot, but we just haven’t had the bones to prove it. Between 1987 and 1993, enormous sauropod footprints were found on the wave-washed rock platforms around Broome, Western Australia. The sandstone in which these footprints occur is only slightly older than the Winton Formation.

Most of the Broome footprints are 45–90 centimetres wide, but at least one set of tracks belong to an animal with feet an incredible 1.5 m long. Footprints this size can only have been produced by a truly gigantic animal, whose size may well have surpassed even the mighty *Argentinosaurus* and



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One of the world’s only recorded dinosaur stampedes is set in stone at Lark Quarry Conservation Park, 95 km south-west of Winton. There, about 170 two-legged coelurosaurs and ornithopods, most the size of turkeys, had gathered by a lake. They were frightened into a stampede by a hungry, *ALLOSAAURUS*-sized theropod. Its 60 cm long footprints show where it pounded through the ancient mudflat before disappearing in the direction of the startled mob.



COURTESY OF TOURISM QUEENSLAND

Paralititan, both of which are thought to have exceeded 30 m in length and weighed as much as 90 tonnes.

Unlike other continents, Australia has few remains of sauropods, and dinosaurs in general. In part, this is the result of there being few exposed rocks of the right age in this country. To a greater degree however, it reflects the simple fact that, in contrast to countries like the USA, we simply don’t have as many people scouring our vast land for dinosaur remains, which are difficult to find at the best of times.

Our biggest yet

THE BONES our team had come to examine were first spotted by a farmer while he was mustering sheep in October 1999. “I was in the foulest mood when I found the things,” he told us over a few tinnies. “I was wheeling a big mob at the time. The bastards were all over the place and had just split in two. All of a sudden I spotted something out of the corner of my eye that looked like a dinosaur bone.” Jutting from the parched soil, its stark whiteness was

clearly visible among the long strands of dry yellow grass.

A year later, the farmer returned to the spot to collect the bones. “We had a great time with the kids trying to put some of the bigger pieces back together,” he said. “Once we’d done as much as we could we decided to call you fellas.”

Dr Mary Wade, an Honorary Associate of the Queensland Museum, then did a preliminary examination of the bones and suggested they might belong to a sauropod. That was all we needed to hear.

When we arrived at the homestead, the bones had been neatly arranged for us on a table. I’ll never forget the synchronised dropping of jaws when we walked into the room. Most dinosaur finds in Australia usually begin – and often end – with tiny, isolated fragments of bone, scoffed at by overseas palaeontologists. But here were literally hundreds of pieces of dinosaur skeleton, including part of the femur (the thighbone), several vertebrae and portions of ribs. I knew at once that they belonged to a sauropod – they were absolutely massive. The piece of femur alone was the size of a medium-sized television, about

Experts in their field. Crawling on hands and knees, palaeontologists scour the ground for small, exposed fragments of the recently discovered giant sauropod named Elliot. The bones were scattered over an area the size of seven rugby fields, presumably dispersed by the currents of the river or lake in which the giant died.

HOW CAN YOU TELL?

Dinosaur bones in the Winton Formation sometimes appear similar to the sun-bleached bones of present-day animals, so how do palaeontologists recognise them in the field? Some of the more distinctive bones can be quickly identified by their size or shape but, at first glance, smaller pieces can be hard to distinguish from bits of more recent skeletons. One major clue is their weight – over aeons underground, the internal cavities of a dead animal’s bones may become impregnated with minerals, making them become much heavier. A dinosaur bone of a similar size to one from a recently dead animal, such as a cow, would weigh almost twice as much as the newer bone.



60 cm high and 50 cm wide. It took two of us to carry it outside.

Although it was far too early to determine if the sauropod was new to science, we decided straight away that it should at least have a familiar name as well as its obligatory museum specimen number: QM F43302. We left the decision to the station manager, and his choice immediately brought a smile to all our faces: Elliot, after a family member.

Determining how large Elliot was, and even his species, will be a long investigative process. All the sauropod fossils previously found in the area are thought to belong to a type of dinosaur named *Austrosaurus*, the first specimen of which was discovered in the late 1920s. *Austrosaurus* had robust front legs and the first bones found were estimated to have come from a creature about 15 m long. The bones of Elliot collected so far indicate that he was very similar to *Austrosaurus*, if not the same species.

The large chunk of femur provided the best gauge for estimating Elliot's size. Using proportions from other sauropod skeletons, I calculated that his femur must have been 1.5–1.7 m long. This is substantially bigger than any other found in Australia – the largest reconstructed *Austrosaurus*

“My instincts tell me there’s much more of Elliot still in the ground.”

femur in the Queensland Museum collection is no larger than 1.4 m.

Most sauropods have femur lengths of 1.3–1.5 m and I could find only a couple of animals with longer legs than Elliot, among them *Brachiosaurus*, the largest specimens of which have femurs just over 2 m long.

Once I’d worked out the length of Elliot’s femur I was able to speculate on his overall length and weight. Sauropods show great variation in the length of their neck and tail, with some of the longest getting most of their length from an enormous tail. For example, *Diplodocus*’s graceful tail accounts for almost 45 per cent of the creature’s total length of 23–27 m. On the other hand, *Brachiosaurus* had a relatively short tail, but its giraffe-like neck accounted for almost 10 m of its total length of 22.5 m.

Judging by the similarities in body proportions to those of titanosaurs, a group of Gondwanan sauropods, it’s a pretty safe bet that Elliot was 16–21 m long. Although not as long as some of the so-called “super giants”, Elliot had a build that would have given him a mass of at least 30 tonnes.

Finishing the job

MY INSTINCTS tell me there’s much more of Elliot still in the ground – at least three times as many pieces as we’ve already found. Given his enormous size, it seems highly unlikely that the pieces we so far have are all that remain. His massive bones would not easily have been moved or eaten by scavengers – even a large carnivorous dinosaur like *Allosaurus*.

Our team found fragments spread out over an area the size of seven rugby fields, but all the bones so far collected come from the surface.



STEVE WILSON

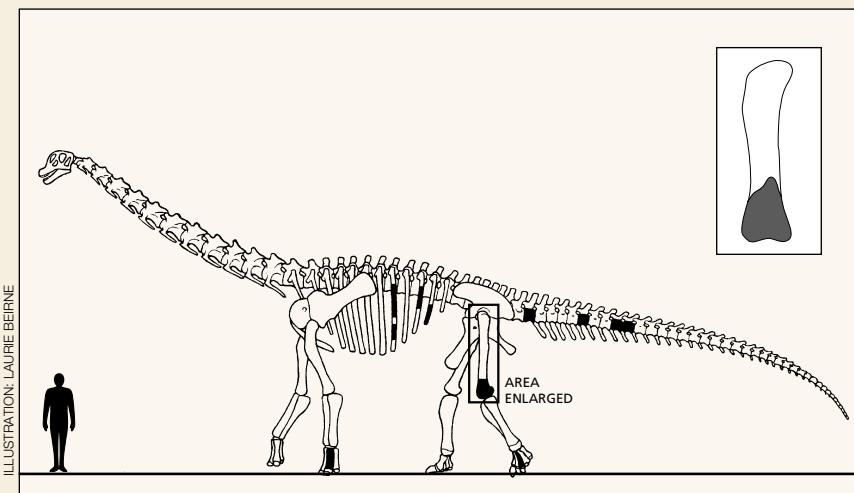
Back in the lab, Joanne Wilkinson carefully tends to the piece of Elliot’s femur. As senior fossil preparator at the Queensland Museum, Joanne first cleans the bone in water and allows it to dry. She then applies soluble plastic diluted with acetone. The porous bone absorbs the plastic and, after several applications, gradually hardens. Pieces of bone that have broken off are affixed with an epoxy-resin glue, to complete the conservation of this most important find.

that could take many years.

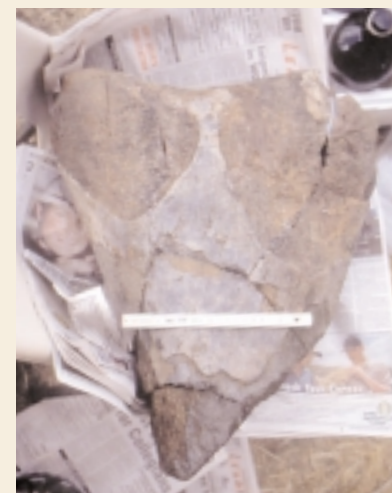
When I was a young dino-freak growing up in the Blue Mountains, New South Wales, nearly all the dinosaur names I memorised belonged to animals from other countries. Thankfully, as the years went by, I was able to add a few Australian ones to that list – *Muttaborrasaurus*, *Minmi*, *Leaellynasaura* and *Atlascopcosaurus*. When my dad asked me which were the biggest I’d always find myself telling him about dinosaurs from overseas. Although I knew about *Austrosaurus*, it never seemed to qualify as a dinosaurian heavyweight.

Those days are over. After 95 million years asleep, Australia’s Dream-time giant has finally awoken.

PIECES OF THE PUZZLE



Although only a fraction of Elliot’s skeleton has been recovered (bones marked in black), there are enough pieces to give us an idea of his size and shape. Some aspects of Elliot’s skeleton indicate he was similar to a sauropod known as a titanosaur. Based on a titanosaur skeleton, Elliot’s total length would have been 16–21 m. At this size he would have been almost 4 m high at the hips and weighed as much as five African elephants.



STEVE SALESBURY

Almost 50 cm across, this portion of the femur forms the upper part of the knee joint. With a total length of 1.5–1.7 m, the complete femur (inset, above left) would’ve been as tall as a family fridge.