
DINOSAUR DREAMING 2013 FIELD REPORT



20TH ANNIVERSARY EDITION



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Dinosaur Dreaming 2013 Field Report edited and compiled by Wendy White. Special thanks to Wendy Turner for helping me tame the table of contents and proofreaders Mary Walters and Alanna Maguire (with input from Lesley Kool, Gerry Kool, David Pickering and Tom Rich).

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DINOSAUR DREAMING 2013 FIELD REPORT

BY LESLEY KOOL

The Dinosaur Dreaming 2013 field trip celebrated its 20th dig at the Flat Rocks site, near Inverloch, on the Bass Coast of Victoria. The site was discovered in 1991 by a group of researchers who had been systematically searching the rocky shore platform from San Remo to Inverloch since the mid 1980s. Numerous fossil bones had been found but never in any concentration until that serendipitous day in March 1991. A storm the previous day had washed away the sand that normally covers the rocks on the shore platform and the team was greeted by a beautifully bare vista. Starting at The Caves, where a couple of fossil bones had been found in January 1991, the team spread out across the shore platform and proceeded to search for exposed bones in the conglomeratic rocks.

It seemed like no time at all before one of the group called out to say that they had found a bone. The rest of the team quickly joined him and within an hour more than 20 fossil bones were discovered in a four metre wide conglomerate layer stretching from the mid-tide level to the base of the cliff. So was the Flat Rocks site discovered and Dinosaur Dreaming was born. It took another three years before annual field seasons commenced in 1994



Jeremy Burton, Dean Wright and John Wilkins work Prep Rock

and they have continued, without pause, ever since.

The site is situated in a logistically difficult environment. The major concentration of fossil bones lies within the inter-tidal zone in a fossil layer which is tilted north at an angle of 15°. Anyone who has visited the site is aware that it is only accessible three to four hours either side of low tide and there have been times when the tide came in much quicker than anticipated, resulting in very wet feet.

The plan for the 2013 field season was to concentrate on the excavation of Prep Rock, the most westerly end of the fossil layer. Prep Rock got its name because originally it was a large flat sandstone outcrop, which was perfect for storing and wrapping the fossil bones that had been discovered on site during the day. Sadly the rock fell apart, due to natural erosion, between the 2000 and 2001 field seasons and it could no longer be used for its original function, but we kept the name to honour its memory. Prep Rock is close to the area where the two *Bishops whitmorei* jaws were found in December 2000 and so the plan was to return to see if we could find anymore mammal material, preferably an upper jaw or the holiest of holies – a mammal skull. This part of the fossil layer typically yields small bones less than 50mm in length, which is why it is the ideal place to find mammals. We did recover many small fossil bones, including a well preserved pubis (part of the hip) and a femur from a small-bodied ornithopod dinosaur.

On her last day at the dig, long time volunteer Astrid Werner found her first mammal jaw. Initially it was very difficult to recognise as it was broken across the middle of the jaw, exposing a cross-section smaller than a match head. Fortunately the sun was shining that day and it glinted off the enamel surface of part of a tiny molar that was exposed in the cross-section. Only an experienced volunteer like Astrid would have spotted the tiny cross-section, which explains why Dr Tom Rich has stated that for every mammal jaw we find, we miss many more.

In the last 20 field seasons some of the best discoveries have been the volunteers. More than 350 people have become Dinosaur Dreamers. Some joined us for just one field season and then moved on, others have kept coming back, year after year, having been hooked on the addiction of 'just one more bone'. Some have gone on to bigger and better things, including a number of university students who have achieved their doctorates. Others, sadly, are no longer with us. But it is safe to say that without these people Dinosaur Dreaming would never have continued for 20 years and been as successful as it has. Dinosaur Dreaming has also been supported in other ways. The creation of the Friends of Dinosaur Dreaming in 1997 has allowed hundreds of individuals and families the opportunity to share in the excitement of discovery and the ongoing research that is pivotal to the project. In turn, their subscriptions have provided much needed funding to keep the annual digs going. A special Friend of Dinosaur Dreaming is Rob Huntley. Rob has provided years of assistance in moving all the dig equipment to and from the dig house each field season. More recently he set up the new web site www.DinosaurDreaming.net which includes monthly features on fossil localities, fossil animals and fossil activities which appear in the Dinosaur Dreaming book and CD. Additional support from individuals and companies who have sponsored the Dinosaur Dreaming project over the last 20 years has provided essential goods and services ranging from



Rob Huntley loads equipment onto his trailer

steel capped boots for all the crew members from Blundstone since 1999 to excavation equipment from Atlas Copco and Total Tools Cranbourne. Over the years Dinosaur Dreaming has enjoyed local support from Bunurong Environment Centre, Inverloch; Foodworks Supermarket, Inverloch; Head Ranger Brian Martin and Parks Victoria Bass Coast division; Dennis O'Donnell, Wonthaggi Optician; Bass Coast Information Centres and RACV Inverloch Resort. It is gratifying to receive such support from local individuals and companies who are proud to sponsor such an exciting project as Dinosaur Dreaming.



John Wilkins, Joe Burgess and Andrew Stocker move a rock

2013 has been a busy year for the Dinosaur Dreaming team. Following on from the Inverloch dig, some of the volunteers headed over to the Otways and spent two weeks working at the Eric the Red West site, on the coast near Cape Otway lighthouse. While the team was in the Otways, I was fortunate to spend a week at Museum Victoria with visiting English palaeontologist Paul Barrett. Paul hails from the British Museum of Natural History in London and is an expert on ornithopod dinosaurs. He visited Melbourne to work on our baby dinosaur Noddy – the partially preserved ornithopod dinosaur, found by Mike Cleeland near the Flat Rocks site in 2010. Since its discovery, Noddy has been exquisitely prepared by Museum Victoria's Vertebrate Palaeontology Collection Manager, David Pickering. Unfortunately for him, Paul's visit coincided with the Otway dig, which David was running, so he was unavailable for the first week of Paul's visit. Fortunately for me, I was available to work with Paul. Not only did Paul

study Noddy but he also went through the growing dinosaur bone collection in the department and identified a number of isolated skull elements, which had previously remained unidentified. He was also able to verify that the pubis and femur found during the 2013 field season were from ornithopod dinosaurs. We are all looking forward to the paper describing Noddy, due to be published in the near future.

In April, a third dig took place at Koonwarra, north of Inverloch in the Strzelecki Ranges. The Koonwarra site is famous for its beautifully preserved fish, insects, plants and bird/dinosaur feathers. During a trip to China in 2009 Tom Rich noticed that the fine lacustrine sediments were very similar to those at Koonwarra. After a fruitless search to find other fossil localities in South Gippsland, Tom decided to re-open the Koonwarra site and assess its potential as a site which could contain more complete fossils. For two weeks in April a team of volunteers tested and sampled sections of the site, demonstrating that it does have potential to yield more complete specimens. Tom discusses the results of that dig and what he plans to do next in his report.

The results from the Koonwarra dig have had a profound effect on Dinosaur Dreaming's excavation regime for the next few years. In June it was decided that, in the light of what needs to be achieved if excavations are to take place at Koonwarra, then only one dig will take place next year and that dig will be at Eric the Red West in the Otways. The decision to suspend excavations at Inverloch was not taken lightly. Each site was examined on its merit and the decision to choose Eric the Red West over Inverloch came down to the fact that Inverloch has had a great run of 20 consecutive years of excavations, whereas Eric the Red West has huge potential for many years to come. It has also produced a partial dinosaur skeleton, a spinosaurid dinosaur vertebra and an upper mammal jaw – none of which have been found at Inverloch.

It is sad to think that after 20 years of digging at Inverloch we won't be returning in 2014 for our

21st field season, but it has been the most amazing journey of discovery for hundreds of people and an experience I will cherish for the rest of my life. The good news is that the fossil layer at the Flat Rocks site is protected by sand and water and I am sure we will return there at some time in the future.

In the meantime Eric the Red West awaits and the Dinosaur Dreaming crew are already preparing for a three week dig in February 2014. The downside of the Eric the Red West site is its remoteness. Situated on the coast near the Cape Otway lighthouse, it is not the easy two hour drive from Melbourne that Inverloch is. For this reason we have decided to invite the Friends of Dinosaur Dreaming to visit us at a special one day dig at the Flat Rocks site after the Eric the Red West dig has finished. We will bring along some of the fossil bones found during the dig and will hopefully break some of the Flat Rocks rock for old times sake. We do hope that you will visit us on the day.

Finally I would like to thank everyone who has been a part of the great adventure that is Dinosaur Dreaming, particularly the stalwarts who have been there almost from the beginning – Marion Anderson, Mike Cleeland, Peggy Cole, Nicole and Alan Evered, Norman Gardiner, David Pickering, Doris Seegets-Villiers, Nick van Klaveren, Mary Walters and Corrie Williams. I would also make a special thank you to Wendy White who took over the unenviable role of 'Evil Overseer' and made it not so evil. As Nicole Evered once said finding dinosaurs at Inverloch is "better than winning Tattsлото" and I would heartily agree with her.



Mary Walters hoses down Prep Rock



MY FAVOURITE FLAT ROCKS FOSSILS

BY TOM RICH

#1 Top of the list: The holotype of *Ausktribosphenos nyktos* found by Nicola Sanderson née Barton on 8 March 1997, a day I shall never forget. Were it not for that discovery, there would not have been a dig at Flat Rocks after 1998.



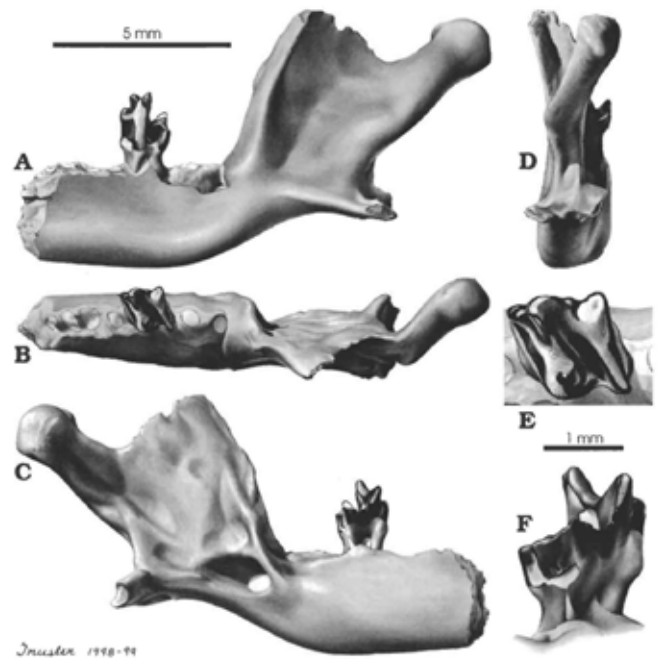
Left: Nicola Sanderson with her find
Right: Peter Trusler's drawing of the *A. nyktos* jaw

#2 Rookies Day 2000 when two jaws of the mammal *Bishops whitmorei*, including the holotype, turned up.



Bishops whitmorei

#3 Chuck Schaff, then of Harvard University, came to Australia and prepared the only molar of *Teinolophos trusleri* then known. When he showed it to everyone present, all instantly recognized that it was a monotreme instead of a eupantothere as I had originally identified it. This was a major advance.



Peter Trusler's drawing of the *T. trusleri* jaw

#4 The discovery in a nodule of Noddy, the partial skeleton of a hypsilophodontid skeleton, by Mike Cleeland. First thought to be a fish, as it was prepared meticulously by Dave Pickering. It just got better and better with gut contents showing what its last meal was, along with possible skin impressions.



Left: Mike Cleeland holds Noddy
Right: Noddy partially prepared

#5 The discovery by Nicole Evered of the holotype of *Qantassaurus intrepidus*, the only dinosaur to be named on the basis of a specimen from the Flat Rocks site.



Left: Nicole Evered with her dinosaur jaw

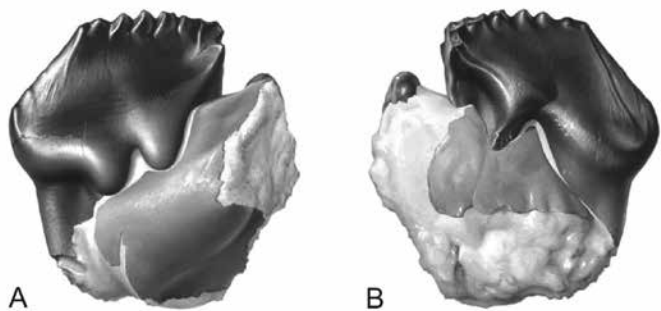
Right: Peter Trusler's reconstruction of *Q. intrepidus*

#6 The discovery by Mary Walters on St Valentines Day 2008 of the most complete jaw of the monotreme *Teinolophos trusleri*. This fossil demonstrates most definitely that this species, although considered by everyone a mammal, has a condition at the rear of the jaw that is more reptilian than typically mammalian.



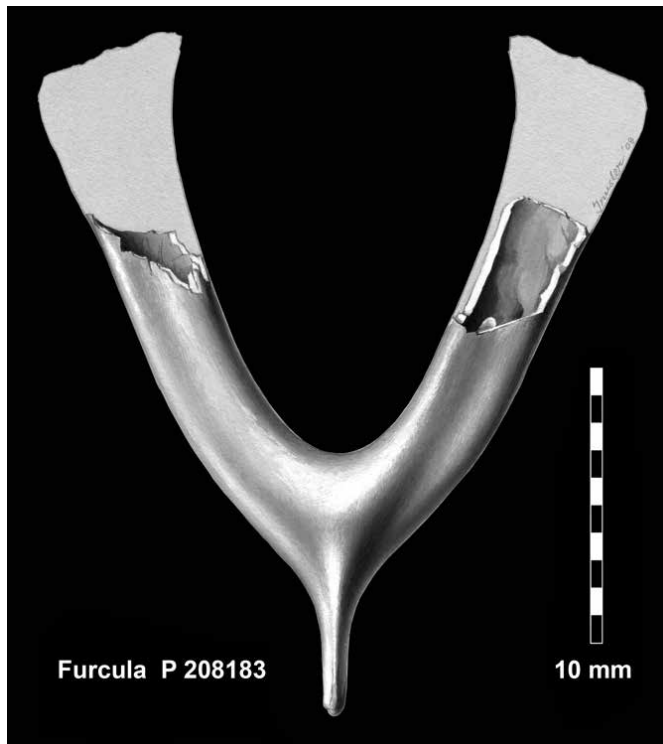
Image of Mary's *T. trusleri* jaw

#7 The discovery of the holotype of *Corriebaatar marywaltersae* which showed that the longest lived group of mammals, the multituberculates, occurred in Australia.



Peter Trusler's drawing of the *C. marywaltersae* tooth

#8 The bird furcula, which was found the same year as the first mammal jaw.



Peter Trusler's image of the furcula

#9 The theropod dinosaur footprint, found and identified by Tony Martin close to the Flat Rocks site.



Tony Martin's dinosaur footprint



A selection of theropod teeth

#10 Not a single discovery but *in toto* a highly important result: more than 90 small theropod teeth. The vast majority, more than 90% of all the small theropod teeth yet found in Australia, were collected from Flat Rocks.



Tamara Camilleri opens the theropod teeth draw in Museum Victoria's vertebrate palaeontology collection

Honourable mentions:

The most unexpected fossil found in three decades of work in the Cretaceous of Victoria was the jaw of *Koolasuchus cleelandi*. Only because it did not occur at Flat Rocks is it not high on the list of 10 favourite fossils. When found, it extended the time range of temnospondyl amphibians by 80 million years. If a living *Tyrannosaurus rex* turns up tomorrow, its time range will be extended only by 65 million years.

The ulna from *Serendipaceratops arthurclarkei* found near Kilcunda in 1994 but not named until compared with *Leptoceratops* in 2003.



Serendipaceratops (above) and *Leptoceratops* (below)

The turtle skull that Lesley describes glowingly in her Slow and Steady article.

The pterosaur humerus from Eagle's Nest. We have found a number of pterosaur teeth at Flat Rocks, but the humerus has the advantage of being undoubtedly a pterosaur.



Pterosaur humerus



ERIC THE RED WEST FIELD REPORT

BY DAVID PICKERING

Since the late 1970s fossils have been regularly found by prospecting along the Cretaceous coast of Victoria. These discoveries, many of which have been scientifically important, have rarely resulted in a site being developed into an organised excavation over a number of field seasons. Dinosaur Cove (1984 – 1994) and Flat Rocks (1994 – 2013) are the well known exceptions.

A third site has been steadily developing in importance since late 2005 to become the next major excavation site in the ongoing project to piece together the Victorian Cretaceous saga.

The Eric the Red West story began when a small group of prospectors led by Mike Cleeland discovered some promising fossils at a site just east of Cape Otway. Lesley Kool prepared the specimens, one of which developed into a partial articulated skeleton of a small-bodied ornithomimid dinosaur, comprising a near complete tail, lower leg bones and ankle with right foot and toes attached. Wonderful! This was only the third articulated dinosaur specimen found in Victoria. Is it *Leaellynasaura*? No, its tail is different. Is it *Atlascoptes*? We can't tell because an *Atlascoptes* tail has not been identified. The prospecting crew had had a big day out because they also found a strange cervical (neck) vertebra just a few metres from the ornithomimid tail. This specimen remained an enigma for many years until Paul Barrett identified it as the first Australian occurrence of a Spinosaurid dinosaur.

During the preparation of the articulated tail Lesley noticed that the vertebral line terminated with the impression of another vertebra. This meant that there was another piece of the tail still *in situ*. I hastily organised an overnigher with



The ornithomimid mandible found by Sharyn Madder

some Museum colleagues and met Mike on site to retrieve the remaining part of the tail.

This was the first field dig at the 'Eric the Crayfish' site; so named because it lay between the Eric the Red anchor and Crayfish Bay. The crew still has a sentimental attachment to this name but Tom Rich pointed out that the site is lithographically identical to the previously named Eric the Red site (the area around the anchor) so the site is now known as Eric the Red West (ETRW).

In comparison to this first field dig in early 2006 which consisted of 6 or 8 people camping overnight in a bush clearing, the 2013 dig comprised a crew of 25 working for eight days based at Bimbi Park and utilising its luxurious amenities. The booty from this dig numbered 141 specimens – more than doubling the previous record from ETRW 2012. Unfortunately Tom's dream of further finds of mammalian upper teeth were unrealised but the dino fans were happy with a number of good finds including Mary Walter's stunning ornithomimid maxilla (upper jaw) with at least ten teeth, Sharyn Madder's interesting ornithomimid jaw with at least two tiny teeth, Toni-Lee Ferrier's near-complete ornithomimid dorsal vertebra and a very robust, complete ornithomimid tibia which no one seems to want to take credit for.



The Eric the Red West crew after the rain

ETRW 2014 is scheduled for three weeks between 1st February and 22nd February in place of the late lamented Flat Rocks, Inverloch. Although the location has changed it is still held under the Dinosaur Dreaming banner and managed by the gang of four. The conditions and methods may change but the camaraderie and enthusiasm to find fossils will stay the same.

I would like to acknowledge and thank the entire crew, both veteran and novice, who work tirelessly and with good humour in sometimes difficult conditions — although it must be noted that the weather was generally quite reasonable for the Otways in late March.

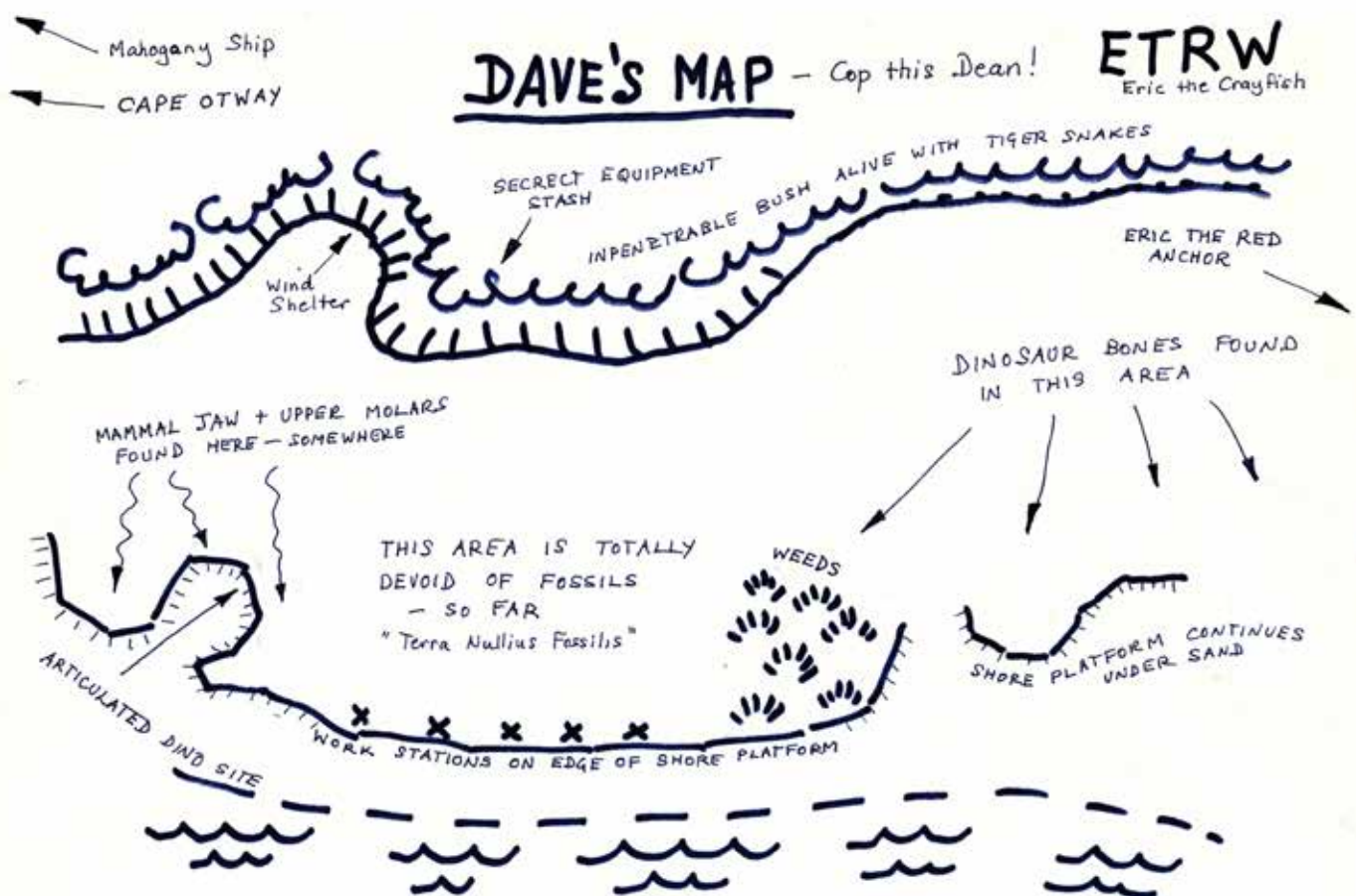
Special mentions in despatches to:

- Pip and Mike for keeping us all well fed and entertained

- Wendy for expert fossil wrapping with amusing labels and for keeping Mike's accounts comprehensible
- Alan for his advice, Mou Tai and nonstop action
- Sean, Phil, Alanna and the rest of the wrecking crew for their heavy industry
- Mary and Lisa for assisting in fossil wrapping and doing heaps of things that needed doing
- Lesley, Gerry and Marion for all their off-site input and assistance
- Keiichi whose enthusiasm kept him, and the rest of the crew, smiling

Reference:

Barrett P.M., Benson R.B.J., Rich T.H. and Vickers-Rich P. 2011. *First spinosaurid dinosaur from Australia and the cosmopolitanism of Cretaceous dinosaur faunas*. *Biology Letters* 7: 933–936. doi: 10.1098/rsbl.2011.0466.



This map is the culmination of 20 years experience in Topographic mapping for the Division of National Mapping - and the reason I left.

SCALE: YOU'RE JOKING.



RESEARCH REPORT

BYTOM RICH

Just before leaving Flat Rocks at the end of her 13th stint there, Astrid Werner took a swim, for it was a rather hot day. Emerging from the water, Lesley greeted her with the welcome news that she had long wanted to hear. She had found her first mammal jaw.

That specimen is still in the rock. Why? Because it is being used as a test example to assess how useful an image of a known mammalian jaw still embedded in the rock can be attained using the Australian Synchrotron. Astrid's mammal jaw, together with a number of other fossils, were scanned in mid July. As yet, the data about Astrid's fossil has not been processed to produce an image. This takes time and so I hope to be able to write something about the nature of this mammal jaw, as well as report on the prospects of obtaining useful images in this way of the additional mammal jaws that will no doubt turn up in the 2014 Field Report.

The 2013 Flat Rocks dig also turned up the usual run of numerous ornithopod vertebrae, teeth and ribs. In addition, Sue Flere found a nice femur and a delicate pubis was collected near Prep Rock. Four pterosaur teeth were found, the most in a single season.

141 specimens were collected from the Eric the Red West locality. Of those that have been well enough exposed to assess what they are, four are of particular interest — all ornithopods. These include an ornithopod maxilla with at least nine upper teeth (a record) found by Mary Walters; a mandible with two exposed and one unerupted teeth found by Sharyn Madder; a complete, robust tibia; and a complete dorsal vertebra found by Toni-Lee Ferrier.

Paul Barrett of the Natural History Museum in London spent just over a week examining the ornithopod material in the Museum Victoria collection. His preliminary interpretation, based primarily on the teeth, is that there may be as few as only two ornithopod taxa represented in the Victorian dinosaur collection. He has not completed his analysis, so may in the end conclude that there are more.

On the other hand, comparing the variation seen amongst fifteen femora of one species of ornithopod from a single site in Tanzania, the variation seen in femora from Victoria is what one might expect in six to eight different species. It is possible that teeth in different species resemble one another much more frequently than their femora do.

Roger Benson, working closely with Erich Fitzgerald, published a paper on the first record from the Cretaceous of Victoria of a large plesiosaur that presumably had a short neck and large head. Such plesiosaurs are typically pliosaurs. However, as all that Roger had to work with was a single tooth, he was not willing to go that far in his identification of the fossil. But it certainly was a larger animal than the plesiosaurs previously found in the same rocks. Fresh water plesiosaurs and pliosaurs are not all that common. To find both in what was once the same body of water is most unusual, if not unique.

Ever since 2010, when Alanna Maguire found the only upper mammalian molars from the Cretaceous of Victoria, much effort has gone into analyzing that one specimen. The effort was made because upper molars may tell us something about the relationship of the Cretaceous mammals of Victoria that the known lower molars may never



The large tibia from Eric the Red West

do. This because they are a different part of the animal. The extensive effort has been required because the individual died when it was quite old and its teeth were heavily worn. In addition, the teeth were badly broken.

After being scanned repeatedly at different facilities in Japan and Europe by a number of people, Peter Trusler used the images thus produced to reconstruct the appearance of these two teeth as best he could. Before Peter could do that, Alistair Evans of Monash University manipulated the images of the various broken pieces of the teeth in order to restore their original fit with one another — a very tedious, time consuming task.

Based solely on that reconstruction by Peter, the two teeth appear to resemble marsupials. Although there is a resemblance there, the incomplete nature of both of the two teeth means that the strength of this interpretation is less than it might be had the teeth been better preserved.

If they are marsupials, or closely related to them, they are about twice as old as the oldest previously known Australian marsupials, and at least 40 million years older than when marsupials were previously thought to have reached Australia from the northern hemisphere via South America and Antarctica.

However, despite that marsupial-like appearance, the possibility must be considered that the two molars are actually the previously unknown upper molars of *Ausktribosphenos*. Ausktribosphenids have previously been regarded as eutherian or placental-like. If the two upper molars are in fact the previously unknown upper molars of ausktribosphenids, it would mean that a marsupial-like upper dentition was occluding with a placental-like lower dentition, a rather incongruous association. To test this idea Peter Trusler, using the wear facets on the lower molars of the mammal *Ausktribosphenos* as a guide, was able to make a plausible reconstruction of what the upper molar of that genus might have looked

like. They look remarkably like those of the two known upper molars. That they could occlude does not necessarily mean that they did occlude. But it does caution against glibly assuming that the ausktribosphenids have placental-like upper molars occluding with placental-like lower molars.

Prior to Nicola Sanderson née Barton discovering the first mammal jaw at Flat Rocks in 1997, the plan was to discontinue work at that site after the 1998 field season. This was because little new was being found at Flat Rocks.

Likewise, Alanna Maguire finding the single specimen at Eric the Red West in 2010 has now determined the direction that future Dinosaur Dreaming field work will take. Upper molars may augment understanding of the Cretaceous mammals from Victoria in ways that the lower molars by themselves cannot. Upper molars have been recovered from Eric the Red West and despite the occurrence at Flat Rocks of nearly fifty mammal lower jaws, no upper molars have been found there. There is something fundamentally different about the way fossil mammalian specimens occur at the two sites. Realising this, and knowing which one did in fact yield a specimen of upper molars, we have decided to concentrate fieldwork at Eric the Red West.

Like at Flat Rocks, understanding of the places at Eric the Red West where fossils are most likely to occur has been gained with experience over the years. Building on this hard won knowledge, David Pickering and those who have worked with him there during several digs, have acquired the tools to find the desired fossils more readily.

This change of direction does not mean that Flat Rocks will be abandoned forever. As Lesley noted, that site is not going to go away.

Reference:

Benson, R.B.J., Fitzgerald, E.M.G., Rich, T.H and Vickers-Rich, P. 2013. *Large freshwater plesiosaurian from the Cretaceous (Aptian) of Australia*, Alcheringa: An Australasian Journal of Palaeontology, DOI:10.1080/03115518.2013.772825



SLOW AND STEADY

BY LESLEY KOOL

Having been involved with Dinosaur Dreaming digs at the Flat Rocks site near Inverloch since its discovery in 1991, I have had the privilege of working with hundreds of volunteers from all walks of life and from many different countries. The name Dinosaur Dreaming is a very apt name as many volunteers will admit that spending any length of time at the dig invariably results in dreaming about finding dinosaurs. Many volunteers arrive with high expectations of being 'the one' who finds the theropod skull or jaw, complete with those wonderful curved shiny teeth, or an ankylosaur skull, or any other dinosaur skull for that matter. But not me. Since the first test dig at the Flat Rocks site in 1992 my dearest wish was to find a turtle skull.

Anyone who has worked at the Flat Rocks site will know that turtle bones are not uncommon. In fact, the phrase "it's only turtle" is heard on a regular basis and I must admit that fragments of turtle shell are some of the most common fossils found at the site. Most of the turtle shell is so fragmentary that it is undiagnosable, so we don't get too excited about it. But over the years a number of turtle braincases have been recovered, which gave me hope that one day something more complete would turn up.

During the 2006 field season a fossil was recovered that was so badly damaged during extraction that no-one could identify what it was. It sat, in many pieces, in my lab for a number of months before I finally plucked up the courage to try and reconstruct it. It was like trying to build a three-dimensional jigsaw puzzle without the original picture. It mostly involved matching the coal and mud-clast patterns in the rock surrounding the bone and filling in any missing areas with

carbo-wax – a low temperature melting wax used by conservators. Once I got all the pieces back together again, I then commenced removing the rock from the outside. To my surprise the first thing I uncovered looked like a large eye orbit and so I continued to remove the rock and expose more. Slowly over a period of hours I uncovered the top of a skull, which was quite flat and textured. It took me a while to orient myself and realise that I was looking at the top of a primitive turtle skull. This was the first evidence of the roof of a turtle skull found anywhere in Victoria and I was delighted. However, my delight was tempered by the fact that when I uncovered the underside of the skull, the braincase was almost entirely missing. This was the area that had been badly damaged during excavation and hardly any of the bone had been preserved. This was so frustrating as I had three turtle braincases with no skull roof but was unable to compare them with the skull which had practically no braincase preserved.

Later that same year, Mike Cleeland (our intrepid eagle-eyed prospector) found an interesting bone at Cape Paterson which, after preparation, was identified as the left rear area of a turtle skull, including a corner of the skull roof and part of the braincase. The skull fragment was approximately one-sixth of the original skull and I remember thinking "if only Mike had found it twelve months earlier, we would probably have had most of the skull". However, beggars can't be choosers and I was grateful for what we had. This individual had been much larger than the turtle which belonged to the damaged skull from Flat Rocks. The top of the skull was covered with rounded bumps or scales, which were not as obvious on the smaller skull. Importantly, part of the left inner ear was preserved and it was very similar to the same area in the braincases from Flat Rocks. But it was still not enough to tie the damaged skull to the braincases.

In late 2006, the turtle skulls and braincases were sent to Dr Eugene Gaffney of the American Museum of Natural History. Dr Gaffney is a world authority on fossil turtles and lead author on the

paper describing *Otwayemys cunicularius* (Gaffney et al 1998), a slightly younger turtle from Dinosaur Cove, south west of Melbourne. Unfortunately, Dr Gaffney was too busy working on another group of turtles and didn't have time to study our turtles, so they were returned to Museum Victoria.

It seemed like my dream of finding the perfect skull would never come true, until one wonderful day during the 2011 dig. The excavating team were removing rock from the very furthest part of the fossil layer, next to the large sandstone knoll at the eastern end of the site.

I was busy identifying and wrapping fossils when one of the crew brought up a small rock with some bone and impression on it. The bone was smooth and flat and looked quite skull-like, but it was the impression of where the top of the skull had been that caught my eye. I could make out rounded, textured patterns, very similar to those on Mike's turtle skull. I quickly joined the



David Pickering and Lesley Kool stabilize the turtle skull

rest of the excavation crew to examine the bone that was still in the rock. There I could see more of the skull roof and the tell-tale texture that told us that it was not a dinosaur. I am sure there was initial disappointment from the rest of the crew that this latest fossil was not the dinosaur skull they had all been dreaming of, but for me it was a dream come true. However, we had no idea how much of the skull was preserved. Was it just a fragment like Mike's turtle skull? Was the braincase preserved? Was it badly crushed, making it difficult to compare with the braincases? With surgical precision the excavation team cut the rock around the skull, leaving plenty of room on all sides so as not to cut through any bone. The bone in the rock was then carefully wrapped, labelled and catalogued before being transported to my preparation lab at home, not far from the dig site.

I waited patiently through the remaining weeks of the dig before starting on the preparation of the skull. The anticipation was delicious. I hoped that we had something more complete than the first skull, but didn't want to get my hopes up too high only to have them dashed with disappointment again. Once again I went through the process of reassembling all the pieces of rock. It was obvious that there was some damage to the skull during excavation so I had a small pile of bone fragments, some of which I was able to return to their original position. I photographed all the individual fragments before matching up the surrounding rock and gluing the pieces back together again. Then came the slow process of removing the rock.

The left ear region was partly exposed and so I began at this point and concentrated on the underneath of the skull. I am sure I must have held my breath many times as I slowly removed the sandstone from the surface of the bone. The palate or roof of the mouth was perfect. The only part missing was a small bone called the vomer at the front of the mouth, but I had the impression of where it had been, so I wasn't too disappointed. I then started work on where the braincase should be and there it was, complete and uncrushed – perfect.

The final step was to uncover the top of the skull. This took the longest time as I had to tease out every sand grain embedded in the grooves between the rounded scales. They were not quite as pronounced as those on Mike's turtle skull, but were still well defined. The shape of the skull was very similar to the smaller damaged skull found in 2006 and the braincase shared many characteristics of the isolated braincases. I could finally link the skulls and braincases together.

When I had finished the preparation we had the best preserved and most complete Early Cretaceous fresh-water turtle skull in Australia. It is also the oldest turtle in Australasia. It truly is the Rosetta Stone for all the turtle skull elements that have been collected over the years along the Bass Coast.



Andrew Plant's reconstruction of our Cretaceous turtle

So it turns out that the only complete skull to have been found at the Flat Rocks site is not a dinosaur but that of a very primitive turtle. We are currently describing the turtle based on the skulls and braincases, which all appear to belong to the same species, and hope to have it ready for publication very soon. It has only taken 20 years of wishing and hoping, but it shows that dreams can sometimes come true if you wait long enough.

Reference:

Gaffney, S.E., Kool, L., Brinkman, D.B., Rich, T.H. and Vickers-Rich, P. 1998. *Otwayemys*, a New Cryptodiran Turtle from the Early Cretaceous of Australia. A.M.N.H. Novitates number 3233, 28pp.

I FOUND A 'HYPSI' JAW!



BY MARY WALTERS

It was during the Otways dig in the presence of the dig team (Sean, Alanna, Lisa and Dave), rock breakers and wrappers that my moment of excitement arrived. The dig team had been working a section towards the east end, and Dave asked me where would I like them to dig next. Immediately in front of me on the shore platform I saw a layer not covered with green fur which appeared a likely looking prospect — the right sort of rock. Dave agreed and asked the diggers to try this spot.

As the dig team lifted some rock, Sean found a small bone. I then took a large piece to break down and on first crack there it was. "I found a 'hysi' jaw! Ooooh, Aaaaaah!", was what I said. So many times during my 20 years on sites I ask "Is this anything?" "Is it bone?" "Is it a keeper?", but for once this specimen was instantly recognizable, with its bright shining teeth. After the instant gratification moment questions arose in my mind. "Can it be identified as to species? is it a preparable specimen? Where is the other three quarters of the mouth?" To answer these questions, our team needs to return and search out more of this creature.



Lisa Nink, Sean Wright, David Pickering and Alanna Maguire help Mary Walters celebrate her find.

THE MAMMALS OF VICTORIA'S CRETACEOUS

As long-time Dinosaur Dreaming diggers can attest, the tiny fragments of Cretaceous mammals that we find are celebrated and prized. But mammal jaw (and other element) finders don't always get

to find out what became of their precious scrap. So here is a list of all confirmed mammal fossils identified since 1997 with Museum catalogue number, notes and taxa.

Reg #	Taxonomy	Collector	Field Number	Year	Preparator	Notes
P208090	<i>Ausktribosphenos nyktos</i>	N. Barton	#1111	1997	L.Kool	HOLOTYPE . Right. P6, M1-3
P208094	<i>Kryoryctes cadburyi</i>		Dinosaur Cove	1993	L.Kool	HOLOTYPE . Right humerus. Slippery Rock Pillar, Dinosaur Cove
P208228	<i>Bishops</i> sp.		#329	1995	L.Kool	600my Exhibition display. Right. P4-M2
P208230	<i>Ausktribosphenos</i> ?			1995	L.Kool	Edentulous jaw fragment
P208231	<i>Teinolophos trusleri</i>		Mentors trip	Nov. 1993	L.Kool	HOLOTYPE . M3 or M4
P208383	Monotremata		Dinosaur Cove	1993	L.Kool	Premolar. Slippery Rock Pillar, Dinosaur Cove
P208482	<i>Ausktribosphenos nyktos</i>	N. Gardiner	#150	1999	L.Kool	Right. M2-3, badly crushed. Found in rock from DD1998
P208483	Ausktribosphenidae ?	N. van Klaveren	#140	1999	L.Kool	Probably Left. x1 premolar & partial tooth
P208484	<i>Bishops whitmorei</i>	K. Bacheller	#450	1999	L.Kool	Right. M2
P208526	<i>Teinolophos trusleri</i>		#560	1994	L.Kool	Right. Edentulous
P208580	Mammalia	A. Maguire	#200	2000	L.Kool	Jaw fragment. (unprepared)
P208582	Ausktribosphenidae	L. Irvine	#500	2000	L.Kool	Right. M3
P209975	<i>Bishops whitmorei</i>	R. Close ?	#387	2000	L.Kool	Right. Roots M1, worn M2. OK M3
P210030	<i>Teinolophos trusleri</i>			2000	L.Kool	Right. Edentulous
P210070	<i>Bishops whitmorei</i>		Rookies day	03.12.2000	L.Kool	Right. Badly broken M1, M2 and x6 Premolars
P210075	<i>Bishops whitmorei</i>		Rookies day	03.12.2000	L.Kool	HOLOTYPE . 600my Exhibition display. Left. P2-6, M1-3. (P1 lost since initial preparation)
P210086	Ausktribosphenidae ?	J. Wilkins	#250	2001	L.Kool	Right. Root fragment
P210087	<i>Ausktribosphenos</i> sp.	G. Kool	#620	2001	L.Kool	Right. Rear half M1, M2-3
P212785	Mammalia	M. Anderson	Rookies day	03.12.2000	L.Kool	Fragment only
P212810	<i>Bishops whitmorei</i>		#300	2002	L.Kool	Left. M2-3
P212811	<i>Teinolophos trusleri</i>	D. Sanderson	#187	2002	L.Kool	Right. Edentulous
P212925	Mammalia ?		#222	1996	D.Pickering	Edentulous
P212933	<i>Teinolophos trusleri</i>		#179	2001	L.Kool	Left. Edentulous. (Plus associated molar: since lost)
P212940	<i>Ausktribosphenos nyktos</i>	W. White	#171	2003	D.Pickering	Left. M1, M2-3
P212950	<i>Bishops whitmorei</i>	C. Ennis	#292	2003	L.Kool	Left. P6, M1-3
P216575	<i>Teinolophos trusleri</i>	N. Gardiner	#180	2004	D.Pickering	Left. x2 molars. Probably M2-3
P216576	Mammalia	A. Musser	#500	2004	L.Kool	Isolated tooth
P216578	<i>Bishops whitmorei</i>	A. Leorke	#600	2004	D.Pickering	Left. M1-3
P216579	<i>Teinolophos trusleri</i>	N. van Klaveren	#635	2004	L.Kool	
P216580	<i>Bishops whitmorei</i>	G. Kool	#800	2004	D.Pickering	Right. P6, M1-3
P216590	<i>Teinolophos trusleri</i>	J. Wilkins	#447	2004	D.Pickering	Posterior part of right edentulous jaw
P216610	<i>Teinolophos trusleri</i>		#557	2004	L.Kool	Left. Edentulous
P216655	<i>Corriebataar marywaltersae</i>	M. Walters	#142	2004	L.Kool	HOLOTYPE . Multituberculata. Left. P4
P216670	<i>Ausktribosphenos nyktos</i>		#184	1999	L.Kool	Left. M2-3
P216680	<i>Teinolophos trusleri</i>	R. Long	#132	2004	L.Kool	Right. Fragment
P216720	<i>Teinolophos trusleri</i>		#648	2002	L.Kool	Right. Edentulous
P216750	<i>Teinolophos trusleri</i>	R. Long	#162	2005	D.Pickering	Right. Edentulous
P221043	<i>Bishops whitmorei</i>	A. Leorke	#100	2005	D.Pickering	Right. M1-2?
P221044	Ausktribosphenidae	C. Ennis	#300	2005	D.Pickering	Left. M2
P221045	<i>Teinolophos trusleri</i>	J. Wilkins	#395	2005	D.Pickering	Right. Edentulous
P221046	Mammalia	H. Wilson	#480	2005	L.Kool	Isolated tooth
P221150	<i>Teinolophos trusleri</i>	J. Swinkels	#340	2006	D.Pickering	600my Exhibition display. Right. x2 molars. Probably M2-3
P221156	Ausktribosphenidae	N. van Klaveren	#360	2006	D.Pickering	Right. M2 (requires preparation to confirm)
P221157	<i>Bishops whitmorei</i>	M. Walters	#585	2006	D.Pickering	Right. Edentulous with alveolae for P6, M1-3
P221158	<i>Ausktribosphenos</i> ?	R. Close	#200	2006	D.Pickering	Right. P5-6, half M plus M2-3
P228432	Ausktribosphenidae		scrap rock	2009	L.Kool	Right. Molar talonid
P228848	<i>Bishops</i> sp.	M. Walters	ETRW, Otways	10.12.2006	D.Pickering	Left. P6, M1, partial M2
P229037	<i>Teinolophos trusleri</i>	M. Cleeland	#91	2008	D.Pickering	Right. Edentulous with alveolae for x4 molars and ultimate premolar
P229194	Mammalia	N. Barton	#770	07.03.2007	D.Pickering	Isolated upper Premolar
P229408	<i>Teinolophos trusleri</i>	M. Walters	#300	14.02.2008	D.Pickering	Left. Ultimate premolar, M1-4
P229409	Ausktribosphenidae	N. Evered	#180	07.02.2007	D.Pickering	Possibly <i>Bishops whitmorei</i> . Left. P5-6, M1-3
P229410	<i>Teinolophos trusleri</i>	C. Ennis	#90	2008	D.Pickering	Right. ?M1 plus M3
P229649	<i>Bishops whitmorei</i>	J. Tumney	#330	2009	D.Pickering	Right. P2-3,5-6, M1-3
P231328	Mammalia	A. Maguire	ETRW, Otways	29.11.2009	D.Pickering	Maxilla fragment with x2 molars
P232567	<i>Ausktribosphenos</i> sp.	J. Wilkins	#270	26.02.2012	D.Pickering	Right. Broken premolars. M1-3
P232892	<i>Bishops</i> sp.	Astrid Werner		16.02.2013	D.Pickering	Left. ?M 2



ALL SYSTEMS GO

BY LESLEY KOOL

When excavations began in 1994, it was simply a matter of brushing away the thin layer of sand and getting stuck into the fossil layer. As the years progressed, the fossil layer became deeper and more sand accumulated above it. In 1997, when the first mammal jaw was discovered, we were excavating the fossil layer approximately one metre below the surface of the shore platform. The discovery of the mammal jaw led to a radical overhaul of our excavation techniques, prompting the team's most radical thinker, excavation manager Nick van Klaveren to come up with an ingenious idea. Between the 1997 and 1998 field seasons Nick devised a plan, hereafter known as the System, to try to keep the majority of the sand from re-entering the excavation area with the high tide. The first attempt to install the System during the 1998 field season was an experience in persistence. Nick's System Mark 1 involved filling the excavation area with feed bags full of empty plastic drink bottles, covered by tarpaulins and wire mesh and secured by rock bolts around the perimeter of the area.



Lesley Kool and Mike Cleeland at Flat Rocks in 1994



The System is installed in 1998

Those of us lucky enough to have been a part of that dig will probably still remember arriving on site to find empty sacks and plastic bottles strewn along the beach between Eagles Nest and Inverloch. It took most of the six week dig to tweak the System so that no bottles escaped, but by the end of the dig, Nick had worked out how to improve the System for the coming field season. In 1999, Nick presented us with the System Mark 2. He replaced the miscreant plastic bottles with 180 square plastic 20 litre drums. By making the excavation area a rectangular five metres by two metres, the drums fit quite neatly. Initially, some drums did escape but the new system was a success overall and considerably reduced the time and physical effort spent digging sand each day. Further adaptations to the System took place before the 2000 dig, including the introduction of a sturdy truck tarpaulin, which was heavy and awkward to haul into place, but improved the overall protection of the System.



A girder is lifted onto the System in 1998



Mesh laid over the bags of bottles in 1998

We had a break from the System for a couple of years following the discovery of two beautifully preserved mammal jaws at Prep Rock, at the most westerly end of the fossil layer, on Rookies' Day in December 2000. Instead of returning to the deeper part of the fossil layer in 2001 it was decided that we had to see if there were more mammals to be found at Prep Rock. Excavating this part of the fossil layer is relatively easy as the fossil layer is more exposed on the surface and so there is less sand to remove each day. Our decision paid off with the discovery of four more mammal jaws in 2001 and 2002, but by 2003 we had dug ourselves into the deeper layers again and Nick introduced us to his new System Mark 3. The new version omitted the plastic drums and concentrated on enveloping the designated excavation area in tarpaulins and mesh, secured by steel girders and rock bolts and surrounded by sandbag walls. Problems with shifting sandbags



Nick van Klaveren and the drums in 2000

and sand accumulating on top of the System meant continuous adjustments during the dig, but the System worked well overall.



The System in 2000

The 2004 field season began optimistically with the installation of the System, but within days of its installation a storm hit the Bass Coast and irreparably damaged it. Replacing all the damaged components would take valuable time that we could not afford, so it was decided that we would abandon the System and go back to old fashioned muscle power. A combination of willing volunteers and low sand levels saved the dig that year and resulted in the discovery of ten mammal jaws, including Australia's first multituberculate – *Corriebataar marywaltersae*.

In 2005 we returned with a new, improved System, but the designated excavation area required a large amount of overburden to be removed prior



Corrie Williams in the hole with the drums in 2000



Nick van Klaveren lifts the drums up the hill in 2000

to the installation. Consequently it was half way through the second week of the dig before the installation of the new System was completed. Then the 'storm of the century', even worse than the previous year, lashed Victoria for 24 hours, causing widespread damage. When we were finally able to return to the site we were confronted by utter chaos. The storm had bent steel girders and ripped the large truck tarpaulin to shreds. We persevered with a modified system for another week but the abnormally rough tides meant that we were constantly rebuilding sandbag walls, so eventually we decided to move the excavations to a shallower part of the fossil layer and abandon the System completely. Once again our intrepid crew came to the rescue and four more mammal jaws were discovered along with hundreds of other fossil bones and teeth.



Gerry Kool drags drums along the beach in 2000

After we abandoned the System, Nick suggested testing the fossil layer to the east (further away from the cliff) of The Bridge, which was the unofficial edge of the fossil layer. Small test digs at the end of the 2005 field season proved that the fossil layer actually continued and so Bridge East was discovered. This also meant that we no longer required Nick's System as the fossil layer was relatively close to the surface of the shore platform. They say that necessity is the mother of invention and Nick's System was definitely necessary to solve the logistical problems we faced at the Flat Rock site between 1998 and 2005. It was a great exercise in ingenuity and perseverance — the Dinosaur Dreaming project has Nick van Klaveren to thank for his clever invention.



The System in 2004



BE PREPARED

BY WENDY TURNER

When I attended my first dig, I knew very little about what would happen to the carefully wrapped and labelled fossils we found. I was told they go to Lesley's, or to the Museum for Dave to prepare. Okay, but what do they do with them? How do the brown blobs we labour so hard to find become free of their rocky matrix? How do you get the fossil out without turning it to mush? By my second dig I had researched fossil preparation a little bit and thought maybe I would like to have a go. The definition of preparation is the action of making ready or being made ready for use. It sounds fairly straight forward. As I watched Dave peering down the microscope with pin vice in hand, it looked anything but straight forward. I wondered if my hand would be as steady.

Members of my family were actually pretty dubious about whether I would have any affinity for preparation. Attention to detail is not really my strongest trait. I'm more a big picture kind of girl. Happily, Lesley took me under her wing.

That first day at Lesley's was pretty nerve racking. She patiently explained microscopes, tools, adhesives, resins and waxes. Lesley's advice of "Just follow the bone" was ringing in my ears as I sat at the microscope. She had chosen a lovely vertebra for my first attempt at preparation. When I next looked up, more than an hour had gone by and slowly the fossil was being revealed. It was a great feeling. It took quite a while to finish that first fossil. I had nightmarish visions of my hard work disappearing in a crumbling mess. When finally the last bit of matrix popped off I felt a rush of joy, excitement and overwhelming relief. The fossil had a lovely deep brown sheen and all its minute details had been exposed for the first time in millions of years.

Since then I've prepared a few different fossils, some more challenging than others. Even a long-dead dinosaur can still cause you a bit of trouble - stray drops of glue and tiny bits of bone that just ping off into the ether. There has been some colourful language, a few "oops" and a little frustration. Sometimes hours can disappear as bit by bit you ease away the matrix with a tungsten carbide needle. Slow and steady is best. The fossil has been waiting patiently for more than a hundred million years, so what's a little bit longer?

Having Lesley and Dave as teachers has been wonderful. All my silly questions are answered patiently and help is readily given. I have even adopted Dave's single hair from a paint brush technique for applying glue. Glue is a whole topic in itself. Who knew there was so much to know about glue?

Actually I have become a bit excited by tools. Bunnings is not just for plants and Father's day presents now. I trawl around looking for glue, acetone and Dremel accessories. I seek advice from my husband on diamond blades and compressors as I plan my future requirements.

My family still think I am a bit crazy for locking myself away with loud power tools, dust and old bones. At least now they get excited when I finish something. Yet I don't think it's for the same reasons as I do. I think they are just happy to have their bleary eyed mother back from behind the microscope.



Detail of vertebra prepared by Wendy in 2011



FRIENDS OF DINOSAUR DREAMING

BY GERRY KOOL

The Friends of Dinosaur Dreaming have long played a major part in the ongoing excavation and subsequent research of the fossil material found at the Flat Rocks site near Inverloch, Victoria.

The group was founded in 1997 soon after the first mammal jaw *Ausktribosphenos nyktos* (then as yet unnamed) was discovered. In the 16 years following, the Friends, via their annual subscriptions, and in many other ways, have been an invaluable part of the Dinosaur Dreaming project.



Alan and Nicole Evered form the greeting party

This year, the Friends' Day was held on 17th February and the many crew members made sure that all who attended, whether it was for only an hour or the best part of the day, were looked after and given the cook's tour. At one point during the day more than 100 people were on the beach taking advantage of the knowledge of these enthusiastic volunteers, who also make this project possible year after year.



Brittany Brooking shows off her fossil find

Included among the Friends were two young ladies from far afield who not only made the effort to travel a huge distance but were also lucky enough to find a fossil during Mike Cleeland's 'erratic' hunt.

Here is a short account of each of their experiences on the day.

Brittany's story:

Brittany was 13 years old when she attended the Dinosaur Dreaming Friends Day. She's always had an interest in anything scientific, and hopes to become a palaeontologist. Brittany and her mother drove 6½ hours from Western Victoria on the day prior to Friends' Day, and then drove home the day after. They were fortunate enough to be originally from, and so have family in, Korumburra. Brittany had a great time, was grinning ear to ear as they left, and will definitely return next year.



Kate's find as it looked in the rock on Friends' Day

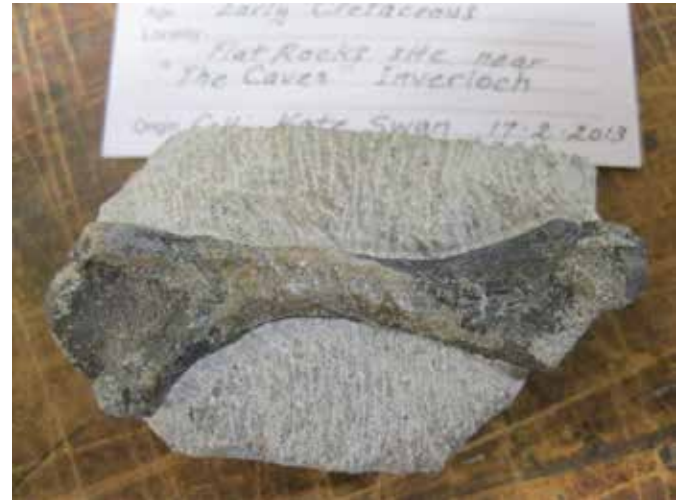


Kate Swan shows off her fossil find

Kate's story:

Kate and her mother lives in Bowral and drove 2 hours to Canberra, flew to Melbourne and drove to Inverloch. Over 900 kms in all but very worth it. They stayed in a B&B in Inverloch and came down especially for Friends' day. They also visited the Museum Victoria on the Saturday, and thought it really a fantastic museum. Kate can't wait to volunteer at Dinosaur Dreaming and take part in Swim O'Clock. Mike was so lovely when looking at yet another piece of petrified wood during the rock platform walks but it was great to hear him say that something Kate found looked promising, and it proved to be a fossil.

Kate said "I started being interested in palaeontology when I was eight or nine and I have visited a few fossil sites. We went fossil hunting at Lyme Regis and found some ammonite fossils, and also visited the Natural History Museum in London to see some of the fossils that Mary Anning discovered which was fantastic. I am currently writing a novel which has dinosaurs in it. I really enjoy writing and drawing and have studied history for a long time. I used to write my name in hieroglyphics when I was in kindergarten. I hope that I can be a volunteer at Dinosaur Dreaming when I am old enough."



Kate Swan's turtle femur

The fossils that Brittany and Kate found were sent to Dave Pickering at the Melbourne Museum where they were prepared and subsequently identified as:

- Brittany's fossil — Dinosaur tibia
- Kate's fossil — Turtle femur

2014 will see the focus move to the west of Melbourne where a dig will take place from 1st February to 22nd February. That site is not very visitor friendly, so we propose to hold our annual Friends' Day at Inverloch sometime in March.



Brittany Brooking's dinosaur tibia

KOONWARRA 2013 AND BEYOND



BY TOM RICH

Between 14th and 29th April 2013, we excavated a road cutting outside Koonwarra in order to ascertain how best to proceed with a future excavation intended to uncover 50 square metres of that fossiliferous layer. Working on the basis of the frequency of fossil tetrapods at the similar Sihetun site in the Jehol district of China, we think that excavation of that much area of fossiliferous rock will be adequate to ascertain whether fossil tetrapods can be found at the Koonwarra Fossil Fish Site (Rich, Xiao-bo and Vickers-Rich 2009, 2012).

Fossils have been known from the Koonwarra Site since the 1960s. According to Waldman (1971), fossils were discovered by workmen straightening out a bend in the South Gippsland Highway in 1962. The University of Melbourne, Museum Victoria, and the Victorian Mines Department



David Pickering digs through the fossil layer

then made collections primarily from the north side of the South Gippsland Highway. Early in 1966, Monash University staff and students began an excavation on the south side of the South Gippsland Highway. In February 1981, Melbourne University and Museum Victoria carried out a further excavation at the site on the south side of the South Gippsland Highway.

The known fossil assemblage is dominated by immature arthropods, small fish and a variety of plants (Waldman 1971, Drinnan and Chambers 1986, Jell and Duncan 1986). In addition, five feathers of birds and/or non-avian dinosaurs have been found (Talent, Duncan and Handby 1966, Waldman 1971).

In 2009, we noticed that the biotic assemblage (together with the nature of the lithology) at the Koonwarra Site was similar to characteristics of the Sihetun locality in the Jehol Fossil Field of Liaoning Province, China. (Rich, Xiao-Bo, and Vickers-Rich 2009, 2012). Because of the recovery of extraordinary fossil tetrapods, including feathered dinosaurs and mammals, at the Chinese sites, we thought it worthwhile carrying out another excavation at Koonwarra in order to determine if, with further effort, tetrapod skeletal material could be found there.

Results of the 14-29 April 2013 Test Excavation

The rock units at the Koonwarra Site (as well as to the east for 50 metres and to the west for 100 metres) dip in a southeasterly direction between 37° and 53°. Although we found some plant material and fish scales outside the Koonwarra Site, by far the richest concentration of fossils was inside it.

Within the Koonwarra Site there is a laminated siltstone/claystone sequence nine metres thick sandwiched between two prominent beds of massive subarkosic sandstone. Most of the fossils recovered occurred in a 1.8 metre section near the middle of this nine metre thick claystone/mudstone sequence. A prominent feature of this



Peggy Cole shows off a fossil find

siltstone/claystone sequence is the presence of varves, suggestive of annual deposition. The varves are more closely spaced in the 1.8 metre section, where most fossils occur, than above it.

The siltstone/claystone unit was exposed along strike for a distance of 20 metres. The 1.8 metre thick section that is most fossiliferous (near the middle of the siltstone/claystone sequence) has an estimated volume of 135 cubic metres that is accessible without the need to tunnel under the overlying massive sandstone. This is more than enough to provide the 50 square metres of the fossiliferous surface area thought necessary to adequately test whether the site has skeletal material of fossil tetrapods (Rich, Xiao-Bo, and Vickers-Rich 2009, 2012).

The assistance of the following people resident in the Koonwarra district is gratefully acknowledged: Sandra and Brian Hayward, Peter and Kate Walsh, David and Barbara Quinn, Wayne and Kathy Reid, Bruce Hengstbenger and William Bullock. Michael Mattingley of Vic Roads, Trarlgon, was most helpful in facilitating the permits needed for the execution of this project. Brad Lester, editor of The Great Southern Star in Leongatha was a great supporter of our dig.

Plans for the next Koonwarra dig

The objective of the next dig is more than collection of the fossils, important as that will be. This locality provides a unique opportunity

to study the detailed history of a lake over a time span of hundreds if not thousands of years. Using a variety of analytical techniques, many only developed in recent decades, there is the potential to study the changes in the physical environment and the response of the biota to those changes. While detailed studies of this nature have been carried out with other lacustrine deposits, none have been focused on one at a polar location during the Mesozoic Era.

We are planning a single two-month effort, rather than a series of shorter excavations, since it would only be necessary to uncover the fossil site once. The site should not be left exposed for a prolonged period when not being actively worked for two reasons. Firstly, the siltstone/claystone will break down if exposed to the weather for months on end. Secondly, we need to collect high resolution data in order to carry out a detailed analysis of the site, so we must ensure that it is not disturbed by unauthorized persons excavating the fossiliferous rock to find trophies for their mantelpiece

We are planning to make detailed records recording the location of specimens in three dimensions. This has not been done before at this locality and will be essential for reconstructing the detailed history of the lake and the changes through time of its biota.

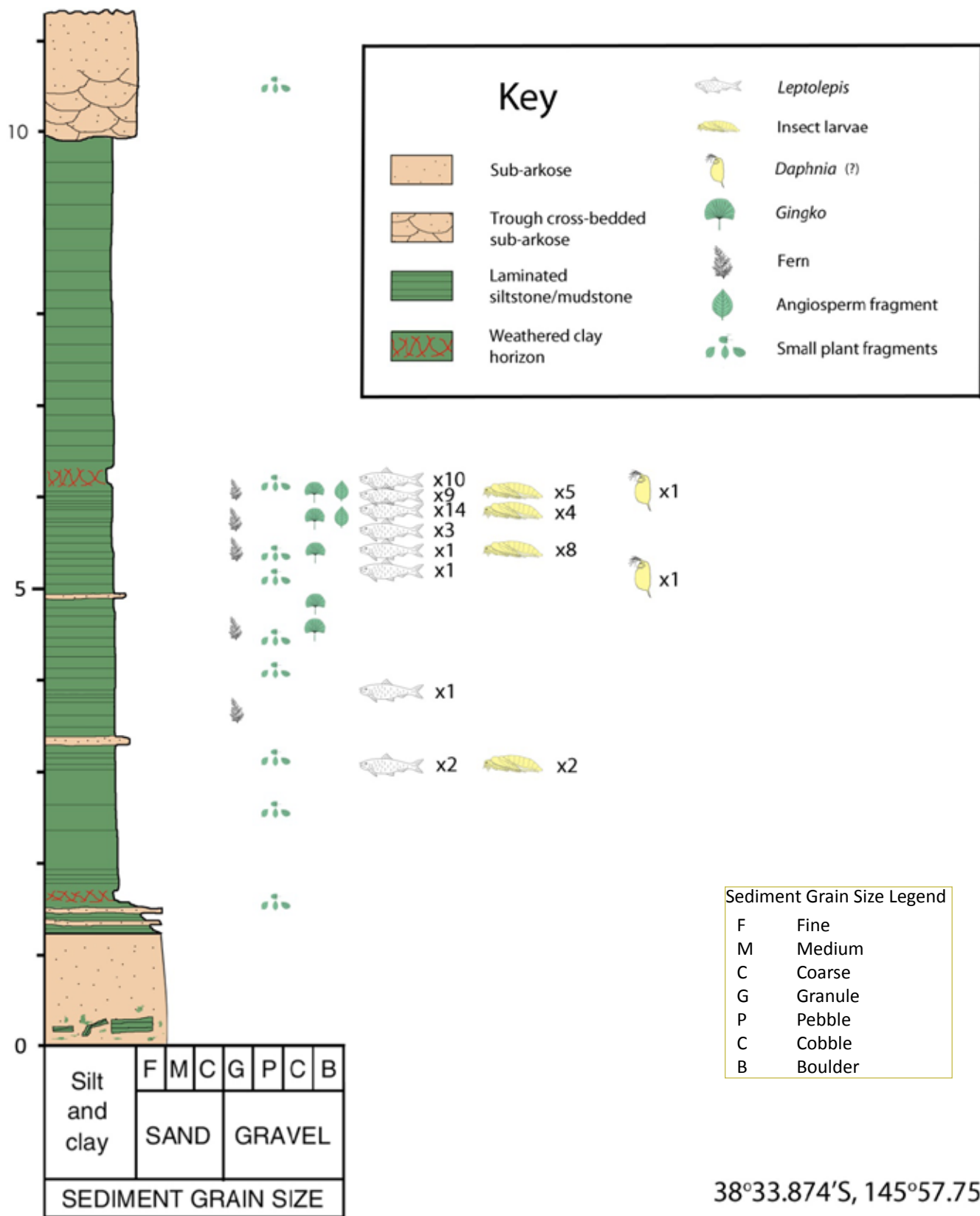
Proposed Duration: March-April, 61 days

Personnel needed each day:

1. A Supervisor
2. Four people removing rock from the ground and recording where each one came from
3. A dozen people splitting rock as many times as possible and checking for the presence of fossils



A fossil insect larva



Section through the fossiliferous units at the Koonwarra Site. Section logged by David Flannery and Emma Flannery and drafted by David Flannery, April 2013.



Tim Flannery shows off a fossil find

4. Two people wrapping specimens and recording the associated data
5. A cook
6. A supply facilitator
7. Emma Flannery supervising collection of data needed for her PhD dissertation on aspects of the fossil site, particularly related to the physical conditions prevailing and a review of the arthropods.

Equipment needed:

1. A 10-20 tonne backhoe: three days at commencement of excavation and two days at end
2. Corer of the fossiliferous claystone between the two sandstone layers
3. Accommodation for two months (ideally a farm house with enough suitable space for tents)
4. Food for the crew (more than 20 people) for two months
5. Consumable collecting supplies (glue, tape, timber, split sets, saw blades and chains, fuel for power tools)
6. Hand tools for excavating fossils
7. Pergolas to cover site during excavation



Plant fossil from Koonwarra

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A beautiful fossil fish



HOUSE REPORT

BY WENDY WHITE

National Science Week, mid-2001: Tom Rich is giving a public lecture about dinosaurs and mammals. He mentions that the work is done by volunteers and motioned to a woman looking after a trolley of fossil specimens. I signed up.

Rookie's Day, November 2001: I sat on the edge of Mary's rock, although at the time I didn't know it was called that. "Excuse me Mary. Is this bone?", I asked as politely as I knew how for what seemed like the hundredth annoying time. To my delight and badly concealed astonishment, Mary said yes! She went on to explain that I'd found what she believed was a dermal ossicle, a bone embedded beneath the skin of a dinosaur. I was really excited. It was a few years later that I understood that they are not diagnostic and tend to live with others of their kind in little jars at the back of shelves.

Week two of the Flat Rocks Dig, February 2002: I double-check the address outside an ordinary house in Inverloch. My car boot is full of all sorts of things I think might be useful on a dino dig. I hear voices at the back of the house, take a deep breath, and walk down the driveway.

Thus began my adventure with the Dinosaur Dreaming project. A relative newcomer, 2013 marks my 12th Field Season. But every now and then, I still pinch myself when I remember that Museum Victoria is letting me play with their fossils. That is so cool.

The 2013 Field Season started with Rookies' training day on 25th November 2012. It was a beautiful sunny day, but the late low tide meant that we couldn't get to site until after lunch. So we reviewed training rocks in Lesley and Gerry's



Dawn at Flat Rocks

back yard. Then we made the rookies carry lots of equipment and shovel a large hole in the sand. At least half a dozen of the rookies found fossils, and the day ended with Lauren Swann jumping up and down in the carpark in celebration of her turtle limb.

2013 Flat Rocks was a three week dig, and we started it on Saturday 2nd February. The low tide was about 11:00 am that day, so that meant a rather civilised 8:00 am start, and no really early mornings in the first week. Jeremy Burton excelled at Safety Officer and we found lots of fossils. There were seven teeth, half a dozen lovely vertebrae, and (on Lesley's day off) the 'hole crew' found a bone that we think is an ornithopod pubis. That one was so beautiful I snapped a photo to send to Lesley right away. Week one also saw a trial of morning stretching, amidst much giggling.

Week two started with a house day, and then early mornings at site. Five teeth and more pretty vertebrae. Astrid Werner found her mammal jaw, but others will tell you more about that. One day, in a strange lapse of judgement and common sense, I started a water fight with John Wilkins by



Fotini Karakitsos leads the morning stretching

tipping a bucketful down his back. None of the objective accounts of the resultant melée declared me the winner.

On Valentine’s Day a brief but heavy rainstorm forced us off the beach early, and Friday 15th saw the Year Twos of Wonthaggi North Primary School come to visit. A big thanks to our explainers Lisa Nink, Andrew Stocker and Mike Cleeland.

Week three started with Friends’ Day – Gerry talks about that in his article. It was good to see a couple of crew from previous years bring their kids, including Ann-Marie O’Brien who decked her three out in dinosaur T-shirts and Gavin and Catherine Williamson with baby Ella born about nine months after their time as crew. After Friends’ day it got hot for a couple of days, and we had to declare multiple Swim O’Clocks. Three more teeth, and more pretty vertebrae. The Great Southern Star in Leongatha published an article about us, and we clustered around a tiny TV set when WIN put us on the news. The whole of Korumburra Primary School came to visit – about 20 students in total. A big thanks to our explainers Lisa Nink (and her assistant Dean Wright), Rohan Long and Mike Cleeland. One day we decided to build a fake Gerry out of sand on the rock where he normally sits. I’m not sure why.

Our T-shirts this year featured our new Dinosaur Dreaming logo, drawn for us by Jeremy Kool.



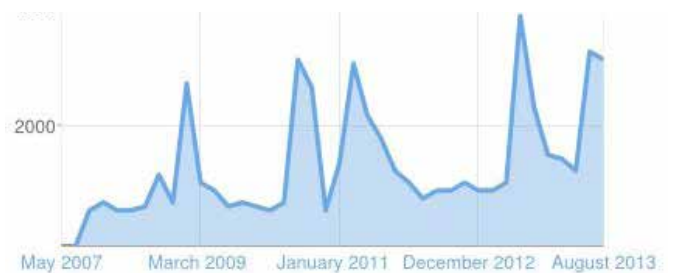
Darren Hastie and Andrew Giles model the 2013 T-shirt



Alanna Maguire and Hannah Carle work on ‘Fake Gerry’

We played a bit of Jenga, did a lot of newspaper quizzes and solved a few cryptic crosswords. We walked down to the beach near our house and looked at the stars. We played guitars and sang songs. We ate well (a big thanks to Lisa who organised the cooks, and to the cooks themselves). We discovered a game called Cards Against Humanity. Most importantly, we found fossils.

The Dinosaur Dreaming blog (www.dinodreaming.blogspot.com) has had more than 50,000 page views. About half of them are from Australia, and the rest scattered around the world. I spent a couple of days this year adding labels and creating a cloud so that it’s easier to navigate. We have one post, on 17th March 2013 (entitled Sat 16th - rain forced us off the beach early) that is significantly more popular than all others. I’m not sure why. Most people who find our site by searching are looking for dinosaurs (including a handful wanting to interpret dreams) but a few are looking for other things such as dead penguins or chair sculptures. I hope they liked what they found.



Visitor statistics from the Dinosaur Dreaming blog



WONDERFUL FOSSIL DIGGING IN AUSTRALIA

BY KEIICHI AOTSUKA

I am Keiichi Aotsuka. I am living in Japan and now I am working at Kanna Dinosaur Center in Japan as a curator. I have joined in the Dinosaur Dreaming five times and joined in the Cape Otway digging in this year. It was really great experience for me. I am sure that my experience in Australia is supporting my life.

My first participation in the Dinosaur Dreaming was 2003. In those days, I was a faculty first grader. Of course, I have an interesting about the paleontology and dinosaurs, but I have no any experience of the fossil digging. I was thinking if I really want to study about the vertebrate paleontology, I defiantly need to experience field work and fossil digging.

One day, one of my friends taught me about the Dinosaur Dreaming project, and project team is recruiting volunteer diggers. I thought it must be a good opportunity for me. So, I decided to join in the Dinosaur Dreaming.

The Dinosaur Dreaming digging site was really beautiful place. The weather was nice, there was hot but low humidity, very different from Japanese summer. The digging was everything new for



Keiichi Aotsuka (on jackhammer) at Flat Rocks in 2008

me. Using the hammer, chisel, electrical pump to remove the water, and more.

I tried to break the rocks with hammer and chisel to find the fossil. However, I couldn't distinguish the fossil with non-fossil stuff. I asked many times to many people "Is this fossil?", but their answer was "No, it is wood chips" or "No, it is beetle bomb". However, I looked rocks very carefully, and I found some brownish things with weird texture. I asked to the team leader, Lesley, and she taught me that it is one isolated turtle bone fragment. I was so excited, it was first fossil discovery in whole my life. The fossil is tiny, but it makes me happy. I think it was the beginning of my career to the paleontologist. The fossil was small, but it gave me a lots of real information, such as fossil color, bone texture or shape, and how the fossils are found from the rocks. I thought that it is a real paleontology, and I thought that I need more experience to learn about fossils. Thereafter, I came to participate in the Dinosaur Dreaming every year until in 2006, and also in 2008.

I had a pleasure as well as fossil excavation. It is the life with the digging crew. We shared a house and stay together, and play with croquet or cards, and sometimes playing music. The digging team is very international; people came from not only Australia, but also overseas, as well as me. Some people came from USA, and some people from German, and some people came from Japan. Thus, I learned several countries culture. People are nice and kind so much. We had the meal together, and chef was on a shift. Therefore, we had different country foods every day. Of course most of the crew composed by volunteer, therefore the team member is not same in every year. I had experienced many meeting and parting.

From 2009-2012, I had no time to go to Australia for my different research project (i.e. Master's thesis). In 2013, I tried to join the Dinosaur Dreaming again. However I could not join in the Dinosaur Dreaming for my vacation schedule. But Lesley and Dave taught me about the Cape Otway digging in March. I was so exciting, I have never



Keiichi Aotsuka meets a Koala at Bimbi Park

been to Cape Otway. Then I decided to participate to the digging project, immediately.

I went backed to Australia after an interval of 4 years. I was very happy to back to Australia. I was pleased with reencountered with some of same member of the Dinosaur Dreaming.

Cape Otway is also nice place. The landscape was amazing, the ocean shows us wild waves! But there is very beautiful place. The rocks color is similar to Inverloch rocks, but different in detail. The rocks really tough, and hardly find the fossils. I spend a lots of times and power to break the rocks. I struggled to find the fossil but I could not find any fossil in first day. But in second day, I found a fossil from that tough rock, and I was surprised because that fossil preservation was so nice. The team leader Dave said that "Fossil is hardly found from here, but the fossil preservation is good. That's why we dig here". I thought it is make really



Keiichi Aotsuka and the crew admire Mary Walter's jaw

sense. In fact, Mary found the incredibly beautiful ornithopods jaw bone in another day. It was the most exciting moments in that digging. I hope that jaw leads great progress of the research project.

I also experienced a great nature power in Australia. The weather in Cape Otway is changeable. Rains off and on every day, sometimes we had a terribly hard rain. However, we saw the beautiful rainbow after the rain. And another day, it was strong windy day. I saw some of seagulls at the digging site, they flew in my front but they could not move forward because of the strong wind. It seems as if a slow motion scene. It was a magical moment. I was impressed so much.

The life at the Cape Otway is also different from Inverloch. We stayed Bimbi Park camping site. There is lots of wild Koala are living. To look wild Koala is really precious for me. After the digging, we enjoyed chat and took meal together. It was a wonderful time for me.

I am lucky person, because I have been to Australia in several times. And I learned a lots of things such as fossil, Australian culture, wild life, and great nature. Every experience in Australia is left in mind as a good memory. I am very grateful for this amazing encounter. Thank you for everybody who participates in this digging project.

I hope we will see you again.
Domo Arigato.



Keiichi Aotsuka points to his fossil find



THE GREAT POSTAGE STAMP SAGA

BY TOM RICH

Arriving at Museum Victoria one fine morning in July 2012, not anticipating anything out of the ordinary, I casually opened my e-mail Inbox. Along with the usual 90% of useless messages such as those announcing that I had won a million dollars if I would just send my bank details, was one from Dr Hilary Maddocks of Australia Post. She wrote asking if I could assist her organization in producing a stamp issue focused on Australian dinosaurs to be launched on 24 September 2013. Thinking that this would be an easy matter of supplying a few references together with a bit of technical advice and little more, innocently I replied.

In response, amongst the first questions from Hilary was whether I could suggest an artist to paint the illustration needed. "That's obvious", I thought. Obvious because Peter Trusler, the artist who had produced similar stamps in 1993 in consultation with Pat Vickers-Rich and myself, could do the job. It would be great to do another such illustration together with him incorporating many new things that had been learned about Australian dinosaurs since then.

Peter was initially very much taken with the idea. But Australia Post needed to have the finished painting by the end of April 2013. Locked into that deadline, Peter agonized for five days about whether in light of all his other ongoing commitments including writing a PhD dissertation on the skull anatomy of the extinct marsupial *Palorchestes*, he could complete the commission in the time allotted. Finally, being brutally honest with himself, he reluctantly turned down this offer to do something that he would have really liked.

With the clock relentlessly ticking towards the deadline of completion of the painting, where could I find another artist who could do the job? One who had to be available as soon as possible who could work the completion of the painting into the time frame set by Australia Post despite other commitments he or she might have?

James Gurney, the author and artist of the *Dinotopia* series of books, and I had briefly crossed paths in 1993. He had come to Australia to promote the first book of that series. While here, he had seen Peter's then recently released Australian dinosaur stamp issue.

Thus his idea of producing a similar series of stamp illustrations for the US postal service was born. Four years later, that series of stamps was released and James sent me a set.

Having seen what he could do and knowing that he could work in the inflexible framework of producing stamp illustrations to the rigid constraints of such art, it occurred to me to ask him to consider taking on the commission.

James was taken with the idea and as luck would have it, his busy professional schedule was such that he could meet the Australia Post deadline.

James and I agreed that he should come to Australia to discuss the project face-to-face. He wanted to see some of the actual fossil material. He also wanted to meet Peter Trusler to 'talk shop' about how to best go about painting such art as well as be introduced to the flora. Another person he wanted to meet was Dr Barbara Wagstaff of the University of Melbourne, a palaeobotanist. She gave him a tour of the Royal Botanical gardens from a Cretaceous perspective.

After much to-ing and fro-ing, James finally booked a flight from New York to Melbourne. A hurricane was descending on the New York area at the time his flight was due to leave. He went to check in only to be told that he needed a visa to enter Australia and so could not be issued a boarding

pass. After pleading to be allowed to fly as far as Los Angeles in order to get out of New York before JFK airport was closed, he got his boarding pass. Calling his wife and saying, “Help, organize an Australian visa for me”, he then dashed for the airplane and it soon lifted off, one of the last to leave JFK for some days. Arriving in Los Angeles, he raced around, got the visa and got on the plane for Australia just before the door was closed.

Visiting the Royal Botanical Gardens with Barbara and the Dandenongs with Peter, James got a real feel for the Cretaceous flora that lived alongside the dinosaurs. This was particularly important because one of the things I wanted to emphasize in the painting was the most major change in the terrestrial flora since plants had emerged from the ocean about 400 million years ago. This event was the rise of the flowering plants or angiosperms. This happened to occur during the 25 million year time span of the painting. At the left hand side of the painting are the older Victorian dinosaurs (*Serendipaceratops*, *Timimus* and *Qantassaurus*) and one amphibian (*Koolasuchus*). Progressing across to the right, the scene becomes younger and illustrates Queensland dinosaurs (*Diamantinasaurus* and *Australovenator*) that lived and died when the angiosperms had come to dominate the flora.

James took all this in, along with discussing various aspects of the animals which are the focus of the stamp issue — the plant story being something



Dinosaur Dreaming crew join the celebration of the stamp launch at the Australian Synchrotron

that I thought could be sneakily put in. Australia Post wanted a dinosaur-centred stamp. They did not specify details so I supplied the ones that I wanted. No micromanagement in this case, which was nice.

While it would have been eminently desirable to have the Cretaceous monotreme *Kryoryctes* on a stamp of its own, the emphasis had to be on dinosaurs. Getting *Koolasuchus*, a non-dinosaur, on a separate stamp took enough persuading given the goals of Australia Post. James Gurney tried to include *Kryoryctes* near either *Serendipaceratops* or *Qantassaurus* but the scenes became too cluttered to have it within the confines of a stamp. At least *Kryoryctes* is in the scene as a whole.

After being in Australia for about ten days, James returned to New York, cleaned up the damage that the hurricane had done to his farm, and produced the required painting in time. During that phase, we corresponded from time-to-time about details. But the tyranny of distance meant that Pat and I could not work as closely with James as we had with Peter two decades previously.

Another e-mail from Hilary asked me to write the text for a small booklet to accompany the release of the stamps themselves. Originally given about two months to produce it, the submission date was moved forward when Australia Post realized that once the text was in their hands, they would need more time than they originally thought to have the booklet out in time. As a result, much of it was written while riding public transport or on airplane trips. Fortunately, because I knew what needed to be said without having to constantly consult the relevant technical literature, it was feasible to write the required text in this manner.

And so after these and many other trials and tribulations, it came to pass that on the 24th day of September in the year of Our Lord 2013, there came forth into the land of Australia a new stamp issue that would be known henceforth and for ever more as Australia’s Age of Dinosaurs.



OUR FOSSILS HAVE TRAVELLED THE WORLD

BY CORRIE WILLIAMS

The fossils from Dinosaur Dreaming site and surrounding areas have travelled the world and educated hundreds of thousands of people about the wonderful and unusual biota of the Cretaceous of Southern Victoria.

From 1993 until January 2013 the Monash Science Centre (MSC) of Monash University travelled scientific themed exhibitions with the aim of entertaining the public, showing real and ongoing scientific research and raising funds for the education programs offered by the Centre. During this time over 3.7 million people attended a MSC exhibition (including 1.2 million in Australia and over 2.5 million internationally).

Many of these exhibits featured fossils, and the current interpretations of those finds, from the Dinosaur Dreaming site at Inverloch. The two main exhibits featuring this material were the Dinosaurs of Darkness Exhibition and the Wildlife of Gondwana exhibition.



At the Museum of Natural History in Anchorage, Alaska



At Otway Dinosaurs in Apollo Bay

The Dinosaurs of Darkness exhibition told the story of life in the polar regions during the Cretaceous, mainly focussing on the dinosaurs, but also featuring turtles, pterosaurs and other animals. It looked at the adaptations in animals that allowed them to thrive in an area which experienced three months of darkness each year. Displays of the basal ornithischians such as *Qantassaurus*, *Leaellynasaura* and *Atlascopcosaurus* were added to as each year new discoveries were made.



At Mercado Lama in Dili, Timor Leste

When the first mammal specimen was found at Dinosaur Dreaming by Nicola Barton in 1997 the information panels on exhibit were rewritten, as were many text books. It was exciting to be able to convey new and breaking science to the public and change perceptions of what Australian fauna was like so long ago. Most visitors marvelled that anyone could see such a small specimen - and that it was so significant. Many thought it a one-off but now, 16 years later, 52 mammal jaws have been found, and the presence of mammals firmly established.



At the South Dakota School of Mines in Rapid City, South Dakota

Patricia Vickers-Rich is still travelling the Wildlife of Gondwana exhibition around the world - later this year it will go from KIOSC at Swinburne University in Wantirna (Victoria) to the Art Science Museum in Singapore. This exhibition showcases the whole history of life on the great southern supercontinent Gondwana. The animals (and plants) found at Dinosaur Dreaming are an important part of that story.

Over the years travelling fossil exhibitions, it has been a privilege to be able to convey to the world the passion and persistence of the volunteers at Dinosaur Dreaming and the wonderful (and sometimes strange) finds that they have made.

Corrie Williams is a volunteer Dinosaur Digger and was Monash Science Centre Exhibitions Manager from 2002 to 2013.

Teaching kits developed around these exhibitions are available by contacting PrimeSCI! at Monash (<http://primesci.monash.edu.au>) or emailing pat.rich@monash.edu.

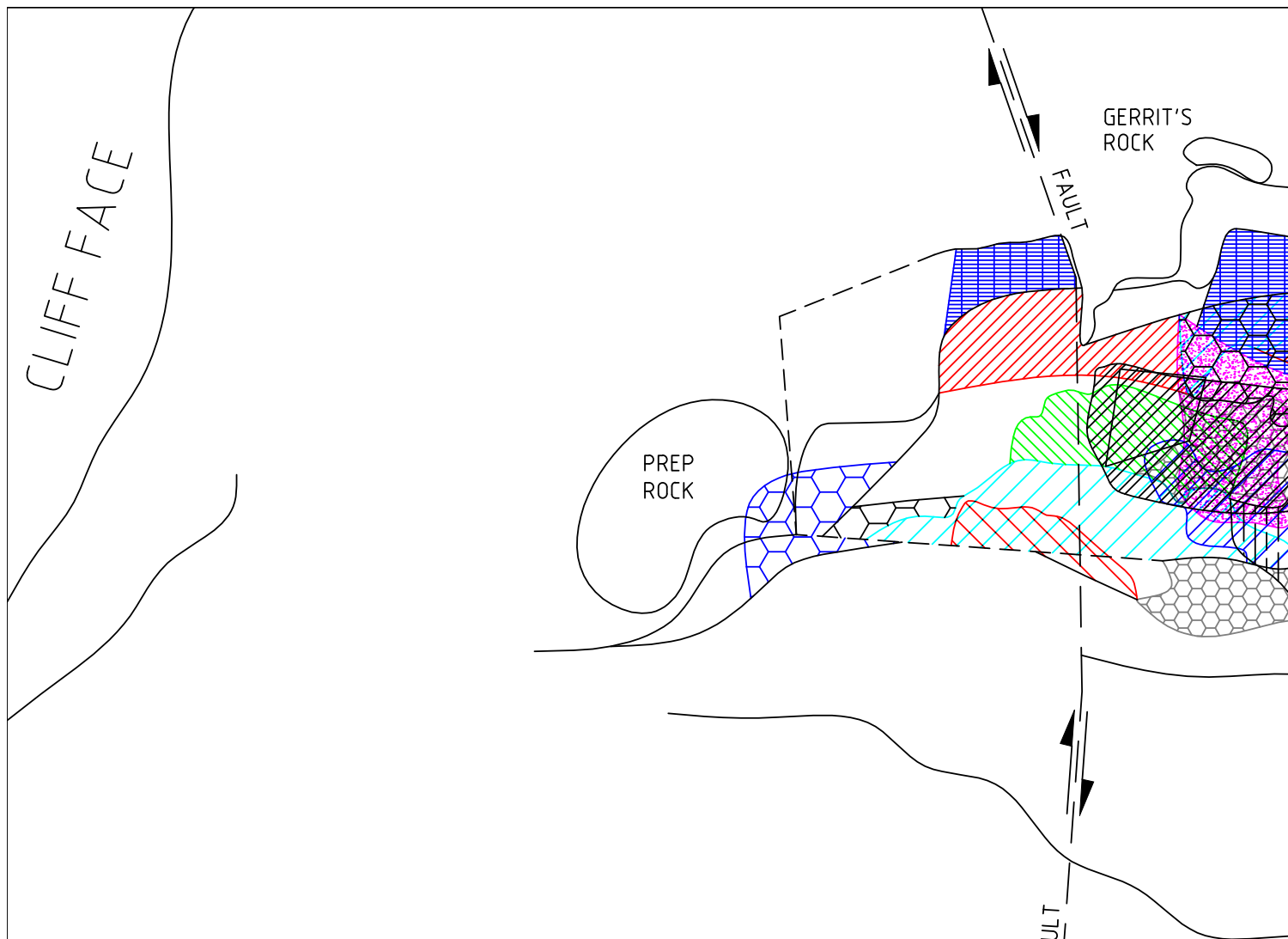












NOTES ON THE 2013 CUMULATIVE MAP










BY DEAN WRIGHT

One night in a beer garden I noticed a sign that stated in bold red letters, "No Smoking Beyond This Point." To the common rabble, to which you find yourself attached, this means "Do not smoke past this sign." To a surveyor, it implies that the intersection of three dimensions with no volume or area at the exact centre of the sign is the only region in three dimensional space where you may smoke. A point has three coordinates and no area. What the sign should have read is no smoking beyond this plane; a straight gradient line with both defined and undefined extents between two fixed points, or a fixed gradient parallel to the sign. I, as a surveyor, live amongst the simples and try not to point out their ignorance unless tested. Do not test me.

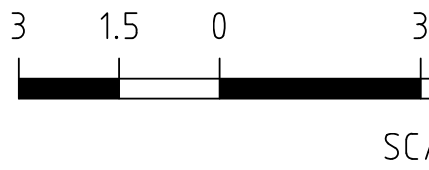
The attached map may appear confused and seem crowded. Excavations have overlapped on numerous years as we have excavated overburden and multiple fossiliferous layers. Whilst it may be difficult to perceive in some areas it is the best 2-Dimensional representation of a 3-Dimensional map I could muster. The map is a simple plane, plain and simple. The bulk of the excavation regions were collected by Nicholas van Klaveren over his years of mapping. A Cartographer is gifted in only needing five different colours to outline geographical borders, but maps in an Atlas do not have to deal with depth. Please accept my best interpretations of the excavation history of the Flat Rocks site from time of record. If you look at the years you have attended and match up to the scale, you can see the extent of the rocks you helped excavate.

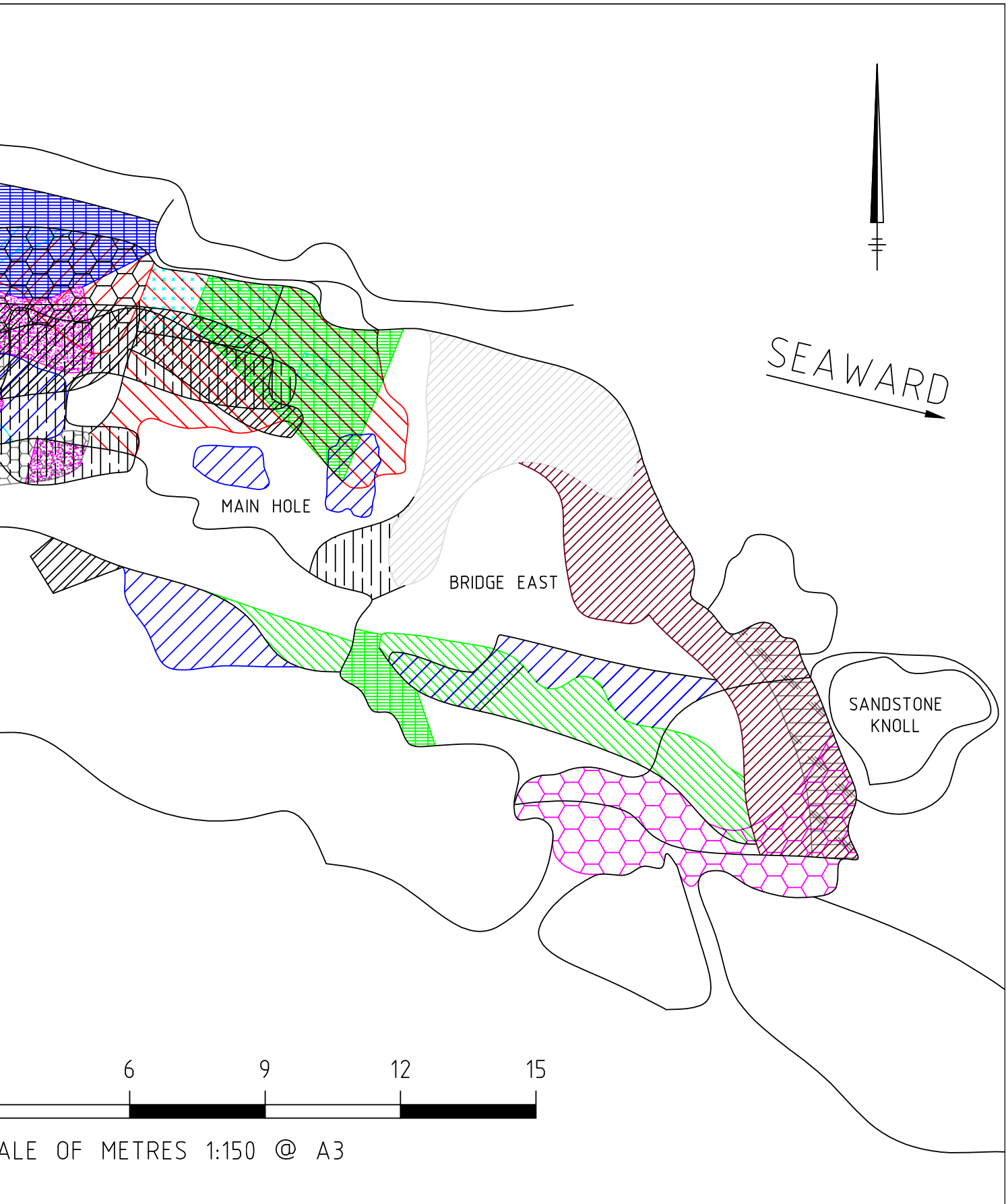


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DRAWN:	DEAN WRIGHT	21/08/2013
SURVEYED:	DEAN WRIGHT	12/02/2013
	LISA NINK	8/07/2012
	DARREN HASTIE	12/02/2013
	STUART CUXSON	21/05/2011







PICTURE A CROC-NEWT

BY PETER TRUSLER

The commencement of the Dinosaur Cove excavations was almost coincidental to my first forays into palaeo-reconstruction illustration. I was already tempting fate by getting involved with illustrating bones for Museum Victoria in the first instance, but in part, my progression in illustrating for palaeontology has been largely due to the impetus from your discoveries along the Otway and Strzelecki coasts.

The crew have been an unruly lot as far as I have been aware - I have always politely placed my orders for interesting things to illustrate, only to get presented with fossil specimens that I never

imagined were to be found here, very little of what I wanted, and more challenges than any illustrator has the right to contemplate. It has however made a better palaeo-artist of me and for that I am so grateful. I hope too that, even though I have mostly lurked behind the dig and prep activities, my artwork has been able to bring another aspect of reward to all that you have achieved here in 20 years. As I reflect on it now it has been quite a journey. I have ended up taking the Early Cretaceous as it has slowly revealed itself through such a multidisciplinary effort, and added a visual dimension to your collective thoughts. Together these have graced scientific papers, featured in the popular press, postage stamps, exhibitions, books, catalogues, TV and an assortment of docos. The ripples of influence that this combination of people and this locality has generated have gone much further than I would have believed possible. As always with palaeo illustration these will continue to be works-in-progress, as research on the material will continue to tease out a deeper



Koolasuchus by Peter Trusler

understanding and I will not be able (or even allowed) to put my brushes away.

Just this month, I have been mulling over the Mesozoic mammal teeth...again. New hi-res scans of the material and better microscopes have allowed the re-examination of the tiny fossil jaws to improve upon their analysis. So, stay tuned.

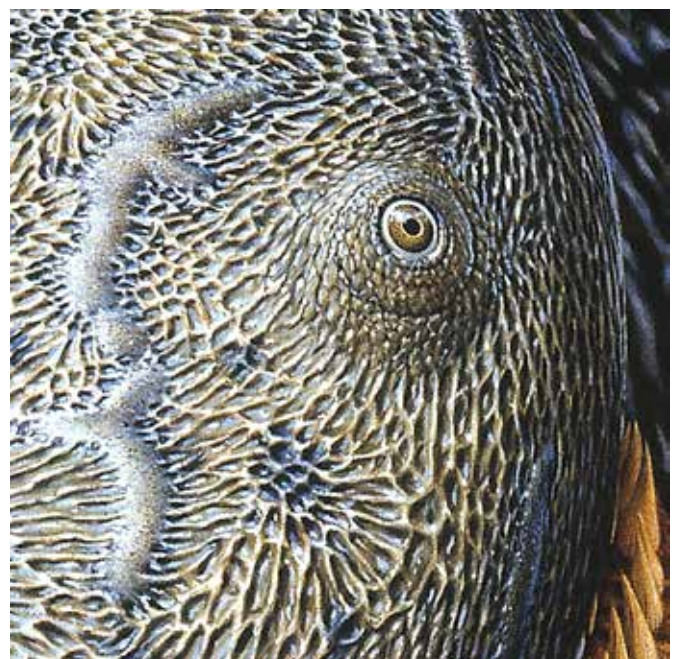
I remain amazed that this type of miniscule material has been recovered from the sediments at all, let alone successfully prepared; they are certainly eye-straining, finger-trembling, fragile crumbs to work upon. Thankfully, there has also been evidence for big beasts and they have deserved big illustrations.

My largest art piece to have been inspired from the years of collecting along the southeast coast is about to be placed on exhibition in Singapore. While it incorporates material from a variety of those sites, it features one of the big surprises to come from the San Remo part of the sequence. You guessed it, *Koolasuchus cleelandi*, the temnospondyl that bears Lesley's and Mike's names. Unfortunately for them, I once described 'their' creature as "superficially resembling the hypothetical offspring of an unholy union between crocodiles and newts!" That, in part, was a reflection of another very steep learning curve that I undertook to create something visually extraordinary; something worthy of some remarkable, albeit fragmentary, remains. I had hoped that concentrating on a big non-dinosaurian animal might tell a wider story about the environment and processes that were being discovered from the deep south of the Early Cretaceous. The challenge artistically was that this fascinating beast, and those of its kind, were never likely to become glamour characters of palaeo-illustration.

Characteristically, temnospondyls possessed conical teeth that had a convoluted, folded internal structure, the labyrinthodont condition. They had well-armoured heads and pectoral girdles, all displaying a distinctive, reticulate

ornament. Some were heavily scaled, and apparently others were not. Generally speaking they were part of the vertebrate evolutionary story of transition from water to land and the group had flourished for more than 200 million years before the Strzelecki sediments were laid down. Because of their transitional nature, the earliest members of the group have always been of intense scientific interest. Fins were evolving into limbs. Swimming was converting to crawling. Oxygen extraction was being required from air, not from water. Vertebral columns reflected this transition, and vertebrae underwent a wide range of morphological experiments in order to cope with the new stresses that terrestrial existence and new modes of locomotion were imposing. Most of the temnospondyls were semi-aquatic, but some were far more terrestrially adapted, and others actually returned to the water, again adapting to aquatic lifestyles. Theirs is a long and complex history, but like so many of the group, *Koolasuchus* was most likely an ambush predator.

The compilation of every aspect applied to my reconstructed images of past life are collaborative efforts in themselves. From the point where I am



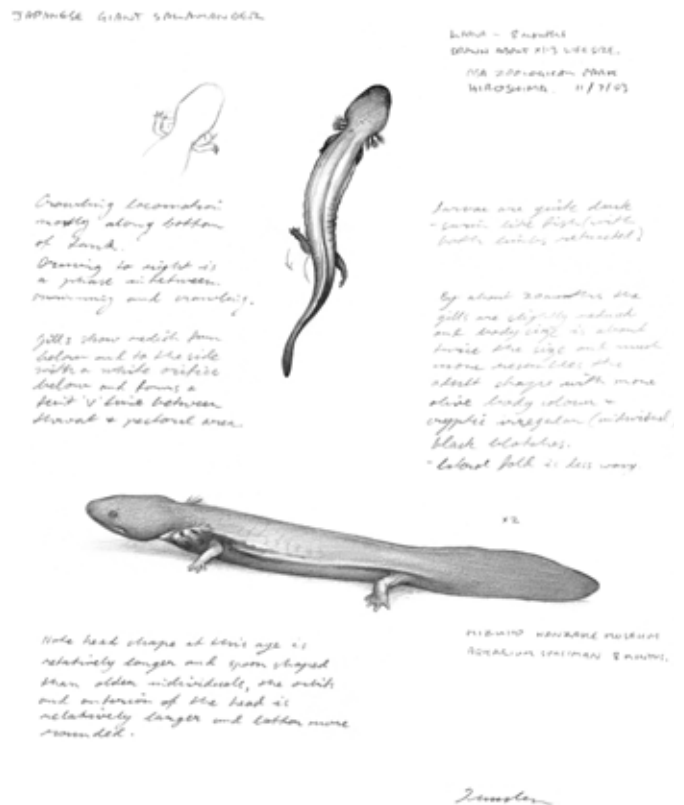
The Koolasuchus eye and sensory glands

introduced to the collected and prepared material to the final hour when I clean the last brushes, many months may have transpired and many people would have assisted me with everything from the comparative studies, palaeo-scientific ones, matters of modern biology and ecology, to artistic matters, intellectual and technical. There are often models to be made, anatomy to be investigated and always consultation to be conducted with specialists from a variety of disciplines.

For *Koolasuchus*, I needed another fast track education to get me up to speed with everything I needed to know about temnospondyls. Enter Anne Warren, Kat Pawley and a number of Anne's students. They handed over volumes of literature, made available comparative specimens from around the world, recounted the theoretical arguments behind the science; visiting my studio intermittently to review the form models I had sculpted and my preliminary drawings. Kat's willing participation and research on biomechanics informed my understanding of functional anatomy. There were important reasons for their intense input, because modern salamanders were the



Detail of a beetle on a fallen leaf



Study notes of a giant salamander larvae in Japan

only comparative living analogues I had. These diminutive modern forms were such distant and highly derived relatives that their value in this reconstruction was dubious.

Nevertheless, Pat and Tom ensured that I was able to study the giant salamander in Japan (a captive breeding population in the Asa Zoo, Hiroshima and wild salamanders in the mountains). Kat and I conducted dissections of the giant Chinese salamander at Latrobe University.

Lesley's fossil turtles made a cameo appearance as too did the Cretaceous lungfish. These inclusions then took me to Healesville Sanctuary to look at modern turtles and the Australian Lungfish. Some appropriate specimens from the Koonwarra site were enlisted for the scene because I could include insects and small fish that were also likely to be part of the river ecosystem. More trips to Museum Victoria, where John Long scrutinised the



Remains of a dragonfly amongst the floating leaves

reconstruction of the fish.

There were the plant details to consider too. In a fit of insanity, I thought that Victoria's Cretaceous plant microfossil record was rather beautiful and so I strew the water surface of the image with



Detail of turtle remains and palaeoniscid fish

fallen leaves and flushed plant debris through the stream flow. That proved to be a technical and logistic nightmare and so I enlisted the services of other artists, Glenda Wise and my wife, Gael, to help cut the stencils to create the golden foliage patterns.

My wish was that I could create a window into a scene in deep time as we understood it may have been. Aside from the major subject of the view, *Koolasuchus*, I wanted the image to carry a hint of the complex patterns of biological ecosystems, a sense of their long and perpetually evolving interactions and delicate balances. It needed therefore to be a contemplative picture and one where the layers of our understanding are also expressive of a multidisciplinary series of interactions. The original art is designed to be explored. Sometimes the smallest details provide big insights.

By the way, the *Koolasuchus* fossils are presently under further study overseas and it will be interesting to see what new insights may emerge.



Detail of a fallen feather

REFLECTIONS OF AN AMATEUR ARMCHAIR PHILOSOPHER



BY CATE COUSLAND

ILLUSTRATED BY
SHARYN MADDER



It's surprising where a lazy afternoon's thinking about dinosaurs can lead; back to glimpses of the deep distant past right through to solutions for world peace!

It was Hilda who started it. A tiny tough independent Apollo Bay lady who I met in her 80s. As she lost her eyesight over the next 20 years I would read to her and in return she would regale me with stories of the early days. Best of all I loved to hear the tales of travelling to Melbourne by boat in the days before there were any roads to the Bay, and how as a young girl she watched the gas lamps being lit in the streets of Melbourne. She was living history and whetted my interest in the Otways past.



From there it wasn't such a big leap to imagine the coast when our indigenous kin were caretakers. Each time a king tide washed against the shore, numerous and sometimes enormous middens would reveal the menu for the last dinner or three. The stone tools, canoe barked trees, eel farms and stone wells added to the picture.



Then I heard about the dinosaurs... how right here on the Otway coast there were fossils of creatures that had walked, run, swum or flown over this very place. Way, way back. Luckily my friend Sharyn was just as excited as me about this long lost world and together we joined the volunteer crews at Cape Otway and Inverloch. Lugging, digging, basking in the sun, covering from the howling wind, rain and sand, we joined the search for those elusive bones. There is a special type of person who can sit on a beach breaking rock for days on end in those conditions and Sharyn and I found ourselves to be right at home. If only our bodies hold out and no unexpected auto accidents interven we can keep on digging into this deep dark past forever.



Can a person feel at one with a squashed echidna? Well I certainly did and it was only 10 o'clock in the morning! And it got me thinking how many plant and animal species descended from ancient ancestors that once walked, rustled, grunted, howled and flew across this land are still with us today. And how those tiny mammals that are fossilized in the Otway rocks have evolved into us, until, like the rodents that are so hard to keep out of my kitchen, we have conquered and become the dominant creatures on earth.



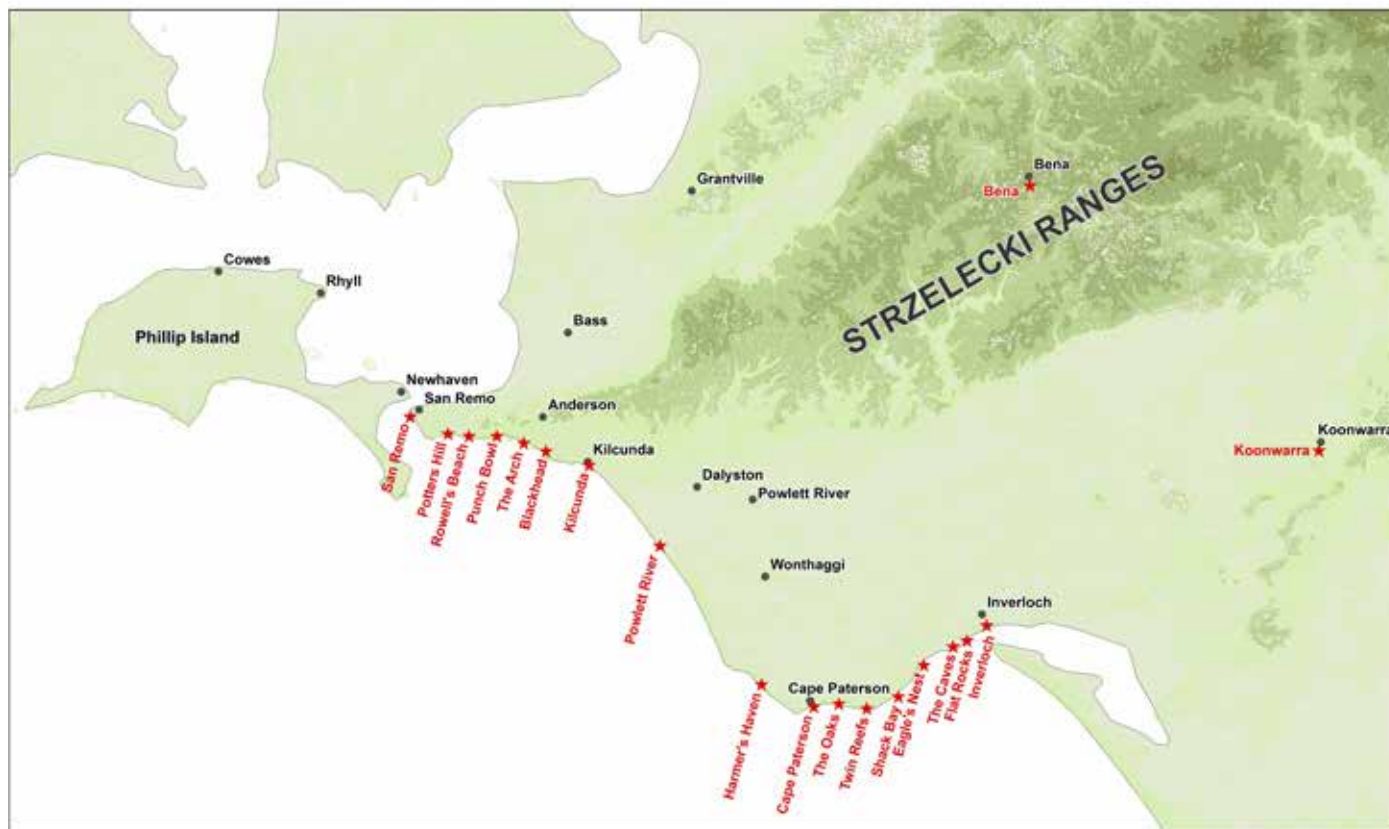
So that was the past... but how do those dinosaurs, megafauna and tiny mammal fossils fit with the future? Well, reflecting in my old armchair in the warm afternoon sun, I remembered not so long ago when I found a dead echidna on the Ocean Road, tyre marks across its small body. And thinking this was a good chance to observe close up, I had a good long look. Then, I nearly dropped it. For right before me was a little paw with pads and nails and a palm just like my own!



Our reign in evolutionary terms is so brief that it seems to me that with a good dose of intelligent armchair reflection on dinosaurs and such like we might begin to put some perspective into thoughts about our long term human prospects. And to maybe consider how much more fun and more sense it makes to accommodate and care for our mammalian fellows and all those other creatures and plants.

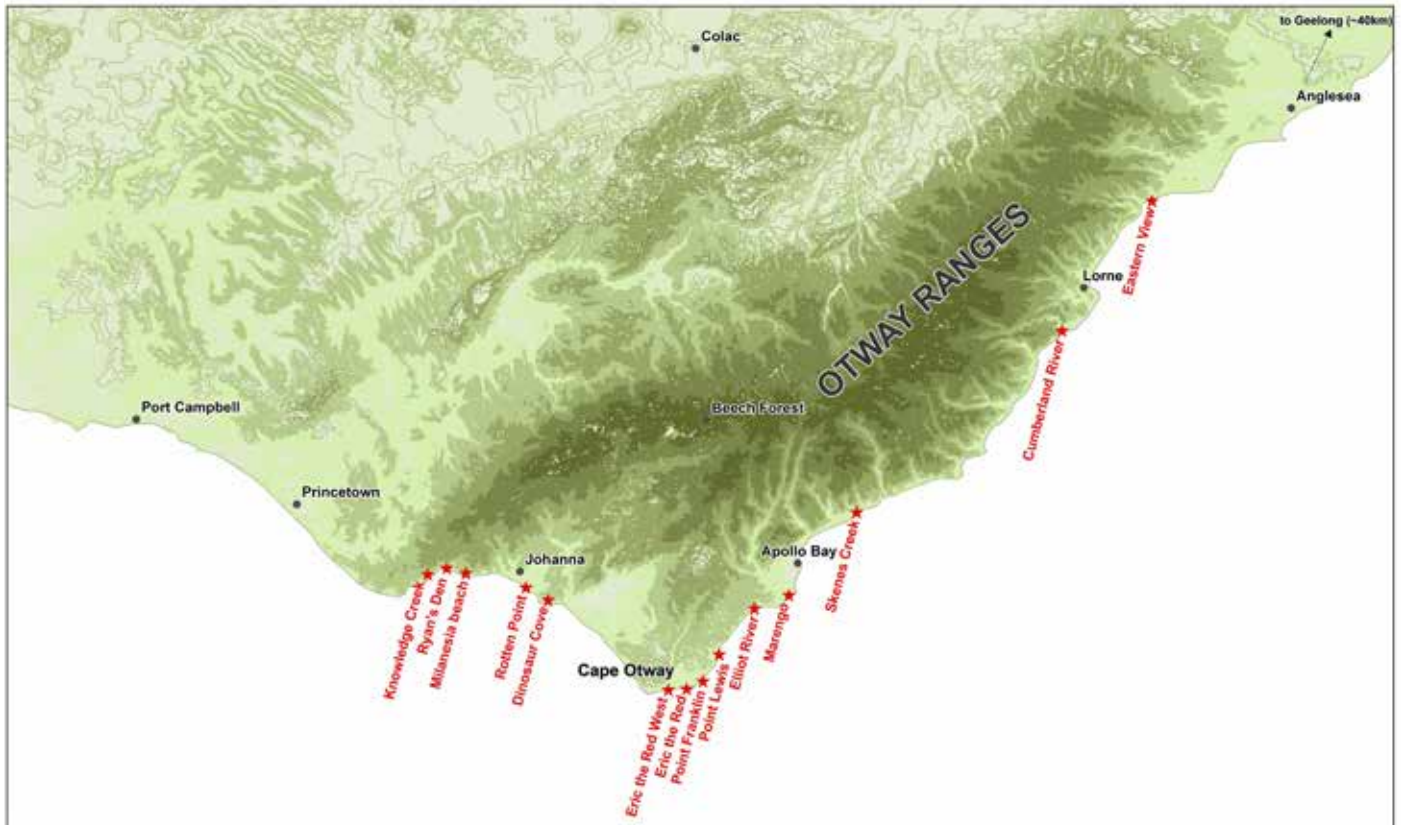
Maybe we could even live in peace for a while... at least until the next species evolves to dominate the planet.

FOSSIL LOCALITIES IN THE STRZELECKI GROUP



TAXA	San Remo	Potters Hill	Rowell's Beach	Punch Bowl	The Arch	Blackhead	Kilcunda	Powlett River	Harmer's Haven	Cape Paterson	The Oaks	Twin Reefs	Shack Bay	Eagles Nest	The Caves	Flat Rocks	Inverloch	Bena	Koonwarra
Mammalia:																			
Tribosphenic (Unidentified)																X			
<i>Ausktribosphenos nyktos</i>																X			
<i>Ausktribosphenos</i> sp.																X			
<i>Bishops whitmorei</i>																X			
Monotremata (Unidentified)																X			
<i>Teinolophos trusleri</i>																X			
Multituberculata (Unidentified)																X			
<i>Corriebaatar marywaltersi</i>																X			
Dinosauria:																			
Dinosaur (Unidentified)	X	X	X	X	X	X	X	X	X		X			X	X	X	X	X	X
Ornithopoda (Unidentified)	X	X		X	X	X	X	X						X	X	X			
<i>Fulgorotherium australe</i>					X														
<i>Qantassaurus intrepidus</i>																X			
Ankylosaurs/nodosaurs					X				X							X	X		
Neoceratopsidae (Unidentified)																X			
<i>Serendipaceratops arthurcclarkei</i>					X														
Theropoda (Unidentified)	X			X	X	X	X	X					X	X		X			
Ornithomimid	X					X										X			
Megaraptora					X										X				
Ceratosaur	X																		
Other Vertebrates:																			
Plesiosauria (aquatic reptiles)	X							X						X		X	X		
Pterosauria (flying reptiles)														X	X	X			
Testudines (turtles)						X		X		X				X	X	X	X	X	
Aves (birds)																X			X
Temnospondyli (amphibians)				X													X		
<i>Koolasuchus cleelandi</i>	X	X	X	X															
Dipnoi (lungfish)	X			X			X	X					X	X		X	X		X
<i>Neoceratodus nargun</i>				X										X	X				
<i>Archaeoceratodus avus</i>														X					
Actinopterygii (ray finned fish)					X	X		X						X		X		X	X
<i>Leptolepis koonwarri</i>																			X
<i>Koonwarra</i> sp.																			X
<i>Wadeichthys oxyops</i>																			X
<i>Coccolepis woodwardi</i>																			X
<i>Psilichthys</i> sp.																			X
Invertebrates:																			
Bivalves					X											X			
<i>Megalovirgus flemingi</i>					X											X			
Insecta (Insects)																			X
Trace Fossils:																			
Dinosaur footprints																X			
Crustacean Burrows: Parastacid											X	X		X	X	X			

FOSSIL LOCALITIES IN THE OTWAY GROUP



TAXA	Ryans Den	Knowledge Creek	Milanesia Beach	Rotten Point	Dinosaur Cove	Eric the Red West	Eric the Red	Point Franklin	Point Lewis	Elliott River	Marengo	Skenes Creek	Cumberland River	Eastern View
Mammalia:														
Tribosphenic (Unidentified)						X								
<i>Bishops sp.</i>							X							
Monotremata (Unidentified)														
<i>Kryoryctes cadburyi</i>					X									
Dinosauria:														
Dinosaur (Unidentified)	X			X	X	X	X	X	X	X	X			X
Ornithopoda (Unidentified)	X			X	X	X				X	X			
<i>Atlascoposaurus loadsi</i>					X				X					
<i>Fulgurotherium australe</i>					X									
<i>Leaellynasaura amicagraphica</i>					X									
Ankylosaur/nodosaur					X									
Neoceratopsian					X									
Theropoda (Unidentified)					X	X		X						
Spinosaurid						X								
Oviraptorosaurid					X									
Ornithomimid					X									
Neovenatoridae indet.					X									
Tyrannosauroid					X									
Other Vertebrates:														
Plesiosauria (aquatic reptiles)					X	X							X	
Crocodylia (crocodiles)					X									
Pterosauria (flying reptiles)					X									
Testudines (turtles)	X				X	X	X	X	X					
<i>Otwayemys cucularis</i>					X									
Dipnoi (lungfish)					X	X			X					
<i>Neoceratodus nargun</i>					X				X					
Actinopterygii (ray finned fish)					X	X								
Invertebrates:														
Freshwater crustaceans														
<i>Palaeoecchinastacus australianus</i>					X									
Bivalves (Unidentified)					X	X								
<i>Megalovirgus flemingi</i>					X									
Trace Fossils:														
Dinosaur footprints		X	X		X								X	
Dinosaur Burrows		X												
Crustacean Burrows: Parastacid		X			X						X	X		



WRECKAGE, SHIPS AND DINOSAUR BITS

BY WAYNE GERDTZ

I stare out to sea, a heaving blur of grey with white-capped breakers. Two thoughts occur to me – why didn't I bring better wet weather gear, and how did this particular place get such an odd name?

I am perched on a rock in a sheltered pocket of the beach and near some dune vegetation, the wind and rain intermittently reminding me of my inadequate clothing. Between myself and the sea is a small pile of grey rock which I have been progressively breaking open with my hammer and chisel, searching for that elusive glimmer of hope – a fossil bone. A few metres beyond, some of my fellow crew are gleefully swinging sledgehammers at a larger section of the rock we uncovered this morning, working on extracting more material to be broken down in a search for more fossils.

We are sitting on a beach near the Cape Otway Lighthouse in late March, close to a location called Eric the Red. The grey rock we are processing was once sediment laid down in a braided streambed in a rift valley over 100 million years ago. Amongst the grey sediments are seams of black coal - fossilised plant material - and very occasionally, fossil bones of animals that lived and died nearby.

That much is all very good and well, but...Eric the Red? What's that name all about?

Weeks later, in the decidedly drier and more comfortable setting of the Discovery Centre at Melbourne Museum, I decide to research why the site is called Eric the Red. It turns out that Eric the Red was a vessel that was shipwrecked close to the shoreline of where we were digging; it ran aground in 1880 on a reef composed of the very

same unit of rock we were excavating. Visitors to the Cape Otway lighthouse will be familiar with the huge rusting anchor from the vessel that is slowly but surely disintegrating as the salty air lashes the Cape.

The vessel itself was wrecked on the final leg of its otherwise uneventful voyage from New York to Melbourne, carrying a cargo of exhibits for the USA pavilion at the 1880 Melbourne International Exhibition – silverware, toys and pianos were among its diverse manifest. Assorted artefacts and timber from the wreck washed ashore in the weeks following the wreck of 1880, and many of these items are now in various family and public collections in towns and farmhouses near the Cape; indeed some of the timber from the hull and deck was repurposed for construction in houses and sheds around Apollo Bay.

An interesting coincidence was that the ultimate intended destination for the Cargo of Eric the Red was the Royal Exhibition Building in Carlton Gardens in Melbourne – this is also the destination for the fossils we were extracting from the site, as Museum Victoria's Palaeontology Collections and laboratory are in the basement of the Exhibition Building. Even more coincidentally, the crewman on the ship responsible for the cargo was one Mr Pickering...

Thankfully the fate of our diggers and our precious cargo was less tragic than that of the crew and cargo of Eric the Red; the wreck resulted in the loss of life of some crew.



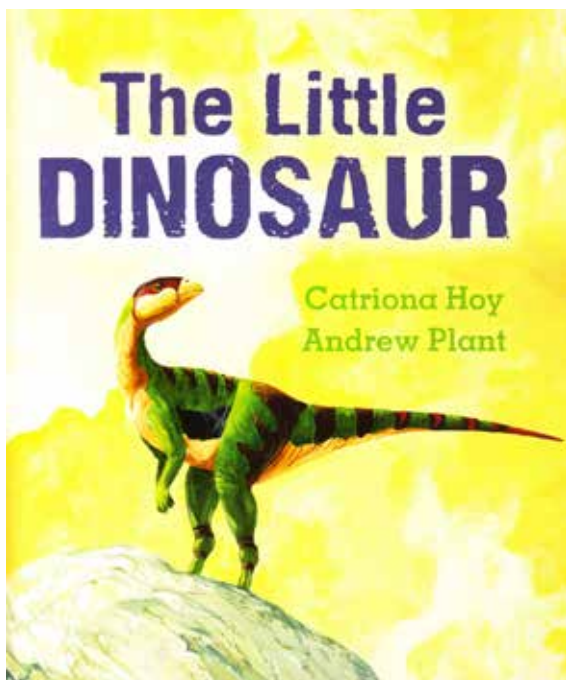
The rusty anchor at Eric the Red



THE LITTLE DINOSAUR

BY ANDREW PLANT

‘Small basal ornithopod’ may be more accurate, but Dinosaur Dreaming’s fractured-femured friend seems to be best known as ‘The Little Dinosaur’ now. Catriona Hoy’s story, which I spent nearly five months illustrating, has been selling beautifully, and has received some great reviews. I’ve been using it a lot as a discussion book during Book Week, which really goes for the whole month of August.

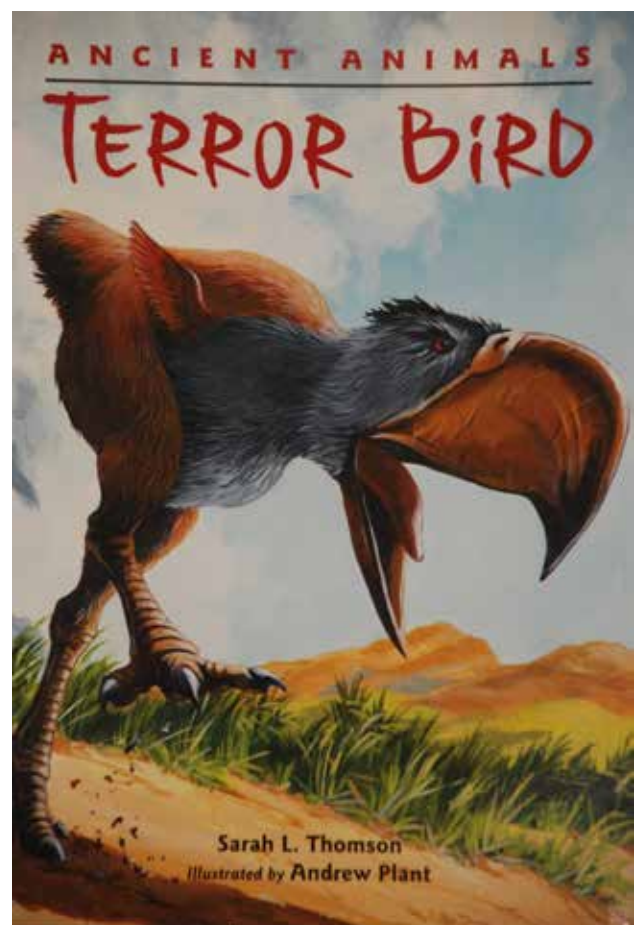


Since the release of ‘The Little Dinosaur’, I’ve had another prehistory book out. Called Terror Bird, it’s about the giant South American flightless birds of 15 million years ago, specifically *Kelenken guillermoi*. It’s part of a series called Ancient Animals by Charlesbridge Publishing. The next one, for which I’ve just finished the illustrations, is called Sabre Tooth, featuring the famous Smilodon. A few other fang-toothed critters are also mentioned in the book, and some of them make

Smilodon look pretty tame! There’s a number of future titles planned, so it should keep me busy for a while.

I’ve also had some discussions with a local publisher on a book on feathered dinosaurs, although the problem is that new discoveries are happening so rapidly that by the time a book is published, it’s already a bit outdated. But that’s the great thing about palaeontology. I also hang onto the hope that there is a publisher out there who likes pterosaurs. I think that they are the most unappreciated of prehistoric creatures, so unique and incredible, so poorly understood, and such a mystery, that it is a wonder that they barely figure in any books of their own. Who couldn’t love creatures with arms the span of a light aircraft, or so small that they could perch happily on your shoulder.

Anyway, like all artists and palaeontologists, I live in hope...





THE ELUSIVE EMU MAN

BY PEGGY COLE

The Lurujarri (Song Cycle) Trail experience was a rich concoction of sensory immersion - visually, aurally, physically, philosophically and especially towards the end of the trail, olfactorally. Mary, Graeme and I joined the Goolarabooloo community members and about 45 others on this trail in August.

The Song Cycle is an oral heritage map. Its songs contain codes of behaviour fundamental to sustaining the balance and well-being of the land and its people and are still sung today. We had certain ideals and misgivings about the trail trials before setting off but on its completion found it to be at times surprising, exhausting, exhilarating, irritating, enthralling; and definitely worth the effort.



James Price Point footprint with Mary Walter's water bottle for scale



Graeme and Mary Walters visit the Whale Research campsite

Camping in small tents was well worth the pain for the joy of waking in the morning to the sounds of ocean waves; sometimes gentle, sometimes soaring on the wind, sometimes pounding against rocks or slushily slurping, filling rock pools.

There were times for personal reflection and experience and opportunity for interaction with many different people from diverse backgrounds and ages.

Many suffered blisters between the blissful moments; pangs of withdrawal for a G&T at sunset rather than the ubiquitous but nevertheless delightful and strangely addictive tea (boiled not in a billy but a full sized copper).



Beautiful beach with ripples

The warmth of friendship and welcome to their country of the Goolarabooloo people was an important ingredient in the overall wellbeing of the group dynamic. The occasional discomfort of uncomfortable clothing; overheated, dusty with sweat and sunscreen with no access to washing after putting up the tent was ameliorated by the rise of the brilliant starscape in a sky whose vastness we'd forgotten, followed by the rise of the almost full moon — a magically golden ball. Falling to sleep in the sandy sleeping bag to the sounds of ocean and/or bush with occasional gentle human punctuation as zips were opened and closed, was assisted by the relaxed limbs, and the promise of a glorious sunrise and a new day only partly able to be anticipated in its promise or mystery.

The photos attempt to capture some of the experiences of the trail, but cannot reveal the indelible imagery that is now part of my own internal landscape.

The Lurujarri Trail follows the land of the traditional Song Cycle. The same camping places are used as have been used for millennia, the same fireplaces lit, the same reefs fished. Within this country, one of the creator beings is spoken of as Marella, the Emu Man, whose ancient footprints and other feather traces remain in the reef that stretches between Broome and Flat Rock, north of James Price Point.

Unfortunately, we were not able to see the famed trackways due to tidal inconsistencies with our time of arrival in the surrounding area. (The bloody tide was IN.) We had to keep moving.

In May 2013 the Woodside announcement that it has dumped its proposed \$45 billion industrial gas hub at James Price Point was a great outcome for the extraordinary environmental and heritage values of James Price Point and the Kimberley coast. An important upshot of the campaign is that the world is now more aware of the substantial natural and heritage values of James Price heritage listed and globally significant dinosaur trackways.



WHEN I GROW UP...

BY LISA NINK

When I was a child any time anybody asked me what I wanted to be when I grow up the answer was always a palaeontologist. Now over 25 years later I am living the dream going on dinosaur digs, learning to prepare fossils, and studying fossils (yes I admit my Honours project is about megafauna, not dinosaurs, but megafauna are just as cool!).

I work as a part-time palaeontologist, doctor, archaeologist, historian, entomologist, psychologist and biologist, and one of my colleagues is an 87 year old horse named Phar Lap. Well, I'm not really any of those things but I do work in the same building as Phar Lap.

For over 4½ years I have worked at Melbourne Museum as an Education Presenter teaching students from kindergarten to year 12 about bugs, the human body, archaeology, history, palaeontology, evolution and biology. So, while I am not really a doctor, a historian or any of those words ending in '-ologist', to the students (at least the very young ones) I am. Of course my favourite '-ologist' to be is a palaeontologist.

Teaching children about dinosaurs and other fossils is a lot of fun. Those long extinct Mesozoic monsters and the other strange animals that shared their world are a source of endless fascination for all children (even those who left primary school long ago). It never ceases to amaze me when a five year old child opens their mouth and exclaims "my favourite prehistoric animal is..." followed by names that challenge even the most enunciated speakers among us. Names such as *Quetzalcoatlus*, *Pachycephalosaurus* and *Liopleurodon*.

Not only do children know how to rattle off dinosaur names as though they were reciting the alphabet, but they have a vast knowledge of these prehistoric beasts. If you ask them about their favourite dinosaur most children will spend a considerable length of time telling you all about where it is from, what it ate and all sorts of quirky little facts. It's always satisfying to know you've made a child's day when they come up at the end of the class and say "When I grow up I want to be a palaeontologist".

One of the most enjoyable aspects of teaching children about dinosaurs is hearing some of the quirky things they come out with. Below is a little sample of questions, quotes and short conversations with children I've taught at the Museum. Some are amusing, some are amazing and some are... well you'll see.

"I like the long necked ones because they were nice."

"My favourite dinosaur is a *Quetzalcoatlus*." What was *Quetzalcoatlus* again?

"Why did the dinosaurs die but we're still here?"
A valid question but very tricky to explain to a five year old.

In answer to how did the dinosaurs die, "God killed them all". Well, I guess it's a lot simpler than a story about a giant rock from outer space hitting the earth and killing them all.

"Why did God kill the dinosaurs?" — One better left to the parents and teachers to answer.

Once, when I asked what we call a scientist that digs up and learns about fossils, a little girl correctly answered "A palaeontologist", shortly followed by a little boy who said, "They don't dig up dinosaurs, palaeontologists just sit and read all day".

"Have you ever seen a real live dinosaur?" I know I look older than I am, but I dread to think how much older this child thought.

When I've asked "Have you ever seen a real live dinosaur?" I have several times had a child answer "Yes, I have one in the backyard". I'd like to know where these children get their dinosaurs. I'd love a pet *Stegosaurus*.

"The dinosaurs all died in the ice age." — Disney has a lot to answer for!

And having been told that "some dinosaurs could spit venom" and that "*spinosauros* could kill *Tyrannosaurus rex*" so does the Jurassic Park franchise.

How do we know *Tyrannosaurus rex* liked to eat meat? "Because my book/DVD on dinosaurs says so"

"Crocodiles are dinosaurs, my book says they are!"

With a photo of a nest of fossil eggs behind me I asked, "Can anyone tell me what baby dinosaurs came out of?". One little girl, wise beyond her years, started to reply "Well there's a mummy dinosaur, and a daddy dinosaur and they..." at which point I interjected "Lay eggs. Yes, we know that some dinosaurs laid eggs". I expect that is exactly what she had planned to say... I just wanted to make absolutely sure it was.



Mike Cleeland with Wonthaggi North Primary School students in 2012



DIG NUMBER TWENTY

- A POEM

BY NICOLE EVERED

Dig Number 20 now must end
So we will say "goodbye", my friend.

The days were hard and hot and long
But this is where we all belong.
We've dug up sand, seaweed and rocks
In damp boots with wet smelly socks.
We've looked in rock to try and find
Anything that's been left behind.

"It's SWIM O'Clock" goes up the cry
-- Amusing all the passers by.
Off racing to the pool they dash
Jumping in with a mighty splash.
The day's main work can then proceed
Until, again, they feel the need!

What a great year for TEETH it's been
Better than we have ever seen.
We have wrapped 14, maybe more
We'll know when we tally up the score.
Our cries of joy when we all saw
Astrid's exquisite MAMMAL JAW.



Hannah Carle carts gear



John Wilkins, Dean Wright and Darren Hastie dig in damp boots

Our thanks go out to everyone
Without you what would we have done.
Cooking, rock breaking, making tea
Carting gear down to the sea.
Back up the steps on the return
When muscles start to cramp and burn.

Lesley, Wendy, Lisa, Nick, John —
To all the team who've come and gone.
Norman, Mary, Gerry, Dean, Dave —
And every little bone we save.
Hole supervisors and each crew
Every day finding something new.

Old and new members of our team
You are the Best! You are the Cream!

Thank you! Thank you for being here
We hope to see you all next year.



Tooth found by Bronwyn Jeynes



WHAT'S IN A NAME?

BY MIKE CLEELAND

ILLUSTRATED BY PIP CLEELAND

Several vertebrate fossil localities that don't appear on any maps have acquired names of their own, which to a visitor from Mars, would not appear to have any sensible meaning.

This listing attempts to describe these places in a manner which will hopefully enable a palaeontologist from the future to locate the sites that have been worked since the 1970s.

Starting at Inverloch and heading west, these include:

Mary Anning

38°39'15.90"s 145°41'8.19"E

So named because of the discovery of a Plesiosaur rib at the site, it is located at the far northern end

of the extensive shore platform making up Flat Rocks proper. The bulk of the fossils have been found at the base of the cliff, but several others have been found further east as the layer strikes out to sea.

Noddyland

38°39'26.17"s 145°41'3.46"E

The general area where the partial skeleton of Noddy was found.

Swim O'Clock Rock

38°39'33.30"s 145°40'56.58"E

The knoll located about 150m north of the Dinosaur Dreaming dig site, at the northern end of the sandy beach and above the swimming hole often used by dig crew. Several bones had been recovered from the surface here, and a trial dig was carried out in February 2012 resulting in the collection of several more.

Honey Locality

38°39'49.73"s 145°40'47.54"E

A site which has consistently produced a variety of bones since first visited in the early 1980s, its name derives from the honey colour of many of the exposed bones. It is situated about 200m southwest of The Caves, on the shore platform.



Ferguson's

38°40"10.31"s 145°40"32.88"E

Ground Zero, the site of the original discovery of Australia's first ever dinosaur bone by William Ferguson on May 7th, 1903. The location is some 250m northwest of Eagle's Nest and includes the end of the elevated shore platform and the lower beach level immediately to the west. The site has produced notable specimens including Ferguson's claw and Tim Flannery's allosaurid astragalus.

Tom's layer

38°40"12.45"s 145°39"58.49"E

Notable for the discovery of several bones by Dr Tom Rich, this locality further west of Eagle's Nest has two active fossil layers.

Lesley's Lair

38°40"14.31"s 145°39"53.92"E

Located at the far western end of the rock platform accessible from Eagle's Nest, fossils were first found here by Lesley Kool, and a trial dig was held before the discovery of the main site at Dinosaur Dreaming.

The Arch

38°32"54.18"s 145°27"28.35"E

The site of a prominent natural rock arch, this locality was discovered by the prospecting party of Tim Flannery et al in the late 1970s. It is notable for hosting the holotype of *Serendipaceratops arthurclarki*.

Tree Trunk Point

38°32"36.85"s 145°26"25.80"E

Named because of the presence of several prominent fossil trees embedded in the rock, a trial dig was held at the locality in the early 1990s but not enough material was recovered to warrant anything but further prospecting.

Andrew's Beach

38°32"14.70"s 145°24"59.36"E

Located east of The Punchbowl, this is the site of the discovery of two temnospondyl mandibles, by Andrew Constantine and Andrew Ruffin.

The Haybaler

38°32"14.10"s 145°24"47.84"E

A local story around San Remo describes how a haybaling machine became disconnected from its tractor and rolled backwards over the cliff at this site east of The Punchbowl. Its rusted remains can still be seen. Two fishermen were said to have been sitting there having lunch some 20 minutes before the errant machine landed.

Rowell's Beach

38°32"8.79"s 145°23"29.26"E

Site of the discovery in 1990 of the holotype of *Koolasuchus cleelandi*, this beach is named after Tom Rowell who formerly owned the property above. It is located east of Potters Hill Rd.

Bore Bay

38°32"7.76"s 145°23"13.35"E

Located at the end of Potters Hill Rd, the beach was named in relation to an exploratory coal bore that was put down at its western end in the coal mining days.

Foots

38°32"13.53"s 145°22"19.77"E

Named by local surfers, and located at the far south end of San Remo Back Beach.



I FOUND A FOSSIL!

Nothing compares with the absolute excitement of finding a really good fossil. It's the one time I find that the crew is happy to stop what they are doing and strike a particularly cheesy pose. Here are some of my favourite photos of happy smiling fossil finders



BY WENDY WHITE



Lauren Swann



Gerry and Lesley Kool



Eve Eidelson



Lauren Swann



Joerg Kluth



Sharyn Madder



John Wilkins



Wendy Turner



Fabrizio Giabardo



Kate Jarvis



Nick van Klaveren



Joe Burgess and Mary Walters



Mary Walters



Astrid Fletcher



Toni-Lee Ferrier



Lisa Nink



James Rule



Sean Wright



Keiichi Aotsuka



Lee-Anne Henley



Andrew Giles, Bronwyn Jeynes, Darren Hastie



Jodi Salmond



Kat Rajchl



Alan Tait



Corrie Williams



Nicole Evered



Nick van Klaveren



Andrew Giles



Jeremy Burton



Kim Davis



Bronwyn Jeynes



Alan Evered



Lauren Swann



Mary Walters



Andrew Stocker



Kerrie Lee



Sue Fleur



Joe Burgess



Eve Eidelson



Fotini Karakitsos



Sharyn Madder and Cate Cousland



Wendy White



Kim Cleaver



Darren Hastie



Fabrizio Giabardo



Lisa Nink, Travis Park, Bill Doherty



James Rule



Wendy Turner



Darren Bellingham



Jenna Kapuan



FOSSIL SHARK TEETH VS DINOSAURS

BY SEAN WRIGHT

Ten major differences between collecting fossil shark teeth in Portland and digging for dinosaurs at Cape Otway:

1. Location, location, location.



Sunrise over Portland

2. Fossil medium — soft limestone and beach sand vs rock.
3. Quantities — shark teeth (lots), dinosaur (extremely rare).
4. Variety — see number 3.
5. Quality — There is nothing I like more than picking up a perfectly formed super sharp shark's tooth straight off the beach. Unlike much of the dinosaur material that can only be described as broken bones and shattered dreams.
6. Man power — shark teeth (solitary or not), dinosaur (we need more men/women).
7. Work load — shark teeth (easy peasey), dinosaur (back breaking slave labour).
8. Access — a nice stroll along a golden sandy beach looking for shark teeth, meanwhile climbing over hill and dale and fighting giant tiger snakes to access the dinosaur bone beds.



Exotic Location

9. Tools needed in the field — shark teeth (a bag with more bags in it), dinosaur (complete workshop including power tools and crowbars).
10. Collecting — I do most of my shark tooth hunting about 5 km from home by myself. When on a dinosaur dig, it's traveling to exotic locations and there seem to be people everywhere.



Sean Wright, Lisa Nink, Alanna Maguire and David Pickering with dinosaur collecting equipment

Summary:

I wouldn't have it any other way.

The experiences we share (Mary finding the Ornithopod jaw springs to mind) are unique within our field of interest. The culmination of my annual working holiday and the friends made while searching for our precious bones, in my experience has not been equalled during my lifetime. Plus the major contribution we are all making to our knowledge base of the dinosaur species in Australia is a rare privilege. I am proud to be a part of Dinosaur Dreaming forever.



THE SACRED HOLE OF THE FLAT ROCKS CLAN

BY PEGGY COLE

In a magic place where the past meets the future and the present is forever embracing both past and future there is a clan, a collection, a fossillection of wondrous beings . Sometimes referred to as diggers, the Flat Rocks Clan includes a variety of beings who have assembled from all parts of the land to observe the annual celebration of those who have gone before on this rocky platform of long buried treasures.

The ancestors must be awakened and those thus disturbed and willing to expose their secret past will be disinterred and carefully transferred to a tranquil resting place where they will be treated with respect and awe. To be admired and studied by beings from many lands via a magical communication system. The awakening of these ancestors is not an easy task. It requires great skill and patience. Banging of drums, building of magnificent edifices, singing of strange songs, playing of wiry instruments, even exhortation of spiritual assistance is of no assistance in their awakening.



A circle of rock-breaking stations awaits the crew in 2010



Drawings in the sand in 2008

Physical and tactical powers must be employed by all the clan members to entice these ancestors from their cretaceous tidal tombs to a critical crescendo of palaeontological preeminence.

For future exploits of members of this mystical clan, watch out for:

- Pickersan gets Pirated;
- Round the World with Pricher and Tricher;
- Koolale gets a Noble Prize;
- “Where’s my Rock?”, asks Koolage;
- Wonderwit is headhunted by an interstellar internet dig organization;
- Mariwal embarks on a quest for an Agnathan jaw for the climate skeptic Ichthyology Society;
- Willikers designs the Flat Rocks Memorial Sculpture;
- Alannamag walks a mile in barefeet to raise money for the ‘Save the Stego Foundation’;
- Dorisol and Alatat find soilitude;
- It’s MINE says Nickervan;
- Cleemike finds fossils in the Sea of Tranquility.



John Wilkins at one with the rock in 2008



MOMENTS FROM 20 YEARS OF DIGGING...

BY ALANNA MAGUIRE

As dinosaur dreamers, we love the thrill of the chase and the thrill of the find. We love the feeling that we're helping, piece by piece, to unpack a complex story of evolution and adaptation, survival and extinction. For many of the 350 diggers who have volunteered over the years, that feeling of cracking open a rock and finding a bone that has been hidden for over 100 million years keeps us going back to Flat Rocks time and time again.

But that is not all that makes Dinosaur Dreaming special.

The dig crew is a melting pot. Each year, each week, a weird and wonderful mix of personalities and characters are thrown together – to work side-by-side on the dig site, and to live in each other's pockets in the dig house. Along with the excitement and ingenuity required when fossil-hunting, it is the wild, the wacky and the sometimes cheeky antics of the dig crew that makes life in the Dinosaur Dreaming house particularly memorable.

Here are just a few of the stand-out moments from the past two decades of dig seasons. For each of these, there'll be a hundred more... just ask any digger.

Dinosaur Dreaming isn't just about doing research, it's about communicating it as well. That's why you can often see a journalist or TV crew down on site. Sometimes it's necessary to use analogies so people can get a good idea of what our fossil animals were really like..... though it is still unclear whether Dave's "killer frog" reference to the labyrinthodont or Lesley describing *Qantassaurus* as a "wallaby dinosaur" accurately portrayed these prehistoric creatures.

The media has provided us with good fodder for jokes... like when the Herald Sun mistakenly claimed we were all equipped with miniature jackhammers, it was inevitable that a toy jackhammer would show up on site.



David Pickering with his toy jackhammer in 2008

The swimming hole, just down the beach a bit, has provided hundreds of diggers with a relieving dip on a hot work day. The swimming hole has also been the site of surprises (like when one of the diggers nearly dived into a stingray) as well as shenanigans (like Mary dancing in spilled champagne) something she'd "always wanted to do".

As Lesley describes earlier in this field report, the System was an important part of excavations for many years. Its evolution over the years was partly due to Nick's creativity and partly in response to particular events... like the sight of all of the drums that we'd carefully packed into the hole and secured with tarp and steel girders spewing out at high tide like a yellow and blue volcano. We were fortunate to have found all of the drums washed down the beach the next day, and a new way of securing the system was immediately devised.

Sometimes you have to get a bit creative... when the hole was full of water one morning (as it tends to be every morning when the tide recedes), John Swinkels wasn't to be deterred. He jumped in and started looking for fossils with the aid of a mask and snorkel.



John Swinkels in the Dreaming Pool in 2010

Some years, depending on where we were digging, the first few days of the season would be about removing the overburden so we could access the fossiliferous layers below. This could be back-breaking work, jackhammering the sandstone, gathering it all up and dumping piles and piles of rocks where they'd be washed out to sea. The wheelbarrow was particularly useful for the transportation of rocks... and other things....



John Wilkins and Alan Tait in 2010

Palaeo Barbie is a long time friend of the diggers. Each year she'd be buried in the hole at the end of the season and the following year she'd reappear...

sometimes still in the hole, black from the anoxic conditions, or sometimes down the beach somewhere.



Palaeo Barbie in The Hole in about 2003

Lavington Street was home for many years. The diggers sleeping in tents out the back were particularly fond of a local rooster, Leonardo, who would open his lungs every half hour from 3am. Leonardo mysteriously disappeared one year.... no one claimed responsibility. Shortly after, a rooster themed alarm clock appeared...

Evenings at the dig house were often a source of musical entertainment. We've had many talented musicians in the dig crew over the years – Dylan with his bagpipes, Peggy and her throat singing, Mike with his inimitable renditions of Fergie Tractor... which were so compelling one year that Pip got herself stuck in a chair acting out the lyrics.



Dylan Littlejohn plays bagpipes in 2004

Many a gourmet dinner has been shared at the dig house... though chopping enough onions for the hordes of hungry diggers has been known to get the better of some people. Ingenious solutions were never far away though.... with John Swinkels' ubiquitous goggles once again saving the day. This particular invention stood the test of time.



Unidentified digger circa 2000, John Swinkels in 2008

Some mornings the diggers would wake to find that a mystery sculptor had visited during the night – creating chair sculptures that towered precariously over the backyard.



John Wilkins creates art in 2010

Every year we had an end-of-dig party to which all of that year's crew were invited. These were sometimes elaborate affairs, with great thought and preparation. One year the crew made lot sof piñatas to create a festive air. Other years have seen talent shows.



Caroline Ennis, Sarah Edwards, Andrew Stocker and Jacqui Turney with the piñatas in 2008

On really rainy days when we could neither work on site nor at the house, the diggers would sometimes venture out to explore many treasures to be found in the op shops of the Bass Coast. On one such excursion, we all dug around for costumes for an impromptu fancy dress party. For some reason, all of the gentlemen ended up wearing dresses....



The dig crew frock up in 2003

The diggers who were around for the Spa Era will never forget the sheer luxury of getting home from site – tired, sore and grubby – and spending the evening relaxing in the spa with the picket fence.

Originally rented as a treat for a dig party, some of the crew made sure that it appeared the next few years as well.

‘Bone of the day’ is an honour awarded to the person (or people) who find the most interesting or significant bone each day. The creation of this nominal award created a healthy dose of competition between diggers. Though it was never clear if the arrangement that the bone of the day winner would wear the *Koolasuchus* hat the following day was any sort of reward at all.



Mary in the *Koolasuchus* hat in 2008

We have been fortunate over the years to have many international diggers join the crew, bringing interesting stories, tasty recipes and funny accents., The Japanese Dinosaur Dreamers were among our favourite international crew – they brought interesting perspectives and a whole lot of fun to the dig.



Japanese Dreamers in 2004

Those diggers who were around in 1997 when the first mammal jaw was found will undoubtedly have etched on their memories the look on Tom’s face when he first saw the proof that he’d long suspected about mammals in the Cretaceous assemblage at Flat Rocks. These sorts of moments, when you know that prehistory has just been re-written, are what makes digging for dinosaurs so rewarding and exhilarating.



Tom Rich realises we have a mammal jaw in 1997



DINOSAUR DREAMER'S LAMENT

BY NICOLE EVERED

Because of finds in other seasons,
For that and for other reasons,
The decision by the ‘powers-that-be’ —
“We should dig by different sea

*The ‘14 season would be best
If held at Eric the Red West”*

Down at Flat Rocks no sound occurs
No chat or laughter and no words,
No pumps flow and no hammers ring —
Only the sound as sea birds sing.

For we, who can’t go to the west,
We’ll carry on, we will not rest
‘Til we return, dear Lesley Kool,
To our Dinosaur Dreaming pool.



THE LAST DAY, THE LAST JAW?

BY ASTRID WERNER

It was my last day at the dig of 2013. I planned to go onsite for the morning and leave after lunch. It was going to be hot, so I had my bathers handy.

The morning was uneventful — broke rock, nothing much appeared worth mentioning. I picked up my last rock and went through it methodically when I spotted a tiny cross section. I took it to the authorities at the prep table. It was inspected and with a “yeah we keep it” it was put down on the table for later processing. Ho hum, just another scrappy bit. Lesley was at a distance talking to a group of people. I went back to my spot to finish off my last rock, then packed up and headed for the swimming hole.

Ah, the delight of a paddle and a wallow in the swimming hole on a hot day. Mary and Wendy joined me and after a while we emerged refreshed. Half way back somebody shouted “Lesley wants to see you” followed by Gerry “You’re in trouble”. In trouble? Hardly. Lesley came walking towards me with a big smile on her face holding a piece of rock.



Astrid Werner with her fossil before our swim



Astrid Werner with her mammal jaw

“It’s a mammal jaw!!” she exclaimed. Really? I couldn’t believe it. She showed me the evidence, a tiny tooth which nobody had recognised except for her, the true expert. So finally after fifteen years of digging at Inverloch I had hit the jackpot and joined the illustrious group of mammal jaw finders, which of course is headed by the immortal Nicola Barton who found the first one in 1997.

Tom Rich decided to scan the jaw in the synchrotron in Clayton before having it prepared to see how complete it is. As to identification, all Tom can say is it is an Ausktribosphenid. The scan was done a few weeks ago but the computer data have not been processed yet. So we are still waiting.

The question is: Will this be the last mammal jaw from Flat Rocks? Who knows, but it could well be.



Astrid’s mammal jaw after some matrix has been removed in the lab



by Fil Berguson - Mini Geologist



Hi, Fil here. This year I wanted to share the dig with my friend George for Friends Day 2013



Of course, safety first...



... and staying away from the digger's sand pile.



George thought it was amusing to 'lose sight of the site.'... I still don't get the joke.

Tours with the fine volunteer guides.



We're over here somewhere... I think.



It's hard for us little guys to get in amongst the crowds for talks...



... so we got a close up. Thanks Lisa!



What a great day! George and I had fun. See you all again soon!



CONFESSIONS OF A DINOSAUR DIGGER

BY DEAN WRIGHT

Definition:

par•ty ('pärtē)

Noun: A social gathering of invited guests, typically involving eating, drinking, and entertainment.

Verb: Enjoy oneself at a party or other lively gathering, typically with dancing and music.

Adjective: Divided into parts of different tinctures.

Separate and distinct from other parties; the dig party is most distinctly categorized by the expressions of disbelief on people's faces when you explained what happened there. Responses of, "so you hung out in a spa every night..... at a dinosaur dig?" and "The guys put on a fashion show with excavation machinery.... that matched their cocktail dresses?" have left us all with the satisfaction that despite being amongst the brotherhood of geeks; we have successfully out-partied the most diligent playboy and promiscuous slapper. We are the subject of the phrase; "You have to watch out for the quiet ones."



Mary Walters emerges from the spa in 2001 mysteriously transformed into a stegosaurus



David Pickering, Rohan Long and Mike Cleeland entertain the crowd in 2003

Noun:

Boiled lollies from a diggers girlfriend's store and tangy thins were conscription food. Sometimes there would be cheeses meant to enhance the wine but consumed by everyone; even the beer drinkers and soft drink junkies. Gerry would be busy drinking Merlot, but never failed to sample each bottle that opened and went to the effort of exclaiming a different jest of gratitude to each pourer. The smokers are all pooled around Mary and away from Norman, though he seldom indulges in the frivolities, lest he miss out on his necessary sleep to rise pre-dawn (and this is summer so pre-dawn is very, very early). Most of the parties occurred pre-smartphone so there was no distracted gaze staring into a backlit screen correcting a neighbor with a Wikipedia entry that must be factual because it references a first year's views. It is a gathering of people who have eaten sparingly and worked hard every day so resistance is down, similar to how cults operate, but no one is being fooled and the diggers from the past weeks are filing in and erecting tents to collapse in, bloated from too many of Gerry's sausages.

Though not everyone drinks, they all indulge in conversation, and it is always friendly and engaged. Laughs can be heard from each little section formed around the standard circle created by chairs, and a natural migration occurs when you rise to go to get another drink and someone fills your seat; forcing you to find a new niche group. One year at Lavington Street a small group congregated on the kerb. As a police car drove down the street, one of the diggers leapt up and fled as if he had just been sprung walking out of the house with a DVD player. These events caused

tangents of conversation that resulted in an epilogue unidentifiable from origin. The questions of his responsive reflexes and why the bushes seemed like an opportune hiding place have never been fully answered and so a myth was created, taking on a life of its own, just as in antiquity.

Verb:

As Jimi Hendrix, Bob Dylan, Queen and Nirvana all represent eras and movements, so too does Dinosaur Dreaming have an anthem and an artist that defines the generation. Rohan Long who has recorded his own albums, front-manned his own band and can play any tune he hears is relegated to backup under the pure animal magnetism of Mike Cleeland and his best known cover — Fergie Tractor. No rendition is ever the same, making each year’s anticipated performance a unique experience. If you don’t know the lyrics, you will have learnt, at the very least, the chorus, by the end of the song resulting in a growing voice singing a simple ballad.



Fergie Tractor by Pip Cleeland

The ancient Greek dance of Horosis is lost to the ages. So too is the Agapanthus dance. This mystic shuffle and flow was not passed on. It occurred but once, but that is probably its strength. Some things can not be repeated lest they stop being unique. To determine whether the dance occurred before or after Troy and others reciting ‘Three Little Maids From School’, or after the clarinet rendition of ‘Baby Elephant Dance’, would foster vigorous debate.

Adjective:

Nokatomi Plaza, 1988. John McClane has just thrown a corpse from the 16th floor window onto a police car triggering a hail of gunfire on the unsuspecting Patrolman below. “Welcome to the party, pal” he exclaims cockily. Same words, different scenario. A team of elite diggers navigate the road in a decommissioned Subaru. The headlights are switched off so as not to give away the position. Team Leader (code name: Nyktos) taps his fingers forward signaling the team to advance. They exit the vehicle with direction and purpose — the mission is clear. The team moves into position under the cover of darkness. They check that the coast is clear and the ‘all go’ signal is given. The ‘specialist’ (Codename: Quanta) starts work. She has nimble fingers and quickly transforms the yellow sign warning of wombat crossings into something new. No smudge, detail simple but defined. The sign has been altered. Mission success. The team evacuates, returning to home base. No crew were lost.

The next morning the field crew makes their way to the site. Passing the sign as they do every morning the operation is noticed. In place of a humble wombat is a sign warning of the crossing of *Austribosphenos*, a genus known to be found in the area.



The Austribosphenos sign on the road to Flat Rocks

FASHIONS IN THE FIELD



BY WENDY WHITE - FASHIONISTA

Once again the Dig Crew show that fieldwear does not have to be boring or khaki. Or at least not all boring and khaki.

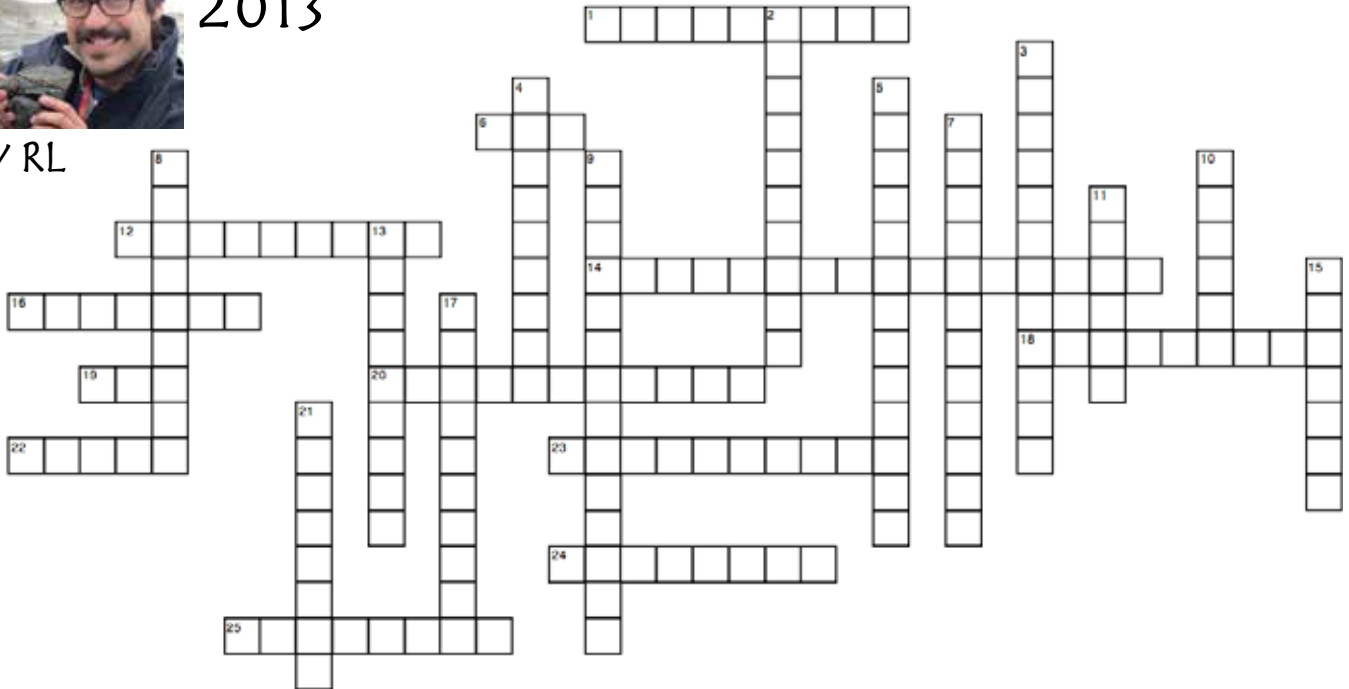


Top Row L-R: Sue Flere teams a jaunty scarf with a pink shirt; Mary Walters models the layered look; Jeremy Burton and Corrie Williams coordinate hi-vis shirts and earmuffs, David Pickering shows off a bandit scarf and a skull T-shirt
Middle Row L-R: Eve Eiedelson in socks, gloves and a hat; Kerrie Lee uses her fieldwear to hide from the camera; Fotini Karakitsos models the latest in wet weather gear, Phil Spinks accessorises with a bucket
Bottom Row L-R: David Pickering shows off his wiper-blade sunglasses; Alanna Maguire and Sean Wright model the summer and winter collections; Jodi Salmond teams shorts, tools and a knitted monkey hat



THE DIG CRYPTIC 2013

BY RL



ACROSS

- 1. *Set my way, o broken testudine!* (9)
- 6. Skeletal element only a ninja would spot. (3)
- 12. Why won't hag give up a section of coal hotspot? (9)
- 14. A United States special: disorganised bistro (phones out of order) harbouring furry bug eater. (16)
- 16. Rustler around here; quick on the draw? (7)
- 18. John or George reportedly tramp after dig deceiver. (10)
- 19. Skeletal element found near ibis rookery. (3)
- 20. Seeker's neck injured at old print outlet on 9-down. (6,5)
- 22. Beach bird is an articulate youngster. (5)
- 23. Gentle seas break on coastal site. (6,4)
- 24. Go to outskirts of Newstead, Western Australia; add sodium to old collection of plates. (8)
- 25. Eccentric Queensland swimmer demands search after airbag. (8)

DOWN

- 2. Talked about curator (the socialist) finds wreck site. (4,3,3)
- 3. Badly need loo brush for undesirable dig by-product... (8,4)
- 4. Grains colour the sedimentary layer. (9)
- 5. "Cor!" laments geo assemblies. (13)
- 7. Head, father and child, to new digs. (4,8)
- 8. A Spanish chicken with herb at 9-down spot. (6,3)
- 9. Scenic route leads to extensive seaway. (5,5,4)
- 10. Modified instrument holds hollow root securing underrated fossil type. (6)
- 11. Push newbie to be a digger. (6)
- 13. Slapping around foremost diggers in Inverloch or Lakes Entrance, perhaps. (9)
- 15. Peak returns around one theropod. (7)
- 17. A scute core breaks at crucial time period. (10)
- 21. Fine formation, awkwardly mounted with terminal flaws retained. (8)

Answers page 70

IN MEMORIAM

HELEN HUGHES

MAY 9, 1945 - MAY 6, 2013

DINOSAUR DREAMER 2009 - 2012

Helen joined our dig crew for rookies training in December 2008 at the Otways. She helped us for three years at Flat Rocks (2009 Week 1, 2010 Week 1 and 2012 Week 3) and another year at Eric the Red West (2011). She will always be remembered for giving us the downstairs fridge, thus singlehandedly easing dig house operations.

When Helen was around, things just got done. The house was a little more organised, and the kitchen a little less feral. At site, Helen could be counted on to ensure that the Rock Rock was clean and the banner was up. Helen would notice what needed to be done and unobtrusively do it.

Helen was a team player without effort or artifice, celebrating the wins of the crew as easily and naturally as her own fossil finds. She was not one to push into the front lines – she let others take the sexy noisy jackhammer jobs. Instead Helen was always ready with a bucket, a shovel, a brush or a broom.

She was more of a listener than a talker, perhaps because she was, after all, a tax accountant, but liked to talk about her family, especially her growing collection of beloved grandchildren.

We were saddened to hear of her sudden death and many of us at Dinosaur Dreaming will miss her very much indeed.



FLAT ROCKS DIG FIELD CREW

1 - 21 FEBRUARY 2013

Marion Anderson	Joerg Kluth
Darren Bellingham	Gerrit Kool
Joe Burgess	Lesley Kool
Jeremy Burton	Kerrie Lee
Tamara Camilleri	Miklos Lipcsey
Hannah Carle	Rohan Long
Kim Cleaver	Alanna Maguire
Mike Cleeland	Lisa Nink
Pip Cleeland	Travis Park
Peggy Cole	David Pickering
Kim Davis	Katerina Rajchl
Bill Doherty	James Rule
Eve Eidelson	Jodi Salmond
Alan Evered	Andrew Stocker
Nicole Evered	Lauren Swann
Sue Flere	John Swinkels
Astrid Fletcher	Alan Tait
Norman Gardiner	Jacqui Tumney
Fabrizio Giabardo	Wendy Turner
Andrew Giles	Nick van Klaveren
Mike Greenwood	Jesse Vitacca
Cindy Hann	Mary Walters
Darren Hastie	Astrid Werner
Lee-Anne Henley	Wendy White
Kate Jarvis	John Wilkins
Bronwyn Jaynes	Corrie Williams
Jenna Kapaun	Dean Wright
Fotini Karakitsos	

OTWAYS DIG FIELD CREW

16 - 24 MARCH 2013

Keiichi Aotsuka	Sharyn Madder
Darren Bellingham	Alanna Maguire
Joe Burgess	Matt McCurry
Mike Cleeland	Lisa Nink
Pip Cleeland	Travis Park
Cate Cousland	Gabby Pavlovic
Eve Eidelson	David Pickering
Toni-Lee Ferrier	James Rule
Sue Flere	Phil Spinks
Wayne Gertz	Alan Tait
Andrew Giles	Mary Walters
Darren Hastie	Astrid Werner
Kerrie Lee	Wendy White
Miklos Lipcsey	Corrie Williams
Rohan Long	Sean Wright

KOONWARRA DIG FIELD CREW

14 - 29 APRIL 2013

Mike Cleeland	Emma Flannery
Pip Cleeland	Ted Inguanti
Liz Ellis	David Pickering
William Ellis	Tom Rich
Tim Flannery	Mary Walters
David Flannery	

WITH DAYS FROM

Darren Bellingham	Kat Pawley
Peggy Cole	Andrew Ruffin
Darcy Duggan	Rolf Schmidt
Mike Hall	Alan Tait
Gerry Kool	Wendy Turner
Lesley Kool	Garry Wallis
Bob McDonald	Jim Warren
Lisa Nink	Wendy White
Mark Norman	



Ornithopod dorsal vertebra found by Toni-Lee Ferrier at Eric the Red West

FIELD CREW PHOTOS

FLAT ROCKS WEEK 1 CREW



L-R Standing: Alan Tait, Norman Gardiner, John Wilkins (obscured), Andrew Giles, Darren Hastie, Rohan Long, Jeremy Burton, Corrie Williams
Second Row: Dean Wright, Sue Flere, Lee-Anne Henley, Mary Walters, Eve Eidelson, Nicole Evered, Lisa Nink
Kneeling: Wendy White, Bronwyn Jeynes, Fotini Karakitsos, Alan Evered, Nick van Klaveren

FLAT ROCKS WEEK 2 CREW



L-R Back Row:
 Lisa Nink
 Dean Wright
 Astrid Werner
 John Wilkins
 Mike Greenwood
 Alan Tait
 Andrew Stocker
Second Row:
 Lesley Kool
 Nick van Klaveren
 John Swinkels
 Jacqui Tumney
 Kerrie Lee
Third Row:
 Norman Gardiner
 Joerg Kluth
 Wendy White
 Joe Burgess
 Gerry Kool
 Jenna Kapuan
 Kim Davis
Front Row:
 Lauren Swann
 Fabrizio Giabardo
 Mary Walters

The Dig Cryptic 2013 Answers
 Across: 1. Otwaymys 6. Jaw 12. Wonthaggi 14. Auskribosphenos 16. Trusler 18. Beetebum 19. Rib 20. Skenes Creek
 22. Noddy 23. Eagles Nest 24. Gondwana 25. Lungfish
 Down: 2. Eric the Red 3. Shoulder Bone 4. Sandstone
 5. Conglomerate 7. Cape Paterson 8. Apollo Bay 9. Great Ocean Road 10. Turtle 11. Shovel 13. Gippstand 15. Timimus
 7. Cretaceous 21. Mudstone

FLAT ROCKS WEEK 3 CREW



L-R Back Row: Lisa Nink, James Rule, Alan Tait, Darren Bellingham, Eve Eidelson, Gerry Kool, Peggy Cole, Alanna Maguire, Travis Park, Wendy Turner, Dean Wright, David Pickering

Middle Row: Kate Jarvis, Norman Gardiner, Nicole Evered, Lesley Kool, Alan Evered, Mary Walters, Astrid Fletcher, Rohan Long

Front Row: John Wilkins, Jodi Salmond, Hannah Carle, Katrina Rajchl, Bill Doherty, Nick van Klaveren

OTWAYS DIG CREW



L-R: Lisa Nink, James Rule, Phil Spinks, Miklos Lipscey, Wayne Gertz, Kerrie Lee, Keiichi Aotsuka, Sean Wright, Sharyn Madder, Wendy White, Mary Walters, Astrid Werner, Alan Tait, Alanna Maguire, Toni-Lee Ferrier, Cate Cousland

