

## FIRST DRAFT

# Hayden believed his maps were only ones state would ever need

*Editor's note: This is the first of two columns about the Hayden Survey.*

Efforts to map parts of western Colorado had been made long before the 1870s. But it wasn't until 1873-1876, with the work of Ferdinand V. Hayden and his crews of topographers, geologists, botanists and more, that the whole of Colorado was mapped in minute detail.

As maps from the survey were being prepared in 1877, Hayden wrote, "When finished, Colorado will have a better map than any other State in the Union, and the work will be of such a character that it will never need to be done again."

He was obviously wrong regarding the latter claim. Still, the Hayden Survey maps were good enough that they were used as the basis for other maps of the state for decades. Even today, they are surprisingly accurate.

Want to find No Thoroughfare Canyon in Colorado National Monument?

It's on a Hayden Survey map, even though the monument itself wouldn't be established for another 34 years.

The Hayden Survey was officially known as the "Geological and Geographical Survey of the Territories."

Hayden began his work in Nebraska Territory in 1869, then moved to the Yellowstone River region in Wyoming in 1871-1872. His work there helped convince Congress to establish Yellowstone National Park in 1872.

In 1873, Hayden moved his crews to Colorado Territory.

The Hayden Survey was one of four major surveys of the West after the Civil War.

Others were John Wesley Powell's two trips down the Green and Colorado rivers in 1869 and 1871-1872; Clarence King's surveys through parts of the Dakotas, Wyoming and northern Utah; and George Wheeler's exploration of California and Nevada on behalf of the U.S. Army.

There was intense competition among the leaders of the surveys, both for funding from Congress and for public prestige until 1879, when the U.S. Geological Survey was formed.

While all of the surveys provided important data, Hayden's crews conducted the most detailed look at the landscapes they explored, including topographic contour lines, and in-depth reports about the resources available in these areas.

It was all done to encourage economic development and entice railroads, farmers, ranchers, miners and others to the region.

The fact that there were already people living in Colorado and nearby — primarily Utes, Paiutes and Navajos — was largely ignored, but it would cause problems in the 1875 season.

Hayden divided his survey crews into seven divisions: There were three topographic and geologic mapping divisions describing different parts of the state. Each of those had its own topographer, geologists, mule packers and a cook.

There was also a triangulation division that determined high points from which each section would be surveyed. There was the supervisory division, led by Hayden himself, which visited the entire area being surveyed.

A quartermaster division made sure food and other supplies arrived for the field crews at designated supply camps. And there was the photographic division, led by William



BOB SILBERNAGEL



Members of the Hayden Survey at work in the Yellowstone area in 1870. Ferdinand Hayden is hatless at the back of the table.



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Ferdinand V. Hayden as he appeared in 1870.

Henry Jackson, who became famous for his photographs of Colorado.

The Middle Division of the three mapping groups — the division responsible for the Grand Valley, Uncompahgre Valley and as far west as the La Sal Mountains — was headed by Henry Gannett, topographer, and Albert C. Peale, geologist.

During three seasons, from 1874 to 1876, the Middle Division alone mapped more than 15,000 square miles of western Colorado using only transits, mercury barometers and special telescopes to determine position based on the stars.

The maps they produced show topographic contours, river drainages, geologic formations, mineral and agricultural potential, all accompanied by detailed drawings of certain locations.

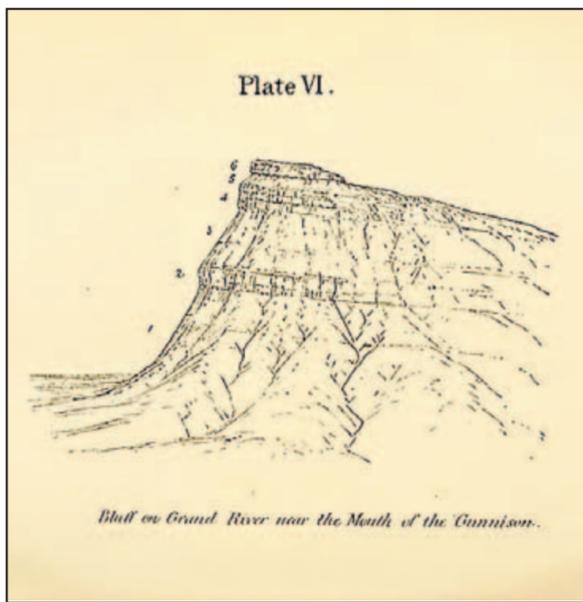
Their written reports also included information about formations that might hold dinosaur fossils; about insects that could prove a problem for agriculturalists; and even about the possible extermination of the American bison.

The other divisions also did critical work. In 1874, the Southern Division, which focused on the San Juan Mountains, mapped the roughly 4 million acres that the Ute Indians had agreed to open up for mining under the Brunot Agreement approved earlier that year.

By 1875, when the same men returned, they noted that two new towns, Ouray and Lake City, had sprung up in the Brunot lands.

Franklin Rhoda, assistant topographer with the Southern Division, recorded the first documented ascent of Mount Sneffels in August of 1874. The 14-hour round-trip hike was difficult and tiresome for the four men involved, Rhoda reported.

"But all our labor was soon rewarded by the glorious view which presented itself to us when we reached the top."



FROM HAYDEN SURVEY'S 1874 ANNUAL REPORT

This drawing of what we now call Mount Garfield accompanied Albert Peale's description of the Grand Valley. Numbers correspond to different geologic formations he described.

The 360-degree view included the Gunnison River, and to the north, "beyond the Gunnison ... there appeared a very elevated plateau, which, commencing near the mountain-peaks, presented a nearly horizontal profile for a considerable distance."

That "nearly horizontal profile" was Grand Mesa, and Albert Peale described it briefly in his 1874 report: "On the north side of the (Gunnison) river is a series of terraces sloping from the basaltic-capped mesa which here forms the divide between the Grand (Colorado) and Gunnison Rivers."

"The edge of the mesa stands boldly out, like the edge of a fortification-wall," he added. "Its slopes are well timbered. The buttes below, extending toward the river, are composed of yellow, gray, and whitish strata, the weathering of which gives a most curious appearance to the landscape."

The members of the Hayden Survey in 1874 referred to this mesa as "the great plateau" or "Great Mesa."

By the 1875 survey season, however, they had settled on another name for the great plateau: "Grand Mesa."

Although the Hayden Survey maps and annual reports were incredibly accurate in many respects, the team was not always correct.

Peale and Gannett were intrigued by Ute stories of a special place the Indians called Unaweep Canyon. In 1874, the Hayden men thought they had located it near Delta, between Roubideau Creek and the Gunnison River.

They corrected their mistake

the following year when they visited the actual Unaweep Canyon. Peale wrote a detailed description of its unique geography and speculated about whether it had been formed in ancient times by the Gunnison, Colorado or Dolores River.

Meanwhile, Hayden himself massively underestimated Colorado's potential.

"Colorado will never support so dense a population that a more detailed survey will be required," he wrote in 1877.

Still, despite such errors, the survey provided detailed maps and reports, and it named important landscape features.

In addition to Grand Mesa, Peale and Gannett named Plateau Creek, the Paradox Valley, Divide Creek, the Little Book Cliffs and the Grand Valley.

In one report Peale noted that, although the Grand Valley was "for the most part a desert covered with sparse (sic) growth of stunted sage-brush," a portion of the valley might one day "be reclaimed by irrigation from the Grand River."

Sources: "Henry Gannett and Albert C. Peale, Pioneer Map-makers of the Hayden Survey on the Western Slope," by William L. Chenoweth; Annual reports of "The United States Geological and Geographical Survey of the Territories," by F.V. Hayden; "Geological and Geographical Atlas of Colorado and Portions of Adjacent Territory," by F.V. Hayden; "The Four Great Surveys of the West," at usgs.gov.

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## REGION SENTINEL WIRE SERVICES

### Containment lines built around wildfire

SALIDA — More than 800 firefighters continue to work on containment lines for a central Colorado wildfire that has charred nearly 10 square miles of national forest land.

The fire has destroyed a cabin and another structure as its northern edge reached 2 miles south of Salida, forcing the evacuation of about 130 homes.

Unseasonably warm and dry conditions have fueled the fire, caused by lightning in the Sangre de Cristo Wilderness Area on Sept. 8. It had been allowed to burn beetle-killed trees until high winds spread flames northward.

Officials also are monitoring a 1.5-square-mile wildfire on forest land 10 miles south of Rifle.

Lightning started the fire on July 28. It, too, has been allowed to consume dead timber.

### 4 hospitalized after shooting at a home

DENVER — Authorities said four people were shot and taken to area hospitals after an incident at an Adams County home.

The Adams County Sheriff's Office says deputies responded to an emergency call at 1:45 a.m. Sunday, reporting shots fired at the home about 4 miles north of downtown Denver.

Sgt. Paul Gregory said four people were shot and taken to area hospitals.

Their conditions weren't immediately known. Investigators were at the scene, and Gregory said no additional details are immediately available.

### 29 black-footed ferrets released

WIND CAVE NATIONAL PARK, S.D. — More black-footed ferrets were released at Wind Cave National park in southwestern South Dakota.

The National Park Service said 29 ferrets were released into their new home at the park on Thursday.

The ferrets will add to the park's estimated ferret population of 18 to 20 animals. The ferrets were raised at the U.S. Fish and Wildlife Service's National Black-footed Ferret Conservation Center in northern Colorado.

Park Superintendent Vidal Davila says the goal is to increase the ferret population and enhance the animal's genetics that have existed in the park since ferrets were originally reintroduced in 2007. Crews will perform surveys in the next week to monitor the newly released ferrets.

Black-footed ferrets are considered one of the rarest animals in North America.

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