The Mesozoic Era

The Mesozoic Era is the second of the three main Phanerozoic geologic eras on Earth. The Greek word for "middle life" is the source of its name. After the Paleozoic Era ended, the Mesozoic Era started 252.2 million years ago and ended with the start of the Cenozoic Era 66 million years ago. The geologic time scale can be seen. The principal divisions of the Mesozoic Era are, from oldest to youngest, the Triassic Period, the Jurassic Period, and the Cretaceous Period. Although the Mesozoic is best recognized as the time of the dinosaurs, it was also the time when the ancestors of the major plant and animal groups that exist today first arose.

Compared to now, there was less of a temperature differential between the equatorial and polar latitudes during the Mesozoic Era, and Earth's climate was typically warm. There was a geological and biological shift throughout the Mesozoic. The

continents started to shift into their current positions during this time. Due in part to the extinction of many previous creature kinds, there was a noticeable modernization of living forms. Three of the five greatest mass extinctions in Earth's history are linked to the Mesozoic: one happened at the transition between the Mesozoic and the Paleozoic, another at the end of the Triassic Period, and a third at the transition between the Mesozoic and the Cenozoic, which led to the extinction of the dinosaurs.

The Triassic Period

Significant change occurred throughout the Triassic Period.

The diversity and domination of life on Earth underwent significant changes throughout this era, which was bookended by extinctions. Many well-

known animal groupings that would later dominate the planet for tens of millions of years first appeared.

After the greatest extinction event in Earth's history decimated life, the Triassic Period (252-201 million years ago) began.

One of the most important periods in our planet's history was the Permian-Triassic extinction event, also referred to as the Great Dying, which occurred about 252 million years ago. It symbolizes the separation of the Mesozoic and Paleozoic Eras.

The Museum's curator of fossil reptiles is Dr. Mike Day

"The Triassic is an interesting period," he explains. It creates the transition between the Mesozoic Era, when archosaurian reptiles, including the dinosaurs, took over, and the late Paleozoic Era, which was primarily inhabited by synapsids, or reptiles that resembled mammals.

It is unclear what caused the Permian-Triassic

extinction event. Numerous explanations have been put out, including the following: sea level change, methane released from the ocean's depths, enormous volcanic eruptions in present-day Siberia, an unidentified asteroid impact, growing aridity, or a combination of many of these. For vast swaths of life, the outcome was disastrous regardless of how the extinction event began.

Up to 90% of all species are said to have gone extinct as a result of the Great Dying. It eliminated all of the trilobites, a group of animals that had lived in the waters for about 300 million years, as well as numerous kinds of insects and numerous reptiles that resembled mammals.
"A re-establishment of ecosystems is what we see when we come through into the Triassic," Paul explains. Coals were absent during the first few million years of the Triassic. This is believed to have something to do with the mass extinction that occurred and the length of time it took for plants to

rebound.

This sequence is known as the coal gap, a period in which there was seemingly no coal being laid down. As coal is formed from plant matter that has decayed into peat, it has been suggested that the absence of coal in the first few million years of the Triassic was a direct result of the Permian-Triassic extinction event, as plants slowly became re-established in the landscape.

Although extinctions have a major role in defining the Triassic, the location of the continents during that period also plays a role. Pangea was the sole enormous landmass.

Paul explains, "One might think that the environment across this large land mass would be very similar because it was joined up." However, it isn't. The flora in the northern and southern regions still differed by a significant amount.

"Pangea was a remarkable event, and nothing like it

has happened since."

The conifers began to take off in the early Triassic period. Since grasses and blooming plants had not yet developed, conifers created enormous forests, with individual trees growing up to 30 meters in height. Other conifer growth forms, including woody vines and shrubs that are extinct now, would have been abundant in the understory.

"You must keep in mind that while we can make references to contemporary species, the form of these extinct plants is frequently unknown or not fully understood," Paul says. "It is challenging to cite a living plant as an illustration of its characteristics."

Large fern prairies replaced the forests where the climate grew drier.

What appeared on land was not all that different from what had previously appeared as animal life started to rebound. The tiny, herbivorous synapsid,

or mammal-like reptile known as the Lystrosaurus, was the most prevalent vertebrate on land.

The amphibians lived in freshwater, but these ruled the land. The Lissamphibians (frogs, salamanders, and caecilians) were most likely just beginning to emerge some 250 million years ago.

Instead, a new, unique group of amphibians called the Temnospondyls occupied the rivers. These were considerably larger creatures, with some reaching lengths of four meters. They probably played a comparable ecological role and shared physical characteristics with contemporary crocodiles.

The earliest ichthyosaurs, a group that would later rule the waters, appeared between 250 and 246 million years ago. It is still unclear where this prosperous group of aquatic reptiles came from.

The Jurassic Period

From the conclusion of the Triassic epoch, which ended 201.4 million years ago, to the start of the Cretaceous Period, which began at 143.1 million years ago, there was a geologic epoch and stratigraphic system known as the Jurassic. Named for the Jura Mountains, where limestone strata from the period were initially discovered, the Jurassic is the eighth period of the Phanerozoic Eon and the second and middle period of the Mesozoic Era. The Central Atlantic Magmatic Province (CAMP) eruption, which was linked to the catastrophic Triassic–Jurassic extinction catastrophe, signaled the beginning of the Jurassic. Around 183 Ma, the Toarcian Oceanic Anoxic Event—a worldwide outbreak of oceanic anoxia—marked the commencement of the Toarcian Age.

ocean acidification, and increasing global temperatures associated with extinctions, possibly caused by the eruption of the Karoo-Ferrar massive igneous provinces. The only geological period

boundary that is still officially ambiguous is the end of the Jurassic, which lacks a distinct, unambiguous border with the Cretaceous.
The supercontinent Pangaea had started to split into two landmasses by the start of the Jurassic Period: Gondwana to the south and Laurasia to the north. There were no ice caps during the Jurassic Period, and the environment was warmer than it is today. Large stretches of dry land were found in the lower latitudes, while forests flourished near the poles.

The Triassic fauna, which was dominated by dinosauromorph and pseudosuchian archosaurs together, gave way to a fauna dominated by dinosaurs exclusively on land. Originating from a branch of theropod dinosaurs, the first stem-group birds emerged during the Jurassic Period. The emergence of the first crabs, as well as contemporary frogs, salamanders, and lizards are further significant occurrence. The first crown group mammals appeared in the Jurassic, and

Mammaliaformes, one of the few cynodont lineages to escape the end of the Triassic, continued to diversify during this time.

GLOSSARY

Cases