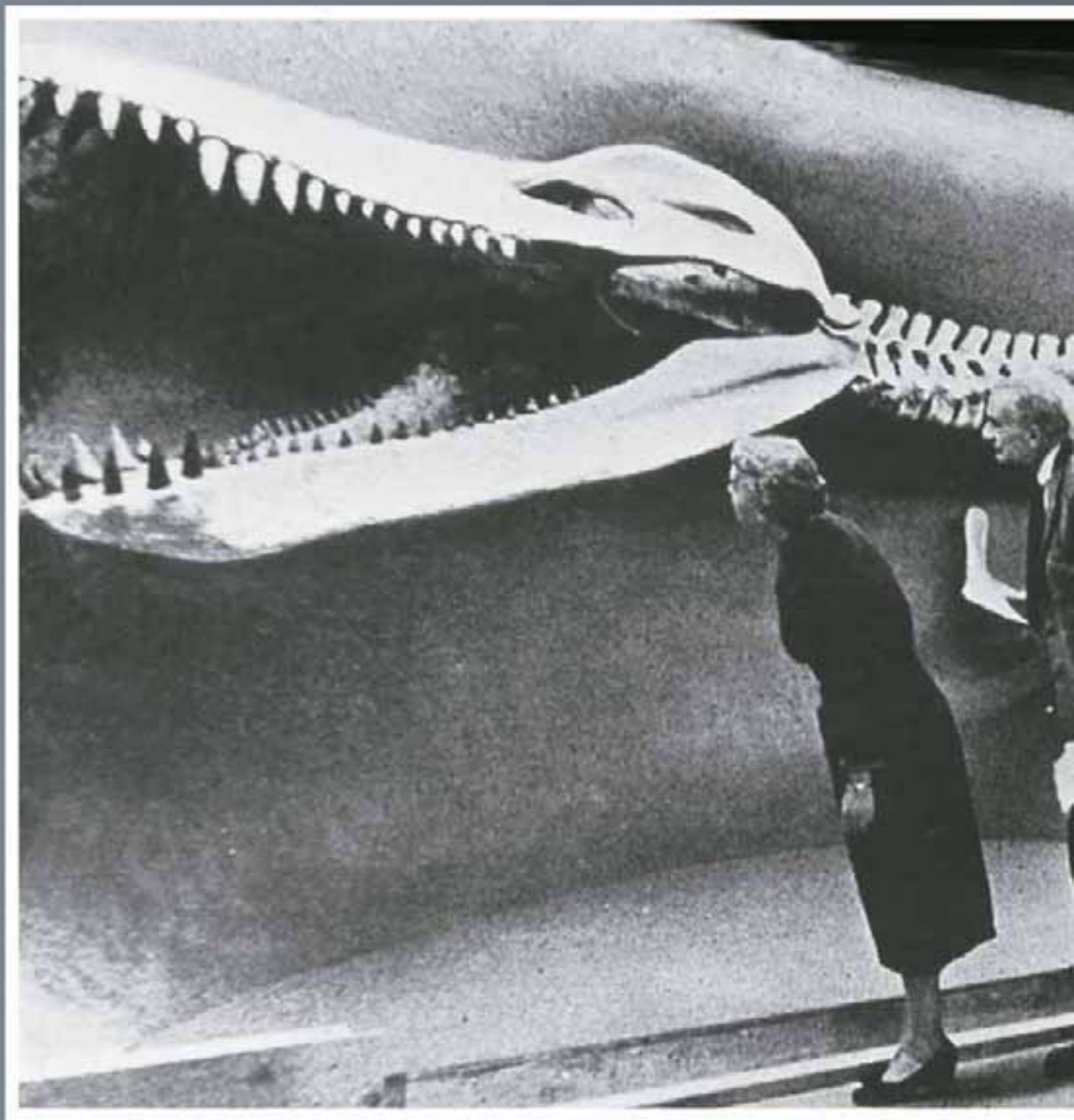
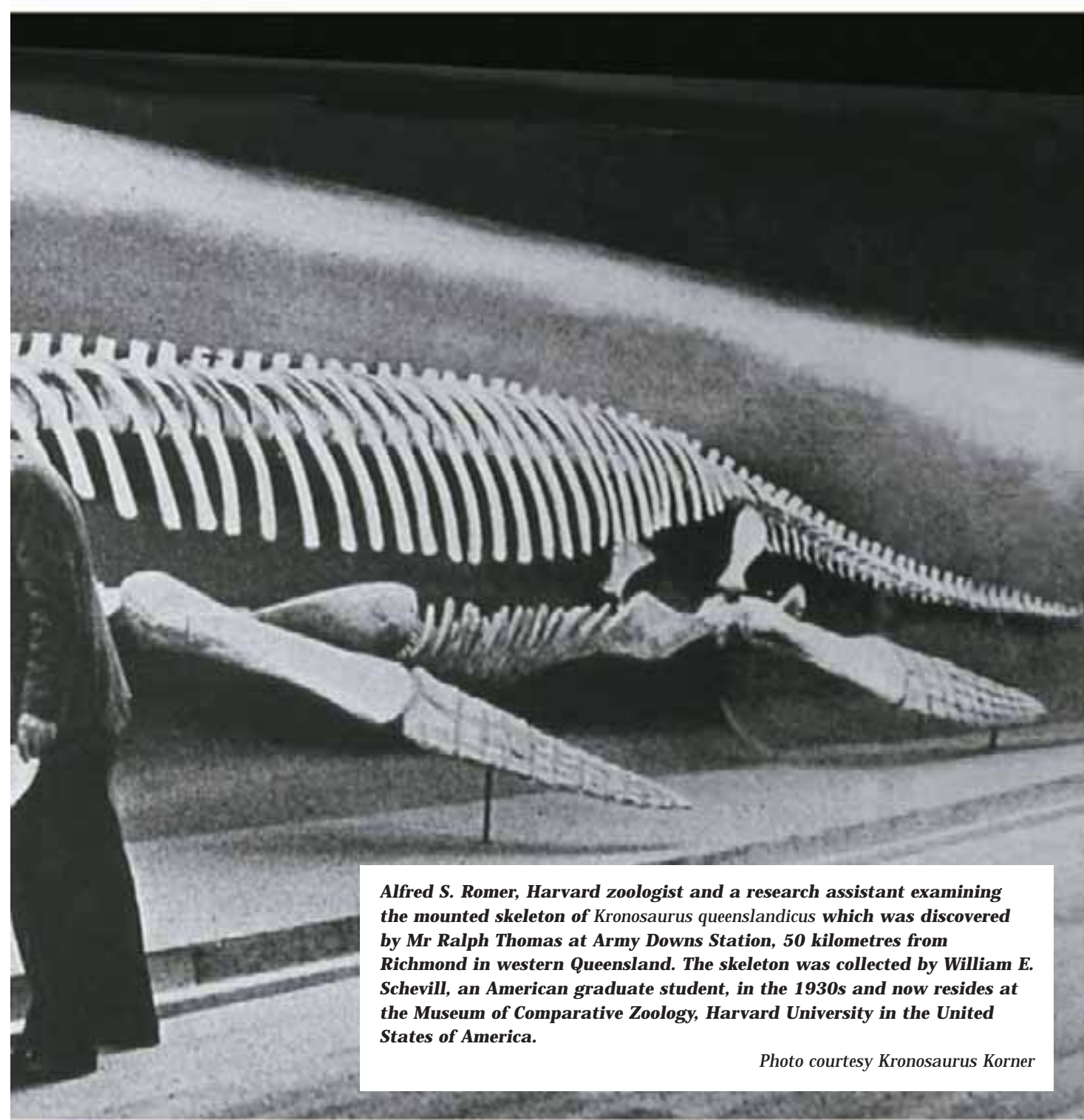


Kronosaurus



Chronicles

Story by Dr Troy Myers



Alfred S. Romer, Harvard zoologist and a research assistant examining the mounted skeleton of Kronosaurus queenslandicus which was discovered by Mr Ralph Thomas at Army Downs Station, 50 kilometres from Richmond in western Queensland. The skeleton was collected by William E. Schevill, an American graduate student, in the 1930s and now resides at the Museum of Comparative Zoology, Harvard University in the United States of America.

Photo courtesy Kronosaurus Korner

'Kronosaurus'; only a few Australians have ever heard of this impressive beast – one of Australia's fossil treasures. Some can reel off facts concerning Kronosaurus' palaeobiology and can relate the story of the 'heinous theft' of the best specimen ever discovered, by the United States of America. But how much of these stories is true? Controversy is rife throughout the scientific community and beyond regarding this magnificent animal and it is now time to delve through the facts and misconceptions and put to bed a few myths.

Let's start with the name, *Kronosaurus*. Those in the know will tell you that the name derives from Kronos, the Greek God of Time who ate his own children. But this woeful tale of infanticide is only partially true. My investigations suggest that there is no God of Time in Greek mythology. Chronos or Chronus represents the embodiment of time, and forms the basis of time-related words such as 'chronology'. But there was no god called Chronos or Chronus. Apparently there was, however, a Titan (one of 12) called Kronos, or alternatively Cronos, or possibly Cronus. These Titans supposedly existed before the Greek gods and were the children of Uranus and Gaia. (It is not clear what the latter two were.)

Now apparently, so the story goes, Gaia (mum) got a little tired of having so many children and was also a little weary of Uranus' (dad) odd habit of hiding his children inside her body (which is a neat trick whether you're a god or not, but he was apparently afraid of them). Meanwhile Kronos (Cronos, Cronus), who had supposedly not been hidden permanently inside Gaia, married his sister Rhea (also a Titan) and had six children, including Zeus. Gaia plotted to end Uranus'

strange habit of hiding his children inside her, but she needed help from one of the kids. Only Kronos (Cronus, Cronos) the loyal child stepped forward to assist his mum. Gaia gave him an adamantite sickle and sent Kronos off to hide. When Uranus next came to see Gaia, Kronos emerged from his hiding place (presumably not inside his mother) and struck a mighty blow cutting off Uranus' genitals. It's not entirely clear what happened next but Kronos (let's forget the rest) and his wife (sister) Rhea took control. Thus began a Golden Age of prosperity and harmony.

But the story doesn't end here. Kronos was fated to be overthrown by his children, and perhaps fearing the family tradition of castration, decided to prevent this from happening. Kronos was not going to be as silly as his father and hide his kids inside their mother. No way. Instead, Kronos chose the much more sensible option of swallowing them and keeping them inside his own body (no chewing, though). Rhea (like her mother) didn't think much of this. So after Kronos had swallowed the first five of his children it was Zeus' turn. Rhea cunningly wrapped a stone in Zeus' clothing and Kronos immediately swall-



The Titan Cronus about to eat one of his children. From a 1599 engraving.

mythology.com

owed the package. (No one said he was bright.) Subsequently, Zeus was taken to a cave and suckled and raised by a divine goat called Amaltheia – (obviously this was better than being swallowed by your dad). Later the grown-up Zeus returned and forced his dad Kronos to regurgitate the other five children. Zeus then revolted against his revolting father and the other Titans and banished them henceforth. **Right! Have you got all that? Perfectly clear, is it? Can you explain it to me please?**

Why Kronosaurus would be named after such a mixed-up, eccentric and downright violent family is beyond

This photo (right) was taken in 1932 and features the Army Downs kronosaurus dig. In the foreground is Ralph Thomas, owner of Army Downs helping excavate the fossilised skeleton of the huge marine reptile. The specimen was later packed with wool and shipped to the United States of America where it is now displayed at the Museum of Comparative Zoology at Harvard University.

Photo supplied by Barry Stevens, compliments of Kronosaurus Korner, Richmond



me. Nevertheless Heber Longman, Director of the Queensland Museum at the time, chose to name *Kronosaurus queenslandicus* as such. Needless to say the derivation of 'queenslandicus' is a little easier to understand.

The holotype specimen (a very important specimen that is held as the name-bearer for a particular species, and the specimen to which all future candidates must be compared) of *Kronosaurus queenslandicus* is a fragment of jaw containing six teeth. Andrew Crombie discovered this specimen in 1899 near Hughenden in north-west Queensland. Longman scientifically described the holotype over the next 30 years. In 1929, more material was found at the same location, including a partial skull that was distinctively broad, low and flat (these characteristics become important later).

In 1931-32 Mr William E. Schevill, an American graduate student, was a member of a six-man Museum of Comparative Zoology (Harvard University, USA) expedition to Australia. Thomas Barbour, then director of the museum, told the press, "we shall hope for specimens of the kangaroo, the wombat, the Tasmanian devil and the Tasmanian wolf." The team returned to America the following year with a collection of over 100 mammals and many thousands of insects but William Schevill, the fossil man of the team, decided to stay in Australia a little longer. Enlisting the help of Captain Guildford de Taliga, an anthropologist, he then organised an expedition to explore the Lower Cretaceous deposits around Richmond

and Hughenden, which to this Bostonite must have seemed like another planet. According to John Long's book, 'Dinosaurs of Australia and New Zealand', the Australian Museum had been invited to join the expedition. "The leader of the expedition, Dr W. E. Schevill, approached the director of the Australian Museum to see if the museum wanted to send a representative palaeontologist along to collect material, but no interest was shown in participating in the expedition." Long also states that at this time "the Queensland Museum was short of funds and could not afford to readily send dinosaur specialists out to such remote locations." This situation is still typical of palaeontology today and presumably this was also the state of affairs at the time of the Harvard expedition.

The team ventured to Grampian Valley, a property 30 miles north of Richmond, where they collected a rostrum (snout) of a young individual of *Kronosaurus*. This property has since revealed more *Kronosaurus* material that is now held at the Queensland

Museum. The team then met a local, Mr Ralph William Haslam Thomas (he is constantly referred to by four names), who told them about some interesting rocks on his property Army Downs, five miles to the north. There the Harvard mob began the task of excavating and recovering what was destined to be the most complete specimen of *Kronosaurus* ever found.

The specimen consisted of about 15 large limestone nodules that had been exposed as the softer sediment encasing them eroded. The Harvard team observed that the nodules were of variable size and contained skull, neck, trunk and tail elements. Many of the bones appeared to be articulated and the skeleton was oriented the correct way up (which is quite unusual for a fossil plesiosaur). Unfortunately, much of the surface bone had eroded or weathered in recent years. Many of the surface skull bones had been destroyed, as well as most of the spines of the backbones, while the bones of the pelvis and ribs were incomplete. None of the 'shoulder' bones could be found. The hind pad-



Photos, John and Carolie Leslie



Scale = 30 centimetres

July 1932 found the Harvard University expedition team at Grampian Valley, a property 30 miles north of Richmond, Queensland, where they camped at a bore near the Grampian Valley homestead, owned by Mr Henry Stevens (above and inset). Here they collected the snout of a young *kronosaurus* (left) that had been discovered by a member of the Stevens family. This specimen was also exported to the United States of America and now resides at the Museum of Comparative Zoology in Cambridge, Massachusetts.

Photo D. and J. Elliott, courtesy Queensland Museum



www.oceansofkansas.com

Dr T. E. White working on the prepared and reconstructed skull of Kronosaurus queenslandicus at Harvard University in the early 1930s (above). Due to time and labour constraints, the remainder of the Kronosaur skeleton was not to be prepared until 20 years later, when work resumed under the supervision of David Fuller, Jim Jensen (right) and Arnold Lewis (below). Funding for this massive task was provided by Mr Godfrey Cabot of Boston.

Photos from the collections of the Ernst Mayr Library, Museum of Comparative Zoology, Harvard University, Archives



Ralph Thomas poses with the skeleton of kronosaurus during its excavation by a team from the Harvard University in late 1932 (right). The skeleton was entombed in large limestone boulders and four tonnes of rock containing the fossil was eventually removed. Ralph had discovered the specimen in 1926 while riding through one of his paddocks on Army Downs.

Photo from the collections of the Ernst Mayr Library, Museum of Comparative Zoology, Harvard University, Archives



dles were present but the large femur bones were badly weathered and the smaller bones at the end of the flippers were poorly preserved. With the help of Schevill's assistant, nicknamed 'The Maniac' because of his affection for explosives, the nodules were dynamited into more manageable pieces for transport. Having spent many hours in temperatures of 40+ degrees sledging away at incredibly dense limestone nodules, I can tell you that dynamite sounds like a wonderful alternative, even if it is just to relieve the frustration of finding nothing inside when you finally crack it open!

According to Schevill's letter applying to the Collector of Customs for permission to export the specimen (November 11, 1932), the blocks were packed into 86 cases and were shipped from Brisbane aboard the *S.S. Canadian Constructor* on or around Dec-

ember 1, 1932. The blocks weighed nearly four tonnes unpacked and nearly six tonnes in their packaging. The Queensland Museum was well aware of the discovery and its export to the USA, as shown by Longman's confirmation, attached to Schevill's application: "I have pleasure in stating that these specimens collected by Mr W. E. Schevill for the Harvard University Museum are bona fide natural history specimens, not obtained for commercial purposes, but for scientific research."

Upon its arrival at the Museum of Comparative Zoology at Harvard, work began on the skull by Dr T. E. White. Preparation on the skull continued for two years. Because of time, labour and money constraints, the rest of the skeleton remained untouched for two decades. In 1956, the fate of the *Kronosaurus* specimen took

a fortunate, but bizarre, turn for the better. Enter a benefactor in the guise of Mr Godfrey Lowell Cabot of Boston, aged in his 90s. And what was Mr Cabot's interest? Sea serpents. In 1817, Godfrey's great-grandfather travelled to Gloucester Harbour to investigate popular reports of a resident 60-foot sea serpent. But Godfrey's great-grandfather was not taken in so easily by such wild reports. He did not see a 60-foot sea serpent on his visit. He did, however, observe a sea serpent of over 40 feet in length. Godfrey, clearly a sceptic, believed his great-grandfather's story and held a lifelong fascination for the sea serpents. And here in Boston was *Kronosaurus*, additional evidence to confirm his great-grandfather's story. Some websites suggest that Cabot provided the funds needed for preparing *Kronosaurus* because of the fam-



The Men Behind the Legend



In 1916, Ralph Thomas (above) enlisted in the Australian Imperial Forces where he served in the trenches of France in World War 1. He was wounded in action on two occasions and was in hospital in England when the Armistice was signed. He was invalided back to Australia and discharged as medically unfit shortly after.

Photo courtesy Ian and Shirley Thomas

Wounded in action notifications courtesy Mickey and Tex Durdin

Like many other significant events throughout history, the discovery and recovery of the Harvard Kronosaur has faded into obscurity and with the passing on of all the key players, little is known about it. An attempt to learn more about the people behind the scenes of 73 years ago led *Australian Age of Dinosaurs* halfway around Australia and finally overseas to the United States of America. Although it was very much a case of 20 years too late in most cases, we did manage to learn a little about the men who made it all happen.

Perhaps the most significant player, Ralph Thomas, who discovered the giant marine reptile on Army Downs, is also the most forgotten. The oldest of 10 children, Ralph was born at Shell Harbour, New South Wales on May 15, 1897, and grew up on a dairy

farm in the Illawarra district. Leaving school at a young age, he went sheep droving until World War I broke out in 1916, whereupon he enlisted with the First AIF. Ralph went on to serve his country with distinction, serving in the infantry in France where he was wounded twice before being invalided back home as medically unfit. Of his regiment of nearly 400 men, he was one of only 90 who returned.

After the war, Ralph moved out to north western Queensland and, setting up his own plant, went back to droving. He acquired a wife, Jessie, who subsequently drew Army Downs, north of Richmond in a land ballot in 1923. Army Downs was a soldiers' settlement block of only 13,103 acres. Blocks of this size were fairly common in the 1920s, but they soon proved to be unviable, earning the name Battlers' Block or Starvation Block. Ralph and Jessie moved onto the property where they lived in a galvanised iron hut. Their first child, Arthur, was born a year later.

Money was obviously tight in those days. In 1924 when Ralph's mother visited him, her diary portrays a man who was seldom home as he sourced work around the district to supplement their income. Ralph's nephew, Ian Thomas, told of how Ralph shore all of

his sheep on his own; no shearing shed, apparently he shored them in a yard. This could quite easily be correct, as one of the only



things remaining at the site of the old Army Downs homestead today is an abundance of rusted shearing combs and cutters. The Depression years of the 1920s and a succession of severe droughts obviously took their toll on Ralph and his family, eventually leading to the breakdown of his marriage. By this time the couple had two children, Arthur and Alison (a third child, Owen had died as a baby). In 1935, the Queensland Lands Department realised that Army Downs was unsuitable as a living area and Ralph was granted Carrick as an additional area. It is thought that Ralph left Army Downs shortly after (when the Army Downs bore failed) and moved to Carrick, eventually selling out and moving to the Injune-Springsure district in 1949.

Ralph first discovered the world famous kronosaurus skeleton in 1926. The fossil was, at this time, entombed in a series of very large limestone boulders. His subsequent offer of the fossil to the Queensland Museum was rejected because of the expense of excavating and transporting the specimen and it was to be a further six years before he approached Dr William Schevill, a graduate student from Harvard University.

Dr Schevill was part of a six-man team sent to Australia to collect speci-



In 1932 Dr William Schevill (above) led an expedition into north western Queensland in search of fossils. On June 4, 1932, they inspected a fossil deposit on Sylvania Station, 25 miles west of Hughenden. Shown in the photograph (left) are L-R the owner of Sylvania, Mr R. C. Eather, Capt de Teliga and Dr Schevill.

Photos from the collections of the Ernst Mayr Library, Museum of Comparative Zoology, Harvard University, Archives

mens of native Australian fauna. When the rest of the expedition returned to America, Dr Schevill stayed in Australia where he toured north Queensland in search of fossils. June 4, 1932, saw Dr Schevill and his accomplices at Sylvania Station 25 miles west of Hughenden where they inspected a fossil deposit. It is unknown if any material was collected from this site and by July 1932 they had moved on to Grampian Valley, 30 miles north of Richmond where they made camp at a bore about a half mile from the Grampian Valley homestead. (It is also not known how many people accompanied Dr Schevill on his expedition, with only one man, Captain Guildford de Teliga, known with any certainty.)

At Grampian Valley, they were shown the fossilised snout of a small kronosaurus specimen. This fossil had been discovered some time earlier by a member of the Stevens family who had removed a tooth from the snout with a hammer and chisel after finding the fossil too large to bring home. Upon collection of the snout, the tooth was presented to a relieved Dr Schevill, who returned it to its original position.

Mrs Carolie Leslie, granddaughter of Henry Stevens who owned Grampian Valley in 1932, recalled some of the events of Dr Schevill's stay at Grampian Valley, as relayed to her by her late father Murdoch Stevens. Murdoch was a young man of 20 in 1932 and accompanied Dr Schevill on many walks of sometimes considerable distances in search of fossils. Apparently Dr Schevill was a very strong man and used to carry with him a 7lb mallet (for cracking limestone blocks) that he continuously threw into the air and caught as he walked.

Shortly after his arrival at Grampian Valley, Dr Schevill was approached by Ralph Thomas. Army Downs joined the northern boundary of Grampian Valley, with the two homesteads being only about one mile apart. Ralph told Dr Schevill of his 1926 discovery and invited him to collect the fossil, thus setting in motion a chain of events that would ultimately lead to one of Australia's most significant fossil discoveries being displayed in the USA.

Carolie related some quite amusing stories of the 1932 digs, as told by her father. Dr Schevill's camp was under a large Bauhinia tree about 200 yards from the Grampian Valley bore and it appears that this was his base for the duration of both the Grampian Valley and Army Downs collections and excavations. One afternoon, the Stevens family went down to the



Murdoch Stevens (above), around the time of the Harvard University's expedition into northwest Queensland. Son of Henry Stevens, owner of Grampian Valley, Murdoch was a frequent companion to Dr Schevill, accompanying him on long excursions in search of fossils.

Photo courtesy John and Carolie Leslie

camp to offer the team some fresh mutton, only to be told, "No thanks, we're right for meat." To their horror, they learned that the men were living on kangaroo meat fried in emu fat, followed by strong cheese and treacle. One particularly cold morning in July, a visit to the camp inspired a remark on the exceptionally cold weather, to which Captain de Teliga replied "I'm praying for another cat!" Apparently the Captain had shot a wild cat a few days earlier and pegged and dried the skin, which he now had pinned to the back of his jacket in an effort to keep warm. This amazing piece of information tied in perfectly with a letter that Ralph Thomas had written to William Schevill in 1933.

By November 1932, Dr Schevill had completed excavating the Army Downs site and on November 11 applied for permission to export the fossils to the United States of America. Permission was granted and the specimens were packed into 86 cases. Each specimen was padded with wool 'locks' which had been purchased locally for one farthing a pound. Weighing about six tonnes, the packed specimens were hauled to the coast and shipped to Cambridge on the *S.S. Canadian Constructor* around December 1, 1932. Many years later, in 1989, Ralph Thomas travelled to America to see the mounted skeleton of kronosaurus, where he met his old acquaintance, Dr William Schevill again. It was to be their first and final reunion. Ralph Thomas died five years later on April 23, 1994, at the age of 97.

David Elliott

ily's embarrassment over great-granddad, but I could find no evidence to this effect. Alternatively, it seems that the great-grandson simply held his forebear's interest in bizarre sea creatures.

There are many websites pushing the story that the incompetent Americans were working on the specimen for 27 years – a ridiculously slow pace. In fact, once funding became available, it took only three years, which for a specimen of this size is an incredible feat. The massive preparation program took place under the supervision of Arnold Lewis, James Jensen and David Fuller. By 1959 the Kronosaurus skeleton was on display, reconstructed under the guidance of famous zoologist/morphologist/palaeontologist Alfred Romer. Now here is where another myth has taken root - many people will tell you that the Harvard specimen is a bit of a joke. "It's nearly all plaster", "the Yanks had no idea what they were doing", "the skeleton is obviously too

long", et cetera. While it is true, in hindsight, that the Americans probably got a few things wrong in the reconstruction, overall they did a damn good job based on the evidence they had available at the time. Problems with the reconstruction aren't nearly as bad as they are made out to be. The Americans themselves were mostly, but not completely, satisfied with the final result, as stated by Romer and Lewis in a 1959 paper: "Upon completion of the mount, the only structural feature which we would wish to modify, given the opportunity, would be to move the pelvic girdle upward and backward by perhaps 20cm."

During reconstruction the Harvard Kronosaurus was lumbered with the nickname 'plasterosaurus' due to the large amount of plaster used in the reconstruction. Unfortunately this tag has stuck, somewhat unfairly. Most of the skeleton is in fact bone, while only one-third is plaster. Compared to many fossil skeleton reconstructions

in museums around the world, this is not a significant amount. In fact the Harvard Kronosaurus has an exceptionally good real bone to plaster ratio. There are numerous skeletons, (particularly dinosaurs) that do not even contain one-third real bone. Furthermore, the vast majority of skeletons on display to the public contain ONLY cast material – the real bone deemed too valuable to be displayed. The fact that Romer was one of the most brilliant, conscientious and industrious morphologists of all time brings me to the conclusion that the reconstruction was based on pretty good evidence and informed speculation. Speculation has always been a part of palaeontology and it is surprising the number of times it is actually proved correct when more fossil evidence comes to light. Also from personal experience, I know that museum visitors generally prefer to see some sort of reconstruction, be it artwork or cast material, than a pile of real bone lacking any reconstruction.

"Army Downs"
7 July 1933

Dear Mr Schevill

Your welcome letter reached me in due course and I was interested in all you wrote, yes 23 degrees below zero is pretty "strong" as you say, the Captain would need more than a catskin on the back of his jacket!!

Well it is now summer with you, that is if they have left you there to enjoy it and not sent you to the ends of the earth looking for more fossils.

We are having a very mild winter, hardly a touch of frost yet and a good season into the bargain, and now wool prices are hardening so that I have already visions of seeing those "Beautiful Glass Flowers", etc.

This is the anniversary of your sojourn here and next week I start shearing again but alas I am short 1600 young sheep that I shored last year. It will be a long time before I forget 1932. Also lost 80 head of cattle.

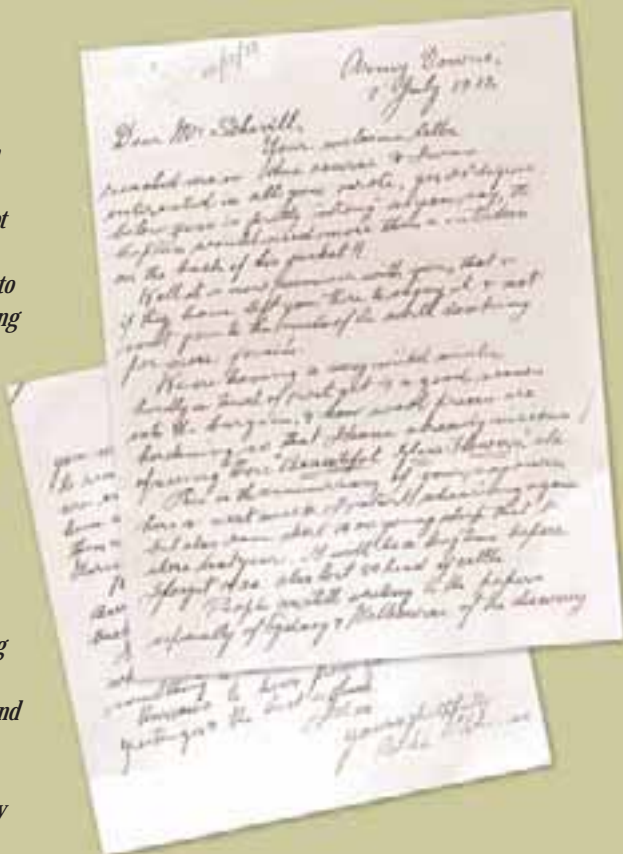
People are still writing to the papers especially of Sydney and Melbourne of the discovery you made here, and they are highly amusing to read, for generally the main points are entirely wrong. Melbourne and Sydney each have a small town near them called Richmond and both claim them as the site where you discovered this Marine Reptile.

Well America has gone wet, but 4 percent beer is not very savage or are you getting back to it gradually?

I hope the old fossil comes up to expectation when you get him cleaned up properly and is something to make the Museum remember you!

Anxious to hear from you at anytime, Greetings and the best of luck

I am Yours faithfully
Ralph Thomas



On the anniversary of the Harvard expedition's recovery of Kronosaurus, Ralph Thomas wrote to William Schevill. The letter was kindly provided to Kronosaurus Korner, Richmond, by a relative of Mr Thomas. The letter provides a number of insights, for instance, the importance of the sheep and wool industry in north-western Queensland at the time. Today the sheep industry is all but gone, mostly replaced by cattle. The ramifications of a serious drought in late 1932 are also alluded to. There is mention of the confusion in the Australian media regarding the location of the discovery and Richmond – confusion that still occurs today. Interestingly, Ralph also mentions the fact that America was slowly emerging from the gangster years of prohibition. The letter also suggests that Ralph was a modest man, as he twice refers to Dr Schevill's 'discovery' of the Kronosaurus, even though Mr Thomas had known about the fossils in the rocks for many years.



In 1989 Ralph Thomas, aged 93, travelled to the Museum of Comparative Zoology to see the prepared and reconstructed Kronosaurus for the first time since it had left his property 57 years before. He had simply told his wife, "I want to see my animal." At Harvard Mr Thomas was also reunited with William Schevill whom he believed had died in World War II. Dr Schevill had also believed that Ralph had died many years previously.
Photo courtesy Ian and Shirley Thomas

The scientists and preparators involved with the reconstruction are often criticised for having made the skeleton far too long – as if Australian counterparts would never have done anything so brash! Kronosaurus certainly seems to fluctuate in size – anywhere from 8m to 15m in length and many sources still cite 8m to 9m as the total length of Kronosaurus. However, as far as I can determine, this information is based largely on unpublished data. According to the paper by Romer and Lewis (describing the Harvard Kronosaurus skeleton), the limestone nodules from Army Downs – when prepared using mechanical and chemical means – revealed part or all of 46 vertebrae between the skull and the front end of the tail. The number of vertebrae was not guessed, nor was creative imagination used, as has sometimes been implied. Instead Romer and Lewis provide a logical and detailed argument for their reconstruction. They state that many blocks contained articulated vertebrae, and that some blocks could be joined. Where blocks could not be joined, the vertebrae in each segment were examined closely to determine if a vertebra

or vertebrae were possibly missing. In all, they restored 11 vertebrae that were not present in the fossil material, but for which they were reasonably certain were indeed missing. They believed that at most they were out by one or two segments, possibly containing at most a few vertebrae each. Romer and Lewis explain how many blocks there were, how many vertebrae were present in each block, and why they believed other vertebrae were present, based on centra size, rib size, position of rib facets and so on.

By my rough calculations, derived from measurements supplied by the Museum of Comparative Zoology, the average 'pre-hip' vertebrae is about 13.5cm in length (the longest vertebrae given by Romer and Lewis in their paper was 14.5cm for one of the biggest mid-dorsals). Now let's assume that Romer and his team were wrong on all 11 vertebrae they restored (highly unlikely), that would equate to about 160cm, giving a total length of about 11.2m. Even if we allow a generous 50cm for missing cartilage and shorten the tail and skull by 30cm each (for good luck), we are left with an animal in excess of 10m

long. Not at all close to the figure of 8m to 9m that is mentioned in many popular books that discuss Kronosaurus. To reach the 8m or 9m figure, Kronosaurus would require a ridiculously stumpy little tail and a much shorter head, for which there is no evidence. I seriously doubt that Romer and his colleagues were wildly out in their restoration of 11 vertebrae, nor were they far out in the tail or skull length. At most they were probably out by six vertebrae or just over 1m (with cartilage added).

In 1935, Dr T. E. White, who prepared the skull of the Army Downs Kronosaurus, wrote a paper describing the skull of this specimen. Intriguingly, White states in this paper that the skull, when restored, "is 3720mm (9ft, 8in) from a line between the quadrates to the tip of the rostrum." This is far larger than the skull that went on display with the entire skeleton in 1959, which is 2940mm long! The discrepancy is not explained, but perhaps this suggests that Romer, Lewis, White et al. had already determined by 1959 that the skull was too long and had allowed for a reduction of over 780mm. A further drastic

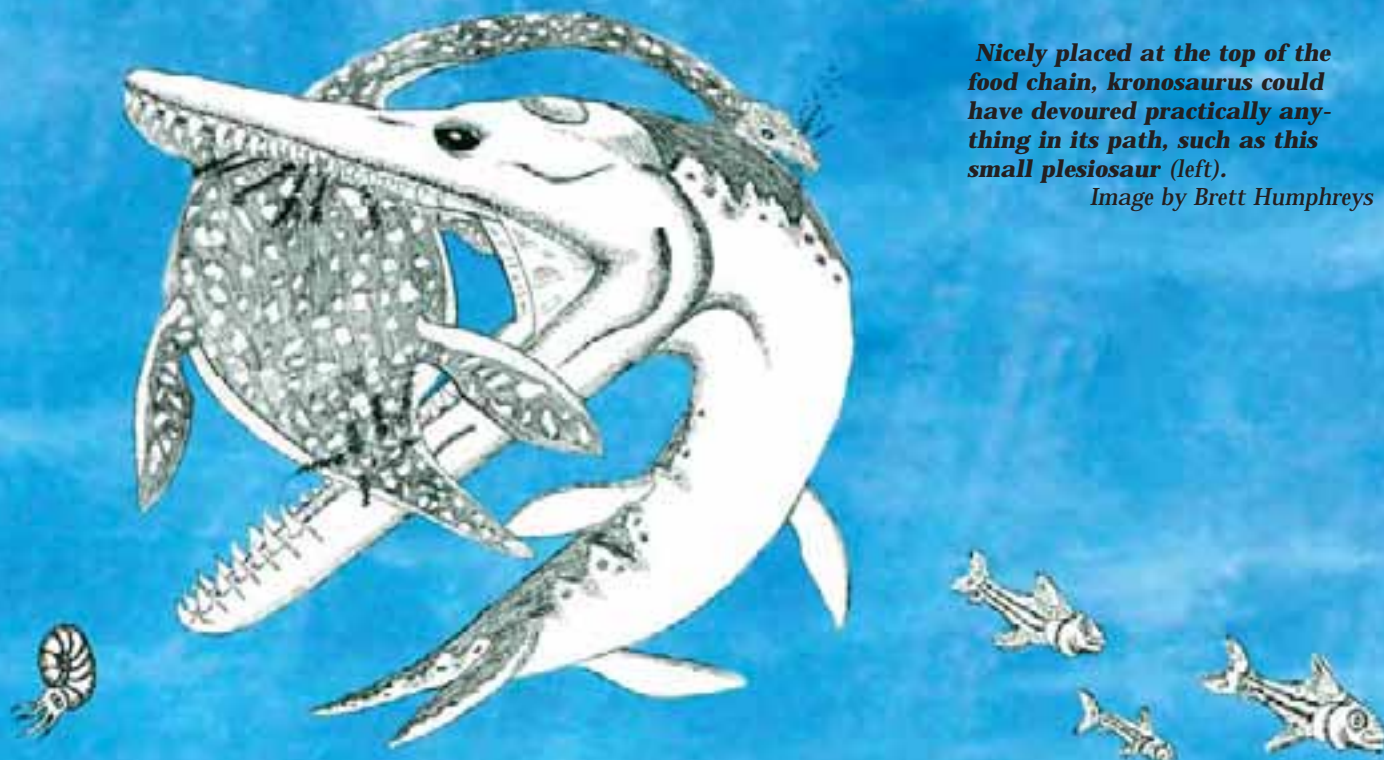


Kronosaurus country. Rob Ievers of Richmond surveys the limestone-studded rolling grasslands of Army Downs (above). Although the exact location of the Army Downs kronosaur discovery is unknown, it is believed to be on the southern side of the station. A handful of artefacts, the crumbling fireplace and a few drunken yard posts (inset) are all that remain of the Army Downs homestead today.

Photos, D. and J. Elliott

Nicely placed at the top of the food chain, kronosaurus could have devoured practically anything in its path, such as this small plesiosaur (left).

Image by Brett Humphreys



The magnificent reconstruction of *Kronosaurus queenslandicus* stands guard at the entrance to *Kronosaurus Korner* marine fossil museum in Richmond, Queensland (right). Based on the statistics of the *Army Downs* skeleton discovered in 1932, this life-sized replica depicts *kronosaurus* as it would have appeared 116 million years ago when the district was home to an extensive inland sea.

Photo, D. and J. Elliott



reduction would therefore seem to be unjustified.

Until someone comes up with some evidence to the contrary, I will continue to believe Romer and Lewis's work based on hard data and years of comparative osteology, complete with their own doubts and caveats. I say well done to Romer and his colleagues, they were very close to, if not on, the money in my book, so stop downsizing this impressive animal! *Kronosaurus* is still very impressive at 10m to 11m in length but at the current rate of misinformation this magnificent animal will be chihuahua-sized by the end of this century.

Kronosaurus queenslandicus was certainly one of the largest marine reptile predators of its time, but perhaps not THE largest. Other pliosaurs, such as *Liopleurodon* (featured in 'Walking with Dinosaurs') and at least two other unnamed specimens may have been larger. There are also a number of ichthyosaurs (dolphin-like reptiles) and Mosasaurs (marine varanid-like lizards) that outgrew our *Krono*, with known species in excess of 16m long (and one unpublished ichthyosaur from the Nevada desert that may be the largest marine reptile ever found at over 25m long), although these creatures did not live at the same time as *Kronosaurus*. Nevertheless, *Kronosaurus* was an impressive animal, nicely placed at the top of the food chain and capable of devouring just about anything it wanted.

There is some contention among researchers that all the Australian *Kronosaurus* material represents one

species. The Harvard specimen and other material from around Army Downs and Grampian Valley are derived from the Wallumbilla Formation that is dated at about 116 million years old. The holotype and other specimens from nearer to Richmond and Hughenden are mostly derived from the Toolebuc Formation that is younger at about 100 million years. Sixteen million years (minimum) is a long time range for any species and this fact, combined with possible morphological differences in specimens from the different aged strata, may support the hypothesis of multiple *Kronosaurus* species.

So what myths have we exploded? Well firstly, the derivation of the name, *Kronosaurus*, isn't as straightforward as is sometimes suggested. Secondly, both the Queensland and Australian Museums were aware of the Harvard expedition to northwest Queensland, and at least one if not both were offered to join. Thirdly, the Queensland Museum was aware of the discovery and had approved the export. So to suggest as many websites (and other sources) do, that "the specimen was removed from Australia without licence, and without Australian scientists or institutions being involved, a situation the local scientific community has never been happy about" is utter nonsense. "Certainly, if further specimens come to light they will remain in the country." Significant specimens, such as *Kronosaurus*, are today largely protected from export to foreign institutions through the Protection of Movable Cultural Heritage

Act 1986. Before any specimen can be exported, it is necessary to obtain an export permit through the National Cultural Heritage Committee, which includes a palaeontologist and takes advice from museum curators. Specimens that are under-represented in Australian institutions are unlikely to be granted permission to export. Of course, protection within Australia and the black market are another matter entirely.

So let's not blame the Yanks entirely for the disappearance of *Kronosaurus* to Boston. A combination of a lack of funds, desire and foresight on behalf of Australian scientists also seems to have been a contributing factor. A number of highly significant *Kronosaurus* specimens, including impressive skull material as well as partial skeletons have since come to light, with most awaiting further preparation. Rather than complaining about legitimate events that occurred over 70 years ago, our energy could be much better directed trying to find an even more complete skeleton and preparing and researching those *Kronosaurus* specimens we have in storage.

Lastly, can we finally admit that the Americans did a damn good job of preparing and reconstructing the most complete *Kronosaurus* skeleton ever discovered, at a time when such a preparation program was not possible in Australia? We can marvel at the best specimen of *Kronosaurus queenslandicus* in the world and be proud of its origins.



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