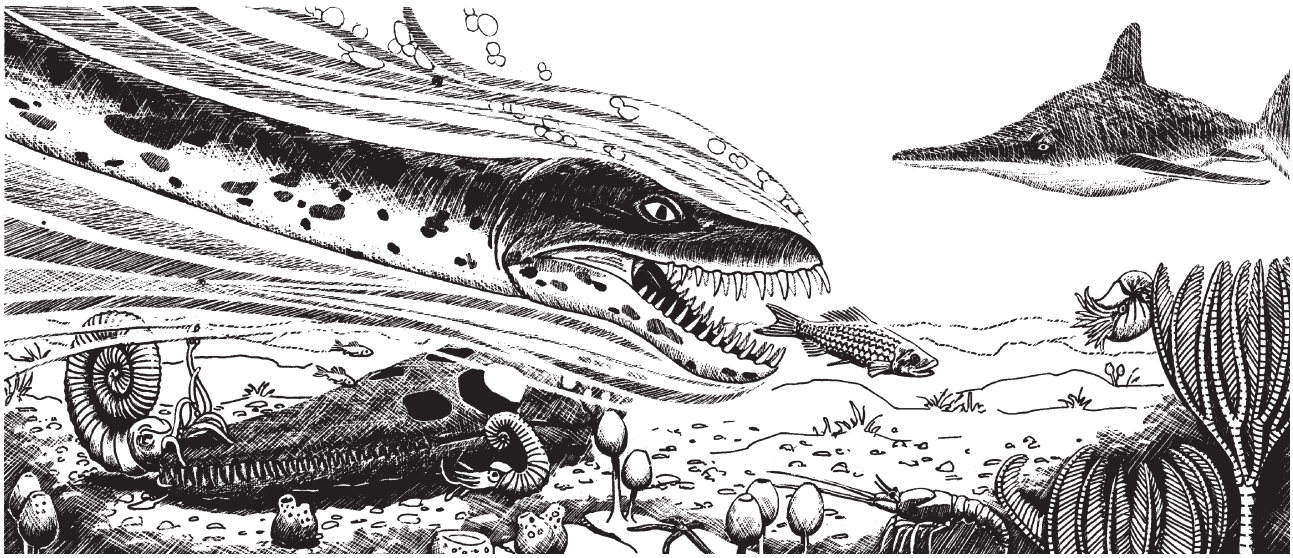
Cretaceous Marine Reptiles

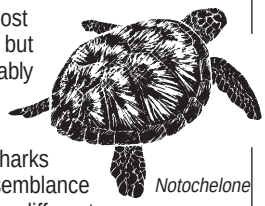


Reptiles were among the first vertebrates to live on the land. Unlike their amphibian ancestors, the reptiles were able to move freely on land because their eggs, which had a protective and often hard shell, did not need to be laid in water or moist areas.

Many millions of years after they first appeared, some reptiles returned to the sea, possibly to take advantage of abundant food supplies. The best record of marine reptiles in Queensland is in the sediments of the Great Artesian Basin. About 110-97.5 million years ago (during the Aptian and Albanian stages of the Upper Lower Cretaceous period), a shallow temperate sea covered much of central Queensland.

The fossil remains of marine reptiles include turtles (mostly *Notochelone*), ichthyosaurs pliosaurs and plesiosaurs. All breathed air and, except for some turtles, were flesh eaters.

The fossil turtle, *Notochelone*, was the most common marine reptile in the inland sea, but the plesiosaurs and ichthyosaurs are probably the best known.



Notochelone

Ichthyosaurs or 'fish lizards' developed a streamlined, fish-like shape similar to sharks and dolphins. They show that a close resemblance or convergence can develop between very different animals that adapt to a similar way of life. Ichthyosaurs were fast and agile swimmers.

Platypterygius ('broad fin') was a large ichthyosaur which grew to 6 or 7 m long. It swam by moving its tail from side to side, as fish do, and similarly, steered with paddles or fins.

Ichthyosaurs were completely adapted to life in the sea. Their young were born live after being hatched from soft-shelled eggs incubated inside their mothers' bodies. The ichthyosaur hatchlings were born tail-first and were ready to swim like baby dolphins and whales. The young were relatively light-weight because their bones were not heavily ossified (mineralised). This, and the angle of their fins, tended to bring them to the surface when they wriggled their tails. Once there, they could breathe while they learned to swim and dive properly.

Platypterygius hatchlings were nearly 2 m long. A hatchling and its mother were discovered in Queensland in 1988.

The hatchling's head was on one side of a piece of rock and ten of the mother's ribs were on the other side. The mother's snout and tail were not found, but nearly 3 m (half) of her body was preserved.

Plesiosaurs and pliosaurs, unlike ichthyosaurs, swam with their paddles and steered with their tails. Generally speaking, pliosaurs were short-necked with big heads and large teeth while plesiosaurs had long, supple necks, small heads and fine teeth. *Woolungasaurus* was a long-necked plesiosaur and a partial skeleton (backbone) in the Queensland Museum suggests the animal could have been 9 to 10 m long. Scientists believe *Woolungasaurus* may have left the water to lay its eggs on the beach, like a turtle.

The most complete Australian plesiosaur remains were discovered in 1999 at an undisclosed site in northern Queensland. The specimen, 80 per cent intact, has been affectionately named 'Dave' after its discoverer. Dave was 5 m long, including a 3 m neck.

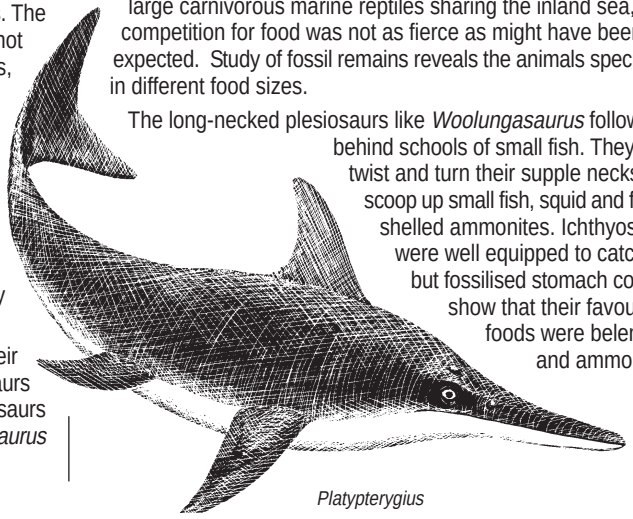
Kronosaurus, a short-necked pliosaur, was probably one of the most ferocious carnivores of the inland sea. The best-known skeleton of this animal, *Kronosaurus queenslandicus*, was taken to America by its discoverers and is on display at Harvard University. Its length, as mounted, is 12.5m long but only 1.5 m in diameter. Its jaws alone are 2.7 m long, with 15 cm teeth.

Kronosaurus' cigar-shaped body was driven through the sea by four of the strongest paddles ever developed by a marine animal. These probably moved the streamlined rigid body faster than any other sea animal - when it kept to a straight line. *Kronosaurus* could have killed and eaten any large animal it caught, but supple ichthyosaurs could have probably dodged it. The animal takes its name from Kronos, a mythical Greek giant who ate his own children.

Kronosaurus and *Woolungasaurus* exhibited two extremes in morphology. The differences in their shapes were achieved during more than 100 million years of adaptation to different sizes of prey and hunting techniques. Some smaller long-necked plesiosaurs, which had less specialised necks than either of these animals, lived in brackish to non-marine conditions in the central parts of the inland sea and streams. Opal miners have found their remains in north-western New South Wales.

Although *Platypterygius*, *Kronosaurus* and *Woolungasaurus* were large carnivorous marine reptiles sharing the inland sea, competition for food was not as fierce as might have been expected. Study of fossil remains reveals the animals specialised in different food sizes.

The long-necked plesiosaurs like *Woolungasaurus* followed behind schools of small fish. They could twist and turn their supple necks to scoop up small fish, squid and fragile-shelled ammonites. Ichthyosaurs were well equipped to catch fish, but fossilised stomach contents show that their favourite foods were belemnites and ammonites,



Platypterygius

forerunners of today's cuttlefish and squid. *Kronosaurus* ate larger fish and reptiles.

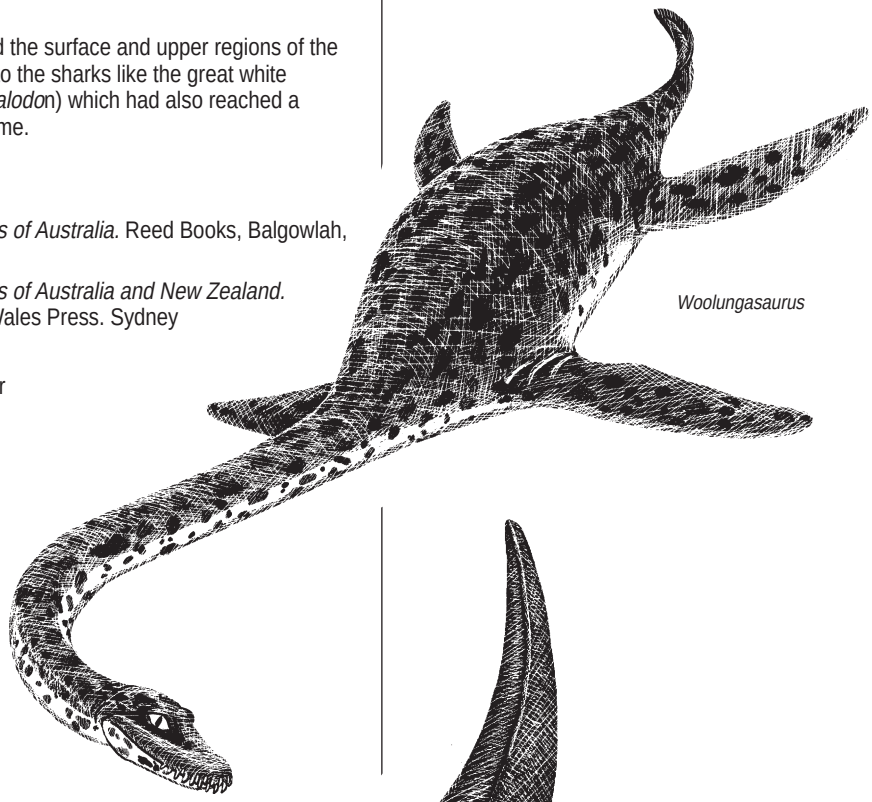
The marine reptiles hunted the surface and upper regions of the sea, leaving the sea floor to the sharks like the great white pointer(*Carcharodon megalodo*n) which had also reached a considerable size at this time.

Further Information

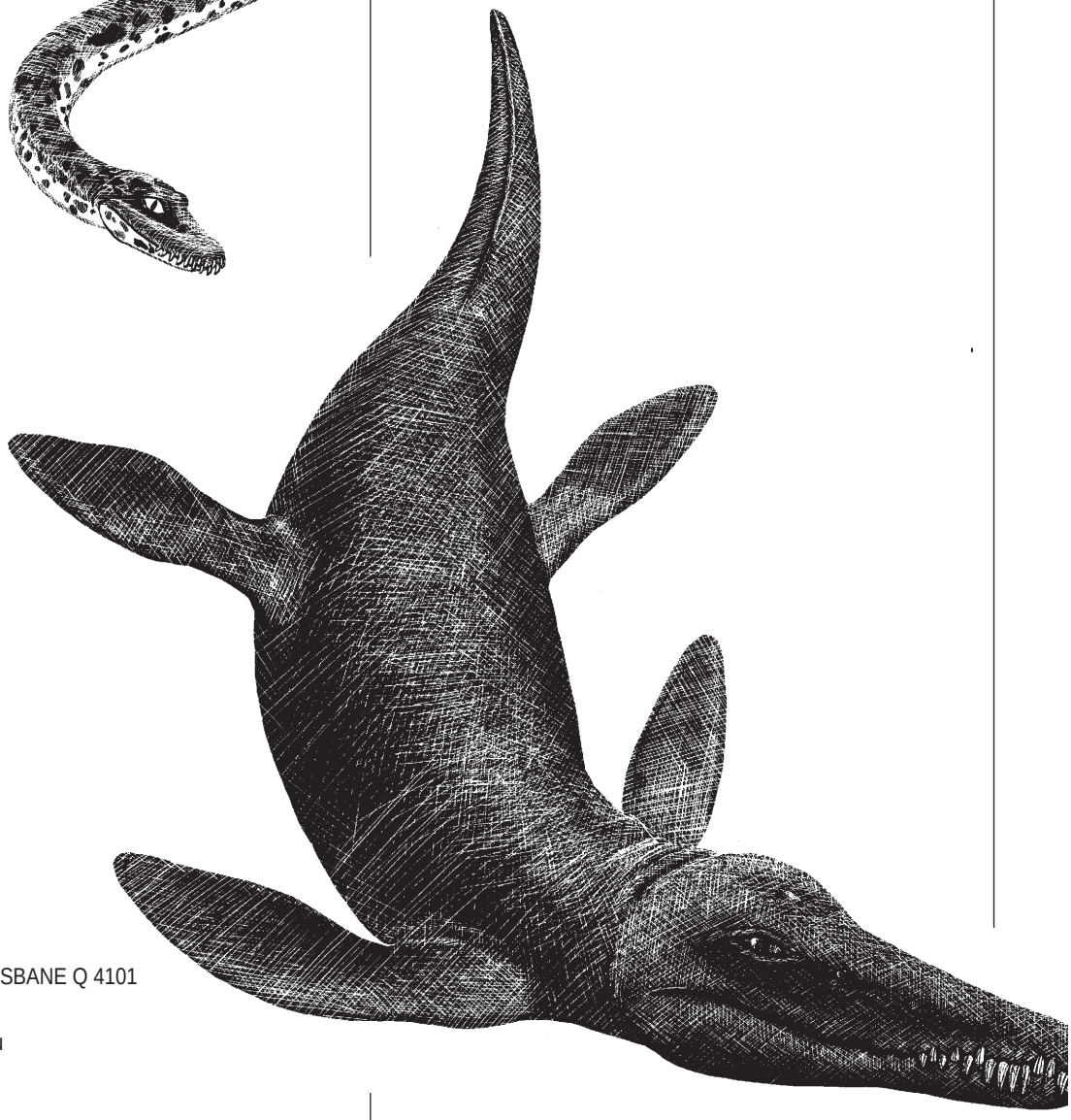
LONG, J., 1990. *Dinosaurs of Australia.* Reed Books, Balgowlah, NSW

LONG, J., 1998. *Dinosaurs of Australia and New Zealand.* University of New South Wales Press. Sydney

Illlustrations by Sally Elmer



Woolungasaurus



Kronosaurus

Queensland Museum
PO Box 3300 SOUTH BRISBANE Q 4101
Ph (07) 3840 7555
www.Qmuseum.qld.gov.au

September 2000