



Waltzing the Billabong

In 2006, a dinosaur graveyard in outback Queensland surrendered a spectacular new sauropod named Matilda. As Australia's best preserved sauropod skeleton and the type specimen of *Diamantinasaurus matildae*, Matilda was a star in her own right, but she was to reveal a stunning secret – she had not waltzed to the grave alone ... Her partner? A murderous carnivore named *Australovenator wintonensis* – the 'Southern Hunter from Winton'!

SETTING THE SCENE

As a kid, 'Scotty' Hocknull dreamt of finding a big carnivorous dinosaur. After all, it was only a matter of time before someone, somewhere in Australia, found a near-complete theropod skeleton, rather than the odd bone, tooth or claw! Nonetheless, he concedes the dream was never *really* contemplated in adulthood.

Fast forward to June 2006 and Scott, now a palaeontologist and Curator of Geo Sciences at the Queensland Museum (QM) was standing with a shovel at the Australian Age of Dinosaurs (AAOD) 'Matilda' Dig site,

west of Winton. In the back of his mind he *knew* that the beast of his childhood dream had roamed these parts; big footprints at Lark Quarry were evidence of that. The pit in which Scott was standing however, was surrendering sauropod bones. With the hope of finding more, he raised his shovel ...

But Scott didn't dig down as usual. Instead, and for reasons he cannot explain, he hunkered down on his knees and started shaving away the pale yellow siltstone overburden in shallow layers. A faint 'clink' told him he had hit something. "Just another ironstone pebble," he thought, and putting his shovel down, he brushed

the surrounding soil aside ... then stopped and stared in disbelief! Before him, basking in the early afternoon sun for the first time in 95 million years, was the beautifully preserved metatarsal from a carnosaur!

Thus was forged the final link in a chain of events that would lead to the spectacular debut of *Diamantinasaurus matildae* and *Australovenator wintonensis* – 'Matilda's River Lizard' and her savage adversary the 'Southern Hunter from Winton'! In June 2009, the announcement of these magnificent creatures made headlines around the world, and combined with the official naming of *Wintonotitan waltzi* – a huge sauropod found only



Select your partners for a Cretaceous waltz

Story by Robyn Molan

3km away in the 1970s, doubled the Australian record of large dinosaurs in one gigantic leap. However, as significant as they are exciting, these unique ancient Australians did not eventuate by accident. Their debut is part of a larger story – a story of the vast isolation of the Queensland outback and a small band of people who laboured for three years to bring these incredible animals back from obscurity. It's a story of determination and sacrifice; of stubborn persistence that would climax in the 'coming of age' of the Australian Age of Dinosaurs Museum of Natural History! This is that story.

EARLY DAYS!

With headquarters based at Belmont – a sheep station 80km from Winton and home of AAOD founders David and Judy Elliott and their family, the Australian Age of Dinosaurs fossil collection had taken over the Belmont shed by September 2005. The latest dinosaur dig had netted 17 pallets of 'Wade' (see AAOD #4 *Birth of an Age*), a large sauropod entombed in silt-stone boulders. "Here we were with a shed full of dinosaur bones and no way of preparing them," says David Elliott. "We desperately needed a prep lab! We agonised over where to locate it and how to pay for a lab technician

to run it. A year later, we were still at a loss as to what to do."

With so much fossil material waiting to be prepared, the last thing on David and Judy's mind was to go looking for more. And then, in December 2005, they received a call from a family who lived on a property the other side of Winton. "It's only one piece of bone," they were told, "but it's big!"

So much for not looking for more! Like the stock-horse in Paterson's poem *The Man from Snowy River*, the Elliotts "snuffed the battle with delight", and before long "there was movement at the station". It was New Year's Day 2006 when the old red truck pulled away from the homestead. On the back were the Elliott kids, Bob 17, Rene 16, Harry 13 and Koraleigh 11, squeezed in around the digging tools, mini-excavator, swags and fishing gear.

David and Judy soon identified the bone as part of a sauropod humerus (upper front leg). They rolled it out of the ground and prepared to search for the remainder. It was obvious that they were going to have to dig deep and after a few heart-stopping moments driving the mini-excavator down a bending plank to get it off the truck, David began removing the topsoil from around the bone. Half a metre down, the family found three chunks of bone – all of which fitted onto the first piece. A further metre below, the excavator hit the remainder of the humerus! "It took the rest of the day to dig around that bone," David reckons, "and it was as hot as hell!" The Elliotts spent a miserable night camped at a waterhole on the Diamantina River. "The generator was roaring, it was stinking hot, gidgee bugs were all over us and the fish weren't biting," he recalls.

By morning, the family had abandoned their fishing rods and returned to the shovels. Their humerus led to another huge bone – a scapula (shoulder blade), stretching a metre and a half in the opposite direction. "The digging went on all day in 46-degree heat," David laughs, adding, "The kids were all flaked out under the truck!" The family went home that night, but David and Judy returned the following day and put in a few more big days of digging and plastering. To get their enormous plaster jackets out of the pit, the Elliotts split the stitching on a wool pack, converting it to a sling. With the excavator boom extended to 'the max' and Judy standing on the back to counterbalance it, they gently lifted the heaviest bones out. However, there were still bones encased in huge boulders



A large fragment of dinosaur bone lies half buried in the black soil (above) following its discovery by a Winton landholder in 2005. The bone was identified as part of the humerus (upper arm bone) of a sauropod dinosaur by the Elliott family on New Year's Day 2006, and subsequent digging with a mini-excavator (top right) revealed a jumble of giant bones in solid rock about 1m below the surface. Over several days, the Elliotts managed to retrieve two bones from this animal (later named 'Matilda') including a scapular (shoulder bone) and the remainder of the humerus (right) which, following restoration, fitted back together almost as good as new (below). Exposed bones in the pit were covered with a protective plaster jacket and the site covered over.



extending back under the overlying black soil and it was obvious that they weren't going to get this lot out without a full scale dig. Reluctantly they covered them with a protective plaster jacket and filled the hole back in.

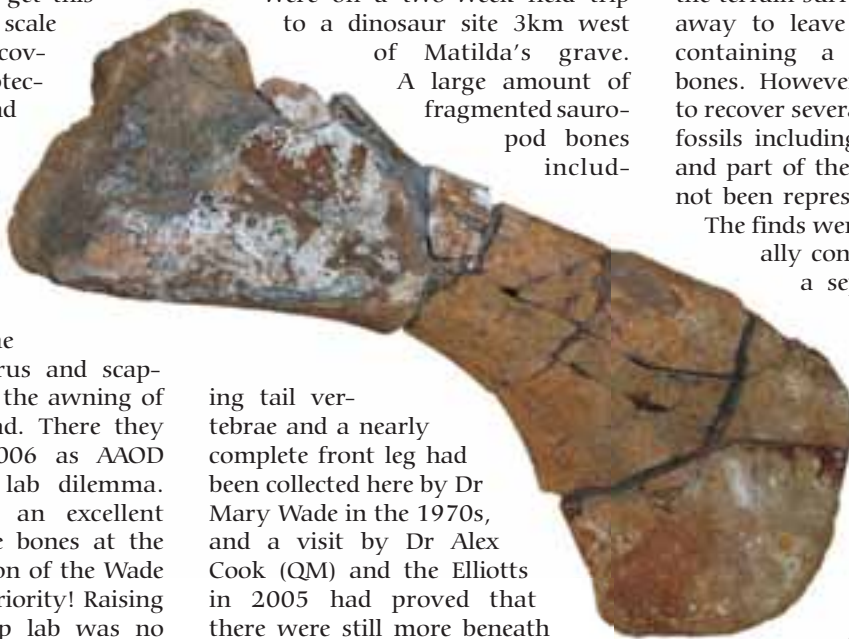
After consulting with the property owners, David and Judy decided to name the new dinosaur 'Matilda' and once home, the plaster-jacketed humerus and scapula were stored under the awning of the Belmont homestead. There they stayed throughout 2006 as AAOD pondered their prep lab dilemma. Although there was an excellent chance of many more bones at the Matilda site, preparation of the Wade material had to take priority! Raising the money for a prep lab was no longer urgent; it was critical!

RETURN TO THE SCENE

Despite being on hold, six months later the Matilda Site received unexpected visitors. It was June 2006,

and a small party comprising AAOD and QM staff and several volunteers were on a two-week field trip to a dinosaur site 3km west of Matilda's grave.

A large amount of fragmented sauropod bones including



ing tail vertebrae and a nearly complete front leg had been collected here by Dr Mary Wade in the 1970s, and a visit by Dr Alex Cook (QM) and the Elliotts in 2005 had proved that there were still more beneath the surface. This dinosaur had been figured in scientific papers written nearly 20 years earlier. With many new sauropod sites now being discovered in the Winton district, any further information on this animal was keenly sought.

Although successful, the site proved to be a 'lag deposit' where most of the terrain surrounding it had eroded away to leave only a small hump containing a few shallow-buried bones. However, the team managed to recover several very important new fossils including the sacral vertebrae and part of the hip girdle which had not been represented until that time.

The finds were sufficient to eventually confirm this sauropod as a separate species which, after careful comparison with Matilda,

Scott was to name *Wintonotitan watti*, or 'Winton Giant'. There was just one problem - the team had found all there was to find and they still had a week to go!

With a crew on hand and a guaranteed dinosaur only 3km away, there was only one thing left to do. Reluctantly, David led them to the Matilda Site.

"We really didn't want to go further with Matilda at that time," explains

David. "We already had so much material that we couldn't prepare – it just seemed crazy to go looking for more! But it was so close ... and we had all the gear and food!" Within three hours, the team had packed up their equipment and relocated to the site of Matilda. It was to be a decision they would never regret.

It was only a few days into this dig that Scott Hocknull found the theropod metatarsal. It had been an incredible week with some fantastic sauropod discoveries. In fact, even before the loader had finished removing the black soil overburden, there was a distinct 'clink!' as it nicked a perfectly preserved sauropod toe bone. "Within a few days, the Matilda site was massive!" says David. "We had boulders with bits of bone sticking out of them, and around the boulders, *more* bones! Really good ones, complete limbs, all well preserved!" In fact, what the team had uncovered was the ancient remains of what was once a huge, rotting sauropod carcass – and now there was an intruder!

Following Scott's incredible discovery, the team from Australian Age of Dinosaurs and the Queensland Museum resumed work with renewed enthusiasm, not really believing there would be more. Soon after, however, and only 1m away, they uncovered a second theropod bone; the complete tibia (shin bone) of what appeared to be the same animal. "Words can't describe it," says Scott. "It was *beautiful!* It was the best preserved bone ever!"

By the close of the dig a couple of days later, there were plaster jackets all over the site. A massive sauropod rib could be seen disappearing under a boulder only to emerge out the other side. There was a huge boulder containing three ribs, stacked one on top of the other like firewood and another containing four toe bones – the remains of a complete foot! Five theropod teeth and a huge sauropod claw had also been uncovered. The team was so elated they phoned the then Mayor of Winton Shire Council, Bruce Collins. "We told him to get out there with his Councillors – we had something big to show them," says David Elliott. "It was great to see their faces. Everyone was *really* excited."

The last few days of the dig were hectic, as the team jacketed the final discoveries and loaded them onto the Belmont truck. A bed of dirt from around the bones was laid on the truck's tray, and the jackets were then nestled into it. The precious cargo was then gently nursed along the 150km of road to Belmont where the bone jackets were stacked in the



An old billiard table, covered with carpet and jammed against the wall of the Belmont shed among the motorbikes and fencing gear! These were the only fossil preparation facilities available to Australian Age of Dinosaurs in early 2006 and with 17 pallets of bones from 'Wade'" waiting to be prepared, any further digs at the Matilda Site were out of the question. In the photo (above), Judy Elliott works on a humerus from Wade collected the previous year.

shed and the dirt spread on plastic sheeting to be sieved at a later date. Long after everyone had departed, the Elliots were still hard at work, covering the site with plastic sheeting to protect exposed bone-laden boulders, erecting a fence to keep out marauding livestock and building an earthen bank around the dig site to keep it from filling with water.

Despite these significant finds and the chance of more to come, it was to be more than a year before the team would resume the search for Matilda and 'Banjo' – as the newly discovered theropod became known. In the meantime, the Winton locals embraced the emergence of the new discoveries. They are, after all, no strangers to fame. Among other attractions, Winton is renowned as the birthplace of Australia's national song *Waltzing Matilda* – which was written by A. B. 'Banjo' Paterson, while visiting Dagworth Station, near Winton, in 1895.

Inspired by recent events revolving around the industrial turmoil of the Great Shearers' Strike and by a catchy tune played by Christina McPherson of Dagworth, Paterson wrote his immortal ballad of a swagman (tramp) who steals a jumbuck (sheep), then attempts to escape mounted police by diving into a billabong (waterhole), where he drowns. The song ends with the haunting refrain "... and his ghost

may be heard as you pass by that billabong, who'll come a-waltzing Matilda with me?"

The term 'waltzing Matilda' was common in the 1890s – Matilda being the name that 'swaggies' affectionately gave their bedroll (or swag). At the time that Matilda the sauropod was given her nickname, David and Judy were unaware of her partner. What greater honour, once the theropod emerged, than to name him after the poet who gave Matilda her waltz? Of course, whether Banjo and Matilda's story is a murder-mystery is purely speculation, but in a stranger-than-fiction twist, Scott Hocknull believes there may have been a billabong involved. Of course, their male and female personas are just poetic licence, of which Paterson himself would surely approve!

THE PREP SHED

It was now July 2006, and AAOD was at a crossroads. "We had run out of storage and were still no closer to funding a prep lab," says David. "Judy and I talked about it and finally decided that the only way this was going to happen was to clean out the shed and make it happen. Once the decision was made, the rest just fell into place." With that, the Elliots threw in \$20,000 to employ casual preparators, cleared the shed of vehicles, set



In June 2006, a team from AAOD and the Queensland Museum revisited a dinosaur site atop an ironstone ridge that had been surface collected in the 1970s. Although several bones were recovered during this dig, the site proved to be a lag deposit - long since eroded away leaving a small cluster of bones in a shallow depression (left). Now known as 'Clancy', this dinosaur was only 3km from Matilda's grave.

With a full team of diggers and more than a week to go, the decision was made to reopen the Matilda site. Removing overburden with a front end loader, the team exposed a row of boulders flanked by a densely packed bone bed (right) representing the remains of a semi-articulated sauropod carcass. And the exciting possibility of an intruder - a carnivore that had been buried beside her (below).

up a table with a couple of pneumatic scribes, hooked up an old air compressor ... and The Winton Dinosaur Preparation Project was born! "It was pretty basic at first," admits David, "We just sat and worked in amongst my junk!"

Several retirees, who had undergone fossil preparation training at the Queensland Museum in Brisbane, started on the backlog of sauropod bones. Bob and Julie Lake from Mt Tamborine were among the first, spending a month at Belmont in September 2006. After working in the rarefied Brisbane lab, David's three-sided corrugated iron lean-to took some getting used to! "It was fairly primitive and very dusty," recalls Julie, "and the compressor was a rattly old thing." With just a fan for cooling, it also got pretty hot at times, she says.

The challenges of prepping in the field were quickly apparent to the Lakes. "In Brisbane, we'd been handed a partly cleaned chunk of bone," says Bob. "At Belmont, we had to get a 200kg plaster jacket from the shed with the tractor, open it with an angle grinder, and start from the beginning". Bob and Julie say Matilda's bones were far more fragile than anything they'd previously worked on, necessitating some novel and unorthodox approaches.

With the digs behind them, the Elliotts got serious about the AAOD prep lab - or 'prep shed' as it became affectionately known. "We cleaned

out truckloads of my rubbish, put nice white gravel on the floor, built prep tables and installed a big air-conditioner," says David. Another milestone was the employment of a full-time preparator; Naomi Calleja, a Bachelor of Science graduate from James Cook University. A city girl from Townsville, Naomi bid farewell to her partner, hitched a lift with the mailman, and moved into the Belmont Jackeroo's hut. Working 20 days on and 10 days off, she then commenced work on the mountain of bones from Wade and Matilda.

Naomi's first challenge was to become proficient in the unique preparation requirements of each dinosaur. It wasn't long before she had graduated from robust Wade to fragile Matilda. Matilda's bones tend to be surrounded by a thick ironstone concretion, Naomi explains. She soon learnt what others before her had discovered; removing thick hard ironstone from fragile bone with a pneumatic scribe turned the underlying bone to powder.

Imagine Naomi's shock when Dave Elliott handed her a four-inch angle grinder and said "Use this instead!" Shock gave way to relief when she realised that the horizontal vibration of the spinning diamond-impregnated disc was far gentler than the jackhammering action of the scribes and much more efficient. Under David's tutelage, she soon became quite proficient in its use to remove the thick bands of ironstone. Likewise, the

Dremel - a hand-held electric tool with a spinning diamond tip - has become the weapon of choice for small areas. Naomi says with experience one comes to recognise dinosaur bone veneer by its wood-grain texture, and an immediate application of Paraloid - a plastic resin dissolved in acetone, is always necessary as soon as the bone is exposed. The paraloid is absorbed into the spaces in the bone matrix and once the acetone evaporates, the resin hardens, consolidating and strengthening the bone. Three concentrations of Paraloid are used in the prep lab, says Naomi, but the strongest brew is always reserved for Matilda!

The last few months of 2006 were a hive of activity and saw some fantastic bones from both Wade and Matilda prepared, including one of Matilda's ribs and a complete pubis and tibia. However, despite such exciting







Bob Lake and David Elliott make a space amongst the junk in the Belmont shed to accommodate a large plaster jacket from the Matilda dig – September 2006.



The initial stages of the Winton Dinosaur Preparation Project relied on the employment of casual preparators including Leslie and Bill Fenwick (left) who spent two weeks working on a rib from Matilda in August 2006. This system was discarded following the permanent employment of Naomi Calleja (below left) due to the difficulty of supervising inexperienced preparators on a permanent basis. The final months of 2006 saw the installation of benches, air lines and preparation equipment that was to transform the Elliotts' corrugated iron shed into Australia's largest fossil preparation facility and see the involvement of numerous volunteers including Suzi Grimmer (below), AAOD's first volunteer preparator who spent four weeks at Belmont in November 2006.



progress in the prep lab, AAOD continued to struggle financially. David Elliott remembers, "All our money had to be reserved to pay Naomi." He adds modestly that at one point he and Judy had to "chuck in another 10 grand to keep it going"!

A CHANGE IN FORTUNE

Thankfully, good fortune was on the horizon. In December 2006, David received a call from local State MP Betty Kiernan informing him that a grant of \$22,000 from the Queensland Government's Gambling Community Benefit Fund for fossil preparation equipment had been successful. It was now possible for up to eight people to prep simultaneously. In January 2007 AAOD received a second financial windfall, when The Australian Geographic Society's 'Free Wade' appeal handed them a cheque for \$15,781.37. "That was a fortune to us in those days!" says David. It guaranteed Naomi's wage for the next five months!

However, nothing could have prepared them for their most fantastic contribution of all. For several years, the AAOD team had been engaged in a fruitless search for a site befitting their vision of an iconic Australian Museum of Natural History. Their original plans to build in the town of Winton were discarded in favour of a wilderness setting nearby, but nothing had worked out and they were fast running out of options. Finally their attention was drawn to a large mesa about 20km southeast of Winton.

The land belonged to Peter and Carol Britton of Mt Landsborough Station, so David rang Peter one evening to see if they were prepared to sell part of it as the future site for the Australian Age of Dinosaurs Museum. After a long silence Peter finally said "Nah, I don't really want to sell it ... but I might give it to you!" They were as good as their word and in late 2006 nearly 1500 hectares of the most beautiful 'jump-up' country was officially donated to AAOD. A rustic, primeval place with deeply etched crevasses, massive boulders, twisted trees and a commanding view, it was perfect for such a significant national project.

To top it all off, in April 2007 the Hon. Anna Bligh, Premier of Queensland, announced that the State Government would match Winton Shire Council dollar for dollar by granting \$500,000 under the Q150 Legacy Infrastructure Funding Program for the first stage of the new museum. At last, it seemed AAOD was on a roll.



Sieving dino dirt in a wheelbarrow (top). Perhaps the biggest advantage of being based at Belmont was the wide range of machinery and equipment available such as the bucket of the front-end loader – a perfect rinsing tub (above left) and sand pit for making a fibreglass cradle a two-metre-long rib (above right).

The prep lab's need for lockable, climate-controlled fossil storage was solved thanks to Scott's parents, John and Morag Hocknull. Hearing about the plight of AAOD, they contacted the Port of Brisbane Corporation and soon after, two six-metre-long insulated shipping containers dressed in colourful skins bearing the AAOD and sponsors' logos were heading west.

Cool dark conditions are essential for bones that have been underground for millions of years, particularly in the outback where temperatures range from below 0° to 48° Celsius.

With the help of volunteers, the team fitted out the insulated containers with shelves and installed temperature and humidity data loggers. "We always believed that the containers

would be perfect for this purpose," says Naomi, "but this equipment confirmed that the environment within the containers met all of the scientific requirements for perpetual fossil conservation."

Ensuring the AAOD fossil collection is catalogued and stored in accordance with Australian Museum standards is an important part of Naomi's job. She says every piece of bone is given a working name and number, and its six sides are digitally photographed before it is prepared. A ruler is included as a scale reference and progressive photographs of the fossil are taken as it is prepped. Naomi says many working pieces may make up a completed fossil (such as Wade's pelvic girdle, which comprised nearly 50 pieces).



Fitting bony chunks of rock back together make for a difficult jigsaw so when a piece is found it is immediately marked so that it can be relocated (above left). Each piece of rock is prepared independently but once completed and fitted back together, a dinosaur bone starts to take shape ... such as this partial coracoid (breast bone) of Wade held by volunteers Sharon and Peter Jamieson, Chris Churches and Bernard Cannon (above).

One of the many unconventional techniques developed by AAOD while based at Belmont was the use of high speed diamond cutting equipment to open plaster jackets and remove thick rock from bones (left and below). As well as greatly reducing preparation time, this process helped minimise damage to large fragile bones while reducing wear and tear on pneumatic equipment.



Once prepared, the completed fossil is then assigned a permanent AAOD fossil number and its location within the collection is recorded. Documenting and updating the fossil database and maintaining digital photography of the collection is a time-consuming process, says Naomi. "You have to record everything because you don't know what might be significant in years to come."

Although the prep lab was humming along, the Matilda Site was going nowhere fast. Scott Hocknull admits he was itching to get back to continue the search for Banjo. A dig involving AAOD and QM staff and several experienced volunteers was scheduled for June 2007, but didn't proceed due to heavy rain. Instead,



Over the course of three years, numerous volunteers made the journey out to Belmont to work on the bones of Wade and Matilda and it was common to find up to eight people in the lab at a time (above). Most volunteers worked on Wade due to the robust nature of the bones; progressing on to Matilda as they gained experience. A single vertebra of Wade can comprise up to two dozen pieces and thousands of hours of work such as these partial vertebrae being worked on by Jim Cronin (right) and Lyn Warland, Rose Siva and Dorothy West (below). Age was certainly no barrier for Dorothy who at 92 years spent several days working in the prep shed.



the visitors made a dash over the 50k of dirt road to Belmont. "The wheels of our little car were completely clogged," says Denise O'Boyle, of Brisbane, who with her friend Jill Corrigan ended up getting stuck at Belmont for 10 days.

"There was mud everywhere!" says Denise. "You couldn't even go for a walk!" Of course, the AAOD staff were delighted to have a captive audience during 'the wet' and soon put all hands to work in the lab, prepping bones and building fibreglass cradles for completed specimens. Gradually the road dried out sufficiently for

David to clear the first 25km with his fire-plough. The night before their anticipated escape, Denise says they watched the clouds with dread. Next minute there was "an unbelievable noise on the iron roof". No, it wasn't rain, just the Elliott kids with the hose bidding them a cheeky farewell!

In August 2007, Kylie Piper, a veteran of five digs, turned up on the Belmont doorstep. A Sydney girl born and bred, she had quit her high-paying science communications job to volunteer for six months on the AAOD project. "My parents didn't believe I'd go and my friends thought

I was completely mad!" she laughs. "Not a single person I knew thought 'Wobby' (her old Mitsubishi Lancer) would make it." Make it he did, and Kylie was soon installed in the AAOD office (a room beside the Elliotts' kitchen), wearing a dozen different hats and working under the title of project coordinator. When asked why anyone would go without pay for six months, Kylie says, "I could see the potential. I could see the effort David and Judy were putting in. I thought I'd give 'em a hand. They fed and watered me!" Kylie says, in good humour, "Working in an office



with sheep cockies was *truly* an experience!" Like Banjo Paterson in *Clancy of the Overflow*, David and Judy had, for some years, "faced the round eternal of the cash book and the journal" (actually make that 'cheque' book), and Kylie's new ideas took some getting used to. "I had to teach David and Judy about weekends!" she laughs. Long after she had retreated to the cottage, Kylie says David's questions kept coming, at 8.00pm, 9.00pm, even 11.00pm! "I started switching the C.B. radio off," she says, in hysterics, "but he got wise and used the phone instead!" David admits its tough being keen, but reckons Kylie was an angel in disguise.



Home is where you make it and for Matilda dig participants and staff that means a comfortable set of shearers' quarters well away from the mod cons of electricity, telephones and internet (above). The package comes complete with a 100m walk to the toilets and a pile of wood to feed the hot water 'donkey' in order to get a hot shower (left). In spite of the lack of modern facilities, the Matilda digs have been an outstanding success and have led to the excavation of countless dinosaur bones. The photo (below) shows the tiny area that was excavated over two weeks in 2007. This area produced so much material that the dig team spent almost as much time plastering bone-laden boulders (top right) as they did digging, resulting in a truck loaded to capacity with bones to prepare back at the lab (bottom right).



THE DIGGERS RETURN!

Although progress continued on all fronts, it wasn't long before AAOD was once again down to its last few thousand dollars. "Things were very, very tight," David recalls. "We thought we'd have to lay Naomi off at one stage." When the September 2007 dig rolled around, the Matilda Site was chosen in favour of a more convenient, but less productive site on Belmont Station. "We needed a full contingent of 26 paying volunteers to guarantee Naomi's wages," recalls David, implying that Matilda's track record was the drawcard. It was the first dig of that size to be mounted away from 'HQ'. Everything had to be carted 150km to another property; cold room, cooking supplies, generator, mattresses, portable toilets, front-end loader, digging tools, plaster – the lot! "It was a massive job," recalls David.

The station owners on whose land the Matilda site is situated were adamant they wanted to remain anonymous; hence their names and that of their property have remained confidential. Although the diggers never got to meet the people in whose shearers' quarters they were camped, they saw daily evidence of their behind-the-scenes presence; gas bottles replaced, generators fuelled up, firewood cut and rubbish bins emptied.

For some diggers, camp conditions came as a bit of a shock. There was no electricity other than the generator, water for showers was heated by a wood donkey – a 44-gallon drum over a fire, and you needed a torch to find the 'thunderbox', which was out in the paddock! Brisbane retiree June Richardson's assessment betrays a bush upbringing; "We were housed in luxury!" she exclaims, but adds "The bindi-eyes around the quarters were a rude shock for some!"

Everyone agrees that the flies were terrible! June delights in recalling, "You had to chase the dead flies to one side of the washing-up water!" Denise O'Boyle says most people, herself included, wore fine mesh fly veils around their faces. Her friend Maxine McMillan, however, arrived wearing a veil that looked more like a fish net. "I took one look at her," says Denise, "and said, 'What are you going to do with that stupid thing?'" She laughs as she admits that Maxine "never had a bloody fly" while hers acted as a giant flytrap!

The dig picked up where the 2006 one had left off, and it wasn't long before bones were being uncovered. The most exciting aspect of this was that many were Banjo's, including a beautifully preserved femur, a sec-



ond tibia and a fibula. Matilda fans were not disappointed either. There were huge limb bones, ribs, toe bones and more – some in concretions so big they had to be dismantled to fit in the loader's bucket. David Elliott and Jim McMillan, who both confess to not having the patience to dig all day with a toothpick, were kept well on their toes as they followed the dig team and jacketed their finds.

Jim says the dig staff are very patient with novices, who are constantly asking "Is this bone?" Denise O'Boyle, an experienced digger, says she didn't count herself in the novice category. Hence, when she found "a small interesting piece", she put it aside for Scott Hocknull's opin-

ion and kept on digging. She recalls that she continued carting bucket-loads of soil from her pit to the front-end loader's bucket, where it joined overburden from elsewhere on site. "Scott took one look at my piece and yelled 'Stop!! Where's the rest of it?'" Denise remembers with a grimace. "I knew immediately," says Scott "it was the end of Banjo's claw where the knuckle attaches and half of it was missing." Denise was devastated, and Scott admits he was cranky. Jim says "The rest of us were breathing a sigh of relief, thinking 'glad it wasn't me!'"

There was only one thing for it ... check every last grain of dirt in the loader bucket! "We could only think



of one person for *that* job," says Scott. Judy Elliott has a needle-in-the-hay-stack reputation, and second time through, came up with two sections of claw. Young Harry Elliott found the final sliver, the precious tip, after sieving the dirt and picking through the remains with the tweezers under the magnifying light! Denise says her shattered confidence was restored two days later when she found another claw. To avoid a repeat of Denise's nightmare, buckets of overburden were then emptied beside numbered star pickets. "This worked fine," says Jim, "until the mongrel cows scattered the piles!"

When asked why they put themselves through such agony and ecstasy, Maxine McMillan leans forward, radiant with 'fever' ... "It's the suspense," she enthuses, "the prospect of uncovering something that's 95 million years old!" "It's the thrill of the chase!" proclaims Jim. "Digging dinosaur bones puts other problems in perspective," offers June Richardson. "It helps keep one foot in the silt."

Just as the September 2007 dig was drawing to a close, Maxine McMillan and Denise O'Boyle uncovered a promising mound; the head of *Diamantinasaurus matildae's* massive right femur. They were barred from going any further due to lack of time, but there and then declared that they'd be back!



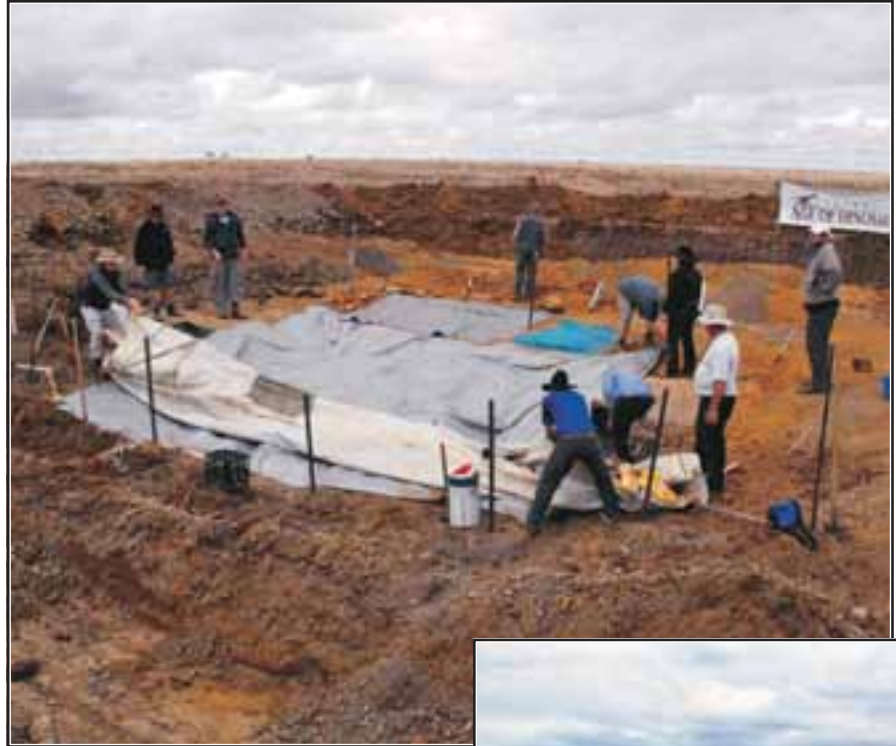
The Matilda dig in late August 2008 exceeded all expectations, but not because of huge sauropod discoveries as in previous years. This was the dig that Banjo the carnosaur came out for his share of the action and over the two-week period, nearly 50 small bones were encased in jackets and countless tiny bone fragments wrapped in alfoil. Although most of Banjo's bones are preserved in small rock nodules, some such this beautifully preserved gastralia (stomach rib) (top left) are almost in the same condition as they were 95 million years ago. The metacarpal (above left) and foot claw (above right) are equally well preserved, while many of the tiny fragments (marked with red flags) intermingled throughout the deposit (left) are believed to belong to Banjo's final meal.

ROMANCING THE BONES

The dig behind them, AAOD's next challenge was to squeeze all the new plaster jackets onto pallets in the already overcrowded shed. The Belmont truck was loaded to the hilt with plaster jackets, with some so big that getting them off tested David's ingenuity ... but not for long! A large cement mixer full of wet sand made sufficient ballast when mounted on the back of the old Belmont tractor to counteract the weight of the heaviest boulders! With the pallet racking full and no room left along the back wall, David started stacking bone-laden pallets into the vehicle bays – and a bit more of his machinery joined the growing line-up of gear out in the sun.

The pallet racking is where David's wife Judy can be found, fitting bone-laden rocks back together. A self-confessed 'compulsive fiddler', Judy spends hours matching patterns and features, and marking connections with felt pens ("grafitti-ing national treasures" as Kylie Piper once put it). The completed 'puzzles' are then glued and photographed, ready for prepping. Judy's reputation as the Queen of Jigsaws is undisputed. "I am in complete awe," says Naomi. According to Judy, you need to get intimate with rocks every afternoon for a month before those patterns become imprinted on your brain.

Following the 2007 dig, the AAOD staff turned their attention to the



The threat of rain led to a hastened covering of the Matilda site early in the second week of the 2008 dig (above). With 25mm of rain overnight and the roads a muddy quagmire, the dig site was abandoned in favour of a day trip to Winton – and a muddy driving experience for the dig team (inset).



daunting task of preparing Australia's most complete theropod skeleton. Scott Hocknull describes Banjo's bones as thin, gracile, flimsy and obsidian-like. It was a hold-your-breath-and-proceed-with-caution exercise. The

team discovered that the visible contrast between the brown-black bone, tan-coloured clay and red ironstone made prepping *Australovenator wintonensis* easier than anticipated. For small pieces such as claws, the tool of choice proved to be the micro-jack, a very fine-tipped, pneumatic scribe. Everyone agrees that Banjo's finished bones are spectacular. Denise O'Boyle says "I cried when I saw the completed tibia. The surface was beautiful! You could see every little condyle ... every attachment for every tendon." In October 2007, AAOD received a visit from another of its guardian angels, Bernard Cannon of Mackay. The part-owner of a pneumatic equipment business, Bernard's impression of the prep lab gear was that it was "pretty rugged – just a few old tradesmen's compressors rigged in an ad hoc way, and working hard!" David sought Bernard's advice, concerned that water was getting in the air lines. Six weeks later, Bernard returned, bringing an assortment of fittings and air chambers with him. Bernard was to return several times and a fantastic new compressor and state-of-the-art delivery system were all due to his involvement.

Some prep lab volunteers proved to be die-hard addicts, hardly able to tear themselves away for smoko (morning and afternoon tea). That's saying something, as smokos were



The 2008 dig added another two utility loads of bones to the pile awaiting preparation on pallet racking at Belmont meaning that many of them had to be stacked onto pallets and left on the floor of the shed (above). This photo was taken in March 2009 from atop the bone storage shipping containers just prior to the collection being packed up and relocated to the Jump-Up.



*The exceptionally well preserved limb bones of *Diamantinasaurus matildae* have provided a welcome boost to the Australian sauropod record and much of this can be credited to the everyday people who have prepared them. With only a few exceptions, representative bones from Matilda's hip girdle and both front and hind limbs have now been recovered including the right humerus being worked on by Bob Lake (left) and the right foot (below) with Harry and Kath Bishop. The right femur was recovered during the first week of the 2008 dig by Denise O'Boyle and Maxine MacMillan (bottom) who along with Maxine's husband Jim donated a 500kg capacity adjustable table to prepare it on. Denise and Maxine made two trips out to Belmont in the heat of summer to ensure that the job was done to their satisfaction!*

always a daily ritual around the Elliotts' huge kitchen table. Bob Lake speaks for many preppers when he says, "That kitchen was the hub of the whole thing. There's heaps of biscuits and syrup and jam and chat, and you never know who you'll meet – politicians, cockies, palaeontologists from around the world ..."

When asked to explain the appeal of sitting in a shed scratching at rocks all day, Bob replies, "It's a zen experience", to which wife Julie adds, "The business of flaking stuff off is hugely addictive ... you go into a world of your own." Tasmanian Tom Bonnice explains that prepping a 1cm section can take an hour, and admits magnification fools you into a false sense of accomplishment. Bernard Cannon concurs. "The day flies – time just disappears. All you see is that little bit in front of you."

Some preppers can become possessive about their bone. Just ask Queensland's former Governor, her Excellency Ms Quentin Bryce AC, now Australia's Governor-General and patron of AAOD. "No one's been game to touch the bone she started," jokes David Elliott. Tom Bonnice says he worked on one of 50 little pieces of Wade's enormous pelvis in 2007. "When I came back a year later, it had been completed," he says, "but I remembered *my* piece ... I recognised it ... that was *real* satisfaction!"

David Elliott says that some fantastic things just 'happen' in the prep shed. He quotes Matilda's right humerus which was irreparably damaged at the dig in 2006 when the



boulder it was in was pulled apart by the excavator. "The bone inside was all crumbs," says David. "It was impossible to fit it back together!" Twelve months later, David and Judy realised that, although the internal bone was gone, they had all of the overlying rock that fitted around it, and this rock had bone veneer on it. "We fitted all of the rock back together and it fitted back onto the bone," says David. "It was then just a matter of filling the hole up with araldite and prepping the rock off. It looks 100 per cent perfect – Scotty couldn't believe it!" he laughs.

Naomi enlarges on some of the less glamorous aspects of prepping. "We wear protective gear but you still end up with black skin and bits of ironstone down your bra, in your pockets, and in the washing machine!" she laughs. She says few people realise how cold winter mornings can be out there, adding that the compressed air cramps your hand, even with gloves on, and the magnifying lamp continually fogs up.

ELLIOT'S ANGELS!

By late 2007, the team were busier than ever with people coming from all over Australia to put in a few days or a week in the prep shed. "Naomi was being run off her feet some days," says Dave Elliott, "and when she went home for 10 days we had to close the lab completely. We needed more staff!"

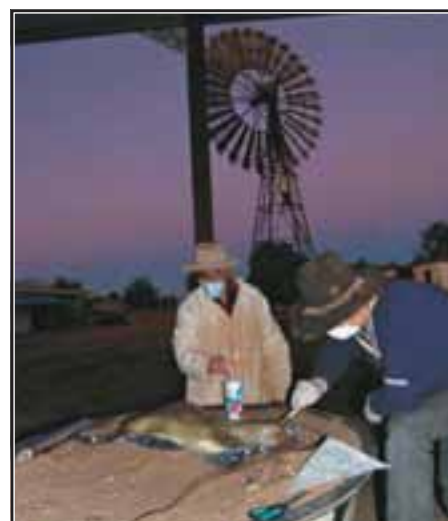
David emailed Trish Sloan, a veteran of the digs and prep volunteer with the offer "There's a job here if you want it!" 'Tricky', an accredited Savannah Guide, had to choose between money and happiness. "Happiness won!" she laughs. Trish soon found herself organising digs, coordinating prep lab volunteers and relieving Naomi in the lab.

Trish's passion and enthusiasm are infectious. She seems to love everything! "I know my calling is guiding," she says. "I love showing people Australia. I love being with people. I get excited when they do. Just to see their eyes glow gives me a buzz." Trish says she couldn't wait to get up on the Jump-Up. She loves the arid country, loves being outdoors, the geology and rock collecting, prepping, photography, birds, catching lizards, annoying the Elliott kids ...

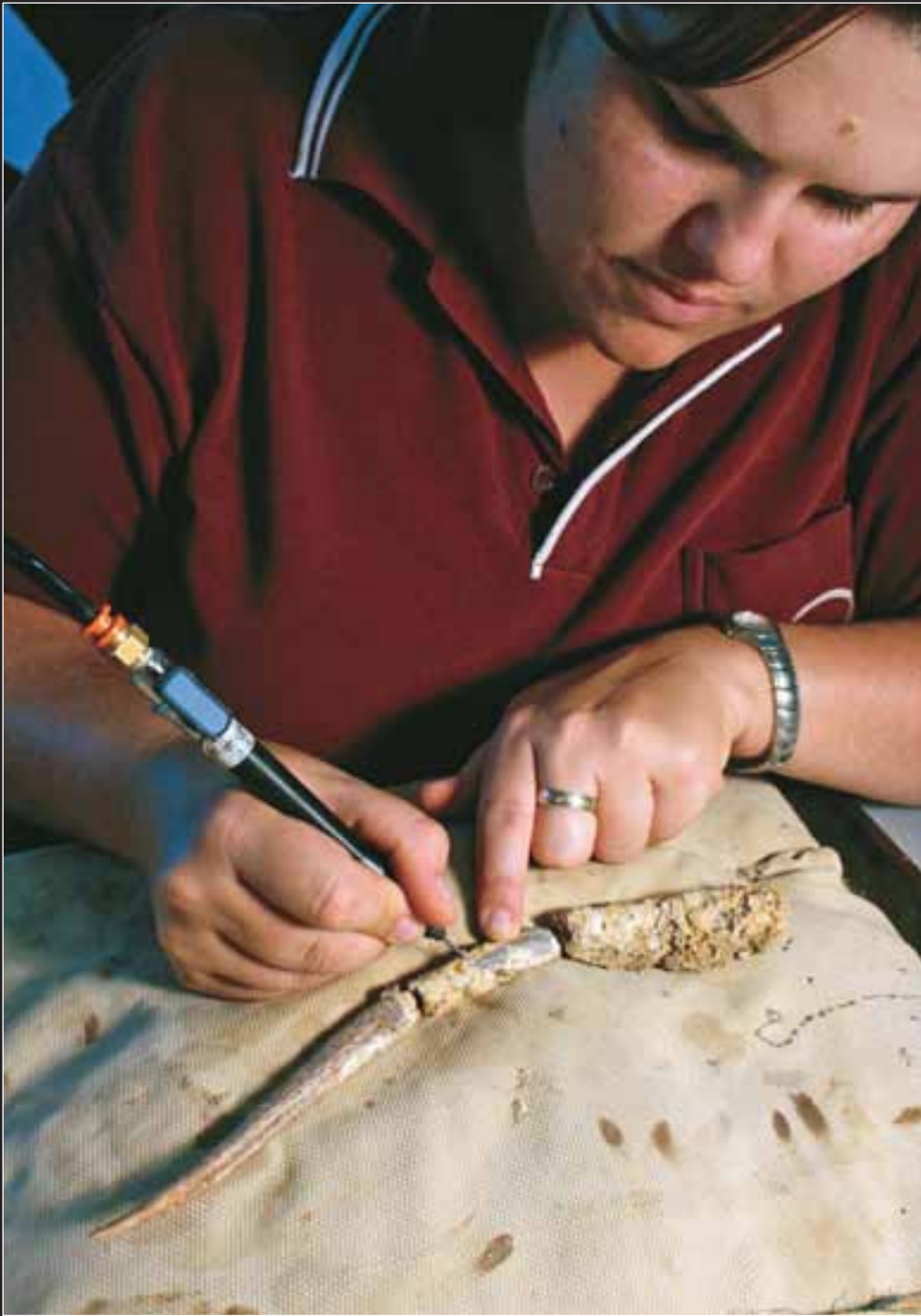
Trish moved into the Belmont cottage with Kylie Piper. "That's when the fun began!" says Kylie. Joined by Naomi, the girls called themselves 'Elliott's Angels' and established a reputation for carrying out 'daring missions', details of which are apparently top secret! They embraced the



Julie Lake and David Elliott finish a fibreglass cradle on a cold winter's evening in 2007 (right). Following preparation, all bones are fitted with moulded cradles; usually made of foam, plaster or fibreglass to ensure they are properly supported before being stored away. It is imperative that fossil bones are kept in a secure, stable environment and insulated shipping containers fitted out with shelving have proved to be ideal for this purpose (above).



Trish Sloan, Naomi Calleja and Kylie Piper, aka Elliott's Angels, get caught out on their way home from a swim in one of Belmont's dams in early 2008 (above). As the first employees of Australian Age of Dinosaurs, the 'dinosaur girls' became very well known at the Corfield pub where they terrorised the locals on Friday nights during the footy season.

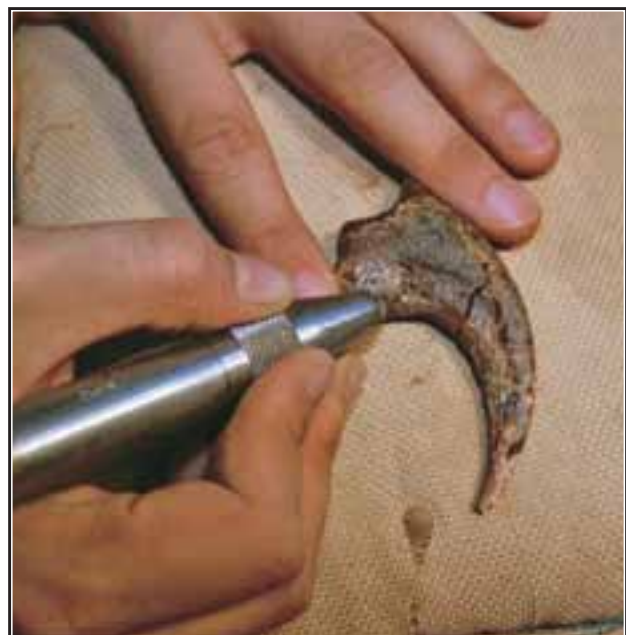


social life of Corfield and Winton. "The locals were so welcoming," says Kylie. Bob Elliott reckons Kylie nearly got herself choked by the 'welcoming' locals at the Corfield pub, but that may have had something to do with the blue scarf she was wearing on State of Origin night.

Bob says for his birthday, the Angels gave him a contract to drive them to the pub. "It didn't say anything about getting them home afterwards!" he chuckles – then admits soberly, "It was always me who drove home." This was a wise move by all accounts. Tricky's reputation for ploughing the Corfield road in 'the wet' was legendary, and Kylie admits Wobby's strike rate for hitting cows was two in one night!

It was now early 2008, and AAOD was still on thin ice when it came to paying wages. "We didn't know where we were going to get the money to pay all these girls!" David exclaims. Fortunately, Kylie Piper came to the rescue with a mammoth Foundation Membership drive. "At that time we had 600 ordinary, but only 30 foundation members" she explains. At \$1100 per subscription, the latter represented serious money. David thought they'd be lucky to get another 20 but Kylie, ever the optimist, announced "We'll set a target of a hundred!"

Rumour has it that Kylie turned to Trish for advice. (Tricky had previously won a bottle of rum from David and Judy for selling 100 AAOD journals in 10 days). The advice must have been good; when the three-month cut-off date arrived, the association had 137 Foundation Members! This phenomenal support was a credit to Kylie, and proved what she already knew; that the project was now more



than just David's dream. David was blown away: "All of a sudden we had \$100,000 to cover wages for the rest of the year," he says. "It was an enormous relief!"

BACK IN THE PIT

September 2008 arrived, and with it the annual AAOD dig. This time there was no question of the location; the Matilda Site beckoned irresistibly. Denise O'Boyle and Maxine McMillan were first in line to reclaim Matilda's half-exposed femur. Over the course of the week they 'delivered' their massive 1.8m pride and joy. Later, Denise, Maxine and Jim generously donated a new 'pram' for their baby; an industrial-strength, height-adjustable table which soon became indispensable in the prep lab. Denise and Maxine have now prepped Matilda's entire femur, a job which required two return trips to Belmont and the removal of an annoying ulna (lower foreleg) bone which was resting awkwardly across it!

Apart from Matilda's femur and ulna, the only other sauropod bones recovered at the 2008 dig were four ribs. There were masses of theropod bones, however – all perfectly preserved but very fragile. Scott Hocknull rattles off the list: "We now have most of the legs including femur, tibia, ankles, claws, phalanges, metatarsals and metacarpals, most of the arm bones, ribs ... everything apart from the vertebrae and the skull really!" He describes clicking *Australovenator's* ankle bone on to the tibia. "For the first time in 98 million years they were articulated," he enthuses. "We could see the first bit of Banjo coming together. It was pretty exciting."

Scott says the crew found dozens of gastralia, fine needle-like bones 10 to 30 cm long, which form a mesh girdle over a theropod's torso to brace its

internal organs. "They are one of the rarest parts of theropod skeletons!" he says excitedly. "Their preservation is phenomenal!" Scott reports that scattered throughout Banjo's remains were lots of fine broken bones, covered in phosphatic nodules; a feature of fossilised stomach contents. He says Banjo's stomach would have bloated and exploded after death, exposing the remnants of his last meal to this process.

CONCLUSIONS AND VERDICTS

The quality of the material being found was great news for AAOD Honorary Palaeontologist Matt White. A geologist from Middlemount with a Masters degree in palaeontology, Matt is planning his PhD on western Queensland's dinosaurs and jokes about the junior apprentice working in the hot sun, whilst the boss oversees progress from the air-conditioned



AAOD preparator Trish Sloan works on a beautifully preserved gastralia or stomach rib in the prep shed in 2008 (top left). Considered very rare, this is merely one of many gastralia collected from Banjo and joins a long list of equally exciting bones including a hand claw (far left) and foot claw (left) as well as this shin bone (right) being prepared by AAOD preparator Robert Proefke. The quality and quantity of bones from *Australovenator wintonensis* has amazed scientists from all over the world and is hailed as one of Australia's most significant dinosaur discoveries.

Billabong Bone Bed

The greatest concentration of dinosaur bones ever found in Australia were at the bottom of a 100-million-year-old billabong. Here the bones of *Australovenator wintonensis* (Banjo) and *Diamantinasaurus matildae* (Matilda) were found. Several hundred bones, piled up one on top of another, were recovered from a small area ... as shown in this map of the site. The ancient billabong deposit continues on to the north, where it's expected more secrets lie buried.



Killing Claw

Banjo's unusually large killing claw would have been about 30cm long when fully sheathed in cuticle. The claw is in the 'thumb' position and would have been a primary weapon.

Text and bone bed image Scott Hocknull, other images Travis R. Tischler

Banjo

Scientific name: *Australovenator wintonensis* (Hocknull et al. 2009)

Pronunciation: oss-tra-low-ven-ah-tor win-ton-en-sis

Etymology: Winton's Southern Hunter

Classification: Theropoda, Allosauroidea

Discovered: June, 2006

Length: Approximately 5m

Height: Approximately 1.5m high at the hip

Weight: Approximately 500kg

Geology: Winton Formation, central western Queensland

Age: Mid-Cretaceous (Latest Albian) 100-98 million years ago

Custodian: Australian Age of Dinosaurs Museum of Natural History (AAOD)

Fossil Material: Holotype specimen (AODF 604): Nine isolated teeth; left dentary (lower jaw); right and left dorsal (trunk) ribs and rib fragments; right and left gastralia (stomach) ribs and fragments; partial right ilium (pelvis); both ulnae (forearm bone); right radius (forearm bone); manus metacarpals (finger bones), hand phalanges and unguals (claws); right femur (thigh bone); both tibiae (shin bones); right fibula (shin bones); right astragalus (ankle bone); pes metatarsals (foot bones), foot phalanges and unguals (claws) as illustrated above. Additional material awaits preparation.



Fossil remains of theropods (carnivorous dinosaurs) number only a few in Australia, with all discoveries represented by only one or two bone fragments. Banjo's skeleton is Australia's most complete theropod skeleton, numbering dozens of bones and many more awaiting mechanical preparation. Banjo's skeleton has been designated as the holotype specimen for a completely new genus and species of theropod dinosaur, named *Australovenator wintonensis*.

Based on bones prepared so far, Banjo can be classified as an allosauroid theropod, most closely related to two similar allosauroids; *Fukuiraptor* and *Neovenator*. *Fukuiraptor* was found in Japan and *Neovenator* from the Isle of Wight in southern England; both found in deposits older than *Australovenator*. Banjo's bones show that *Australovenator* shared many features with primitive allosaurs and a more advanced theropod group called the carcharodontosaurids, a family of theropod dinosaurs found in Europe, North America, South America and Africa. Based on shared features, it's possible to place *Australovenator* on in the family tree of allosaur theropods. *Australovenator* was most likely the descendant of *Fukuiraptor* and the ancestor to *Neovenator*.

Twenty eight years ago, a dinosaur bone was discovered near Eagles Nest in southern Victoria. Once prepared, the bone was immediately recognisable as an astragalus (ankle) of a theropod dinosaur. In 1981, it was thought to belong to a dwarf species of *Allosaurus*, based on very similar features it shared to the larger Jurassic-aged dinosaur, *Allosaurus fragilis*. Debate surrounding this one bone has swung back and forth in and out of favour of its identification as a specimen of *Allosaurus*. Now, 28 years later, we can confidently assign the astragalus to *Australovenator*, an allosauroid.





The scientific analysis of *Australovenator wintonensis* by Queensland Museum palaeontologist Scott Hocknull entailed a tremendous amount of detective work including the comparative study of Banjo's weaponry and limb bones (above). The ratio between a limb bone and its counterparts such as Banjo's tibia and fibula also holds important information for AAOD palaeo-artist Travis Tischler (below) by enabling him to ascertain the physical and mechanical characteristics of the animal.



car - then contradicts himself by saying that they both did time on the shovel. Digging trenches to examine the stratigraphy of the soil tells scientists much about the way the animals died, he explains.

Both Matt and Scott noticed that there was no consistent orientation to the bones. "Bone shafts will orientate themselves in the direction of water flow," Matt explains. "We began to suspect that Matilda and Banjo had been stuck in mud." Matt says sandy deposits and erosion are indicators of a high energy environment, typical of rivers and flood zones. Conversely, evidence of mud, pollen, fine animal matter and micro-organisms suggest a low energy environment. He explains that during floods, fast-flowing water will bypass sharp bends in a river, cutting new and straighter paths. The bypassed section becomes a low-energy oxbow waterhole or billabong. The scientists' trench digging confirmed that Matilda and Banjo were buried in a low-energy environment, or billabong, as they suspected. In contrast, the fossils of nearby *Wintonotitan* which are far more weathered than *Diamantinasaurus*, were found on a sandy point bar, indicating that they were washed up by high-energy floodwaters.

Scott enlarges on Matilda's last hours. "We can fantasise that *Diaman-*

tinasauros matildae got bogged in the billabong, and the carnivore, in trying to eat her, also became stuck," he says. Local graziers can readily appreciate this theory; their livestock frequently become bogged in sticky black mud as dam water levels recede.

Although Matilda and Banjo's skeletons were not articulated, their individual bones hadn't moved far from their partners. Most of Matilda's right front leg bones were all found close together including an entire foot entombed in a siltstone concretion. "We've found small bits of crocodile so can assume they may have torn at the joints too," he surmises. "We didn't even know there was a billabong when we named Matilda and Banjo," he says. "Even the name Banjo was 'off the cuff'. We didn't really think about it." He adds "It's all a bit spooky, really..."

Scott paints a picture of how the Winton landscape would have looked 95 million years ago, based on their stratigraphic research. The topography would not have been that much different to the present day, he concludes; flat open land with ferns instead of grasses, big meandering rivers and oxbows and seasonal flooding, but with rivers draining north to

the Gulf of Carpentaria, not south as we have now. Imagine the waterways rich with fish, turtles and crocodiles with herds of sauropods grazing on the plains and you have a snapshot of the world of *Diamantinasaurus*, *Australovenator* and *Wintonotitan*.

At first, Scott assumed that *Diamantinasaurus* and *Wintonotitan* were the same species. However, the more their bones were prepared, the more obvious their differences became. Although similar in length, *Diamantinasaurus matildae* is short and stout in comparison to the tall, slender *Wintonotitan wattsi*. Scott explains that *Wintonotitan* has long, thin, toe bones; whereas Matilda's are solid and stocky, suggesting that she carried more weight. Her pelvis is massive compared to *Wintonotitan*, he continues, and her ribs much broader and more planklike.

To their amazement, the scientists realised that the two sauropods; although found only a few kilometres apart, were as different as hippo and giraffe. *Diamantinasaurus* had a round, barrel-shaped gut on stout legs. *Wintonotitan*, on the other hand, was slender and more erect. "It stands to reason," says Scott, "that plant-eating dinosaurs; like our modern-day

animals of the Serengeti, would have filled every ecological niche. There is good evidence, reflected in their bodies, that while *Diamantinasaurus* may have wallowed near the waterhole feeding on water plants and low vegetation, *Wintonotitan* probably lived on higher ground, browsing amongst the tree-tops".

Australovenator, Scott says with confidence, would have been a nasty piece of work. A nimble, agile and fleet-footed predator, it would have used its huge claws and razor-sharp teeth to bring down grazing animals with frightening efficiency. However, at only a fraction the size of the sauropods, it would have been unlikely to take on *Diamantinasaurus* or *Wintonotitan* directly. Scott says *Australovenator wintonensis* would have lacked the solid appearance of *Tyrannosaurus rex*, looking and acting more like a cross between *Allosaurus*, *Velociraptor*, *Fukuiraptor* and an upright komodo dragon. Banjo's legs were thin and gracile, he explains passionately, and his hands were huge! With forearms the size of ours, but fingers five to six times longer and sporting massive claws, Banjo was the leopard or cheetah equivalent of that time.



Working well into the evening on their last day together at the AAOD Facility at Belmont, Scott Hocknull and Travis Tischler reconstruct the giant foot of *Diamantinasaurus matildae* in a sand pit as the mountain of bones awaiting preparation stand behind them – silent witnesses to the significance of the moment.

Clancy

Scientific name: *Wintonotitan watsi* (Hocknull et al. 2009)

Pronunciation: win-ton-oh-tie-tan wot-sigh

Etymology: Watt's Winton Giant

Classification: Sauropoda, Titanosauriformes

Discovered: June, 1978

Length: Approximately 15m to 16m long

Height: Approximately 3m high at the hip

Weight: Approximately 10 to 15 tonnes

Geology: Winton Formation, central western Queensland

Age: Mid-Cretaceous (Latest Albian) 100-98 million years ago

Custodian: Queensland Museum (QM)

Fossil Material: Holotype specimen (QMF 7292): left scapula (shoulder blade), partial left and right humeri (upper forearm), partial left and right ulnae (lower forearm), partial right and near complete left radii (lower forearm), near complete right metacarpus (foot) preserving complete metacarpals II-V with proximal half of metacarpal I (toe bones), fragmentary dorsal (trunk) and sacral (pelvic) vertebrae and ribs, partial right ilium (pelvis), right ischium (pelvis), caudal vertebral (tail vertebrae) series including anterior caudals, middle caudals, posterior caudals and proximal chevrons (tail ribs), as shown above. Numerous additional unidentified or unrecognised bone fragments.



The holotype skeleton of *Wintonotitan watsi* (or Clancy) was first discovered in the late 1970s by Keith Watts, after whom the species is named. The Queensland Museum collected the specimen from the surface in the 1970s, including partial limbs and tail vertebrae. In 2004 and 2006, Australian Age of Dinosaurs returned with the Queensland Museum to excavate the remaining skeleton. These excavations revealed more vertebrae and parts of the pelvic girdle, enabling its full scientific description in 2009. *Wintonotitan watsi* is much more slender in its limb proportions compared to the robust *Diamantinasaurus matildae*. It is distantly related to *Diamantinasaurus*, having branched off the titanosaur family tree further down than *Diamantinasaurus*.



Text Scott Hocknull, images Travis R. Tischler

Matilda

Scientific name: *Diamantinasaurus matildae* (Hocknull et al. 2009)

Pronunciation: dye-ah-man-teen-ah-sor-us mah-til-day

Etymology: Matilda's Diamantina (River) Lizard

Classification: Sauropoda, Titanosauria, Lithostrotia

Discovered: June, 2005

Length: Approximately 15m to 16m

Height: Approximately 2.5m high at the hip

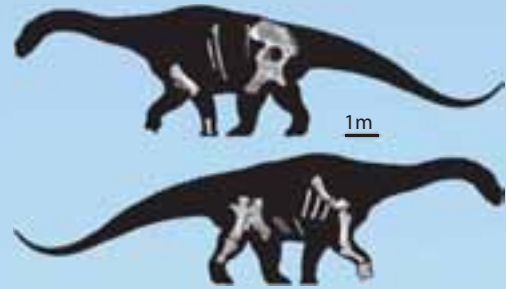
Weight: Approximately 15 to 20 tonnes

Geology: Winton Formation, central western Queensland

Age: Mid-Cretaceous (Latest Albian) 100-98 million years ago

Custodian: Australian Age of Dinosaurs Museum of Natural History (AAOD)

Fossil Material: Holotype specimen (AODF 603): Right scapula (shoulder blade), right and left humeri (upper forelimb), right ulna (lower forelimb), near complete right metacarpus including metacarpals II-V (front foot), phalanges and a manusungual (claw). Left metacarpal I (toe bone). Dorsal (trunk) ribs and fragmentary gastralia (stomach ribs). Left sternal plate (breast plate). Left ilium (upper pelvis) and isolated sacral processes. Right and left pubes and ischia (lower pelvis). Right femur (thigh bone), tibia (shin bone), fibula (shin bone) and astragalus (ankle bone) as illustrated above. Additional material awaits preparation.



Diamantinasaurus matildae is a robust dinosaur, with limb bones much more massive than those of *Wintonotitan wattsi*, even though both were a similar size. Matilda has been reconstructed as a wide-hipped, bow-legged dinosaur with a rotund shape.

The overall appearance of *Diamantinasaurus matildae* reflects a couple of possible behaviours, the first being it might have been able to stand on its hind legs with the tail for support (tripodal stance). The second is that of a semi-aquatic animal, using the billabongs that eventually preserved its bones as a wallow. Although it is difficult to confirm either of these behaviours, Matilda was probably not living far from the billabong that she eventually died in. Perhaps she lived in billabongs or water courses some of the time, filling the niche of a hippo way back in the Cretaceous Period.



With plenty of Banjo's plaster jackets still to be prepared, more of 'Winton's Southern Hunter' is coming to light with every passing week. As luck would have it, Scott was at Belmont in early 2009, shortly after the preparation of 'an insignificant piece of crud' had begun. After scrutinising it, Scott recognised the piece as one side of Banjo's lower jaw! "It's fantastic!" he enthuses, "Sixty percent of theropods discovered are headless. We can now be pretty confident we will find all pieces of the skull." Stunned by the length of the jaw, Scott says we now know Banjo was a long-snouted carnivore. The 18 tooth sockets are small in relation to the jaw's length, he says. Unlike *T-rex*, which had a short jaw with big teeth for a powerful, crushing bite, Banjo's fine teeth and long jaw would have been used for a slashing, tearing action. What does this mean for Australian palaeontology and the Winton district? "It means the equivalent of Africa's lion is still out there waiting to be found!" proclaims Scott, with boyhood glee.

DINOSAUR MAGIC

For the participants involved in Matilda and Banjo's unveiling, the experience has been unforgettable. When asked what it is about dinosaurs and outback Queensland that keeps them coming back, everyone has an answer. June Richardson says nostalgically, "I love the bush. I grasp at every opportunity to get back – that's where my heart is."

Tom Bonnice sighs, "There's something about western Queensland. It's a magnet!" Jim Cronin completes the diggers' feedback sheet with one word ... "MAGIC!"

Many volunteers nominate the landscape, the sunsets and the brilliant night skies. Others say that meeting people from all walks of life; like-minded people with similar interests, keeps them coming back. Their praise extends to the AAOD and QM staff. Chris Wawryk says digs give you an education that includes modern and prehistoric animals, how the land formed, social history, and the AAOD experience. She writes, "Apart from the science, participants can get really excited about AAOD as a venture by Australians, for Australians."

Jim McMillan is adamant that for him the magnet is "David and Judy's passion, their *vision...*". "They're unsung heroes," declares Tom Bonnice. Peter Jamieson says "You go a long way before you come across people who are that true blue." "David's a guy of integrity with a heart of gold," announces John Westman, then adds, "... bordering on being a nutcase!" Bob Lake sums it up: "The Elliotts are the ideal, perfect Australian family," he says with sincere admiration. "David's a quintessential Australian sheep cocky. It's something I thought this country had lost but it's still alive." There is unanimous agreement that David and Judy are a formidable team; that their involvement in the project was somehow meant to be. "It was serendipity," concludes Julie

Lake, "... a meeting of forces above and below the ground."

For David and Judy, the 'meeting of forces' has been a blessing and a curse. Mostly, says Judy, they've loved every minute of the last seven crazy years, even though it's meant less time for the kids and even less for the housework. "The kids come home from boarding school and we're too busy to do stuff," she laments. "That's been the hardest thing. Having visitors on their home turf has been good for the kids, Judy concedes, adding they've got used to people asking them questions.

Luckily for David, young Bob has been able to do the lion's share of the station work since 2007. "Bob's the boss these days," laughs Judy "and David's his lackey!" Bob reckons the man from Belmont's made a smart choice handing him the reins. "Making stuff-ups is a good way to learn," he says cheerfully, adding that not having the old man looking over your shoulder has its advantages; "When it was 42° outside, and Dad wasn't looking, I used to slip into the air-conditioned prep shed for a chat!" he jokes.

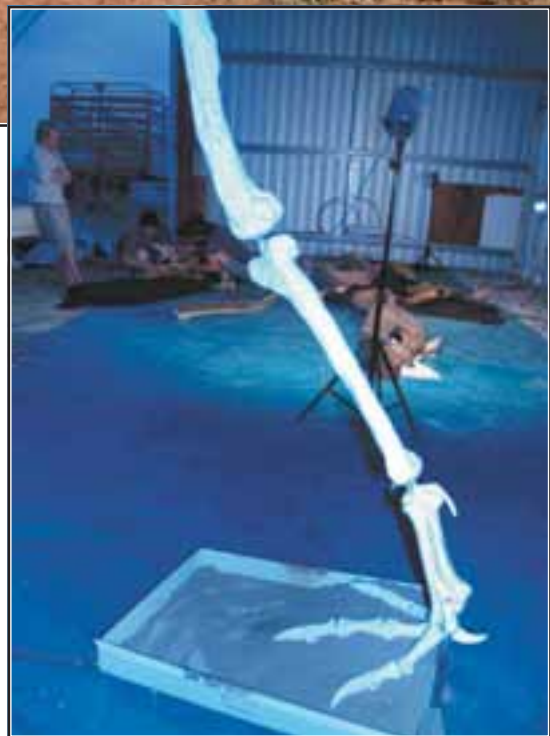
For the volunteers who have been part of AAOD during its Belmont era, the move to the Jump-Up brings mixed feelings. They say the chance to witness life on a working sheep station has been a bonus, and the hardships something of an eye-opener. Tom Bonnice says, "If something doesn't work, country people put up with it till they can fix it themselves.



The incredible bones of Diamantinasaurus partially arranged in their life positions. This photo shows Scott Hocknull in the process of fitting Matilda's massive hip girdle together for the first time; an emotional moment for all those who prepared them.



Travis Tischler does battle with a length of second-hand pipe from the Belmont rubbish tip (above). With nothing at his disposal but plaster and a sand pit, Travis managed to mould and cast many of Banjo's bones over the course of a week and this rough-and-ready pipe frame was soon transformed into the amazing hind limb of *Australovenator wintonensis* - brought back to life after 95 million years (right).



They just accept it and get on with life". Bernard Cannon agrees. "We'd be in a blind panic, but out there, it's not the end of the world."

Without prompting, Tom Bonnice mentions Banjo Paterson travelling all the way to Winton 100-plus years ago. He says David and Judy are still that same breed, unchanged in 100 years. "They don't realise they are living the real Australian life ... they don't understand how romantic that is".

In March, Scott Hocknull spent time at Belmont, arranging all the bones of *Diamantinasaurus* and *Australovenator*, as they would have been when articulated. From these simple bony beginnings, he and AAOD palaeo-artist Travis Tischler have provided an interpretation of Banjo's size, shape and appearance. In a delicate

blend of science and art, Australia's most complete carnosaur skeleton is now being brought back to life!

Travis is also reconstructing the front leg of Matilda, a model which shows that the hippo comparison requires no stretch of the imagination. With just a little artistic licence, one can't help but conjure up an image of sweet Matilda's ample bottom swaying from side to side on the dance floor, as the elegant Banjo, with charming toothy smile and evil glint in his eye, steers her in a waltz to certain death.

END OF AN ERA

2009 has heralded big changes for AAOD, the first being the closing of the old prep shed at Belmont, and the opening of the new lab on the Jump-

Up. Two more shipping containers have been generously donated by the Port of Brisbane, and staff cottages and an amenities block have been erected. For AAOD, it is the end of an era. Over the decade, a spectacular museum of natural history will gradually take shape and David Elliott predicts it will be a facility of which all Australians can be proud.

Unfortunately, Elliot's Angels are now only together in spirit; with Kylie returning to Sydney in late 2008 and Naomi to her fiancé in Townsville later in 2009. Trish, however, has settled in to life on the Jump-Up, and is thrilling visitors by catching the odd lizard or snake. Tricky says she's been busy helping to get the museum running, organising tours, working in the prep lab, training guides, and living her dreams.



John and Bev Ursem cast the bones of Diamantinasaurus in the Belmont sand pit (top left); a process that entails moulding opposite sides of each bone in damp sand and filling the moulds with plaster. Following this procedure the bone halves were fitted together with hessian strips soaked in plaster (top right) leaving a hole at each end to accommodate a steel pipe for mounting the specimens onto. Once the metal frame had been welded into the desired shape (above) the models were mounted in their real life positions at the newly built AAOD preparation facility on the Jump-Up (left).



Travis Tischler and Matt White work on a life sized reconstruction of *Australovenator* at the new AAOD preparation facility in readiness for opening day (left). On July 3, 2009, Queensland Premier Anna Bligh made a special trip out to Winton where she opened the first stage of the Australian Age of Dinosaurs Museum as part of Queensland's 150th birthday celebrations and officially announced three new Australian dinosaurs to the world (below). Following 95 million years of obscurity, *Australovenator*, *Diamantinasaurus* and *Wintonotitan* have returned to the public arena.

For the Elliott family, station life is a little quieter these days. The Belmont office is still just as busy, but the same can't be said for the kitchen. David's managed to put a few motorbikes back in his shed and Judy no longer shares the house with dinosaur bones. Bob doesn't have to put up with Naomi's desk outside his bedroom – in fact, he's bagged Naomi's hut!

Meanwhile, at the Queensland Museum's Geosciences Facility in Brisbane, a 20-year-old prison of bog, fibreglass, paint and plaster has been dismantled from around the fragmented bones of *Wintonotitan* (see *Will the real dinosaur please stand* Page 84), and the bones added to those found in June 2006. Amazingly, many pieces have been fitted back together after living 1500km apart for nearly 40 years. In celebration of a long lost identity and in keeping with the theme of its birthplace, this magnificent animal has now been nick named 'Clancy', after Banjo Paterson's immortal ballad *Clancy of the Overflow*. *Wintonotitan wattsi*, with a new look and a new name, is stepping out for his share of the limelight at last.

When news of *Diamantinasaurus*, *Australovenator* and *Wintonotitan* went to scientific print in early July 2009, palaeontologists from around the world sat up and took notice. The scientific world had been waiting for the likes of *Australovenator wintonen-*

sis for a long time, eager to learn how carnivorous dinosaurs might have specialised and evolved since the splitting of Australia and Antarctica from the supercontinent Gondwana several hundred million years ago.

When asked which dinosaur is the bigger star, Scott Hocknull admits for him, it's *Australovenator*, but concedes that it depends on which scientist you talk to. The Winton locals are happy to let all three share the limelight; bush folk are generous that way. They're holding a little in reserve though, because they know Wade is still to come!

Matilda, Banjo and Clancy's story has all the ingredients of a cherished family recipe. What is it about this tale that resonates with all Australians? Perhaps it's that we love a titanic struggle; whether it's on the footy field, in a billabong or in a makeshift office beside the kitchen. We love to win a bet, especially one with impossible odds, and we love our heroes, especially the unsung ones. Australia's national identity was built on true blue characters, larrikinism, and the anti-establishment spirit; we love to believe that there's a pinch of the Elliotts, a sprinkle of the 'Angels' and a dash of the swaggie in all of us.

If there's one final ingredient, it would have to be a dusting of magic; the magic that comes with the moment of discovery, finding the



needle in the haystack or being saved by an angel. It's in the poetry of an arid landscape; in the romance of the stone. It's in a boy with a dream and a cocky with a vision; in living your passion and waltzing to your own beat. Clancy's comeback and Matilda and Banjo's story draw us in for all these reasons, but perhaps more than anything because we love a good yarn – especially one with a spooky ending.



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