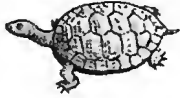

DINOSAUR DREAMING 2015 FIELD REPORT





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FRONT COVER: The crew heads to Eric the Red West to begin the 2015 dig. Photo by Peggy Cole.

BACK COVER: View of the Cape Otway Lightstation, our home for the 2015 field season. Photo by Genevieve Cini.

The Dinosaur Dreaming 2015 Field Report was compiled and edited by Wendy White. Special thanks to my proofreaders, Dorothy White, Mary Walters and Alanna Maguire. Uncredited photographs by the editor.

CONTENTS:

<i>View from the Wrapping Station — Wendy White</i>	4
<i>From the Lab — David Pickering</i>	10
<i>Seen in the Field, Seen in the Lab — Wendy White and David Pickering</i>	14
<i>Research Report — Tom Rich</i>	16
<i>The Mammals of Victoria's Cretaceous</i>	19
<i>Fossil Localities in the Otway Group</i>	20
<i>Fossil Localities in the Strzelecki Group</i>	21
<i>Friends of Dinosaur Dreaming — Lesley Kool</i>	22
<i>Fundraising Report — Darren Bellingham</i>	24
<i>Dinosaur Footprints in the Otways — Mike Cleeland</i>	26
<i>Neat, Plausible... and Wrong — Tom Rich</i>	28
<i>Fabulous Fossil Finds — Wendy White</i>	30
<i>A Tale of Two Digs — Lesley Kool</i>	31
<i>T. Rex and Family — James Rule</i>	34
<i>Dinosaurs at the Wool Museum — Wendy White</i>	37
<i>Dinosaurs: Dawn to Extinction — Jade Koekoe</i>	38
<i>Happy Birthday Koolasuchus — Mike Cleeland</i>	40
<i>Koolasuchus cleelandi — Dylan Cleary</i>	41
<i>Building a Koolasuchus in our Park — Judy Vradenburg</i>	42
<i>Won't Somebody Think of the Slugs? — Melanie Mackenzie</i>	44
<i>Dreams Do Come True — Jade Koekoe</i>	48
<i>My Pretty Mammal Jaw — Livvi Campbell</i>	49
<i>Lisa Almost Got Struck by Lightning — Dean Wright</i>	50
<i>Fashions in the Field — Wendy White</i>	53
<i>Game of Bones — Bronwyn Jeynes</i>	54
<i>A Chance Encounter on a Beach — Toni-lee Millard</i>	55
<i>Diggers' Palaeo Tattoos — David Pickering</i>	56
<i>2015 Dig Cryptic — RL</i>	57
<i>I Found a Fossil! — Wendy White</i>	58
<i>I Found a Fossil (at Flat Rocks)! — Wendy White</i>	60
<i>Field Crew Lists</i>	61
<i>Field Crew Photos</i>	62



VIEW FROM THE WRAPPING STATION

BY WENDY WHITE

The Fossils

The 2015 Field Season yielded some 631 fossils wrapped at site. Even though fossil experts David Pickering and Lesley Kool were unable to attend this year, we still introduced the practice of discarding obviously insignificant shoulder bones at site. This practice was commonplace at our Flat Rocks site, but had been relatively rare at Eric the Red West.

Despite not cataloguing shoulder bones (probably about 10% of the total number of bones found), 631 was significantly more fossils than we had found in any previous season. We had thought 2014 was massive, with 428 fossils, but it appears that the hole crew, led by our irrepressible sedimentologist Alan Tait, had really honed in on a great spot to extract rock.

We do a preliminary classification in the field (mainly for bragging rights) which is corrected and updated by David Pickering and his team back at the lab. Of the 631 Field Catalogue items, this initial classification revealed:

- 547 had a field interpretation as bones (see Figure 1 — note that some of these classifications might be wishful thinking)
- 25 were halves (incomplete fossils where part had been lost or smashed)
- 13 were classified as plants
- 28 were classified as invertebrates (shellfish in this case)
- 2 were collected as “beetle bums” (interesting mineral deposits but not fossils)
- 1 was a line I accidentally left blank (#127)
- 16 were discarded after a microscope check back at the house

Some of you may know that my first (academic) love was mathematics, so I thought it would be fun to classify the Field Catalogue by the things that Lisa and I recorded in it. And, of course, to produce charts. I love charts.

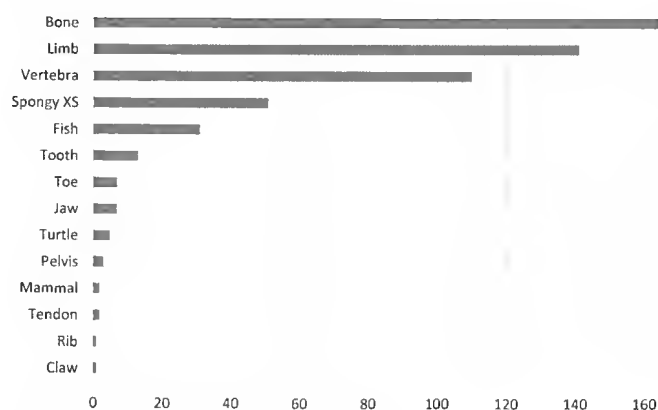


Figure 1: Field classification of bones

I cannot resist making a few comments about this graph. I included hand and feet bones under “Limb”, and we ended up with about 12 a day. Many of the “Spongy XS (cross-section)” bones will also end up being the ends of limbs. Most of the teeth belong to ornithopod dinosaurs, but we also found rarer theropod and pterosaur teeth. “Toes” include both hand and foot phalanges. The “Jaws” are mainly ornithopod dinosaurs, but a few are fish that I was unable to distinguish on site — most are lower jaws (mandibles), and some are the rarer upper jaws (maxillae). Tendons are relatively rare as not all dinosaurs have them and those that do only have them in selective parts of their bodies such as their tails. Mammals are obviously rare, not because mammals were rare in the fauna (in fact, like today, small rodent-like mammals probably teemed in the environment), but because they are so small. We may actually have post-cranial mammal elements in our collection but these have not been identified as mammalian.

I missed the first two days of the dig (returning from overseas), and most of the actual digging of sand. I am reliably informed that the job of digging out the hole was made considerably harder work by the decision to store left-over fossiliferous rock there at the end of the 2014 Field Season



(and yet a number of good fossils including an ornithopod dentary were found in this rock). This rock provided the crew with an immediate source of rock to break whilst the quarry was prepared for the extraction of new rock. Lisa Nink was the fossil wrapper for those two days and did a brilliant job setting up the catalogue. Peggy Cole took on the role of dig photographer for the first days of the dig.

This season, we found a large number of beautiful vertebrae. I really like the vertebrae, even though preparation of most of the vertebrae specimens has been delayed until all the other fossils have been inspected - they take a lot of time to prepare. However, I waxed lyrical on the labels. I labelled the vertebra as cute little, sweet little, pretty, curly and beautiful, and even said they were shaped like a space invader or a jelly fish (sorry, Nicole, for mentioning jelly fish - I know I'm supposed to call them sea jellies now).

We had busy days and lean days. I thought it might be fun to graph how many catalogue items we recorded each day (Figure 2). Note that Saturdays (31 January, 7 February and 14 February) were crew changeover days and Saturday 20 February was clean-up day. On 13 February a lightning storm forced us off the beach early.

We had a number of exciting fossil moments on site.



Photo: P. Cole

Mary Walters and Alan Tait catalogue fossils

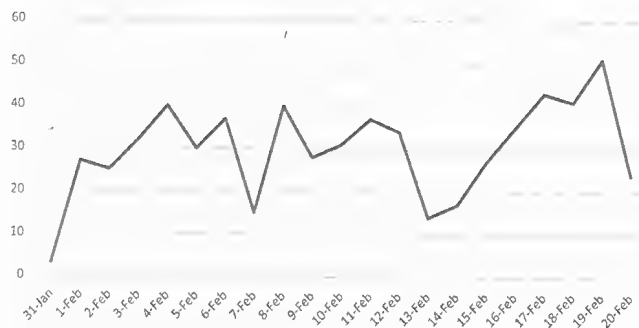


Figure 2: Number of fossils catalogued by day

On Monday 2 February (my first day on site), an unrecorded digger found something I labelled "You sure is ugly" (#41). I am reasonably certain it refers to the fossil and not the digger, but I was really rather jet-lagged. Later that day, an unrecorded digger found a fossil I thought deserved a long description - "Very interesting! Flattened flange which appears to be connected to a 'vertebral' shaped part." Not even sure how I fit all of that on the label (#53). David Pickering has since identified this as an ornithopod surangular (the hinge at the back of the jaw) which has been registered into the museum collection. Great find, Norman.

On Wednesday 4 February, the hole crew presented a fossil centrum/toe to Mary Walters to trim, and Mary immediately pointed to a great big beautiful ornithopod jaw exposed on the same surface. David Pickering provided an update - #125 is in fact the left maxilla of an ornithopod dinosaur with at least 10 teeth in great condition. It is arguably the largest maxilla we have found and has been studied at the Australian Synchrotron. Mary, you rock! The centrum/toe was of little interest. The hole crew looked a bit sheepish at that point. 4 February was a good day - in addition to that beautiful jaw, a possible ornithopod pubis was extracted from the hole (#91), and then Chantelle Roberts found another possible pelvic element (#117).

Livvi Campbell found a mammal jaw on Saturday 7 February (#200) only a few hours after arriving at site. Actually, she initially found half a mammal jaw (a great field identification by Lisa Nink before it even got to me). So we arranged a

couple of searchers to help her look through her rubble, and about half an hour later, James Rule emerged victorious clutching a tiny piece of gravel containing an almost invisible snippet of something that we all agreed looked like enamel. I sent this particular fossil back to the museum individually boxed, hand-carried and hand-delivered by Astrid Werner.

On Sunday 8 February, I once again seemed rather critical of the fossil finds labelling #235 "Orrible spongy plate from hole".

On Monday 9 February, #273 got a label that read "LR spongy long XS". I wonder what I meant when I wrote LR?

Wednesday 11 February saw me label one of Jacqui Tumney's finds as "Blob with dent". Later that day, we extracted an ornithopod femur from hole, with enough visible bone to identify it. Finally! An opportunity for me to wax lyrical about a fourth trochanter and whip out my copy of Galton. Find #345 was labelled "Big flat bone — Mary says tibia, Alan says skull". I am obviously either completely undecided or attempting to keep the peace. I think of a tibia and a skull as things that do not particularly resemble each other.

On Thursday 12 February, Jade Koekoe found the only fossil positively identified as a lungfish tooth on site (#362). It was really attractive, as lungfish teeth often are. Also on the 12 February, #351 was



Andrew Wilson and Giulia Cinquegrana defy the incoming tide

something I labelled "Bone on Rock" — what was I thinking? Of course it's a bone on rock. Maybe I was trying to differentiate from bone IN rock but that seems unlikely.

On Friday 13 February, #385 was labelled "Interesting spongy XS — Mary asks *turtle?*". Apparently Mary got no answer and we sent the unresolved question back to the lab. Turtle? David Pickering has replied, "Turtle or not, #385 was too smashed to reconstruct. Shame."

On Sunday 15 February, James Rule found a "Thing with holes that looks almost like a crocodile scute" (#432). I suspect that it's a fish palate (they're pretty funky-looking) but time will tell.

Monday 16 February, Darren Bellingham found another "Pine Cone" (#448) — not nearly as



Wrapping assistants Jade Koekoe, Jacqui Tumney, Nava Taylor and Pip Cleeland

spectacular as the one that Astrid Werner found last year, but now we have two of them. To be honest, they're probably not actually pine cones, but they have rather spectacular pine-coney swirls. David Pickering tells me that these have been identified by Melbourne University as Araucarian Cones and are well worth having.

On 17 February, we found one called "Bone that was small and round that then became flat" (#487). In this case, an unpromising cross section was given to Mary Walters to break through, to "see if it goes anywhere". And it did.

On 19 February, Alan Tait found a "Lovely little thing with round bits that stick out" (#581), and Jess Parker found an "Enigmatic bone with holes that might resolve into an ornithopod jaw or might not" (#600). Then Alan Tait found "Flat bone (fishy texture) that Alan told the crew was a skull" (#605). It may well have been a skull, but I had doubts. Back in the lab, David Pickering determined that #600 was not an ornithopod jaw. As it was prepared, it became apparent that it was the cervical (neck) vertebra of a pterosaur not previously represented in the fossil record of Australia, and in pristine condition. He promises more news later. Awesome find, Jess.

On 20 February, Tim Ziegler found a fossil (#626) that has made Tom Rich very happy. At the time we declared it a strange tooth, larger than our usual mammal tooth, with what appeared to be

four lumps, and Tom is now reporting it might be in fact two teeth from a monotreme the size of a platypus. And Wendy Turner found #627, "Very dense shaft that Mary couldn't call a tooth". Which means that Mary and I stared at it for some time wishing and hoping before giving up. David Pickering reports that #627 was only a fragment, and will not be kept. Sorry, Wendy.

The Wrapping

With the record haul of fossils, the wrapper job was more intense than ever before. Despite working frantically at times, often well into our breaks, it seemed by the time it came for knock-off there was a backlog remaining, and diggers wanting to get home were watching and waiting for me to finish. Thanks to Nick van Klaveren for making me sneaky cups of tea whilst I was stressing.

This year I introduced the role of Wrapping Assistant, a digger wrenched away from hammer and chisel for a day (usually around morning tea time) and armed with newspaper and sticky tape instead. Besides wrapping and labelling, assistants were tasked with taking photos of fossil-finders, reminding diggers not to hoard fossils until the last moment, and entertaining the head fossil wrapper with amusing anecdotes and character assassinations. They all did an excellent job, and rightly deserve my thanks and that of the crew.



Wrapping assistants Amber Craig, Kim Davis, Chantelle Roberts and Dean Wright

First to agree to undertake the task was Amber Craig who quickly allayed any trepidations I had by working with a care, neatness and precision that surpassed all expectations.

Next up was Kim Davis, and we giggled all day thinking up scandalous gossip such as makeover suggestions for crew members and arguing about who would feature in the dig's most eligible bachelor list.

Chantelle Roberts had a turn, bubbling with enthusiasm. During lulls she gambolled across the rocks with my camera, taking photos for the blog and this report.

Dean Wright was the only male assistant in my posse (not sure why, that's just the way it turned out). Whilst perhaps lacking the delicate fingers of some of the more precise assistants, he nevertheless attacked the role with diligence and charm.

I wasn't intending to use newbies in this role, but Jade Koekoe (who is a librarian-in-training), was so keen to learn about the labelling and cataloguing side of the dig that I gave her a go. Once again the fossils were wrapped beautifully, labelled diligently and stacked carefully in the pack.



Eve Eidelson applies Fossil Finding Fairy Dust to Jodi Solmond



The crew reads our story in The Coloc Herald

Jacqui Tumney is one of the quiet achievers of the dig, and was, as expected, an excellent fossil wrapper.

Nova Taylor took on the job for a day, another wonderful wrapper.

Pip Cleeland brought an artist's eye to the role as we nattered merrily about this and that and wrapped lots and lots of fossils.

Finally, my undying gratitude to Alan Tait, who unfailingly, no matter how long his day had been, helped me to transfer the day's finds to the Field Catalogue and packed fossils in hastily reconstructed boxes with an enthusiasm that made me forget that the rest of the crew had knocked off for the day and was washing off the sand and grit or kicking back with their choice of beverage.

The Equipment

Unlike Flat Rocks (our site near Inverloch), Eric the Red West is off the beaten track, is not ravished by tides and has very few visitors. We can therefore leave some equipment overnight at site above the high water mark. We have been storing low-value fossil wrapping material (such as newspaper, toilet paper, sticky tape, labels and repurposed Chinese food containers) this way. This year these were stored in a bucket whose lid was beautifully inlaid with wood and which was decorated with dinosaur and dragon stickers. This was contributed by Paul and Win Chedghey and much appreciated!



Photo: S. Alkemade

The crew gathers for the morning quiz

This year my major equipment innovation was the introduction of lap-held “Stable Tables” for my assistant and me. After seeing them on special at a discount department store, I thought I’d give them a go. They worked really well, and helped to mitigate the wrapping challenges on windy and drizzly days by providing a dry flat surface.

The Hijinks

The dig is not without its distractions, especially on a quiet fossil day. Each week Alan Tait would run his much-lauded geology tour, and the crew would wander off towards the ocean and stare at rocks.

Sometime in week 1, a game of beach cricket broke out. I was up the other end of the beach when this happened, so am not exactly sure how this occurred, or indeed why.

This year we missed dig regular Travis Park. Travis and his wife Heather welcomed son Lenox John on 31 August. Congratulations Travis and Heather!

It’s always fun to have a birthday on the dig, and this year Billy Parker volunteered his. At his surprise birthday cake that evening, Billy confided to the dig crew that there was nothing he’d rather be doing on the day he turned 20 than finding dinosaurs.

Two separate newspapers interviewed us at site this year. The Age published the story on Saturday

28 February (with video) and The Colac Herald published their story on Friday 13 February. We were a little disappointed that the Colac Herald did not include a picture of Lauren Swann in her dinosaur onesie, worn especially for the occasion.

On 16 February, Tim Ziegler decided that sandwiches were a bit passé and built himself a fancy lunch at site complete with tablecloth, plate and cutlery.

On 19 February, during a lull in fossils found outside the hole, Eve Eidelson decided to fix the dry spell by applying Fossil Finding Fairy Dust directly to the diggers.

Another day, when things were a bit quiet, a few of the crew decided to re-interpret Games of Thrones if it were to take place on a dinosaur dig.

And as always, we had The Quiz. Twice a day, at morning and afternoon tea, the crew would compete to answer newspaper quizzes up to a year old, with no expectation of any prize but glory (and for some subjects - teasing).

References

Galton, P.M., 1974, *The ornithischian dinosaur Hysilophodon from the Wealden of the Isle of Wight*. British Museum (Natural History), Bulletin, Geology, London, **25**: 1-152c



Saraj Alkemade, Eric Khalil, Michelle Agnew and Tim Ziegler cool off in the ocean on a hot day



FROM THE LAB

BY DAVID PICKERING

Museum Victoria Vertebrate Palaeontology Preparation Laboratory — what happens to the fossil you that found after the dig.

At the conclusion of the annual Dinosaur Dreaming Field Dig, after the crew has returned to the “real world”, the work begins for the team at the Museum Prep. Lab.

The daunting task of processing hundreds of new specimens – more than 600 from the 2015 season – will continue long after the 2016 dig commences. It takes many hours of exacting work to prepare even the simplest of small bones. Complicated, intricate specimens can take weeks, even months, to finish.

The problem lies in the fact that the Cretaceous fossils from Victoria are not heavily mineralised and are, therefore, softer than the surrounding matrix. Lesley Kool likens it to “Removing a Mars Bar from a block of concrete”. Only a slight exaggeration! Another factor is that the sandstone conglomerate is resistant to the acetic acid which we use to dissolve rocks like limestone to expose fossils such as Cenozoic whale and Devonian Gogo fish specimens. (The advantages of using this system of preparation is that you can process the fossils in batches and successfully extract extremely thin or fragile specimens.) This means that we have to resort to mechanical means to expose the Dinosaur Dreaming fossils. The main weapons are air scribes (miniature jack hammers driven by compressed air) in a variety of shapes and sizes and, for the really delicate work, pin vices with tungsten carbide sharpened rods to carefully remove the matrix, sometimes a grain at a time. Care must be taken when using the air scribes



Fossils fresh from the field

because the vibrations emanating from the tool through the rock can cause fractures in the fossil before it even sees the light of day.

The use of consolidant chemicals, applied to any exposure of the fossil, helps to resist this disintegration. Plastic beads are dissolved in a solvent such as acetone at low concentration. This solution, when applied, sinks into the bone. The acetone evaporates, leaving the plastic in the structure of the bone. This method has facilitated the extraction of the miniscule mammal jaws from our sites.



Liso Nink and Poul Chedghey lay out wrapped fossils

When the fossils arrive at the Museum from the field they are carefully unwrapped in batches of about 50 parcels. Each specimen is examined under a stereo microscope and an order of preparation priority is established. Specimens of obvious interest and unidentified pieces are high on the priority list. Some are identified as scientifically useless. These are not immediately discarded but carefully broken down in case they contain hidden fossils. Low priority specimens which are probably good enough to be registered and added to the collection but are either fairly common elements or fossils which are complicated, time consuming pieces such as

vertebrae which have been identified as not of a new type. Our aim is to examine all of the parcels to select the most interesting specimens for preparation. This system works only up to a point as there are still 260 out of 600 parcels from the 2015 dig which remain unopened. During this procedure all the fossils are carefully cleaned, any micro fractures glued using cyanoacrylate (high quality superglue) applied with a hair from a paint brush and they are given coats of the bone hardening consolidant (Paraloid B72). This is in itself a lot of work and we have not yet started to get the fossil out of the rock!

Museum No.	Field No.	Identification	Element	Finders
P252007	23	Plesiosaur	Tooth	Helen Phelan
P252006	45	Ornithopoda	Partial left dentary	Norman Gardiner
P251921	50	Ornithopoda	Scapula	
P252018	53	Ornithopoda	Surangular	
P252014	81	Plantae		Steven Bianchi
P252178	121	Ornithopoda	Damaged maxilla	
		Ornithopoda -		
P252003	125	<i>Atlascopcosaurus?</i>	Left maxilla	Mary Walters
P252051	135	Ornithopoda	Pre-maxillary tooth	Mike Cleeland
P252011	192	Plesiosaur	Tooth	
P252207	200	Ausktribosphenidae	Posterior part of edentulous right mandible with 1 detached molar	Olivia Campbell
P252198	224	Ornithopoda	Tooth	
P252038	243	Ornithopoda	Jugal (skull element)	Dean Wright
P252193	247	Vertebrata	Unidentified bone	
P252015	251	Plantae		Astrid Werner
P252016	279	Plantae		Nick Van Klaveren
P252179	297	Vertebrata	Unidentified. Possible skull element	Mary Walters
P251918	308	Ornithopoda	Right femur	
P252005	315	Ornithopoda	Pre-maxillary tooth	Dean Wright
P252228	321	Ornithopoda	Tibia? Limb element	
P252037	344	Dinosauria	Metatarsal	
P252191	347	Ornithopoda	Vertebra, neural arch	
P252002	350	Ornithopoda	Right ilium	
P252010	351	Ornithopoda	Partial right dentary	
P252050	383	Dinosauria	Radius	
P252036	410	Dinosauria	Metatarsal	
		Ornithopoda - possibly		
P252190	435	<i>Leallynasaura</i>	Left femur	John Wilkins, Dani Measday
P251922	443A	Ornithopoda	Pedal ungual	James Rule
P251923	443B	Ornithopoda	Tooth	James Rule
P252017	448	Plantae	Pine cone	Darren Bellingham
P252197	482	Dinosauria	Partial limb. Ulna?	
P252023	500	Theropoda	Limb element	
P252046	514	Teleostei?	Unidentified fish bone	Darren Bellingham
P251919	571	Ornithopoda	Rib with rib head	Mel Mackenzie
P252004	600	Pterosaur	Cervical vertebra	Jess Parker
P252013	612	Plantae		Dani Measday
P252052	626	Monotremata	Tooth. Upper premolar?	Tim Ziegler
P252192	Extra	Ornithopoda	Tooth	Alan Tait

Bones and teeth registered in the Vertebrate Palaeontology Collection

Statistics of the 2015 Dig fossil yield (as of 7 October 2015)

- Total number of parcels (Field Numbers) : 631
- Number of specimens registered into the Museum Victoria Collection : 34
- Number of “Low Priority” specimens for future preparation : 100
- Number of discarded specimens : 241
- Number of parcels remaining unopened : 260

Note for the mathematics compulsives who have calculated that the total number in the various categories (635) exceeds the total Field Numbers (631). The reason for this is that a few rocks contained two registered specimens while some others have been found in the rock broken up here at the lab.

In addition to this tally, 24 specimens of Unioids (fresh water bivalves) were collected and have been registered into the Museum Victoria Invertebrate Palaeontology Collection. Fortunately these fossils require little to no preparation after their discovery.

Field No.	Identification	Finders
24	Unioid	Mike Cleeland
25	Unioid	Mike Cleeland
26	Unioid	Mike Cleeland
28	Unioid	
47	Unioid	Mike Cleeland
67	Unioid	
68	Unioid	
77	Unioid	Amber Craig
113	Unioid	Mary Walters
143	Unioid	Adrienne Mallinson
144	Round shell. Unioid?	
148	Unioid	Pip Cleeland
149	Unioids	
198	Unioid	Mike Cleeland
199	Unioid	Mike Cleeland
262	Unioid	Mary Walters
281	Unioid	Nova Taylor
316	Unioids	
454	Unioid	Mel Mackenzie
470	Unioid	Mel Mackenzie
557	Unioid	Nick van Klaveren
579	Multiple unioids	
584	Unioid	
597	Unioid	

Unioids registered in the Invertebrate Palaeontology Collection



Unwrapped fossils ready for microscope inspection

Here are a few examples of fossils of high interest from the Eric the Red West site in 2015:

P252003. Found by Mary Walters. This is a left maxilla (upper jaw) of an ornithomimid dinosaur. Possibly *Atlascopcosaurus*. The preservation of this specimen is excellent and exposing more than ten teeth with full enamel was a joy. Despite the fact that the piece is fairly complex, the preparation was straightforward as the matrix separated nicely from the bone when touched with the scribe tip. This specimen has recently been scanned at the Australian Synchrotron.

P252207. Found by Livvi Campbell. A right mandible (jaw) of an ausktribosphenid mammal, probably *Bishops*. This is only the second mammal jaw found outside of the Flat Rocks (home of Victorian Cretaceous mammal jaws) Inverloch site. On first inspection I thought that the jaw was edentulous (no teeth) but a single molar was discovered on the counterpart rock split from the



main piece. The first mammal jaws I prepared were stressful occasions but familiarity breeds not contempt in this case, as they will never be easy to prepare, but a nice challenge.

P252004. Found by Jess Parker. This cervical (neck) vertebra from a pterosaur took me by (pleasant) surprise as the piece presented itself as just a fleck of bone. One of a large number that go nowhere but the break up bin. The specimen itself is in superb, near-mint condition which has retained characters that have enabled us to align it to a small group of pterosaurs which are not represented in the Australian fossil record. Once again a fairly complex shaped specimen which was great fun to prepare.

P252052. Found by Tim Ziegler in the last hour of the dig. An upper molar from a monotreme mammal with a passing resemblance to *Kollikodon*. This tooth, which is big by our standards, is like nothing we have found before in the Cretaceous rocks of Victoria. This specimen came in kit form. The tooth itself had fallen out of the rock leaving behind a perfect impression of its shape in the rock but had suffered damage to two of its cusps. While one cusp was repairable the other was not but scanning both object and impression at the Australian Synchrotron has given researchers a perfect image of the complete tooth. "Ericodon" could prove to be a very important fossil.



Preparation tools



David Pickering prepares a specimen with an air scribe

Vertebrate Palaeontology Preparation Team:

David Pickering
Paul Chedghey
Astrid Werner
Geoff Thomas

With assistance from:

Ben Francischelli
Lisa Nink
James Rule
Dean Wright
Tim Ziegler

I wish to thank the team for all their efforts not just in the Dinosaur Dreaming Project but also their work in the preparation and collection of Cenozoic marine mammals, sharks and birds, Australian megafauna and Devonian fish.



**SEEN IN THE
FIELD**
BY WENDY WHITE



**SEEN IN THE
LAB**
BY DAVID PICKERING

We thought it might be interesting to compare what we see in the field with what we can see in the lab. In the field, things are rushed and the sun or rain is beating down, the wind is threatening to blow away delicate fossils and a salty film is slowly covering our hand lenses. In the lab, the light is good, the microscope is expensive and skilled technicians can remove any sand grains obscuring diagnostic elements.

Here is a sample of fossils from the Field Catalogue and their lab notes, about two thirds of the way through initial lab analysis.

Ref #	Field Description	Lab Notes
5	Mary Walters' claw	Not claw. Frag limb element. Discard.
8	Ornithopod tooth 1/2 broken - crown only	Yes, but most crown gone. Discard.
20	2 parts caudal vert	Ornith manual(?) phalanx from left over 2014 rock. Register.
23	Helen Phelans' hollow limb (just shaft?)	Nice plesiosaur tooth — register.
36	Norman Gardiners' poss tooth thero/pleisio	Not tooth or bone. Carbonised stick. Discard.
45	Norman Gardiners' poss crushed jaw (ornith) — interesting	Ornithopod. Partial left dentary. Register.
50	Flat flanged bone (some missing bits)	Ornithopod scapula. Register.
58	Curved toe-bone	Completely maggotted. Discard.
64	Shattered hollow shaft	Went nowhere. Discard.
75	Is this even bone?	Not bone. Discard.
114	Smashed turtly bone	Horrors! Discard.
119	Triangular XS	Wedge of spongiosa only. Discard.
121	Possible jaw plus 2 other bones	Damaged Maxilla. Ornithopod. Register.
130	Fish jaw	Frag. of rib? Discard.
135	Dean Wright's tiny shaft with thick walls in grit	Pre maxilla tooth. Ornithopod. Register.
141	Nick van Klaveren's ornithopod tooth	Fragmented scrap only. Discard.
168	Short spongy limb from hole	Ornith caudal vert. Unfortunately too much missing. Discard.
179	Sweet little vert	Sweet but discarded as it had sustained a direct hit and was beyond repair.
224	Small shaft from hole	Ornithopod tooth. Register.
225	Large caudal vert from hole	Fairly complete ornith. caudal vert.

Ref #	Field Description	Lab Notes
238	Mike Cleeland's dense shaft, poss tooth	Not tooth. Small frag of hollow tube. Discard.
247	Alan Tait's small limb	Unident. Bone. Not limb. Register.
251	Astrid Werner's mega beetle bum	Keep and register. <i>T. rex</i> of beetle-bums.
290	Poss fish small jaw - micro check	Fish but useless. Discard.
301	Crumbly dark flat bone	Interesting. Poss skull plate. Unfortunately lost too much material. Discard.
308	Very big/long limb bone	Ornith. Right femur. Register.
314	Corrie Williams' cute little vert-thing	Too incomplete to assemble. Shame. Discard.
315	Dean Wright's possible tooth	Ornithopod pre maxilla tooth. Register.
317	James Rules' nice rectangular XS from hole	Fishy frag. Discard.
326	Dean Wright's possible tooth	Shattered ornith. tooth. Unfortunately not repairable. Discard.
328	Bean-shaped bone	Goes nowhere. Discard.
338	Corrie Williams' toe bone	Shattered Centrum. Can't fix. Discard.
346	Curvy twisted bone	Mostly missing. Discard.
347	Beautiful "big" vert	Ornith. dorsal vert. Register.
350	Pelvic element	Ornithopod right ilium. Register.
374	Claudia Bowman's smooshed shaft	Too smooshed. Discard.
377	Claudia Bowman's curvy bone	Interesting shaped bone but too damaged to reconstruct. Bugger! Discard
383	Andrew Wilson's limb/process end	Dino humerus. Register.
390	Harry Osmond's pretty little Y-shaped bone	Tip of rib head. Not enough. Discard.
411	Mary Walters' dense flat little bone in many bits	Remains of ornith. tooth. Unrecoverable. Discard.
435	John Wilkins' and Dani Measday's infilled shaft	Ornithopod Left Femur. Register.
440	Darren Bellingham's poss tooth	Not tooth. Silicified wood? Discard.
443	James Rules' 2 bones - 1 poss claw 1 long thin	Pedal ungual + ornith tooth X2 registration numbers.
475	Sharyn Madder's pretty curvy bone	Too much missing. Probably fish. Discard.
489	Interesting little bone with dimples	Unusual structure but unfixable. Discard.
500	Poss tibia or rib from hole	Therepod tibia. Register.
571	Mel Mackenzie's toothy shaft	Ornith(?) rib w head. Register.
596	Nick van Klaveren's maybe-bone in rust layer (Mike says 70%)	No. Discard.
623	Mary Walters' little shaft that might have one end	Shocker of a shaft with no ends. Discard.
624	Wendy Turner's very dense shaft that Mary couldn't call a tooth	Was an ornith. tooth. Crown gone. Discard.



RESEARCH REPORT

BY TOM RICH

For the first time since 2009, fossil mammals turned up at Eric the Red West — two of them. One was a lower jaw of *Bishops*, a specimen of which had been found there previously.

Fossil collecting on the last day of the 2015 dig at Eric the Red West was confined to the morning. The afternoon was spent tidying up the site. It was on that final morning that Tim Ziegler found something that had not been seen in Victoria previously. It was a large tooth of a mammal, in a number of pieces.

To reassemble it, the individual pieces have been scanned at the Australian Synchrotron along with a piece of rock that has a mould of an otherwise missing fragment. From that data, rapid prototype 3D models of the various pieces will be reconstructed at about five times natural size. These pieces will then be assembled to find out what the tooth would look like.

One cusp of this tooth is complete. It bears a striking resemblance to a cusp on an upper molar of a Cretaceous mammal known from rocks at Lightning Ridge, *Kollikodon ritchei*. *K. ritchei* has been interpreted as a monotreme (egg-laying mammal). If Tim's tooth is a monotreme, it is certainly not the common one known from the Cretaceous of Victoria, *Teinolophos trusleri*. In the first place, *T. trusleri* is much smaller than the animal represented by Tim's tooth. The lower molars of *K. ritchei* are quite unlike those of *T. trusleri*, but rather similar to Tim's tooth. Also, *T. trusleri*, being from Flat Rocks, is much older, perhaps as much as 25 million years.

A Cretaceous monotreme much closer geographically, more similar in age and probably about the same size animal as the one that bore Tim's tooth is *Kryoryctes cadburyi* from Dinosaur Cove. However, *K. cadburyi* is only known from a humerus or upper arm bone.

What follows in the next four paragraphs is therefore speculation based on the most slender of evidence, but, in any case, fun to consider.

Although the living platypus does not have functional teeth, there is a specimen of *Obdurodon dicksoni* about 20 million years old that has a skull very similar to the living platypus with one big difference. It has molars and premolars. So the nature of the teeth in the ancestors of the platypus is known. In contrast, while somewhere in the past, the ancestors of echidnas must have had teeth, it is not known what those teeth looked like.

Based on a large mandibular canal or tunnel in the lower jaw of *K. ritchei*, it has been regarded as a monotreme. The teeth of *K. ritchei* are quite unlike those of *O. dicksoni*. So whatever *K. ritchei* is, it is not closely related to the platypus.

Having eliminated platypus as being a descendant of *K. ritchei*, how about echidnas? This is where Tim's tooth and *K. cadburyi* come in.

K. cadburyi, when first published, was only identified as a monotreme. However, when the humerus of it is compared to that of an echidna and a platypus, it is clearly more similar to an echidna. With an echidna-like humerus from Dinosaur Cove and a possible *Kollikodon*-like tooth from 17 kilometres away at Eric the Red West which is about the same geological age, is it possible that at last we are finally seeing what the teeth of the ancestors of echidnas that had them looked like?

To answer that question, a skeleton of the same species that bore Tim's tooth is needed. Might such a specimen be found at Eric the Red West?

What led to the recognition of Eric the Red West as a potentially significant site worthy of a major excavation was the discovery by George Casper in 2005 of a partial skeleton of an ornithopod dinosaur.

In the four subsequent years, two mammal specimens were found near that partial skeleton, in close proximity to a fossil tree stump. The tree stump appears to have acted as an obstruction to the flow of water and resulted in the accumulation of plant debris around it. That debris in turn appears to have ensnared floating vegetation, the carcass of the dinosaur and the mammalian specimens.

As work continued at Eric the Red West and the excavation moved away from the tree stump area to the east, the yield of fossils went down until 2015. What seems to have happened this year is that now the dig has entered another area with fallen logs that also ensnared fossils. Not only did mammals turn up for the first time since 2009, but the number and preservation quality of the individual isolated bones has increased markedly. This “log jam” appears to be far more extensive than the accumulation of plant debris around the tree stump, promising several productive field seasons to come at Eric the Red West.

Most of these isolated bones were those of small ornithopods, as has been typical of all the Victorian Cretaceous sites. But what is more common than previously has been the number of theropod bones.

One of the unexpected prizes of the 2015 field season only became apparent as David Pickering started to prepare a block of rock with only the most modest part of the fossil inside showing. It has turned out to be a cervical (neck) vertebra of a large pterosaur or flying reptile (P252004).

An exquisite maxilla fragment with ten teeth that closely resemble those of *Atlascopcosaurus loadsi* was found by Mary Walters. As that species was first named on the basis of a much less complete

maxilla with fewer teeth that was found only a few kilometres away at Point Lewis, it is not surprising that it turned up at Eric the Red West. The presence of that species at Eric the Red West adds to the likelihood that the partial skeleton found by George Casper a decade ago belongs to *A. loadsi*. The structure of the caudal or tail vertebrae in that specimen is quite unlike those in *Leaellynasaura*, the other small ornithopod represented in the Otways by partial skeletons.

Four partial dinosaur skeletons have been collected from the Cretaceous of Victoria in the past three decades. None have yet been mounted as skeletons in the manner that people expect to see dinosaurs displayed. This has been due in part to the fragility of the fossils. Modern technology promises to overcome this limitation. To this end, during the past year, the Australian Synchrotron has scanned two of them. One is the holotype individual of *Leaellynasaura amicagraphica* from Dinosaur Cove and the other is a specimen known as Noddy found close to the Flat Rocks site by Mike Cleland. While the scan data made by the



Jess Parker in the lab with her pterosaur cervical vertebra

Photo courtesy of J Parker

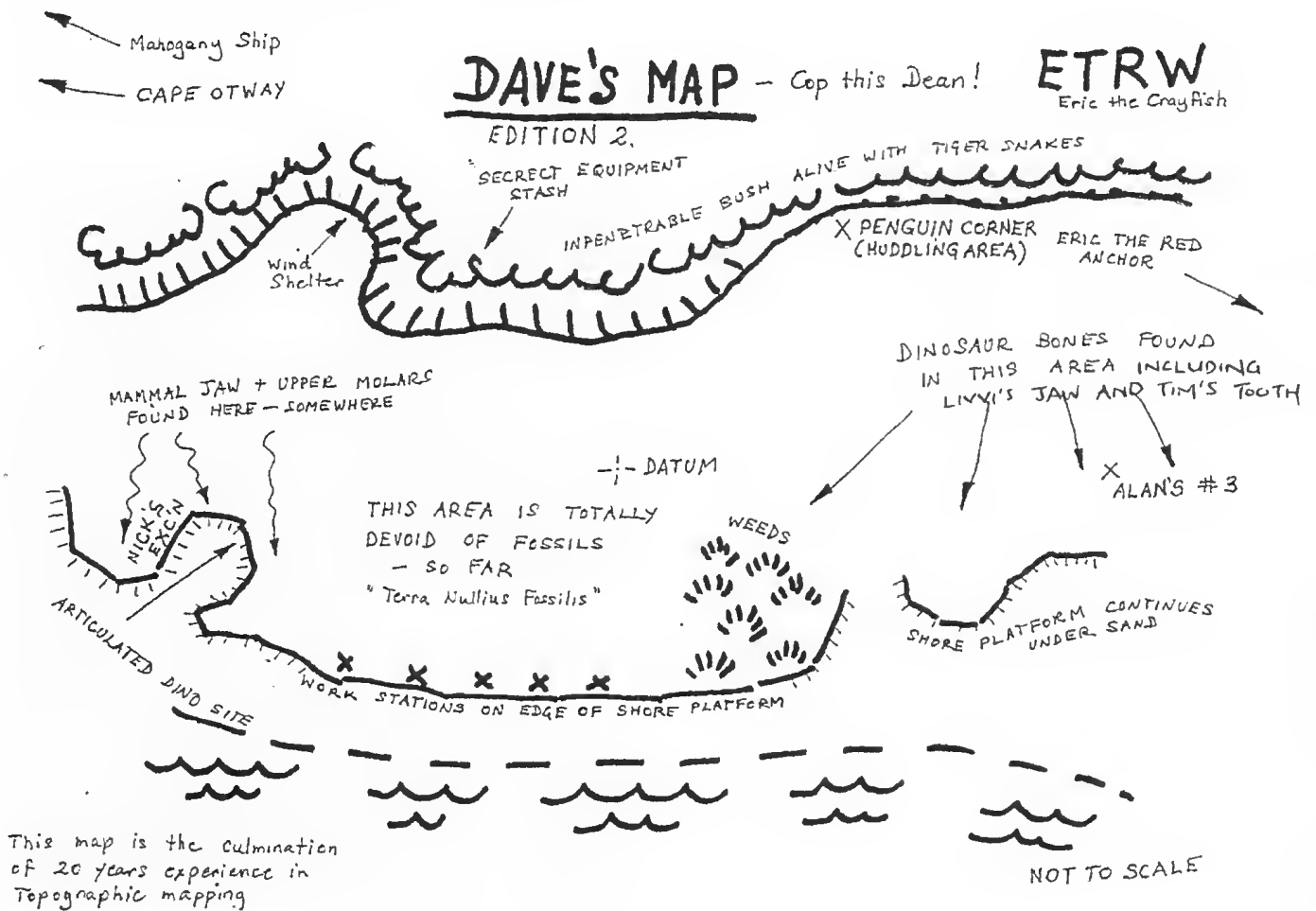
synchrotron exists, more must be done in order to present specimens for display. The data needs to be processed before models of the individual bones can be made with a rapid 3D printer. To do that will take one qualified person about one year. Finding such a person and finding the funds to pay them to do that task is a project now underway.

Knowing the age of fossils is one of the most fundamental aspects of palaeontological research. A long term objective of the Dinosaur Dreaming project has been to date all of the 32 known fossil tetrapod sites along the Victorian coast by investigation of their fossil pollen content. To this end, Dr. Barbara Wagstaff has been awarded a grant by the National Geographic Society to carry out the field work necessary to collect the samples needed and to have them processed by a firm in Calgary, Alberta, Canada. That processing produces slides which Barbara will then examine to identify

the pollen present. Four samples will be collected from beneath each site and four from above to bracket the age of each locality.

The first field trip to start this project was carried out in June in the Otways. More trips to the Otways will be made next summer and in the meantime, trips for the same purpose will sample localities in the Strzeleckis.

In about two years, Barbara plans to produce a report in which the ages of all 32 sites will be tabulated. Once this is done, it will then be possible to examine the collections of not only dinosaurs but all the other fossils to see if there are trends through time that are not now evident because we simply do not now know the chronological order of the various fossil assemblages.



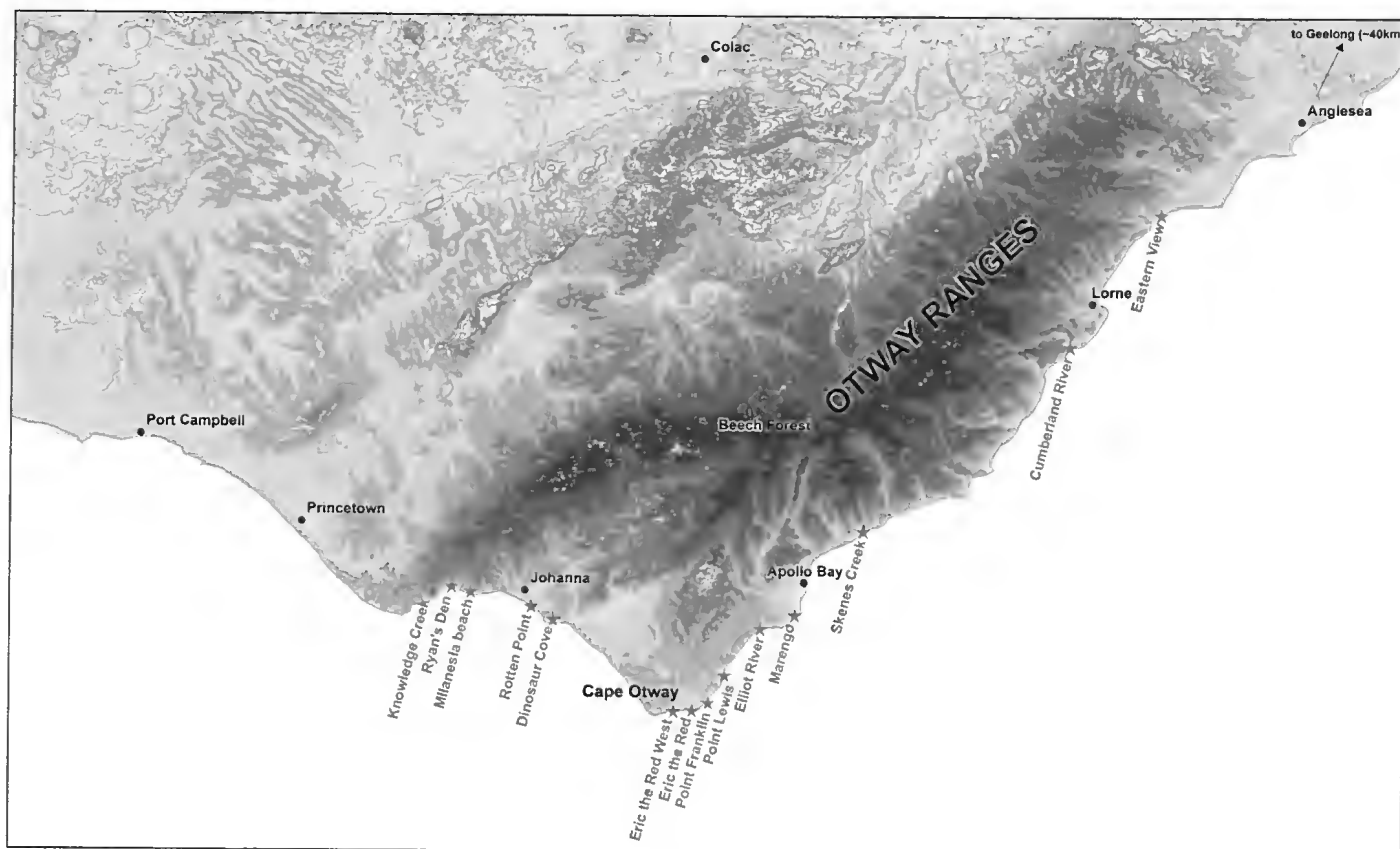
THE MAMMALS OF VICTORIA'S CRETACEOUS

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 from the Victorian Cretaceous, with their Museum catalogue numbers, notes and taxa.

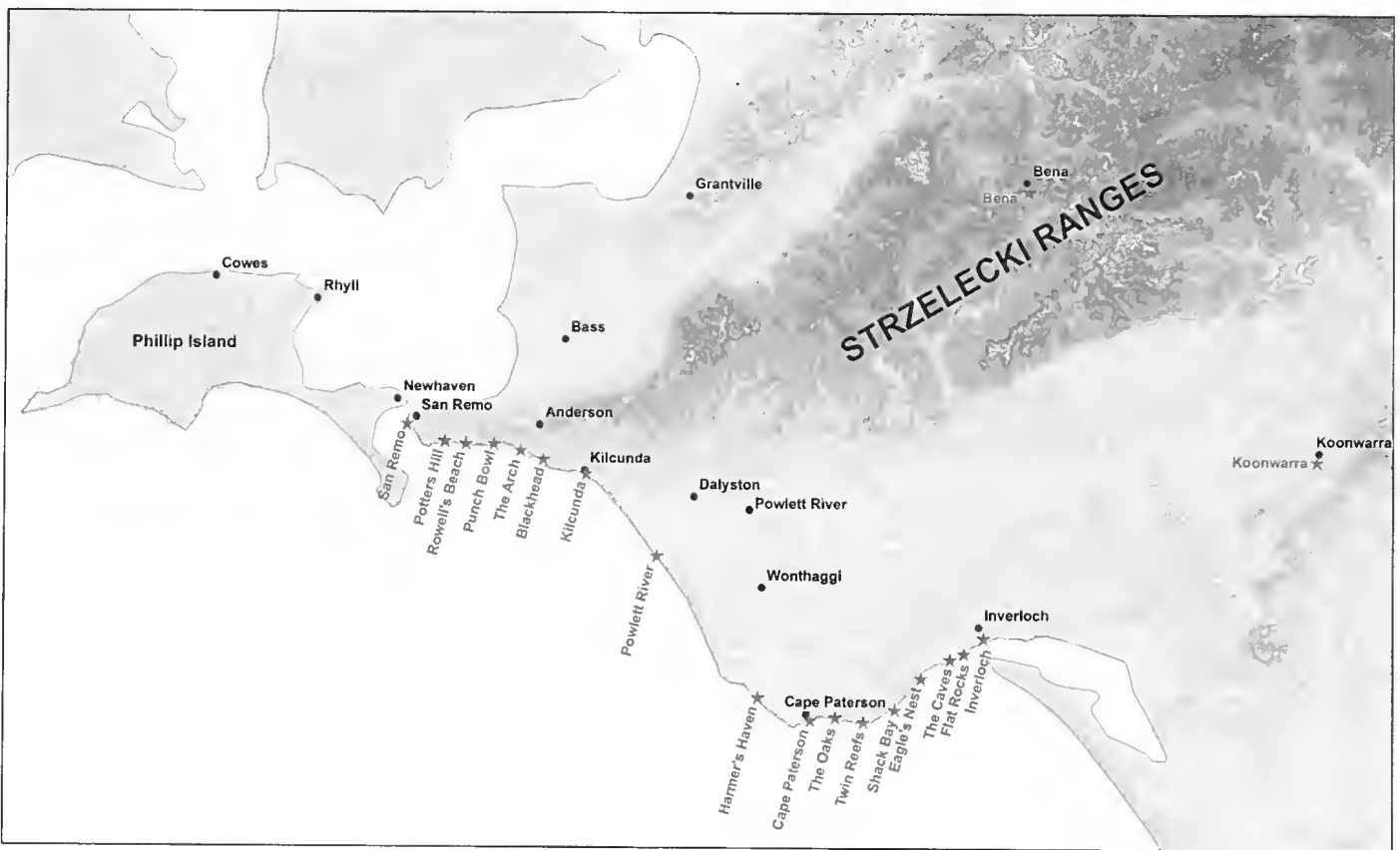
Reg #	Taxonomy	Collector	Field Number	Year	Preparator	Notes
P208090	<i>Ausktribosphenos nyktos</i>	N. Barton	#1111	1997	L.Kool	HOLOTYPE. Right. P6, M1-3
P208094	<i>Kryoryctes codburyi</i>		Dinosaur Cove	1993	L.Kool	HOLOTYPE. Right humerus. Slippery Rock Pillar, Dinosaur Cove
P208228	<i>Bishops</i> sp.		#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	<i>Monotremata</i>		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	<i>Ausktribosphenidae</i> ?	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	<i>Ausktribosphenidae</i>	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 HOLOTYPE. 600my Exhibition display. Left. P2-6, M1-3. (P1 lost since initial preparation)
P210075	<i>Bishops whitmorei</i>		Rookies day	03.12.2000	L.Kool	Initial preparation
P210086	<i>Ausktribosphenidae</i> ?	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)
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>Corriebotoor morywaltersoe</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	<i>Ausktribosphenidae</i>	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	<i>Ausktribosphenidae</i>	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	<i>Ausktribosphenidae</i>		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	<i>Ausktribosphenidae</i>	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
P252052	<i>Monotremato</i>	T. Ziegler	ETRW #626	20.02.2015	D.Pickering	Upper premolar
P252207	<i>Bishops</i> sp.	O. Campbell	ETRW #200	07.02.2015	D.Pickering	Posterior part of right mandible w x1 molar

FOSSIL LOCALITIES IN THE OTWAY GROUP



TAXA	Knowledge Creek	Ryan's Den	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)							X							
<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	X	X	X			
<i>Atlascoposaurus laodsi</i>					X									
<i>Fulguratherium australe</i>					X				X					
<i>Leaellynosaura omicographica</i>					X									
Ankylosaur/nodosaur					X									
Neoceratopsian					X									
Theropoda (Unidentified)					X	X		X						
Spinosaurid					X	X								
Oviraptorosaurid					X									
Ornithomimid					X									
Neovenatoridae indet.					X									
Tyrannosaurid					X									
cf. <i>Australovenator</i>						X								
Other Vertebrates:														
Plesiosauria (aquatic reptiles)					X	X							X	
Crocodylia (crocodiles)					X									
Pterosauria (flying reptiles)					X	X								
Testudines (turtles)		X			X	X	X	X	X					
<i>Otwayemys cunicularis</i>					X									
Dipnoi (lungfish)					X	X								
<i>Neoceratodus nargun</i>					X									
Actinopterygii (ray finned fish)					X	X								
Invertebrates:														
Freshwater crustaceans														
<i>Palaeochinastacus australianus</i>					X									
Bivalves (Unidentified)					X	X								
<i>Megalovirgus flemingi</i>					X									
Trace Fossils:														
Dinosaur footprints	X		X		X							X		
Bird footprints					X							X		
Dinosaur Burrows	X													
Crustacean Burrows: Parastacid	X				X						X	X		

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	Eagle's Nest	The Caves	Flat Rocks	Inverloch	Bena	Koonwarra
Mammalia:																			
<i>Tribosphenic (Unidentified)</i>																			
<i>Ausktribosphenas nyktos</i>																	X		
<i>Ausktribosphenas sp</i>																	X		
<i>Bishops whistmorei</i>																	X		
Monotremata (Unidentified)																	X		
<i>Teniolophus trusleri</i>																	X		
Multituberculata (Unidentified)																	X		
<i>Corriebaatar marywaltersi</i>																	X		
Dinosauria:																			
Dinosaur (Unidentified)	X	X	X	X	X	X	X	X	X		X								
Ornithomimidae (Unidentified)	X	X		X	X	X	X	X						X	X	X	X	X	
<i>Fulgurathrium australe</i>					X										X				
<i>Qantassaurus intrepidus</i>																			
Ankylosaur/nodosaur					X											X			
Neoceratopsidae (Unidentified)									X							X			
<i>Srenedipoceratops arthurclarki</i>					X												X		
Theropoda (Unidentified)				X	X	X	X	X					X	X		X			
Ornithomimid	X					X										X			
Megapaptor	X					X										X			
Ceratosaur	X				X									X					
Other Vertebrates:																			
Plesiosauna (aquatic reptiles)	X		X					X						X		X	X		
Pterosauna (flying reptiles)														X		X			
Testudines (turtles)						X		X		X				X	X	X	X	X	
Aves (birds)																			
Fermospandyl (amphibians)				X													X		X
<i>Koalasuchus cleelandi</i>	X	X	X	X													X		
Dipnoi (lungfish)	X			X			X	X					X	X		X	X		X
<i>Neoceratodus nargun</i>				X															
<i>Archaeoceratodus avus</i>				X															
Actinopterygii (ray finned fish)					X	X		X						X		X		X	X
<i>Leptolepis koonwarra</i>																		X	X
<i>Koonwarra sp</i>																		X	X
<i>Waldichthys oxyops</i>																		X	X
<i>Coccolepis woodwardi</i>																		X	X
<i>Pulchichthys sp</i>																		X	X
Invertebrates:																			
Bivalves					X											X			
<i>Megalovirgus flemingi</i>					X											X			
Insecta (Insects)																X			
Trace Fossils:																			X
Dinosaur footprints																X			
Crustacean Burrows: Parastacid											X	X		X	X	X			



FRIENDS OF DINOSAUR DREAMING

BY LESLEY KOOL

The Dinosaur Dreaming 2015 field season took place at the Eric the Red West site, near Cape Otway, south-west of Melbourne, but we decided to hold the Friends of Dinosaur Dreaming Day at the Flat Rocks site, near Inverloch, as it is geographically closer to Melbourne and more convenient for a one-day trip.

On Sunday 15 March, approximately three weeks after the end of the field trip to Eric the Red West, Friends of Dinosaur Dreaming were invited to join the Dinosaur Dreaming crew at the Flat Rocks site where some of the fossils that had been found during the previous field season were on display. There was still a large amount of rock remaining from the rock fall which had occurred just prior to the Dinosaur Dreaming 2014 field season. It had been stored locally and was transported back to the site for the volunteers to break up. A number of small bones and teeth were discovered including a pterosaur tooth and a small ornithopod dinosaur tooth, both found by ace prospector, Mike Cleeland.



A young visitor tries digging to the fossil layer



A tibia found in the shore platform near Flat Rocks

Mike also led a group of Friends on a fossil hunt to the nearby "Ankylosaur Point", named after the large ankylosaur rib that Mike found there a number of years ago. The fossil layer is quite thin at this locality but new fossil bones are regularly exposed due to erosion. On this occasion a nice ornithopod tibia was discovered and young Dinosaur Dreaming Friend, Ben Landy, helped Mike to remove it from the shore platform.



Ben Landy shows off the tibia from the shore platform



Mike Cleelond shows off o fossil find

A number of other bones were also found, including a small curvy-shaped bone in cross-section, found by John Swinkels, which turned out to be a very well-preserved turtle thoracic vertebra, which made me very happy.

In addition to the regular Friends of Dinosaur Dreaming who visited the site on the day we were delighted to see Nicola and Dale Sanderson and their two children Rowan and Kara. Nicola first volunteered to be a member of the Dinosaur Dreaming crew in 1996 and shot to fame during the 1997 field season by discovering the first mammal jaw from the Flat Rocks site. She met her future husband, Dale, during the 2001 field season and they married in 2003. She missed a couple of field seasons before returning in 2007,



Nicola Sanderson, Lesley Kool, Liso Nink, Dale Sonderson and David Pickering on Friends' Day



David Pickering with o cast of Banjo's forelimb

when, on virtually the 10th anniversary of the discovery of the first mammal jaw, she found the first mammal tooth from an upper jaw at the site — an incredibly tiny (about 1 millimetre across) premolar of the monotreme *Teinolophos* that was not much bigger than the sand grains around it... so Nicola and Dale are always welcome whenever they can join the crew, even for just a day.

One of the highlights of the day was the display of the cast of the fore-limb of the Queensland theropod dinosaur *Australovenator wintonensis*, or "Banjo" as he is known in Winton, where he was found. During the Dinosaur Dreaming 2014 field season a beautifully preserved theropod dinosaur claw was found and featured on the cover of the 2014 Dinosaur Dreaming Annual Report. Comparison with Banjo's claws show that the Victorian theropod dinosaur was very similar to Banjo, even though it is nearly 20 million years older. David Elliott, director of the Australian Age of Dinosaurs in Winton, Queensland, kindly sent a cast of Banjo's arm to Museum Victoria, complete with claws. David Pickering brought it to Friends' Day, along with a cast of the claw from Eric the Red West. It was amazing just how similar the claws were and the Friends and crew of Dinosaur Dreaming got the thrill of seeing these specimens which are normally locked away in Museum Victoria's Comparative Collection.



FUND RAISING REPORT

BY DARREN BELLINGHAM

It is April 2015. Another successful dig at the Eric the Red West fossil site near Cape Otway is completed. Over 600 bones are catalogued and some promising finds are in the lab under the Royal Exhibition Building, including a mammal jaw, a mammal tooth and one of the best dinosaur maxillae ever collected in Victoria. Little did we know that a pterosaur neck vertebra was waiting to be uncovered by the middle of the year. This is why we do what we do. Tom Rich has already decided it will be well worth organizing a field season in 2016. But, in April 2015, we became aware that there was a problem. The money available in 2016 will not be sufficient to fund our field season. In 2015, Dinosaur Dreaming volunteers were invited to contribute to the dig — not a huge sum but clearly a sign of dwindling resources.

In 2007 (whilst the main dig was still at Flat Rocks) there was a similar funding shortfall and that November (on what turned out to be the day of the federal election), an auction was held and raised over \$11,000 (including a large contribution from the sale of a sketch by Peter Trusler) but this was a lot of work and the core members of the Dinosaur Dreaming dig crew had vowed never to do it again.

So in May and August, Dave Pickering invited a number of volunteers to discuss what could be done.

Jacque Smith, who works at the Rivoli cinema in Camberwell, organized a private screening of "Jurassic world" on Monday 15 June, soon after it opened. Paleontologist Tom Rich gave a short talk about our dig prior to the film. Jade Koekoe



Darren Bellingham at the Wool Museum

created flyers and Nicole Evered and I ran a raffle (first prize a 3D-printed copy of the *Australovenator* claw found in 2014) and a bookshop on the night. A total of 153 people attended, and we raised over \$2,800. The raffle was won by Nicole Evered (no, it was not rigged, we got a punter from the crowd to pick out the ticket). Dinosaur Dreaming would like to thank all those who attended and particularly Jacque and the Rivoli management for allowing us to run the event. All agreed that this was a great way of raising money. We plan to have another film night soon.

We decided that we should promote Friends of Dinosaur Dreaming around the Otways area by contacting local governments (especially local libraries) and using our contacts in Apollo Bay community radio. We plan to contact the larger businesses in the Greater Otways area to gather donations and sponsorships — for example, there are some large dairy companies in the area who may be interested. Door-knocking some of the retail businesses in Apollo Bay and Lorne might yield donations or support through displaying our Friends material. It was decided that our Annual Friends' Day will be held at Eric the Red West and that continued attempts to recruit new Friends from the areas close to that site will be a priority. We are considering a small permanent display of casts and fossils and sales of calendars and books at Bimbi Park (which we use as a base during the dig).



The *Wildlife of Gondwana* exhibition opened at the National Wool Museum in Geelong in July 2015 and Pat Vickers-Rich has organized for applications to join Friends of Dinosaur Dreaming to be available there. The Wool Museum is keen to have some Dinosaur Dreamers attend the exhibition to talk about the dig and promote the Friends. We plan to have some volunteers there during the Christmas school holidays.

The crew had a lively debate about crowdfunding — a good idea but it might take more than 12 months to reap rewards. As a start, Tamara Camilleri has set up a Dinosaur Dreaming twitter account and has been tweeting as DinosaurDreaming (@DinoDreams1).

As a first step in exploring whether online advertising funding is worthwhile, Wendy White monetized the Dinosaur Dreaming blog (which means it now has advertisements). The blog has over 100,000 “all time” page views. Monetizing it has, in its first month, raised about \$20, which may not be much, but hopefully it will increase in the dig season when we post more often.

In August, long-term Dinosaur Dreaming volunteer Dean Wright received \$500.00 from the *AusNet*

Services' Community Cornerstone Program on our behalf. In a little over two months we had banked over \$3000.00. *Ka-ching!*

Mike Cleeland is working on a Victorian dinosaur calendar, and feels that he could have one available for 2016. Dave Pickering is exploring an idea to put our dig T-shirt illustrations on a calendar for sale. A dig bandana featuring the 2014 claw is in the pipeline.

As a friend or volunteer you can do your part to help fund the dig. Make sure you tell friends, family and workmates (particularly those with young children or who live in southwestern Victoria) about Friends of Dinosaur Dreaming and the advantages of membership, including a copy of this report and the opportunity to visit a real dinosaur dig! A membership for your child or grandchild, nephew or niece would make a unique Christmas or birthday gift. On the home page of the Dinosaur Dreaming website www.dinosaurdreaming.net, there is a link to the membership form. Keep an eye out for other fundraising activities and check the blog every now and then.



DINOSAUR DREAMING

Presents

A Jurassic World screening

introduced by Dr Tom Rich
Curator of Vertebrate Palaeontology,
Museum Victoria

Where: Rivoli Cinemas, Hawthorn East

When: Monday 15th June

Time: 6:30 pm

Price: \$20 at the door

Pre-booking: <https://www.stickytickets.com.au/27015>
\$20 plus \$1.50 booking fee

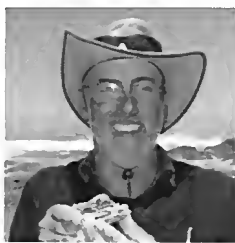
All proceeds will support Dinosaur Dreaming in their search for real dinosaurs in Victoria.

DINOSAUR DREAMING 

MONASH University

 MUSEUM VICTORIA

The Dinosaur Dreaming fundraising movie night flier



DINOSAUR FOOTPRINTS IN THE OTWAYS

BY MIKE CLEELAND

Before 2010, which marked the discovery and collection of tracks from Milenesia Beach and Dinosaur Cove, dinosaur footprints had been reported from three localities in the Otways.

First Locality

An isolated print was found by Tom Rich at Knowledge Creek, west of Dinosaur Cove, and removed by hand at the time. This medium sized ornithopod print has been cast and is widely available as a display item.

Second Locality

In February 1978, a report was received of the discovery of a trackway at Skene's Creek.

To quote from a memo written by Dr Tom Rich to the Director of the Museum:

On 15 February Mr Arthur Edgerton... showed me two photographs of a trackway he had photographed last January on the beach near Skene's Creek east of Apalla Bay. On the basis of these photographs a first hand investigation appeared warranted and Mr Edgerton agreed to take me to the site two days later.

About an hour and a half was spent at the site on 17 February attempting to relocate the trackway. Unfortunately the effect of a late December storm that had removed much sand from the beach and enabled Mr Edgerton to make the initial discovery had been subsequently undone by the transport of new sand into the area. However, during the visit, it became clear by comparison of the photographs and the exposed rock that the trackway was preserved not in recemented Holocene beach sand ... but in the Cretaceous Otway Group itself. The only puzzling thing about this occurrence is

that there are no more trackways preserved on the exposed rock which appears to be practically identical with what appears in the photographs. There are ripple marks preserved on this rock but the absence of any other trackways is the reason for retaining some degree of scepticism until the original trackway is rediscovered.

Because Mr Edgerton visits this area twice a year, it is likely that in the not too distant future, the trackway will be rediscovered by him. The area under the sand where the trackway is thought to occur is approximately 20 x 50 metres. The individual tracks themselves are about ten centimetres long with three toes splayed out and a fourth circular "heel" mark at the back. It is doubtful whether these tracks can be identified beyond Tetrapoda, they could be birds or dinosaurs. Mr Edgerton has kindly donated his original photographs to the Museum and has agreed to loan the negatives should they be needed in order to produce a higher quality, detailed print.

Thirty-seven years later, nothing further has come to light about the mysterious Skene's Creek trackway, or the photographs. Neither can Mr Edgerton be traced.

On one occasion, Tom Rich took me there and showed me the site where, as best he could recall, the footprints had been. It was on the rock platform some 300 metres west of the point where Skene's Creek crosses under the Great Ocean Road. Ripple marks were evident in the sandstone there, but prints were not.

More recently Nick van Klaveren told me that he had seen the photographs at or about the time Mr Edgerton brought them in, and that the site was actually further east, only some 100 to 150 metres west of the point where the creek flows under the road. His recollection was that the trackway was oriented in a roughly northwest to southeast direction.

I've visited the Otways almost every year since 1989 and invariably stop at Skene's Creek, ever hopeful that the sand will be scoured away and

the enigmatic trackway will again be revealed. Yet not once have I seen anything that looks even suspiciously like a print at that site.

What will the future hold for the Skene's Creek trackway? Will some lucky prospector be on hand for a storm erosion event? Do the prints still exist, or have they been lost to erosion during lonely periods of unobserved exposure in the 37 years since 1978? Whatever the outcome, I hope I'll still be visiting the Otways in 2052, 37 years ahead.

Third Locality

In early January 1989 the exquisitely named Mr Helmut Tracksdorf was holidaying in the Otways when he discovered three prints in the Cretaceous sediment near Browns Creek.

To quote from his account:

The locotion could be more occurotely described as Browns Creek which is locoted on the Great Ocean Road bock towards Lorne.

From Skene's you trovel post Petticoot Beoch ond then just around the corner is Browns Creek. No more than 2 kilometres from Skene's Creek.

I cannot recoll if the prints were heading towards the rood or towards the oceon.

The distance between the two main prints was ot leost 1 metre.

I recall more than two prints (three to be exoct), which were in olignment but only two prints were close (os depicted in the photos) ond a third print further owoy (up to five metres owoy) however the olignment was definitely in one direction. The quality of the third print was very poor os wave erosion hod taken its toll on the specimen

Lesley Kool recalls:

A group of us, including Nick von Kloveren, returned to Skene's Creek some time loter (probably during the 1989 dig) ond locoted the prints. There was one that was quite distinct, showing three toes and o heel. The second print was much less distinct, moinly o heel impression, but we collected it os well and they ore currently housed in the Vertebrate Poloeontology collection.

The specimens are today catalogued in the Museum as P208232.

Paleoichnologist Tony Martin compares the Knowledge Creek print with the Browns Creek trackway and notes that:

These two tracks – separated by quite o few kilometers – are nearly identical, so they were likely made by very similar dinosaurs.

Helmut's brother returned to the site in 2013 and was able to relocate the sawcuts showing where the two prints had been removed.

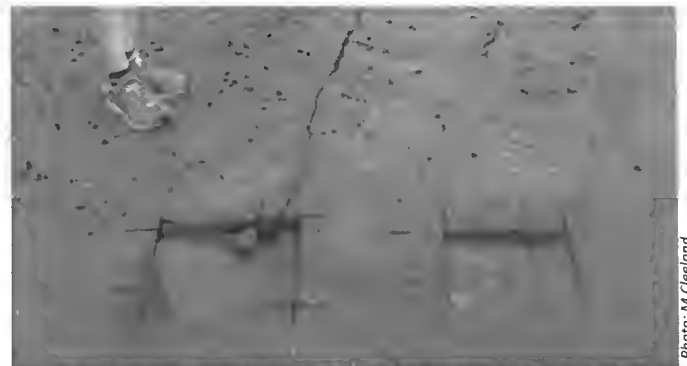
In February this year, I also relocated the footprints, or at least the site from which they were removed. The location is about 150 metres west of the outlet of Browns Creek. Nick's sawcuts from 1989 were plainly visible on the ripple marked shore platform, and little erosion seemed to have occurred in the ensuing years.

This is both good and bad. Good because it allows us to relocate the original site of the trackway; bad because it means new tracks are unlikely to have been exposed.

Time, however, is on our side. The ripple-marked sediment on the shore platform extends east and west from the site of the original discovery. Who knows what it may yet reveal to the next generation of prospectors in the Otways?

Reference:

The Great Cretaceous Walk; Adventures and Misadventures of an American Palaeontologist in Australia.
www.greatcretaceouswalk.blogspot.com



Saw-cuts show the position of the footprints at Browns Creek

Photo: M Cleeland



NEAT, PLAUSIBLE... AND WRONG

BY TOM RICH

Palaeoclimatology and Dinosaurs in South-east Australia EDMUND D. GILL*

By relating a number of recent publications, it appears possible to answer a question which has puzzled many for a long time. Why is it that reptilian fossils are practically absent in the extensive Lower Cretaceous deposits of Victoria, while they are so much better represented in rocks of the same age in the northern part of the continent? It is not through lack of availability of outcrops, because in both South Gippsland and the Otways the rocks are accessible in extensive cliffs, shore platforms, valley walls, roadcuts and (formerly) in mine workings. It is not through lack of looking, because many professional and amateur geologists have made extensive and purposive searches. Overseas scientists have looked, believing that their particular methods would succeed where ours have failed. All have agreed that the environment was suitable for preservation. However, the only finds in Victoria are a single claw from a small dinosaur found last century near Cape Paterson in Gippsland (Woodward, 1906; refigured Gill, 1965), and a small humerus of rather uncertain affinities found by Mr T. Bryan in 1949 in the same area, and examined by Dr E.H. Colbert who stated it may have belonged to a saurischian dinosaur (perhaps a small theropod). Following this discovery, a group (including the author) spent December 2–5 of that year hunting for further bones without success.

The important find in 1962 of fossil fish (Gill, 1965; Waldman, 1971), insects, a king crab (Riek and Gill, 1971), other arthropods (Talent, 1965) and bird feathers (Talent *et al.*, 1966; Waldman, 1970) at Koonwarra in South Gippsland is notable, but no reptile was found at that site. The only further reptile to come to light in the Lower Cretaceous beds of Victoria is a chelonian in western Victoria (Warren, 1969). In the same region a bird feather was found early in the century (Chapman, 1910).

In recent years the writer has examined in other connections the coast of South Gippsland (Gill, 1967) and the Otways (Gill, 1971; 1972) but at the same time continued the search for fossil bones. The examination of these well-exposed rocks for over a century by many people, with many specific searches for fossil bones, yet with negligible finds, must now be regarded as significant.

* National Museum of Victoria, Melbourne.

RESEARCH COMMUNICATIONS



However, the synthesis of palaeomagnetic, isotopic, and palaeontologic evidence now appears to provide an explanation.

Palaeomagnetism

Wellman, McElhinney and McDougall (1969) defined the polar-wander path for Australia as presently understood. Their Figure 10 places the South Pole south-west of New Zealand and south-east of Tasmania in Lower Cretaceous time. The implication is that south-east Australia was close to the South Pole, and therefore the climate would be unsuitable for reptiles, since they are poikilothermic. However, in northern Australia the country was sufficiently removed from the Pole for large reptiles to succeed, for example the plesiosaur *Woolungasaurus*, the ichthyosaur *Myopterygius*, the pliosaur *Kronosaurus*, and an Iguanodontid of about 35 feet in length (Hill *et al.*, 1968). *Walgetosuchus* is recorded from Lightning Ridge. The evidence suggests that there existed an overall temperature rise from the South Pole along a north-west trending gradient (Fig. 1).

Palaeontofogy

In addition to the evidence of the large reptiles, information has recently become available from other groups of fossils. Dealing with the foraminifera, Scheibnerova (1971a, b) states 'the existence of climatic zonation during Cretaceous time is accepted, and the existence and development of world-wide distribution of planktonic foraminifera in the Cretaceous is discussed, as well as foraminiferal zonation depending on temperature difference due

to palaeolatitudes. On the basis of micro-faunal assemblages the environments of the Great Artesian Basin sedimentary area during part of the Cretaceous (Aptian-Albian-Lower Cenomanian) is classified as marine, shallow and cold in comparison with the Tethyan areas.' Numerous fossil insect larvae, including stone-flies, were found at Koonwarra in South Gippsland, which also suggests a cold climate.

Oxygen isotope palaeotemperatures

Scheibnerova pointed out that the oxygen isotope palaeotemperature measurements so far carried out are in keeping with a temperature gradient such as is shown in Figure 1. These results are summarized for ready reading in Table 1. All are assays on the skeletons of free-swimming cephalopods (Belemnites).

The palaeotemperatures shown in Table 1 were determined on samples from six localities which form two palaeoclimatic zones. If one follows the thermal gradient from the south-east to the north-west the first group is that at Lake Eyra where the temperatures range from 13.7° to 16.5°C, and next Oodnadatta with a figure of 21°. On a similar palaeolatitude at Hughenden, the temperatures range from 15.2° to 16.2°. On a higher palaeolatitude are the determinations from the Murchison River 17.5° to 26.1°, and Giralda 20.3° to 30.1°. Assay of the various belemnite skeleton layers shows that there were seasonal variations in temperature, and because the seas were of the shallow continental type, a good deal of variation would be expected due to microclimates. Thus although the number of assays is limited and they are spread over a great area, the general increase in temperature range is probably significant and certainly fits in with the other evidence outlined. Stevens (1971) considers that the New Zealand climate at this time was cool-temperate.

Australian Cretaceous birds

While the reptiles found the temperatures of south-east Australia in Lower Cretaceous times inimical to their way of life, it is interesting to note the presence of birds as indicated by the three feathers discovered at Koonwarra. The function of feathers is to trap a layer of air and so insulate an organism with a temperature appreciably above the ambient temperature. The fossil feathers may be assumed to indicate the presence of a warmer temperature organism, even if not of such high body temperature or of such well-controlled temperature as modern birds. It is significant that fossil birds are found in this cold climate relatively close to the

My predecessor's predecessor as curator of palaeontology at the then National Museum of Victoria was Edmund D. Gill. In 1972, he addressed the question of why specimens of dinosaurs were all but unknown in south-eastern Australia. He masterfully summarized in just two pages the

relevant evidence known at the time and his reasoning was impeccable. It is an excellent example of good science. The case was well laid out and it was possible for new evidence to disprove the conclusions. An hypothesis that cannot be tested by evidence is not science.

About a dozen years later by which time it was clear that there was a significant record of dinosaurs in Victoria, we had lunch together. He remarked with a smile, "you have proved me wrong." That my colleagues and I had done so did not bother him at all. Rather, he was pleased to see this new knowledge come forth. At the time he wrote the article, he honestly thought it never would.

TABLE 1 Cretaceous Oxygen Isotope Temperatures

ZONE	AREA	AGE	°C	REFERENCE
1	LAKE EYRE, SA			
	Primrose Springs	Aptian	13.8	Dorman & Gill, 1959
	Wood Duck Cr. and Peake Stations		15.0	
	Lake Eyre		16.5	
	Lake Eyre		13.7	
OODNADATTA, SA				
	Fossil Creek	Albian	21.9	Bowen, 1961
	HUGHENDEN, OLO	Upper	15.2	Lowenstam & Epstein, 1954
		Albian	16.2	
	ROMA, OLO	Aptian	21.2	Dorman & Gill, 1959
2	MURCHISON R., WA	Albian	17.7	Bowen, 1961
	W. of Murchison House Station	Turonian	26.1	
	N. of aerodrome		± 18.8	
	Nearby locality		17.5	
	Lower Murchison River	In Albian Maestrichtian range	± 19.8	
	GIRALIA, WA	Albian	20.3	
		Turonian	30.1	

SUMMARY: Palaeoclimatic zone 1 13.7 – 21.9°C
 Palaeoclimatic zone 2 17.7 – 30.1°C

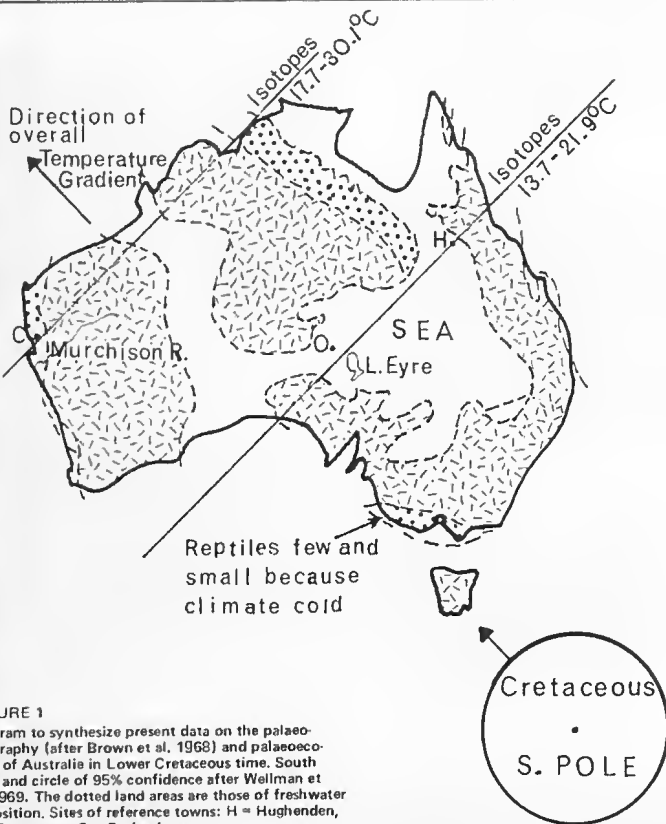


FIGURE 1
 Diagram to synthesize present data on the palaeogeography (after Brown et al. 1968) and palaeoecology of Australia in Lower Cretaceous time. South Pole and circle of 95% confidence after Wellman et al. 1969. The dotted land areas are those of freshwater deposition. Sites of reference towns: H = Hughenden, C = Carnarvon, O = Oodnadatta.

South Pole of the time.

The oldest known birds in the world are from the Upper Jurassic, not very much older than the birds found in Victoria. As so little is known about the early evolution of birds, it could be that they originated in Australia and not in Europe as is usually supposed. It could be that it was the struggle of the reptiles to survive in this cold climate that led to the evolution of feathers, and so the possibility of maintaining a higher temperature. The higher body temperature would prevent immobilization by the cold. Whether the earliest birds migrated into Australia or out of it, one wonders what their route was. With their very limited powers of flight, they could not cross any wide sea, or perhaps any sea at all. As yet we know little of these matters. However, they stimulate the search in Australia for better remains of the early birds. Sediments that were fine enough to preserve feathers with detail, and of sufficiently low dynamics not to destroy these fragile remains, could well fossilize the skeletons of these early birds. After all, the extremely fine bones of leptolepid fish have been conserved in these rocks. There is no reason why the skeletons of these birds should not be preserved somewhere, and this fact stimulates further search.

Submitted 14 January 1972
 Re-submitted 25 September 1972

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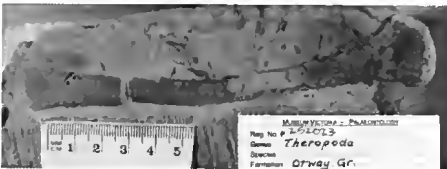
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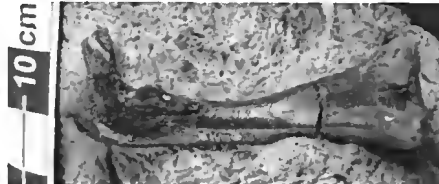
FABULOUS FOSSIL FINDS



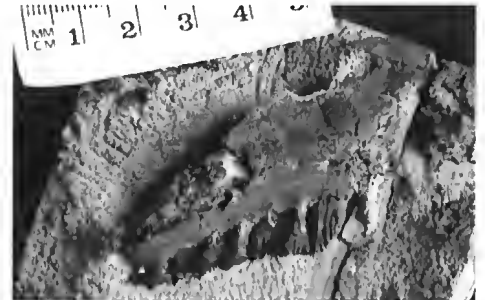
BY WENDY WHITE



P252023 Theropad tibia (#500)



P252190 Ornithopad femur found by John Wilkins and Dani Measday (#435)



P252003 Ornithopod maxilla found by Mary Walters (#125)



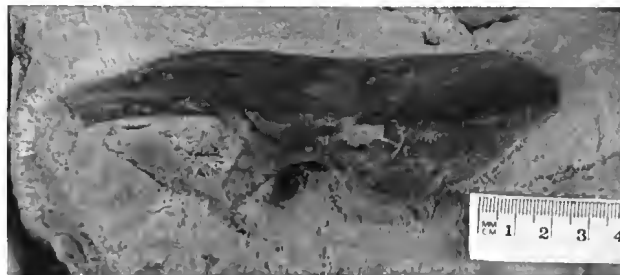
P252007 Plesiasaur tooth found by Helen Phelan (#23)



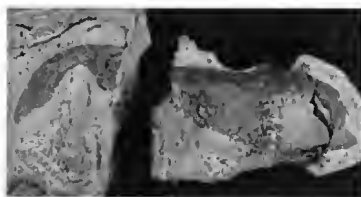
P252037 Dinosaur limb (#344)



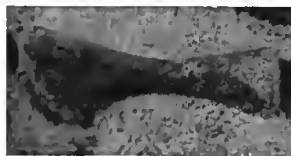
P252036 Dinosaur metatarsal (#410)



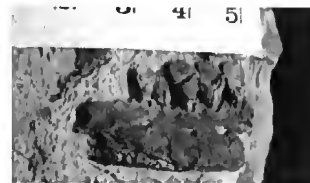
P252002 Ornithopad right ilium (#350)



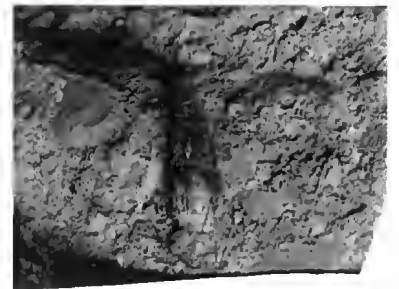
P252018 Ornithopad surangular found by Narman Gardiner (#53)



P252050 Dinosaur humerus radius Andrew Wilson (#383)



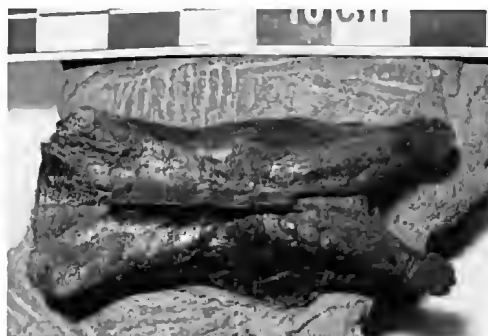
P252006 Partial left ornithopad dentary found by Narman Gardiner (#45)



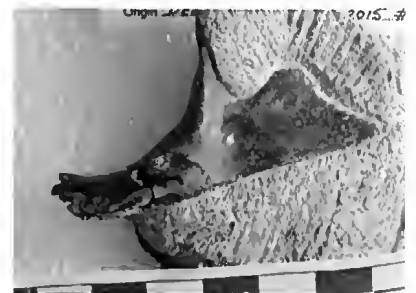
P252011 Plesiasaur tooth (#192)



P252017 Araucarian cane found by Darren Bellingham (#448)



P252004 Pterosaur cervical vertebra found by Jess Parker (#600)



P252038 Ornithopad jugal found by Dean Wright (#243)

It's all about the fossils. Here is a selection of some of the prettier ones that we found this season. Where known, the museum registration number (the "P-number") is captioned, as well as the Field Catalogue number. Photos by Darren Bellingham (Museum Victoria).



A TALE OF TWO DIGS

BY LESLEY KOOL

Earlier this year, my husband Gerry and I received an invitation to participate in the celebration of the launch of the third stage of the Australian Age of Dinosaurs (AAOD) Museum in Winton, Queensland. As we had yet to visit the AAOD centre, we accepted the invitation and headed north at the end of May. We really didn't need an excuse to visit western Queensland — having been there a few times in the past we looked forward to seeing the open plains and big sky once again. Unfortunately, this part of Australia is in the grip of a long-term drought, which was most evident when we drove through northern New South Wales. Everything looked so dry, even the ubiquitous eucalypts. We arrived in Winton on Saturday 30 May and after visiting the famous Waltzing Matilda Centre in town we headed for the Jump-Up, about 20 kilometres outside Winton where the AAOD Reception Centre is situated.

Having read about the AAOD Reception Centre from its planning stage through to its official opening in April 2012, I did not expect to see such an innovative building in one of the most spectacular settings one could envisage. The Jump-Up is the name given to an impressive flat topped mesa just outside Winton, which was donated to the AAOD by a local family. It covers an area of 1800 hectares and provides breathtaking views of the surrounding countryside as well as being the perfect setting for AAOD. The AAOD Reception Centre houses a dinosaur-themed shop and café, but most importantly, you get to see some real dinosaur bones in the fossil gallery. The bones of *Australovenator wintonensis* (Banjo) and *Diamantinasaurus matildae* (Matilda) are on display, along with reconstructions of what they

may have looked like. In fact, on your arrival at the AAOD Reception Centre you are greeted by a life size model of "Banjo" which is very life-like and looks like it is straight out of Jurassic World.

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



The AAOD Reception Centre

Photo: L. Kool

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

We were fortunate to arrive in Winton at the end of the first week of a three week field season. We joined the new crew at a site approximately 80 kilometres from Winton on a property called Elderslie where dinosaur bones had previously been found. At the end of the first week the previous crew had uncovered a scapula, approximately one metre long, of a large sauropod dinosaur. The task of the new crew was to excavate around the scapula to see if there were any more bones associated with it. After settling into their quarters in a modified shearing shed and a final run through of health and safety rules, the crew piled into their vehicles and left in convoy to the



Matilda

Photo: L. Koal



Banjo

Photo: L. Koal

excavation site, approximately one kilometre away, through a number of paddocks. The regular crew had arrived earlier and set up the marquee and trays of bone fragments for the new crew to examine to train their eyes on what to look for.

The excavation site looked like any other part of the paddock, except that the front end loader had cleared away a large area of top soil to reveal a pit between 50 centimetres and 100 centimetres deep. In the centre of the pit was the prize from the first week's crew – a beautiful sauropod scapula, almost completely exposed. This is another departure from the excavation method used by the Victorian Dinosaur Dreamers. Even if we found a bone as large as the sauropod scapula, the rock surrounding it is so hard that only a cross-section of the bone would be visible and it would have to be transported back to the Museum preparation laboratory where months of painstaking preparation would be needed to uncover what it took the AAOD volunteers less than a day to achieve.

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



Photo: I. Koof

AAOD volunteers hard at work near Winton

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

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

once they have removed any bones as they have such a huge area of Winton Formation to cover, compared to the thin strip of coastal exposure available to the Dinosaur Dreamers.

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



Photo: I. Koof

Paleontologist Stephen Parapat with a dinosaur scapula



T. REX AND FAMILY

BY JAMES RULE

Hey, Dinosaur Dreamers! This year after the dig, I spent my time in between studying and finding fossils a little differently. I went and got a job at Scienceworks, one of Museum Victoria's three museums. Soon after I got the job, I learnt that Victoria's resident science and technology museum was getting something a little different, a travelling exhibition on tyrannosaurs! This made my new job even better, not only was I working at a museum, I got to be around dinosaurs every day. I quickly became the resident palaeo-expert at Scienceworks (my colleagues are convinced that I am going to disappear after 5 October, when the exhibit leaves), getting a lot of questions from both co-workers and visitors. I was asked to work during special events for the exhibit, fact-check educational shows, look for problems with the exhibit and write up an article on the exhibit for *The Scienceworker*. For some reason or other, members of the public understood the tyrannosaur exhibit to be an opportunity to take their "fossils" along to be identified. I was shown various rocks, extant bones and one rock that



James Rule doing "the Chris Pratt"

Photo supplied by J Rule

turned out to contain a fossil sponge. One girl came very close to presenting a fossil by bringing along a chunk of the Otways coast where we find our mammals, pterosaurs and dinosaurs. In many cases, I handballed these enquiries to the Discovery Centre, but I was proud that I was finally at the stage of my life where I could be the one answering these questions rather than just asking them.

The exhibit's name was *Tyrannosaurs: Meet the Family*, and indeed it turned out to be a blockbuster. Scienceworks pulled out all the stops to advertise it, including setting the animatronic dinosaurs loose in Federation Square, and hiding 54 toy dinosaurs in the regular exhibits of Scienceworks. I even started my own collection, to the point where I probably could have been just paid in dinosaur figurines. When the exhibit was finally completed and my department (customer service and education) was shown through, I was just excited as I was when I was first taken to Melbourne Museum as a kid (in hindsight, I was sort of embarrassing). I had never seen a *Tyrannosaurus rex* before. The moment I turned the corner and saw how truly enormous the exhibit was, is one that I will never forget. In total, there were eight skeletons, three models and two chickens as well as various other fossil elements. There were also plenty of interactives (since it was Scienceworks), with kids able to reconstruct the tyrannosauridae family tree, build a *T. rex* skeleton, test their force against the bite of a *T. rex* as well as interact on-screen with dinosaurs.

Alongside the skeletons, there were more general palaeontological themes explored by the exhibit. The public were provided the opportunity to learn about comparative anatomy, functional morphology, phylogeny, palaeobiology, and my personal favourite, feathers and the link between dinosaurs and birds. The *Tyrannosaurus* skull was displayed in the IMAX theatre during the showing of *Jurassic World*, and so audiences could go to the exhibition to learn about what Charlie, Delta, Echo and Blue really would have looked like. Dinosaur



Photo: J Rule

James Rule's new dinosaur figurines (and from Star Wars)

Dreamer Travis Park also gave a good lecture on the subject of dinosaurs and birds as part of the Palaeontology Lecture series at Scienceworks. Dr Tom Rich and Dr Rolf Schmidt gave the other two lectures, and these were all a big hit with the adult visitors. The exhibit even featured the pubis from Dinosaur Cove, thought possibly to be from a tyrannosauroid.

I am going to be sad to see it go (the exhibit will be closed by the time I return to work), but it has been a tremendous experience, not only in terms of working with fossils but also in seeing the public's reactions to it. I have seen visitors walk out of the exhibit both terrified and ecstatic. I have met many junior dinosaur experts, including some with lots of questions, some who thought they knew everything and some who actually did know everything. I met a two year old who not only knew how to pronounce all their names, but understood and repeated back to me (in his own words) all the palaeobiological concepts I explained to him that even some older children struggled with. During the Family Science Nights I had the opportunity to help inspire a few kids to



Photo: J Rule

Guanlong, the green dinosaur!

follow their dreams of palaeontology, including one girl who wanted to know if girls too could become palaeontologists. Thanks go to Dinosaur Dreamers David Pickering, William Parker, Ben Francischelli, Tim Ziegler, Lisa Nink and Travis Park for helping out with those events.

To conclude, here is a brief overview of the stars of *Tyrannosaurs: Meet the Family...*

Guanlong wucaii

The green-feathered cover girl of the exhibit, *Guanlong wucaii* lived in the Jurassic of China, discovered in the Xinjiang province. It differed from the usual tyrannosaurs by having a three fingered hand, as well as a crest possibly used for display.

Daspletosaurus torosus

A late Cretaceous heavyweight from Montana, USA. This particular specimen has toothmarks present on its hip, and overall was a little worse for wear. There is evidence that it used to chow down on hadrosaurs in the form of preserved gut contents.



Photo: J Rule

Daspletosaurus greets visitors with a happy smile



Photo: J Rule

Dilong was thought to have fabulous blue feathers

Dilong paradoxus

An early Cretaceous contender, *Dilong paradoxus* was found in the famous Liaoning province of China. It was the first tyrannosaur that was discovered with feathers preserved. It is possible these feathers were used for insulation and display, but not for flying.

***Alioramus* sp.**

Another late Cretaceous tyrannosaur, this time from Mongolia. *Alioramus* has the most teeth in its jaws out of all the tyrannosaurs. Its snout was longer than the other tyrannosaurs, who had very long snouts themselves. The specimen on display in the exhibit is yet to be identified to the species level.

Albertosaurus sarcophagus

From the late Cretaceous of Montana, USA, comes *Albertosaurus sarcophagus*. Albertosaurs have been found in mass death assemblages in Alberta, Canada. These bone beds reveal albertosaurs or varying ages, which has led to the suggestion that these animals lived in packs. Imagine a flock of Albertosaurs running at you!



Photo: J Rule

Albertosaurus sees you!



Photo: J Rule

The long-snouted Alioramus

Gorgosaurus libratus

Another late Cretaceous theropod from Alberta, Canada. The *Gorgosaurus libratus* in the exhibit takes the category of being the only articulated specimen on display composed of real fossil bones instead of cast ones. The skeleton was composed of post-crania behind the pelvis, and is thought to represent an angsty teenager based on growth rings. It spent a lot of time lying down (it wasn't mounted), but I'm sure it's just going through a phase.

Tyrannosaurus rex

The one and only! Living in the late Cretaceous of Saskatchewan Canada, this specimen has been dubbed "Scotty". Taking claim as the third largest *Tyrannosaurus rex*, as well as being one of the most complete, Scotty is also the first complete and mounted *T. rex* to visit Melbourne. Scotty's shadow liked to come alive and eat visitors (with little success, as they just dropped out of his ribcage) as well as make hand puppets with his tiny fingers.



Photo: J Rule

Scotty, the star of the show



DINOSAURS AT THE WOOL MUSEUM

BY WENDY WHITE

On 25 July, *Wildlife of Gondwana* opened at the National Wool Museum in Geelong. Guests were welcomed by Monash University's Pat Vickers-Rich and Sandy Cruden, along with Wool Museum director, Padriac Fisher.

We enjoyed some sushi and dinosaur cupcakes, and assembled wooden dinosaur bones in the aptly named Qantassaurus Lounge as we waited for the opening.

Once inside, we wandered through 3.8 billion years of fossils, skeletons and reconstructions



Wayne Chatwin assembles the Gallimimus skeleton

Photo: L. Kool

from artists such as Peter Trusler. On the floor, coloured lights wound the planet back in time. Kids and adults alike enjoyed gazing at animals such as *Gallimimus* and *Megalania* (a giant lizard). And Mary Walters found a much-magnified cast of the holotype of *Corriebaatar marywaltersae*, a mammal tooth she found at Flat Rocks in 2004.

08 NEWS

WEDNESDAY JULY 22 2015 GEELONGADVERTISER.COM.AU

Otways dinosaurs on show

Bizarre beasts back in town



STRANGE BEASTS: Dinosaurs that roamed the Geelong region will be featured in a new exhibition at the National Wool Museum.

SOME of the strangest dinosaurs to roam the planet have been found in the greater Geelong region.

Many of those polar dinosaurs will be showcased at a year-long exhibition, opening at Geelong's National Wool Museum this weekend.

The exhibition, *Wildlife of Gondwana: Beasts of the Great Southern Supercontinent*, looks at creatures such as Vic-

toria's *Leaellynasaura* and *Qantassaurus*, the giant lizard *Megalania* and *Bullockornis*, the giant flightless bird.

The exhibition is based on the groundbreaking research of Dr Patricia Vickers-Rich, who with her husband Tom Rich has uncovered internationally important discoveries in the Otways. It includes real fossils, skeletons and 20 full-scale skeletal casts, many

of which have never been on public display in Australia before.

The exhibition also includes vivid illustrations by Monash University graduate Peter Trusler, providing a clearer picture of how the majestic species lived.

Geelong councillor Andy Richards, the council's arts and culture spokesman, said it was exciting to have an exhibition

of its calibre at the museum.

"*Wildlife of Gondwana* reveals bizarre, unusual looking dinosaurs virtually unknown to most Australians," he said.

"This is a great opportunity to explore and learn about Australia's natural history."

Gondwana included most of today's southern hemisphere, including Antarctica, South America, Africa, Madagascar, and Australia.



Geelong Advertiser, 22 July 2015



DINOSAURS: DAWN TO EXTINCTION

BY JADE KOEKOE

I am sure many of you already know that the fossils from Dinosaur Dreaming sites have travelled the world. Well I'm going to tell you about Singapore's reaction to *Dinosaurs: Dawn to Extinction*, an exhibition curated by Dr Patricia Vickers-Rich, the PrimesSCI! team and the SCI!Expo team.

Dinosaurs: Dawn to Extinction opened at the ArtScience Museum on the waterfront of Singapore in late 2013 and ran till August 2014. The whole exhibition filled eight halls and covered around 4000 square metres of space. It included fossils, models and art from the American Museum of Natural History in New York, the San Juan National Science Museum in Argentina, the collection of artist Peter Trusler and SCI!Expo at Monash University, which of course means fossils that we had a hand in finding!

When first approached about curating this exhibition Dr Patricia Vickers-Rich wondered if she could take on such a big task:

This 4000 square metre exhibition is the largest I have ever curated — with more than 900



The Most Intrepid of Dinosaurs gallery

staff working with me on this from all around the world. When I was first contacted about coordinating, writing the content, managing a large team — I wondered if this could be done... and of course it was.

Dr Patricia Vickers-Rich really wanted this exhibition to cover all the senses. In interviews she reveals the work put into getting smells for the exhibition just right. Her dedication to that vision of an all sensory exhibition shows in the hundreds of positive media and blog posts which stated what an excellent interactive exhibition *Dinosaurs: Dawn to Extinction* truly was. For example Little Day Out, a website dedicated to news about kids activities and events in Singapore, writes:

...setting the tone for the rest of the galleries are little signs inviting visitors to touch-and-feel selected exhibits... Dinosaurs: Dawn to Extinction



The banner for the Dinosaurs: Dawn to Extinction exhibition



The Liaoning Forest diorama

is both experiential and interactive, allowing visitors to engage multiple senses throughout the exhibition to discover more about dinosaurs.

Even Dr Patricia Vickers-Rich was impressed with the number of people who came to see this exhibition:

The great thing about it was the large number of visitors, in the hundreds of thousands, but even more significant was the spirit of co-operation amongst all of those that were involved in creating this massive exhibition.

Of the galleries created for this exhibition, there were three in the media that appeared to receive the most attention: the two halls entitled The Most Intrepid of Dinosaurs - Polar Inhabitants! and the Liaoning Forest.

Dr Patricia Vickers-Rich describes The Most Intrepid of Dinosaurs galleries as:

Two beautiful halls, flooded with the light of the Aurora Australis that truly showcased our dinosaurs of darkness and the superb art of Australian Peter Trusler — part of the Dino Dream Team.

The Liaoning Forest is a diorama that completely immersed visitors in an eastern Asia landscape of 130 million years ago, which is an important place because it is where we have gained our first real understanding of feathered dinosaurs. Imagine you are standing in a pine tree forest where large

dinosaurs, birds, insects and early mammals all live together. In the distance you can see lakes with marshy shores surrounding them. The area is filled with rich plant and animal life, where large dinosaurs leave their tracks everywhere while smaller mammals dart in and out around their legs.

As we know, exhibitions like *Dinosaurs: Dawn to Extinction* would not be possible without those, like the Dinosaur Dreamers, who have a passion to find fossils.

Exhibitions like *Dinosaurs: Dawn to Extinction* should inspire us to, as Dr Ibrahim Komoo (Emeritus Professor and Vice-Chancellor at the University of Malaysia Terengganu and Chair of UNESCO Geoparks Committee) said, continue to “fossil hunt in a party atmosphere”. By contributing our time and passion to finding fossils, we help to interpret how our planet worked before humans came along.



The ArtScience Museum



HAPPY BIRTHDAY KOOLASUCHUS

BY MIKE CLEELAND

The sand was down at the western end of Rowell's Beach on the morning of 30 April 1990. Although several other bones had been found on this beach during 1989 and early 1990, much of the beach had been hitherto concealed. An erosion event had now revealed a new rock exposure, featuring the characteristic carbonaceous claygall and gravel conglomerate that hosts the bones in this area. A large brownish chunk of exposed material caught my eye as I wandered over it, and I initially assumed it was wood, as no bones of that size were known from the area. It wasn't until I knelt down and looked closely at the exposed structure that I saw the characteristic labyrinthine infolding of the enamel and dentine that is displayed by the Temnospondyl amphibians, clearly exposed in an eroded cross-section of a tooth. Only then did I realise that I could have stumbled upon something significant.

There was a crack several centimetres wide through the rock bisecting the bone, which could be seen in cross-section in the walls of the crack. More bone was showing nearby, although at the time I couldn't understand the spatial relationship between the two exposures. I returned later with the rocksaw and removed the rear part of the lower right jaw, as its extent was reasonably clearly defined by its surface exposure.



David Pickering points out details of the iconic Peter Trusler Koolasuchus painting to Pip Cleeland



Lesley Kool watches Mike Cleeland cut the Koolasuchus cake

When Dr Tom Rich saw the fossil at the museum, he decided that we should return to the site to remove the rest. The front portion of the jaw was removed with a rocksaw. The initial cut left a gouge mark near the end of the embedded jaw before a fortuitous decision was made to move the saw a few centimetres further out "just in case".

The nearby bone was eventually extracted by a combination of rocksawing and jackhammering, removed a large chunk of rock with the entire bone encased and undamaged. It was later revealed to be the curiously crushed lower left jaw.

Buoyed by the discovery, the team returned for a deeper excavation and removed roughly a cubic metre of rock in the hope of finding the skull or other associated bones. But it wasn't to be, and the only additional bone found at the site was a solitary tarsal.

It was then that the hard work began, with Lesley Kool devoting several months to the exacting preparation that finally revealed the intricate ornamentation over the jaws.



Mike Cleeland and Dylan Cleary admire a specially commissioned *Koolasuchus* painting by Pip Cleeland

Continued prospecting in the area has produced a steady trickle of bones including more from *Koolasuchus*, and a partial skull found by Andrew Ruffin further east towards Punch Bowl.

Twenty-five years after we found *Koolasuchus*, it was party time, and Dinosaur Dreaming crew held an enjoyable get together in commemoration of the discovery. After the celebration on 2 May 2015 in the car park at Potters Hill Road, enthusiastic prospectors trekked to the site where one of the children managed to identify a small bone in a nearby erratic. Those more enthusiastic about exploring the afternoon tea facilities around San Remo in turn made their arrangements.

Thanks are due to Michelle Cleary for producing another superb *Koolasuchus* cake, her son Dylan for the presentation of his poem and everyone else who contributed to the 25 year celebration of *Koolasuchus cleelandi*.



KOOLASUCHUS CLEELANDI

BY DYLAN CLEARY

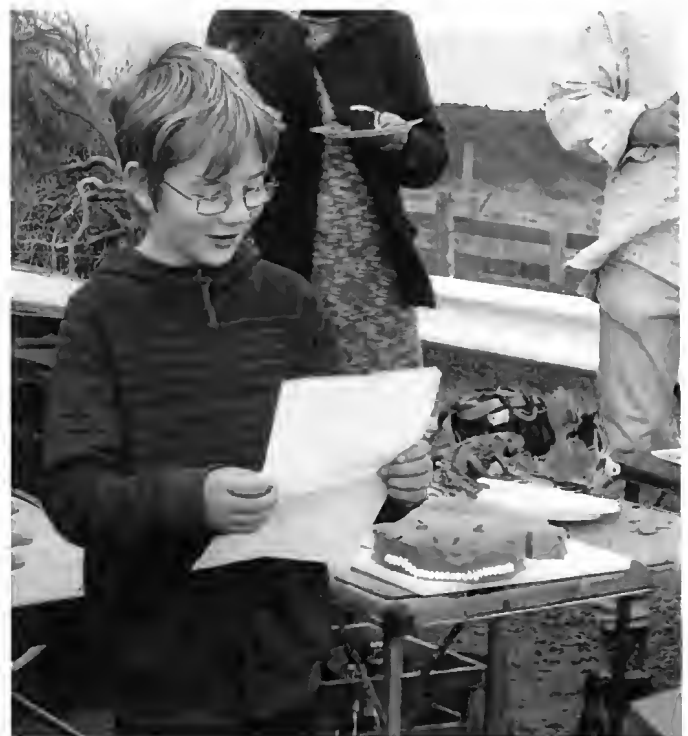
Koolasuchus cleelandi,
We don't wish for its spirit to die.
So we're celebrating, you and I,
Our *Koolasuchus cleelandi*.

We're celebrating with some tea,
Its 25th anniversary!

When Mike passed on to Lesley his fossil,
She discovered it really was colossal!

In the fast-flowing rivers it hunts,
Looking for the little runts.

Koolasuchus cleelandi,
We don't wish for its spirit to die.
So we're celebrating, you and I,
Our *Koolasuchus cleelandi*.



Dylan Cleary reads his poem



BUILDING A KOOLASUCHUS IN OUR PARK

BY JUDY VRADENBURG

The Wallace Avenue Park in Inverloch was one of several parks put aside in 1987 following a State Government ruling by Jim Kennan, Minister for Environment and Planning, who stipulated that public open space must be set aside and developed if Apex Park (on Williams Street) was to be sacrificed for elderly units. The land was purchased as Council park land, but was left in a state of neglect. In February 2010, Bass Coast Shire Council (BCSC) proposed to sell the park for residential development, however neighbourhood locals launched a vigorous appeal which resulted in Bass Coast Shire Council voting to retain the land as public open space at its ordinary meeting in July 2010.

The locals were determined to see the park developed to ensure its retention, so the Wallace Avenue Community Park Group was formed — members included Judy Vradenburg, Gerry Lonergan (Inverloch Rotary Club), Norman Vradenburg, Barb Langston and Carli Johnstone. We achieved ATO Tax Concession Charity status in December 2011 and Fundraiser Registration with the Victorian Department of Consumer Affairs

in January 2012. We researched government grants with the help of Ken Smith's office and were directed to a 3:1 grant available through *Regional Development Victoria, Putting Locals First Program*. To add weight to our application letters of support were obtained from Inverloch Rotary Club, Inverloch Lions Club, Inverloch Primary School, Inverloch Preschool, Bendigo Bank, Hon Ken Smith MLA and the South Gippsland Conservation Society. A casual survey of nearby streets was undertaken in 2012, documenting 761 children, 327 adults and 38 elderly/disabled who wished to use the park once developed.

A great many applications for funding from various local organizations and businesses were unsuccessful; however, through persistence we raised funds through sausage sizzles (with the help of Inverloch Rotary Club), collection tins at various retail outlets throughout Inverloch, donations from Inverloch Rotary and Inverloch Lions Club, \$500 from Cr Ross Smith's discretionary fund, \$1,000 pledged by Bendigo Bank, private donations and an outstanding \$5,000 offered by Inverloch RACV Resort following discussions with Amanda Tonkin during the 2012 survey. A fence along the northern boundary was constructed in 2012 with the help of Clay Wyhoon of Garden Effects Landscaping, who donated two days labour, and Mitre 10 who contributed toward the cost of materials. The remaining cost was born by the group and a donation from a neighbour. Council installed picnic tables and a bench seat.



Sculptors Dan, Phil and Angus making the Koolasuchus

For various reasons Council would not allow the installation of playground equipment so the group researched tradesmen to install a sculpture/seat, maybe of a lizard or dinosaur. An impressive blue tongued lizard sculpture at Leongatha Primary school led us to consult the sculptor– Phil Stray of Crafted Landscapes – in September, 2011. An energetic personality with a passion for childhood creative play space, Phil was quick to offer support, quotes, designs and a great deal of patience as the group waded through Council and Government regulations and procedures. Our desire was that a local prehistoric creature would be depicted, and after much debating over plans and regulations, *Koolasuchus cleelandi* was suggested by Louise Wilson from South Gippsland Conservation Society, since it fit perfectly within Council height restrictions.

A State Government Grant of \$35,540 was awarded to the group in 2014 and work on the project was commenced in March 2015 with the help of Howard Scott at BCSC. Clay Wyhoon donated \$3,000 of in-kind labour to reshape the block, prepare the area for the sculpture and install extensive drainage works. Phil Stray and his team – Dan and Angus – moulded the sculpture, complete with eggs and mud rock surrounds, in April 2015, under the guidance of Lesley Kool. Mike Cleeland provided the template for the footprints in the concrete path, which was installed by Council. Native trees were planted by Council and an information board, put together



Photo: P Cleary

Neva Cleary channels her inner *Koolasuchus* with consultation from Lesley Kool, Mike Cleeland, Council and the Community Park Group, was installed on site.

Already the park is becoming a popular destination and meeting spot, with a sense of ownership rapidly developing among the locals. *Koolasuchus cleelandi* is now thriving on an ample diet of grass and flowers fed to him by children, sparking much interest with his endearing grin. Visitors are intrigued, some as young as eight or nine reportedly going home to research local prehistoric creatures. Advantageous connections formed between Council, volunteers and visitors are rippling out into the community. An official opening is planned in November.



Photo: J Vradenburg



Photo: J Vradenburg



Photo courtesy of J Vradenburg

L-R: Sculptors consult with Cr Jordan Crugnale and Lesley Kool; finishing touches are added to the feet; Judy Vradenburg, Gerry Lonergan and Norman Vradenburg along with some of the Vradenburg grandchildren on top of the *Koolasuchus*



WON'T SOMEBODY THINK OF THE SLUGS?

BY MELANIE MACKENZIE

Picture this... 105 million years ago, Eric the Red West was at the fracture zone of a dissolving Gondwanaland. As Antarctica split from Australia, the very beach that the Dinosaur Dreaming diggers frequent in February became a rampaging river to rival the Amazon, teeming with life in its depths and at its edges, from plesiosaurs to ornithopods and, of course, Tom's favorite ancestral mammals.

Hammering along to the dulcet refrain of Eve's psychopathic aunt song, it's hard not to get lost in the rocks, and everyone loves the thought of discovering that giant extinct Nessy... but every now and then it's worth letting that hammer hover for an extra second to contemplate life at this moment.

As Alan and John races to find the sweet-spot in the hole and James hovers Golem-like over his precious stash of fresh rocks, a pseudoscorpion wiggles its way across my platform. I restrain my chisel as the escaping critter brings me back to the present for just a second.

So let me take you on a pictorial journey of just some of the 'living' critters the crew may have encountered as they chain-ganged their way through the summer dig...



Photo: L. Nink

Look, no sting! This gorgeous little pseudoscorpion, a species of *Protogarypinus*, was carefully measured by Lisa (who we suspect wanted to keep it as a pet if she could find a tiny enough collar).



Photo: H Worwick, Museum Victoria

The only downside to a pseudoscorpion is that it doesn't glow in the dark under a UV light like this regular scorpion does.



Photo: L. Nink

The Otway Black Snail *Victaphanta compacta* is endemic to the area. As one of the few ancient Gondwanan species that have survived to the present it must be doing something right... I suspect being a carnivore has helped... apologies to Peggy, Nick and all the other dig vegetarians out there.

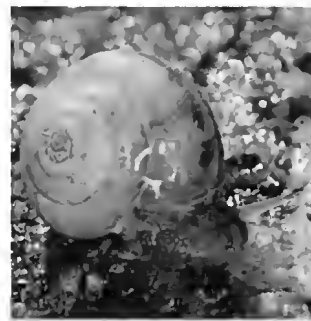


Photo: H Worwick, Museum Victoria

A slightly less welcome snail is this *Theba pisana* – the White Italian Snail. It is an agricultural and garden pest here, known for not only eating crops but also for clogging up harvesting equipment. When dry, their brown bands stand out against their predominantly white shells and I reckon they look a bit like lollies. If you keep an eye out along the side of any sandy beach track you'll often spot a few.



Photo: M Mackenzie, Museum Victoria

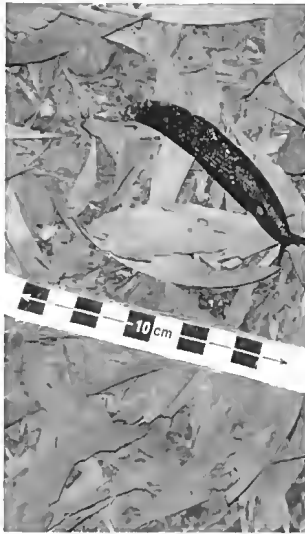


Photo: I. Nink

It was hard to avoid stepping on this introduced slug *Arion ater* as we made our way along the boardwalk at Melba Gully... they were huge! But the fireflies and stars were well worth the carefully trodden trail, as were the deeply-voiced (and slightly spooky) tales from Mike.



Photo: J. Parker

Sure they're the dirge of wheat-fields and ruin your flour, but who can stay angry at such an adorable proboscis? Apparently one in every five animals on this planet is a weevil, including this lovely little *Leptopius*.



Photo: J. Parker

And what about 'antler-boy'? This awesome Feather-horned Beetle (*Rhipicera femorata*) uses his antennae to sense female pheromones in the area.



Photo: J. Parker

Ok, so I was calling these Melaleuca-loving guys 'stink bugs' but according to the expert (thanks Ken!) they are actually Gum Tree Shield Bugs (*Poecilometis patruelis*).



Photo: I. Nink

I believe it was John's fault that these "gullible sandwich eaters (groan) kept beady eyes on Wendy and Mary at lunchtime. Much bigger than a regular seagull, I'm particularly taken by the fancy red-tipped beaks of the Pacific Gull (*Larus pacificus*).



Photo: M. Mckenzie, Museum Victoria



Photo: J. Parker

It was nice to see a Sooty Oyster Catcher (*Haematopus fuliginosus*) strutting its way through the intertidal zone and poking around for invertebrates.



Photo: J. Parker

And for a quick burst of colour, this Crimson Rosella (*Platycercus elegans*), straying far from the sauce bottle, was spotted by Jess.

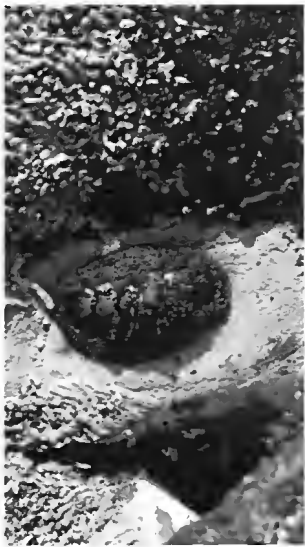


Photo: J Parker

“No, we’re not related to trilobites”. An enormous hairy, plated chiton *Plaxiphora albida*, surrounded by *Galeolaria* tube worms. Chitons are molluscs (related to snails) and have extremely hard teeth which they use to graze on rock-face algae.



Photo: J Parker

The algal genus *Codium* comes in different forms. While some species look like typical branched, green seaweeds, others can be globular like this specimen, with a velvet-like surface.



Photo: J Parker

Mystery solved! My tentative ‘gastropod egg case’ identification has been refined to that of the marine snail *Dicathais orbita*. These gastropods often lay their eggs in communal nurseries attached to the underside of rocks and other protected areas.



Photo: J Parker

‘Digging with the stars’ (ouch...that was terrible) — just some of the many colours of the Cushion Sea Star (*Meridiastra calcar*), and a close up of the cute little green asteroid *Parvulastra exigua*.

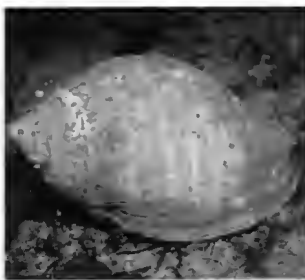


Photo: J Finn, Museum Victoria

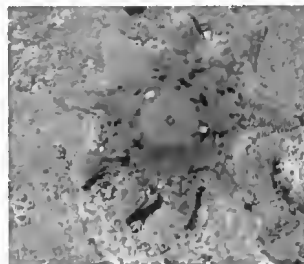


Photo: J Finn, Museum Victoria



Photo: M Noman, Museum Victoria

True, our main cardio workout on the dig is carrying gear up and down from the beach, but if there’s one thing we all get from breaking rocks it’s muscles! Meet *Brachidontes rostratus*, one of the ‘other kind’ of mussel seen in many of the rockpools by the dig site.

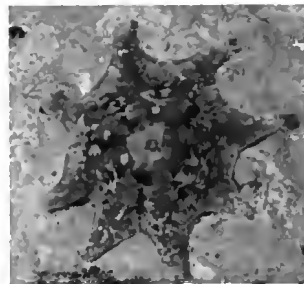


Photo: J Finn, Museum Victoria

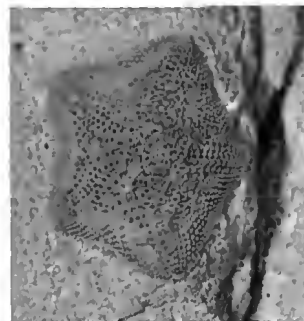


Photo: J Finn, Museum Victoria



Photo: J Finn, Museum Victoria

The always gorgeous (and irresistibly poke-able) Waratah anemone *Actinia tenebrosa*.

Warning: If you start singing 'anemone' to the tune of the Muppets' version of Mah Nà Mah Nà it is VERY hard to get out of your head.

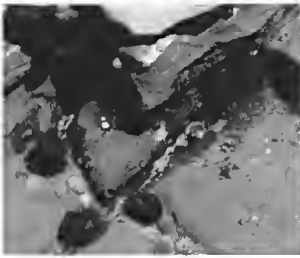


Photo: J Parker

And finally... the amazing Koalasaurus... rarely seen, grows a goiter-like clone on its back and terrorises American tourists by dropping from trees. Ok ok, so it's just a Koala... but a very cute one. *Phascolarctos cinereus*.



Photo: J Parker

And a few other extant critters — rookies Dani and Mel flanking the all-knowing-one, Lisa "sorry, it's not a bone, it's a bit of coal, but good try" Nink.



Photo: L Nink

Thank you to the wonderful photographers noted above and those who helped with IDs including Ken Walker and Julian Finn (Museum Victoria), Mark Harvey (Western Australian Museum) and the Marine Research Group of the Field Naturalists Club of Victoria (www.fncv.org.au/marine-research-group).

Want more? There are plenty of fantastic field-guide style books, apps and websites available. Here are just a few of them:

Websites:

Australian Faunal Directory
www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home

Port Phillip Bay Taxonomic Toolkit
www.portphillipmarinelife.net.au

Bowerbird — a citizen science website where images of Australia's biodiversity are shared, identified and discussed
www.bowerbird.org.au

Apps:

Free Museum Victoria apps available from iTunes or Google Play:

- *Field Guide to Victorian Fauna* – everything from terrestrial to marine, including some very cool audio for birds and frogs
- *Bunurong Field Guide* – many more marine critters

Books & e-books:

Museum Victoria Field Guide series (books & ebooks) – current titles:

- *An Introduction to Marine Life*
- *Crabs, Hermit Crabs and Allies*
- *Barnacles*
- *Sponges*
- *Shrimps, Prawns and Lobsters*

Melbourne's Wildlife: A Field Guide to the Fauna of Greater Melbourne, Museum Victoria & CSIRO Publishing

Coastal Invertebrates of Victoria – An Atlas of Selected Species, Marine Research Group of the Field Naturalists Club of Victoria



DREAMS DO COME TRUE

BY JADE KOEKOE

It had always been a dream of mine to participate in a dig, so it was with great excitement and anticipation that I made my way to the Otways Lighthouse in February this year.

As this was my first dig (other than attending Rookies day in November, 2014) and the first time I was going to be away from my two year old for any significant length of time, I was also feeling a little nervous. It didn't help that I knew that where I was going there would be limited phone reception! Thankfully I didn't panic about that fact too much and I was able to enjoy being me and not "Mummy".

I was part of the second week dig team and I'll never forget that first walk down to the beach. The view was gorgeous and the smell of the sea filled me with memories long forgotten — childhood memories of wanting to have work that would allow me to always be outside, under a lovely blue sky.

Very soon I fell into a comfortable routine, spending my day breaking rock, searching for elusive fossils and learning from the most talented and amazing group of people I have ever had the pleasure of knowing. I would set myself up on



Jade Koekoe with Lisa Nink at Eric the Red West



The view as the crew walk to the beach

the beach next to Wendy, Mary, Corrie, Lisa or Jacqui and in the evenings I got to know two very interesting individuals... Billy and James. Each person I got to know was a guiding star in my quest for fossils and each seemed to delight in telling me stories of digs past.

I had a day working in the hole with Alan and Giulia. It was messy work and the rock surface we were working on had to be constantly washed so we could see fossils that may appear in our next cut. I also had a day working with Wendy preparing fossils for transport back to the Museum. I greatly enjoyed the detailed task of protecting and labelling fossils. I saw it as building up the metadata around a fossil, giving each fossil we found the beginning of its very own story. It's made me think I should try and learn how to catalogue all the dig data back at the Museum, if those in charge will have me.

I also learned, from chats with Corrie and Alan, what the area of Eric the Red West could have looked like back when our fossils were still living creatures. Those conversations resulted in many dreams where I imagined and built a Cretaceous era landscape. Does that count as dreaming about dinosaurs?

My week of dinosaur digging gave me a vast amount of knowledge... and a desire to know more. I feel so lucky to have found a group of like-minded people who inspire me greatly. Thank you for giving me the chance to be a part of Dinosaur Dreaming. I hope you don't mind if I decide to join you for next year's dig as well.

Read more at misskokothelibrarian.com.



MY PRETTY MAMMAL JAW

BY LIVVI CAMPBELL

Everyone on the dig has their own method for choosing the rock that holds the elusive (some would say fictional) mammal jaw. The veterans of the dig just scan the pile and manage to pick bone laden rocks every time. The beginner rock breakers nervously hover over the pile trying to vibe out the best lump of stone, asking all the experts if the rock they are holding is a winner.

2015 was my second year on the dig. I'm not quite as nervous breaking rock as I was the year before but I still spent long stretches of time, days even, not finding anything. Promising rocks with thick coal seams reaped nothing but tricky looking mud and twigs.

While chipping up unrewarding rocks, you tell yourself that every rock you clear from the pile is one rock closer to finding bone. The next rock you break will definitely contain the first mammal jaw found in the Otways for six years. You are sure of it.

And that is what happened to me! One fateful February day, sitting on the wet sand at Eric the Red West, I picked a juicy-looking rock from the hole and started chiseling.

Midway through my rock, I noticed some shiny brown. I wasn't excited. Already that morning I had been tricked by mud twice and I was sure Wendy had more valuable finds to catalogue than beetle bums and mud splatters. Through my hand lens, I was sure I spotted pores and striations, but it was very smooth and bright, quite unlike the other bones I had spotted.

Over at the wrapping station, Wendy and Mary went quiet when I presented my "maybe" bone.

'Well, Livvi, don't get too excited...' started Wendy. That was it, back to breaking rock, it's just more mud. "...but I'm 90% sure this is a mammal jaw."

For the rest of the dig I'm sure my dirt smeared face was grinning from ear to ear. I had been so scared I was missing things and breaking rock so slowly, but it was working out for me.

Back in the lighthouse I was thrilled with how pretty the jaw was under the microscope, how clearly you could see the spaces where teeth would have sat, how unbelievably small it was. I was a proud mother.

It was at breakfast the next morning that I realized it wasn't just me that was pleased with the find. What gave the game away was Tom sitting down with his porridge next to me, such a newcomer to the dig, at the breakfast table.

Since February I've been on a whirlwind media tour. Just kidding! But the dig did make the front page of The Colac Herald, I was interviewed by ABC regional radio and appeared on the Melbourne University science news website, which was pretty big to me.

Who knows what we will find in 2016?



P252052 Livvi's mammal jaw back at the lab (#626)



LISA ALMOST GOT STRUCK BY LIGHTNING

BY DEAN WRIGHT

Introductom.

Scene: Wind swept beach. Warmly clad adults are scattered, but congregate around rock outcrops.

Wendy – “Dean, are you actually going to break some rock today?”

Dean – “I can’t break rock. I’m documenting our struggles for future generations so that they can understand the conflict and nuances of the Dig. Dig – that’s funny because you would think the most interesting part of a Dinosaur dig would be the Dinosaurs, but we always refer to it as the Dig. Also I’m creating a pause, so we can have a flashback and alter the time line which is necessary when this documentary offends all the right people... There – we needed that.”

Mary – “Are you having one of your ‘special’ moments Dean?”

Dean – “This moment’s not special; it’s boring. We have an Aboriginal site, sacred to the Dreaming, to the north; fossil beds to the east; and to the west – to the west we have scatterings of newbies, many of whom are unlikely to do anything remarkable enough for anyone outside the organisers to remember their names... Except for Billy. Billy was smart. He had his birthday on the dig. You don’t forget someone you’ve sung for. The repeat offenders are keeping to themselves in their little cliques. They are both aware of, and ignoring, the complication that happens within the crew.

Wendy – “Complication as in how?”

Dean - “We can’t talk about the complication

yet though. Like a play, you have to lay things out in three separate and distinct sections: the introduction of the subject; the complication; and the resolution. I’m going to use a mock documentary setting to lay out the thematic elements.”

Wendy – “You do know life isn’t TV, don’t you Dean?”

Dean – “Newbies don’t watch TV. They stream shows or pirate them... And you have to give it a snappy title or they won’t even bother to look it up on IMDB.”

Lisa Almost Got Struck by Lightning: Life at the Lighthouse.

In summer of 2015, two groups of people gathered at the Cape Otway lighthouse. It would be the scene of a generational divide not seen since the birth of rock ‘n’ roll. In the middle was a man named Tom Rich who, like Robert Johnson, started it all.

In the immaculate rolling hills, cut abruptly by coastal cliffs, nestled a trio of scattered cottages equipped with limited bathrooms and a serviceable kitchen. The three bedding chambers housed the most notable (in some cases the most notorious) of crew members. Two servantile dorms were allocated to the retainers in a Marxist decree that showed the segregated equality. The first of the rooms housed a collection of belles whose giggles escaped showing that, even in prison, a wealth of society can bloom. The second of these two dorms housed the brutish thugs whose barbarity and rule of suppression through odour saw an ever changing Alpha emerge. The lifestyle of the latter and its toll on the psyche seeps through in Alan Tait’s scientific writings:

...bulk of the sediment forming the Strzelecki Group and Eumeralla Formation in the Early Cretaceous rift valley was volcanoclastic sediment derived from volcanoes at the eastern end of the rift and transported westwards. I



think I smell salami! However, large amounts of quartzose sediment entered the rift valley from its north side where the rift changed direction in South Australia. Is that Darren? This quartzose sediment contains pink garnets and forms Pretty Hill sandstone in South Australia and western Victoria. I think that's Darren I smell. Another input of quartzose sediment from the north side of the rift valley Tyers Conglomerate in Gippsland. I've forgotten what real air smells like. At Marengo, near Apollo Bay, angular quartz grit is present in the Eumeralla Formation, and the...

The bulk of the diggers sought the privacy and peace only a nylon tent can provide. The North tent city, named after the philosopher Alfred North Whitehead, is located in the western portion of the East Picnic Ground, gateway to the western half of the North Anchor. Which is named... not after Alfred North Whitehead, but for its position above the south road. It is the most contested and confusing layout on the lighthouse grounds.

No sooner had camp been established than the factions started to form. Volunteers from the museum, young lackeys of the deranged preparator known only as Dangerous Dave, quickly bonded with other members of their generation. Whether it was the charm and intelligence of the museum volunteers, or their ability to parrot words of people who actually knew what they were talking about, they soon gathered a following. Like the Children's Crusade of 1212, the youth followed the rhetoric and formed a coterie on their fateful journey, to evaporate into history, but in the meantime to be a marching army.

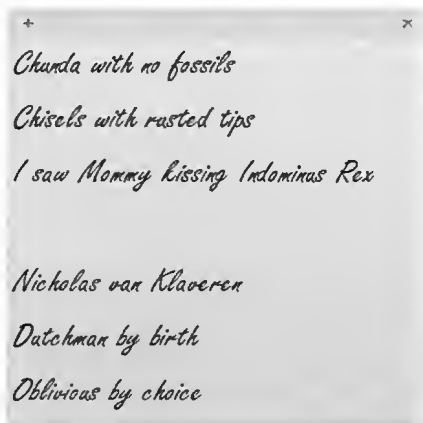
Passive and easy going by nature, the remaining Core watched in silent interest. The setting was new and experimental and work needed to be done. Soon the daily march would be upon them. Equipment and hopes in tow, the experienced and rookie diggers alike would head down to the site to excavate rock and test their *metal* against the frigid conditions of the Otway coast.

Cell phone reception, the Charlie of the Harry Potter generation, was in short supply and seemed for a moment to be their undoing... Surely they would be forced to socialise with people outside their clique. Wi-Fi could only be picked up near the cash register of the café, usually only accessible at dinner time, and phone reception was limited to a small unreliable patch at the Lighthouse itself. It was there the newbies, sick from bandwidth withdrawal, would gather to contact the significant others – friends and Facebook “friends” – and look up incomprehensible answers to their unresolved questions. This text conversation between James Rule and a fifty-six year old Lebanese truck driver, catfishing James after convincing him that she was Dr Who, told of the hardship of bandwidth withdrawal.



During a lightning storm the team evacuated the dig site to the relative safety of the Lighthouse. Amidst Thor's anger, the howling winds and

downpour, Nicholas van Klaveren, in his isolated tent, collected these few words to describe the crew's separation from the site.



Yeah, poetry. That's why he had his tent so far away from everyone else's.

By the second week of the dig, it seemed as if two distinct genera were forming, incapable of bearing fertile conversation. The experienced crew gathered at night and queried each other – desperately trying to figure out the younger digger's names. At this time, a separate faction emerged. The Establishment for the Development of the Island of Catan, or TEDIC, took hold of the dilapidated Museum. Infighting soon broke out. The Machiavellian Dame took on three rivals, outplayed only by their giggles at obtaining wood to go with their sheep, in a life and death battle for sovereignty for the Island of Catan. John Wilkins, a relatively passive player, recounted the tale in his memoirs.



Only two events brought the now established neutrality of the second week to a halt. The aforementioned Tom Rich conducted talks on the history of Dinosaur Dreaming. The crew gathered for the talk, which established conviviality for a moment before their *Carassius auratus auratus* attention spans caused the group to segregate again.

— Oh, and Lisa almost got struck by lightning.

Resolution

Scene: Back porch of the Lighthouse Keeper's Cottage. Older generation inside watching a movie. The sound of cries of laughter coming from the museum block as the newbies play Cards Against Humanity.

Mary – "What are you doing?"

Dean – "Focusing."

Mary – "It looks like you're trying to blow smoke out your ears."

Dean – "In the introduction I left a pause for a flashback. If I can go back to it, I can alter the events so we have one crew this year instead of two."

Mary – "Oh. That would be nice."

Dean – "I'm fairly certain it will work. On the first night we have to get everyone together and establish the dynamic that the experienced crew are the ones that have hung around wherever the dig goes. That way the newbies who really did enjoy it will at least talk to the experienced crew so we know who they are."

Mary – "Oh well. I've finished my cigarette. Carry on."



FASHIONS IN THE FIELD



BY WENDY WHITE - FASHIONISTA

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



Photo: C. Paragnani



Photo courtesy of P. Cole

Peggy Cale and the wisdom of layers



Lauren Swann in a dinosaur anesie



Photo: C. Roberts

Amber Craig and the secret agent laak



Photo: C. Paragnani

Claudia Bowman and Giulia Cinquegrana in warm and cool weather



Steven Bianchi with reflectar sunglasses and a big hammer



Giulia Cinquegrona and Cassia Paragnani



Livvi Campbell models the latest in sparkly hammers



Mike Cleeland baasts fancy sunglasses



Photo: L. Nink

Chantelle Raberts in a dinosaur print dress



Photo: S. Alkemode

Tim Ziegler in bandanna and Swamp Wolloby skull.



Photo: S. Alkemode

Tim Ziegler dresses far lunch



Saraj Alkemade and a fly swatter



Photo: P. Cole

Narmon Gordiner and Alan Tait won't get last in these hats



Photo: P. Cole

Chantelle Raberts and Helen Phelan brighten up the beach on a dull day



GAME OF BONES

BY BRONWYN JEYNES
PHOTOS BY LISA NINK AND
MELANIE MACKENZIE



Saraj Alkemade

The summer dig spans weeks, but winter seems to last a lifetime.

The struggle for the ultimate bone has begun.

It will stretch from Inverloch where the tide controls our hours to the exposed coast of the Otways where blown sand and hail drive us from the beach.

Doctors and researchers, preparators and palaeontologists, uni students, parents, old volunteers and new... all will play the Game of Bones.

The dig season is coming...



Dani Measday



John Wilkins



*Melanie Mackenzie defeats
John Wilkins*



*John Wilkins beaten at the
feet of Melanie Mackenzie*



*Lisa Nink prepares punishment
for John Wilkins*



A CHANCE ENCOUNTER ON A BEACH

BY TONI-LEE MILLARD

Location: Dutton Way Beach, Portland, Victoria.

It's a rare occasion (in winter) to see another person on the beach that my sister, Leonie, and I have zigzagged and combed in search of fossilised sharks teeth, with our Grandfather (aka Puppar aka Douglas Robb, now deceased), since we were little tackers. So it's practically impossible not to hone in on the solitary figure ahead for a few seconds to make a few assessments — for example, gender and risk analysis. After all, I am a little girl wandering the beach alone and unarmed (except for bowling-ball-sized, interesting-to-me rocks in each hand). I ascertained the male heading towards me was quite short, around my height, tastefully dressed in comfortable, earthy, ruggedish, explorative-type clothes, and not a concern to my immediate safety.

After calculating the person's mid-line beach walk direction, I moseyed up nearer to the back sand bank, deciding a nod and a smile would be the maximum interaction required. Not to be. He V-lined and asked me if that (pointing down the beach) was the abalone farm. I responded with a "Yes" and a "Why? Are you looking for a job?" He laughed and then we chatted.

It turns out that this person, Andrew, was living the dream life. Travelling the globe in search of fossils, preparing fossils, living alone near a beach with good surf and fossils to dive for and employed at Crystal World in Melbourne.

After chatting a bit more and walking back to the carpark, I took him back to my place (!) to show him a *Carcharodon megalodon* tooth (from an

extinct species of shark that lived approximately 15.9 to 2.6 million years ago, during the Cenozoic era) found by my Grandmother (aka Mummar, aka Leura Robb (née Heard), now deceased) in 1974, plus a rather large collection of shark fossil teeth. He seemed delighted, took a few photos and gave me a fossil shell from his recent trip across the Nullabor (to go with the ones I'd picked up years earlier).

Andrew told me about the Dinosaur Dreaming web page and that I could apply to be a volunteer via that site (which was how he started his journey).

We kept in occasional touch for a few months, then he disappeared into the wide world from whence he came. Sometimes I forget his surname, so I think Andrew Feral, which somehow reminds me of Ruffin.

I was smiling for weeks after that serendipitous meeting.

Application done, off to the big smoke for an interview at the Melbourne Museum with an interesting couple, who happily decided to accept me despite my not studying or holding any formal qualifications, nor am I an -ologist of any sort. Neither was Andrew Ruffin (which gave me a lot of hope to be accepted based on my passion and interest in loving to get out in the field and look for fossils).

PS: My grandparents nickname for me as a youngster was 'Hawkeye'.



Tani-lee Millard at a beach near Portland

Photo supplied by T Millard



DIGGERS' PALAEO TATTOOS

BY DAVID PICKERING

Most of our Dinosaur Dreaming crew love fossils. Some of our crew collect dinosaur figurines, some of us have shelves full of dinosaur books, and some even dedicate their careers to the research of extinct animals.

And then there are those who choose to display their love of fossils and extinct fauna by decorating their bodies with amazing palaeo-tattoos.

Here is a selection.

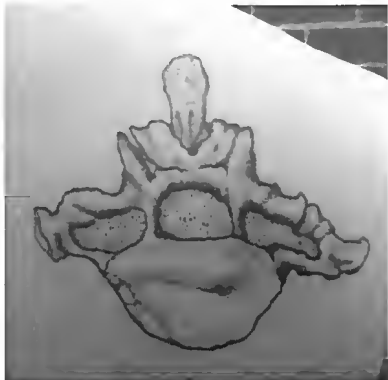


Photo supplied by D Wright

Dean Wright's stegosour vertebra



Photo: L Nink

Tomaro Camilleri's dinasaur footprints



Photo supplied by D Wright

Dean Wright's theropod jaw



Dean Wright's theropod tooth



Photo: D Pickering

Rohon stores down the inspirotion for his tottoo



Photo: D Pickering

Rohon Long's dodo



Photo: D Pickering

Seon Wright's temnospondyl

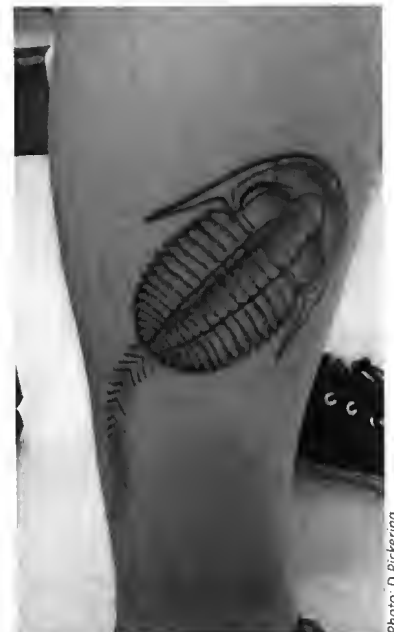
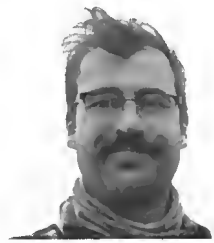


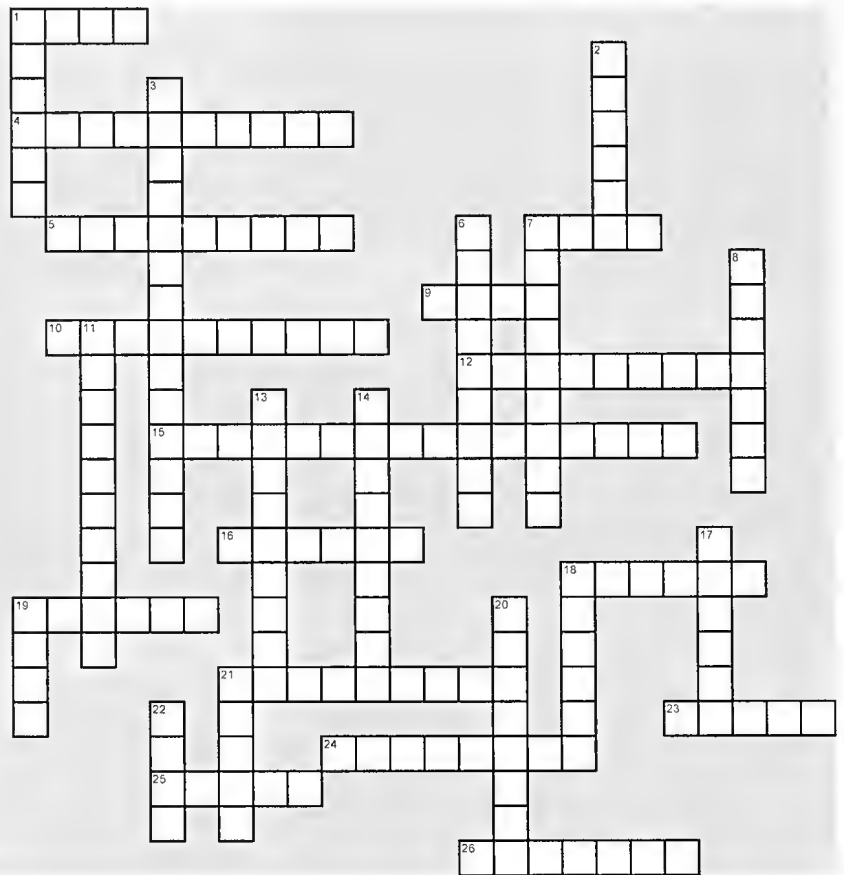
Photo: D Pickering

Seon Wright's trilobite



SETTER: RL

2015 DIG CRYPTIC



Across

- 1. Atlas Copco always delivers some fuel. (4)
- 4, 23-across. Relevant rock ensemble strangely prizes Lego truck. (10, 5)
- 5. Excitedly, I take around linocut with porcelain component. (9)
- 7, 22-down. Perhaps a precursor to *High School Musical* with onsite 19-across processing? (4,4)
- 9. Stays his additional ten seconds and gets inundated by this. (4)
- 10. Popular cobbler bundles not dispersed. (10)
- 12. Sega's first classic computer game: *Jupiter's Moon*, sadly not quite close to the bone. (10)
- 15. Raucous class atop broken 19-across. (16)
- 16. Rose and Jasper amongst others get two pints with initial zeal. (6)
- 18. Captain scratching head and befuddled in old age. (6)
- 19. This coal is soft yet holds back diggers' goal. (6)
- 21. Group of bishops locate bible behind eroded mountain. (9)
- 23. See 4-across.
- 24. Unforages/unravels old rocker? (8)
- 25. A rookie amongst the performers of *Rock Chunk*. (5)
- 26. Sex god gets something charged up to wear. (7)

Down

- 1. The dig's essential edge which I seldom withheld. (6)
- 2. See 21-down.
- 3. Unseal layer à la curious 19-across progeny of rich parents. (14)
- 6. Setting or upsetting abrasive unit. (9)
- 7. Worst fear witnessed and reported: a flying, leathery beast! (9)
- 8. Purchase audit brings pipe for dig bycatch. (7)
- 11. After seven, start off and creep outside to support beam source. (10)
- 13. God above! I really stripped with mob known for pockets and jumpers? (9)
- 14. "More men to confuse!" says *Teinolphos*. (9)
- 17. Overactor perhaps, creates a hit on the dig. (6)
- 18. Alan swallows half a bird in old age. (6)
- 19. Silence after Wi-Fi finishes chip accessory. (4)
- 20. Heard you'd fallen for backbeats and essential rock element. (8)
- 21, 2-down. Reciprocal disarray left in a cold space. (5, 6)
- 22. See 7-across.

Answers: Across: 1. COAL 4, 23-across. STRZELECKI GROUP 5. KAOLINITE 7, 22-down. PREP ROCK 9. TIDE 10. BLUNDSTONE 12. SPONGIOSA 15. ATLASOPCOSAURUS 16. QUARTZ 18. APTIAN 19. FOSSIL 21. PLACENTAL 24. FERGUSON 25. CLAST 26. EROSION Down: 1. CHISEL 3. LEAFLYNASAURA 6. GRITSTONE 7. PTEROSAUR 8. BIVALVE 11. LIGHTHOUSE 13. MARSUPIAL 14. MONOTREME 17. HAMMER 18. ALBIAN 19. FISH 20. FELDSPAR 21, 2-down. POLAR CIRCLE



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 of 2015.

BY WENDY WHITE



Sharyn Madder



Rohan Lang and Harry Osmand



Lauren Swann



Giulia Cinquegrana and Alan Tait



Steven Bianchi

Photo: C Roberts



Tim Ziegler and Michelle Agnew



Claudia Bawman



Jacqui Turney



Michelle Agnew

Photo: S Alkemade



Darren Bellingham



Amber Craig



Claudia Bowman and Andrew Wilson



Mary Walters



Toni-lee Millard



Giulia Cinquegrana



Mike Cleeland



Jahn Swinkels



Billy Parker



Dani Measday



Claudia Bawman



Harry Osmand



Alan Tait



Andrew Wilson



Jadi Salmond



Genevieve Cini



Wendy Turner



Bridget Firth



Helen Phelan



Caitlin Jay



Ben Francischelli



Jahn Swinkels and Amber Craig



Melanie Mackenzie



Cassia Paragnani



James Rule



Eric Khalif



Saraj Alkemade



Livvi Campbell



Andrew Giles



Eve Eidelson



Jade Kaekae



Adrienne Mallins



Cassia Paragnani, Nick van Klaveren and Jacqui Tumney



Jaerg Kluth



Tim Ziegler



Kim Davis



Jess Parker



Toni-lee Millard



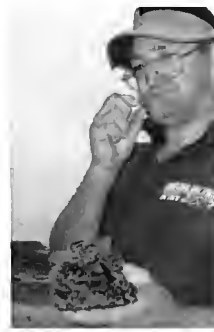
Lisa Nink



Miklas Lipcsey



Jade Kaekae



Jahn Wilkins



Chantelle Raberts



I FOUND A FOSSIL (AT FLAT ROCKS)!

BY WENDY WHITE

Although we spent most of this year's Field Season at Eric The Red West, we did spend three days digging at Flat Rocks. We found some fossils there, too.



Dean Wright



Ben Francischelli



Mary Walters



Manique Winterhaff



James Rule



Caitlin Jay



Bronwyn Jaynes



Fotini Karakitsas



Caitlin Jay



Dani Measday



Ben Francischelli



Wendy White



Jess Parker



David Pickering

Photo: T Millard



Astrid Werner



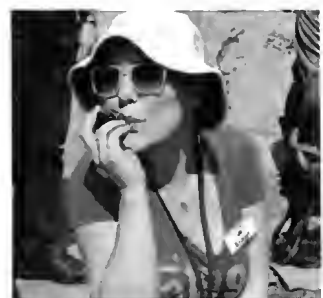
Eve Eidelsan



Jade Kaekoe



Claudia Bawman



Bridget Firth

ERIC THE RED WEST DIG FIELD CREW

31 JANUARY -

21 FEBRUARY 2015

Saraj Alkemade	Dani Measday
Michelle Agnew	Toni-lee Millard
Darren Bellingham	Lisa Nink
Steven Bianchi	Harry Osmond
Claudia Bowman	Cassia Paragnani
Livvi Campbell	Jess Parker
Genevieve Cini	Billy Parker
Giulia Cinquegrana	Helen Phelan
Mike Cleeland	Pat Rich
Pip Cleeland	Tom Rich
Peggy Cole	Chantelle Roberts
Amber Craig	James Rule
Kim Davis	Jodi Salmond
Eve Eidelson	Lauren Swann
Bridget Firth	John Swinkels
Ben Francischelli	Alan Tait
Norman Gardiner	Nova Taylor
Andrew Giles	Jacqui Tumney
Mike Greenwood	Wendy Turner
Caitlin Jay	Nick van Klaveren
Eric Khalif	Mary Walters
Joerg Kluth	Astrid Werner
Jade Koekoe	Wendy White
Miklos Lipcsey	John Wilkins
Rohan Long	Corrie Williams
Melanie Mackenzie	Andrew Wilson
Sharyn Madder	Dean Wright
Adrienne Mallinson	Tim Ziegler



John Swinkels watches James Rule extract rock from the hole

Photo: P Cole

FRIENDS' WEEKEND DIG FIELD CREW

22 - 23 MARCH 2015

Paul Chedgy	Joerg Kluth
Win Chedgy	Miklos Lipcsey
Genevieve Cini	Sharyn Madder
Mike Cleeland	Lisa Nink
Pip Cleeland	David Pickering
Peggy Cole	John Swinkels
Kim Davis	Alan Tait
Alan Evered	Wendy Turner
Nicole Evered	Mary Walters
Caitlin Jay	Wendy White
Bronwyn Jeynes	John Wilkins
Fotini Karakitsos	Corrie Williams
Lesley Kool	Dean Wright



Alan Tait conducts a geology tour of Eric the Red West

FIELD CREW PHOTOS

ERIC THE RED WEST WEEK 1 CREW



L-R Back Row:
Mike Cleeland
Pip Cleeland
Wendy White
Miklos Lipcsey
Norman Gardiner
L-R Middle Row:
John Swinkels
Helen Phelan
Nick van Klaveren
Mike Greenwood
Amber Craig
Dean Wright
Caitlin Jay
Chantelle Roberts
Kim Davis
Steven Bianchi
L-R Front Row:
Alan Tait
James Rule
Mary Walters
Genevieve Cini
Adrienne Mallinson

Photo: L Nink

ERIC THE RED WEST WEEK 2 CREW



L-R: Lisa Nink, James Rule, Pip Cleeland, Toni-lee Millard, Mike Cleeland, Nick van Klaveren, Nova Taylor, Jade Koekoe, Dean Wright, Livvi Campbell, Jacqui Tumney, Harry Osmond, Rohan Long, Corrie Williams, Billy Parker, Astrid Werner, Mary Walters, Giulia Cinquegrana, Joerg Kluth, Claudia Bowman, Cassia Paragnani, John Wilkins, Bridget Firth, Andrew Wilson, Alan Tait

ERIC THE RED WEST WEEK 3 CREW



L-R Back Row:
Pip Cleeland
Wendy Turner
Darren Bellingham
Eric Khalif
Alan Tait
John Wilkins
Eve Eidelson
Middle Row:
Lisa Nink
Mike Cleeland
Tim Ziegler
Nick van Klaveren
Dean Wright
Mary Walters
Andrew Giles
James Rule
Tom Rich
Front Row:
Sharyn Madder
Jodi Salmond
Saraj Alkemade
Jess Parker
Melanie Mackenzie
Michelle Agnew
Dani Measday

FRIENDS' DAY CREW



L-R Back Row: Pip Cleeland, Mike Cleeland, Alan Tait, Miklos Lipcsey, Dean Wright, Corrie Williams, Kim Davis, Mary Walters, Wendy Turner, Sharyn Madder, David Pickering, Bronwyn Jeynes, Wendy White, Nicole Evered, Lisa Nink, Lesley Kool
Kneeling: John Wilkins, Alan Evered, John Swinkels

