PREHISTORIC NEW ZEALAND

Many people don't realise that New Zealand has a fascinating ancient history, and that prehistoric creatures once roamed, flew and swam in our forests, skies and seas.

The oldest fossils ever found in New Zealand were discovered in 1948 by a school boy in Nelson. They were trilobites, sea creatures that were alive around 500 million years ago.

The land that would form New Zealand didn't exist yet - it was just sediment at the bottom of the sea.

New Zealand fish fossil are rare. Our oldest fish fossils date back to the Devonian period about 300 million years ago. Many early fish species had armour plating, spines and blade-like jaws. Examples include placoderms and acanthodians.

Image Credit: Nobu Tamura

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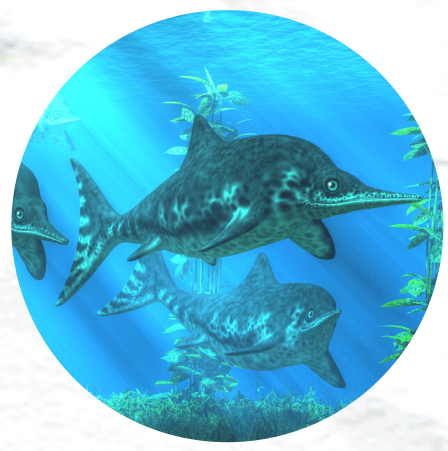
TRIASSIC PERIOD

During the Triassic period, 248–205 million years ago, New Zealand was still a mostly marine environment, but parts began to rise out of the sea. The land would eventually form part of a super continent known as Gondwana (shown above).

Ancient forms of kauri, rimu, tōtara and kahikatea trees began to colonise the land. Fossils of plants including wood, leaves, seeds, spores and pollen have been found.

Large marine reptiles swam off the coast, for example, 3m-long ichthyosaurs. They looked a bit like dolphins and had large, sharp teeth to catch squid and fish.



Fossil remains of another Triassic marine reptile have been found here - a giant sea lizard called a nothosaur that grew to about 3m long. They probably lived like seals, hunting in the water for squid and fish, but coming to land to rest and breed.

Image Credit: Nobu Tamura

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JURASSIC PERIOD

During the Jurassic period, 200–145 million years ago, most of New Zealand's land mass was part of Gondwana. Jurassic dinosaurs and birds flourished during this time, however their fossils have been rarely found in here.

A single Jurassic dinosaur fossil has been found near the Waikato River. It is the finger bone of a small therapod dinosaur that was similar in size and shape to Compsognathus (shown below).

This little dinosaur was about the same size as a turkey and would have lived in a swampy, forest habitat hunting lizards and insects.

New Zealand's oldest fossil insect, a relative of the wētā, is from this period. The ancestor of the tuatara, pictured at the top of the page, also lived at this time. Wētā and tuatara are known as 'living fossils' because they look very similar to their Jurassic relatives.

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CRETACEOUS PERIOD

About 85 million years ago, the New Zealand continent, known as Zealandia, broke away from Gondwana. Giant marine reptiles swam in the seas; flying pterosaurs patrolled the coasts and dinosaurs roamed the land.

Evidence of New Zealand's dinosaurs is rare, but paleontologists know that at least 6 different species lived here including an ankylosaur, a hypsilophodont, therapods and sauropods

Cretaceous fossil dinosaur bones have been found in the Chatham Islands, the North Island and near Hawkes Bay. Joan Wiffen is famous for discovering many of them.

She discovered a toe bone of a large meat-eating therapod, measuring about 12m long, that would have looked similar to a Tyrannosaurus Rex.

They would have hunted smaller plant-eating dinosaurs like this 1m-tall hypsilophodont.

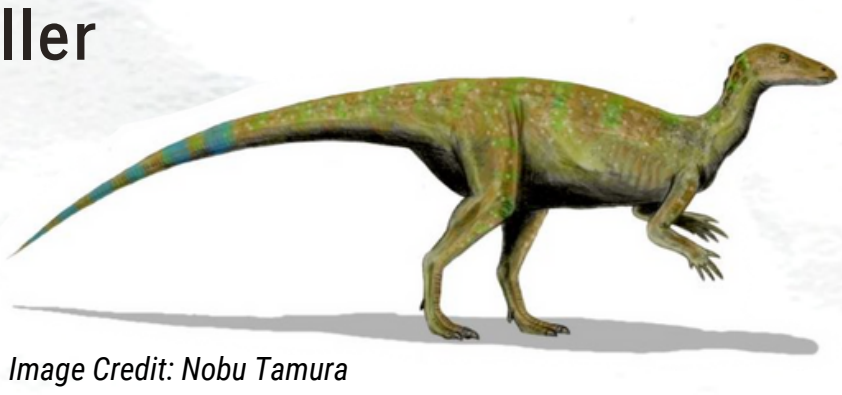

Image Credit: Nobu Tamura

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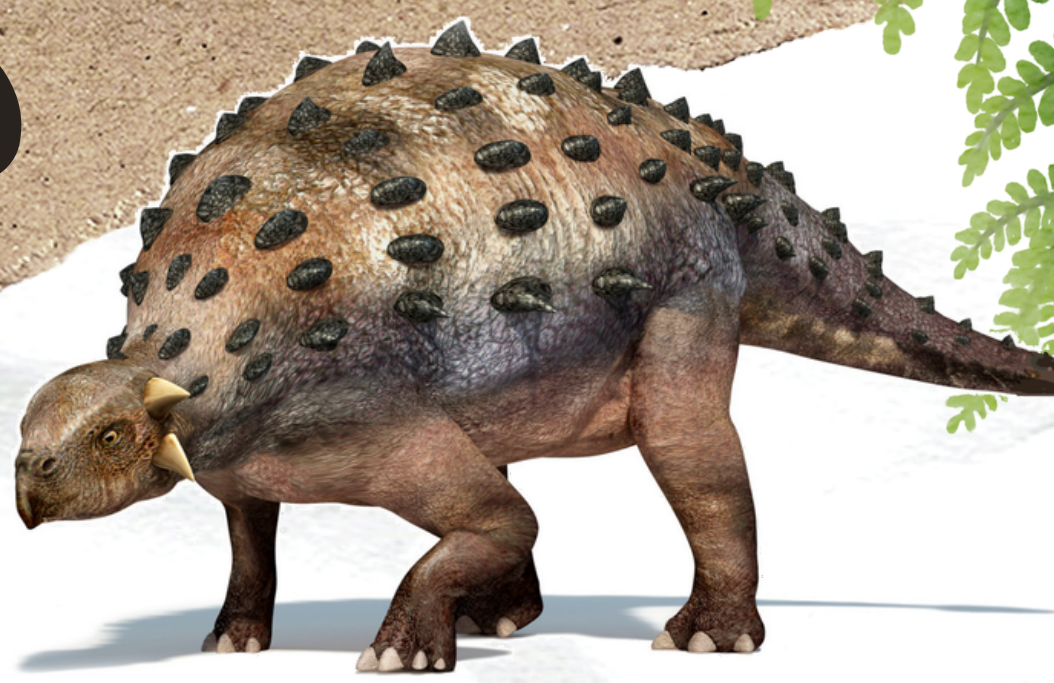
CRETACEOUS PERIOD



A piece of rib and two tail bones have been found that probably belonged to a type of ankylosaur (shown above). They were herbivores with armoured plates on their backs to help protect them from attack by large therapods.

The discovery of a huge vertebra bone shows that one of the largest known dinosaurs, a titanosaurid, roamed the land. They could grow 45m long!

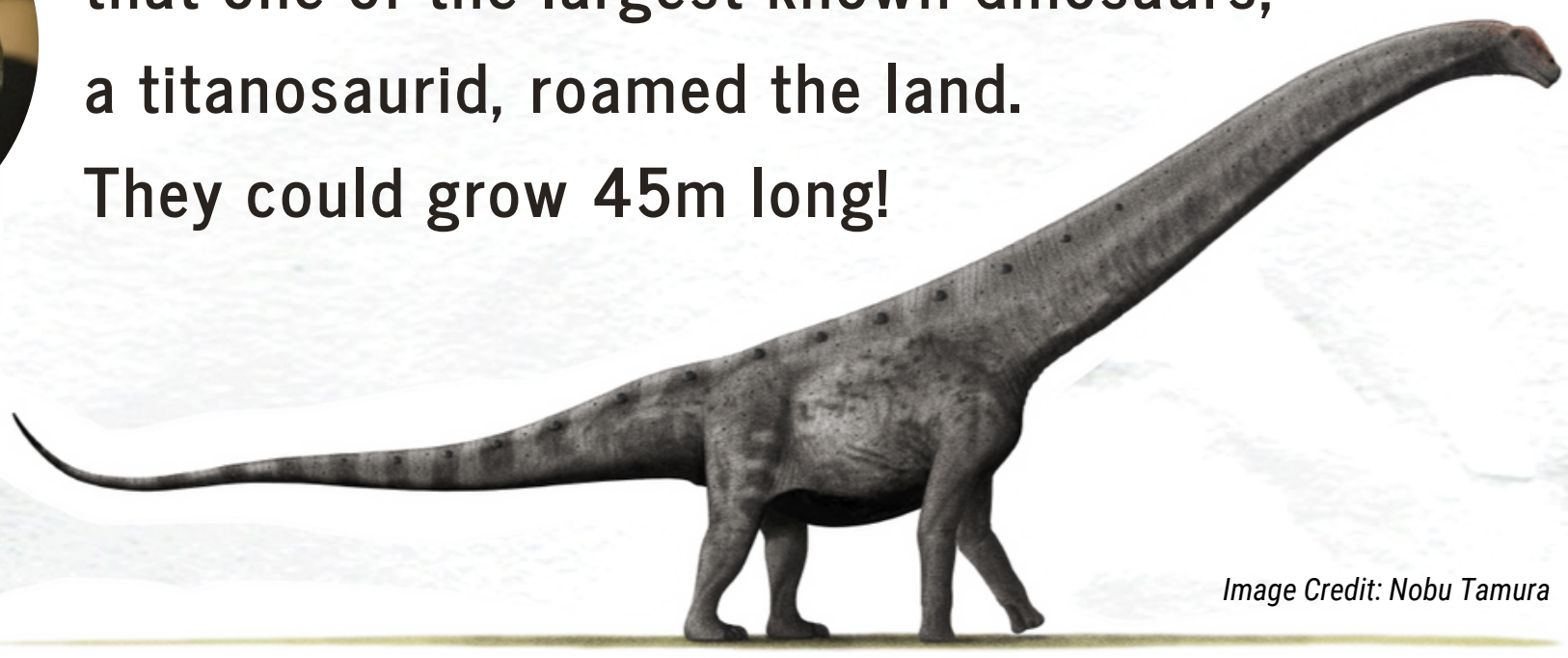


Image Credit: Nobu Tamura

Fossil footprints and a rib bone provide evidence that 12m-long sauropods, that looked similar to a small Diplodocus, also lived here.

Large herbivorous dinosaurs swallowed stones called gastroliths to help them grind up the plant matter in their stomachs.

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CRETACEOUS PERIOD

Other prehistoric reptiles lived in Zealandia during the Cretaceous period that were not dinosaurs. If it flew, swam or had legs splayed out like a lizard it was not a dinosaur.

The bones of two types of plesiosaur have been found here. Elasmosaurs were the largest, reaching about 10m long with long necks. Short-necked pliosaurs also lived in our oceans.

Fossil remains of 12m-long mosasaurs have been found in the North Island. They were fearsome predators, with huge teeth and wide jaws that could snap up plesiosaurs, sharks, turtles and even other mosasaurs!

Pterosaurs were large, winged reptiles. They roosted along the coast and glided over the sea to catch fish. An arm bone and tooth found by Joan Wiffen suggest that New Zealand's pterosaurs had a wing span of about 4m. They are not related to birds - but dinosaurs are!

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MASS EXTINCTION

At the end of the Cretaceous period, 66 million years ago, a mass extinction event marked the end of the reign of the dinosaurs and other large prehistoric reptiles.

The most commonly accepted explanation is a catastrophic meteorite impact. Scientists think that a 10km-wide meteorite hit the Earth on the Yucatan Peninsula in Mexico.

Investigations of fossilised plants show that a dust cloud covered the entire surface of the Earth, blocking out the sun and plunging it into darkness for at least 3 months.

Paleontologists think that animals weighing over 25kg couldn't survive the harsh conditions caused by the impact, e.g. there wouldn't have been enough food for them to eat.

Smaller animals survived by adapting to a reduced food supply, living underground or hibernating. Among the survivors were the ancestors of modern mammals and small therapod dinosaurs that were the ancestors of modern birds.

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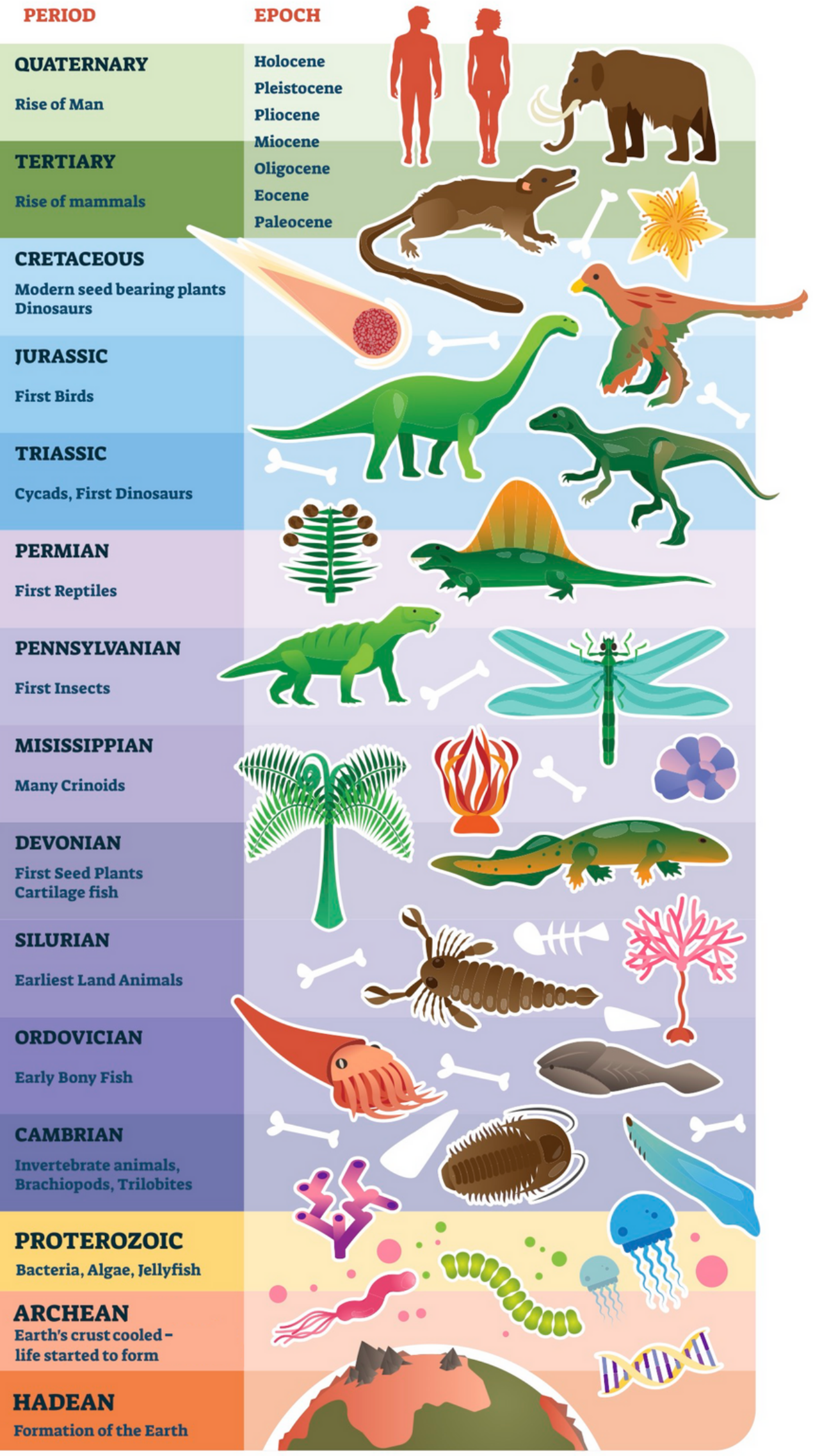
GEOLOGICAL TIMELINE

MILLIONS OF YEARS AGO	ERA	PERIOD	EPOCH
0	CENOZOIC	QUATERNARY — Rise of Man	Holocene, Pleistocene
1.8			Pliocene
		TERTIARY — Rise of mammals	Miocene, Oligocene, Eocene, Paleocene
50	MESOZOIC	CRETACEOUS — Modern seed bearing plants, Dinosaurs	
100			
150		JURASSIC — First Birds	
200		TRIASSIC — Cycads, First Dinosaurs	
250	PALEOZOIC	PERMIAN — First Reptiles	
300		CARBONIFEROUS: PENNSYLVANIAN — First Insects	
		CARBONIFEROUS: MISISSIPPIAN — Many Crinoids	
350		DEVONIAN — First Seed Plants, Cartilage fish	
400		SILURIAN — Earliest Land Animals	
450		ORDOVICIAN — Early Bony Fish	
500		CAMBRIAN — Invertebrate animals, Brachiopods, Trilobites	
550	PROTEROZOIC	Bacteria, Algae, Jellyfish	
2500	ARCHEAN	Earth's crust cooled – life started to form	
4000	HADEAN	Formation of the Earth	
4540			



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