

# Dr. Ferdinand Vandever Hayden: 150 Years after Yellowstone

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**Figure 1: Hayden portrait, 1859.**  
E.R. Morgan photo, National Portrait Gallery, S/NPG.77.183.

## FRACTURED CHILDHOOD AND DRIVE TO LEARN

Ferdinand Vandever Hayden was born in September 1828 or 1829 in Westfield, Massachusetts, USA, the eldest child of Asa and Melinda Hayden. As signified by his indeterminate birthdate, much of Hayden's early years are not well known. What is known is that Hayden had a troubled childhood, and he came from a poor background. His father was unreliable and had a prison record. Melinda divorced Asa in 1840 on grounds of neglect. She subsequently moved to Rochester, New York, and remarried in 1841. In 1841–1842 Hayden was sent to live with his aunt in Rochester in Lorain County, Ohio.

The move to Ohio benefited Hayden. His aunt and uncle cared for him greatly enough to offer to adopt him, which he declined due to not wanting to become a farmer (Fryxell, 2010). Instead, in September 1845 Hayden walked the 15 miles to Oberlin College. Virtually penniless and with few educational credentials he stated his case to the college president. He was admitted to the Preparatory Department, and in 1846 advanced to the freshman class. He was dubbed the boy of the class given his ability to fall in love regularly. One student said Hayden was an enigma to most teachers and classmates and thought of him as “an enthusiastic dreamer who would never conquer in practical life” (Foster, 1994).

Yet Hayden often said his Oberlin years were the happiest of his life. He joined a literary group, recommended books to his tutors, and studied under George Allen, who taught geology and natural history. He worked his way through college, never receiving a dime he did not earn (White, 1894). In August 1850, Hayden graduated “with a decided taste for the natural sciences” he claimed

(Foster, 1994). Out of 40 students admitted in 1846, he was one of only 13 to graduate. In September 1850 he enrolled in Oberlin's Theological Department, but to earn money he taught at schools around northeast Ohio.

## MEDICINE AND THE MISSOURI HEADWATERS

From 1851 to 1853, Hayden lived in Cleveland, Ohio, where he studied medicine and learned geology from Jared Potter Kirtland and John Strong Newberry. Through Kirtland and Newberry, Hayden became acquainted with numerous scientists of the day, and his desire to conduct field studies was born. “I feel as though I could endure cheerfully any amount of toil, hardship, and self denial provided I could gratify my strong desire to labor in the field as a Naturalist,” he wrote Spencer Baird, Assistant Secretary of the Smithsonian Institution, in February 1853. “But I am poor,” he continued, “...every longing desire to engage in that most delightful of pursuits...must be smothered by poverty.”<sup>1</sup> Such correspondence shows Hayden's natural enthusiasm and drive to pursue his goals, despite hardship.

It was in 1853 that Hayden received his hard-earned break from the famous James Hall of Albany, New York, whom he had met through Newberry in 1851. With help from Kirtland and Newberry, Hayden had been trying to convince Baird or Hall to hire him. He wrote Hall on 3 March 1853, stating he had a job offer to teach, but would decline “if I can find employment in the ‘field’ at even one half the sum...<sup>2</sup>” Hall finally obliged by late March and began plans for a fossil collecting trip to the “Bad Lands” of the Upper Missouri River.

Fielding Bradford Meek, Hall's assistant, was also hired for the trip. From June to August, Hayden and Meek traveled upstream from St. Louis, explored the Badlands mid-June to mid-July, then traveled back downstream. They observed the stratigraphy and collected fossil and living specimens along the way. In all, the expedition was a success. Amongst other triumphs, Meek and Hayden's first expedition had doubled the known types of Cretaceous invertebrate shells at that time (Foster, 1994). More importantly, the trip proved Hayden's abilities to many prominent scientists. These included Joseph Leidy, who analyzed the vertebrate remains from the trip, and Spencer Baird, to whom Hayden continued to write. Along with Meek, Leidy and Baird became constant figures in Hayden's career after 1853.

Hayden completed his M.D. in January 1854 from Albany Medical College, but he was anxious to conduct more fieldwork. In 1854, he attached himself to a 20-month expedition that took him more than halfway up the Yellowstone River to the Bighorn River confluence and then on to the Upper Missouri River to north-central Montana in 1855. He explored Yellowstone River

<sup>1</sup>Smithsonian Institution Archives: SIA, RU 7002, letter number 351.

<sup>2</sup>New York State Archives, NYSA; Merrill Papers, Library of Congress.



**Figure 2: Hayden and horse at camp in 1870. W.H. Jackson photo, USGS-jwh01647.**

tributaries into Wyoming on a topographical survey in 1856, made collections in Nebraska in 1857, and worked with Meek in Kansas in 1858. In 1859–1860 he was on a 15-month military expedition that circled what is now known as the Greater Yellowstone Ecosystem, but due to difficult terrain the party could not navigate into the source region of the Yellowstone River.

Meanwhile, Hayden was becoming a major scientific contender. Still in his 20s, in 1856 he was elected to the Academy of Natural Sciences of Philadelphia and with Meek published their first of many joint publications. His first geologic map was published in 1857. By 1861, Hayden lived in Washington, D.C., where he summarized his work to that point in the large volume *Geology and Natural History of the Upper Missouri*. In 1862, he published what might have been the first claim that western North America had uplifted since Cretaceous time.

## HAYDEN'S SURVEY AND YELLOWSTONE

The Civil War derailed Hayden's mounting field endeavors. He joined the Union Army in 1862 and was assigned to several medical posts. Albeit he managed to collect some specimens from his post in Beaufort, South Carolina (Foster, 1994). In June 1865, he was honorably discharged with the rank of lieutenant colonel by brevet. In November 1865, Hayden was appointed auxiliary professor of geology and mineralogy at the University of Pennsylvania, with an arrangement that his duties would not interfere with western exploration (White, 1894). Hayden kept the position until 1872.

Nebraska statehood in 1867 granted Hayden his next hard-earned break, when Congress appointed him to direct the Geological Survey of Nebraska with a mere US\$5,000 from unexpended legislative funds (White, 1894). Hayden had lobbied to conduct a survey there since the 1850s, and his appointment was essentially uncontested (Foster, 1994). This was the virtual start to

the U.S. Geological & Geographical Survey of the Territories, as his survey would eventually be known—most commonly referred to as the Hayden Survey. With each year, Hayden expanded the survey's appropriations and geographic scope, and by 1879 it had scaled up to work large expanses of Colorado, New Mexico, Utah, Idaho, Montana, and Wyoming.

Following stories and his own curiosity, Hayden's survey finally set sights on the upper Yellowstone River in 1871. The roster included naturalists, scientists, and topographers, as well as photographer William Henry Jackson and artist Thomas Moran. The expedition's maps would be the first to coherently tie that region together, and the images by Jackson and Moran along with Hayden's lobbying efforts and an advanced copy of his survey's report proved to be crucial pieces in the 1872 decision to set aside Yellowstone as the world's first national park. Hayden (and Yellowstone) benefited from fame from the 1871 expedition, but his genuine appreciation of the landscape is writ large. "But no language can do justice to the wonderful grandeur and beauty" he remarked of the Grand Canyon of the Yellowstone, and of Yellowstone Lake, "...one of the most beautiful scenes I have ever beheld" (Hayden, 1872).

## LASTING CONTRIBUTIONS

Despite meager beginnings, Dr. Ferdinand Vandeveer Hayden persevered to make an illustrious career. Arguably, his contributions have had lasting effects on American institutions. For one, his lobbying for appropriations essentially normalized government-funded science. Furthermore, although only one of the four "Great Surveys of the West," some considered his to be the model for the U.S. Geological Survey (Picard, 2010) established in 1879. He wanted to head that survey too, but it would be two other western survey leaders, Clarence King, then John Wesley Powell, who took the role before Hayden's death in 1887. Competition aside, however, Hayden's legacy perseveres, as his 1871 expedition was not only a turning point for himself and his survey, but also for land conservation and the American people.

## ACKNOWLEDGMENTS

This article would not have been possible without Dr. Renee Clary. Thacker wishes to acknowledge the numerous peoples affected by the Western surveys, the results of which were used intentionally and unintentionally to displace them.

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<sup>3</sup>Hayden's 1853 correspondence with Baird and Hall are from Foster (1994) and Fryxell (2010).