

Fossil News

Middle Years - Student notes

Origin
energy



Government of South Australia
Department of Education and
Children's Services

This Outreach Education Program for schools is made possible by the partnership between the South Australian Museum and the Department of Education and Children's Services. Outreach Education is a team of seconded teachers, managed through the Open Access College, who are based in public institutions.

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Remarkable new discoveries are being made by ‘fossil detectives’ working at the South Australian Museum. To prepare for your visit, check out some of the following highlights.

Fossil tree discovered in the desert.



Type: Thought to be a species of Eucalyptus tree.
Height: Approx. 4.5m
Age: It could be millions of years old.
Habitat: It grew at a time when the physical conditions of Central Australia were much wetter than today.

A German missionary Rev. Johann Reuther sold the fossil tree to the museum in 1907. It now stands outside the east wing of the museum. Aboriginal people told Reuther about it and he asked John Irrgang, a teamster at the Mission station to collect it for him. It was lying down in three pieces on a salt pan east of Lake Eyre and Irrgang needed a wagon with a team of horses to get it back to the Mission in 1900.

Eventually it was purchased by the museum and cemented together in its upright position.

Aboriginal people in the area believed it was the body of a Dreaming Ancestor called Kadimarkara who died and turned into stone.

As hard as rock! Wood becomes petrified when it is buried under sediment and the surrounding ground water saturates its tissues. The wood and its pore spaces become filled with minerals, in this case silicates, and a rock-like fossil results. Petrified remains of trees from the Cretaceous period (135–65 million years ago) and the Tertiary period (65–2 million years ago) are common in Central Australia and are also found further south at places such as Gawler and the Onkaparinga.

Dinosaurs lived in South Australia!

Rare and precious dinosaur bones discovered buried in the floor of the 120 million year old Eromanga Sea are unmistakable records that dinosaurs once roamed around the shores of the inland sea in South Australia. The distinctive shape of each bone means that it can be recognized as part of the skeleton from a particular family of dinosaurs, even though the species cannot be identified without more of the skeleton.

The solitary bones on display in the museum each came from the decaying carcass of a dinosaur that had been carried down river and drifted out to sea to be torn apart by large predators before sinking to the bottom.



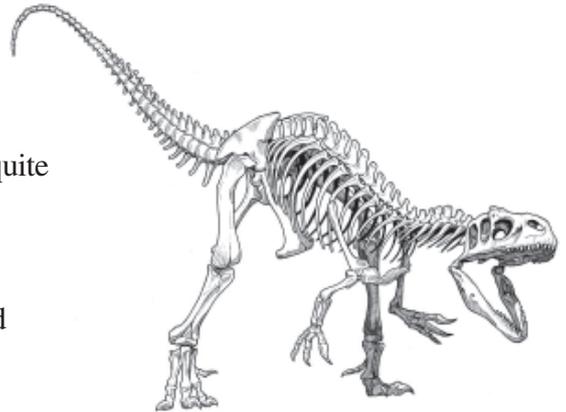
A small tail (caudal) vertebra from a turkey-sized carnivorous dinosaur, such as *Compsognathus*.

Theropoda gen. et sp. indet.
 Early Cretaceous (Aptian), Bulldog Shale,
 Andamooka, South Australia.

***Allosaurus atrox* ankle bone discovered in Victoria**

Amongst the first fossils discovered in Victoria was the ankle bone of an animal that has been identified as an *Allosaurus*. The size of the bone suggests the dinosaur was a bit smaller than the great *Allosaurus* that hunted in other parts of the world. The Australian dinosaur would have only been 6 metres long and 2 metres tall. (Still quite a fierce animal)

The South Australian Museum has a cast of an *Allosaurus atrox* skeleton that can give you a good idea of what these carnivores would have looked like



Although *Allosaurus* is best known from western U.S.A., it has also been found in East Africa, Eastern Asia and Victoria, Australia. The American bones are about 140 million years old whilst the ankle bone found in Australia is about 120 million years old.

***Tyrannosaurus rex*, back from the Cretaceous.**



Tyrann = tyrant - *o-* *saurus* = reptile - *rex* = king

- Order:** Theropoda
- Height:** Approx. 6m.
- Age:** Cretaceous period (135-65 million years)
- Habitat:** *T. rex* roamed around countries in the northern part of the world more than 60 million years ago. It did not live in Australia.

Picks, shovels and dynamite! The skull of *T. rex* which is on display outside the Discovery Centre (second floor) is an exact replica that was cast from the skeleton excavated in 1908 at Hell Creek, Montana, U.S.A., by the famous palaeontologist, Barnum Brown. He had, six years earlier, discovered the very first skeleton of *T. rex* in the same area but much of it was missing. The fossil site was in open, desolate country, five days' travel by horse-drawn wagon from the nearest railway, more than 200 kilometres away. The excavation took three months, using scrapers, picks, shovels and dynamite. Eventually all the bones were unearthed and in 1915 a complete skeleton, a composite of the two finds, was put on display at the American Museum of Natural History.

Monster meat mincer. *T. rex* had large sharp teeth that were very good for eating meat. It could bite off a piece of meat as big as a bale of hay. If *T. rex* broke a tooth or it was worn away from eating, it would grow another one to replace it. *T. rex* was 6 metres high and 14 metres long. It had two legs and could run very quickly when chasing other animals it wanted to eat.

Opalised sea monster uncovered at the SA Museum.



Plesio = ribbon - *saur* = reptile

Type: Plesiosaur - marine reptile **Length:** 6.5m.
Age: Late Cretaceous 115 million years ago.
Habitat: 120 million years ago when dinosaurs lived on the land, plesiosaurs swam in an icy inland sea here in South Australia.

Like a turtle with snake's head.

A remarkable opalised skeleton was discovered near Andamooka in 1968 by John Addyman. This rare find was later identified as a plesiosaur. When it died and its body sunk down onto the seafloor where it was buried by layers of sand and mud. Its skeleton was turned into a fossil and later the bones changed into opal. Scientists believe it is the best opalised skeleton on earth. These marine reptiles hunted for fish and belemnites (squid-like animals) using their long necks and sharp teeth to snare their prey. A plesiosaur's body would have been encrusted with scales, biting parasites and barnacles.

Life size plesiosaur now on show.

Type: Life size model.
Length: 6.5m.
Material: Fibreglass.

Almost eaten by a plesiosaur.

Museum taxidermist Mr Jo Bain worked in collaboration with museum palaeontologist Mr Ben Kear to establish the exact size and proportion of the Addyman plesiosaur. They also referred to plesiosaur fossils interstate and in overseas collections to assist with their calculations. Approximately three months was devoted to this research before making the model. References were also made to living relatives such as the marlin for skin



Visit the museum website for more details on how the model was made. www.samuseum.sa.gov.au/fossils/fgw2-5.htm#model

Ichthyosaur

The giant pliosaur Kronosaurus had jaws up to 3 metres long armed with conical teeth as big as railway spikes. Kronosaurus probably hunted other marine reptiles such as ichthyosaurs and plesiosaurs.

Swift moving ichthyosaurs, up to 10 metres long, probably dived deep using their keen eyesight to hunt fish, belemnites and ammonites near the sea floor.



Beautiful gems from a desert ocean



The Origin Energy Fossil Gallery features some of the best opal fossils of South Australia.

The Eromanga Sea that covered the interior of Australia 100 -120 million years ago was rich in marine life. Ichthyosaurs, plesiosaurs, fish, sharks, ammonites and belemnites swam in open water. Slow moving and sedentary animals such as starfish, crinoids, cockle, snails and tube-worms lived on the seafloor.

Only those bones that became trapped in seafloor sediment had a chance of becoming fossils. Some were replaced by clear silica, and others by precious opal.

Many of these opal fossils have been generously donated or are on loan by members of the general public.

Ana, a student carrying out research at the museum on marine fossils, carefully excavated ancient shells from pieces of seafloor collected near Coober Pedy in northern South Australia. These marine invertebrates lived at the same time as the plesiosaur, 120 million years ago. They can now be seen on display in the Origin Energy Fossil Gallery.



Stolen fossils returned to the museum.



During 1991, South Australia Museum staff became increasingly aware of the destruction of several important fossil sites across Australia. In the Flinders Ranges, commercial collectors had stolen rock slabs containing some of the oldest animals on our planet.



Seapens: Charniodiscus

Explosives used.

On Kangaroo Island, thieves illegally used explosives to blow out a volume of rock the size of a small car from a cliff face which they split on the beach.



Trilobite *Redlichia takoensis*

These and other stolen fossils were illegally exported from Australia in breach of the Commonwealth Protection of Moveable Cultural Heritage Act 1986. This legislation controls the export of important cultural heritage objects so that our irreplaceable heritage is not lost to Australia forever.

Giant prawn found on Kangaroo Island!

Imogen and Harriet investigate the 'hands-on' fossils while visiting the new fossil gallery. Harriet is holding a model of a giant prawn that lived here in South Australia at the same time as the trilobites, 530 million years ago. In fact it ate trilobites!

