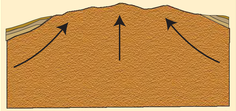
A LOOK BACK IN TIME

Over 1,000 Million Years of Geological History Exposed in Shell Canyon

Over 1,000 Million Years Ago Proterozoic Era

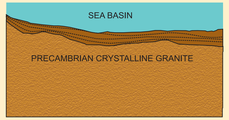
During Precambrian time, there were many marine transgressions (shallow seas moved in over the land), extensive volcanism, and widespread glaciation. The land was alternately subjected to uplift with subsequent erosion, followed by down warping. Basins developed as sediments moved down from adjacent highlands. Eventually these sediments formed younger Precambrain bedrock.



About 800 million years ago, this part of Wyoming uplifted and ancient seas gradually receded. Forces of erosion uncovered deep layers of Precabrian crystalline granite bedrock, which had formed 2,900 million years ago during the late Archean Era.

About 570 Million Years Ago Paleozoic Era

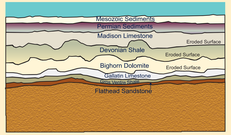
During the Middle Cambrian time, seas once again invaded the entire region and deposited sediments.



Most of the sediments came from exposed Precambrian granite eroded from adjacent highlands. Over time, these sediments compacted into hardened layers of sandstone (Flathead), shale (Gros Ventre), limestone (Gallatin), and conglomerates. The dark, red Flathead sandstone at the beginning of the interpretive trail, formed in this time period.

570 to 71 Million Years Ago Proterozoic-Mesozoic Eras

The region underwent a series of marine transgressions between the Cambrian and Cretaceous periods. Each time the land mass lifted, erosion occurred. Each time the land sank, water moved in and deposited sediments. The Mesozoic Era (270-85 million years ago) was the age when dinosaurs walked the earth.



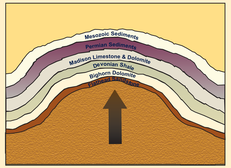
Plant and animal remains deposited on the sea bottom, along with sediments, and fossilized in the hard rock layers. Invertebrate shell fossils are most characteristic of Madison limestone and Bighorn dolomite.

71 Million Years Ago Mesozoic Era

This region's last marine invasion ended about 71 million years ago in the Cretaceous period of the Mesozoic Era. 138 million years ago, the land mass sank and was inundated by the Cretaceous Sea. Thick sediments deposited over the basin. The heavy overlying weight of sea water compressed the sediments into various rock layers. During this particular sea invasion, western Wyoming provided swampland habitat for dinosaurs. The dinosaurs later became extinct in this period.

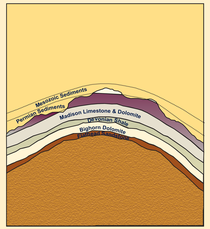
65 Million Years Ago Mesozoic Era

Near the close of the Cretaceous Period, the sea receded for the last time. The sea bottom rose to become what is now known as the Big Horn Mountains. Mountain building processes produced an elevated landform with a Precambrian granite core, and overlying sediments compacted into hard rock layers. The Big Horn Mountains are part of the Rocky Mountain system.



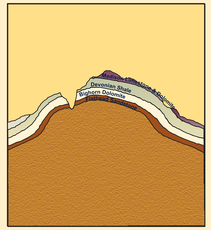
65 to 37 Million Years Ago Mesozoic Era

Wind and water carved away the mountain range as each newly exposed rock strata succumbed to persistent erosional forces. Through time, the upper layers were completely removed leaving . . .



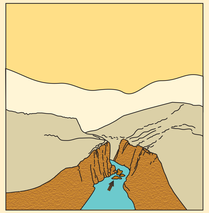
1 Million Years Ago Cenozoic Era

. . . the present day shape of the Big Horn Mountains. (Glacier activity continued up to 10,000 years ago when a warming cycle melted most of the Bighorn's glaciers).



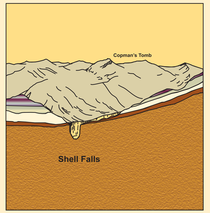
Shell Canyon

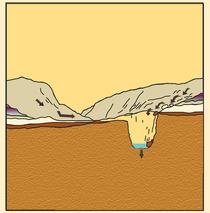
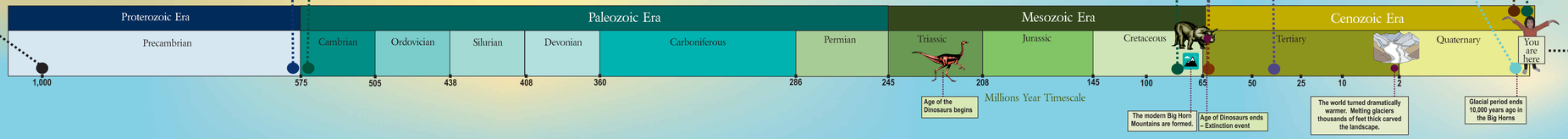
Shell Canyon formed by stream erosion and mass slumping (rapid downward movement of an earth mass on a slope weakened by an underlying porous layer, super saturated with water). Most canyon cutting occurred over the last million years, arriving at its present form long before man appeared.



Recent Times Cenozoic Era

Dynamic forces of wind, water, and ice continue to carve and mold the Big Horn Mountains. Shell Creek cuts deeper into Precambrian granite.



Today Cenozoic Era

Slumping transports rock and sediments from upper canyon slopes to the valley floor, where the stream carries them down the mountain. The life and times of Shell Canyon stands before you, a story of truly epoch proportions.