
PERMIAN MONSTERS
Life Before the Dinosaurs
8 DETAILED PAGES
COLORING BOOK
BASED ON ARTWORK
– by –
JULIUS CSOTONYI
Suitable for kids or adults!

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Julius Csotonyi is a freelance natural history illustrator and biological sciences graduate. His passion has been drawing dinosaurs since childhood, but over the years Julius has expanded his portfolio to include all branches of scientifically inspired artwork. He has collaborated on projects with several major museums and book publishers from around the globe, including the National Geographic Society and the Royal Tyrrell Museum, working closely with scientists and drawing on his own scientific background. An MSc graduate of Ecology and Environmental Biology (University of Alberta), and a PhD graduate in microbiology (University of Manitoba), Julius has published scientific papers on mutualisms in Utah and unusual bacteria at alien-looking deep ocean hydrothermal volcanic vents. His scientific background has impelled him to strive to restore as realistically as possible the curiously alien environments that earth has hosted in its deep past. His style ranges from pencil and ink line drawings to watercolor, pastel, 2-dimensional digital illustrations and 3-dimensional digital models; and his work encompasses dinosaurs and other prehistoric life, sharks and other living animals, as well as some space art, fantasy and science fiction themes.

For more information on the artist visit: **csotonyi.com**

THE PERMIAN

The Permian is a geological period that began approximately 290 million years ago, millions of years before the age of the dinosaurs.

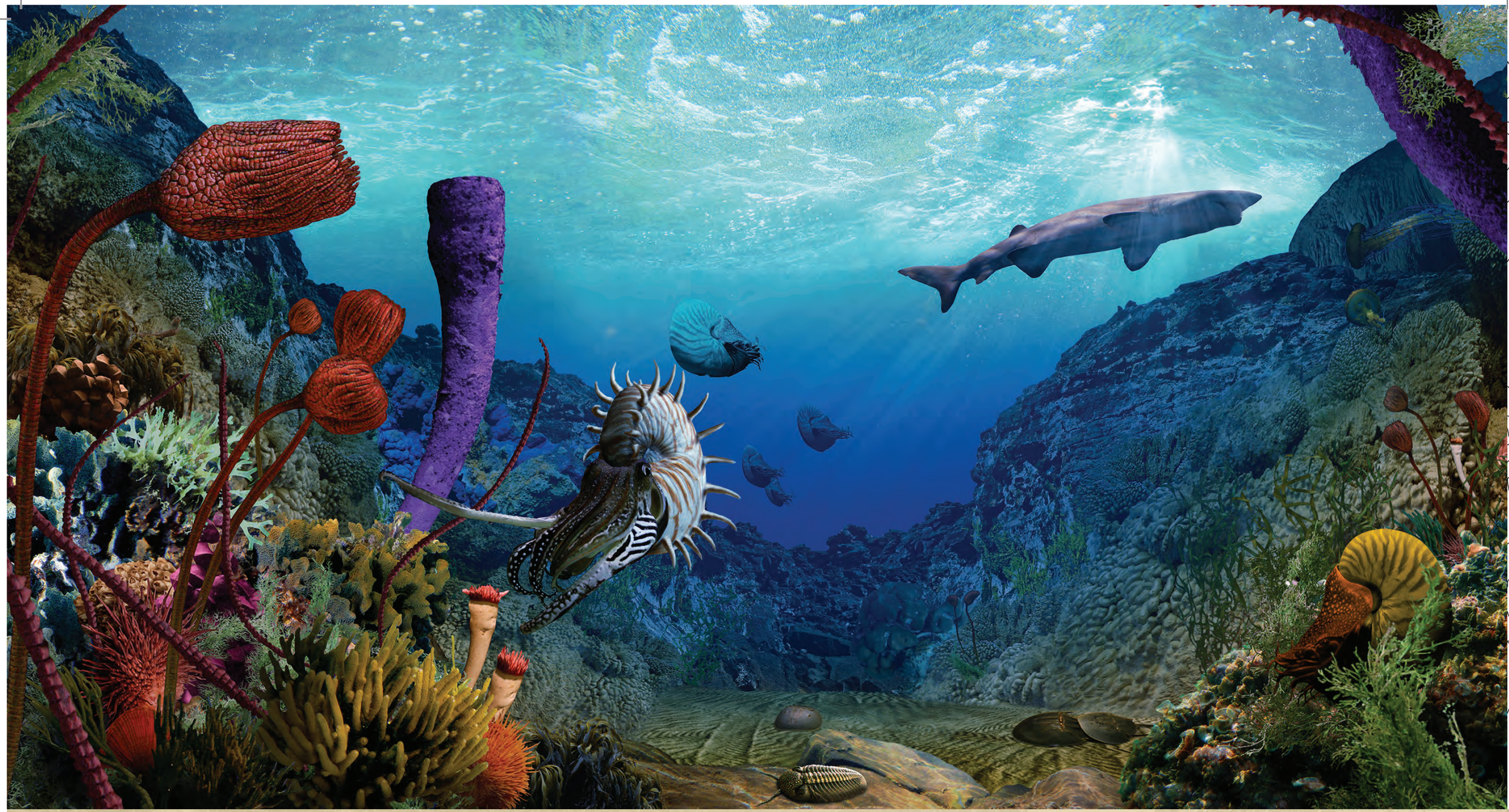
During the Permian, the first large herbivores and carnivores conquered life on land.

The Permian began at the end of an ice age, therefore the Earth was cooler than present day. As time passed, the icecaps melted and the Earth slowly warmed up, becoming a lush green planet, where both animal and plant life thrived.

Plant life consisted of ferns, conifers and small shrubs. Animals included fish, arthropods, amphibians and reptiles. During the Permian, reptiles developed mammal-like characteristics, but the first true mammals would not appear until the next geological period, the Triassic.

The Permian period lasted 40 million years. It ended 250 million years ago with the start of the Triassic period.

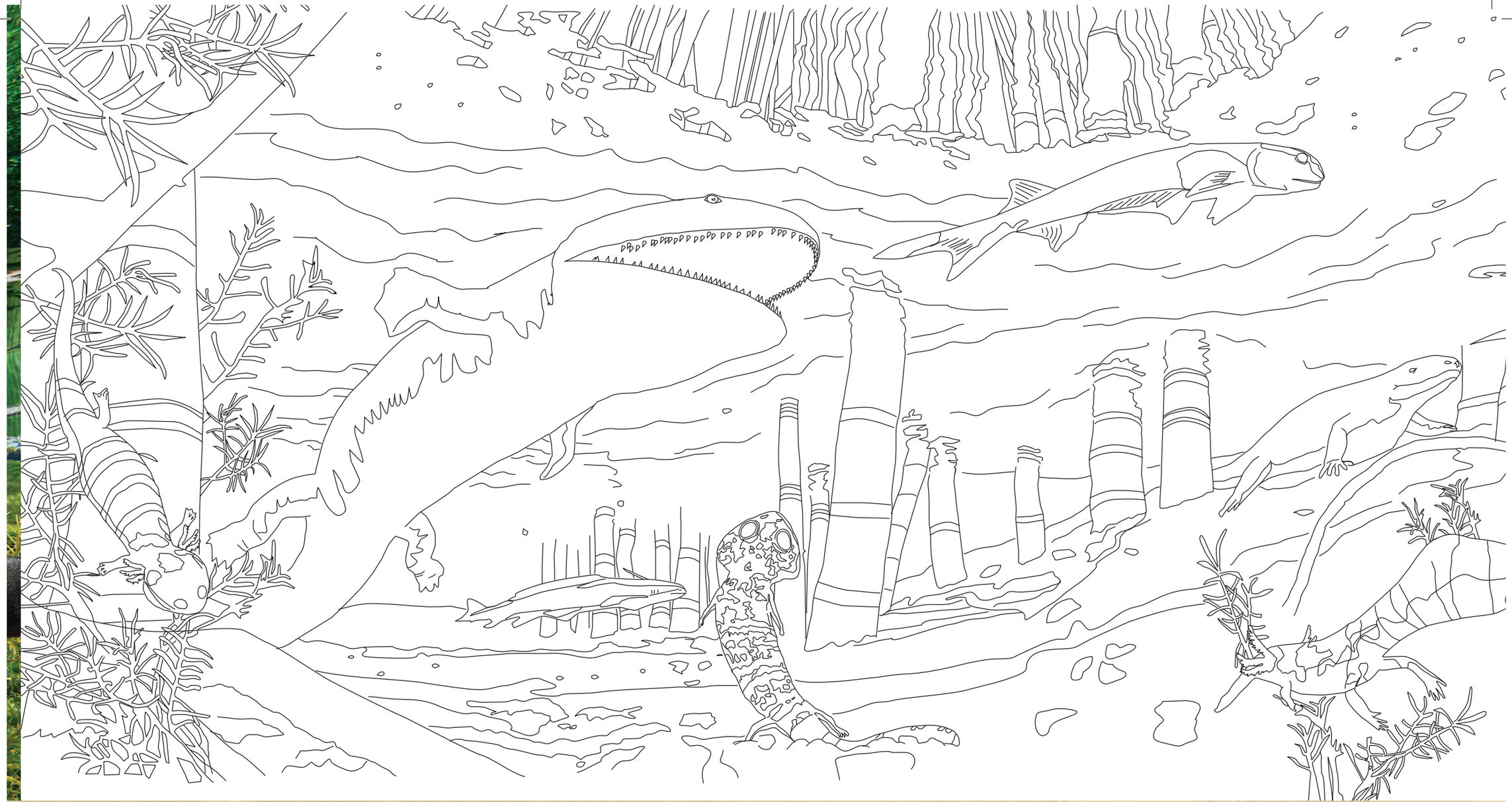
The Permian ended with the largest mass extinction in the history of Earth: over 90% of all plant and animal life were wiped out. By the end of the Permian the Earth had become a biological desert.



During the Permian, Earth's single land mass Pangea was surrounded by an enormous ocean called Panthalassa. Panthalassa teemed with life from tiny single-celled organisms to marine arthropods and large fish. This illustration presents a Permian seascape with ammonites, trilobites, crinoids, gastropods, brachiopods, sponges, coral, horn coral, algae and the shark-like Helicoprion in the background.

PANTHALASSIC OCEAN

Amphibians became top predators by the Early Permian, however their numbers were reduced with the evolution of large land-dwelling carnivores and global warming. Many amphibian lineages were wiped out during the Permian-Triassic Extinction. Set in what is now Europe, this illustration presents a general Early Permian scene, with amphibian as the main focus, illustrating Acanthodus, Apateon, Discosauriscus, Micromelerpetom, Orthacanthus, Sclerocephalus and Seymouria.



PERMIAN AMPHIBIANS

Reptiles dominated land for the first time during the Permian. They evolved into many forms, from large carnivores (meat eaters), herbivores (plant eaters) and small likely warm-blooded reptiles which would eventually give rise to mammals. Pelycosaurs are synapsids that appeared in the late Carboniferous and dominated the Early Permian. Early pelycosaurs were small lizard-like animals which evolved into many different types of herbivores and carnivores, both small and large, no more than 4 meters in length. They lost their dominance in the Middle Permian and the few groups that made it through became extinct during the Permian-Triassic extinction.

PELYCOSAURS

Dinocephalians were therapsids that appeared in the Early Permian and became the largest animals of this period, some possibly weighing up to 2 tons. Some were carnivores (meat eaters), while others were herbivores (plant eaters) or omnivores (meat and plant eaters). The dinocephalians mysteriously became extinct at the end of the Middle Permian leaving no descendants.

DINOCEPHALIANS

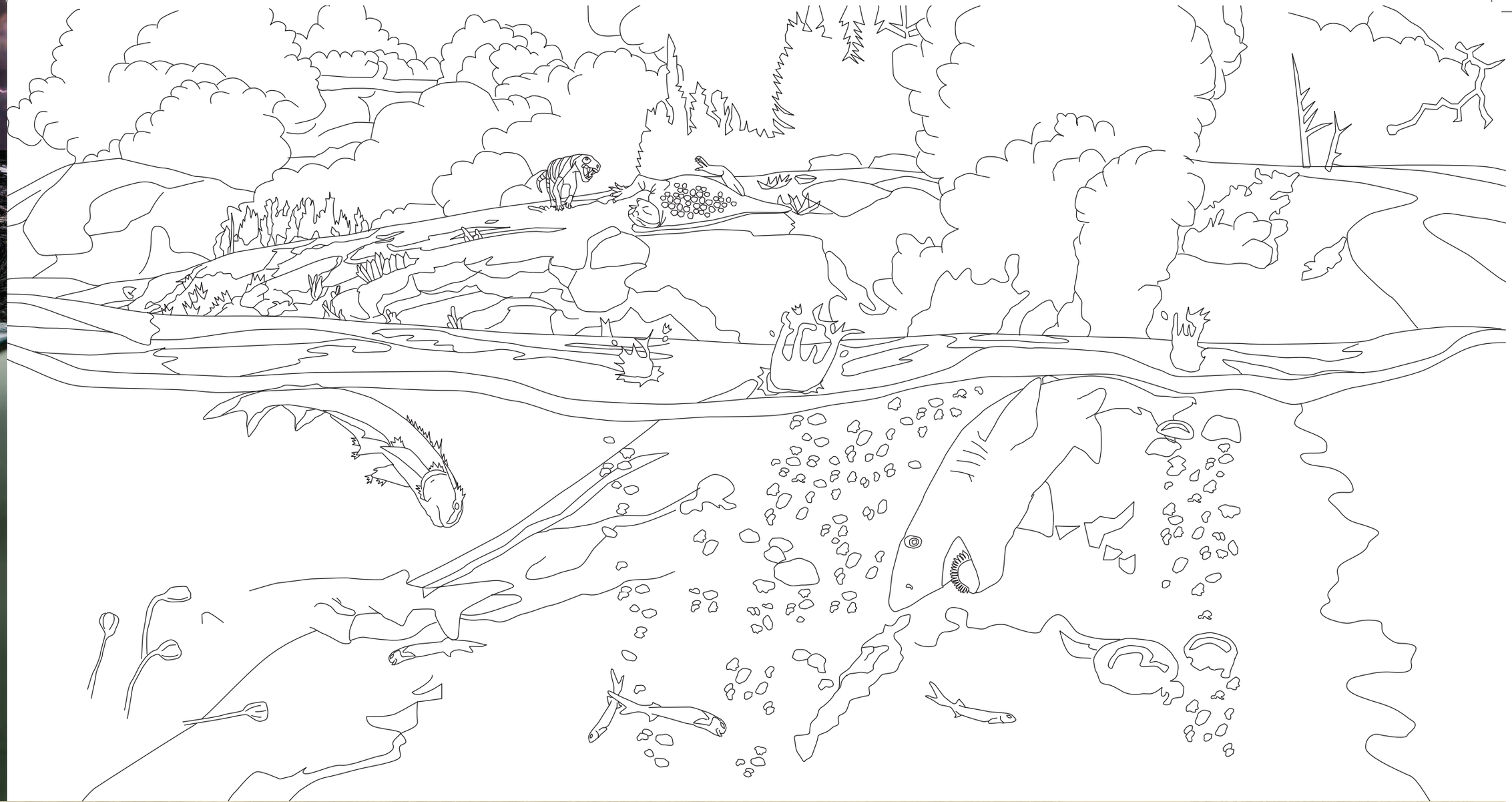
Pareiasaurs are a group of anapsids that were dominant in the Late Permian. These medium to large-sized herbivores (plant eaters) include the biggest terrestrial anapsids that ever lived, growing up to 3 meters in length. Pareiasaurs had small heads with a large round body, stocky limbs and short pointy tail. It has been suggested that they are related to modern turtles. Pareiasaurs became extinct during the Permian-Triassic extinction.

PAREIASAURS

Gorgonopsids are therapsids that appeared in the Middle Permian. They were carnivores (meat eaters), some were dog size while others possibly grew up to 4 meters in length. Gorgonopsids had huge powerful jaws and large saber-teeth, and were the top predators of the late Permian. Gorgonopsids became extinct during the Permian-Triassic extinction.

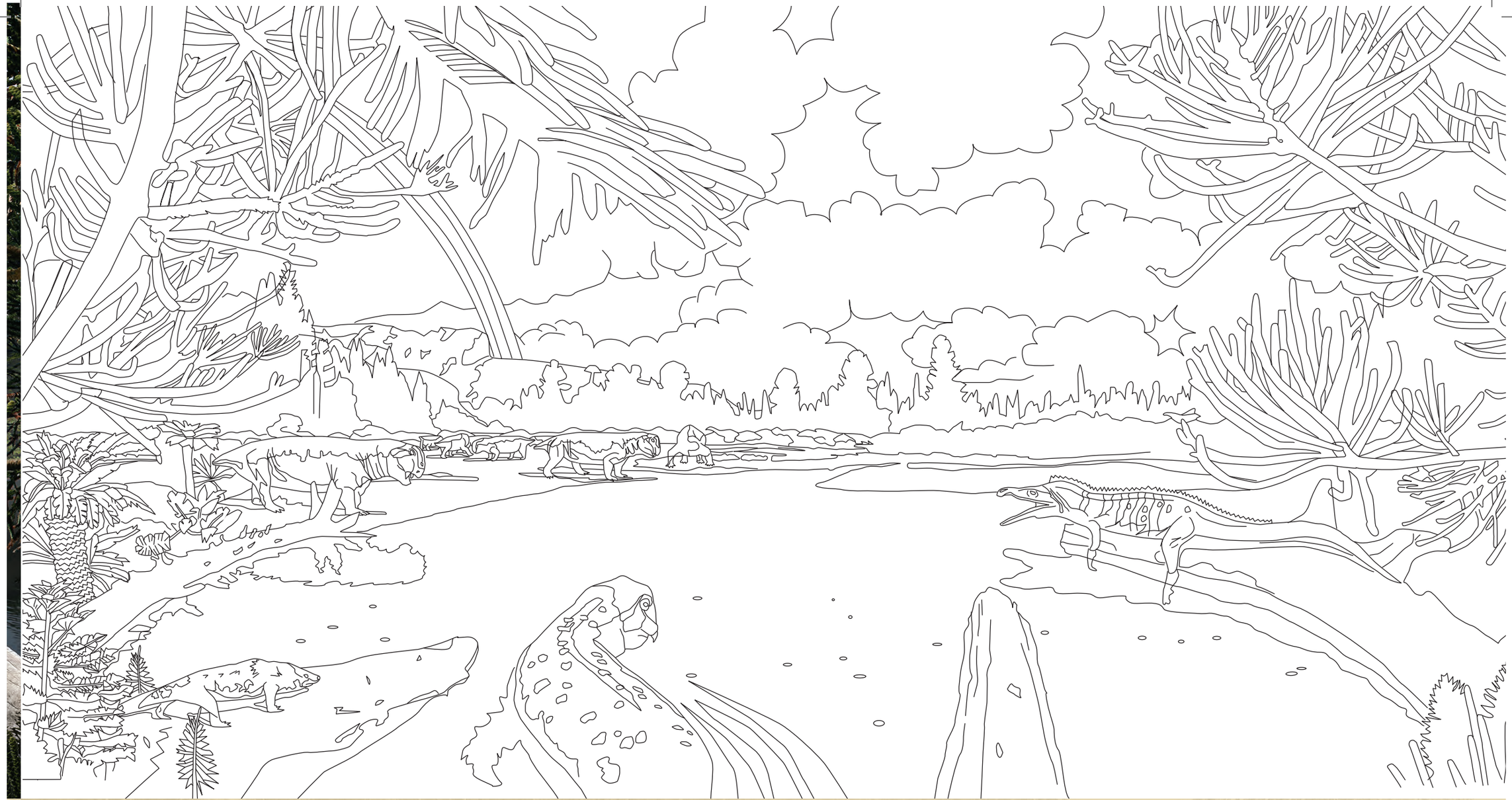
GORGONOPSIANS

The Permian ended with the largest known extinction in Earth's history, known as the Permian-Triassic extinction or 'The Great Dying'. Up to 96% of the Earth's marine species and 70% of reptile, amphibian, insect, and plants species became extinct.



PERMIAN EXTINCTION

It took 30 million years for surviving species to recover from the Permian-Triassic Extinction. The animal survivors, known from the fossil record, are small to medium sized that may have burrowed to survive in the extreme temperatures of the planet.



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