THE FOSSIL KEEPER'S TREASURE



with amazing fossils to touch

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HAVE YOU EVER WONDERED HOW
WE KNOW ABOUT PLANTS AND ANIMALS THAT
LIVED AND DIED MILLIONS OF YEARS AGO?

Maybe you've walked along a beach and stumbled upon a clue from the past, buried in the layers of a rock – it's a fossil! Fossils are the remains of ancient life. Every fossil tells a story, from the biggest dinosaur bone to the tiniest trace of a trilobite.

In this book we're going to uncover the fossils of:

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WHAT ARE FOSSILS?

Fossils are the remains of an ancient plant, animal, bacteria or fungi. We find them buried in layers of rock.

HOW DO FOSSILS FORM?

When an organism dies it usually rots away. But if it is quickly covered with layers of mud, silt or sand, it can become fossilized. Over time, the remains become hard, like stone, and can survive for millions of years. There are many other ways a fossil can form, and many different types, too.

MOULDS AND CASTS

When a life form is buried but breaks down over time, it can leave an empty space (mould) in the rock. Other sediments might fill the mould, creating an exact copy (cast) of the original life form.

MOULDS AND CAST

BODY FOSSILS

Preserve the hard parts of a life form, like bones, teeth and shells. These parts are replaced with minerals over millions of years, forming exact stone copies of the original life form.

BODY FOSSIL

TRACE FOSSILS

Record evidence of life, like burrows, tracks and footprints, and poo. They can tell us how ancient animals moved, where they slept, what they ate – and even how they went to the bathroom!

TRACE FOSSIL

COMPRESSION FOSSILS

Form when a plant or animal is flattened (compressed) in sediment over time.

COMPRESSION FOSSIL

SOFT TISSUE FOSSILS

Are the rarest of fossils. They occur when both the hard parts and soft tissues of an animal are preserved, such as insects captured in amber, or Ice Age animals frozen in ice.

SOFT TISSUE FOSSIL

~ One of the world's first animals ~

TRILOBITES

TRILOBITES ARE A TYPE OF EXTINCT SEA CREATURE THAT EXISTED LONG BEFORE THE DINOSAURS. THEY WERE ONE OF THE FIRST SIGNS THAT LIFE ON EARTH WAS FLOURISHING.

Trilobites were arthropods. They did not have a backbone but a hard exoskeleton that protected their soft insides, much like the crabs and spiders living today. The fossil of the trilobite species Olenoides serratus is extra special because both its hard parts and its soft parts, like its antenna and legs, were preserved, helping scientists learn even more about these ancient animals.

Trilobites would have scurried along the seabed, looking for soft-bodied prey like worms to shred up and eat.

At this time in Earth's history, life was only found in the oceans. The animals of the Burgess Shale, near the Canadian Rockies, lived in deep water at the base of cliffs that would erode over time, leading to mudslides that fossilized its creatures.

Before this time, animals didn't have shells or exoskeletons. Changes in the oceans, including more calcium in the water, led to animals growing these hard parts.

The first trilobite fossil was discovered by Reverend Edward Lhwyd in South Wales in 1698. Since then, these fossils have been found all over the world.

During the Paleozoic Era, there was a sudden explosion of life in the oceans. This event is known as the Cambrian Explosion, when many new animals first appeared in the fossil record.

Touch a Trilobite!



LIVING TIME PERIOD: *Cambrian (505 mya), Paleozoic Era*

TYPE OF ANIMAL: *Marine arthropod*

TYPE OF FOSSIL: *Cast fossil*

PRESERVATION: *Underwater mudslides*

Olenoides serratus is one of the largest and more common trilobite fossils found in the Burgess Shale, where it could reach lengths of 9 centimetres.

~ The first fish to 'walk' ~

TIKTAALIK ROSEAE

TIKTAALIK ROSEAE WAS A FLESHY-FINNED FISH WITH A GIANT STORY TO TELL. WHEN SCIENTISTS DISCOVERED ITS FOSSILIZED REMAINS, THEY WERE FINALLY ABLE TO ANSWER ONE OF LIFE'S BIGGEST QUESTIONS: HOW DID FISH EVOLVE INTO FOUR-LEGGED ANIMALS?

This is because Tiktaalik wasn't just any fish, but probably the first to leave the water and 'walk' on land. This likely makes Tiktaalik, along with animals in the same family, the common ancestor to all vertebrates, including amphibians, reptiles, birds and mammals.

Scientists discovered the first Tiktaalik fossils in the far north of the Canadian Arctic, where the Inuktitut people live. The fish is named after the Inuktitut word for 'large freshwater fish'.

This ancient fish lived about 375 million years ago during the Devonian Period.

Tiktaalik was halfway between a fish and the earliest four-legged animals. It had fins, gills and scales like a fish, but a strong pelvis, ribcage and neck like land animals. It likely had lungs, too, for breathing air.

Tiktaalik had a long body and a flat head. It could grow to nearly three metres long – about the same length as a modern tiger!

Tiktaalik thrived in shallow, meandering streams, swamps and other freshwater habitats such as ponds. It most likely spent most of its life in the water, but would occasionally use its sturdy fins to haul itself on to land.

LIVING TIME PERIOD:
Late Devonian (375 mya), Paleozoic Era

TYPE OF ANIMAL:
Lobe-finned fish

TYPE OF FOSSIL:
Body fossil

PRESERVATION:
Ancient rocky streambeds and floodplains

Like many modern fish, Tiktaalik's fin bones were thin and light which helped it swim. But they also had thick wrist, elbow and shoulder bones, which it used to support its own weight and prop itself up in shallow water.

Touch a Tiktaalik!

