



Meriwether Lewis

Courtesy of Independence National Historical Park



Location Map

Lewis and Clark in Montana Powder River Area

Bob Bergantine and Ginette Abdo



MBMG



William Clark

Courtesy of Independence National Historical Park

As Clark descended the Yellowstone River he dutifully noted the many natural features he saw. A modern traveler here still can see and appreciate what he described.

Friday July 30, 1806, at the mouth of the Powder River, Clark noted:

... the water ... is 100 yds wide, the bed to this river nearly ¼ of a mile this river is Shallow and the water very muddy and of the Colour of the banks a darkish brown. I observe great quantities of red Stone thrown out of this river...



The Powder River flows into the Yellowstone River about 7 miles southwest of Terry, Montana.



Photo by Ginette Abdo, MBMG

The red rocks in and near this stream induced Clark to call it *red Stone river*.



Photo by Clay Schwartz, MBMG

The red-colored stones are chunks of clinker from the Fort Union Formation that washed or fell into the river, which tumbled and smoothed them. Clinker forms when lightning, grass fires, or spontaneous combustion ignites coalbeds, and the adjacent rock—if siltstone or shale—is baked and fused, forming orange, red, and yellow “burned rock.”



Photo by Ginette Abdo, MBMG



Photos by Ginette Abdo, MBMG



These banks, *a darkish brown*, are near the mouth of the Powder River and are composed of layers of silty clay deposited by the river. Erosion of these sediments produces the mud in the river and its muddy look. The next day, July 31, Clark continued downstream about 7 miles past Powder River to present-day Terry, Montana.



Photo courtesy of Wayne Mumford (www.waynemumford.com)

... here the river approaches the high mountainous country on the N W. Side. those hills appear to be composed of various Coloured earth and Coal without much rock...this high Country is washed into Curious formed mounds & hills and is cut much with reveens.

The rugged hills on the N.W. Side of the Yellowstone are the Terry badlands carved out of the Fort Union Formation. The darker, patterned, flat area south of the river is floodplain alluvium, formed by modern erosion and flood deposits.

The high Country is entirely bar of timber.

I observe Several Conical pounds [mounds] which appear to have been burnt.

These mounds are capped with erosion-resistant clinker—shale and siltstone that were baked when the underlying coalbeds burned.

... great quantities of Coal or carbonated wood is to be seen in every Bluff and in the high hills at a distance on each Side.

Lewis and Clark sometimes called the coal of eastern Montana and western North Dakota “carbonated wood” because it contained the remains of the woody plant material. This low-grade coal is lignite.



Photo by Ginette Abdo, MBMG

Sediment . . . erosion . . . badlands . . .

Altitudes near Terry range from 2200 to 2500 feet above sea level; the climate is semiarid. About 65–55 million years ago, however, vegetation grew abundantly here in a moist, subtropical climate near sea level.

Rivers flowing eastward from the mountains toward the inland sea deposited sand, silt, and mud.

Woodlands, grasslands, and swamps were interspersed in the area. As plants in the swamps died, their remains accumulated and slowly turned to peat.

When the rivers meandered or flooded, layers of sand, silt and clay buried the partially decomposed vegetation (peat) in the swamps.

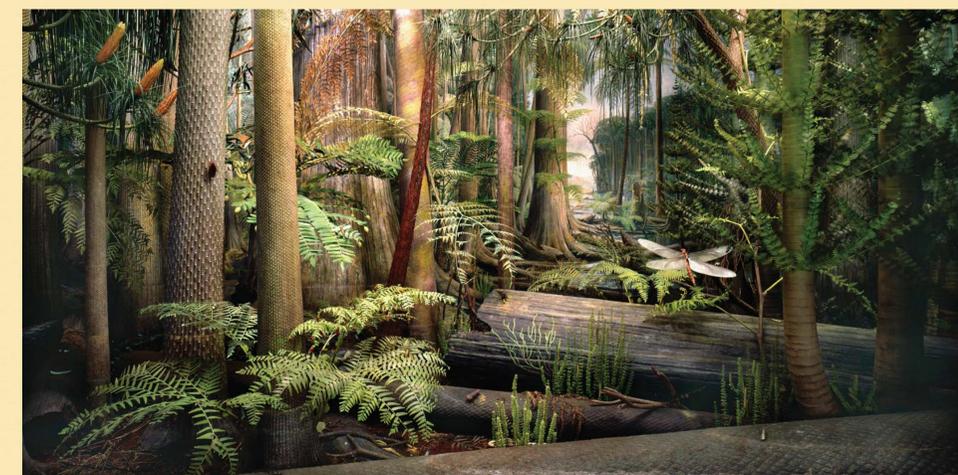
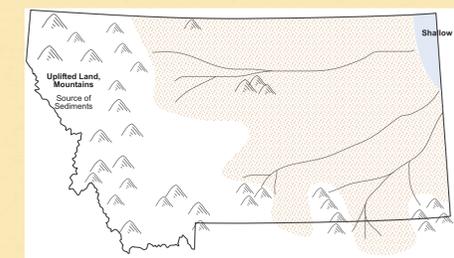


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Photo by Ginette Abdo, MBMG

Through geologic time the clay, silt, and sand became mudstone, siltstone, and sandstone, respectively. The peat became coal.

Sandstone and clinker of the Fort Union Formation tend to resist erosion; they often cap hills and buttes in the area. The finer-grained siltstone and mudstone of this formation erode more easily. Rivers and seasonal streams cut through the flat-lying rocks, forming the canyons, ravines, gullies, and hoodoos typical of a badland landscape.