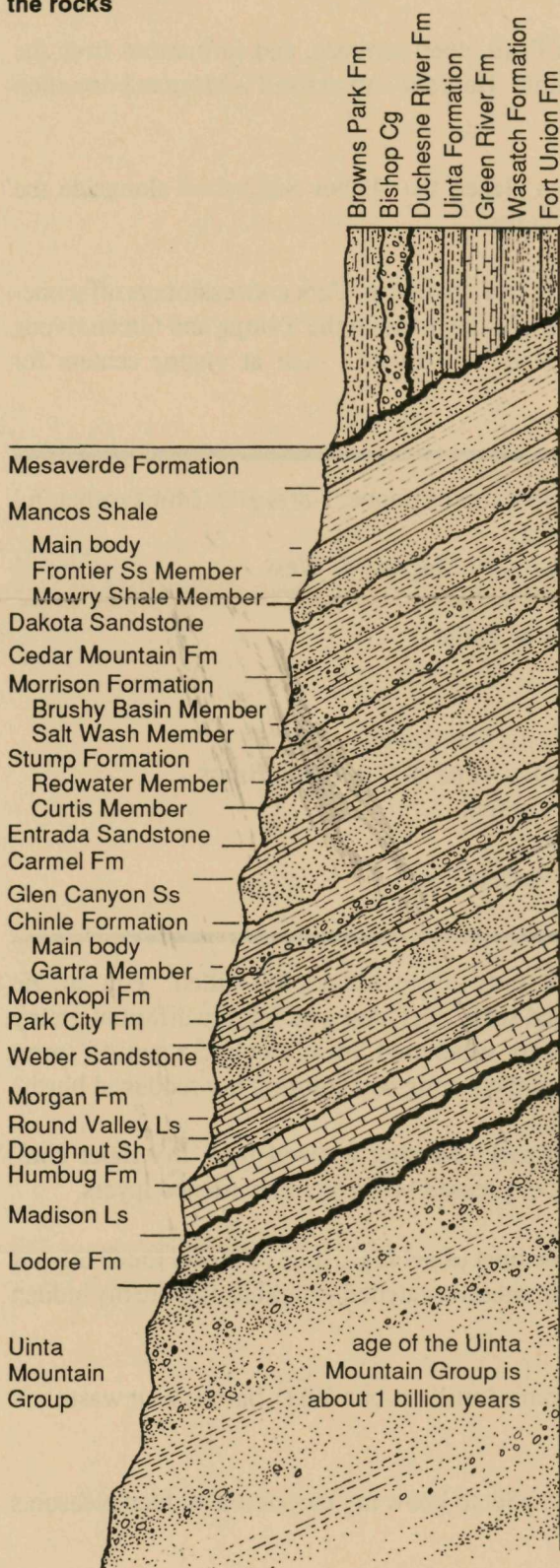


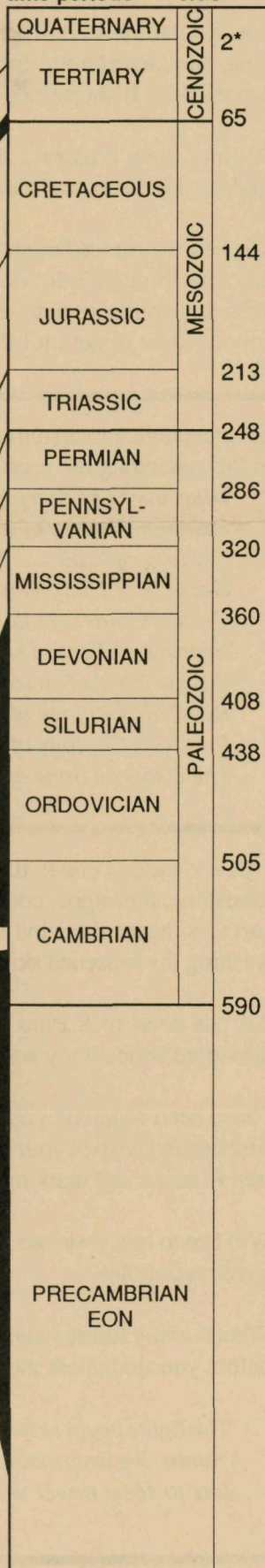


Geology

the rocks



time periods eras



a primer on stratigraphy

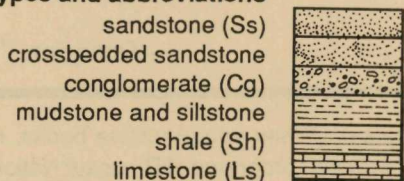
A **formation** (abbreviated Fm) may be a single distinctive layer, or several successive layers (strata) with similar characteristics. When a formation consists primarily of one type of rock, it is named accordingly: Mancos Shale, Entrada Sandstone, Madison Limestone, etc. Geologists often subdivide formations into **members**, which may vary considerably from one area to another. This chart shows only a few of the more common subdivisions used in this area. Adjacent formations that have similar features may also be combined into **groups**.

A thicker wavy line between formations indicates an **unconformity**. This is a "gap" in the geologic record: an interval in which no deposition occurred, or in which existing deposits were eroded away before deposition resumed. Unconformities can be inconspicuous and represent relatively brief intervals, or they can be quite obvious. For example, in Whirlpool Canyon the Lodore Formation overlies a ruggedly eroded surface on the Uinta Mountain Group—one hint of the long interval between deposition of the two rock bodies. (These major gaps are shown by the solid black areas in the space connecting the strata with the time chart.)

Stratigraphic charts are usually shown as simple vertical columns with all the layers horizontal—just the way they look in places such as the Grand Canyon, but not very similar to the tilted rocks of Dinosaur. The folding and faulting in this area make it impossible to see all of Dinosaur's strata at any one site, and difficult to portray them realistically in a conventional geologic column. If you turn this chart on its side, you'll see it as a generalized cross section of the region, with the uplifted Uinta Mountains to the left and the downwarped Uinta Basin at the right. Rocks exposed in Dinosaur National Monument range from about the upper one-third of the Uinta Mountain Group to the lower part of the Mancos Shale. Some exposures of Bishop Conglomerate and Browns Park Formation also occur in the monument.

Formations vary greatly in thickness, and are not to scale on this chart. Actual thicknesses of these range from a few meters in the Dakota Sandstone to more than 7,000 meters in the Uinta Mountain Group.

key to rock types and abbreviations



* these figures = millions of years before present

The geology of Dinosaur provides a more complete record of the Earth's history than that of the Grand Canyon. The rocks can provide you with information about the Earth and its environments from the present to more than one billion years ago. In order to appreciate the geological story and the chapter written in each formation, you should take along geological guides, a hand lens, and binoculars. **Remember this is a National Park. Do not chip rocks or take geological samples. All plants, animals, natural and cultural features, including the rocks, are protected so that others may enjoy them.** Here are some sites you should consider visiting:

Lodore Canyon

Towering, deep-red walls made of billion-year-old sand and pebbles that were eroded from a mountain range and compressed to become the Uinta Mountain Group.

Sound of Silence hiking route

A route through the Morrison, Stump, Entrada, Carmel, Glen Canyon, and Chinle formations.

Split Mountain Overlook

In a view extending from Split Mountain Boat Ramp to Green River Campground are colorful exposures of the Weber, Park City, Moenkopi, Chinle, Glen Canyon, Carmel, Entrada, Stump, and Morrison formations.

Ruple Point

This vantage point gives views of upper Split Mountain, Whirlpool Canyon, faulting and folding, and formations from the Morrison through the Humbug.

Harpers Corner

Spectacular views of the Mitten Park Fault, deep canyons, and formations from the Uinta Mountain Group through the Chinle. Harpers Corner itself is Morgan Formation capped with Bishop Conglomerate.

Jones Hole Trail

Follows, then crosses a fault that has placed the Weber Sandstone alongside the Lodore, Madison, and Humbug formations.

River trips

The best way to see Dinosaur's geology is on a river trip. Park concessioners offer one-day trips through Split Mountain and multi-day trips on the Yampa and Green rivers. Private permits require application well in advance. Ask at visitor centers for concessioner or permit information.

Resources

Several publications sold at park bookstores (or by phone: 1-800-845-3466) are helpful in understanding the geology of the area:

Dinosaur: The Story Behind the Scenery, Hagood & West

Geologic History of Utah, Hintze

Geology of National Parks, Harris & Tuttle

Geology of Utah, Stokes

Golden Guide: Geology, Rhodes

Imprints of Time: The Art of Geology, Van Diver

Ranger Rick's Naturescope: Geology—The Active Earth, Braus

Roadside Geology of Colorado, Chronic

Roadside Geology of Utah, Chronic

The Usborne Book of the Earth, Watts & Tyler

The rocks speak

I am the Earth's crust: tilted rocks. A study of life, but not life stilled. You call me sandstone, limestone, conglomerate and such. Yet have you felt my different grainy surfaces, heard the wind blow across my weathered brow, smelled a sudden storm washing my loosened skin, or absorbed the setting sun coloring my reddened blush?

All has been rock...and will become rock, whether spewed from my inner core, deposited beneath my watery surface, or pressed between my hardened layers.

I have been watching you twinkle in the mist of geologic time: Felt the touch of your first fire and wisp of your painted brush, silently watched your kind explore my hidden past to count and mark my treasures.

Will I be to fuel your cars, light your home, fertilize your fields, harbor your waste and cover your holes?

Whatever my future I invite you, come. Get to know my moods and hidden pleasures before your judgment passes.

The lights begin to twinkle from the rocks: the long day wanes: the slow moon climbs: the deep moans round with many voices. Come my friends, 'tis not too late to see a newer world....

—Tennyson, "Ulysses"

