

A squirrel with brown fur and a long tail is perched on a thick, dark brown tree branch in the upper left corner of the image.

current conservation

A solid pink circle containing the word "kids" in a white, lowercase, handwritten-style font.

kids



THE REDISCOVERY OF AN ANTIQUE THE DINOSAUR ANT

Words **Matthew Creasey** and Pictures **Sreeja Basu**

The searing heat of the Australian outback evaporated into the night and a chill descended, sinking deep into the hollows between the mallee trees which surrounded the impromptu camp. Bob Taylor had itchy feet. Not because of his desert boots (although perhaps that too), but because he was itching to begin his search. In a way it had been over 40 years in the offing and this unplanned delay was trying on the nerves. What he sought was out there, somewhere, in the darkness.

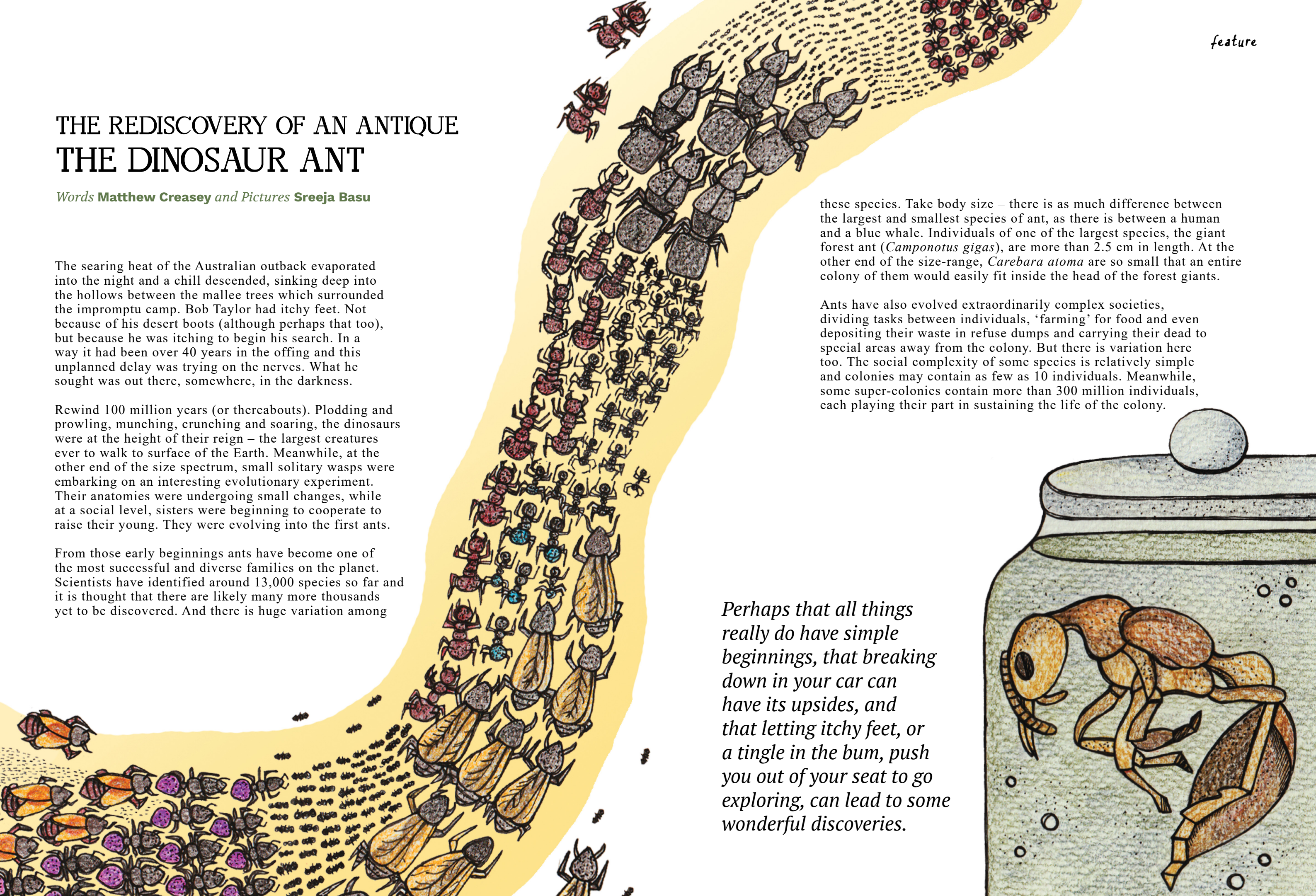
Rewind 100 million years (or thereabouts). Plodding and prowling, munching, crunching and soaring, the dinosaurs were at the height of their reign – the largest creatures ever to walk to surface of the Earth. Meanwhile, at the other end of the size spectrum, small solitary wasps were embarking on an interesting evolutionary experiment. Their anatomies were undergoing small changes, while at a social level, sisters were beginning to cooperate to raise their young. They were evolving into the first ants.

From those early beginnings ants have become one of the most successful and diverse families on the planet. Scientists have identified around 13,000 species so far and it is thought that there are likely many more thousands yet to be discovered. And there is huge variation among

these species. Take body size – there is as much difference between the largest and smallest species of ant, as there is between a human and a blue whale. Individuals of one of the largest species, the giant forest ant (*Camponotus gigas*), are more than 2.5 cm in length. At the other end of the size-range, *Carebara atoma* are so small that an entire colony of them would easily fit inside the head of the forest giants.

Ants have also evolved extraordinarily complex societies, dividing tasks between individuals, ‘farming’ for food and even depositing their waste in refuse dumps and carrying their dead to special areas away from the colony. But there is variation here too. The social complexity of some species is relatively simple and colonies may contain as few as 10 individuals. Meanwhile, some super-colonies contain more than 300 million individuals, each playing their part in sustaining the life of the colony.

Perhaps that all things really do have simple beginnings, that breaking down in your car can have its upsides, and that letting itchy feet, or a tingle in the bum, push you out of your seat to go exploring, can lead to some wonderful discoveries.



But how did such variation and complexity evolve? In biology, it is commonly assumed that complexity must have evolved from simple beginnings. So in the case of ants, it would be predicted that the first species would have relatively small colonies and simple social systems. However, actually showing this is difficult – how do you study species that were around during the time of the dinosaurs? The answer is - find a ‘Dinosaur Ant’...

So back we go to Bob Taylor and his itchy feet. It is 1977 and Professor Taylor, an Australian myrmecologist (ant researcher), was embarking on just such a search – a Dinosaur Ant hunt.

Back in 1931 an expedition across the deserts of Western Australia had brought back two specimens of a previously unknown ant species. These were pickled in alcohol and given to the National Museum of Victoria in Melbourne. Named *Nothomyrmecia macrops*, there they sat for years, before a leading ant specialist finally recognised their importance. Their bodies suggested that they might come from a species very similar to the very first ants. If a living colony could be found, they could be studied and we might learn more about the origins of the multitude of species living today. A number of expeditions went back to the original discovery site, but all failed to find anything. Eventually, rediscovering the Dinosaur Ant became the Holy Grail of myrmecology and Professor Taylor, then chief curator of the Australian National Insect Collection, made it his mission to find The Grail.

An expedition was organised, which would drive from Taylor’s base in Canberra in the far East of Australia, over 3000 kilometres to the original site where the Dinosaur Ant specimens had been found, near Esperance



in Western Australia. However, with over a thousand kilometres still to travel, problems with the vehicles forced the expedition to make camp in an area of bush close to the small town of Poochera. After darkness fell, Bob decided to take a stroll and after only 20 paces, let out a yell (his language of course must be excused – he was very excited, and very Australian!). “The bloody bastard’s here! I’ve got the Notho-bloody-myrmecia”. He had found a *Nothomyrmecia* worker, wandering up a tree trunk, only yards from where the trucks had broken down. Over subsequent years, it was found that *Nothomyrmecia* did indeed have small colonies, and a form of sociality much simpler than that seen in many modern species. It seemed that this truly was the Dinosaur Ant – a missing link back to the very first ants to roam the Earth, 100 million years ago. So what can we learn from this? Perhaps that all things really do have simple beginnings, that breaking down in your car can have its upsides, and that letting itchy feet, or a tingle in the bum, push you out of your seat to go exploring, can lead to some wonderful discoveries.

Further Reading

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a day in the life

A NIGHT IN THE LIFE OF A FROG AND A FROG BIOLOGIST



Funnily, a day in the life of a batrachologist (one who studies frogs) actually begins at night. With the sun going down, the forest is shrouded in darkness and becomes an orchestra of sounds. It was on one such cold night, during the monsoon of 2011, that I encountered a fascinating sight which posed several questions in my mind. I got out of the vehicle and walked along a small trail beside a fast flowing stream, in the remote forests of the Kalakad Mundanthurai Tiger Reserve (KMTR), in Tamil Nadu, India. My headlamp threw a thin beam which sliced through the dark and illuminated the path. I was joined by my colleagues Prashanth M.B. and Dr. Ganesh T. Together we were hoping to spot a species of frog which I had seen in that area: a green frog with golden marks actually inside the eye. This frog, known by the scientific name *Raorchestes chalazodes*, was a re-discovery, not seen in this region for 130 years!

Perhaps the reason it had been ‘lost’ was because of its amazing camouflage. Or perhaps it was something to do with its behaviour. That fateful night I finally spotted the green frog and quickly turned off my light so as not to disturb it. In the dark I got my camera ready and turned the light back on. And behold! The frog was squeezing itself into a stalk of bamboo. It took little over a minute to squiggle into the narrow hole and I and my colleagues were spellbound by the sight. Then the frog began to call from inside. Among frogs, males produce a sound to attract a female. We assumed that the frog must be breeding inside the bamboo. I carefully split open the bamboo and found the male frog sitting with the eggs. Then we found another and yet another such male inside the bamboo clump and all of them were with eggs.



Soon, it was time for dinner. The air was getting cooler by that hour and so was our food. We sat down on the road, took out our packed dinner, comprising cold idly and sambar. As we ate we heard noises in a tree nearby and when we pointed the torch in that direction, we saw a pair of glowing eyes. Excited, we went closer and saw a rare flying squirrel. These squirrels are the size of a cat and glide from one tree to another. While working at night, we often encountered a diversity of wildlife. Some nights we would see large-scaled pit vipers, brown palm civets, mouse deer, leopards or elephants. We would also often startle sleeping birds. Birds do not sleep in nests, but on branches, curling up like a fluffy ball.

I spent the next three years studying the behaviour of *Raorchestes chalazodes*. But how does one observe the behaviour of frogs that breed inside bamboo, without cutting it open? Well, I used an endoscope - a small camera attached to a long wire and a screen. Every night for 6 - 8 months, my colleague Vignesh and I would insert the endoscope into the bamboo clump and observe the frogs' behaviour, without harming them. Having worked all night, we would return to base on an old motor bike, get a good breakfast and sleep until the evening, when our day would start all over again!

So for a batrachologist, the day actually starts at night. And out of the darkness, some extraordinary things can be uncovered.

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