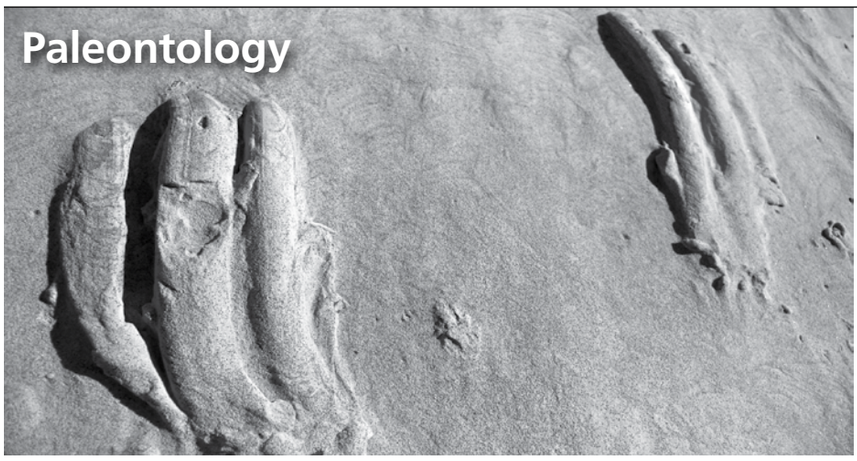
Capitol Reef National Park

National Park Service
U.S. Department of the Interior



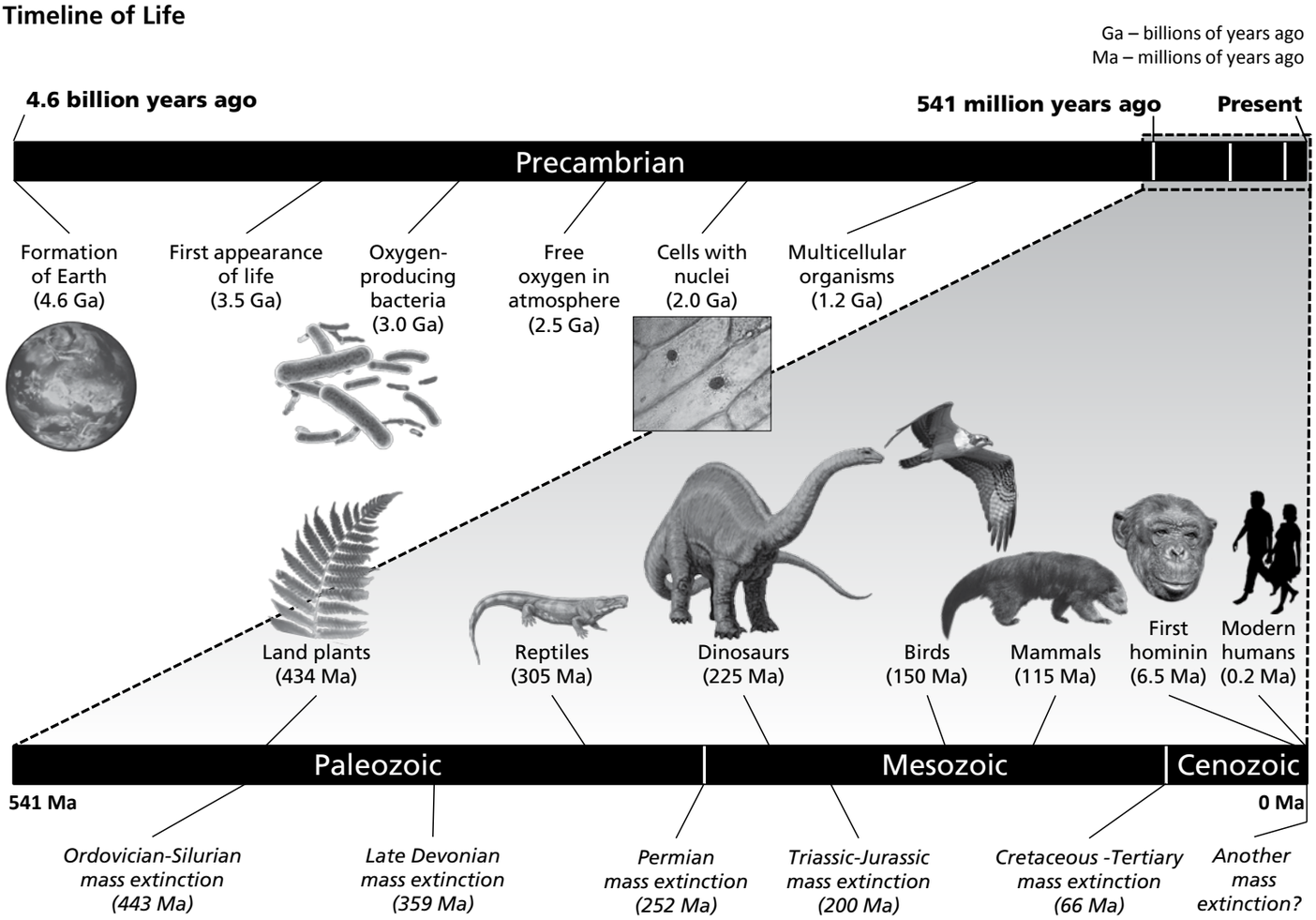
Paleontology

Capitol Reef's fossils capture the eternal struggle between life and death on our planet.

Life and Death

The last 3.5 billion years of Earth's history have been a relentless and dramatic struggle of life and death. Life on Earth has grown in both size and complexity from its humble origins as microscopic single-celled organisms to include everything from plants to dinosaurs, and of course, humans. However, this amazing explosion of life has not been without great peril. Five major mass extinction events have occurred in Earth's history, eliminating up to 96% of all species. It is in this constant face of death that life has taken hold on our planet.

Timeline of Life



What is a Fossil?

Fossils preserve the record of life on Earth. Fossils are the physical remains or traces of organisms that were once alive. Paleontologists study fossils in order to better understand the history and evolution of past life. Fossils provide a wealth of information on ancient ecosystems and past climates, which together provide an indication of the effects of changing climate on Earth's life—knowledge that will be critical to addressing concerns in the face of current climate change.

Fossils are exceedingly rare. Most organisms die and decay without leaving behind any preserved remains or traces. It is thought that less than one bone in a billion becomes fossilized. For an organism or trace to become fossilized, very specific conditions must be met. Most importantly, fossilization requires that the item be buried rapidly for initial preservation. In the case of physical remains, minerals dissolved in groundwater can then slowly replace the original bone or shell until it is turned into stone.

Past Life at Capitol Reef

The extraordinary rock record at Capitol Reef spans 200 million years of Earth's past, encompassing the entire Mesozoic Period (252-66 Ma)—the "Age of Reptiles." The Mesozoic was marked by the rapid diversification of life, highlighted by the rise of the dinosaurs. Many of the fossils found at Capitol Reef reflect this prolific period, where life flourished under warm climatic conditions.

Triassic Trackways

Some of the oldest and most extensive reptile tracks in the western U.S. are found at Capitol Reef within the Moenkopi Formation. Tracks and swim traces of two crocodile-like species, Chirotherium and Rotodactylus, are found as sandstone casts in mudstone layers. These trackways indicate that these species lived in a marine-influenced environment and provide an incredible snapshot of a day in the life of a reptile…225 million years in the past.

Plant Megafossils

Plant megafossils are exposed at many localities within the Chinle Formation at Capitol Reef. These large plant fossils—preserved as impressions, petrifications, and casts—contain representatives from most major groups of vascular plants including ferns, horsetails, and conifers. The types of plant species found in the Chinle suggest that 225 million years ago, Capitol Reef was a land of rivers and swamps with a wet, tropical climate. These conditions provided a suitable environment for life forms that would not survive in the currently arid conditions of southern Utah.

Giant Stromatolites

Bizarre fossils known as stromatolites are located within the desert-formed Navajo Sandstone at Capitol Reef. Stromatolites are layered structures formed by the accumulation of cyanobacteria in stagnant water. They are the oldest fossils on Earth, some dating back over three billion years. Cyanobacteria were the dominant life form for more than two billion years, and are thought to be primarily responsible for the oxygenation of the atmosphere—helping sustain life as we know it on our planet. At Capitol Reef, the discovery of five-meter-high stromatolites suggests that the Navajo desert had large bodies of standing water, challenging current assumptions that it was entirely dusty and dry.

Oyster Reef

A dense oyster shell reef dominated by the oysters *Exogyra* and *Pycnodonte* represents yet another form of life from Capitol Reef's distant past. These 100-million-year-old oysters reflect a time when a sea inundated this area and created the brackish marine conditions necessary to support this form of life. The shells of these oysters were ultimately concentrated in the beach deposit preserved as the Dakota Sandstone.

An Irreplaceable Legacy

Fossils are irreplaceable, non-renewable resources. Excavating, removing, damaging, or otherwise defacing fossils or other paleontological resources within the park diminishes our legacy, and is ***strictly prohibited by federal law and is punishable by fine and/or imprisonment***. If you are fortunate enough to find a fossil in the park, leave it untouched, take a photo, and share your exciting discovery with a park ranger. Keeping fossils where they are found will help preserve their scientific, educational, and interpretive value for present and future generations.