Out of the Water

Fossilized Oxygen Machines

Some of the oldest fossils on Earth, and the earliest fossils represented in the Wall, are stromatolites—literally, "layered rocks." Dating to as much as 3.5 billion years ago (March 20), they are the accreted remains of single-celled organisms that are the oldest form of life on the planet—the blue-green algae, or cyanobacteria, responsible for the accumulation of oxygen in Earth’s atmosphere. In the beginning, free oxygen didn’t exist in the atmosphere, which was likely composed mostly of hydrogen and carbon dioxide. Through the process of photosynthesis, the single-celled algae metabolized carbon dioxide and released free oxygen. Over the course of millions of years this process dramatically changed Earth’s atmosphere, and facilitated the later development of more complex forms of life. These stromatolites are still alive today in certain parts of the world, especially Western Australia. To see ancient fossil remains here, look to the left of the previous panel, near the top of the Wall, in the Apache Group Limestone (D).

Most of Earth was covered by water throughout the Paleozoic Era and marine species dominated the planet. During the Paleozoic’s Cambrian Period, 542–488 mya (mid to late November), an explosion of new life was made possible by the development of complex, multicellular life forms that could respond to the diverse demands of their watery environments—burrowing into bottom sediments, living on ocean floors, or swimming through open seas. Mostly invertebrates, the fauna of the Cambrian included trilobites, brachiopods and mollusks. Later came fish and other vertebrates. By November 21 (488–444 mya), life was no longer confined to the seas and plants moved onto land, followed by invertebrates, November 27–29 (444–416 mya). By December 2 (416–359 mya), amphibian-like vertebrates walked dry ground, eventually followed by reptiles at the end of the Paleozoic Era, while primitive conifers, cycads and ferns covered the landscape.

Can you find the fossils?

In the gray Paleozoic limestones (E) near this panel, see if you can find these fossils:

- **foraminifera** (to your left and up), tiny one-celled animals, commonly referred to as forams, whose fossilized shells look like wheat grains
- bivalved, meaning two-shelled, **brachiopods** (below this panel)
- bases of solitary “horn” corals (below this panel) with a unique horn-shaped chamber that looks like an ice cream cone
- round stem fragments or “buttons” of anchored animals called **crinoids** (to your left)

What about Dinosaurs?

More recent **Mesozoic Era** (251–65 mya, or mid-December) sedimentary rocks containing fossils of dinosaurs are not found in the Catalinas. The carnivorous Albertosaurus has been found in the Santa Rita Mountains south of Tucson and herbivorous sauropod Sonorasaurus (pictured above) was excavated from a remote canyon about 40 miles southeast of Tucson. Fossilized dinosaur bones and footprints are also found in northern Arizona in rock formations of the Colorado Plateau.

Rising from the western end of the Catalinas, Pusch Ridge is visible just beyond the Wall. It was named for German pioneer George Pusch (1847–1921), who built Steam Pump Ranch near the base of the ridge, on the Cañada del Oro, in 1874. Pusch Ridge was home to one of the last populations of Desert Bighorn Sheep in Arizona; none have been seen there since 2005.