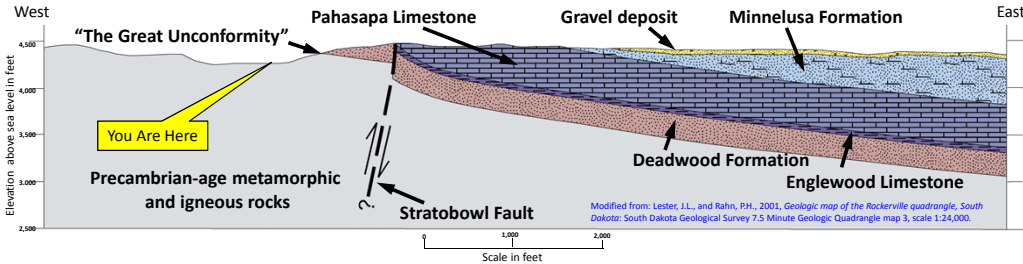


G E O L O G Y

This interpretive site is located near a significant geologic boundary.

- You are standing approximately 450 feet west of a geologic contact called the “Great Unconformity” that separates older Precambrian-age rocks from younger Paleozoic-age rocks.
- To the west (left) are metamorphic rocks of Precambrian age. As you drive toward Mount Rushmore, Precambrian-age rocks include schist, amphibolite, quartzite, and granite. A large road cut in schist is 1.7 miles to the southwest.
- To the east are gently-dipping younger sedimentary rocks of Paleozoic age. The road cut 0.2 miles to the east is in the Pahasapa Limestone. An outcrop of Pahasapa Limestone is also visible as a distant ridgeline approximately 4 miles to the north.

By the beginning of the Paleozoic era, approximately 540 million years ago, the Precambrian-age rocks had been eroded down to a nearly level surface. A seaway encroached from the west about 525 million years ago, resulting in the accumulation of sedimentary rocks. The erosional surface between the Precambrian rocks and the younger, overlying Paleozoic rocks represents a break in time of approximately 1 billion years where rocks were not preserved. This break in time is called the “Great Unconformity.” It is marked below in the aerial photo and is located on the hillside about 450 feet to the east-northeast of this location.



The Paleozoic and Tertiary sedimentary rocks deposited near this interpretive site include, from youngest to oldest:



- **Gravel deposit**
 - Sand and gravel
 - Up to 40 feet thick
 - Precise age uncertain; younger than approximately 34 million years old (during the Tertiary Period)
- **Minnelusa Formation**
 - Yellow sandstone, tan limestone, and red shale
 - 500 feet thick
 - Approximately 320 – 270 million years old (during the Pennsylvanian Period)
- **Pahasapa Limestone** (regionally known as the Madison Limestone)
 - Light gray dolomitic limestone
 - 420 feet thick
 - Approximately 358 – 341 million years old (during the Mississippian Period)
 - All of the large caves in the Black Hills are in this formation
- **Englewood Limestone**
 - Pink limestone
 - 40 feet thick
 - Approximately 363 – 358 million years old (during the Devonian-Mississippian Periods)
- **Deadwood Formation**
 - Brown sandstone and shale
 - 240 feet thick
 - Approximately 525 – 500 million years old (during the Cambrian-Ordovician Periods)

The geologic history of the Black Hills began approximately 2.5 billion years ago, during Precambrian time, when sedimentary rocks, such as shale and sandstone, and basaltic lavas were deposited in a basin that covered much of this area. Metamorphism, under added heat and pressure, converted the sedimentary rocks into metamorphic rocks such as schist and quartzite, and igneous rocks such as basalt and gabbro into amphibolite. Near Mount Rushmore, the Harney Peak Granite intruded the metamorphic rocks about 1.7 billion years ago. This granite is the rock in which Mount Rushmore National Memorial is carved.

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Quick Response (QR) Code to additional information.

Approximately 65 to 35 million years ago, tectonic forces formed the Central Rocky Mountains and pushed this area up, forming the elongate domal uplift known as the Black Hills. Since then, erosion has exposed the ancient Precambrian core in the center of the Black Hills and the younger, gently-dipping sedimentary rocks on its flanks, resulting in the landscape that we see today.