YELLOWSTONE
NATIONAL PARK
THROUGH THE LENS OF TIME

BRADLY J. BONER
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UNIVERSITY PRESS OF COLORADO  Boulder
FOR MY PARENTS,
who first introduced me to Yellowstone National Park

FOR MY WIFE, JEANNETTE,
my fellow traveler in this mystical place

AND FOR MY CHILDREN, ADELINE AND WILL,
who are part of the next generation to whom Yellowstone always belongs
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HISTORY WRITING IS GENERALLY A SEDENTARY ACTIVITY: GO TO THE archives, access the documents, take notes, read the secondary sources, and write your book. All of this accomplished while using a minuscule of muscle and merely visualizing the scenes of the action.

Brad Boner has taken on a daunting task. He first researched and cataloged the photographs William Henry Jackson created as a member of the Hayden Scientific Expedition of 1871 to the Yellowstone region. This would be sufficient effort to merit our admiration, but he then spent weeks, months, and years meticulously tracking down the exact locations where Jackson made the original exposures and made new ones. Many of these locations were easy enough to find, well known to Yellowstone aficionados. Many others were not.

The art of rephotography is different. In some respects, it can be more creative. In this case, it is surely more physical. Boner had to be prepared for frustration in locating sites, risk in getting lost, danger in animal encounters, smoke from nearby wildfires, and enduring rain and even snowstorms—all part of Yellowstone National Park’s size, abundant wildlife, and fickle weather. The photographer in Yellowstone enters a world where he is merely a visitor and has none of the guarantees of an urban, urbane park. In Yellowstone’s backcountry, you can expect the unexpected.

Jackson’s recorded scenes along the Yellowstone River in Paradise Valley in 1871 give an idea of a pristine country. One hundred and forty years later, buildings and roads—the artifices of human occupation—dot the landscape, intruding on our sense of the bucolic. But we are quick to note that Paradise Valley is not inside the boundaries of the park.

By contrast, there appears to be a minimal change in a great deal of the photographs taken within Yellowstone’s borders. This will come as a happy revelation, for we environmental historians are, in the main, declensionists—believing that the world is “going to hell in a handbasket” and humans are the reason. Some of the Jackson/Boner comparisons tell us that change is not
endemic and that a “climax” ecology is possible as long as we humans keep out of the way. This, of course, is what natural national parks are all about—minimizing human impact. Many of Boner’s photos show that the parks, at least Yellowstone, have been successful. We are all familiar with the expression “change over time.” Rephotography gives palpable meaning to the expression. No other technique can so clearly give expression to the concept.

Boner clearly enjoyed this project, and he invites the viewer to join him in the adventure. So many photographs! If deciphering Jackson’s sites is not an intellectual exercise, it is certainly a challenging puzzle. What was Jackson, in each case, thinking? What was the circumstance of the exposure? Why did Jackson choose a particular location? What were the limitations of the technology at hand? What was he trying to “say” to his viewers? And, above all, are there evident changes in the natural landscape? For this viewer, it is the examination of the landscape between past and present that forces contemplation. If change is evident, who and what are responsible? Which changes can be attributed to nature? And which to human intervention?

Rephotography gives the reader the opportunity to contemplate. This is not a book to be viewed on a computer screen. Curl up with it in a comfortable chair (preferably in the winter) and give yourself the opportunity to view the past and the present. Ideas will come forth regarding how we lived 140 years ago. What were the advantages in living during Jackson’s era? How do they stack up with the world today? Discuss these images with a friend or spouse and kids. Worldviews that you failed to consider may surface. Many of us may feel that life almost a century and a half ago offered values, community, and adventure that are missing today. Perhaps in these photographs we can discover them anew.

Beyond the natural excitement of comparisons, Brad Boner has picked one of the most significant pioneer photographers in whose footsteps to follow. William Henry Jackson had a full career and is surely part of the history of the exploration of the American West. But in Yellowstone he played a particularly noteworthy role. Earlier explorers, such as the Washburn-Langford-Doane Party of 1870, failed to take along a photographer. Ferdinand Hayden would not make that mistake.

Jackson’s role in the creation of Yellowstone National Park is notable. As Hayden and Nathaniel Langford made the push for a national park in the winter of 1871–72, Hayden, in the words of historian Marlene Merrill, “saturated congressmen with Jackson’s most dramatic photographs of thermal features, waterfalls, and mountains.” Did Jackson’s photographs make a difference? They certainly helped. The Yellowstone Act passed Congress astoundingly fast, signed into law by President Ulysses S. Grant on March 1, 1872. One could argue that the political power of Hayden and Langford and lobbying efforts by the Northern Pacific Railroad were the reasons it passed quickly. But just as important were the images of William Henry Jackson. Hayden’s written descriptions and Thomas Moran’s sketches and paintings were surely influential, but none could compete with Jackson’s photographs: images that did not exaggerate and could not be manipulated.

Finally, this book and its images must be seen as a tribute to the National Park Service as it celebrates its centennial in 2016. It is not a matter of what one sees in many of the images, but what one does not see. Had it not been for the constant care and commitment to keep the Yellowstone landscape natural and pristine for future visitors, many of Boner’s photographs might show the folly of misguided policies. Sometimes we forget that we humans are in control of Yellowstone. Bureaucrats and powerful politicians could have dictated a more commercial path for our first national park. Fortunately, that was not the case, and these wonderful photographs—past and present—confirm our commitment to nature and future generations.

—Robert W. Whitehead, Jackson Hole, Wyoming
ACKNOWLEDGMENTS

This project would not have been possible without the personal guidance and assistance of several individuals in a variety of locations. While I name several here, I am sure I have missed a few. Those who have guided me on this incredible journey yet remain unnamed also have my gratitude for their contribution, however small, to this project’s completion.

Joan Anzelmo, former public affairs specialist for Yellowstone and Grand Teton National Parks and former superintendent of Colorado National Monument, was a personal mentor from the very beginning who encouraged me at every turn. Mrs. Anzelmo almost always knew exactly who to contact for whatever question I had. As a follower of my work as a photojournalist at the Jackson Hole News&Guide, Mrs. Anzelmo personally vouched for my professionalism when making crucial introductions that were integral to the project’s success.

Yellowstone National Park superintendent Dan Wenk was gracious enough to take time out of an extremely busy schedule to meet with me several times during this project. His belief in this project’s overall message of the importance of Yellowstone’s preservation was a pivotal part of its completion.

I had the pleasure of corresponding with several people across the country when putting together a complete set of William Henry Jackson’s 1871 photographs from the Yellowstone region. Colleen Curry, supervisory museum curator at the Yellowstone Heritage and Research Center in Gardiner, Montana, gave me access to the four-volume set of photographs Jackson personally donated to Yellowstone National Park. These were among the earliest prints ever made from Jackson’s negatives and provided a baseline for the entire project.

Edward McCarter, still pictures chief at the National Archives and Records Administration in Washington, DC, and librarian Rutha Beamon helped me find some of Jackson’s photographs in NARA’s collection that were not already scanned and available in their digital library. Jenny M. Stevens, librarian at the US Geological Survey Photographic Library in Denver, provided alternate
versions of Jackson's photographs from various albums of albumen prints in the library’s archives. These photographs acted as a cross-reference to ensure I had the numbering sequence correct when assigning Jackson’s descriptive information to certain photographs. Jackson scholar William Hallam Webber, of Gaithersburg, Maryland, provided me with much of his research material that also helped confirm the numbering sequence of Jackson’s 1871 Series of photographs. Steven B. Jackson, curator of art and photography at the Museum of the Rockies at Montana State University, helped clarify photographer Joshua Crissman’s involvement with the 1871 Hayden Survey.

Mary Robinson, house director of the McCracken Research Library in Cody, Wyoming, and Matthew Hermes, research associate professor at Clemson University, helped fill crucial gaps in my research regarding the fate of several of Jackson’s 1871 glass collodion negatives in a 1875 fire at Edward Bierstadt’s “Albert-type” studio in New York City.

Victor and Frances Warnick of Emigrant, Montana, Scott DePuy of Livingston, Montana, and the Royal Teton Ranch near Gardiner, Montana, have my appreciation for allowing me access to their property north of Yellowstone National Park and in Paradise Valley to find some of Jackson’s photo points. Mr. Warnick was kind enough to point out the general location where the Bottler brothers’ ranch buildings once stood and showed me a few artifacts found at the site.

Rachel Cudmore, film permit coordinator for Yellowstone National Park, accompanied me to several of Jackson’s 1871 photo points in the park. Since the best light for photography is often in the morning and evening, Ms. Cudmore endured several early mornings to serve as my official chaperone and to explain to curious tourists why I was wandering around in areas typically off-limits to the general public.

To verify some of the more detailed historical content throughout the manuscript and photo captions, I consulted Yellowstone National Park historian Lee H. Whittlesey, who read my manuscript and viewed my photographs, spending several hours on the phone with me to correct errors, clarify the historical record, and expand on several sections of the book. Marlene Deahl Merrill, an 1871 Hayden Survey scholar and editor of two books on the subject, also read the manuscript, providing her own corrections and insights. I am indebted to both Mr. Whittlesey and Mrs. Merrill for helping me provide a more accurate and complete picture of Yellowstone’s early history as it related to my contemporary images. My good friends and professional colleagues Cory Hatch and Martin Reed also provided valuable feedback and copyediting.

Yellowstone National Park geologist Henry Heasler, answered my e-mails and spent several hours on the phone with me answering questions about the formation of the park’s landscape, its geological anatomy, and ongoing geothermal activity. Because some of F. V. Hayden’s original findings turned out to be incorrect, Dr. Heasler’s insights offer a present-day understanding of Yellowstone’s geology.

Since many of the landscapes in my contemporary comparisons to Jackson’s 1871 images have been visibly affected by fire, I turned to Roy Rankin, supervisory vegetation management specialist for Yellowstone National Park. He provided historical records of fire activity in many of my contemporary photographs. Mr. Rankin, who began working in Yellowstone in 1979, often would be able to identify—by memory alone—the name and year of a fire that burned a particular landscape shown in my photographs. “These fires are kind of like my children,” he said. “I know where I was and what I was doing when each one of them started.”

I also must thank my friend Matthew J. Reilly, PhD, who did not hesitate to accept my offer to spend ten days paddling a canoe around Yellowstone Lake searching for several of Jackson’s photo points. Doing so alone would have been a daunting, if not impossible, task, so his presence on the journey served a dual purpose of safety and companionship. The guitar and bottle of whiskey Dr. Reilly packed into our little boat were especially welcome at our evening campfires.
My gratitude is also extended to the staff of the University Press of Colorado for their interest and enthusiasm for this project and the time and expense involved in producing and publishing this book. I also cannot express enough gratitude to friends, family, and Yellowstone lovers worldwide who contributed to the Kickstarter crowdfunding campaign that raised the additional funds necessary to bring this book to life. A list of more than two hundred individual contributors may be found on pages 293–295.

Finally, but not least important, I thank my beautiful wife, Jeannette, who was nothing but supportive of my efforts. Not only did she accompany me on some of my grandest adventures in Yellowstone—particularly the great trek across the Mirror Plateau with our good friend Kelsey Dayton—but she also tolerated many days, and sometimes weeks, at home as I gallivanted around the world’s first national park in my old Volkswagen camper van. Shortly after completing my photographic work in 2013, Jeannette gave birth to our first child, a little girl we named Adeline. My wife and I look forward to continuing our adventures to Yellowstone with her and our son, Will, born in February 2016, and experiencing that magical wonderland as a family, just as I first did as a child many years ago.
YELLOWSTONE NATIONAL PARK
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INTRODUCTION
“Nothing has been, nothing can be said, to magnify the wonders of this national pleasuring ground. It is all and more than all that it has been represented. In the catalogue of earthly wonders it is the greatest, and must ever remain so. It confers a distinctive character upon our country... here, the grandest, most wonderful, and most unique elements of nature are combined, seemingly to produce upon the most stupendous scale an exhibition unlike any other upon the globe. It should be sustained. Our Government, having adopted it, should foster it and render it accessible to the people of all lands, who in future time will come in crowds to visit it.”


First visited Yellowstone when I was about ten. My parents loaded my brother and me into an old Chevy Blazer, pop-up camper in tow, and we headed west from our home in the Black Hills of South Dakota, destined for the world’s first national park. We were a typical American family on a great American road trip.

One of my most vivid memories of that unforgettable summer vacation was standing at the Brink of the Lower Falls of the Yellowstone River, watching the water rush by and plummet more than 300 feet into the Grand Canyon of the Yellowstone River. I remember it being loud, having to almost yell as I barked questions at my dad, questions he probably only pretended to know the answers to.

Above all, I remember being filled with deep and fantastic wonder. I could actually feel the power of the falls—as wind on my face, an unseen force on my chest. It is what raw power feels like, a feeling that’s hard to describe and best experienced.

I was also just a little scared. In my child’s mind everything was so big. Even with a safety rail at the overlook, I held my dad’s hand, and I swear I can remember him squeezing mine, as if he were just a little scared too.
The overlook at the Brink of the Lower Falls is one of my favorite places in the park because it always invokes that sense of childlike wonderment I first experienced almost thirty years ago. Everything—from the towering canyon walls to the rushing water and deep roar of the falls—is exactly how I remember it. Everything is still big, and I still feel the force of the Lower Falls in my chest. It is an experience so phenomenal, it is unforgettable. Standing at the overlook today still makes me just a little scared, but I know now it’s not necessarily fear; it’s simply incredible to be so close to something so powerful.

I began this project as a personal curiosity to explore the park and reconnect with that memorable summer of my childhood. It has evolved into a journey to connect Yellowstone's own past with its present.

One can only imagine what pioneer photographer William Henry Jackson must have felt as he explored Yellowstone with the rest of the 1871 Hayden Survey, hundreds of miles from civilization, in a land so extraordinary that it was almost mythical. There were few trails, vague maps, and little knowledge of the region. Upon entering Yellowstone, they encountered a land that was completely and truly wild.

Yellowstone is always changing. The Grand Canyon is getting deeper and wider as the Yellowstone River carves a chasm into the earth. The activity of geysers, mud pots, and other thermal features are in constant flux. The flows of the great hot springs at Mammoth are always shifting, creating new layers of delicate, colorful cascades and leaving the old terraces to crumble in decay. These changes are barely noticeable in a single person’s lifetime. Some can be witnessed over decades. Others are measured in centuries, millennia, and eons. Most of the changes we see today are the intrusion of humans upon the landscape.

Today, roads and bridges wind through the park. There are pathways and boardwalks where people can safely walk, and restaurants, campgrounds, and hotels where they can eat and sleep. These are inevitable sacrifices that make it possible for millions of visitors to experience the wonders of Yellowstone every year.

Even with the impact of humanity, Yellowstone remains remarkably intact. The Yellowstone River is the longest undammed waterway in the Lower 48. The park’s landscape and iconic landmarks are relatively unchanged, save for those wrought by snow, ice, wind, rain, and fire. Because of the forethought of those enamored by Yellowstone more than 140 years ago, we can today experience a land that is still mostly wild. As intended, Yellowstone endures as a “pleasuring-ground for the benefit and enjoyment of the people.”

As the world’s original national park, Yellowstone stands as America’s first and greatest experiment in the preservation of an extraordinary landscape. When compared with Jackson’s photographs from 1871, these contemporary images, taken during the summer seasons of 2011 through 2014, illustrate just how well that experiment has stood the test of time.
Prior to 1869, the rugged wilderness surrounding the headwaters of the Yellowstone River, in the northwestern corner of the Wyoming Territory, had remained relatively unexplored, save for Native Americans, trappers, and prospectors who ventured into the area in search of game or gold. Mountain men spoke of extraordinary wonders such as spouting geysers, bubbling mud pots, towering waterfalls, and a spectacular mountain lake; but their stories seemed exaggerated and were dismissed as ramblings of those who had spent too much time alone in the wilderness. Even the accounts of Jim Bridger, the legendary scout, trapper, and hunter who served as a guide to US Army and civilian parties alike, were often dismissed as embellished campfire tales.¹

Stories about the mythical Yellowstone region began to spread among the growing population of the southern Montana Territory drawn to the area by the construction of the Northern Pacific Railroad, and some began hatching plans to venture into the region themselves. In September 1869, Charles W. Cook, David E. Folsom, and William Peterson, three men from Diamond City, Montana—just east of present-day Helena—made the first organized excursion into the heart of what is today Yellowstone National Park, intent on verifying the stories. Following the Yellowstone River and entering the region from the north, the trio visited rumored wonders such as Tower Fall, the Grand Canyon of the Yellowstone and its waterfalls, Yellowstone Lake, and the Lower and Midway Geyser Basins on the Firehole River, where they witnessed the eruption of several geysers.

Despite being waylaid by an early season snowstorm during the first week of their trip, the party covered a remarkable distance in a short amount of time, probably due to the group’s small size. The trio exited the area via the Madison River at present-day West Yellowstone after less than a month in the region and returned to Diamond City.²

Though the Cook-Folsom-Peterson Expedition confirmed many of the stories about Yellowstone, major eastern publications were reluctant to pub-
lish their written accounts, dismissing descriptions by the relatively unknown explorers as unreliable.3 However, their stories gained regional interest and drew the attention of Henry Washburn, surveyor-general of the Montana Territory, and businessman Nathaniel P. Langford, former US collector of internal revenue for the Montana Territory. The pair soon began organizing a larger party to explore the region more extensively in the coming summer.

In mid-August 1870, Washburn and Langford’s party departed Helena for the Yellowstone region. Their group included thirteen civilian travelers, mostly fellow businessmen and political associates from the Montana Territory. Jay Cooke, a personal acquaintance of Langford and a major financial backer of the Northern Pacific Railroad, saw an opportunity to publicize Yellowstone as a destination for tourists who would travel to the region by rail. Cooke funded his friend’s endeavor and eagerly awaited Langford’s findings.

Given the influential status of many of the civilian members, Washburn lobbied for a military escort to accompany the explorers into potentially hostile Indian country. Led by Lt. Gustavus C. Doane, a small contingent of six troops from the US Army’s Second Cavalry in Fort Ellis, near Bozeman, was assigned to travel with the group.4

The party followed the same general route the Cook-Folsom-Peterson Expedition took the year before. At Tower Fall, the group turned away from the Yellowstone River and headed south, ascending what is today Mount Washburn near Dunraven Pass, and continued to the Grand Canyon of the Yellowstone River. It was here that Walter Trumbull, a civilian member of the party, and Charles Moore, a US Army private in the military escort, would sketch the first crude representations of the Upper and Lower Falls of the Yellowstone.

Now reunited with the Yellowstone River, the expedition followed the waterway south to Yellowstone Lake. At the river’s outlet at the lake’s north end, they followed the eastern shoreline in a clockwise circumnavigation, climbing some of the high peaks of the Absaroka Range to the east and near the upper Yellowstone River to the south. At West Thumb, the party turned west, crossed the Continental Divide near present-day Craig Pass, and struck the Firehole River, following it north to the Upper Geyser Basin.5 Langford would later detail their witness to what is generally known to be the first named geyser in Yellowstone:

Judge, then, what must have been our astonishment, as we entered the basin at mid-afternoon . . . to see in the clear sunlight, at no great
distance, an immense volume of clear, sparkling water projected into the air to the height of one hundred and twenty-five feet. “Geyers! geyers!” exclaimed one of our company, and, spurring our jaded horses, we soon gathered around this wonderful phenomenon. It was indeed a perfect geyser . . . It spouted at regular intervals nine times during our stay, the columns of boiling water being thrown from ninety to one hundred and twenty-five feet at each discharge, which lasted from fifteen to twenty minutes. We gave it the name of “Old Faithful.”

After exploring the basin and observing and naming several geysers, the party traveled north along the Firehole to its junction with the Madison River. Like the Cook-Folsom-Peterson group the previous year, they followed the Madison west out of the region. Near Virginia City, Montana, the party disbanded, Doane taking his small military contingent back to Fort Ellis while the rest of the party returned to Helena in late September.

Local interest for a report from the highly publicized trip reached a fever pitch upon the party’s return to Helena. The editions of the Helena Daily Herald containing the expedition’s early reports sold out, prompting the newspaper to republish the articles only a few days later. Due to the reputable status of many of the influential members of the expedition—and the harrowing account of one member, Truman Everts, who became separated from the party and spent thirty-seven days alone and lost in the Yellowstone wilderness—subsequent reports were widely published in several large newspapers and periodicals, including Scribner’s Monthly: An Illustrated Magazine for the People, Denver’s Rocky Mountain News, and the New York Times.

The broader American public was becoming increasingly curious about the faraway land known as Yellowstone.

In November 1870, Langford began giving lectures on his experience from the previous summer. After speaking to eager local audiences in Helena and Virginia City, he took his lecture tour to the East Coast, delivering speeches in New York, Philadelphia, and Washington, DC. Jay Cooke, whose keen business mind knew tourists would become interested in visiting Yellowstone via the Northern Pacific, funded Langford’s lecture series, which grew in popularity so quickly that he often spoke to standing-room-only crowds.

On January 19, 1871, Langford was scheduled to speak at Lincoln Hall in Washington, DC. For an admission price of 50 cents, an advertisement in the Washington Star declared, attendants would hear of “a trip during the past season to a hitherto unexplored region at the headwaters of the Yellowstone, including discoveries of cataracts many hundred feet high, active volcanoes, fountains of boiling water 200 feet high, and many other features of scenery, interesting and striking in the highest degree.”

Fate proved to be on Yellowstone’s side, because a man in the audience that evening possessed the knowledge, experience, and influence that would eventually help create the world’s first national park.

THE 1871 HAYDEN SURVEY

The mid- and late 1800s were a time of great exploration in the American West, and the developing industries and increasing population of America’s Gilded
A pencil sketch of the Upper Falls of the Yellowstone by Walter Trumbull, son of US senator Lyman Trumbull of Illinois, during the 1870 Washburn-Langford-Doane Expedition.
Age increased demand for coal, lumber, gold, and other natural resources. The US government looked to the frontier lands in the western territories—much of which had remained unexplored since the Louisiana Purchase in 1803—to catalog the geology and potential resources of the region, in addition to scouting possible routes for a transcontinental railroad.

Ferdinand Vandeveer Hayden, a renowned geologist from Pennsylvania who had spent several years in the 1850s exploring regions near the Missouri River west of Fort Pierre in the Dakota, Montana, and Wyoming Territories, was appointed geologist-in-charge of the first task: a survey of the new state of Nebraska during summer 1867. Congress then expanded the surveys to include all unexplored lands in the western territories, particularly those surrounding the Rocky Mountains. Hayden received additional funds to explore the Colorado and Wyoming Territories for the next two years.

In 1869 Hayden led an exploration and survey of the Front Range of the Rocky Mountains in Colorado. The following year he explored the central and southwestern portions of the Wyoming Territory, which extended from the South Pass area, at the southeastern end of the Wind River Mountains, to the Henry’s Fork of the Snake River in present-day Idaho. Hayden spent winters at the Smithsonian Institution in Washington, DC, examining specimens and compiling his report from the previous year’s work while laying plans for the upcoming season’s exploration as well as teaching geology at the University of Pennsylvania in Philadelphia.

On January 19, 1871, Hayden attended a lecture by another explorer of the West that may have set his mind on exploring the Yellowstone in the coming summer. Nathaniel Langford had stopped in Washington, DC, to speak about his journey to the area surrounding the headwaters of the Yellowstone River. Hayden, who had also likely read Lieutenant Doane’s report from the same expedition, was undoubtedly interested in Langford’s lecture, given his own experience more than ten years earlier.

Though Hayden had never been to the upper Yellowstone, he had come very close. From 1859 to 1860, Hayden was the appointed naturalist for a US Army expedition commanded by Capt. William F. Raynolds to explore and map the area between Fort Pierre and the headwaters of the Missouri River, including the Yellowstone. Raynold’s party had been productive during summer and fall 1859 as they explored the Missouri River and its tributaries north and west of the Black Hills in the Dakota Territory and those surrounding the Wyoming Territory’s Bighorn Mountains. The expedition then journeyed south and encamped for the winter in central Wyoming, near present-day Glenrock.

The following spring, Raynolds—who called Yellowstone “the most interesting unexplored district in our widely expanded country”—planned to take his party into the region from the southeast, most likely via the upper Yellowstone River south of Yellowstone Lake, today called the Thorofare. He then intended to traverse the Yellowstone Plateau diagonally, from southeast to northwest, to Three Forks, Montana, near the headwaters of the Missouri River. It was late May by the time Raynolds and his party attempted to enter the area surrounding the headwaters of the Yellowstone, and a deep, lingering snowpack from the previous winter blocked their access near Togwotee Pass. Even their guide, mountain man Jim Bridger, who had more than twenty years of knowledge and experience in the region, could find no feasible entry. Raynolds later wrote that Bridger was adamant from the onset that the rugged Absaroka Mountains, still packed with a winter’s worth of snow, would make it virtually impossible to access the Yellowstone’s headwaters from the southeast.

Forced to abandon his plans to explore Yellowstone, Raynolds continued west into Jackson Hole, then turned south at the Snake River. After a treacherous crossing of the Snake near present-day Wilson, Wyoming, the party ascended Teton Pass and crossed into Pierre’s Hole—today’s Teton Valley, Idaho. Now in familiar territory, the party headed more or less directly north, skirting the west slope of the Teton Range and Yellowstone’s western edge to a scheduled rendezvous with the rest of Raynolds’s command in Three Forks.

The veil of mystery surrounding the upper Yellowstone would not be pulled aside for another decade, as government exploration of the western territories halted during the Civil War. Hayden, however, perhaps guided by fate if not by his own design, was destined to return.

Listening to Nathaniel Langford speak about the mystique of Yellowstone in January 1871 may have been a catalyst for Hayden’s decision to attempt a return to the region, especially after being denied entry eleven years earlier with the Raynolds expedition. As a man of science, Hayden was also likely tempted by the prospect of leading a well-funded, well-equipped survey into a region of seemingly vast scientific potential. Financier Jay Cooke, who funded Washburn
and Langford’s expedition the summer before, also likely encouraged Hayden to make Yellowstone the subject of his next geographical expedition.19

A government survey of the Yellowstone region would inevitably occur, and given the rising public interest and lobbying from the Northern Pacific, Hayden likely decided its exploration should be conducted sooner rather than later. The US Congress, primarily interested in a detailed report of natural resources and a thorough mapping of the territories, felt it was within the scope of the survey’s charge and approved Hayden’s proposal, appropriating $40,000 for the task, and he immediately began planning for the coming summer’s work.20 As fate would have it, the timing of Hayden’s decision to explore Yellowstone in summer 1871 would prove pivotal in preserving at least part of the region from being exploited by those seeking personal gain.

Hayden’s planning included a strategy to gather tangible evidence of the fascinating landscapes rumored to be within Yellowstone. While public interest had grown immensely, skepticism remained that published accounts about prior expeditions to the Yellowstone region—and even Langford’s lectures—could have been exaggerated or fabricated entirely. Much later in life, Langford wrote that he lamented the absence of photographic documentation of his 1870 excursion into Yellowstone:

*It is much to be regretted that our expedition was not accompanied by an expert photographer, but at the time of our departure from Helena, no one skilled in the art could be found with whom the hazards of the journey did not outweigh any seeming advantage or compensation which the undertaking promised.21*

Hayden, who likely remembered Raynolds’s use of a photographer during the expedition of 1859–1860,22 had begun to use photography as supplemental documentation during his own survey into the southern Wyoming Territory in 1870. The medium had become accepted as a more truthful representation of its subject matter; when sketches and drawings could be embellished, photographs couldn’t lie. Now Hayden was preparing to enter one of the most mysterious regions ever explored, and if he was going to put so many resources into exploring and verifying Yellowstone’s wonders, he was determined to bring back proof.23

**WILLIAM HENRY JACKSON**

In spring 1866, Civil War veteran and budding photographer William Henry Jackson left Vermont the day his engagement to his fiancée came to an abrupt end. Seeking to leave the past behind, he left New England to search for adventure and a new life in the American West. Jackson paid his way to Salt Lake City by working as a bullwhacker on a wagon train, and in summer 1867 had settled in Omaha, Nebraska. By the following spring, Jackson had taken over a local photography studio and two galleries with his brother, Edward.24

In summer 1868, Jackson began photographing the construction of the Union Pacific Railroad for the company’s promotional materials. The massive undertaking to connect the East and West Coasts provided Jackson with plenty of subject matter, as tens of thousands of workers in hundreds of crews toiled on the project. Jackson also took an interest in the region’s Native American culture, photographing Indians from various tribes in his studio and on nearby reservations.25
Jackson’s work led to a brief meeting with Hayden in summer 1869 as Hayden’s team surveyed parts of Nebraska en route to the Front Range of Colorado. In July the following year, Hayden, on his way to explore the central and southern regions of the Wyoming Territory, visited Jackson’s studio during a layover in Omaha. Upon viewing the work Jackson had produced along the Union Pacific route, Hayden invited the young photographer to join his survey team for the summer—albeit unpaid except for travel and outfitting expenses, given the limited government appropriation.

Always interested in an adventure and keen to a business opportunity (he would be allowed to keep the rights to his photographs), Jackson accepted and worked with Hayden for the remainder of the summer. He documented the survey’s exploration of the southern foothills of the Wind River Mountains, Flaming Gorge on the Green River in the southwestern corner of the Wyoming Territory, and the Uinta Mountains in the northeastern Utah Territory. Jackson also photographed the great Chief Washakie and a band of Shoshone hunters at their camp near South Pass in central Wyoming as the tribe traveled to hunt bison in the Wind River Valley.

Hayden was so pleased by the young photographer’s images that he offered Jackson a paid position as the official photographer for his survey team. Jackson enthusiastically agreed and left Omaha to take up residence in Washington, DC, in order to work more closely with Hayden and prepare for the following season. In his first autobiography, *The Pioneer Photographer*, Jackson noted
the circumstances that put him and his camera on the trail to the Yellowstone region in summer 1871:

The general plan had been to continue the work of 1870 by extending it into adjacent territory. Before this plan took shape, however, public attention was directed to the wonders of the Yellowstone through lectures and magazine articles. A lecture in Washington made by Mr. N. P. Langford, which Dr. Hayden attended, made him decide on the Yellowstone as the field of his operations for 1871.29

In late May and early June 1871, Hayden’s team began to muster in Ogden, Utah, and on June 9, the survey’s wagon train began the journey of more than 400 miles to Fort Ellis, Montana, just east of Bozeman.30 Well equipped from a government appropriation almost twice that of the previous year, Hayden’s survey included scientists specializing in geology, meteorology, botany, topography, mineralogy, and other practices as well as guides, hunters, cooks, and other support crew. Henry Elliott was the survey’s artist and Jackson and his assistant, George Dixon, served as the survey’s official photographers.31

A month later, Hayden’s party arrived at Fort Ellis. Even though the team had explored and surveyed the southeastern Idaho Territory during the four weeks of their journey from Ogden, the most anticipated portion of their summer’s work was yet to come. Here, artist Thomas Moran joined the survey as a last-minute guest, whose travel expenses from the East were paid by Jay Cooke. Moran had illustrated Langford’s “The Wonders of the Yellowstone” for Scribner’s Monthly, based on description and rudimentary sketches, which inspired him to see Yellowstone for himself.32

Hayden rested his team at Fort Ellis for almost a week, resupplying and coordinating with the US Army, which agreed to provide a military escort of about forty soldiers. The Army would also send their own expedition into Yellowstone under the command of Capt. John W. Barlow, chief engineer of the Division of Missouri. Barlow would share Hayden’s escort while a small team of engineers focused on mapping the region, primarily working separate from, but sometimes in tandem with, Hayden’s survey team.33

Hayden’s party departed Fort Ellis on July 15, 1871, heading southeast over the Gallatin Range to Trail Creek, which they followed to its confluence with the Yellowstone River on the northern end of present-day Paradise Valley, Montana. From here the Hayden Survey turned south and followed the Yellowstone into the “mythical wonderland” that, in less than a year, would become Yellowstone National Park.34
1871: Photography comes to Yellowstone
Previous page. An illustration in Hayden’s Sixth Annual Report (1873) shows a photographer taking pictures of Grotto Geyser in eruption. Many of the illustrations in Hayden’s annual reports are based on images by his survey photographer, William Henry Jackson.
William Henry Jackson’s photographs are widely credited with giving the American public its first look at Yellowstone’s extraordinary landscape and helping convince Congress to designate the region as the world’s first national park. But Jackson was not the only photographer in Yellowstone during the summer of 1871. At least three others are known to have been in the area at the time.

THOMAS HINE
Thom Hine, a photographer from Chicago, accompanied Capt. John W. Barlow of the US Army on his reconnaissance into the Yellowstone country. Barlow’s group would share Hayden’s military escort and sometimes worked alongside his civilian party but most often traveled separately and explored some areas Hayden did not. Hine produced more than 200 glass negatives during Barlow’s expedition, rivaling Jackson’s total.

Tragically, circumstances would dictate that Hine would not garner the same fame as Jackson for his early photographs of Yellowstone. Upon completion of the expedition in September 1871, Hine returned to Chicago with his precious cargo of negatives, as Jackson wrote many years later, “just in time to have them destroyed in the great fire.”

Indeed, the epic Chicago Fire of October 8–10, 1871, struck only days after Hine’s return, consuming the headquarters of the US Army’s Division of Missouri, which included the specimens and notes from Barlow’s expedition to Yellowstone and Hine’s entire season’s worth of negatives. Only a handful of stereo view prints survived, one being the first known photograph of Old Faithful geyser in eruption. While Hine’s legacy is nowhere near that of Jackson’s, he should be recognized for his important first photograph of one of Yellowstone’s most iconic landmarks.

JOSHUA CRISSMAN
Joshua Crissman, a photographer based in Bozeman, Montana, accompanied Hayden’s party as a guest and worked with Jackson for part of the 1871 expedition. Jackson had met Crissman two years earlier, in summer 1869, when Crissman resided in Corrine, Utah, and offered Jackson and his assistant the use of his darkroom as they photographed the construction of the Union Pacific Railroad. This act of generosity may have prompted Jackson to return the favor and invite Crissman to accompany the Hayden Survey into Yellowstone.

Crissman traveled and photographed with Hayden’s party as it journeyed from Fort Ellis into Yellowstone and visited Mammoth Hot Springs, Tower Fall, and the Grand Canyon of the Yellowstone. He continued south with the survey to West Thumb on Yellowstone Lake, where part of the survey’s military escort was recalled to Fort Ellis. Crissman returned with the escort, as did guest artist Thomas Moran and Jackson’s assistant, George Dixon, who took the negatives Jackson had produced up to that point back to Bozeman, therefore lightening his burden for the remainder of the trip.

While Crissman was certainly the first to show off photographs from the 1871 Yellowstone expedition in Bozeman (Jackson would remain in Yellowstone for several more weeks), his distribution was, at best, limited to the region. Most of Hine’s work was destroyed almost immediately upon his return to Chicago. Jackson however, had the resources of the US government at his disposal upon his return to Washington, DC, after the survey. He and his assistants were able to produce a large quantity of prints in a short amount of time, and Hayden made sure they were distributed widely and, perhaps more importantly, to the right people—notably, members of Congress who would be influential in passing the legislation for Yellowstone’s preservation. Therefore, William Henry Jackson became virtually a household name, as his photographs gave America the first real glimpse into Yellowstone.
Jackson and Crissman often worked in tandem during the time Crissman accompanied the survey. Several of Jackson's stereoview images from 1871 bear close resemblance to those of Crissman's (and vice versa), so there is a good possibility the pair may have collaborated for the sake of practicality in certain precarious locations—particularly the Grand Canyon of the Yellowstone. It is believed that the photographers would set up their respective stereoview cameras at different points and expose two plates for a single view, then share the negatives with each other. Doing so would provide both photographers with a greater body of work in the limited time they had.5

There has also been speculation that some of Jackson's 8 x 10 negatives from 1871 were taken by Crissman—namely, a selection at Mammoth Hot Springs (Nos. 214–231)—due to a somewhat confusing entry in Jackson's book of descriptions for his photographs, Miscellaneous Publications, No. 5: Descriptive Catalogue of the Photographs of the United States Geological Survey of the Territories, for the Years 1869 to 1875, Inclusive, printed by the Department of the Interior in 1875.

When the Hayden Survey returned to Yellowstone in 1872, Jackson had little time to photograph Mammoth Hot Springs to his satisfaction. Crissman,
however, had produced a number of negatives at Mammoth that summer, so Jackson purchased several to include in his official 1872 Series. Jackson’s entry for these photographs in Miscellaneous Publications, No. 5 reads,

*A series of twelve negatives made by J. [Crissman] of Bozeman, Mont. They are Fully Described in Nos. 214 to 231 of the 1871 Series.*

This entry has led some historians to believe Crissman was the photographer of the 8 × 10 negative Nos. 214–231 in Jackson’s 1871 Series. However, Steven B. Jackson (no relation to William H. Jackson), curator of art and photography at the Museum of the Rockies in Bozeman, refutes this theory:

*Research of surviving Crissman stereo views from 1871 suggests that he had only a 6 × 8 stereo camera. Jackson loaned Crissman a 6½ × 8½ (probably also a stereo camera) after Crissman lost his camera to the [Grand Canyon]. Because the 1871 series that Jackson refers to is all 8 × 10, Jackson is probably the photographer of the 1871 series and only referred to this series for descriptive information, not to identify Crissman as [the photographer] of the 1871 series. Some stereo views from 1871 are most certainly by Crissman, but probably not any 8 × 10 images.*

Jackson’s loan of his 6½ × 8½ camera to Crissman during the survey came after Crissman’s own stereoview camera was blown into the Grand Canyon of the Yellowstone by a gust of wind. Jackson had brought the outfit—which he had used during the Wyoming survey the previous year—as a contingency that obviously proved useful. Therefore, if Crissman had a second camera of his own—an 8 × 10—he would have had little need for Jackson’s loaner. This observation, combined with the fact that no other 8 × 10 photographs confirmed to have been taken by Crissman in 1871 are known to exist, reinforce the probability that all of the 8 × 10 images listed in the 1871 Series in Miscellaneous Publications, No. 5 were made by Jackson.

**Augustus M. Thrasher and Henry Bird Calfee**

Augustus M. Thrasher accompanied Rossiter Raymond, Calvin C. Clawson, and three others from Deer Lodge, Montana, into Yellowstone from the west via the Madison River in August 1871. The stated goal of the Raymond-Clawson party was simply to see the area’s rumored wonders for themselves rather than explore new territory or gather specimens for scientific study, garnering them the nickname “the first tourists in Yellowstone.” The group reportedly visited the geyser basins on the Firehole River, Yellowstone Lake, and the Grand Canyon of the Yellowstone. Thrasher was listed as the group’s photographer and supposedly took several pictures of the journey, though none are known to exist today.

Henry Bird Calfee, who ran a photographic business in Bozeman with his partner, Nelse Catlin, photographed in Yellowstone for the greater part of the 1870s and early 1880s. Calfee claimed to have first visited the region in 1871. However, even though Calfee produced hundreds of negatives in Yellowstone during the 1870s, none have been verified as having been taken in 1871.
3

THE WET COLLODION PROCESS
Previous spread, left: “Photographing in High Places.” William Henry Jackson, kneeling, mixes chemicals as his assistant, Charly Campbell, holds the dark tent while working in the Tetons in 1872.

Previous spread, right: William Henry Jackson with his photo outfit on the summit of Mount Washburn in Yellowstone, 1871.
William Henry Jackson used two cameras during the 1871 expedition into the Yellowstone region: an 8 × 10 camera, which yielded a single glass negative of that size, and a 6½ × 8½ stereoscopic view camera, which produced a pair of images side-by-side on a single plate, one slightly offset from the other. The resulting print, when placed in and viewed through an apparatus called a stereoscope, created the illusion of a three-dimensional image. Stereo images were very common in the late 1800s, but their popularity waned in the early part of the twentieth century.

Both cameras used the collodion wet-plate process, the most popular method at the time for making a photographic negative. This cumbersome and inconvenient procedure required a good degree of practice to master. Nevertheless it produced a negative superior to the two other photographic processes of the day: the daguerreotype and the collotype.

The process began in a darkroom—in Jackson’s case while in Yellowstone, a portable, light-tight tent set up in the field. A chemical called collodion was spread onto a glass plate and the plate was dipped into silver nitrate, which adhered to the collodion and made the plate sensitive to light. When the wet plate was placed in a light-tight holder, it could then be safely taken out of the darkroom and brought to the camera, which was likely already in position and ready to photograph a scene. After installing the holder on the back of the camera, a slider was removed, exposing the plate to light coming through the lens.

Once the plate was exposed for the desired amount of time—determined mostly by guesswork based on the photographer’s experience and ranged from several seconds to a few minutes—the slider was replaced and the plate holder was removed from the camera and taken back to the darkroom. There, more chemicals were applied to develop and wash the plate.

The biggest challenge for Jackson was the fact that the wet-collodion process required that the plate be exposed while still wet, which meant the entire process of preparing, exposing, and developing the plate often had to be completed in less than twenty minutes. While many locations Jackson photographed in the wilds of Yellowstone allowed for his portable darkroom to be set up near where he positioned his camera, he described overcoming other situations that proved impractical or impossible for the camera and darkroom to be in close proximity:

To get any comprehensive view of [Tower Fall], it was necessary to go to the bottom of the ravine below, a descent of about two hundred feet, through steep sides covered with thick growth of small timber and brush. Rather than take the dark box down to the bottom, I worked from the top. Backing my plate with wet blotting paper, and wrapping the holder in a wet towel and the dark cloth, I scrambled and slid down to the rocky bed of the stream, with plate holder and camera in hand. After taking the picture, I had a slow, laborious climb back again, and reached the top out of breath in a wringing perspiration. Four round trips gave me the desired number of negatives, a full half day’s work, making a stiff price in labor for the one subject.

Once developed and dry, prints could be made from the glass negatives. Only direct contact prints could be produced, given that enlargement technology wouldn’t be developed for several decades. Thus, albumen prints are often close to the same size as the negative from which they are produced, sometimes with edges cropped or trimmed as desired. The ragged borders seen in many of the scans of Jackson’s original glass negatives are caused primarily by tape that was applied to the negative to mask certain areas during printing. As the tape aged it became brittle and would flake off the margins of the plates, taking the varnish and collodion binder with it. Some of the masking tape remains intact where irregular white margins are seen in an image.
Finding the Photographs
Finding the Photographs

Part of the adventure of rephotographing William Henry Jackson’s images from the 1871 Hayden Survey was locating the exact spots where he took the original photographs. While many of these locations were obvious (some are popular overlooks today), others were more difficult to find. I had visited Yellowstone several times but was not familiar with every landmark in the park. Part of my personal challenge was to find every photo point myself, without asking others who might know their location. I had created my own scavenger hunt: Yellowstone was the playing field, and discovering its wonders on my own was the reward.

Jackson’s descriptions in *Miscellaneous Publications, No. 5* offer some details for the photographs, but many are vague and, in most cases, do not reveal precise locations. Jackson did not keep a diary or journal during the 1871 survey and apparently relied on the notes of others for his descriptions. However, other members of the expedition recorded the journey with varying detail.

The journal of survey mineralogist Albert C. Peale outlined the expedition’s day-by-day route through the region and provided an excellent baseline for locations visited by the expedition. More importantly, it provided valuable clues for the locations where a few of Jackson’s photographs were taken, such as the picture of hunters Joe Clark and José at Mirror Lake (No. 302). Only two Yellowstone photo points in Jackson’s 1871 Series could not be determined: No. 301, of F. L. Goodfellow with the survey’s odometer, and No. 304, of an elk shot by one of the survey’s hunters. Peale’s journal, however, points to dates and general locations where these photographs were most likely taken.

Thomas Moran, the famous painter who accompanied the Hayden Survey as a guest, also kept a diary, though is not nearly as detailed as Peale’s journal. However, since he was working with Jackson most of the time they were in Yellowstone together, Moran often noted sketching and/or photographing at specific locations in his brief diary entries. Between Moran’s diary and Peale’s
I quickly found that many of the photo points were grouped close together, and often one image was simply photographed in the opposite direction of another. This made sense given the cumbersome nature of the wet-collodion photographic process of the early 1870s. Because it often took some time to scout a scene, set up the camera and dark tent, and then prepare, expose, and develop a glass plate, it seems logical that Jackson would choose locations where he could make multiple images in a short amount of time.

It took a fair amount of scouting to find the exact vantage point where Jackson stood to create several of his images. I logged many miles on foot searching for several of Jackson's photo points, including those around the Upper and Lower Falls, the Grand Canyon of the Yellowstone, the Crater Hills in Hayden Valley, the east shore of Yellowstone Lake, and the remote and rugged Mirror Plateau, offering an excuse to visit nooks of the park I might not have otherwise thought to explore. I photographed many locations elbow-to-elbow with dozens of other visitors to Yellowstone. And I was rewarded with solitude while searching for and ultimately discovering other photo points in Yellowstone's backcountry, far away from the throngs of tourists and the drone of motorhome engines. I appreciated these places the most. When looking upon a scene for the first time myself, I couldn't help but think I was feeling the same sense of awe the Hayden party must have experienced when they stood in the same place almost a century and a half earlier.

Some of the photo points presented their own unique challenges. On a frosty morning in late September 2012, I crossed the Yellowstone River at the Nez Perce Ford to gain the vantage point for a single photograph—No. 265—located on the opposite side of the river from Sulphur Caldron in the Mud Volcano Area. Because boats are prohibited on the Yellowstone River inside the park, I had to cross the river on foot. The water was cold, and even though the river was at its lowest point of the season, it was still waist deep. Taking deliberate steps and using a pair of trekking poles for balance, I managed to side step through the current. After successfully crossing the river, I had to cautiously detour around a herd of bison while hiking to my destination about a mile to the north. The effort proved worthwhile, since accessing the location without fording the Yellowstone River would have required a 14-mile round-trip hike from Canyon Village to the north or another of equal distance from Yellowstone Lake to the south.

In 1871 the Hayden Survey circumnavigated Yellowstone Lake on horseback from the river's outlet at present-day Fishing Bridge counter-clockwise to Steamboat Point. However, like those who piloted the Anna, the little sailboat constructed by members of Hayden's team to take soundings of the lake's depths and map its shoreline, a friend and I chose to navigate the lake by boat to find Jackson's photo points at the end of Flat Mountain Arm and along the eastern shore. Paddling Yellowstone Lake—the largest freshwater lake above 7,000 feet in North America—in a canoe was itself an unforgettable experience. After embarking from Grant Village and rounding Breeze Point out of West Thumb and entering the main body of the lake, we could finally see just how big it really is. How daunting a task it seemed to navigate its waters, one paddle stroke at a time, in such a small craft. Nine days and thousands of strokes later, we were sitting on the beach in Sedge Bay on the northeast shore, having paddled more than 60 miles to find thirteen of Jackson's photo points around the lake—Nos. 271, 278–287, 279a, and 292.

By far the most difficult photo points to reach were those at Mirror Lake on the Mirror Plateau, where the Hayden Survey camped after leaving Yellowstone Lake and traveling several miles north and northeast along Pelican Creek en route to the Lamar River, then known as the East Fork of the Yellowstone. On August 24, 1871, Jackson photographed the lake and the survey's encampment there (Nos. 299 and 300) as well as hunters Joe Clark and José with their
Above: Dr. Reilly paddles along the Southeast Arm of Yellowstone Lake in summer 2012. In all, we spent nine days paddling more than sixty miles to find thirteen of Jackson’s photo points around the lake.

Facing page: Dr. Reilly hikes through a burn area in summer 2012 on the way to the Signal Hills on the east side of Yellowstone Lake in search of the photo points for Jackson photo Nos. 283 and 284.
Finding the Photographs 31
finding the Photographs

Pack animal stacked with elk meat after a successful hunt (No. 302). Jackson also made one of the most well-known photographs of the 1871 expedition at Mirror Lake—No. 303—the image of the survey lined up in a pack train along the shore of the lake as they prepared to depart, “showing the manner in which all parties traverse these wilds.”

Today, the Mirror Plateau remains one of the most remote and seldom-visited areas of the park. At an elevation of almost 9,000 feet, on the geographic divide that separates the Yellowstone and Lamar Rivers, Mirror Lake is more than 3½ miles from an established trail and about 9 miles from the nearest trailhead in Lamar Valley. The hike to Mirror Lake involves off-trail navigation.

Above: Jeannette Boner looks into the Upper Pelican Valley from the southern end of Yellowstone’s Mirror Plateau. Lodgepole pine trees killed by fires and beetles have fallen across each other like huge matchsticks, making travel across the plateau slow and tedious.

Left: Kelsey Dayton fords the Lamar River en route to the Mirror Plateau during an excursion to find Jackson’s 1871 photo points at Mirror Lake.
Please respect property owners and ask permission before accessing private land and obey the park’s closed areas by staying on established trails and boardwalks—for your own safety and for the protection of the valuable and delicate resources.

If you are attempting to find some of these photo points yourself, please do so with a light footstep. While a few of today’s landscapes reflect visible changes, such as the construction of roads and bridges and the growth of new trees, many are strikingly similar to how they appeared when Jackson photographed them in 1871. In some cases, individual rocks and trees remain where they stood more than 140 years earlier. It is times like these that you are looking through a window into the past, and you have a unique opportunity to see almost exactly what the members of the Hayden party looked upon. Please leave these objects as you found them, ensuring that those who follow can gaze back in time as well.

For those interested in their own scavenger hunt of Jackson’s 1871 Yellowstone photographs, GPS coordinates are listed for locations accessible to the general public. For this project, I was granted special permission from Yellowstone National Park officials to access some locations closed to the public, such as those in thermal areas and others in the Grand Canyon of the Yellowstone. Some photo points outside the park, in Paradise Valley, are now on private land. GPS coordinates are not listed for these locations.

Through grizzly bear country via map and compass—or, for the technologically savvy, a GPS device—and hopscotching over dead and downed lodgepole pine trees, making for slow and arduous travel. The reward is a corner of Yellowstone seldom seen by other park visitors. In all, we hiked more than 35 miles in four days to traverse the Mirror Plateau, on and off trail, from Lamar Valley to Artist Point at the Grand Canyon of the Yellowstone, all to rephotograph just four of Jackson’s 1871 images.
5 Captions, Excerpts, and Notes
Captions for Jackson’s 1871 photographs were transcribed from the second edition of Miscellaneous Publications, No. 5. Minor grammar, punctuation, and spelling errors in Jackson’s descriptions were corrected (i.e., “Botler” was corrected to “Bottler”), but the common spelling of certain words in the late 1800s was retained. For instance, “canyon” was written as “cañon” and the early spelling of the Gardner River was “Gardiner” (see page 285, Chapter 6, Section II, note 1). Additions that clarify the original descriptions appear in brackets; however, early measurements—such as the height of mountains and waterfalls and the depth of Yellowstone Lake—were retained and corrections appear as footnotes to preserve the historical record. Lowercased place-names in Jackson’s descriptions that later became official names were changed to uppercase (e.g., “southeast arm” was changed to “Southeast Arm”). In the first appearance of a place-name mentioned by Jackson that was later changed, the current name immediately follows within brackets (e.g., “East Fork of the Yellowstone [Lamar River]”).

Jackson sometimes wrote extended descriptions for a group of photographs, such as those of the Devil’s Slide on Cinnabar Mountain (Nos. 210–213) and the “deep, wild, romantic gorge” of Tower Creek (Nos. 234–237). These longer descriptions were broken up and distributed among the corresponding photographs in the series. Jackson’s captions appear in italics below his photographs, while my commentary appears in plain text. Captions for my contemporary comparisons were written by me and appear below my images.

Excerpts from writings by members of the 1871 Hayden Survey accompany several of Jackson’s photographs. Jackson’s own words from his first autobiography, The Pioneer Photographer, offer an excellent, first-person narrative of the ecstatic thrill that came with creating some of the first photographs of

While William Henry Jackson did not keep a journal or diary during the 1871 Hayden Survey—something he later wrote that he “never ceased regretting”—determining dates for when he made specific photographs was possible by cross-referencing other sources. Thomas Moran’s diary and Albert Peale’s journal offer insight as to when Jackson photographed at certain locations in Yellowstone.

Moran, the expedition’s guest artist, worked closely with Jackson and appears in several of Jackson’s photographs in Paradise Valley, at Mammoth Hot Springs, and at the Upper Geyser Basin. Moran, Jackson, guest photographer Joshua Crissman, and Jackson’s assistant, George Dixon, appear to have worked as a group somewhat independently from the rest of the survey for the first three weeks of the expedition. Moran often wrote concise daily entries in his journal, such as, “July 29. Photographing & sketching around the Falls & Cañon,” suggesting he was working on his own drawings as well as assisting Jackson.

Survey mineralogist Peale makes only passing reference to Jackson in his journal entries during the first half of the survey, from Fort Ellis to Yellowstone Lake; he primarily notes when Jackson left or arrived at camp and briefly mentions his photographic activities. However, after Moran, Dixon, and Crissman left the survey in early August and returned to Fort Ellis with part of the survey’s military escort, Peale appears to have taken an active role in assisting Jackson for the remainder of their time in Yellowstone. Peale’s journal entries from this point describe several instances where he accompanied Jackson during his photographic efforts, and he also appears in many of Jackson’s images.

Between Moran’s diary and Peale’s journal, it was possible to determine precise dates for several of Jackson’s 1871 photographs. However, because the survey often spent several days in some locations and neither Moran nor Peale mentions Jackson creating specific photographs during those times, an exact date for some images could not be determined. For these photographs, a date range is given for when they were likely produced.
Yellowstone. His second autobiography, *Time Exposure*, elaborates on some details glossed over in the first. But because *The Pioneer Photographer* was written and published almost fifty years after the 1871 survey, and *Time Exposure* was written several years later, some of his accounts contain minor inaccuracies. Further, because Jackson did not keep a journal in 1871 and had to rely on memory and the notes of others to write his autobiographies, he sometimes mixes up recollections from his three trips to Yellowstone with the US Geological Survey as Hayden's official photographer. Regardless, Jackson eloquently expresses his experience and first impressions of the Yellowstone country.

Peale's journal is written very casually, including observations that detail everyday life during the journey through the region. Some of Peale's entries capture his feelings for the wonders he was experiencing, and many identify himself as the subject in several of Jackson's photographs.

From his journal entries, Peale crafted letters, at Hayden's request, to his hometown newspaper, the *Philadelphia Press*, and dispatched them from the field, making them the earliest accounts of the 1871 survey to be read by the general public. They provide an immediate first glimpse of one of the most dramatic unseen landscapes of the American West.

Peale's journal has been published in *Yellowstone and the Great West: Journals, Letters, and Images from the 1871 Hayden Expedition* while his letters to the *Philadelphia Press* appear in *Seeing Yellowstone in 1871: Earliest Descriptions and Images from the Field*, both compiled and edited by Marlene Deahl Merrill. Citations for quotes from Peale's journal and letters are to their respective appearances in these publications.

Hayden wrote his article “The Wonders of the West—II: More About the Yellowstone” for the February 1872 issue of *Scribner’s Monthly* largely as a propaganda piece to garner public support for the creation of Yellowstone National Park. This follow-up to Nathaniel Langford's “The Wonders of the Yellowstone,” published in two parts by *Scribner’s* the year before, spares no verbiage in describing the region's fantastic scenery and exotic landscape. Hayden's writing in “The Wonders of the West—II” is colorful and descriptive and is surpassed in romantic expression only by Langford's piece.

What Hayden describes in his *Scribner’s* article with vivid passion, his *Preliminary Report of the United States Geological Survey of Montana and Portions of Adjacent Territories; Being a Fifth Annual Report of Progress* outlines in minute detail. Also published in early 1872, this was Hayden's official report to his superior—the US secretary of the interior—and it is clear it was written for a different audience. The report is almost five hundred pages of analytical, scientific observations and records by Hayden, Peale, and other survey members, with accompanying maps, charts, and illustrations. While this is what would be expected in a meticulous, scientific account of a season's exploration, there are nuggets in the *Fifth Annual Report* where Hayden slips into the elegant prose he used so prolifically in “The Wonders of the West—II.” In fact, several excerpts from the respective works bear close resemblance. It is possible that Hayden, while attempting to remain the objective scientist in his official report, at times simply could not help repeating himself when describing the extraordinary landscape he'd experienced the previous summer.

US Army Capt. John W. Barlow, of Chicago, who led a small contingent of engineers into Yellowstone in summer 1871 and at times traveled in tandem with Hayden and shared his military escort, filed a report to the US secretary of war, William W. Belknap. Barlow’s report was much less detailed compared to Hayden's *Fifth Annual Report*, primarily because most of the captain's Yellowstone specimens, photographs, and other items were lost when his office was destroyed in the Great Chicago Fire shortly after his return in late September 1871. However, Barlow's field notes—a journal of sorts—were saved and transcribed into his report from the expedition, often with little revision. His writing is mostly a day-to-day narrative of the engineers' route, but it also contains a few expressions of fascination and awe of the Yellowstone country.
WILLIAM HENRY JACKSON’S 1871 PHOTOGRAPHS

with Contemporary Comparisons
VALLEY OF THE YELLOWSTONE

“At different points on the road from Fort Ellis, beautiful vistas of majestic ranges of mountains, lying to the east of the Yellowstone River, were obtained; and now, as we emerged from the winding valleys of the mountain region through which we had been traveling for three days, these lofty peaks, from across the river, seemed almost directly above our heads . . . The Yellowstone here is a broad, swift stream, some 300 feet wide, and not fordable. Our course now lay up the west bank of the river, nearly due south.”—Capt. John W. Barlow, Reconnaissance of the Yellowstone River

SECTION I
No. 200. VALLEY OF THE YELLOWSTONE [Paradise Valley], looking south from the first cañon.* On the left the Yellowstone or Snowy Range [Absaroka Range] stands out in bold relief, the eye following it up to Emigrant Peak, thirty miles away. The river winding among groves of cottonwood through a broad lake-like valley, from three to five miles in width, until it fades away in the distance, forming one of the most attractive views in the catalog.

* Trappers and prospectors who frequented the Yellowstone country called this the “first cañon,” as it is the first of four canyons between this point and Yellowstone Lake. It is today called Rock Canyon.
"The mountains southeast of our camp and on the road to the lake looking toward the Yellowstone country [are] glorious, and I do not expect to see any finer general view of the Rocky Mountains."—Thomas Moran's diary, July 1871

US Highway 89 now runs along the west side of the Yellowstone River, where it passes through Rock Canyon and exits what is today Paradise Valley, Montana, just south of Livingston. The braids in the river have shifted and some of the outcroppings on the hillside appear to have eroded away, including Jackson's original photo point, which was slightly higher than where this picture was taken. The contemporary photographer replaces the figure looking out over the valley from the outcropping near the center of Jackson’s image.
Monday, July 17, 1871

No. 201. VALLEY OF THE YELLOWSTONE, looking south from the first cañon.

Survey mineralogist Peale notes in his journal that it "rained a little" on the morning of July 17, which may explain why the mountains in the distance appear obscured in Jackson's photograph.
Wednesday, May 23, 2012

“On the east side of the Yellowstone the eye takes in at a glance one of the most symmetrical and remarkable ranges of mountains I have ever seen in the West. Several in my party who had visited Europe regarded this range as in no way inferior in beauty to any in that far-famed country.”—Ferdinand V. Hayden, *Fifth Annual Report*

Jackson’s second view of Paradise Valley is about a mile south of No. 200 on what is today private land, and US Highway 89 is again seen bisecting the scene. Though Paradise Valley supports a number of farms and ranches just north of Yellowstone National Park, the area remains remarkably unchanged today.
No. 202. EXIT OF THE YELLOWSTONE,* through the first cañon, showing a portion of the mountain range included in the last view.

* The “first cañon” [Rock Canyon] was also known as the “exit of the Yellowstone” for its location where the river leaves the mountains and enters the plains of central Montana.
“The Yellowstone River cuts directly through this ridge, and thus forms its first cañon, and the point of exit from the cañon is called the exit of the Yellowstone from the mountains.”—Ferdinand V. Hayden, *Fifth Annual Report*

An alfalfa field and irrigation sprinklers now appear in the area of this photograph of Rock Canyon from the north. Jackson’s original photo point is now on private land on the south edge of Livingston, Montana, about three miles north of No. 200. Cottonwood trees have sprung up in the foreground and dense forests of pine trees have overtaken the hillsides that were nearly bare in Jackson’s time.
Tuesday, July 18, 1871

No. 203. **BOTTLER’S RANCH**, on the Yellowstone, opposite Emigrant Peak. A log cabin of the pioneer stamp, owned by three brothers who have earned a wide reputation for whole-souled, hearty hospitality. Here all wagons and extra baggage were left, for beyond this point was nothing but a narrow trail, accessible only to the sure-footed mule or hardy Cayuse.

Pictured from left to right in this photograph are an unidentified man, Frederick and Philip Bottler, and Peale. The final individual at right closely resembles other photographs of the survey’s general assistant, Clifford De V. Negley.

Since Jackson’s description specifically notes that the ranch was “owned by three brothers,” the unidentified man at left may be Henry Henselbecker, the half-brother of the Bottler brothers.

“Opposite Emigrant Peak, a thriving ranch has been established by two brothers, named Bottler, who have several fields already under cultivation. Their crops of wheat, potatoes, and many other vegetables yield an abundant harvest, while in the raising of stock and making of butter and cheese they have met with remarkable success.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*
None of the original structures remain at the site of the Bottler brothers’ ranch; however, residents of an adjacent farm claim a pile of old lumber at the site is remnants of some of the outbuildings. The site of the old Bottler Ranch, about 4½ miles south of Emigrant, Montana, is now on private land, but this view can be seen by looking west to the hillside from US Highway 89.
No. 204. EMIGRANT PEAK. A great volcanic cone on the east bank of the Yellowstone opposite Bottler’s, and the southern terminus of the Yellowstone Snowy Range. Elevation, 10,629 feet, and 5,500 feet above the river at its base.* On its northern flank is the well-known Emigrant Gulch mining district, and the site of what was once Yellowstone City.

Prior expeditions had indicated the Yellowstone country was too rugged for wagon travel, so the Hayden Survey left their wagons, visible in this photograph, at the base camp they established at Bottler Ranch. Some members of the survey stayed at this “permanent camp” while the rest continued into Yellowstone in a train of horses and pack mules, with the only wheeled apparatus being the survey’s odometer (No. 301) to measure the distance traveled. Those who stayed at Bottler’s acted as couriers, resupplying the others working in Yellowstone.

“Opposite our camp were the Yellowstone mountains, with peaks rising 12,000 feet above the sea-level and 6,000 feet above the valley. For beauty and symmetry of outline I have never seen this range equaled in the Far West.”—Ferdinand V. Hayden, “Wonders of the West—II”

* Emigrant Peak is measured today at 10,915 feet and rises almost 5,000 feet above the Yellowstone River.
Members of Hayden’s survey team pitched their tents a few hundred yards south of the Bottlers’ cabin on July 17, under the skyline of Emigrant Peak. Jackson probably made his photograph of the camp the following afternoon. Ranch houses today dot the landscape along the Yellowstone River in the distance, which is still lined by cottonwood trees. Peale and artist Henry Elliott climbed the peak and returned to camp in one day on August 28, on the survey’s return journey out of the region.
Sunday, August 27, 1871

No. 205. VALLEY OF THE YELLOWSTONE. Six miles above* Bottler’s, looking north.
Great masses of volcanic breccia in the foreground, a basaltic table in the middle distance, and in the extreme distance the sharp crest of Emigrant Peak.

* Jackson’s use of the words above and below are most often synonymous, respectively, with upstream and downstream and refer to locations along the Yellowstone or Firehole Rivers.
“Some very picturesque rocks were passed, many of them standing out like turrets from the ruins of old castles.” —Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

A bridge for US Highway 89 spans the Yellowstone River near where Jackson photographed Paradise Valley and Emigrant Peak. Hepburn’s Mesa, named for local rancher John Hepburn, who lived in Paradise Valley in the mid-1900s, rises abruptly on the far side of the river. Some of the rocky outcroppings at far left in Jackson’s photograph have crumbled away, likely due to a combination of natural erosion and the construction of the nearby Yellowstone Trail railroad bed, located only a few yards away in the opposite direction. The bottom of the contemporary photograph shows where some of these huge boulders appear to have settled.
Thursday, July 20, 1871

No. 206. THE LOWER OR SECOND CAÑON OF THE YELLOWSTONE [Yankee Jim Canyon],* from the lower end looking up. The granite walls rise in abrupt angular lines one thousand feet or more above the turbulent stream, forcing its way through the narrow channel at their feet.

* This canyon, about 35 miles south of Livingston and 14 miles north of Gardiner, Montana, was called the “second cañon” of the Yellowstone, being the second of four canyons along the river between the exit of the Yellowstone (Rock Canyon—Nos. 200 and 202) and Yellowstone Lake. Hayden named this canyon Butter Keg Canyon in 1871 for a mishap in this area when a cask of butter almost tumbled into the river. However, the name didn’t stick, and it was later named Yankee Jim Canyon after James George, who operated a toll road through the canyon, the only access to the northern part of the park for several years.7
“The river, of a beautiful green color, rushes along below, through the narrow gorge, the resisting rocks throwing the water into numerous ripples, each capped with white foam.”—Albert Peale, Philadelphia Press, Aug. 11, 1871

Thick trees now block the view Jackson captured looking up the Yellowstone River from the north end of Yankee Jim Canyon (right). This photo point was identified after discovering the distinctive cluster of rocks at bottom right. Moving about 200 yards to the south offers a similar scene (above). US Highway 89 winds through the canyon along the east side of the Yellowstone River.
No. 207. THE SECOND CAÑON from its upper end looking down.
"Following up the Yellowstone valley, tall mountain ranges continue on either side, the river falls off somewhat in width and depth, and, flowing near the eastern range, leaves a broad spread of rolling country."—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

The Old Yellowstone Trail—the earliest road into Yellowstone National Park—passes in front of where guest artist Moran sat looking toward Yankee Jim Canyon, about ten miles north of Gardiner, Montana. Hay fields line the west side of the Yellowstone River in the distance and Dome Mountain rises more than 3,500 feet above the valley at right.
No. 208. THE SECOND CAÑON at the water’s edge. On one side rise abrupt perpendicular walls of gneiss, and on the opposite side, less abrupt, are scattered a few cottonwoods among the mass of rocky debris affording pleasant shade for the fisherman, for the river in this neighborhood is most abundantly stocked with the largest and finest of trout.

Moran is pictured sitting on the west bank of the Yellowstone River as it flows through what is today called Yankee Jim Canyon. While the famous painter from the East was a novice outdoorsman—he had never ridden a horse or slept in the open air before his journey into Yellowstone—Moran was known as an excellent fisherman who did his part to supply the expedition with plenty of trout.
"Not the least attractive feature, and one that to us amounted to a wonder, was the abundance of fine trout which the river afforded. There seemed to be no limit to them, and hundreds of pounds' weight of the speckled beauties were caught by the different members of our party." — Ferdinand V. Hayden, "Wonders of the West—II"^{21}

The thick cottonwoods that line the west bank of the Yellowstone River, on the left side of Jackson's photograph, have been obliterated by several years of higher water through Yankee Jim Canyon. The large boulder in the center of the river, known as the Big Rock by local whitewater rafting guides, remains a steadfast landmark. While boats of any type are prohibited on most rivers and creeks within the boundaries of Yellowstone National Park—the channel between Lewis and Shoshone Lakes is the only exception—this section of the Yellowstone that flows north out of the park and through Paradise Valley is popular among rafters and anglers.
No. 209. APPROACH TO CINNABAR MOUNTAIN from below, looking up the river from the standpoint of No. 207.

Moran is pictured with his sketchbook just north of Cinnabar Mountain, center, and Jackson’s portable dark tent is visible at the far left. Since the wet collodion process required the photographer to develop his glass plates immediately after making an exposure, Jackson had to unpack and set up his portable darkroom each time he wanted to take pictures.
We passed two very pretty, small lakes, near which, among the fragments of broken igneous rocks, I found a number of beautiful agates, chalcedonies, and pieces of obsidian, or natural volcanic glass.”—Albert Peale, Philadelphia Press, Aug. 11, 1871

Jackson moved his camera about 300 yards south from the photo point of No. 207 and turned it 180 degrees to capture the view looking toward Cinnabar Mountain and Mammoth Hot Springs, about 10 miles beyond. The contemporary photographer takes in the view from where Moran sat above what is today Cutler Lake, and his 1978 Volkswagen Westfalia replaces Jackson’s dark tent. This is one of the only contemporary photographs that shows less water, not more, compared to Jackson’s original.
Nos. 210–213 are different views of Cinnabar Mountain and the Devil’s Slide, ten miles above the second canyon. [On the right] side is a band of bright vermilion-tinted clay, which has been mistaken for cinnabar, and hence the name Cinnabar Mountain.

Moran is shown seated beneath the Devil’s Slide, with an unidentified survey member standing behind.
“We soon came to Cinnabar Mountain—so called from the red color of some of the exposed rock on its side. Here we encountered the first of the wonders of the Yellowstone.” — Albert Peale, Philadelphia Press, Aug. 11, 1871

A power line now spans the scene in front of the geographical oddity of Devil’s Slide on the east flank of Cinnabar Mountain, about six miles northwest of Gardiner, Montana. Markings on the large rock in front of Moran in Jackson’s photograph match those on the opposite side of the boulder in the foreground of the contemporary image, suggesting it was trundled aside with several others during installation of the power line. However, the stone visible at the far left of both images apparently remained untouched.
No. 211, CINNABAR MOUNTAIN [is composed] of alternate beds of limestone, sandstone, quartzites, and volcanic dikes, elevated to a very nearly vertical position, with the softer strata so worn away as to leave the harder and more enduring ridges standing.

An unidentified figure can be seen on the talus slope beneath the right (north) side of the Devil's Slide formation.
“[The] Devil’s Slide, or Cinnabar Mountain, as it is usually called . . . is one of the singular freaks of nature which occur very seldom in the West.”—Ferdinand V. Hayden, “Wonders of the West—II”

Jackson has four 8 × 10 photographs of Devil’s Slide in his official 1871 Series, suggesting it was of particular interest to the survey. The photo point for this image was found to be just beyond where the survey member is seated in No. 212, as the boulder just behind him is the same one visible at left in Jackson’s No. 211, but it appears to have been broken into fragments in the contemporary image.

Nos. 211 and 212 are confirmation that Jackson used at least two different lenses, perhaps simply swapping those on his stereoview and 8 × 10 cameras. The photo point for No. 211 is several yards closer to the Devil’s Slide formation than No. 212, but the photograph for the former shows a wider field of view than that of No. 212, indicating Jackson switched lenses between these pictures.
No. 212. CINNABAR MOUNTAIN AND THE DEVIL’S SLIDE. Our views include only the central portion of the long series of ridges.

The man sitting on the rock in front of Devil’s Slide remains unidentified.
Unlike No. 211, most of the boulders in the foreground of this photograph have remained virtually unchanged in the 141 years since Jackson made his image and a tree has sprouted in the foreground at left. The photo point for No. 211 is just beyond where the contemporary photographer takes the place of the person seated in the center of Jackson’s photo.
No. 213. THE DEVIL’S SLIDE. Prominent among [the central portion] are two parallel walls, fifty feet apart and two hundred in height, running up the mountainside 1,500 feet.

Two figures—Moran on the right and an unidentified man on the left—stand near the base of the southern wall of Devil’s Slide, likely to offer the viewer a sense of scale.
Standing in the gorge, and glancing upward along the solid perpendicular wall, a feeling of awe comes over one, and our minds naturally revert to the time when these masses must have been forced into their present place.”—Albert Peale, *Philadelphia Press*, Aug. 11, 1871

Just as in photo No. 211, many of the rocks in the foreground of this view have inexplicably vanished. While Cinnabar Mountain is part of the Gallatin National Forest, the land between the Old Yellowstone Trail road and the base of Devil’s Slide is privately owned. Please ask permission from the landowners before hiking into the area.
Ten miles above Cinnabar Mountain, and thirty-five from Bottler's, we come to Gardiner's River, a mountain torrent cutting its way through Cretaceous and Tertiary strata, in picturesque cañons, and emptying itself into the Yellowstone at the foot of the third cañon [Black Canyon]. Four miles above the junction of the streams, and at an elevation of 500 or 600 feet above Gardiner's River, we come suddenly in sight of the springs [Mammoth Hot Springs]. Before us lies a high white hill of calcareous sediment, deposited from numerous hot springs. The whole mass looks like some grand cascade that had been suddenly arrested in its descent and frozen. On examination it was found that the deposit extended for some two miles further up the gorge, and below reached to the edge of the river, occupying altogether about four square miles. The principal mass, occupying an area of about one square mile, is arranged in a series of terraces, one above the other, each being composed of beautiful basins, semicircular in shape and having regular edges with exquisitely scalloped margins. Small streams flow down from them in channels lined with oxide of iron,* with the most delicate tints of red. Others show exquisite shades of yellow, from a deep, bright sulfur to a delicate cream color. Still others are stained with shades of green. All these colors are as brilliant as the brightest aniline dyes.†

The water, after rising from the spring-basins, flows down the declivity step by step, from one reservoir to another, at each one of them losing a portion of its heat until it becomes as cool as spring-water. Holding in solution a great amount of lime, with some soda, alumina, and magnesia, they are slowly deposited as the water flows down the mountain, forming the succession of basins. The temperature varies from 160 Fahr. to 194, the boiling-point at this elevation.

These natural basins vary somewhat in size, averaging five by eight feet, and from one to four feet in depth. Their margins are beautifully scalloped and adorned with a natural beadwork of exquisite beauty. —William H. Jackson, Miscellaneous Publications, No. 5

Jackson made more photographs at Mammoth Hot Springs—17 in the official 1871 Series—than at any other area in Yellowstone during the survey. He would later write that the "subject matter close at hand was so rich and abundant that it was necessary to move my dark box only three or four times." Jackson also wrote that the warm water emanating from the springs hastened development of his glass negatives.7

* The colors seen in the terraces at Mammoth are caused not by deposits of iron oxide (rust), but by microorganisms called thermophiles that thrive in the hot water of the springs.

† Aniline is a chemical compound used to mix dyes and paint.
No. 214. GROUP OF LOWER BASINS.

In addition to the figure standing at the base of Minerva Terrace at right, two others can be faintly made out standing on the ledge above the formation at left.
“About a mile above the channel of Gardiner’s River, we suddenly came in full view of one of the finest displays of nature’s architectural skill the world can produce. The snowy whiteness of the deposit at once suggested the name of White Mountain Hot Spring. It had the appearance of a frozen cascade.”—Ferdinand V. Hayden, *Fifth Annual Report*

Several of Jackson’s images at Mammoth Hot Springs, including this of Minerva Terrace, were rephotographed at a wider field of view in order to show almost a century and a half of growth and expansion. The hot springs at Mammoth can deposit anywhere from a trace to 1 meter of travertine, or calcium carbonate, per year. Combined, the hot springs at Mammoth are estimated to flow at a rate of about 500 gallons per minute, leaving behind more than 2 tons of travertine every day.
No. 215. GROUP OF LOWER BASINS.

The figure examining the basins at the bottom of Minerva Terrace, and what appears to be three others standing at the top of the formation, remain unidentified.
Friday, June 14, 2013

“I now had before me novel and marvelously fine subjects for my camera. The delicate terrace in the deposits about the hot spring pools and terraces afforded an endless variety of detail for picture making.”—William H. Jackson, *The Pioneer Photographer*

Moving downhill from the photo point for No. 214, this second contemporary image of Minerva Terrace was also rephotographed with a wider field of view than the original in order to show the vast growth of the formation as it extends to the east and north. Though activity at Mammoth is constantly shifting—some flows have been known to change course overnight—the amount of water emanating from the springs remains relatively consistent.

The complex boardwalk system, partially visible at right, that allows visitors to safely view the hot springs and preserve the terraces at Mammoth, requires constant maintenance. Water flows have been known to overtake a section of the boardwalk in a matter of days, requiring them to be rerouted or removed.
No. 216. GROUP OF UPPER BASINS.

This photograph of Moran on Jupiter Terrace at Mammoth Hot Springs is one of the most well-known images from the 1871 Hayden Survey. It may have been one of Jackson’s personal favorites as well, as it is the only photograph he signed with his initials in the four-volume set he donated to Yellowstone National Park.
"[W]hen the water flows slowly, myriads of the little basins are formed, one below the other, with a kind of irregular system, as it might be called, which constitutes the difference between the works of nature and the works of art . . . Even the photograph, which is so remarkable for its fidelity to nature, falls far short. It fails to give the exquisitely delicate contrasts of coloring which are so pleasing to the eye."—Ferdinand V. Hayden, *Fifth Annual Report*

Just like Minerva Terrace to the north, Jupiter Terrace has grown immensely in both height and length since the Hayden Survey first visited the area. The original photo point for Jackson’s image is likely under several feet of mineral deposits. The structures of old Fort Yellowstone and the present-day Mammoth visitor complex, themselves built on ancient beds of travertine, are visible in the distance, at right.
Bathing in the pools at Mammoth today is, of course, prohibited, but it was a popular activity in the early days of the park. Hayden noted that a small group of entrepreneurs had settled at the hot springs in summer 1871 and began developing the area as a healing destination:

“Around these springs are gathered, at this time, a number of invalids, with cutaneous diseases, and they were most emphatic in their favorable expressions in regard to the sanitary effects. The most remarkable effect seems to be on persons afflicted with syphilitic diseases of long standing.”
Thursday, July 5, 2012

“The steep sides of the hill were ornamented with a series of semicircular basins, with margins varying in height from a few inches to 6 to 8 feet, and so beautifully scalloped and adorned with a kind of bead-work that the beholder stands amazed at this marvel of nature's handiwork.”—Ferdinand V. Hayden, *Fifth Annual Report*"}Turning 180 degrees and moving slightly north from the photo point for No. 216 shows the general view for another of Jackson's more well-known photographs of Moran on Jupiter Terrace, near the outer edge of the Main Terrace. Like photo No. 216 and many others taken at Mammoth, Jackson's original photo point has been buried by more than 140 years of mineral deposition from hot springs activity that has expanded the terrace to the east (left). The summit of Bunsen Peak is on the horizon, to the south beyond the springs.

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**SECTION II: THE GREAT HOT SPRINGS ON GARDINER'S RIVER**

79
No. 218. LARGE SPRING UPON SUMMIT, near the outer margin of the main terrace, supplying the . . . bathing-pools [in Nos. 216 and 217] with their water. Its dimensions are twenty-five by forty feet.
Friday, August 17, 2012

“Here we find the largest, finest, and most attractive spring of the group at the present time. The largest spring is very near the outer margin of the terrace and is 25 by 40 feet in diameter; the water so perfectly transparent that one can look down into the beautiful ultramarine depth to the bottom of the basin.” —Ferdinand V. Hayden, *Fifth Annual Report*[^1]

The spot where Jackson photographed the Mammoth Hot Springs’ Main Terrace and Bunsen Peak could not be accessed due to activity from nearby New Blue Spring. The original photo point is about 20–30 yards east (left) of where this image was made. The photo points for Nos. 219–221 are on the small hillside, at center right.

[^1]: "Fifth Annual Report"
No. 219. GROUP OF SPRINGS upon the same level with the above great boiling spring, of less activity, but greater beauty in form and tint.

Close examination of this photograph shows three unidentified survey members on the small ridge at the northern edge of the Main Terrace, at center left.
Friday, August 17, 2012

"About 300 feet above our camp there is one large circular basin about a quarter of a mile in diameter filled with pools of water which boils up in various places over the surface. It is beautifully clear, seeming to be of a greenish-blue color."—Albert Peale's journal, July 21, 1871

More than 140 years of spring activity has raised the ground level by several feet to that of the ridge seen in the center of Jackson's photograph, on the northern edge of the Main Terrace, in this view looking north toward the town of Gardiner. Activity at New Blue Spring, near the edge of the terrace at the center of this photograph from summer 2012, covers the photo point for Jackson's No. 218.
No. 220. GROUP OF SPRINGS upon the same level with the above great boiling spring, of less activity, but greater beauty in form and tint.
Friday, August 17, 2012

“This wonder alone, our whole company agreed, surpassed all the descriptions which had been given by former travelers . . . Indeed, no future tourist in traveling over the Far West will think of neglecting this most wonderful of the physical phenomena of that most interesting region.”—Ferdinand V. Hayden, “Wonders of the West—II”

While hot springs in this section of the Main Terrace appear to have been more active in Jackson’s 1871 photograph, the area has become dormant today and activity has shifted elsewhere. Sheep Mountain, just across the Wyoming/Montana border to the north, is the tall peak on the horizon at right.
No. 221.* GROUP OF SPRINGS upon the same level with the ... great boiling spring [No. 220], of less activity, but greater beauty in form and tint.

* The numbers in this scan of Jackson’s original glass negative—in white at lower left and backward in black at upper left—are incorrect. An albumen print in Jackson’s four-volume set at the Yellowstone Heritage and Research Center shows the correct number, 221.
“At the top of the hill there is a broad flat terrace covered more or less with these basins, one hundred and fifty to two hundred yards in diameter, and many of them going to decay.”—Ferdinand V. Hayden, *Fifth Annual Report*

Today, spring activity on the Main Terrace has shifted away from the area Jackson photographed in 1871. Park geologists say the flow of water from the entirety of the Mammoth Hot Springs remains consistent, even though flows from individual springs are constantly shifting.
July 22–23, 1871

No. 222.* **GROUP OF SPRINGS** upon the same level with the . . . great boiling spring [No. 220], of less activity, but greater beauty in form and tint.

Moran is seen peering into what was known as Cupid’s Cave, at center right of Jackson’s photograph of Cupid Spring, on the western edge of the Main Terrace.†

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* Like the scan of Jackson’s glass negative for No. 221, the number on this photograph at lower left is incorrect. The albumen print at the Yellowstone Heritage and Research Center is correctly labeled No. 222.†
“In many places small upheavals have occurred, the rock has been rent open, allowing an escape of steam and gas jets, whose formations in the hot regions beneath can be heard through these openings.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*²⁰

Cupid’s Cave has long since been filled in by spring activity from Cupid Spring, which also formed the large mound at top center of this present-day photograph taken from the Cupid Spring viewpoint, at the end of the boardwalk visible in Nos. 223 and 224. The stairway leading to one of the Main Terrace overlooks is in the upper left corner.
No. 223. GROUP OF SPRINGS upon the same level with the . . . great boiling spring [No. 220], of less activity, but greater beauty in form and tint.

Moran climbs in the gully below Cupid Spring (and is shown looking into Cupid’s Cave in the previous photograph, No. 222), a potentially risky activity, as noxious gas emitted from the spring can pool in the bottom of this somewhat confined space and accumulate to levels that could become toxic for humans to breathe.
“[W]e had our first close view of the enchanted land when our party came upon the Mammoth Hot Springs . . . I found myself excited by the knowledge that next day I was to photograph them for the first time.”—William H. Jackson, Time Exposure

Jackson made this photograph of Cupid Spring looking north from just above Anthony’s Entrance, the name given to the area where the spring flows into the Main Terrace. The tree pictured at the bottom right is likely the same one in Jackson’s original and the hillside at right is the “fissured ridge” pictured in No. 224 that separates this area from the Main Terrace.
No. 224. AN OBLONG FISSURED RIDGE, of about 150 yards in length, six to ten feet high, and from ten to fifteen broad at the base. The fissure runs from one end to the other, and is from six to twelve inches wide, from which steam issues in considerable quantities. The inner portion of the shell is lined with a hard, white enamel like porcelain, covered with beautiful crystals of sulfur that have been gathered from the surging and seething cauldron of sulphurated steam rising from it.
“At sunset the view from the top of the springs was very pretty, the white sediment in the foreground, the hills near us of a golden green color, while the Mountains, in the far distance, of a dark blue color with red exposed spots in places, while the clouds stood in masses on their sides.”—Albert Peale’s journal, July 21, 187122

Jackson moved his camera above Cupid Spring to photograph the scene looking south toward Bunsen Peak (right). Decades of travertine deposits from the spring built up the large mound at center, while the area where Moran is pictured seated on the prominent formation, at left in Jackson’s photograph—today officially known as Fissure Ridge—has partially collapsed. Anthony’s Entrance is the gap at center between the two ridges of travertine. Jackson’s photo point for No. 223 is on the ledge to the right of Anthony’s Entrance in this photograph. The boardwalk at right is the same one pictured in the contemporary photo of No. 223 and is also the photo point for No. 222.
Sunday, July 23, 1871

No. 225. A GENERAL VIEW of the northern face of the main central portion.

Moran, right, appears on the terraces with who is probably Peale.²¹
Just in the rear of [camp] were a series of reservoirs or bathing-pools, rising one above the other, semi-circular in form, with most elegantly scalloped margins composed of calcareous matter, the sediment precipitated from the water of the spring . . . The deposit is as white as snow, except when tinged here and there with iron or sulfur. Small streams flow down the sides of the snowy mountain, in channels lined with oxide of iron colored with the most delicate tints of red. Others present the most exquisite shades of yellow, from a deep bright sulfur to a dainty cream-color. In the springs and in the little channels is a material like the finest Cashmere wool, with its slender fibers floating in the water, vibrating with the movement of the current, and tinged with various shades of red and yellow, as bright as those of our aniline dyes.”—Ferdinand V. Hayden, “Wonders of the West—II”

A parking lot and boardwalk system for visitors is seen today near Liberty Cap. Spring activity in Opal Terrace covers Jackson’s original photo point for this image, about 20 yards in front of where this photo was taken. The spring began flowing in 1926, leaving behind a foot of mineral deposits annually for several years. An earthen dam was built to protect a historic house near the spring from being overtaken by mineral deposition.
No. 226. CAP OF LIBERTY, distant view. At the base of the principal terrace is a large area covered with shallow pools, where some of the ornamentations are perfect, while others are fast going to decay, leaving the decomposed sediment as white as snow.

Moran is pictured standing on Hymen Terrace, just west of Liberty Cap.
“Upon [a] sub-terrace is a remarkable cone about 50 feet in height and 20 feet in diameter at the base . . . It is undoubtedly the remains of an extinct geyser. The water was forced up with considerable power, and probably without intermission, building up its own crater until the pressure beneath was exhausted, and then it gradually closed itself over at the summit and perished.”—Ferdinand V. Hayden, *Fifth Annual Report* 26

The changes and growth of the terraced hot springs at Mammoth are again evident in this image, facing east toward Capitol Hill, seen just above the boardwalk, and with Mount Everts on the horizon. Flows from nearby Palette Spring have built up the Hymen Terrace, in the foreground, and have overtaken the dead trees at the far right side of Jackson’s photograph, where the Palette Spring viewpoint is situated today.
No. 227. **CAP OF LIBERTY, near view.** On this sub-terrace is a remarkable cone about fifty feet* in height, and twenty feet broad at the base, its form suggesting the name of the Liberty Cap. It is undoubtedly the remains of an extinct geyser.†

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* Moran stands at the base of Liberty Cap—today measured at 37 feet—to offer the viewer a sense of scale for the height of the formation.

† Jackson’s statement that Liberty Cap is “the remains of an extinct geyser,” is technically not correct, but he lived during a time when even geologists were not quite certain what a geyser was. True geysers require higher water temperatures than are present at Mammoth Hot Springs, as well as a periodic discharge of water, as opposed to a constant flow like that at Mammoth. The geology of the Mammoth area does not have the kind of plumbing system that produces geyser activity.†
“From its peculiar form we almost involuntarily named it the ‘Liberty Cap.’ It is entirely composed of carbonate of lime, in flexible cap-like layers, with a diameter at the base of fifteen feet, and a height of about forty feet.—Ferdinand V. Hayden, “Wonders of the West—II”

Liberty Cap, a tower of travertine created by hot spring activity in one location over thousands of years, is one of Mammoth’s signature attractions. Hayden named the feature after its resemblance to the peaked hats worn during the French Revolution, representing liberty and freedom.

The cone remains relatively intact, but a close comparison of these two photographs indicates chunks of various sizes have fallen off during the last century and a half, and some remain scattered at the base of the formation today.
Jackson’s stated location for this photo—near Liberty Cap—is incorrect. This is a third view of Minerva Terrace (Nos. 214 and 215), taken from a location about 200 yards south and one “step,” or terrace group, uphill from Liberty Cap. The view looks south, and the “extinct portion of the Main Terrace” that Jackson refers to—seen as the large, dark humps on the skyline—is Mound Terrace. Steam from active spring activity on Minerva Terrace subtly rises on both sides of the figure, probably Moran, seen climbing along the terrace rim just below the crest of the hill at center right.
We were greeted with one of the grandest sights imaginable. Before us rose . . . a mass of white sediment arranged in separate terraces looking like a vast frozen cascade. Each one of the terraces has a number of hot springs . . . some of them white, others red, others of a delicate pink tint—rising one above the other were innumerable pools of water, some hot others warm and others still cold.”—Albert Peale’s journal, July 21, 1871

Like the previous images of Minerva Terrace (Nos. 214 and 215), this scene was photographed with a wider field of view to show the extensive vertical and lateral growth of Minerva Terrace to the east and north, partially obscuring Mound Terrace beyond.
No. 229. LOOKING DOWN upon Gardiner’s River from the summit of the main terrace, the beautiful basins forming the foreground, and rising abruptly from the river to a height of from 1,500 to 2,000 feet, is a vertical bluff [Mount Everts] of beautifully stratified Cretaceous and Tertiary beds, capped by a basaltic plateau. *

* This top layer of Mount Everts is composed of welded volcanic ash, rather than basalt, that is about 2.1 million years old.31

The survey’s camp can be seen at the center of this photograph, just to the right of where Moran stands at the edge of the terraces, with the Gardner River just beyond, hidden at the base of Mount Everts. Jackson’s shadow, and that of his camera and tripod, are cast by the afternoon sun at lower right.
“The wonderful transparency of the water surpasses anything of the kind I have ever seen in any other portion of the world. The sky, with the smallest cloud that flits across it, is reflected in its clear depth, and the ultramarine colors, more vivid than the sea, are greatly heightened by the constant, gentle vibrations. One can look down into the clear depths and see, with perfect distinctness, the minutest ornament on the inner sides of the basins; and the exquisite beauty of the coloring and the variety of forms baffle any attempt to portray them, either with pen or pencil.”—Ferdinand V. Hayden, *Fifth Annual Report*

The original point where Jackson took his photograph of Moran at the edge of the Main Terrace, just above today’s Canary Spring, is likely a few yards in front of where this photo was made. Several active hot springs in the area have extended the terraces to the east. Mount Everts, the “vertical bluff” in the distance opposite Mammoth Hot Springs, was named for Truman Everts, who gained fame for surviving thirty-seven days lost and alone in the Yellowstone wilderness after becoming separated from the Washburn-Langford-Doane party in September 1870.
No. 230. GENERAL VIEW OF THE MAIN SPRING and terrace from above.
“We are the first organized party that has ever visited these springs, and we have made a stay of two days in order to explore them more fully.” —Albert Peale, Philadelphia Press, Aug. 11, 1871

Trees have sprouted up to partially obscure the view of the Main Terrace, as viewed from the hillside to the south, and the Grand Loop Road now traverses the scene in the foreground. While most of Yellowstone’s landscape has remained more-or-less preserved since summer 1871, it was inevitable that some areas would be altered by the construction of roads, bridges, and other infrastructure that allow millions of visitors to experience the park every year.
July 22–23, 1871

No. 231. GENERAL VIEW OF THE MAIN SPRING from below.

The survey’s camp is seen at right of this picture at the base of what Hayden called “White Mountain Hot Springs.” Hayden’s party was the first organized, scientific group to explore and document Mammoth Hot Springs, as both the Washburn expedition of 1870 and the Cook-Folsom-Peterson party of 1869 bypassed the area as they journeyed along the Yellowstone River from Paradise Valley to Tower Fall.36

“Here, at the foot of this curious white mountain, we encamped . . . examining the wonderful spring formation of this region, and the country around it.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*37
The Grand Loop Road now crosses the general area where the Hayden Survey camped for three nights to explore Mammoth Hot Springs. The mass of the Main Spring seems to have grown from the vantage point where Jackson made his 1871 photograph, found by discovering the large rock at the center of the frame in both images.
The great hot springs on Gardiner's River.
About two hundred yards above its entrance into the Yellowstone the stream pours over an abrupt descent of 156 feet,* forming one of the most beautiful and picturesque falls to be found in any country. Tower Falls† are about 260 feet above the level of the Yellowstone at the junction, and they are surrounded with pinnacle-like columns, composed of the volcanic breccia, rising fifty feet above the falls and extending down to the foot, standing like gloomy sentinels or like the gigantic pillars at the entrance of some grand temple.”—Ferdinand V. Hayden, Fifth Annual Report

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* The waterfall is about 350 yards upstream of where Tower Creek meets the Yellowstone River, and today’s measurement of the falls is 132 feet.

† Many early references to the waterfall have the name written as “Tower Falls,” but today’s official name has it in singular form, as in “Tower Fall.”
No. 232. THE FIRST BRIDGE EVER BUILT ACROSS THE YELLOWSTONE, near the junction of East River [Lamar River] with the Yellowstone, and about fifteen miles above the Hot Springs. It was built by miners in the summer of 1870,* to accommodate the “stampede” that set in toward the Clark’s Fork “diggings.” The river is here 200 feet wide,† and flows with great force and rapidity between perpendicular walls.

“[W]e crossed the Yellowstone river on a bridge, the first and only one that has ever been thrown across its waters. It is substantial and quite pretty, spanning the river just before it is joined by the East Fork, and immediately after its emergence from the Grand Cañon. The water rushed beneath it seemingly delighted at having escaped from its imprisonment.”—Albert Peale, Philadelphia Press, Oct. 25, 1871

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* The bridge was built in early 1871, not summer 1870.
† The river is only about 120 feet wide at this site.
Collins John “Yellowstone Jack” Baronett built the first bridge over the Yellowstone River about 300 yards upstream from its confluence with the Lamar River and 2 1/2 miles downstream from Tower Fall, near the geologic terminus of what was called the “fourth cañon,” known today as the Grand Canyon of the Yellowstone. The bridge in Jackson’s photograph was burned by the Nez Perce Indians in 1877 as they fled US Army soldiers during their resistance to relocation to reservation lands. It was repaired the following year and in operation until 1905. Today, a faint trail leads to the bridge’s former location on both sides of the Yellowstone and a foundation of stacked rocks is still visible on the east side of the river.
No. 233. **TOWER FALLS**, near view from near its base. About 200 yards above its entrance into the Yellowstone, [Tower Creek] pours over an abrupt descent of 156 feet.*

A figure, probably Moran, can be seen climbing the large boulder at the base of Tower Fall.

* The waterfall is about 350 yards upstream from where Tower Creek meets the Yellowstone River, and today’s measurement of the falls is 132 feet.
"I went down the side of the canyon to where the water fell and stood in the spray. Looking up, the sight was grand." — Albert Peale’s journal, July 25, 1871

The stones and boulders in Tower Creek as it flows away from Tower Fall have been shifted by decades of spring runoffs. The columns of volcanic breccia, which give the cascade and creek their name, have crumbled over time; recent photographs indicate the large, broad column immediately to the right of the waterfall in Jackson’s photograph fell in the late 1990s, obscuring the large boulder at the base of the falls and changing the course of the creek below. Other recent photographs indicate the taller spire above and behind it, known as Sulfur Rock, crumbled in the early to mid-2000s.
No. 234. TOWER FALLS, distant view from above. The falls are about 260 feet above the level of the Yellowstone at the junction.

The spire known as Devil’s Hoof, named by the Washburn–Langford–Doane party of 1870, “from its supposed similarity to the proverbial foot of his Satanic majesty,” is visible directly above the waterfall and is identified by its distinct shape resembling that of a cloven hoof.
Friday, June 14, 2013

“The fall is exceedingly picturesque, and . . . the stream appears to drop from among a number of tower-like rocks, some of them extending upward more than a hundred feet above the crest of the falls.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

Fires have cleared the hillside of trees behind Tower Fall, and the steep slope where Jackson captured this image is still covered with dead and downed trees. The amount of water flowing over Tower Fall appears to be greater in Jackson’s original photographs. However, this is probably due to the long exposures required in the wet-plate process, which ranged from several seconds to a few minutes.
Wednesday, July 26, 1871

No. 235. TOWER CREEK ABOVE TOWER FALLS [is] surrounded by columns of volcanic breccia . . . rising from 50 to 100 feet above the falls, and extending down to its foot, like gloomy sentinels or gigantic pillars at the entrance to some grand temple. They form the most conspicuous feature in the scenery, and suggest the name given to creek and falls.

Jackson may have accidentally bumped his camera during the long exposure required to capture this photograph of Tower Creek, as close examination shows parts of the photo appear as a double image.
Some of the columns of volcanic breccia, sometimes called hoodoos, in Jackson’s photograph of Devil’s Den—the name given to the deep ravine just above Tower Fall—have toppled into Tower Creek. Others remain unchanged today—most notably, the single boulder that appears to be delicately perched atop a pillar of rock at center right. Some of the large rocks along the right bank of Tower Creek appear to be the same while others have shifted, and several trees have fallen across the creek in the distance.
Wednesday, July 26, 1871

No. 236. TOWER CREEK ABOVE TOWER FALLS

A painting of this scene by Moran names the tall pillar at center left Sulphur Rock, probably due to its yellowish color, but there is no sulfur present in the geology of this area.\(^\text{11}\)
“Tower Creek runs a tortuous course between fantastic pinnacles of conglomerate rock and makes a final leap of one hundred and thirty-two feet into a deep ravine.”—William H. Jackson, *The Pioneer Photographer*  

This photograph, taken only about 50 feet from the brink of Tower Fall, illustrates the remarkable combination of nature’s resilience and willingness to change over a relatively short period of time. It shows in detail the stark changes to the great columns of softer volcanic rock, such as Sulphur Rock, at far left (also visible in Nos. 233, 234, and 237), and how the hard granite boulders in the foreground remain virtually unchanged by the creek’s unrelenting course.
Wednesday, July 26, 1871

No. 237. TOWER CREEK ABOVE TOWER FALLS
"As we gaze from the margin down into the depths below, the little stream, as it rushes foaming over the rocks, seems like a white thread, while on the sides of the gorge the somber pinnacles rise up like Gothic spires."—Ferdinand V. Hayden, Fifth Annual Report

The broken columns above Tower Fall are again visible at the center of both images, and some of the rock formations in the foreground have also succumbed to erosion. Water can trickle into small cracks in the rock and expand as it freezes. As the freeze/thaw process is repeated over decades or centuries, it slowly weakens the formations to the point where they eventually crumble away or yield to the slightest of earthquakes. The Yellowstone River winds through the scene in the distance, just above where it flows into the area known as The Narrows (No. 238).
No. 238. COLUMN ROCKS, on the east bank of the Yellowstone, a short distance below the mouth of Tower Creek, and forming one side of a deep narrow cañon. The walls are about 600 feet in height, and have two rows of basaltic columns, each one of which is about twenty-five feet in height and five feet in diameter. Between these two layers, which are 200 feet apart, are beds that seem to have a large amount of sulfur in their composition, from their bright yellow color.*

* The colors in the sediments between the columns of basalt are caused not by the presence of sulfur but by hydrothermal activity that has altered the composition of the material.14
“In the walls of the lower end of the Grand Cânion, near the mouth of Tower Creek, we can see the several rows of columns of basalt arrayed in a vertical position, and as regular as if carried and placed in the sides of the gorge by the hand of art.” —Ferdinand V. Hayden, *Fifth Annual Report*

The great column rock features on the opposite side of the Yellowstone River, as viewed downstream from Tower Fall, appear to have seen little change over the last century and a half, at least when viewed from a distance. The Yellowstone River enters an area known as The Narrows—a short, constricted area of the river—at the base of the formation identified in one of Moran’s paintings as “Sulphur Mountain,” but that name is no longer used today. This area is also considered the lower end of what early trappers called the “fourth cañon,” today’s Grand Canyon of the Yellowstone. Jackson’s original photo point, just off the trail that leads to the Yellowstone River, is now partially blocked by trees (*right*), but moving slightly to the right offers a very similar view (*above*).
“Sixteen miles below Yellowstone Lake, at the head of the Grand Cañon, are the Great Falls of the Yellowstone, the Upper, and the Lower. The two falls are not more than a quarter of a mile apart. Above, the river flows through a grassy, meadow-like valley [Hayden Valley], with a calm, steady current, until within about half a mile of the Upper Falls, when the rapids commence hurrying the waters on between low, but narrow and precipitous, walls of massive basalt, when they literally shoot out through a narrow contracted gorge over a precipice 140 feet,* striking a slanting shelf below, ricocheting off into the basin a mass of snow-white foam. The river then spreads out over a wide, gently descending bed of rock, with walls from 200 to 400 feet in height, until it reaches the brink of the Lower Falls, when the stream is contracted to a width of 100 feet, and then plunges over the precipice, a solid, unbroken mass, and falls 397 feet* into the spray-filled chasm, enlivened with rainbows and glittering like a shower of diamonds. The walls of the cañon immediately above the Lower Falls are about 400 feet in height, or a total depth to the bottom of the falls of about 800 feet, and upon each side of the falls are perfectly [vertical] for nearly the whole height.”—William H. Jackson, Miscellaneous Publications, No. 5

* The Upper Falls are measured today at 109 feet, while the Lower Falls are 308 feet.
No. 239. THE LOWER FALLS. A near view, not far from the bottom of the cañon, and about 800 yards* below the falls.

* This location is only about 525 yards downriver from the base of the Lower Falls.
"It was a most entrancing thought—that we were in the presence of one of the grandest views in the world and one that never before had been photographed."—William H. Jackson, The Pioneer Photographer

A path and stairway system now lead down the route Jackson used to access the lower reaches of the Grand Canyon of the Yellowstone to photograph the Lower Falls, near today's Red Rock Point. Jackson's original photo point, only a few dozen feet lower from where this photograph was taken, has been washed out and is not safely accessible today. The overlook at the end of the Brink of Lower Falls Trail can be seen just to the right of the top of the falls.

The volume of water pouring over the great falls of the Yellowstone fluctuates with spring and summer runoff flows, from more than 60,000 gallons per second at its peak to less than 5,000 gallons per second in late fall.
No. 240. THE LOWER FALLS, distant view from farther down the canyon.
“The fall . . . was grand, and presented a symmetrical and unbroken sheet of white foam, set in dark masses of rock, while rainbows were formed in the spray from almost every point of view.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

Jackson had a knack for finding some of the best views of the Grand Canyon and the Upper and Lower Falls, as many of his photographs were taken from locations that became viewpoints for visitors, such as this view from what is today Lookout Point on the North Rim Drive. Part of the stairway leading to Red Rock Point (No. 239) is visible at lower left. Red Rock Point and Grand View Point (No. 252) are also popular overlooks today.
No. 241. THE LOWER FALLS. A view from the top of the cañon, west side, one mile below the falls,* and showing the cañon for that distance.

* This photo point is about halfway down the Grand Canyon near today’s Red Rock Point and only about one-third of a mile downriver from the Lower Falls. Because the Yellowstone River generally flows south to north, Jackson uses “east” and “west” in his descriptions to indicate the side of the Grand Canyon from which he took his photographs. However, because the river bends to the east at the Lower Falls and flows east/northeast for several miles, what Jackson calls the “east side” and “west side” in this area are today called the South Rim and the North Rim, respectively.
“Working enthusiasm was keyed to the highest pitch by the grandeur of the canyon and the falls, the greatest scenic features of the Yellowstone.”—William H. Jackson, *The Pioneer Photographer*

The Red Pinnacle frames the right side of the Lower Falls in this view about 75 yards southeast of No. 239. Just to the left of this photo point is a near-vertical cliff that towers 300 feet above the Yellowstone River. Though this area is inaccessible to the general public today, the pinnacle is visible from several places around the Grand Canyon and can be seen in many of Jackson’s photographs, including No. 242 and Nos. 248–251.
No. 242. THE LOWER FALLS. A view from the top of the cañon, west side, one mile below the falls,* and showing the cañon for that distance.

* This area is only about a half mile below the Lower Falls.
"But the objects of the deepest interest in this region are the falls and the Grand Cañon . . . it is only through the eye that the mind can gather anything like an adequate conception of them."—Ferdinand V. Hayden, Fifth Annual Report

Mist rises from the Grand Canyon of the Yellowstone as the first light of morning hits the Lower Falls in a view from an outcropping (closed to the public) near the Lookout Point parking lot on North Rim Drive. Lookout Point can be seen at the precipice of the cliff in the center of the contemporary photograph.
No. 243. THE LOWER FALLS. View from the east side of the cañon.
Thursday, August 4, 2011

“All was silent, except the roaring of the water as its waves dashed upon the solid rock at our feet. Far above us the trees along the edge seemed like a line of grass.” — Albert Peale, Philadelphia Press, Aug. 29, 1871

Jackson’s original photo point and the cliffs along the left side of this image have eroded and crumbled since Jackson photographed the Lower Falls from this location in 1871. This photo, taken in summer 2011, shows massive runoff over the falls from the previous winter’s heavy snowpack. Part of the steep steel staircase leading to Uncle Tom’s Point can be seen just to the left of the falls, near the shadow line. “Uncle” Tom Richardson began leading tourists to this spot in 1898 after constructing a series of stairs, ladders, and fixed ropes. Today, the trail descends 500 feet via a series of paved inclines and more than 300 stairs.
No. 244. *UPPER FALLS, from the top of the cañon, just above the Lower Falls.

* The number on this albumen print is incorrect.
“Here the cañon of the Yellowstone finds its beginning in a beautifully wooded gorge between two and three hundred feet in depth, through which the river flows swiftly, though smoothly.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

The location of Jackson’s first view of the Upper Falls of the Yellowstone, on the rim of the canyon near the top of the trail leading to the Brink of the Lower Falls on North Rim Drive, is revealed by rocks at the lower left corner of both frames. Though trees now block the view (right), a popular overlook about 50 yards west along the trail offers a similar scene (above).
No. 245. UPPER FALLS, near view from the east side of the cañon.
"About 350 yards above the Lower Falls are the Upper Falls. What they lack in sublimity they gain in picturesqueness."—Albert Peale, *Philadelphia Press*, Aug. 29, 1871

The spot where Jackson photographed the Upper Falls of the Yellowstone, just downhill from the Upper Falls Viewpoint on South Rim Drive, is now washed out and inaccessible, but a very similar view is seen through a break in the trees slightly to the right. The only evidence of human intrusion into this scene are the Brink of the Upper Falls Overlook, just to the right of where the Yellowstone River pours over the precipice, and the Canyon Bridge, constructed in 1914–1915 by the US Army Corps of Engineers, visible just above the falls. The bridge is also pictured in the contemporary photographs for Nos. 246, 258, and 259.
July 28–30, 1871

No. 246. *UPPER FALLS, near view from the east side of the cañon.

* The number at the bottom center on this albumen print is incorrect, but the correct number is faintly written between the branches of the pine tree at center left.
"From any point of view the Upper Falls are most picturesque and striking . . . The whole presents in the distance the appearance of a mass of snow-white foam."—Ferdinand V. Hayden, *Fifth Annual Report*

Jackson turned the back of his camera to a vertical position and changed lenses to capture a closer view of the Upper Falls from the same location as No. 245. Mountain men and prospectors were the first white men to see the Upper and Lower Falls in the mid-1800s, but the Cook-Folsom-Peterson party was the first to refer to this waterfall as the Upper Falls in the accounts of their 1869 excursion into Yellowstone.

The Upper Falls mark the geological junction of harder, erosion-resistant beds of ancient lava and softer layers weakened by hydrothermal activity, creating the Lower Falls and the Grand Canyon downstream.
No. 247, UPPER FALLS, near view from the west side.
“[U]pon reaching the brink of the precipice, the whole volume is thrown outward and divided almost at once into drops which aggregate into conical shapes, their apexes projecting forward, not unlike an array of comets.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

The Yellowstone River plunges 109 feet in this view just below the Brink of the Upper Falls overlook. Remnants of a handrail are still present near this location (now closed to public access) visitors used to view the Brink of the Upper Falls in the park’s earlier years. Nathaniel Langford and Cornelius Hedges may have visited this spot during their expedition into the region in 1870 with General Washburn, as some of Langford’s accounts describe this area.
"Above the falls, the river flowing over hard, compact, iron-like basalt, makes but little impression upon it, but after its leap it has different material to deal with. Instead of unyielding rock, there is a vast deposit of soft volcanic ash with harder seams and dike-like eruptions of breccia and basalt. Ages ago this whole region was the basin of an immense lake. Then it became the center of volcanic activity; vast quantities of lava were emptied, which, pooling on the water, took the form of basalt. Volumes of volcanic ash and rock fragments were thrown out from the craters from time to time, forming breccia as they sunk through the water, and mingled with the deposits from siliceous springs. Over this were spread the later deposits from the waters of the old lake.

In time the country was slowly elevated, and the lake was drained away. The easily-eroded breccia along the river channel was cut deeper and deeper as ages passed, while springs and creeks and the falling rain combined to carve the sides of the canyon into the fantastic forms they now present, by wearing away the softer rock and leaving the hard basalt and the firmer hot-spring deposits standing in massive columns and Gothic pinnacles. The basic material of the old hot-spring deposits is silica, originally white as snow, but now stained by mineral waters with every shade of red and yellow, from scarlet to rose color, from bright sulfur to the daintiest tint of green. When the light falls favorably upon these blended tints, the Grand Canyon presents a more enchanting and bewildering variety of forms and colors than human artists ever conceived. The erosion was practically arrested at the upper end of the canyon by a sudden transition from the softer breccia to hard basalt, and the falls were the result."—William H. Jackson, *Miscellaneous Publications, No. 5*

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1 The colors in the canyon walls—composed of a type of rock called rhyolite—are caused by oxidation of iron compounds in the rock that has been altered, or "cooked," by hydrothermal activity. The colors reflect varying amounts of water in the individual iron compounds and hydration of the minerals.

2 The theory for the formation of the Grand Canyon of the Yellowstone has evolved since Jackson's time. After the Yellowstone Caldera erupted about 640,000 years ago, lava flows and volcanic tuffs buried the area, but hydrothermal gases and hot water below the surface weakened the rock. The Yellowstone River began eroding this layer, carving a canyon beginning at Tower Fall and heading upstream to the Lower Falls, where the ancient lava bed meets harder, more resistant rock layers.
No. 248. GRAND CAÑON, looking down from over the Lower Falls, west side.
"[The Lower Falls] are at the head of one of the most remarkable canyons in the world. It extends for about thirty miles, and averages at least one thousand feet in depth, its walls being in many places vertical. At the bottom of this deep gorge the river rushes along, boiling and surging as it goes. From the top it appears like a mere attenuated thread of green color.”—Albert Peale, *Philadelphia Press*, Aug. 29, 1871

This location is on the trail leading down to the Brink of the Lower Falls, just uphill from an overlook at the first switchback that affords a view of the canyon. While a portion of the canyon wall along the left side of the photo has crumbled away, it is likely the pair of trees at center left, on the small ledge in the contemporary photograph, are those seen in Jackson’s image. The Red Pinnacle towers over the west (left) side of the river, and Artist Point is just above it on the South Rim of the canyon, in the far distance.
No. 249. GRAND CAÑON, looking down from over the Lower Falls, west side.
In some respects this canyon is the greatest wonder of them all. The river has carved out a channel through the basalt volcanic breccia and hot spring deposits, one thousand to twelve hundred feet deep and one to two thousand feet in width, at the bottom of which the water foams along with torrent-like rapidity . . . None but an artist with the most delicate perception of colors could do justice to the picture."—Ferdinand V. Hayden, "Wonders of the West—II"5

Jackson made both vertical and horizontal photographs from many of his views of the Grand Canyon of the Yellowstone, perhaps to show the great width and depth of the geological wonder. Several trees have grown to obscure the outcropping seen on the right side of Jackson's photograph.
July 28–30, 1871

No. 250. GRAND CAÑON from the east bank.
“Decorated with the most brilliant colors that the human eye ever saw, with the rocks weathered into an almost unlimited variety of forms, with here and there a pine sending its roots into the clefts on the sides as if struggling with a sort of uncertain success to maintain an existence—the whole presents a picture that would be difficult to surpass in nature.”—Ferdinand V. Hayden, *Fifth Annual Report*

This is the general location where Jackson made this photograph looking down the Grand Canyon of the Yellowstone, at a spot about 100 feet above the Brink of the Lower Falls, on the east side of the river. Today, a trail leads to an overlook just uphill from this location. The Red Pinnacle is again visible at center left.
July 28–30, 1871

No. 251.* **GRAND CAÑON** *from the east bank.*

The shadows in this photograph indicate it was taken within a few minutes of No. 250.

* The number at the bottom center of the original glass negative is incorrect. A horizontal view labeled No. 251 appears in the four-volume set of albumen prints at the Yellowstone Heritage and Research Center, but Jackson’s original location for that version, just downhill from that of this photograph and No. 250, is now too unsafe to access.
“Standing near the margin of the Lower Falls, and looking down the cañon . . . Mr. Thomas Moran, a celebrated artist, and noted for his skills as a colorist, exclaimed with a kind of regretful enthusiasm that these beautiful tints were beyond the reach of human art.”—Ferdinand V. Hayden, *Fifth Annual Report*

Jackson again turned the back of his camera vertically and made this photograph of the Grand Canyon from the same standpoint of No. 250. The farthest point of the rim visible on the central horizon is Inspiration Point, on the west side of the canyon, while Artist Point is just below it, at the tree line on the east side.
No. 252. GRAND CAÑON. *West side, one mile below the falls,* looking down.

* This location is only about three-quarters of a mile below the Lower Falls.
Sunday, October 23, 2011

“[N]o language can do justice to the wonderful grandeur and beauty of the cañon below the Lower Falls; the very nearly vertical walls, slightly sloping down to the water’s edge on either side, so that from the summit the river appears like a thread of silver foaming over its rocky bottom; the variegated colors of the sides, yellow, red, brown, white, all intermixed and shading into each other; the Gothic columns of every form standing out from the sides of the walls with greater variety and more striking colors than ever adorned a work of human art.”—Ferdinand V. Hayden, Fifth Annual Report

A pine tree bisects the scene from where Jackson made this photograph looking down the Grand Canyon from near the Grand View overlook, on the west side of the canyon, and a large chunk of the stone tower on the right side of Jackson's image has fractured off, exposing lighter, less-weathered rock underneath.
July 28–30, 1871

No. 253. GRAND CAÑON from the east side, one mile below the falls,* looking down.

* This point is only about a half mile below the Lower Falls, directly across the canyon from today's Lookout Point (No. 240).
Thursday, September 8, 2011

“It is no small undertaking to descend the steep and slippery side of the cañon... while the yellow, volcanic and nearly vertical walls of the gorge beneath bid defiance to the most expert climber... the rock is soft and crumbling, affording no secure footing, while the river rushes away in a perfect torrent over innumerable cascades and ripples, causing eddies and whirlpools which would dash to atoms any unlucky adventurer who should be so unfortunate as to find himself engulfed in its waters.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

By aligning features in the foreground, on the canyon rim, and on the horizon, it was determined that the exact spot where Jackson stood to photograph this scene has since crumbled into the canyon. The contemporary image was taken less than 6 feet from the void but is still too far to the right of where Jackson stood, a testament to the risks he took while photographing the Grand Canyon of the Yellowstone. A large portion of the cliff wall on the right side of this image has also crumbled away, revealing the ever-changing nature of the canyon. However, two small trees clinging near the canyon rim at the upper right corner of the frame are possibly the same as those pictured in Jackson’s image.
No. 254. THE WALLS OF THE CAÑON, as seen from below.
“There are portions of the day when these colors seem to be more vivid, and the rugged walls of the cañon stand out more in perspective, so that while the falls fill one with delight and admiration, the Grand Cañon surpasses all the others as the one unique wonder, without a parallel, probably, on our continent.”—Ferdinand V. Hayden, *Fifth Annual Report*  

Jackson swung his camera about 120 degrees from the location where he photographed the Red Pinnacle and the Lower Falls (No. 241) to capture the cliffs of the Grand Canyon to the north. Lookout Point is perched atop the outcropping at the center of the frame. New trees have thrived on the steep slopes, and part of the small rock spire seen at center left in Jackson’s image remains on the hillside today.
Nos. 255 and 256. *CRYSTAL FALLS.
Cascade Creek is a small tributary of the Yellowstone, cutting its way through a deep cañon of volcanic ash and basalt,† and just before its union with the Yellowstone flowing over a series of ledges, making a cascade as beautiful as its previous course has been weird and ugly. There is first a fall of five feet, and another of fifteen; then it spreads out over the rocks down an abrupt descent of eighty-four feet.‡

* The photograph Jackson labeled No. 256 in the 1871 Series, described as a second view of Crystal Falls, has never been located. Since No. 256 is listed in both the 1871 and 1875 editions of Jackson’s catalog of descriptions for his photographs it is reasonable to assume prints were made from the glass negative. But despite an exhaustive search of a number of potential sources, a print of No. 256 has never been found.

† Cascade Creek cuts a canyon through a layer of hardened rhyolitic lava, not basalt.‡

‡ The height of Crystal Falls is today measured at 129 feet.
“Cascade Creek flows from the west into the Yellowstone, between the Upper and Lower Falls. Just before it enters the Yellowstone, it flows over a series of ridges of breccia, making one of the most beautiful cascades in this region; hence the name of the little stream . . . As this little cascade is seen from the east branch of the Yellowstone, dividing up into a number of little streams and rushing down from ledge to ledge until it reaches the bed of the river, it presents a picture of real beauty.”—Ferdinand V. Hayden, *Fifth Annual Report*

A large tree partially obscures the view of Crystal Falls from Jackson’s original photo point, about 40 yards from the base of the waterfall. Crystal Falls is about 200 yards upstream from where Cascade Creek flows into the Yellowstone River between the Upper and Lower Falls. They can be viewed from the top after a short walk along a trail that connects the parking areas between the Brink of the Upper Falls and the Brink of the Lower Falls.
No. 257. RAPIDS ABOVE THE UPPER FALLS of the Yellowstone, immediately above the falls, showing the narrow rock-bound channel.
“Just above the Upper Falls are two beautiful cascades, 20–30 feet high, and at the east one, the rocks so wall in the channel that it is not much more than 100 feet wide.” — Ferdinand V. Hayden, *Fifth Annual Report*

The present-day overlook for park visitors at the Brink of the Upper Falls frames the bottom edge of this contemporary photo of the rapids above the waterfall. The Yellowstone River becomes turbulent as it pours over a series of rapids for about a half mile before the Upper Falls but is mostly calm and serene for the remaining 15 miles above the falls to Yellowstone Lake.
July 28–30, 1871

No. 258. RAPIDS ABOVE THE UPPER FALLS of the Yellowstone, a quarter of a mile farther up the stream.
"Just along the Upper Falls there are five huge, detached blocks of basalt in and near the center of the channel. These show the force with which the water has rushed down the channel at some period."—Ferdinand V. Hayden, *Fifth Annual Report*

The view of the original photograph of the rapids above the Upper Falls is now choked with trees (*right*), but moving only about 8 feet to the right reveals a very similar scene (*above*). The Canyon Bridge spans Jay Creek where it meets the Yellowstone River at its western bank. The bridge was constructed in 1914–1915 by the US Army Corps of Engineers, replacing an older bridge in the same location built in 1893–1894 as part of the park’s original road system. Vehicular traffic was diverted to the new road to the west in the late 1950s, but the Canyon Bridge is still open to pedestrians walking along the North Rim Trail.
No. 259. **RAPIDS ABOVE THE UPPER FALLS** of the Yellowstone, showing the huge, detached masses of basalt* that have been left standing in the middle of the river.

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* The boulders in the middle of the Yellowstone River are not basalt. Rather, they are detached masses of rhyolitic lava flows.15
If below the Falls this river surpasses all others in the West for its rugged grandeur, above the falls it excels in picturesque beauty.”—Ferdinand V. Hayden, “The Wonders of the West—II”

The huge boulders in the middle of the Yellowstone River that Jackson photographed from the east side of the river remain unmoved by water or time, and the rocky outline of the riverbank at the bottom of both photographs appears relatively unchanged as well. This is harder, more resilient volcanic rock than the weaker layers downstream that yielded to hundreds of thousands of years of erosion, forming the Grand Canyon of the Yellowstone. The Canyon Bridge is again seen from this photo point, located on the east bank of the river, about 200 yards north of No. 258.
CRATER HILLS AND MUD VOLCANO AREA

"[W]e emerged upon a broad plateau [Hayden Valley], covered with grass, and intersected by numerous streams, which became quite wide as they approach the river.

Crossing Alum Creek . . . we came to Crater Hill, and found ourselves in the midst of new wonders. Here are two conical white hills, each 250 feet high, around the base of which there are numbers of hot springs and steam jets. The principal spring [Sulfur Spring] is about twelve feet in diameter, and resembles a huge boiling caldron, the water reaching the height of two and even three feet at times. It is surrounded by a beautiful collar-like rim, fashioned into various beautiful shapes. In the stream flowing from it there is an abundant deposit of sulfur . . .

Proceeding through a narrow strip of woods, we came upon a number of mud springs, the contents of which were in a state of violent ebullition [Blue Mud Pot]. To use a homely but expressive comparison, they resembled huge pots of boiling mush, the only difference being in their color, which was of a dark leaden blue. Tasting the mud, we found it to be strongly impregnated with alum.

Leaving these springs, we encamped four miles further on, near some more mud volcanoes, at the foot of a low hill [Mud Volcano Area] . . . Going to the top of the hill back of the camp, we caught sight of huge volumes of steam, and were greeted with sounds as though some engine were laboring near us. Proceeding in the direction of the noise, we found a stream of transparent water gushing from a grotto at regular intervals [Dragon’s Mouth Spring], accompanied by a discharge of steam . . . Leaving this, we visited another stream of muddy water [Mud Geyser], which our hunter assured us would commence boiling violently about sundown. We sat on down on the bank, waiting somewhat incredulously for the performance to commence. Soon the water began to rise, and suddenly it was thrown into the most violent agitation, the water and mud being cast up about ten feet. At the same time there was an immense discharge of steam. After lasting about twenty minutes, it subsided as suddenly as it began, and the water became perfectly quite."—Albert Peale, Philadelphia Press, Aug. 29, 1871
No. 260. SULFUR SPRING. At Crater Hills, ten miles above the falls, on the east side of the Yellowstone, in the center of a most interesting group of hot springs, is a magnificent sulfur spring. The deposits around it are silica and enamel like the finest porcelain. The thin edges of the nearly circular rim extend over the waters of the basin several feet, the open portion being fifteen feet in diameter. The water is in a constant state of agitation, and seems to affect the entire mass, carrying it up impulsively to a height of four or five feet. The decorations about the spring, the most beautiful scalloping around the rim, and the inner and outer surface, covered with a sort of pearl-like bead work, give it great beauty.
"It is the decorations about this spring that lent the charm, after our astonishment at the seething mass before us—the most beautiful scalloping around the rim, and the inner and outer surface covered with a sort of pearl-like bead work. The base is the pure white silica, while the sulphur gave every possible shade, from yellow to the most delicate cream. No kind of embroidering that human art can conceive or fashion could equal this specimen of the cunning skill of nature."—Ferdinand V. Hayden, *Fifth Annual Report*

Sulfur Spring is located in the Crater Hills area of Hayden Valley, about a mile west of Grand Loop Road. The feature, also known as Crater Hills Geyser, still displays the "constant state of agitation" Jackson described, throwing water upwards of 15 feet or more at times. The "beautiful scalloping" around the spring's orifice that Jackson described appears better preserved than those on the geyser craters at the Upper Geyser Basin. Sulfur Spring was one of the more popular attractions in the early days of the park. An old wagon trail leading to the area is still faintly visible, but with no established trail to the Crater Hills, it is seldom visited today.
No. 261. MUD SPRINGS [Blue Mud Pot], at Crater Hills, near the Sulfur Spring.
"The surface is covered all over with puffs of mud, which, as they burst, give off a thud-like noise, and then the fine mud recedes from the center of the puffs in the most perfect rings to the side. This mud-pot presents this beautiful picture."—Ferdinand V. Hayden, *Fifth Annual Report*  

Blue Mud Pot at Crater Hills is about 225 yards south of Sulfur Spring, and still displays consistent thermal activity. A lone bison, one of hundreds that roam Hayden Valley, wanders the thermal area in the distance.
Tuesday, August 1, 1871

No. 262. * THE GROTTO SPRING [Dragon's Mouth Spring]. About two miles above the Crater Hills, on the west side of the Yellowstone. A column of steam issuing from a cave on the side of the hill, with an opening of about five feet in diameter, readily locates its position. The roaring of the waters in the cave, and the noise of the waves as they surge up to the mouth of the opening, are like that of the billows lashing the sea-shore. The water is as clear as crystal, and the steam is so hot that it is only when a breeze wafts it aside for a moment, that one can venture to take a look into the opening.

* The number on the original glass plate at bottom left is incorrect and has occasionally caused the description for the “oblong fissured ridge” at Mammoth Hot Springs (No. 224) to be attributed to this image.

The man peering into the cavern of Dragon's Mouth Spring remains unidentified. It cannot be Peale, who by this time was well ahead of Jackson’s group and had left for the geyser basins on the Firehole River with Hayden.4
The next interesting spring we called the Grotto. A vast column of steam issues from a cavern in the side of the hill, with an opening about five feet in diameter. The roaring of the waters in the cavern, and the noise of the waves as they surge up to the mouth of the opening, are like that of the billows lashing the sea-shore.”—Ferdinand V. Hayden, *Fifth Annual Report*

Steam billows from the feature today named Dragon’s Mouth Spring in the Mud Volcano Area just south of Hayden Valley. The feature has been known by several different names over the years, including Gothic Grotto, Devil’s Workshop, and Belching Spring. Every few minutes, hot water surges from the orifice on the hillside—thought to resemble the lashing of a dragon’s tongue. The frequency of these surges decreased in 1994 and around 1999 the temperature of the water inexplicably dropped by about ten degrees.”
No. 263. CRATER OF THE MUD GEYSER. The only true mud geyser discovered, eight miles below Yellowstone Lake, it has a funnel-shaped orifice in the center of a basin 150 feet in diameter, and in which there are two other hot mud springs.

The man standing at left near the crater of the Mud Geyser remains unidentified.
“This is a true intermittent spring. July 28 and 29 it played several times, throwing the water to the height of 20 to 30 feet. The impression among the mountain-men was, that this is a periodic spring, and played once in six hours precisely.”—Ferdinand V. Hayden, *Fifth Annual Report*

The water level at Mud Geyser appears much higher today than it did in early August 1871. This had been another popular attraction for early tourists visiting Yellowstone, and the geyser’s eruptions would expel muddy water up to 50 feet into the air every few hours. Activity ceased in the early part of the twentieth century. Jackson’s original photo point for his image, located a few yards downhill and closer to the spring from where this photograph was taken, could not be accessed due to the potential for high levels of noxious gases—specifically hydrogen sulfide—that can pool in the basin of the thermal feature to levels that can become toxic.
Tuesday, August 1, 1871

No. 264. MUD GEYSER IN ACTION. The flow of the geyser is regular every six hours, the eruptions lasting about fifteen minutes. The thick, muddy water rises gradually in the crater, commencing to boil about half way to the surface, and occasionally breaking forth with great violence. When the crater is filled it is expelled from it in a splashing, scattered mass ten feet in diameter to forty feet in height. The mud is a dark lead-color, and deposits itself thickly all about the rim of the crater.

Because long exposures required in the wet-plate photography process made it virtually impossible to freeze fast motion, Jackson resorted to drawing lines on his negative to simulate spouting water. He added other minor details to several of his photographs, mostly those of thermal features—such as Nos. 260, 265, 277, and 298—whose bubbling or spouting action could not be captured in-camera. Steam and clouds, also difficult to capture in wet-plate photography, were likely added during the printing process to a few other photographs throughout the series.
“We sat down on the bank to wait, somewhat incredulous, for the water was quite placid with the exception of the centre which bubbled a little. Soon however the water began to rise gradually, until suddenly, it was thrown up about 10 feet every few seconds and a cloud of steam rose from it continually. We gazed on it with wonder. After continuing about twenty minutes it stopped as suddenly as it began and the water became as smooth as the most placid lake.”—Albert Peale’s journal, July 27, 1871

This is a best guess for the location where Jackson photographed Mud Geyser in eruption in 1871. In 1993 soil temperatures around the geyser skyrocketed for unexplained reasons, killing most of the trees around the feature’s southern edge and the hillside to the west. The steam vents visible in the contemporary photo appeared in early 1995 as a result of the elevated thermal activity in the area.
No. 265.* A MUD SPRING on the opposite side of the river, and of the same nature as No. 261.

* Due to the incorrect number scribed on the glass plate at lower left, this photograph has often been misidentified as the crater of Mud Geyser (No. 263).
“On the east side of the Yellowstone, close to the margin of the river, are a few turbid and mud springs, strongly impregnated with alum. The mud is quite yellow, and contains much sulphur . . . Just opposite this spring, on the west side of the river, is a singular vertical wall of rather coarse basalt, which looks like huge mason-work, separated by the joint age into nearly rectangular blocks.”—Ferdinand V. Hayden, *Fifth Annual Report*

Activity has long ceased at the mud spring Jackson photographed in 1871 on the east side of the Yellowstone River, opposite the Mud Volcano Area. Steam from Sulfur Caldron rises at the far right, and the plume on the center left skyline is from Dragon’s Mouth Spring (No. 262). Steam also rises from a small thermal vent on the hillside at the center of the image.
"In shape it is aptly compared to the human hand; the northern portion would constitute the palm, while the southern arms might represent the fingers. Careful soundings gave the greatest depth at 300* feet. When calm, the waters reflect the sky in the most delicate and beautiful ultramarine hues, but when stormy, and lashed by the strong winds of this high altitude, it resembles in its white-capped breakers and heavy rolling surf some of our larger inland seas. The lake is plentifully stocked with salmon-trout, their numbers being almost incredible, and will average two pounds in weight."—William H. Jackson, Miscellaneous Publications, No. 5.¹

¹ The maximum depth of Yellowstone Lake is today measured at 390 feet in an underwater canyon just east of Stevenson Island.⁹
No. 266. YELLOWSTONE RIVER where it leaves the lake, looking down [north] from the same stand point as [No. 267].
“The trail proved generally easy, skirting the river, which now becomes much broader, with gently sloping banks and broad grassy meadows. It seemed almost incredible that so tame and quiet a scene could be found in the midst of a region usually so wild and terrible.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*¹

Fishing Bridge now spans the Yellowstone River just north of where it exits Yellowstone Lake, and trees and other vegetation line the steep west riverbank in the foreground. The 10,760-foot summit of Cathedral Peak, which sits on the boundary of Yellowstone National Park and the North Absaroka Wilderness, is on the horizon at far right.

The Yellowstone is the longest undammed river in the contiguous United States, flowing freely for almost 700 miles from its source in the Absaroka Mountains, southeast of Yellowstone Lake, to its confluence with the Missouri River in western North Dakota.⁵
No. 267. YELLOWSTONE LAKE, looking south from where the river leaves it, and showing the larger portion, or the body, of the lake.
“The lake lay before us, a vast sheet of quiet water, of a most delicate ultramarine hue, one of the most beautiful scenes I have ever beheld. The entire party were filled with enthusiasm. The great object of all our labors had been reached, and we were amply paid for all our toils. Such a vision is worth a lifetime, and only one of such marvelous beauty will ever greet human eyes.”—Ferdinand V. Hayden, *Fifth Annual Report*  

Jackson swung his camera 180 degrees from the point where he photographed the outlet of the Yellowstone River (No. 266) to capture perhaps the first photograph ever taken of Yellowstone Lake. A herd of bison grazes on the sandbar in the contemporary scene and Stevenson Island, named by Hayden to honor survey manager James Stevenson, is visible just below the central horizon.
Wednesday, August 2, 1871

No. 268. YELLOWSTONE LAKE is some twenty-two miles long, from north to south, and about ten or fifteen miles in width from east to west, with an elevation of 7,427 feet above tide water.*

* Yellowstone Lake is measured today at 20 miles long and 14 miles wide and sits at an elevation of 7,733 feet above sea level, making it the largest lake above 7,000 feet in North America.7
"A beautiful picture is this clear blue sheet of water nestling among the snow-peaks of the highest mountain-range on our continent."—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

The view of the same sandbar seen in No. 267, near the Yellowstone River’s outlet from the lake, is now blocked by trees (right). Moving downhill only a few yards yields a similar view (above) of the lake and the Absaroka Mountains in the distance, about 15 miles to the southeast.
No. 269. FIRST CAMP OF THE SURVEY, upon the banks of the lake, at the mouth of Bridge Creek,\(^*\) and just opposite Stevenson’s Island.

\(^*\) Jackson’s stated location for the Hayden Survey’s first camp on Yellowstone Lake “at the mouth of Bridge Creek,” which is almost 4 miles southwest of the Yellowstone River’s outlet, is incorrect. The camp’s actual location was likely Topping Point, only about three-quarters of a mile south of where the river leaves the lake (Nos. 266–268). A small stream today known informally as Lodge Creek, which Jackson may have mistaken for Bridge Creek when writing his descriptions after the survey, flows into Yellowstone Lake at Topping Point. Documentation from other members of the team also support the location of this camp as Topping Point.\(^9\)
We made our first camp on the northeast shore of the Lake, near the point where the river takes its departure from it. Here we had one of the finest views of this beautiful sheet of water... Our camp was located in a broad, open, meadow-like space, with the grass two feet or more in height, adorned with bright flowers having a great variety of colors.”—Ferdinand V. Hayden, "Wonders of the West—II”

Topping Point, just north of the Lake Village development and due east of Lake Lodge, is a best guess for the location of Jackson’s photograph of the survey’s first camp on Yellowstone Lake. This is the only cluster of trees for several hundred yards in any direction, and Stevenson Island is visible at left in both photographs. In the contemporary image, visitors from the nearby Lake Lodge and Lake Yellowstone Hotel walk along the shoreline, which has experienced significant erosion during 140 years of the lake’s lashing waves (see also No. 272).
Tuesday, August 8, 1871

No. 270. CAMP OF THE SURVEY upon the large southwest arm of the lake [West Thumb].

Peale is seen pointing a rifle in front of the tent at far right in both of Jackson’s photos of the survey’s camp at West Thumb, Nos. 270 and 271. At the center of No. 270 one can see a blurry figure with what appears to be a tripod, perhaps Jackson’s assistant setting up a camera to capture image No. 271.
Our second camp was pitched at the hot springs on the southwest arm [West Thumb]. This position commanded one of the finest views of the lake and its surroundings. While the air was still, scarcely a ripple could be seen on the surface, and the varied hues, from the most vivid green shading to ultramarine, presented a picture that would have stirred the enthusiasm of the most fastidious artist.”—Ferdinand V. Hayden, *Fifth Annual Report*

Some members of the Hayden Survey moved the group’s camp south to West Thumb while others took a side trip to the geyser basins on the Firehole River to the west. Their camp was on the lake’s shoreline on the southern edge of what is today the West Thumb Geyser Basin. This location was a public parking lot from the 1930s until the 1970s and was used by people who had launched a boat on Yellowstone Lake and needed a place to park their cars and boat trailers. Hints of the old blacktop that once covered the area are visible in this photograph. Recent efforts by the National Park Service to reduce the human footprint in Yellowstone have led to the reclamation of human-impacted sites that have become unnecessary or obsolete.
No. 271. CAMP OF THE SURVEY upon the large southwest arm of the lake.

Stevenson is seen standing near the tent at far left and Peale is the man holding a rifle at far right.
A near view of the camp shown in No. 270, likely taken from the location of the blurry figure visible at the center of that image. In the far distance lies the east shore of Yellowstone Lake and the western edge of the Absaroka Mountain Range, where Jackson photographed Nos. 278–287 during the survey’s circumnavigation of the lake.
No. 272. CAMP OF THE SURVEY ESCORT, upon the large southwest arm of the lake.
Decades of lashing waves have eroded the west shoreline of Yellowstone Lake (see also No. 269), including a significant portion where the Hayden Survey's military escort pitched their tents at West Thumb, about a hundred yards south of Nos. 270 and 271. Flat Mountain forms the skyline to the far south. The southeastern shoreline of West Thumb burned during the Shoshone Fire in 1988.
Monday, August 7, 1871

No. 273. THE ANNA, * the first boat ever launched upon the lake. Its framework was brought up from Fort Ellis and then put together, and covered with tar-soaked canvas. A tent fly made the sail. In it two adventurous members of the survey visited every arm and nook of the lake, and made all the soundings. It is so named in compliment to Miss Anna Dawes, a daughter of the distinguished statesman whose generous sympathy and aid have done so much toward securing these results.

* The Anna was named for the sister of the party’s general assistant Chester Dawes, shown sitting in the boat, at right, with survey manager Stevenson. Dawes was the son of US Rep. Henry Dawes, a powerful congressman who chaired the House Ways and Means Committee and was instrumental in securing appropriations to fund the 1871 survey. An early catalog of descriptions for Jackson’s photographs, printed in late 1871, lists the boat’s name as “Annie,” and the earliest prints of this image also show the name “Annie” on the boat. Later prints and alternate versions of this photograph, and an engraving that appears in Hayden’s Fifth Annual Report (published in early 1872), show the name changed to “Anna,” perhaps an effort to be more formal in naming the boat after a US congressman’s daughter. Interestingly enough, the name “Annie” reappears on the boat in another engraving—a composite of Jackson’s 1871 photo Nos. 273 and 286—in part 2 of Hayden’s Twelfth Annual Report, published in 1883.
“We had brought up the framework of a boat 12 feet long and 3 1/2 feet wide, which we covered with stout ducking, well tarred . . . Our little bark . . . whose keel was the first to plow the waters of the most beautiful lake on our continent, . . . was named by Mr. Stevenson in compliment to Miss Anna L. Dawes, the amiable daughter of Hon. H. L. Dawes. My whole party were glad to manifest, by this slight tribute, their gratitude to the distinguished statesman, whose generous sympathy and aid had contributed so much toward securing the appropriation which enabled them to explore this marvelous region . . . Our little boat performed most excellent service.”—Ferdinand V. Hayden, *Fifth Annual Report*

Recreating the photograph Jackson made of Stevenson and Dawes in the *Anna*, the contemporary photographer, left, and Matthew J. Reilly, PhD, sit in the canoe used in the rephotography project to navigate Yellowstone Lake and locate several of Jackson’s 1871 photo points. This location is at the West Thumb Geyser Basin, near the shoreline, below the camps pictured in Nos. 270 and 271. The rocky outcropping seen in No. 274 is visible over the contemporary photographer’s right shoulder and Bluff Point can be seen at center right.
Monday, August 7, 1871

No. 274. A VIEW ALONG THE SOUTHWEST ARM OF THE LAKE [West Thumb], looking north from the camp. The shore is covered to a considerable thickness with the disintegrated silica deposited from the flowing hot springs, so that in walking over it, it seems like treading on the broken fragments of washed shells along the seashore.
Saturday, September 22, 2012

“There are some of the most beautiful shorelines along this lake that I ever saw. Some of the curves are as perfect as if drawn by the hand of art.”—Ferdinand V. Hayden, *Fifth Annual Report*

The rocky outcropping where Jackson photographed members of the 1871 Hayden Survey fishing in Yellowstone Lake is still present today just off the shoreline of the West Thumb Geyser Basin. A cluster of rocks at lower left also appears somewhat intact.

Underwater thermal activity abounds in the bay at West Thumb and also in Sedge Bay (No. 289) and Mary Bay, on the lake’s northeast shore. Winter Spring, the only lake spring where the top water is warm and the water below is cold, is located just below the surface between the outcropping and the shoreline in this photograph.
No. 275. A HOT SPRING CONE [Fishing Cone], entirely surrounded by the clear cold water of the lake. In the center is the spring of boiling water. One may stand on it, extend his rod into the lake, catch the trout, and cook them in the boiling spring, without removing them from the hook. It is six feet in diameter at the water's edge.

Variations of this photograph appear with steam emitting from Fishing Cone, indicating Jackson added the detail in the printing process.
“Some of the funnel-shaped craters extend out so far into the lake that the members of our party stood upon the siliceous mound, extended the rod into the deeper waters, and caught the trout and cooked them in the boiling spring without removing them from the hook.”—Ferdinand V. Hayden, *Fifth Annual Report*

Early engravings and postcards of Fishing Cone show tourists standing on the feature and dipping trout into its orifice, a popular activity for several years that led to nicknames like “Fisherman’s Kettle,” “Fishpot Spring,” “Chowder Pot,” and the current, official name, Fishing Cone. Angling from the feature has long been prohibited. Fishing Cone is actually a geyser, with several eruptions of up to 40 feet high recorded in 1919.
No. 276. A GROUP OF HOT-SPRING BASINS in the same vicinity. Their great beauty lies almost wholly in the exquisite color they possess, and of which no pen can convey any adequate idea.
"So clear was the water that the smallest object could be seen on the sides of the basin, so that, as the breeze swept across the surface, the ultramarine hue of the transparent depth in the bright sunlight was the most dazzlingly beautiful sight I have ever beheld."—Ferdinand V. Hayden, *Fifth Annual Report*43

The water level in many of the pools of the West Thumb Geyser Basin appears to have dropped since Jackson first photographed them in August 1871. Part of the boardwalk system that winds through the basin can be seen just beyond the springs, and Bluff Point, also seen in No. 273, is visible on the horizon across West Thumb bay, at far right.
No. 277. MUD PUFFS [Thumb Paint Pots]. A thick boiling and bubbling mass of reddish mud. These mud springs lie all about the camp (Nos. 270–272), and their constant thud is heard night and day, as the hot steam struggles up from below, and exploding scatters the mud in every direction.
"There are also a great number of mud-springs high up on the bank, where the orifice comes up, a considerable distance, through the soft superficial clays. The constant thud may be heard at our camp night and day from half a dozen of these mud-puffs. They have built up a large number of small circular mounds about 2 feet high."—Ferdinand V. Hayden, *Fifth Annual Report*®

This is the best guess for the point where Jackson photographed what he called “mud puffs” at the West Thumb Geyser Basin. The features shown in the contemporary image are now known as the Thumb Paint Pots. Thermal activity decreased at the Thumb Paint Pots in the 1970s but recently became more active.
[No. 279A]. *YELLOWSTONE LAKE. [This southern view] includes the Upper Yellowstone [River] and the bay in which it empties.

This photograph has been relabeled No. 279A by the contemporary photographer for the sake of clarification, as there are two photographs in Jackson’s 1871 Series labeled No. 279 that show similar views. Both are looking south toward the inlet of the upper Yellowstone River into Yellowstone Lake, but they were taken a couple hundred yards apart. The photograph labeled No. 279 in this book is the second image in Jackson’s five-picture panorama of Yellowstone Lake (Nos. 278–282).
"It would be difficult to find a valley in the West that presents as fine a picture to the eye."—Ferdinand V. Hayden, *Fifth Annual Report* 

This photograph, taken a couple hundred yards west and slightly downhill from Langford Cairn, above the east shore of the lake’s Southeast Arm, shows rock formations that have changed little after almost a century and a half, and a large tree still stands on the right side of the image. Close comparison of the marsh and delta where the upper Yellowstone River enters the Southeast Arm reveals higher water levels in the lake today.
Sunday, August 13, 1871

Nos. 278–282. YELLOWSTONE LAKE, a bird’s-eye panoramic view, in five sections, taken from the high hills on the east side of the Southeast Arm, near where the Upper Yellowstone empties into the lake. The first view [No. 278] looks south and shows the high range that separates the waters of the Yellowstone from those of the Wind River.

Peale is seen standing at bottom center behind George Kelley, one of the survey’s ambulance drivers. Peale also appears in Nos. 279 and 281 of the panorama.
"Looking up the valley from some high point, one could almost imagine that he was in the presence of the ruins of some gigantic city, so much like old castles, cathedrals of every age and clime, do these rocks appear; add to this, the singular vertical furrows which are cut deep into the sides and render more striking their antiquated appearance."—Ferdinand V. Hayden, *Fifth Annual Report*

Jackson’s panorama of Yellowstone Lake from Langford Cairn begins with a view looking southeast toward the drainage of Beaverdam Creek and a 1,353-acre burnt patch can be seen on the hillside at center from the Beaverdam Fire in summer 2007. Colter Peak is the highest point on the skyline at center right. Dr. Reilly and the present-day photographer replace Peale and Kelley in the contemporary photograph.
Sunday, August 13, 1871

No. 279. YELLOWSTONE LAKE, a bird’s-eye panoramic view, in five sections. [This] second view includes the Upper Yellowstone and the bay in which it empties.
“Four of the most important tributaries of the Missouri, viz, the Big Horn, the Yellowstone, the Madison, and the Gallatin, carry the melting snows from these mountains northward, and then through the Mississippi Valley to the Gulf of Mexico, more than three thousand five hundred miles.” — Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*  

The second photograph in Jackson’s five-picture panorama of Yellowstone Lake looks south toward the Thoroughfare and the inlet of the upper Yellowstone River into the Southeast Arm of Yellowstone Lake. Colter Peak (also seen in No. 278) is seen at far left. Dr. Reilly is visible where Peale sat 140 years prior at bottom center, and a large boulder that isn’t shown in Jackson’s 1871 photograph is now visible at far left, perhaps a result of tumbling down the hillside after an earthquake.
No. 280. YELLOWSTONE LAKE, a bird’s-eye panoramic view, in five sections. The third view [looks southwest] across the [Southeast and South] Arms of the lake.
Monday, July 23, 2012

The third photograph in the panorama shows the lower quarter of the Southeast Arm of Yellowstone Lake. The South Arm and Peale Island are visible at center right. The large boulders in the foreground are still present, but more than 140 years of earthquake activity has shifted some from their previous positions.
No. 281. YELLOWSTONE LAKE, a bird’s-eye panoramic view, in five sections. [The fourth view looks northwest across] Promontory Point to the distant mountains on the farther side.
The fourth image in the panorama is a view looking due west of Langford Cairn. The Promontory, which divides the South Arm and Southeast Arm of Yellowstone Lake, traverses the center of the scene, with evidence of fires from the summers of 2004 and 2007 along its eastern shore. Mount Sheridan, left, and Flat Mountain, center left, are visible on the skyline.
Sunday, August 13, 1871

No. 282. YELLOWSTONE LAKE, a bird’s-eye panoramic view, in five sections. [The] last of the series is a view [north], past Promontory Point, into the large open space of the lake, where it fades away into the horizon.
The final view in the panorama looks north/northwest toward the main body of the lake. The Promontory is seen at left, while Signal Point can be seen directly across the upper end of the Southeast Arm. The Signal Hills, where Jackson photographed Mounts Doane and Stevenson (Nos. 283 and 284), rise above the lake on the right side of this image. The high peaks of the Washburn Range, including Observation Peak and Mount Washburn, line the horizon in the far distance.
MOUNTS DOANE AND STEVENSON [are] situated some six or eight miles* east of the Southeast Arm of the lake. They are the fragments of the rim of an immense crater.†

* Mount Stevenson is about six and a half miles east of Signal Point, while Mount Doane is a half mile farther.

† Mounts Doane and Stevenson are remnants of volcanic breccia and lava flows 50 million years old and are about 10 miles southeast of the rim of the Yellowstone Caldera.
“Near our camp were two volcanic peaks, both of which we ascended—one, Mount Doane, named after Lieutenant Doane, commanding our escort . . . the other . . . we named Mount Stevenson, in honor of Mr. James Stevenson, Dr. Hayden’s chief assistant, upon whose efforts much of the success of the expedition depends.”—Albert Peale, Philadelphia Press, Oct. 25, 1871

The Columbine Creek Fire, which burned 18,500 acres in summer 2007, scars the Columbine Creek drainage below Mounts Doane and Stevenson, in this view from the Signal Hills, just east of Signal Point on Yellowstone Lake. Members of the Hayden Survey made note of several wildfires burning in Yellowstone during summer 1871, including one beyond the skylines of Doane and Stevenson.
Thursday, August 17, 1871

No. 284. MOUNTS DOANE AND STEVENSON. The first 10,118 feet above the sea, and the other but a few feet lower.*

* The Hayden Survey’s first estimation of Mount Doane’s elevation was off by only about 500 feet, as the mountain is today measured at 10,656. Though Mount Stevenson appears slightly higher in these photographs because it is a half mile closer, its elevation of 10,352 feet is 304 feet shorter than its neighbor to the northeast.
This is a best guess for the location where Jackson made his two photographs of Mounts Doane and Stevenson, as no tangible landmarks in the foreground could be found to help line up the scene. It is believed, however, that this is within a few yards of where Jackson and survey physician and general assistant Charlie Turnbull stood in the Signal Hills, east of Yellowstone Lake.
No. 285. VIEW LOOKING UP THE SOUTHEAST ARM, with Promontory Point in the center.
"So far as beauty of scenery is concerned, it is probable that this lake is not surpassed by any other on the globe."—Ferdinand V. Hayden, "The Wonders of the West—II"35

Many of the large boulders of volcanic rock remain on the left edge of this image looking south toward The Promontory from Signal Point, while others have succumbed to the relentless lashing of waves on the east shore of Yellowstone Lake.
No. 286. VIEW LOOKING UP THE SOUTHEAST ARM, the waters of the bay extending far away into the distance.
Three separate fires ravaged the northern end of The Promontory in summer 2007, burning 1,638 acres—one of the few visible changes is this scene. While some new trees have sprouted on the east shore of the lake, at the left side of this photograph, many of the rocks and boulders that extend into the lake remain unmoved.
No. 287. VIEW LOOKING UP THE SOUTHEAST ARM. In the foreground on the left the basalts are shown, where detached masses of breccia extend out into the lake.
“The lake seems to have beaten against the shore, and worn away a large portion, leaving a bluff wall 50 feet high above the water level. A large mass of the conglomerate has been cut off by the waves, and left in the lake 100 feet from the bluff shore.”—Ferdinand V. Hayden, *Fifth Annual Report*

Many of the rocky outcroppings in the foreground of Jackson’s photograph have broken down, but some are still present in the foreground of this view looking south across the Southeast Arm of Yellowstone Lake from Signal Point. A plume of smoke from the North Buffalo Fire, burning in summer 2012 almost 30 miles south of the lake, billows into the stratosphere at center right. The tree seen on the shoreline at the left side of Jackson’s photograph has long since died, but its stump and roots still cling to the shoreline.
Wednesday, August 23, 1871

No. 288. EARTHQUAKE CAMP, near Steamy Point, east side of Yellowstone Lake, so named from several slight shocks of earthquake, which were experienced at this place on the night of the 19th of August, 1871.*

The party stayed in this location for four nights from August 19 to 23, 1871, after completing their circumnavigation of Yellowstone Lake. The frame of the Anna, which the party cached here after leaving the lake, and the survey's odometer (No. 301) are both visible in Jackson's image. Smoke from the campfire in front of the tent at center left was likely added during the printing process.

* Peale's entry for August 20 states the party felt the first earthquake at about 1 a.m. that morning, so Jackson's description that it was felt "on the night of the 19th of August" wasn't entirely off base. Peale continues to note that they experienced several earthquakes, some stronger than others, during their four-night stay at this camp.
“Our tents are pitched on bluffs some distance above the level of the lake, on a beautiful lawn, dotted with grand old spruce trees, whose symmetry would have been an ornament to the finest park.”—Albert Peale, *Philadelphia Press*, Oct. 25, 1871

The East Entrance Road now traverses the location of the Hayden Survey’s “Earthquake Camp” near Steamboat Point. The 26-mile road between Fishing Bridge Junction and East Entrance Station is one of five points of entry into Yellowstone, providing access to the park from Cody, Wyoming, via Sylvan Pass.
No. 289. MARY’S BAY,* east shore of Yellowstone Lake, showing one of the numerous beautiful curves (as perfect as if drawn by the hand of art) of the shoreline.

* The name Mary Bay—named after Mary Force, a friend of survey artist Henry Elliott—was transferred to the larger bay to the northwest by Hayden in 1878." The bay pictured in Jackson’s image is today named Sedge Bay.
“We have explored, with much care and detail, one of the most beautiful lakes in the known world.”—Ferdinand V. Hayden, *Fifth Annual Report*  

Jackson took this photograph of Sedge Bay just downhill from the location of the survey’s “Earthquake Camp,” pictured in No. 288. Much of Lake Butte—seen directly across the bay—and the surrounding landscape was burned by the East Fire in summer 2003.
August 19–22, 1871

No. 290. STEAMY POINT [Steamboat Point], east shore of the lake, near its outlet. Numerous steam vents abound here, which are in operation constantly, sending off steam with a noise like that of the escape pipe of a steamboat.
“There are a number of steam jets . . . from two of which there issue vast columns of steam with great force, making a good bit of noise. The resemblance to a steamboat letting off steam is perfect.”—Albert Peale’s journal, Aug. 20, 1871

Erosion has slowly worn away the softer sediments at Steamboat Point to reveal the southern tip of Lake Butte, but the harder volcanic rock in the foreground has resisted the waves on the northeast shore of Yellowstone Lake. The stonework at the Steamboat Point parking lot and overlook can be seen at upper left as the Point Fire, right, burns along the east shore of the lake in September 2011.
No. 291. PELICAN’S ROOST, near Steamy Point. A detached mass of the hot spring deposit, which has been cut off from the mainland by the action of the waves, and left in the lake one hundred feet from the shore.
Thursday, July 14, 2011

“The rock [at Steamboat Point] is of volcanic origin, immense masses of which are distributed in wild confusion along the shore.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

Jackson incorrectly identifies the large detached mass of rock in this image as Pelican Roost, which is actually located about a mile and a half offshore, to the southeast. The original photo point for this image, about 10–15 yards to the right of where this photo was taken, has been destroyed by erosion from the relentless lashing of waves on the northeast shore of Yellowstone Lake.
Peale is the small figure seen at center right of Jackson's photograph of Flat Mountain Arm on Yellowstone Lake, taken the day after the survey departed the geyser basin at West Thumb. The downed mature lodgepole pine trees that crisscross the foreground of this scene suggest that a fire may have swept through the area a few years prior.
"The autumnal fires sweep through the dry pines at times so that many square miles are covered with dead trees. These are soon blown down by the winds, and their long bodies are loved upon each other in every possible direction. Sometimes these fallen pines are piled up in a sort of irregular net-work, for six or eight feet in height, presenting insurmountable obstacles in the way of the traveler."—Ferdinand V. Hayden, "Wonders of the West—II"  

The hillside at the west end of Flat Mountain Arm, which appears relatively open and sparse in the 1871 photograph, is now covered with dense trees, blocking Jackson’s original view (right, N44°21.831' W110°27.098'). The closest alternative view (above) is a few hundred yards downhill, just back from the shore of Yellowstone Lake.
No. 293. THE HIDDEN LAKE, within a quarter of a mile of Yellowstone Lake, and near the camp in [Nos. 270–272]. It is about a mile in length, entirely hidden among the dense pines, and might easily escape notice.
“[W]e struck up into the woods and came across a small lake about half a mile long and about a third of a mile in width. It is not far back from [Yellowstone] Lake and is very pretty indeed.” — Albert Peale's journal, Aug. 8, 1871

Jackson's description of this photograph as “the hidden lake” has misled many historians into thinking that this is the body of water with the proper name Hidden Lake, just northwest of Yellowstone Lake's Flat Mountain Arm. Jackson's photo No. 293 is actually a view from the west shore of Duck Lake, located near the West Thumb Geyser Basin. A short trail from West Thumb leads to the east shore of the lake, and an old service road leads down to the west shore from a pull-out on the Grand Loop Road, about a third of a mile north of its junction with the South Entrance Road, near West Thumb.
"On [the] Fire Hole River, a tributary of, and sometimes called, the Madison, are the principal ones of the famed spouting geysers. Our time being very limited indeed, we only have a few views of the craters of the most noted geysers. For a more extended list, see catalog for 1872."—William H. Jackson, Miscellaneous Publications, No. 5.

After establishing their first camp on the northwest shore of Yellowstone Lake near the outlet of the river (No. 269), Hayden took a small group of survey members and struck west on July 31, 1871, traversing the Central Plateau to the geyser basins on the Firehole River. Jackson and Moran, who had fallen behind the main party while enthusiastically photographing and sketching at the Grand Canyon, the Crater Hills, and Mud Volcano, caught up to the group Hayden left at the first camp at Yellowstone Lake on August 1. The following day, this party moved south along the lake, eventually reaching the West Thumb Geyser Basin (Nos. 270–277) on August 5, where they established another camp. On August 7, Jackson, Moran, and other members of the survey traveled west to the Upper Geyser Basin on the Firehole River to rendezvous with Hayden. Once there, they had but one day—August 8—to sketch and photograph. Jackson was able to capture only one geyser in eruption, the Grotto (No. 298), before he had to return to the camp at West Thumb. Moran left the Yellowstone region from the Upper Geyser Basin via the Madison River with part of the military escort that had been recalled to Fort Ellis.

* Jackson was able to extensively photograph the geyser basins when he returned to the newly established Yellowstone National Park with the Hayden Survey in summer 1872.
No. 294. CRATER OF THE CASTLE GEYSER. Bearing a strong resemblance to an old castle, but of the purest white marble. This view, taken from the side opposite the river, shows the main portion to be composed of very thin lamina of silica. The entire mound is about forty feet in height.
“In point of beauty we must yield the palm to the ‘Castle.’ It is situated in the center of a large and gently sloping mound of the siliceous deposit. Its crater rises above this about twenty-five feet fashioned in turrets, whence its name. Some of them are broken down, as thought the ‘Castle’ had been subjected to a bombardment. It is about fifty feet in length, and is encrusted with a bead-like formation. The water gushes from it every few hours, making a great deal of noise.”—Albert Peale, *Philadelphia Press*, Oct. 19, 1871

Vandals plagued the geyser basins in Yellowstone for several years after the park’s establishment. The despoilment of Castle’s crater, while severe, is relatively unnoticeable in this photograph of the geyser’s south side. However, the ornate, globular formations on the opposite side of the cone, seen in one of Jackson’s photographs from the survey’s third trip to Yellowstone in 1878, have been ravaged and plundered.

Capt. William Ludlow of the US Army and his team of engineers bore witness to “the utter ruthlessness of these sacrilegious invaders of nature’s sanctuary” during their reconnaissance of the park in 1875:

“[Castle Geyser] showed . . . how greatly protection against vandalism is needed. From every part of the ‘Castle’ pieces had been chopped, loosening great quantities of the rock and threatening to ruin the construction. Two women, with tucked-up skirts and rubber shoes, armed, one with an ax, the other with a spade, were climbing about. Should this continue for another year or two, the beauty of form and outline of the geyser-craters would be destroyed. It should be remembered that these craters were constructed with the greatest slowness by almost imperceptible additions, which can only be made by a discharge from the geyser; while the material, though hard, is very brittle and easily knocked to pieces.”
Tuesday, August 8, 1871

No. 295. CRATER OF CASTLE GEYSER. A view from the river side. Here we see the peculiar crystallization of the silica in large globular masses, like spongiform corals, and running off into the usual exquisite bead-work to the laminated base. On the right, close to its base, is a small but very active and turbulent little geyser [Tortoise Shell Spring], probably an offshoot from the greater one. In the center of the view, and the most striking object in it, is the beautiful hot spring [Crested Pool], with elegantly carved border and water of the clearest turquoise blue. It is nearly circular, about twenty-five feet in diameter, and funnel-shaped, passing down to a depth of sixty feet in the center. The water is of almost unnatural clearness, and the varying depth gives a most beautiful gradation of color. It has a constant temperature of 172 degrees.*

The man climbing the crater of Castle Geyser is likely Thomas Moran. The artist wrote in his diary that he worked with Jackson to make photographs at the Upper Geyser Basin, making this the final picture of Moran in Yellowstone in 1871 before he left the region with Lieutenant Doane. An alternate version of this photograph, without the figure on the crater, appears in Jackson's four-volume set of albumen prints at the Yellowstone Heritage & Research Center.

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* Crested Pool is measured today at 42 feet deep. The thermal feature's temperature has fluctuated greatly since the Hayden Survey took their reading of 172 degrees Fahrenheit in 1871, ranging from 200 degrees prior to the 7.4-magnitude Hebgen Lake earthquake in 1959 to 155 degrees for several years after.
“Fifty yards east of the castle-crater is a beautiful deep spring of very hot water, of great depth, having a raised and scalloped rim a few inches in height, and 20 feet in diameter. This cavity contains perfectly transparent water, though of blue color, and appears to be a hundred feet in depth.”—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*  

Part of the intricate boardwalk system at the Upper Geyser Basin, essential for keeping visitors safe and preserving the thermal features, now stands between Crested Pool and Castle Geyser. The pool boils every few minutes, with some of the more intense boils reaching upward of a few feet. On rare occasions, Crested Pool has been known to boil water up to 10 feet high.  

Castle Geyser sits on one of the largest formations of sinter mineral deposits in the world, estimated to be several thousand years old. It erupts in roughly ten- to twelve-hour intervals, spouting water up to 90 feet high.
CRATER OF THE GIANT, located about a quarter of a mile below the Castle.*
It is about ten feet in diameter at its base and twelve in height, with an orifice of about three feet in diameter. It projects a column of water to a height of from 125 to 150 feet, the eruptions lasting about two hours.

* Giant Geyser is about a half mile downstream from Castle Geyser.
“One [geyser] has a large crater, 5 feet in diameter, shaped something like the base of a horn, one side broken down, the highest point being 15 feet above the mount on which it stands. This proved to be a tremendous geyser, and has been called the ‘Giant.’ It throws a column of water the size of the opening to the measured altitude of 130 feet, and continues the display for an hour and a half. The amount of water discharged was immense.” — Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*

Close comparison of Jackson’s photograph of the crater of Giant Geyser to this image taken in 2012 shows marked changes, some probably natural but others undoubtedly human-caused. Several large pieces around the crater’s rim and base have broken away.
No. 297. CRATER OF THE GROTTO, a few rods* below the Giant, and ensconced in a grove of trees. It differs externally from all the other craters, but, like them, consists of a mass of silicious sinter, twelve feet in diameter and five feet high, full of large sinuous orifices, from which the water is projected during an eruption.

* A “rod” is a unit of length equal to 5 1/2 yards or 16 1/2 feet.
"This is an exceedingly intricate formation, 8 feet in height and 90 in circumference. It is hollowed into fantastic arches, with pillars and walls of almost indescribable variety." — Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*  

The odd-shaped crater of Grotto Geyser, named for the cavernous features in the formation, is situated about 150 yards northeast of Giant Geyser (No. 296). The club-like feature protruding from the center is theorized to be a tree stump covered with sinter—minerals deposited by hundreds, if not thousands of years of eruptions. Steam also emits from Rocket Geyser, at left.
Tuesday, August 8, 1871

No. 298. **THE GROTTO IN ERUPTION.** throwing an immense body of water, but not more than forty feet in height. The great amount of steam given off almost entirely conceals the jets of water.

Due to limited time at the Upper Geyser Basin, the Grotto was the only geyser Jackson was able to photograph in eruption in summer 1871. Just as he did on his photograph of Mud Geyser (No. 264), Jackson drew lines on his negative of Grotto Geyser in eruption to simulate water being expelled from the crater.
The eruptions of Grotto Geyser can last anywhere from one to twenty-four hours and can splash water more than 40 feet high. The length of Grotto's eruption will often determine the duration of nearby Rocket Geyser, seen here in eruption with Grotto.

Capt. Ludlow also took note of vandalism that plagued the Grotto's crater in the report from his 1875 reconnaissance:

"after seeing the injury done to its crater by visitors . . . we could not help wishing that the discharge of boiling water were absolutely continuous, so that the depre-
dators might be kept at a respectful distance."

In 1886, the US government finally stepped in and sent the US Army to administer the park to stem the destruction of the geysers and protect Yellowstone's wildlife from poachers.
"[We] resumed the march toward the East Fork [Lamar River], continuing in a northeasterly direction. Very little was known of the intervening country, though it was generally understood that a high mountain range would have to be crossed; that there were deep and rugged ravines, with masses of heavy timber to be passed through . . . after climbing a short steep ascent, we found ourselves on the crest of the divide between the Yellowstone and the East Fork, 10,000 feet above the sea and 2,000 feet above the valleys of these rivers. The descent of the valley of the East Fork was over a rolling country, a good deal cut up by ravines and water-courses. The distance from the crest of the ridge to the valley was about six miles, and the difference of elevation 2,300 feet. The last two miles were very steep and rocky, and severely worried the animals. The horse of one of the escorts gave out before ascending the crest of the divide, and had to be abandoned. We entered the valley at the junction of two branches of the East Fork, one coming in from the east [Soda Butte Creek], the other from the southeast [Lamar River]. The valley at the forks of this stream is four miles wide, and is a rolling prairie, with groves of trees and thickets of willows along the river banks. The larger branch forks about three miles up, and still a few miles above breaks into numerous small streams, finding their sources in the high mountain range to the east. Many peaks of this range are distinctly seen from this part of the valley. They are very conspicuous, rising probably more than 12,000 feet above the sea."—Capt. John W. Barlow, *Reconnaissance of the Yellowstone River*
Thursday, August 24, 1871

No. 299. CAMP UPON THE SUMMIT OF THE DIVIDE, between the head of the East Fork and the main Yellowstone, by the side of a little lake [Mirror Lake], 8,700 feet above the sea.*

The campfire seen in this photograph is shown still emitting smoke in Nos. 300 and 303.

* Mirror Lake is measured today at an elevation of 8,961 feet.
"We then struck across the country traveling until we reached a very beautiful small Lake on which we camped about [half] past 4 o'clock."—Albert Peale’s journal, Aug. 23, 1871

Upon leaving Earthquake Camp on Yellowstone Lake (No. 288) on August 23, the Hayden Survey traveled north/northeast in Pelican Valley to the head of Pelican Creek, then climbed onto what is today the Mirror Plateau, eventually camping at Mirror Lake. Today, the water level at the lake is much higher than it was in 1871, covering the shoreline where the survey members pitched their tents. First called Divide Lake for its location on the divide between the Yellowstone and Lamar River watersheds, it was renamed Mirror Lake for its propensity to reflect its surroundings.
No. 300. **ANOTHER VIEW of the same lake.**

An unidentified figure can be seen kneeling by the western shore of the lake, just left of the smoldering campfire.
“From the divide the view is far extended and very fine . . . We camped at night on the summit of the divide, between the valleys of the East Fork and the main Yellowstone, by the side of a little lake 10,000 feet above the sea.”—Ferdinand V. Hayden, *Fifth Annual Report*

The higher water levels at Mirror Lake seen in this 2012 photograph show the shoreline extended several yards to the north. The Clover-Mist Fire swept through the area during the great 1988 fire season, ultimately burning more than 140,000 acres northeast of Yellowstone Lake. Mirror Lake remains one of Yellowstone’s most remote locations, about 3½ miles from an established trail and more than 9 miles from the nearest trailhead in Lamar Valley.
Thursday, August 24, 1871

No. 302. OUR HUNTERS, José and Joe Clark, returning from a successful hunt, with pack-animal laden with elk meat.

“Joe [Clark] and José came in [to camp]. They had gone out early for the deer and Elk they had killed. They stayed behind for Jackson to photograph separately.” — Albert Peale’s journal, Aug. 24, 1871
The sloping geography in the background of Jackson’s photograph of hunters Joe Clark (left) and José on the Mirror Plateau closely resembles that seen by turning about 180 degrees from the photo point of No. 299, supporting Peale’s journal entry that the photo of the survey’s hunters was taken at the lake. Because people seldom visit Mirror Lake or the Mirror Plateau today, the elk and bison that still roam the area are much more skittish than those in places frequented by humans, like Hayden Valley and Mammoth Hot Springs.
“When all the packs were ready we all mounted and formed a line along the Lake and Jackson took two views of it.”—Albert Peale’s journal, Aug. 24, 1871

Lt. Gustavus Doane is shown leading the party away from Mirror Lake, followed by Hayden, Stevenson, chief topographer Anton Shönhorn, Goodfellow (with the odometer), and the rest of the survey and military escort.
Due to the higher water level at Mirror Lake today, the spot where the Hayden Survey lined up in a pack train along the west shore is now submerged. Numerous blowdowns of mature lodgepole pine trees burned by wildfires and the lack of an established, maintained trail make for slow and arduous travel to the lake and across the Mirror Plateau.
No. 305. THE CONE OF AN EXTINCT HOT SPRING OR GEYSER [Soda Butte] upon the East Fork of the Yellowstone.* A very curious mammiform mound, of about forty feet in height.

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* Soda Butte is not on the Lamar River—known in 1871 as the East Fork of the Yellowstone River—rather it is located on Soda Butte Creek.
“Upon the east branch there are a few interesting ruins of springs. There is one very curious mammiform mound, about forty feet high, built up by overlapping layers, like the ‘Cap of Liberty’ on Gardiner’s River, only by much less hydrostatic force.”—Ferdinand V. Hayden, *Fifth Annual Report*.  

Jackson took three photographs of Soda Butte, the extinct geyser on the Northeast Entrance Road about 2¾ miles east of the confluence of Soda Butte Creek and the Lamar River. At first glance, the formation appears relatively unchanged, but closer comparison shows a number of pieces broken away, and a fracture visible at the top in Jackson’s 1871 photograph has widened considerably.
No. 306. THE CONE OF AN EXTINCT HOT SPRING OR GEYSER. The material is principally calcareous . . . built up by overlapping layers like the Cap of Liberty on Gardner's River.

The man standing at the base of Soda Butte is probably Peale but could also be the survey's general assistant, Charlie Turnbull.
"This cone is a complete ruin. No water issues from it at the present time, and none of the springs in the vicinity are above the ordinary temperature of brook-water."—Ferdinand V. Hayden, *Fifth Annual Report*

"The Northeast Entrance Road now runs through the spot where Jackson made this photograph of Soda Butte, and a roadside pullout covers the sagebrush that is shown in the foreground of Jackson's image. The top of Soda Butte has partially crumbled away, likely a combination of natural and human influence. Mount Norris is seen in the distance, just above and right of the formation."
No. 307. THE CONE OF AN EXTINCT HOT SPRING OR GEYSER. No water issues from the cone at the present time, and none of the springs in the immediate vicinity are above the ordinary temperature of brook-water.

Smoke from forest fires burning in the area may have obscured the far horizon in this photograph, and Jackson may have darkened or drawn the mountains on this print by hand, which may explain the slight variations of the skyline behind Soda Butte between this photograph and its contemporary counterpart.
“Here we spent one day exploring the east branch of the East Fork, which has its sources high among the most rugged and almost inaccessible portions of the basaltic range. There are several wonderfully jagged peaks about the sources of this branch, which rise up 10,000 to 11,000 feet above the sea.”—Ferdinand V. Hayden, *Fifth Annual Report*¹

Soda Butte Creek still flows west toward the Lamar River, in the foreground of both images, and a historic tour bus cruises along the Northeast Entrance Road at left, near where a pair of horses are seen in Jackson’s photograph. The 29-mile road that runs through Lamar Valley between the Northeast Entrance and Tower Junction is one of the few park roads open to wheeled vehicle traffic in the winter. Barronette Peak¹⁹ rises in the distance, on the skyline at center left, while Abiathar Peak looms to the northeast, just above and left of the Soda Butte cone. The summit of The Thunderer is visible near the edge of the frame at far right.
No. 301. THE ODOMETER, made by attaching a pair of shafts to the fore wheels of an ambulance, to the spokes of which were attached the instruments that recorded their revolutions, and measured the surface of the country over which we passed. These were the first wheels that were ever taken into this little-known region.

“The ‘velocipede’ is a sort of go-cart, made from the wheels of one of our ambulances by attaching two of them to a pair of shafts, placing the wheels about three feet apart, and letting the shafts project backward, forming handles by which the whole can be lifted over such fallen timber as the mule attaches is unable to surmount. On one of the wheels the odometer is placed. It is no easy task to manage this arrangement, especially where the timber is very thick, and often it becomes wedged between two trees, requiring the utmost strength to extricate it.”—A. Peale, Philadelphia Press, Oct. 19, 1871¹⁶

Jackson likely took this photograph of F. L. Goodfellow with the odometer on August 15, as the survey was at “Camp Hovey” near Signal Point, on the east shore of Yellowstone Lake (photo Nos. 285–287). Peale wrote in his journal on that date, “Jackson and I came back to Camp and I assisted him in taking pictures. We photographed Goodfellow and his go-cart.”¹⁷ Why it was placed at this point in the 1871 Series is unknown.

This is one of only two of Jackson’s 1871 Yellowstone photographs where the original photo point could not be found, the second being No. 304 of an elk shot by one of the survey’s hunters.
No. 304. **AN ELK, Cervus Canadensis.** Very abundant about the lake. The one shown in the view is two years old, with horns still in the velvet.

“We passed the Elk that Smith shot and when Jackson came along he photographed him.”—Albert Peale’s journal, Aug. 24, 1871

This photograph, the second of only two from the 1871 Series without a contemporary comparison, was taken after the party left Mirror Lake and headed east toward Lamar Valley. Peale’s journal entry for August 24 reads in part, “We passed the Elk that Smith shot and when Jackson came along he photographed him.” Therefore, Jackson’s description that elk were “very abundant about the lake” is probably a reference to Mirror Lake.
7

AFTER THE SURVEY
When it comes to the legacy of Yellowstone, the significance of the 1871 Hayden Survey is nothing short of monumental. The idea to preserve Yellowstone for public use had been floated on a couple of occasions in years prior, however, they remained little more than casual suggestions and would never evolve into an effort to withdraw the region from settlement. It wasn’t until the Hayden expedition returned from Yellowstone in fall 1871 that the concept of a national park became a realistic possibility.

After leaving the western territories and arriving in Washington, DC, Ferdinand V. Hayden and several members of his team began the arduous process of cataloging and examining the thousands of specimens they gathered that summer. The survey had collected rocks, flora, bird specimens, skins of animals, and samples from Yellowstone’s thermal features. Albert Peale’s meticulous report would be the first scientific study of the composition and temperature of a vast number of Yellowstone’s geysers and hot springs. Survey artist Henry Elliott contributed numerous panoramic drawings of the expedition’s route from Ogden, Utah, to Yellowstone, and guest artist Thomas Moran created watercolor paintings from his field sketches. Meanwhile, Jackson and his assistants busied themselves making photographic prints, preparing to give the American public their first look into one of the most mysterious regions in the West.

In late October, Hayden received a letter at his Washington, DC, office—signed by those with financial interests in the Northern Pacific Railroad—suggesting that he include in his official report a recommendation that Congress craft legislation to set aside Yellowstone’s most dramatic features as a national park. Railroad investors obviously had a motive to capitalize on the throngs of tourists who would visit the region by rail, but Hayden shared the general sentiment for Yellowstone’s preservation and began lobbying friends in influential political circles. Nathaniel Langford, who clearly had a way with words, joined...
him in the effort; Langford's speech about the Yellowstone earlier that year contributed to Hayden's decision to explore the region.  

A pair of identical draft bills—S. 392 and H.R. 746—were introduced in their respective houses of Congress in mid-December, and the broader effort to secure the legislation's passage began. Hayden arranged for a display in the Capitol Rotunda of scientific specimens gathered during the expedition, but perhaps among the more important items present were Jackson's photographs.  

Without them, skeptics may have dismissed descriptions as poetic exaggeration, even though Hayden was one of the most respected geologists of his time. Hayden himself admitted several times that much of Yellowstone's landscape was beyond words. Jackson's photographs—some of which Hayden likely circulated to influential senators and congressmen—served as tangible proof that the curiosities of Yellowstone were no embellishment.  

Also on display—and certainly no less important—were several of Moran's sketches and paintings. Each artistic medium truly complemented the other; Jackson's pictures captured the reality of Yellowstone's remarkable landscape while Moran's paintings expressed vivid colors that a black-and-white photograph could not.

As the year turned to 1872, support for the park picked up considerably. Bill S. 392 cleared its first hurdle in little more than a month after introduction, passing the Senate on January 30. It was then sent to the House of Representatives, which waited until late February to consider the legislation. In the meantime, congressmen and the public could digest Hayden's just-published official report as well as his article "The Wonders of the West—II," in the February 1872 edition of *Scribner's Monthly*. The final sentence of the *Scribner's* piece directly challenged the US Congress to take action on the proposed legislation:

*Why will not Congress at once pass a law setting [Yellowstone] apart as a great public park for all time to come, as has been done with that not more remarkable wonder, the Yosemite Valley?*

This was a reference to the Yosemite Grant Act (1864), which ceded ownership of the Yosemite Valley from the federal government to the State of California under the condition that it be set aside for public use as a state park. Being a similar concept—preservation of government land primarily for the enjoyment and use by everyone—the language in the Yosemite Grant was undoubtedly used as a model for the 1872 Yellowstone Act. The main difference between the two was simply that Yellowstone would be under federal (not state) administration.

On February 27, the House passed its version of S. 392, sending it to the desk of President Ulysses S. Grant for his signature and final approval, which he delivered three days later, thus designating Yellowstone as the world's first national park on March 1, 1872.

No single item or person from the 1871 Hayden Survey can be credited with the creation of Yellowstone National Park. Jackson's photographs, however, deserve credit for eliminating any skepticism that might have remained about the validity of the region's fabled wonders. They are therefore a significant contributor among the larger body of evidence to make the case for Yellowstone's preservation.

The withdrawal of the Yellowstone region from settlement would have almost immediate ramifications. More than 2,000 miles away from the nation's capital, the entrepreneurs Hayden's party encountered the previous summer had been busy furthering their plans to develop Mammoth Hot Springs, billing them as a healing destination where visitors could purportedly find relief for a variety of ailments. Matthew McGuirk promoted McGuirk's Medicinal Hot Springs on a plot of land where runoff from Mammoth enters the Gardner River. Uphill from McGuirk, partners James McCartney and Henry Horr built a ranch, and later a hotel, at the base of the Mammoth terraces themselves. The federal government would eventually invalidate McCartney and Horr's occupancy, and most of the buildings they constructed were destroyed by 1881. McGuirk's claim for 160 acres surrounding his operation—filed just
eight days after President Grant signed the Yellowstone Act—was rejected. He was evicted from the park in summer 1874 by none other than Nathaniel Langford, who became Yellowstone’s first superintendent two years earlier after helping Hayden usher the park’s enabling legislation through Congress.

The feelings expressed by early visitors to Yellowstone National Park have transcended generations. Langford’s article “The Wonders of the Yellowstone,” in the May and June 1871 issues of *Scribner’s Monthly*, was the first widely published description of that mystical region. He undoubtedly used this material as he lectured to a skeptical public about what he had experienced during his first foray into Yellowstone in summer 1870. It is obvious he was attempting to express the astounding nature of what he had seen, but in his description of the Lower Falls and the Grand Canyon of the Yellowstone he admitted, like Hayden, that such things are beyond words:

*The Great Falls are at the head of one of the most remarkable cañons in the world—a gorge through volcanic rocks fifty miles long . . . and the river, broken into rapids and cascades, appeared no wider than a ribbon. The brain reeled as we gazed into this profound and solemn solitude. We shrink from the dizzy verge appalled, glad to feel the solid earth under our feet, and venture no more, except with forms extended, and faces barely protruding over the edge of the precipice. The stillness is horrible. Down, down, down, we see the river attenuated to a thread, tossing its miniature waves, and dashing, with puny strength, upon the massive walls which imprison it. All access to its margin is denied, and the dark gray rocks hold it in dismal shadow. Even the voice of its waters in their convulsive agony cannot be heard. Uncheered by plant or shrub, obstructed with massive boulders and by jutting points, it rushes madly on its solitary course, deeper and deeper into the bowels of the rocky firmament. The solemn grandeur of the scene surpasses description. It must be seen to be felt. The sense of danger with which it impresses you is harrowing in the extreme. You feel the absence of sound, the oppression of absolute silence . . .

. . . and you would rise from your prostrate condition and thank God that he had permitted you to gaze, unharmed, upon this majestic display of natural architecture.*

If one had never seen the Grand Canyon of the Yellowstone, it would be easy to dismiss Langford’s description as a romantic embellishment. However, a visit to the canyon rim proves this is not the case. Whenever I see the Grand Canyon, I experience the same feelings that Langford evoked more than 140 years ago: a mixture of excitement, fascination, and just a little fear. I think fear is what makes it exciting. Even at the popular overlooks, where thousands of tourists crowd the edges every day to view the Lower Falls and the Grand Canyon, there isn’t a lot of talking. I would like to think it is because they are having a similar experience—that they too are at a loss for words.

This is the lesson these contemporary comparisons to Jackson’s 1871 photographs can teach us. Because of the vision of a few people in the winter of 1871–1872, the wonders of the Yellowstone have captivated millions. My wife and I had our first child in December 2013 and a second in February 2016, and I am glad to know that my daughter and son, my grandchildren, and beyond will have the opportunity to see a Yellowstone that is more-or-less unchanged from when I first experienced it as a child—and from when Jackson first photographed it almost a century and a half earlier. In that regard, we’ve been given a gift. But it is also a reminder that Yellowstone doesn’t really belong to us. It always belongs to future generations, and we are merely stewards of the world’s first national park. Yellowstone, with all its rivers, canyons, geysers, mountains, and lakes, was here for millions of years before we came along. It will remain for millions more when we are gone. But while we are here, it is ours to care for.
APPENDIX A
YELLOWSTONE ACT OF 1872

That our legislators, at a time when public opinion is so strong against appropriating the public domain for any purpose however laudable, should reserve, for the benefit and instruction of the people, a tract of 3,578 square miles, is an act that should cause universal joy throughout the land. This noble deed may be regarded as a tribute from our legislators to science, and the gratitude of the nation and of men of science in all parts of the world is due them for this munificent donation.—F. V. Hayden, Fifth Annual Report

YELLOWSTONE ACT, 1872
An Act to set apart a certain Tract of Land lying near the Head-waters of the Yellowstone River as a public Park
Approved March 1, 1872 (17 Stat. 32)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the tract of land in the Territories of Montana and Wyoming, lying near the headwaters of the Yellowstone River, and described as follows, to wit, commencing at the junction of Gardiner's river with the Yellowstone river, and running east to the meridian passing ten miles to the eastward of the most eastern point of Yellowstone lake; thence south along said meridian to the parallel of latitude passing ten miles south of the most southern point of Yellowstone lake; thence west along said parallel to the meridian passing fifteen miles west of the most western point of Madison lake; thence north along said meridian to the latitude of the junction of Yellowstone and Gardiner's rivers; thence east to the place of beginning, is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park or pleasing-ground for the benefit and enjoyment of the people; and all persons who shall locate or settle upon or occupy the same, or any part thereof, except as hereinafter provided, shall be considered trespassers and removed therefrom. (16 U.S.C. § 21)

SEC 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable, to make and publish such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition. The Secretary may in his discretion, grant leases for building purposes for terms not exceeding ten years, of small parcels of ground, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all of the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, and their retention in their natural condition. The Secretary may in his discretion, grant leases for building purposes for terms not exceeding ten years, of small parcels of ground, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all of the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, to be expended under his direction in the management of the same, and the construction of roads and bridle-paths therein. He shall provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this act to be removed therefrom, and generally shall be authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this act. (16 U.S.C. § 22)
APPENDIX B

SOURCES FOR WILLIAM H. JACKSON’S PHOTOGRAPHS

William Henry Jackson’s Miscellaneous Publications, No. 5: Descriptive Catalogue of the Photographs of the United States Geological Survey of the Territories, for the Years 1869 to 1875, Inclusive lists, with some numbering discrepancies, 199 8 × 10 negatives and 107 stereoscopic negatives in his 1871 Series. Jackson undoubtedly made more photographs during the 1871 survey than are listed in Miscellaneous Publications, No. 5, however, most were likely duplicate images or may have been of lesser quality and therefore were not included in his official catalog.

Of the 199 8 × 10 photographs listed in the 1871 Series, 109 were made as the survey traveled from present-day Livingston, Montana, south along the Yellowstone River through what is today Paradise Valley, Montana, into the region that is today’s Yellowstone National Park. Jackson also made 30 of the 107 stereoscopic views listed in the 1871 Series during this portion of the expedition; however, since most of them were produced at the same locations as his 8 × 10 views (with some exceptions and variations), only Jackson’s 8 × 10 images were rephotographed for this project to avoid redundancy.

Several of Jackson’s photographs from the Hayden Surveys have been reprinted with various crops. For the purpose of this project, the image that is closest to the original was chosen so as to rephotograph, as closely as possible, what Jackson captured in 1871.

There are two primary sources for Jackson’s 8 × 10 photographs from the 1871 Hayden Survey: the National Archives and Records Administration in Washington, DC, and a four-volume set of albumen prints personally donated by Jackson to Yellowstone National Park in April 1932, which now resides at the Yellowstone Heritage and Research Center in Gardiner, Montana.

By far, the best source for Jackson’s photographs are the original 8 × 10 glass-plate negatives, currently housed at the National Archives in Washington, DC. Unfortunately, in 1875, several of the glass negatives for photographs listed in the official 1871 Series were lost when disaster struck Edward Bierstadt’s Photo-Plate Printing Company in New York City. Hayden had sent the negatives to Bierstadt to create several sets of Albert-types, made using a new printing method that could mass-produce photographs with relative ease. On January 13, a fire destroyed part of Bierstadt’s studio, including Jackson’s negatives—most of which were Yellowstone views. Only a few sets of the Albert-type proofs survived.1

It is reasonable to assume that other negatives besides those lost in the fire may have been accidentally damaged beyond repair, given the fragile nature of glass collodion plates. Only about 50 of Jackson’s 1871 glass negatives from the Yellowstone region are accounted for at the National Archives.2 Some are alternate variations of official photographs in the 1871 Series—the negatives for
the official versions likely destroyed in the fire at Bierstadt’s studio. Examples of these “outtakes” that appear in this book include the image of James Stevenson and Chester Dawes in the *Anna* at West Thumb (No. 273) and the photograph of Castle Geyser and Crested Pool at the Upper Geyser Basin (No. 295). An additional seven negatives at the National Archives are 8 × 10 film sheets, possibly duplicates of the original glass plates or large-format photographs of albumen prints.

The negatives at the National Archives were scanned in such a way to yield a remarkably high-quality digital image containing rich detail across a large tonal range of highlights, midtones, and shadows. Many of these scans are easily identified in this book by a distinctive black-and-white ragged border, caused by tape that was applied to the negative to mask certain areas during printing. Jackson’s name and sometimes the catalog number assigned to the negatives are often seen written in the margins.

The remaining Jackson images in this book are scans or copy photographs of historic albumen silver prints—contact prints of the glass negatives themselves—acquired from various sources. The primary source was the collection of albumen prints Jackson personally donated to Yellowstone National Park in 1932. This four-volume set is one of the most complete known collections of Jackson’s 8 × 10 and stereoview photographs from the 1871 survey and may be among the earliest prints from the glass negatives. Some of the photographs in this set were seldom published widely. However, even this collection is missing six 8 × 10 photographs listed in the 1871 Series in *Miscellaneous Publications, No. 5*: A photo of Yankee Jim Canyon from the south (No. 207), two views of the Lower Falls of the Yellowstone River (Nos. 240 and 242), one photograph of the Upper Falls (No. 246), a yet-undiscovered or nonexistent photograph of Crystal Falls (No. 256), and a view of the Yellowstone River’s inlet into Yellowstone Lake (No. 279).

Other sources for Jackson’s 1871 Yellowstone images include the US Geological Survey Photographic Library in Denver, the Denver Public Library, and the Library of Congress in Washington, DC. These are also scans of albumen prints from volumes similar to those Jackson donated to Yellowstone. Some of these images were cropped less than those in Jackson’s four-volume set, such as Nos. 285 and 287. Since I preferred the most complete, uncropped version of any given photograph, I used the image that was cropped less.

This book contains all but one of the 109 8 × 10 photographs Jackson produced in Paradise Valley, Montana, and Yellowstone during the 1871 Hayden Survey and listed in the 1871 Series of *Miscellaneous Publications, No. 5*, the most complete and comprehensive collection of Jackson’s Yellowstone photographs from that year known to be published. The missing image is the aforementioned undiscovered photograph of Crystal Falls (No. 256), and extensive efforts to locate the photo were unsuccessful.

I contemplated whether to rephotograph Jackson’s 1871 images in black and white or color. It didn’t take long to conclude that, had the technology been available at the time, Jackson would have opted to photograph Yellowstone’s striking and vast palette as it naturally appeared. I also considered the photographic medium: whether to use a large-format film camera similar to Jackson’s or the latest digital technology. Ultimately, I determined that the emphasis of this project was the subject matter contained in the photographs and less about the cameras used to make them. Therefore, I used a 35mm digital SLR camera to rephotograph Jackson’s images.

All of Jackson’s 1871 photographs were toned for optimal reproduction and small dust specks and other minor imperfections were spotted out. However, major blemishes, such as the aforementioned damage from masking tape or cracks and scratches to the glass plates themselves, were preserved.
ON JUNE 13, 1980, I ARRIVED AT YELLOWSTONE NATIONAL PARK FOR THE FIRST TIME. I DROVE THROUGH THE SOUTH ENTRANCE ON MY WAY TO MAMMOTH, WHERE I WOULD BEGIN MY NEW JOB AS YELLOWSTONE’S PUBLIC INFORMATION OFFICER TWO DAYS LATER.

I was twenty-five years old and had driven across the country from Maryland. Once in Wyoming, near Rock Springs, I saw my first herd of pronghorn antelope. On to Dubois, where I saw my first moose, then over Togwotee Pass, catching my first glimpse of the magnificent Teton Range. Little did I know then that one day I would live, work, and raise my daughter at the base of those incredible mountains in Grand Teton National Park.

Some thirty-six years later, every mile in and around Yellowstone holds a memory for me. Now, with the benefit of hindsight, I can testify that Yellowstone changed me and set my life’s course, even on that very first drive. I was a neophyte city girl unfamiliar with free-roaming wild animals, spouting geysers, bubbling hot springs, and a canyon so breathtakingly beautiful it seemed painted on the land. My journey of discovering the wonders of Yellowstone began that June day as I gaped out the car window at bison, elk, geysers, and finally the otherworldly Mammoth Hot Springs that would form the backdrop to my daily life. Those first impressions of Yellowstone remain so vivid that I can still feel the same awe and wonder I experienced so many years ago.

I fell in love with everything Yellowstone and dedicated my days to sharing it with millions of people as the park’s spokesperson. I spoke for the bears and the bison, the hot springs and the geysers, the rivers and the lakes, the geology, the human history, and discussed gnarly issue battles like wolf reintroduction. In one particularly intense summer it was my job to explain the epic 1988 wildfires to the world, with many at the time fearing all of Yellowstone would go up in smoke. That didn’t happen, of course, and Yellowstone National Park endures for new generations to visit and fall in love with.

Even after working twenty-seven years at Yellowstone and neighboring Grand Teton National Park, I began a new journey of discovery with this book. Looking at page after page of contemporary comparisons to William Henry Jackson’s pictures from the 1871 Hayden Survey—among the first ever made in Yellowstone—I was totally enthralled and dumbstruck by all the details I was never aware of and never noticed before. Brad Boner helps readers understand the way Jackson turned a lens to capture a certain scene or how some spots show the subtle tumble of rocks over 140 years. Then there are landscapes that remain wonderfully the same, down to individual trees or the curve of a shoreline.

It is mind-boggling to trace the expedition’s journey through Jackson’s photos and contemplate what it must have been like for the Hayden Survey, not only to endure the rigors of travel but also to later try and explain the fantastical curiosities they had seen to a skeptical public. Jackson’s photos went a long way to provide real evidence to help convince Congress to set aside this incomparable place as the world’s first national park. And with the creation of Yellowstone, Americans so embraced the worthiness of protecting the country’s most extraordinary places that an entire system of national parks came into being.

Fast-forward through almost a century and a half since Yellowstone’s establishment in 1872: now, in 2016, there are 412 units of the National Park System—including 59 national parks, 128 national historical parks, 83 national monuments, 24 national battlefields, 10 national seashores, 18 national recreation areas, 19 national preserves, 4 national parkways, 4 national lakeshores, and 2 national reserves—spanning about 84 million acres with locations in every US state and several territories and receiving about 310 million visitors.

Facing page. Hundreds of tourists gather to watch an eruption of Old Faithful at the Upper Geyser Basin in Yellowstone National Park in August 2016, the centennial of the National Park Service.
annually. Clearly the national park idea that began with Yellowstone has proven wildly successful.

In his 1872 report to Congress, Nathaniel Langford, Yellowstone's first superintendent, wrote, “Our government, having adopted it, should foster it and render it accessible to the people of all lands, who in future time will come in crowds to visit it.” Since then, trains gave way to airplanes and wagons yielded to automobiles, allowing visitors to flock to Yellowstone in more ways and numbers than Langford could possibly have imagined. The crowds he predicted almost 150 years ago have arrived, and they have become so large that Yellowstone and many other national parks are feeling the pressure of hosting hundreds of millions of people every year.

When I began working in Yellowstone, park visitation was around 2 million people annually. Today it has more than doubled, setting records almost every year and approaching 5 million visitors. The popularity of the parks is exploding at a time when aging infrastructure, dwindling budgets, and reduced staffing make it challenging, if not impossible, to protect the very resources that inspired their creation. This is the core dilemma for the National Park Service, an agency with a mission that mandates both preservation of the resources and serving the visiting public—all on a shoestring budget that gets tighter each year.

As the sheer numbers of people trying to visit the most popular areas at the most popular times increase year after year, the growing fear is that our parks are “being loved to death.” Popular destinations have long lines of people, cars, and tour buses, all trying to get to the same spot to do the same activity or see the same thing at peak hours and in peak seasons. Roads are packed, parking lots are full, and trails and campsites are at capacity. This is especially true at the most popular parks such as Yellowstone, Yosemite, and Grand Canyon and historic sites like Independence National Historical Park, the Washington Monument, the Statue of Liberty, and many other NPS units throughout the country.

New national strategies are needed to protect our national parks long into the future. It may seem counterintuitive to turn visitors away at the very gate that is engraved with the most famous line in Yellowstone’s enabling legislation—that the park was created “for the benefit and enjoyment of the people”—but the reality is that Yellowstone and many other parks are often pushed beyond sustainable levels of visitation. It is certainly a conundrum for the National Park Service in the twenty-first century; the best way to experience and appreciate these treasures is undoubtedly firsthand, but their very survival depends on our restraint.

The technology exists today to create systems that would space out visitation, ultimately giving visitors a better experience while reducing human impacts on fragile natural and cultural resources. It simply may be time for people to make a reservation to visit the most popular and crowded national parks at peak season. And as a society, we must be willing to accept that not every desired activity or recreational pursuit should take place.

In addition to the pressure of hosting hundreds of millions of visitors every year, the National Park Service is facing a Congress that is increasingly unwilling to adequately fund America’s national parks. As of 2016—the Park Service’s 100th anniversary—Yellowstone alone has a $660 million backlog of infrastructure maintenance needs, a fraction of the almost $12 billion necessary throughout the entire system. Ideally, Americans who love the parks would send politicians to Washington who reflect their values, and sustaining our national treasures for new generations of visitors to discover would not be a partisan issue.

This book of rephotographs of William Henry Jackson’s first images of Yellowstone is reassuring to all of us who love America’s national parks. Despite the passage of 145 years since Jackson first took these photos, and well over 150 million visitors later, Yellowstone’s landscape and incredible resources are remarkably unchanged. In many respects we have Jackson to thank for visually communicating the reasons places like Yellowstone deserved protection and not exploitation. Brad Boner’s present-day images give witness to this feat. And while human impacts are exponentially greater in current times and there will always be squabbling over budgets and disagreement about new recreational uses, there is a unifying concept of preservation of these incredible places that must not be forgotten.

“National parks are the best idea we ever had,” wrote author and environmentalist Wallace Stegner. “Absolutely American, absolutely democratic, they reflect us at our best rather than our worst.” The underlying conclusion of Through the Lens of Time is that Yellowstone and the national park experiment are success stories, affirmations of the very idea of setting aside incredible places for preservation and public benefit. The National Park Service’s mission to protect and preserve Yellowstone and all of our country’s national parks remains a noble and viable goal, and an exemplar to the world—a best idea if ever there was one.

—Joan Anzelmo
Jackson Hole, Wyoming
Former Spokesperson, Yellowstone & Grand Teton National Parks
Former National Spokesperson, National Park Service, Washington, DC
Former Superintendent, Colorado National Monument
NOTES

FOREWORD

1. Merrill, Yellowstone and the Great West, 207.

INTRODUCTION

1. An Act to set apart a certain Tract of Land lying near the Head-waters of the Yellowstone River as a public Park, 17 Stat. 32 (1872).

CHAPTER 1

1. Haines, Yellowstone Story, 53–59 and Merrill, Yellowstone and the Great West, 10–11.
2. Haines, Yellowstone Story, 91–100.
3. Ibid., 101.
4. Ibid., 101–9 and Cramton, Early History of Yellowstone, 13.
5. Haines, Yellowstone Story, 109–27 and Merrill, Yellowstone and the Great West, 12.
6. Langford, ”Wonders of the Yellowstone,” 123.
8. Everts, ”Thirty-Seven Days of Peril.”
9. Haines, Yellowstone Story, 134–37; Merrill, Yellowstone and the Great West, 12–13; and Cramton, Early History of Yellowstone, 15–16.
10. Haines, Yellowstone Story, 137; Merrill, Yellowstone and the Great West, 13; and Cramton, Early History of Yellowstone, 17.
13. Haines, Yellowstone Story, 137–38.
14. Merrill and Merrill, Up the Winds, 9–11.
16. Merrill and Merrill, Up the Winds, 11.
18. Haines, Yellowstone Story, 86–89 and Merrill and Merrill, Up the Winds, 11.
20. Ibid., 13–14.
22. Merrill and Merrill, Up the Winds, 8.
24. Jackson, Pioneer Photographer, 10, 13–14, 42.
25. Ibid., 42–43.
29. Ibid.
30. Merrill, Yellowstone and the Great West, 70.
31. Ibid., 31–32 and Haines, Yellowstone Story, 141–42.
32. Haines, Yellowstone Story, 349n126.
33. Merrill, Yellowstone and the Great West, 18.
34. Ibid., 119–20.

CHAPTER 2

1. Merrill, Yellowstone and the Great West, 205; Brust and Whittlesey, ”Thomas J. Hine,” 14, 16 and Jackson, Pioneer Photographer, 73.
4. Ibid., xiv.
6. Jackson, Miscellaneous Publications, No. 5, 44.
10. Ibid., 41.

**CHAPTER 3**


For a list of equipment and materials required for wet-plate photography in the field, see

**CHAPTER 4**

1. Merrill, *Yellowstone and the Great West*.
2. Ibid., 169.
3. Ibid., 161, 170.

**CHAPTER 5**


**CHAPTER 6, SECTION I**

3. Guest artist Thomas Moran, who was traveling with photographer William Henry Jackson at this time, writes in his diary that they “did some photography in the Lower Cañon” (Nos. 200–202) on July 17 (Moran, diary, 6). The survey’s main party, including geologist-in-charge Ferdinand V. Hayden, did not pass through this area and instead entered Paradise Valley via Trail Creek, several miles to the south. Moran, Jackson, and survey manager James Stevenson had taken a side trip to the Crow Agency near Livingston, Montana, and intended to rendezvous with Hayden and the main group that evening at Bottler’s Ranch (Nos. 203 and 204) (Merrill, *Yellowstone and the Great West*, 258n4, 7).

5. Merrill, *Yellowstone and the Great West*, 121.
7. Ibid., 51.
8. Ibid.
9. Jackson arrived at the Bottler Ranch with Moran and Stevenson about 1:30 a.m. on July 18 and probably took this photograph later that day, as both Moran’s diary and Peale’s journal note Jackson and Moran left the ranch the morning of July 19 for Mammoth Hot Springs (Merran, diary, 6 and Merrill, *Yellowstone and the Great West*, 122–23). Though Jackson and the rest of the party returned to the ranch in the early evening of August 27 after more than a month in Yellowstone and stayed through the morning of August 29, this photograph probably wasn’t taken during that stay, as Peale, who is pictured in this image, was away climbing Emigrant Peak with survey artist Henry Elliott for most of the day on August 28 (Merrill, *Yellowstone and the Great West*, 175).

11. Neither Peale’s journal nor Moran’s diary mentions Jackson photographing the survey’s base camp at the Bottler Ranch, but both indicate Jackson arrived in the early morning hours of July 18 and left the morning of July 19 for the Yellowstone country (Merrill, *Yellowstone and the Great West*, 121–23 and Moran, diary, 6). On the return trip, Peale writes that they arrived at Bottler’s “between 4 and 5 o’clock” on August 27 and left the morning of August 29 (Merrill, *Yellowstone and the Great West*, 174–75, 178). The shadows in this photograph show it was taken in the early afternoon. Though it could have been made on either July 18 or August 28—the only days Jackson would have been at the ranch in the early afternoon—it was probably taken July 18, as Jackson already had his photographic outfit unpacked to take No. 203. Further, Jackson probably was busy most of August 28 making prints from the second half of the expedition (Merrill, *Yellowstone and the Great West*, 175).
13. Peale’s August 28 journal entry describes his ascent of Emigrant Peak with survey artist Henry Elliott in great detail: “We were told before we started that it could not be done, and indeed, by any other route than we took, it was impossible.” (Merrill, *Yellowstone and the Great West*, 175).
14. Moran, Jackson, and a few other survey members passed this area on July 19, likely in the morning, while traveling south on their way into the Yellowstone country, but Moran—whose party was traveling separately from Peale’s group—doesn’t mention any photographic work until the following morning, after they camped in Yankee Jim Canyon (No. 208) (Moran, diary, 6–7), about 3½ miles south of this location. However, Peale’s August 27 journal entry states he “overtook Jackson and [Charlie] Turnbull, who had been photographing” after passing back through Yankee Jim Canyon on the survey’s return journey to the Bottler Ranch. Since this photograph appears to have been taken in the early afternoon, and Peale’s journal indicates
they reached the ranch (about six miles north of this location) between 4 p.m. and 5 p.m. on August 27 (Merrill, Yellowstone and the Great West, 174–75), it is probable Jackson took this photo on that date. Jackson may have then placed it in this section of the 1871 Series for the sake of continuity of the survey’s route.

15. Barlow, Reconnaissance of the Yellowstone River, 7.

16. Moran notes photographing in Yankee Jim Canyon on the morning of July 20 (Moran, diary, 6–7). Peale’s journal entry for the same date indicates it was raining that morning (Merrill, Yellowstone and the Great West, 125), which is apparent in Jackson’s photograph, as there are no stark shadows and the mountains in the distance are obscured. Jackson’s photo Nos. 206–209, located between Yankee Jim Canyon and Devil’s Slide, about 6½ miles to the south, were also likely taken on this date, as Moran notes continuing south to Cinnabar Mountain and reaching Devil’s Slide on the evening of July 20 (Moran, diary, 7).

17. Merrill, Yellowstone and the Great West, 259n11.


20. Moran, diary, 3; Jackson, Time Exposure, 200–1; and Jackson, Pioneer Photographer, 71.


23. Peale noted in his journal that Jackson, his assistant George Dixon, Moran, guest photographer Joshua Crissman, and two other survey members left Bottler’s Ranch the morning of July 19 to get a head start on photographing scenes between the ranch and Mammoth Hot Springs (Merrill, Yellowstone and the Great West, 122). Moran’s entry for July 21 states the main party, which included Peale, caught up to their group at mid-morning, as they were photographing at Devil’s Slide (Moran, diary, 7).


CHAPTER 6, SECTION II

1. An extensive explanation for the differences in spelling between the Gardner River (named after fur trapper Johnson Gardner) and the town of Gardiner, Montana (named after the river), can be found in Lee H. Whittlesey’s Yellowstone Place Names. The short answer is that the correct spelling is “Gardner,” but Nathaniel Langford probably had heard the mountain man Jim Bridger, who knew the Yellowstone country well, pronounce the name phonetically as “Gard-e-ner” in the mid-1860s, so the name of the river—one of the oldest place-names in Yellowstone—appeared as “Gardiner” on maps for several decades. The name was officially changed back to the correct spelling around 1960. The town near Yellowstone’s North Entrance, however, retained its spelling as Gardiner. (Whittlesey, Yellowstone Place Names, 112). Interestingly, Capt. John W. Barlow spelled the name correctly throughout his brief report from the US Army Corps of Engineers’ 1871 expedition (Barlow, Reconnaissance of the Yellowstone River).


4. Both Moran’s diary and Peale’s journal indicate they arrived at Mammoth Hot Springs on the afternoon of July 21 and left July 24 (Moran, diary, 7 and Merrill, Yellowstone and the Great West, 128). Moran provides no information about when specific photographs were made at the springs, though it seems unlikely Jackson would have been able to photograph at Devil’s Slide on the morning of July 21, travel to Mammoth, and photograph there that same evening. Jackson himself hints that he didn’t begin photographing at Mammoth until the day after arriving at the hot springs [Jackson, Time Exposure, 198]. Moran states the party left Mammoth on the afternoon of July 24 for Tower Fall while Peale suggests they left shortly after breakfast, but the two were likely still traveling in separate groups at this time (Merrill, diary, 7 and Merrill, Yellowstone and the Great West, 132). Jackson probably did most, if not all, of his photographic work at Mammoth from July 22 to 23. Peale’s journal makes only vague reference to Jackson’s work around the hot springs, mentioning one photograph in his July 23 entry, where he and Moran are pictured (likely No. 225), and another, unknown image in which he appears with survey manager James Stevenson and Alec Sibley of the survey’s fourth mule team (Merrill, Yellowstone and the Great West, 131).


11. Ibid., 65.

12. Ibid., 66.

13. Ibid., 66.

14. Merrill, Yellowstone and the Great West, 128.


18. Whittlesey, Yellowstone Place Names, 79.

19. For reasons unknown, this scan of the original glass negative at the National Archives shows the image incorrectly labeled as No. 216. This may have caused some historians to believe Cupid Spring was also part of what some members of the survey called “Diana’s Bathing Pools,” but it is likely that name was instead a reference to Jupiter Terrace (Nos. 216 and 217). Peale also suggests that Jupiter Terrace and Diana’s Bathing Pools are one and the same, noting in Hayden’s Fifth

NOTES
Annual Report that the “lower terraces are . . . shallower and their basins filled with cooler water. We have the same form of natural bathing-basins of a pure white color. To these latter pools some of our party gave the names of Jupiter’s baths and Diana’s pools” (Hayden, Fifth Annual Report, 177). Since Peale was specifically referencing the “lower terraces” and Cupid Spring is almost 250 yards west and uphill from Jupiter Terrace, it is likely only the latter were the springs he and Jackson referred to as “Diana’s Bathing Pools.”

23. Peale’s journal entry for July 23, reads, “I came across Jackson who was photographing and was taken in a picture with Mr. Moran” (Merrill, Yellowstone and the Great West, 131). This is the only photograph at Mammoth where Moran appears with another person. Many of Jackson’s photographs taken near this area, such as Nos. 226–228, were probably also made on this date, but there is no documentation to say for sure.

27. Heasler, personal correspondence with author, January–April 2014.
29. A special thanks to park historian Lee Whittlesey for catching this. I had originally photographed New Palette Spring on the hillside Jackson referenced in Miscellaneous Publications, No. 5 near Liberty Cap, just east of Palette Spring, as it vaguely resembles Jackson’s photograph of the Minerva and Mound Terraces. This was the only location I had completely misidentified in this project, and Mr. Whittlesey’s correction was certainly appreciated so I could rephotograph the correct scene.

30. Merrill, Yellowstone and the Great West, 128.
31. Heasler, personal correspondence with author, January–April, 2014.
33. Everts, “Thirty-Seven Days of Peril.”
34. Merrill, Seeing Yellowstone in 1871, 25.
35. Hayden, Fifth Annual Report, 64.
36. Whittlesey, Yellowstone Place Names, 164.
37. Barlow, Reconnaissance of the Yellowstone River, 9.

CHAPTER 6, SECTION III


2. Peale wrote in his journal entry for August 26 that he assisted Jackson in making this photograph of Baronett’s Bridge from the west bank of the Yellowstone River after camping nearby on their return journey out of the region: “This morning Jackson and I started with the pack mule back to the bridge and took an excellent picture of it. It was dark and cloudy, raining at times, and Jackson had to give a long exposure” (Merrill, Yellowstone and the Great West, 173). Although this photograph was taken as the survey was on its way out of the Yellowstone country, Jackson may have placed it in this position in the series due to the fact that, according to Moran’s diary, the party camped near the bridge (but did not cross it) on July 25 on their way from Mammoth Hot Springs to Tower Fall (Moran, diary, 8).

4. Merrill, Seeing Yellowstone in 1871, 72.
5. Whittlesey, Yellowstone Place Names, 43 and Haines, Yellowstone Story, 144–46, 243.
6. Though Moran states they reached Tower Fall on July 25 and left at midday on July 27, the only day he mentions photographing at the area was July 26 (Moran, diary, 8). Both of Jackson’s autobiographies also suggest he photographed at Tower Fall for only one day (Jackson, Pioneer Photographer, 75 and Jackson, Time Exposure, 199).

7. Merrill, Yellowstone and the Great West, 134.

CHAPTER 6, SECTION IV

2. Moran’s diary indicates they reached the Grand Canyon on the evening of July 27 and stayed through July 31 (Moran, diary, 8). This would have given them three full days to sketch and photograph the canyon and its waterfalls, though Jackson recalls photographing at the canyon for only two days (Jackson, Pioneer Photographer, 75). Moran’s time frame is probably correct, given that he kept his diary during the survey, while Jackson’s recollections were written several decades later. Peale, who at this time was working with a group separate from Moran and Jackson, makes no mention of the photographer’s activity at the Grand Canyon (Peale’s party was about a day ahead of Jackson’s at this time), but he does detail a descent to the bottom of the canyon with survey artist Elliott on July 27. Peale notes his group left the canyon later that day and continued south along the Yellowstone River to the Mud Volcano Area (Merrill, Yellowstone and the Great West, 136–40).

3. Jackson, Pioneer Photographer, 75.
5. Barlow, Reconnaissance of the Yellowstone River, 39.

**CHAPTER 6, SECTION V**

2. Heasler, personal correspondence with author, January–April, 2014.
3. Ibid.
7. Ibid.
11. Heasler, personal correspondence with author, January–April, 2014.
13. Ibid., 83.
14. Ibid.
15. Heasler, personal correspondence with author, January–April, 2014.

**CHAPTER 6, SECTION VI**

2. Though Moran doesn’t specifically mention sketching or photographing at Crater Hills, his July 31 diary entry specifies his party, which at this time included Jackson, visited the area on that day only, between the time they left the Grand Canyon and reached the Mud Volcano Area, where they camped for the night (Moran, diary, 9).
4. Ibid., 91.
5. Moran’s diary entry for August 1 reads, “photo & sketching at mud volcano” (Moran, diary, 9).
8. Whittlesey, *Yellowstone Place Names*, 90.
12. Merrill, *Yellowstone and the Great West*, 139.

**CHAPTER 6, SECTION VII**

3. Moran’s diary entry for August 2 reads, “Made photographs & sketches of the Lake & river in forenoon” (Moran, diary, 9), so Nos. 266–268 were all likely made on that date.
9. Although Moran’s diary states they reached the camp on Yellowstone Lake in the afternoon of August 1, the shadows in this photograph indicate it was taken the following morning, likely before Moran and Jackson returned to the Yellowstone River’s outlet from the lake to sketch and make pictures (Nos. 266–268). Further, Moran and Jackson both note the main party had already departed for West Thumb by the time the artist and photographer had finished their work at the outlet that day (Moran, diary, 9–10 and Jackson, *Pioneer Photographer*, 76–77).
10. Reaching Yellowstone Lake was one of the survey’s primary objectives, so it comes as no surprise that the achievement was well documented. Therefore, we are given several clues as to the location of the team’s first camp on the lake.

Hayden suggests they made their camp shortly after reaching Yellowstone Lake: “[W]e arrived at the lake, and pitched our camp on the northwest shore, in a beautiful grassy meadow or opening among the dense pines” (Hayden, *Fifth Annual Report*, 96).

Both Moran and Peale note that they reached the camp almost immediately upon reaching the lake. Peale arrived on July 28 and wrote, “I got to the Lake and saw camp ahead of me” (Merrill, *Yellowstone and the Great West*, 141). Moran’s group wouldn’t arrive for another four days; he notes on August 1 that they “reached the Yellowstone Lake where the whole party & Escort were encamped” (Moran, diary, 9).
Finally, a watercolor by survey artist Elliott, which is similar to Jackson's photo No. 268, also places the campsite just south of the river's outlet from the lake.

12. Although Peale is pictured in Jackson's photographs of the survey's camp at West Thumb, he did not arrive at this camp until August 7, after a visit to the geyser basins on the Firehole River with Hayden. Peale departed for the Firehole from the survey's first camp near the outlet of the Yellowstone River (No. 269) on July 31 while the rest of the party, including Jackson, moved the camp south to West Thumb. Since Jackson had already left for the Upper Geyser Basin when Peale arrived at West Thumb on August 7, it is likely the camp scenes in photo Nos. 270–272 were taken on the afternoon of August 8, when Jackson returned to West Thumb (Merrill, Yellowstone and the Great West, 143, 150–51, 269–70n26). The shadows in these photographs, particularly those in the picture of the survey's military escort (No. 272), also indicate they were taken later in the afternoon. Peale writes in his journal that the whole party left West Thumb on August 9 for their circumnavigation of Yellowstone Lake (Merrill, Yellowstone and the Great West, 156).

14. Because Jackson describes this as a picture of "the first boat ever launched upon [Yellowstone Lake]," it often has been dated July 29, the day Hayden notes in his Fifth Annual Report as the Anna's maiden voyage from their first camp on the lake (No. 269) (Hayden, Fifth Annual Report, 96). However, the visible landmarks of Bluff Point at center right and the rocky outcropping at far left (also seen in No. 274) indicate this picture was taken at West Thumb. Therefore, this photograph couldn't have been taken until the morning of August 6 at the earliest, the day after the party established their camp at West Thumb (the shadows suggest the photograph was taken in the morning). Moran doesn't mention photographing at the West Thumb Geyser Basin until August 7 (Moran, diary, 11), so Jackson's photograph of the Anna, and also those of the lake and hot springs in Nos. 274–277, were probably made on that day, before Jackson and Moran left this camp for the Upper Geyser Basin (Merrill, Yellowstone and the Great West, 269–70n26).

17. Merrill, Yellowstone and the Great West, 264n14.
20. Ibid.
22. Merrill, Yellowstone and the Great West, 270n27.
24. Whittlesey, Yellowstone Place Names, 107.
26. Ibid., 100–1.
27. Ibid., 132.

28. Merrill, Yellowstone and the Great West, 158.
29. Peale noted in his August 13 journal entry that he climbed the mountain near the survey's camp with Jackson and Kelley to photograph Yellowstone Lake from a prominent point that is today called the Langford Cairn (Merrill, Yellowstone and the Great West, 158).

32. On August 17 Peale wrote, "Jackson and Turnbull went out photographing and did not get in until after dark" (Merrill, Yellowstone and the Great West, 162). This would be accurate for Jackson's photographs of Mounts Doane and Stevenson from the Signal Hills, as the shadows in these images indicate they were taken late in the afternoon or early evening. Since they had a journey of more than three miles—most of it through timber—back to the survey's camp near Signal Point, they likely would not have returned until well after sunset.

33. Merrill, Seeing Yellowstone in 1871, 63.
34. Peale notes he and Jackson tried to photograph Yellowstone Lake from their Signal Point camp on the morning of August 15, but smoke from wild fires in the area had obscured the view. His journal entry for the following day notes Jackson had better luck on the afternoon of August 16: "After eating out lunch we went over to the Lake. [Jackson] took a number of photographs and we started back to camp" (Merrill, Yellowstone and the Great West, 162).

35. Hayden, "Wonders of the West—II," 394.
37. Peale's August 23 journal entry states, "Jackson took two views of the camp that morning, just before the party left Yellowstone Lake and struck north up the Pelican Valley (Merrill, Yellowstone and the Great West, 168). Only one of the photographs, No. 288, made it into the official 1871 Series.

38. Merrill, Yellowstone and the Great West, 164–68.
39. Ibid., 164–66.
40. Merrill, Seeing Yellowstone in 1871, 64.
41. Merrill, Yellowstone and the Great West, 273n17.
42. Hayden, Fifth Annual Report, 137.
43. Merrill, Yellowstone and the Great West, 164.
44. Barlow, Reconnaissance of the Yellowstone River, 38–39.
45. Peale's journal entry for August 10, reads, "After breakfast I lay around in the fly while Jackson fixed some chemicals after which He, Kelley, and I, with the photographic pack, went to the top of a hill near camp and took a picture of the Lake. I was in the picture" (Merrill, Yellowstone and the Great West, 157). Jackson may have placed this image, and No. 293, at this point in the 1871 Series to group it with other photographs of Yellowstone Lake.

47. Jackson probably photographed the "hidden lake"—today called Duck Lake—on the morning of August 9, before the party departed from West Thumb for
their circumnavigation of Yellowstone Lake. Peale wrote in his journal that he and others discovered the lake on August 8 after exploring the West Thumb Geyser Basin. The entry later reads, "While we were at supper, Lieut. Doane and Col. Barlow’s party came in camp and some little time after, Smith, Jackson, and Dunning arrived" (Merrill, Yellowstone and the Great West, 155–56). Given this timeline, it is conceivable that someone told Jackson about the "hidden lake" on the afternoon or evening of August 8, when he returned to the camp at West Thumb from the Upper Geyser Basin, and he photographed it the following morning.

48. Merrill, Yellowstone and the Great West, 155.

CHAPTER 6, SECTION VIII

1. The river is now officially called the Firehole River, which flows north and, upon merging with the Gibbon River, forms the Madison.
3. Merrill, Yellowstone and the Great West, 143.
5. Ibid., 11.
6. Merrill, Yellowstone and the Great West, 269–70n26. Why Jackson placed these photographs at this point in the 1871 Series—inconsistent with the survey’s route—is unclear. Other photographs are out of order as well, such as Nos. 292 and 293, so it could be that Jackson was trying to keep photographs of similar subject matter grouped together.
7. Merrill, Seeing Yellowstone in 1871, 52.
9. Ibid., 29.
10. Moran, diary, 12.
11. Whittlesey, Yellowstone Place Names, 77.
15. Geyser Observation and Study Association, “Giant Geyser.”

CHAPTER 6, SECTION IX

2. Peale’s journal notes the party reached Mirror Lake at about 4 p.m. on August 23 and left the next day. The shadows in photo Nos. 299, 300, 302, and 303 indicate they were taken in the morning. Peale later writes that the party left the lake just after breakfast on August 24, after Jackson photographed the pack train along the western shore of the lake (No. 303) (Merrill, Yellowstone and the Great West, 169).
3. Merrill, Yellowstone and the Great West, 168.
4. Whittlesey, Yellowstone Place Names, 172. The lake’s name appears as “Mirror Pond” on Hayden’s 1878 map of the park. The name Mirror Lake first appears on a map from an 1883–1884 exploration of the park by the US Geological Survey.
5. Hayden, Fifth Annual Report, 137.
6. Peale’s journal entry for August 24 indicates this picture was taken just after Jackson photographed the survey’s pack train lined up along Mirror Lake (No. 303): “When all the packs were ready we all mounted and formed in a line along the Lake and Jackson took two views of it. Before the second one was taken, Joe and José came in and were taken in it. They had gone out early for the deer and elk they had killed. They stayed behind for Jackson to photograph separately” (Merrill, Yellowstone and the Great West, 169).
7. Ibid., 169.
8. Merrill, Yellowstone and the Great West, 169.
9. Peale’s journal entry for August 25 states he rode his horse a short distance up Soda Butte Creek from the Lamar River to join Jackson, who was photographing at a formation that is today named Soda Butte (see also Nos. 306 and 307) with Hayden and general assistant Charlie Turnbull (Merrill, Yellowstone and the Great West, 170).
11. Merrill, Yellowstone and the Great West, 170.
13. Albert Peale’s October 25 letter to the Philadelphia Press reads, “The mountains around the East Fork of the Yellowstone are grand; rising in sharp peaks, white on the sides, huge masses of rock stand out in bold relief, resembling castles and fortresses. Our view of them was somewhat interfered with by the smoke from numerous fires which are now raging in their forests” (Merrill, Seeing Yellowstone in 1871, 72).
15. Yellowstone National Park historian Lee Whittlesey notes Barronette Peak, named after Collins Baronett, who built the first bridge over the Yellowstone River (No. 232) in early 1871, “has the dubious honor of being the only place name in Yellowstone that is officially approved in a misspelled form.” Whittlesey, Yellowstone Place Names, 43.
16. Merrill, Seeing Yellowstone in 1871, 47.
17. Merrill, Yellowstone and the Great West, 161.
18. Ibid., 170.
19. Ibid.
CHAPTER 7

8. Ibid., 169–71.
11. Ibid., 171–72.
12. Ibid., 254.

APPENDIX A


APPENDIX B

2. US Geological Survey Photographic Library, "Correlation List of New and Old Numbers."


Molly Absolon
Jonathan Adams
Kevin and Vicki Adams
Michael and Shelia Alessandro
Neal Alexandrowicz
Jeanne and Peter Anderson
Tiffanie Andrews-Rost
Joan Anzelmo
Chad, Traci, and Zachary Arnold
Douglas Ayers
Mickey Babcock
Back of Beyond Books
Jake Bacon
Jamie Bailey
Gerrit E. Bartholomew
Kathleen M. Batchelder
Albert and Kelly Battisti
Patricia Bauchman
Jennifer Baum
Mel Best
Dan and Kate Berman
Scott and Susan Bierman
Jonathan Blackman
Sharon Blackmon
Bill and Michele Blosel
Christopher and Kristin Blosel
Brent Blue, MD
Jolene Bollman
The Bodensteiner Family
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Linda and Gary Boner
Josh Bond
Jaclyn Borowski
Noah Brenner
Charlotte Bright
Travis Brink
Greg Bryan
Adam D. Bryant
Julie Butler
Melissa Cassutt
Noah Carr
Kent Carter
Margaret Anne Cashman
David Chaney
Jenny Cheff
Rich Clarkson and Associates
Jessica Cleereman
David Clemans
Clouse Family
Tasso and Marnie Coin
Edward A. Coleman
Jean Corey
William Cornette
Tricia Coyne
Charlie Craighead
Kelly Currier
Darcy Curtin
Susan Czapinski
Kendra Daijogo
Joe and Lacy Dailey
Kelsey Dayton
Mary Dahlberg
Dave Dauncey
Brian de Coninck
Brian Lee DeFluri
Kelly Yanke Deltener
AJ DeRosa
Mark Dolan
Ryan Dorgan
Alan W. Dye
EcoTour Adventures
Mr. and Mrs. John Eckhardt
Michele Eckhardt
Lynn Edenfield
Joyce Edlefsen
Karl and Kathy Edman
Teri Ehresman
Dan Elliott
Stephen Elliott
Gary Einstein
David Evans
Mike Feeny
Dawn Donovan Felchle
Helen Freedus
J. Freeman
Sarah Gaffney
John Gillespie
David A. Gonzales
Elizabeth and Geoffrey Gould
Philip Greene
H.P.J.
Jim and Sara K. Hadd
The Hagen Family
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Heather Hansen
Lesley Harris
Madison and Jackson Harris
Amy, Cory, and Grace Hatch
Glenn and Carol Hayes
Douglas Henderson
Peggy Henderson
Robb Hicks
Alan, Mary, Kortlyn, Gavin, and Connor Hietpas
Al Hoffman
Kathryn Holloway
Paul Horsted
Naka Ishii
Judy and Daryl Jennings
Scott Johnson
Kelli Jones
Janet Jones-White
Ali Kacarevic
David Kenealy
Melissa Crawford Kestner
Paul and Kate Klein
Karl and Patricia Koeppen
Miranda D. LaFontaine
Rob Lancefield
Lori L. Larson
Ronald J. Lee
Joel Leibow
Dan Leigh
Edward E. and Helen M. Lenkiewicz
Christine Leusch
Jim and Cora Ligori
Peter J. Likus
Matt Loomis
Yadira Lopez
The Lothringier Family
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Heather Stone Martin
Charles Mason
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Ariana Mercer
Mike Merigliano
Annie and Ryan Mertaugh
Josh Metten
Adam Meyer and Jen Simon
Michael Miller
Dina Mishev
Ashley Wilkerson Moore
Sally Jean Moore
Matt and Emily Mulica
Mason Mullally
Allen Murabayashi
Richard J. Murphy
Ronn and Marketa Murray
Kent Nelson
Ron, Debi, and Lucy Nemetz
Nicole Newsted
Emily and Todd Nichols
Cathy O’Connor
Jerome A. Offner
Tony and Erin Palagonia
Christopher Travers and John Parker
P. Parisi
Michael Pearlman
Chris Peters
Ruth Ann Petroff
Barbara Phillips
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Lara Plecas
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John and Brooke Pudar
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Amy Reams
Stephanie Reardon Redfern
Martin, Emily, and Tobias Reed
Tim and Jenn Rein
Matthew Reiswig
Chad Repinski
Dave Rhinehart
Kathy Rinaldi
Alan Rogers
Amy Rogers
Ashley Rowbury
Judi Roye (Adler)
Whitney Royster
Brice W. Samuel
Harvey and Mary Schmidt
Aska Shiratori-Langman
Denise Skipe
Roxanne Shive
Gere Sibhach
Mike Simmons
Adam Meyer and Jen Simon
Matthew Sinclair
Margie Singleton
Sandra Slye-Hittle
Margaret Smallbrock
Susan Smart
Katie and Philip Smith
Robert B. Smith
Grant Stevens
Amanda Templar
Diane Temple
Kimberly Thomas
Linda Thomas
Casey Thompson
Clay and Jessilyn Thompson
James Thompson
Jill Thompson
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Mike Tillmans
Beth Toftum
Wright and Sharon Towery
Lane and Chris Valiante
Eric Vandegrift
Jeff Vanuga
V. C. Wald
A Wellman
Mary Welke
John Werner
Steve Westergard
Mike Weston
Ron Weston
Jennifer Marshall Weydeveld
Sidney Whitaker
Todd Wilkinson
John Willis
Janis Wilson
Laura Wind-Norton
Sarina Winterrowd
John Wise
Kelli Wunderlich
Jake Young
Mo Zimney
Dava Zucker

THE DEVIL’S EYE.
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