

## The Tale of Two Digs

In my previous post I mentioned that the bones of *Australovenator wintonensis* (Banjo) and *Diamantinasaurus matildae* (Matilda) are on display at the Australian Age of Dinosaurs Reception Centre, situated on the Jump Up approximately 25km from Winton, Queensland.

So where did Banjo and Matilda come from? They are part of a growing number of dinosaur species that have been unearthed in the Mid-Cretaceous Winton Formation of Central Queensland. In 1999, grazier David Elliott discovered dinosaur bones on his property, which led to annual digs by the Queensland Museum, followed by the creation of the Australian Age of Dinosaurs, co-founded by David and his wife Judy. The Winton Formation is approximately 1100 m thick and is dated from between 98 to 95 million years old (Late Albion-Cenomanian). The sediments are made up of siltstones, sandstones and claystones, formed in a fluvial depositional environment. The dinosaur bones are often associated with “blacksoil”, which expands when it is wet and cracks when it dries. The cracks become filled with windblown soil and over time and repeated wet/dry cycles heavy objects such as dinosaur bones rise to the surface. Once exposed on the surface large bones quickly erode to smaller fragments, which is what the fossil hunters look for when they prospect. The discovery of a concentration of bone fragments on the surface may indicate more complete bones below, so test pits are dug and if the bones becomes larger, then the heavy machinery is brought in to clear away the over-burden.

The tactic of surface prospecting is similar in Victoria where the rocky shore platform is scoured for exposed bones at low tide. That is about where the similarity ends as the exposed bones found along the Victorian coast line are in solid sandstone conglomerate and are regularly covered by high tide and/or sand. The bones are much softer in texture than the rock in which they are encased and can disintegrate if handled roughly. In Winton the exposed bones are found in paddocks with no danger of the tide coming in, although they do have to contend with the rare flooding event from heavy rains. The bone fragments are found sitting loose on top of the soil and are easily collected without too much concern regarding their fragility, having survived hundreds of years working their way to the surface.

We were fortunate to arrive in Winton at the end of the first week of a three week field season and were invited to join the new crew at a site approximately 80km from Winton on a property called Elderslie where dinosaur bones had previously been found. At the end of the first week the previous crew had uncovered a scapula, approximately one metre long, of a large sauropod dinosaur. The task of the new crew was to excavate around the scapula to see if there were any more bones associated with it. After settling into their quarters in a modified shearing shed and a final run through of the O.H.& S. rules, the crew piled into their vehicles and left in convoy to the excavation site, approximately one kilometre away, through a number of paddocks. The regular crew had arrived earlier and set up the marquee and trays of bone fragments for the new crew to examine to train their eyes on what to look for.

The excavation site looked like any other part of the paddock, except that the front end loader had cleared away a large area of top soil to reveal a pit about 50cm deep. In the centre of the pit was the prize from the first week’s crew – a beautiful sauropod scapula, almost completely exposed. This is another departure from the excavation method used by the Victorian Dinosaur Dreamers. Even if we

found a bone as large as the sauropod scapula, the rock surrounding it is so hard that only a cross-section of the bone would be visible and it would have to be transported back to the Museum preparation laboratory where months of pains-taking preparation would be needed to uncover what it took the AAOD volunteers less than a day to achieve.

In order to determine if there were more bones associated with the scapula the volunteers got to work, using screwdrivers and awls to tease away the blacksoil from the surrounding area. On their hands and knees they removed a large amount of soil in a relatively short period of time. The soil was removed in small clumps, placed in buckets and carried to the edge of the excavations where it was deposited.

The speed with which they were able to clear a large area from around the scapula is also quite different from the excavations in the Victorian sites, where the fossil layer is slowly removed using sledgehammers and long chisels or plugs and feathers. The resulting rock is then broken down further in the hope of finding tiny bones and teeth. The AAOD volunteers were able to expose an area in one day that would take the Dinosaur Dreamers a full six week dig to accomplish.

As it turned out there were no more bones associated with the scapula so the next day the bone was plaster jacketed and transported back to the preparation laboratory close to the AAOD Reception Centre, just outside Winton. The excavation pit was back filled using the front end loader, thus allowing the vegetation to re-grow. The dig crew went on to examine a number of other potential sites in the area over the following two weeks, discovering more bones, including three large nodules and a beautifully preserved tree trunk. Using the technique of initial prospecting looking for surface bone, then digging a test pit to determine if there was unweathered bone below the surface they were able to explore many sites. In comparison the Dinosaur Dreamers concentrate on one specific site for the whole field season, slowly following the fossil layer until it peters out or becomes too difficult to continue. In a way it is fortunate that the AAOD volunteers can quickly assess potential sites and move on once they have removed any bones as they have such a huge area of Winton Formation to cover, compared with the thin strip of coastal exposure available to the Dinosaur Dreamers.

Both excavation methods have been developed over a number of years to suit the conditions under which the fossil bones are preserved. Soft sediments allow for fast exposure of fossils and even faster preparation. This technique, although excellent for finding large sauropod bones is not suitable for the discovery of small fossils such as tiny mammal jaws and small dinosaur teeth. Both forms of excavation have been honed to give the best results under different environmental conditions. The technique used by David Elliott and the AAOD volunteers has produced some spectacular results and with a large part of Western Queensland still to prospect, their search has only just begun. Besides, they will soon have a magnificent new Museum to fill, if David has his way.

For more information on the Australian Age of Dinosaurs or if you would like to volunteer on their next dig visit their web site:

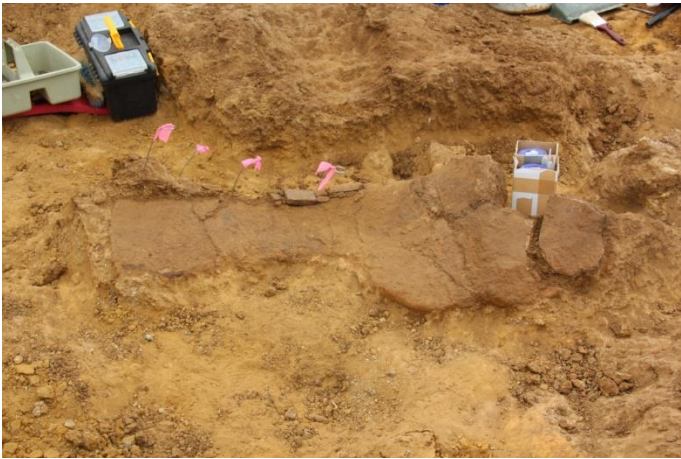
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*Excavations at one of the dig sites near Winton, Queensland.  
Photographer: Gerry Kool*



*Excavations at the Dinosaur Dreaming site, Inverloch, Victoria.  
Photographer: Lesley Kool*



*Sauropod dinosaur scapula at one of the Elderslie sites, near Winton.  
Photographer: Gerry Kool*



*Ornithopod dinosaur bone from the Dinosaur Dreaming site, Inverloch.  
Photographer: Lesley Kool*



*Preparation of dinosaur bones at the AOD prep lab, Winton.  
Courtesy of AOD.*



*Preparation of dinosaur bone at the Dinosaur Dreaming prep room, Inverloch.  
Photographer: Lesley Kool.*