

Yellowstone Science

A quarterly publication devoted to the natural and cultural resources



Tales of Yellowstone's First Tourists
The Value of *Nature Notes*
A Wolf-Coyote Face-off
Nature on Display

Volume 8

Number 1



A Drop in the Historical Bucket

Have you ever wondered about the first visitors to Yellowstone—how difficult a journey they might have had, and what their impressions would have been of the strange things they experienced? The first party was not unlike that of George Mallory and company when, in their attempt to surmount the world’s tallest peak, they “hiked off the map” into unknown territory—with little of the preparatory whirlwind that can accompany a park visitor today. No pre-drawn “trip-tik”; no reserved lodging or campsite awaiting; no web sites, guidebooks, or CD-roms to suggest “can’t miss” highlights of Yellowstone. In the wake of reports from the Washburn and Hayden expeditions of 1870–1871, Clawson, Raymond, and friends set out to explore what was to become the world’s first national park. Lee Silliman shares excerpts of the travelers’ accounts, which perhaps leave us with as many questions as they answer.

Thomas Patin paints a picture of how later visitors to the more well-traveled park might stand at an overlook to enjoy the view, and experience what exhibit designers tried to conjure up in a cyclorama display. Was this by design or accident? Will a “magisterial gaze” at the live Yellowstone ever be supplanted by the vicarious visit to the TV travelogue or the multidimensional web site? Or will there always be plenty (perhaps even an excess) of people who must experience the real thing, a place that will never be as static as a museum display?

For nearly 50 years, people living and working in the park shared their experiences and natural history observations in *Nature Notes*. This simple but popular old newsletter spawned many other communiques, and still offers researchers valuable snapshots of Yellowstone’s past. In tribute to its continuing popularity and worth, we reinstitute nature notes as a recurring feature and encourage readers to submit relevant cultural and natural history accounts for inclusion in the ever-growing record of *Yellowstone Science*. Some future reader will sift through the bucket of accumulated stories to form their impressions of this time and place.

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Yellowstone Science

A quarterly publication devoted to the natural and cultural resources

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Yellowstone Nature Notes:

A Neglected Documentary Resource

by Paul Schullery and Lee Whittlesey

The documentary legacy of Yellowstone is huge: thousands of books; more thousands of scientific reports and papers; newspaper and magazine articles beyond counting; and a still poorly identified wealth of other materials, including unpublished journals; commercial pamphlets and circulars; administrative records of managers, concessioners, and interest groups; and visitors' letters, postcards, and related memorabilia in almost unimaginable abundance. Between us, we have devoted more than half a century to the study of this overwhelming mass of stuff, and though we both have personal favorites, we agree that there is nothing else like *Yellowstone Nature Notes*. For its bottomless reservoir of intriguing natural history tidbits, its hundreds of short essays and reports on all kinds of engaging subjects, and its unmatched window onto the day-to-day doings of earlier generations of Yellowstone nature lovers, *Yellowstone Nature Notes* is unique, priceless, and a lot of fun. It is also a neglected chapter in Yellowstone's rich documentary history.

On June 14, 1920, Yellowstone's Park Naturalist, Milton P. Skinner, issued a brief typescript report containing notes on flowers, geology, animals, and birds. Similar brief reports appeared in July, August, and September of that year, and in June, July, and August of 1921. In July, August, and September 1922, these were issued more formally, typeset, and printed. Apparently they were distributed through park offices, but may also have been posted at a few locations in the park.

These modest reports were the beginning of *Yellowstone Nature Notes*. It would become one of Yellowstone's longest, most informative, and certainly most entertaining literary traditions, a tradition that took a more mature form on June 20, 1924 (none are known to have appeared in 1923), with the appearance of Volume 1, Number 1, of a typescript (apparently mimeographed) newsletter with the actual title *Yellowstone Nature Notes*. Later writers and researchers seem to have routinely regarded the 1920–1922 reports as early issues of *Yellowstone Nature Notes*, but the name was not actually used until 1924, when the series also acquired issue numbers.

Though it seems likely that *Nature Notes* was intended especially for park staff and other locals, it was available to a wider audience. The first issue explained that "This is the initial number of a series of bulletins to be issued from time to time for the information of those interested in the natural history and scientific features of Yellowstone National Park and the unmatched educational opportunities offered by this region. Copies of these bulletins will be mailed free to those who can use of them. Write or telephone your request to the Information Office at Mammoth Hot Springs, or call there in person, and your name will be placed on the regular mailing list."

Nature Notes was not unique to Yellowstone. Many other parks launched similarly named newsletters. National Park Service director Stephen T. Mather and Yellowstone Superintendent Albright

placed a high value on educational activities, and the *Nature Notes* program flourished for many years. In 1936, Hazel Hunt Voth produced a "General Index to the 'Nature Notes' Published in Various National Parks 1920–1936," a large volume funded by the Works Progress Administration and published by the National Park Service from the Park Service's Berkeley, California, office. By that time, Acadia (beginning in 1932), Crater Lake (1928), Glacier (1927), Grand Canyon (1926), Grand Teton (1935), Hawaii (1931), Hot Springs (1934), Lassen (1932, combined with Hawaii), Mesa Verde (1930), Mount Rainier (1923), Rocky Mountain (1928), Shenandoah (1936), Yosemite (1922), and Zion/Bryce (1929) had joined Yellowstone in producing their own *Nature Notes*.

National park history enthusiasts may enjoy knowing that the Voth bibliography reveals that *Nature Notes* added an obscure additional element to the long-time rivalry between the two "Y-parks," each of which has been championed for being first at various things. Voth's *Nature Notes* bibliography dated the beginning of *Yellowstone Nature Notes* to that first June 1920 report, though Yosemite seems to have launched its *Nature Notes* by that name in July 1922, earlier than Yellowstone produced its own similarly named version. Advocates and partisans are free to interpret this chain of events however best favors their predispositions.

Discussing the production of *Nature Notes* by the various parks, Voth noted that "publication in some cases has been



erratic; in some cases it has been suspended . . .” The sustained production of any sort of report or newsletter, year after year, administration after administration, is very difficult in any bureaucracy, and it must have been especially so in some of these perpetually understaffed national parks. That makes the steady appearance of *Yellowstone Nature Notes* until the end of 1958 an almost heroic achievement. Through the administrations of six superintendents, and seven park naturalists and chief park naturalists (they became “chiefs” once there was more than one of them; today they are called chiefs of interpretation), *Nature Notes* was produced faithfully, evidence of considerable commitment to this form of education. We would enjoy hearing from any readers with more information about the *Nature Notes* program throughout the parks. It does appear that some centralized authority must have been taking part, because of similarities in design and approach. We have not yet canvassed many other parks to learn how long they produced their own *Nature Notes*.

Interpretation is a term that still must confuse many visitors; park staff who educate the public have long been called interpreters. Milton Skinner, more or less the father of *Yellowstone Nature Notes*, had come to Yellowstone in 1895 as a walking-tour guide for the Yellowstone Park Association (a hotel concessioner). In the 1920s, he would eventually write a series of influential books and articles about the park’s wildlife and other natural attractions. (Skinner is one of many Yellowstone figures deserving of further study.) Prior to the creation of the National Park Service in 1916, and even before the creation of the education division of the park service in 1920, virtually all interpretive activities were performed by park concessioner employees, primarily stagecoach drivers (who gave mile-by-mile commentary) and hotel porters (who gave walking tours of the thermal areas), but also by the occasional independent educator or outfitter. Skinner was not the first Yellowstone interpreter, but he was a longtime public educator even before the park’s administrators defined their own responsibilities in the field.

Skinner, while working for the park

engineers in 1913, suggested that a “bureau of information” be established to educate visitors. Though we do not know what influence his specific suggestion may have had, the spirit of that suggestion was finally acted upon by Superintendent Horace Albright in 1920, when he hired Skinner as the park’s first “park naturalist.” Here again some confusion exists; the label “naturalist” customarily means someone who studies nature, but in park jargon, it more specifically means someone who gives talks, walks, and otherwise conducts interpretive activities. Skinner very quickly created the little monthly nature reports mentioned above, the precursors to *Yellowstone Nature Notes*. But Skinner, who is remembered now as having a difficult personality, ceased being park naturalist in September of 1922. In June 1923, Frank Thone was named acting park naturalist, a position he held until late August. It seems likely that these administrative changes may explain the hiatus in the production of the nature reports that year.

Edmund J. Sawyer became park naturalist in 1924 and soon started the actual *Yellowstone Nature Notes*. With the fourth issue, the publication was given a cover sheet and more or less assumed the look that it would have for the next thirty-four years. Sawyer, some of whose artwork is in the park’s collection, is probably responsible for many of the early illustrations in *Yellowstone Nature Notes*—simple little line drawings and marginal sketches that became a hallmark of the publication until its final issue.

Subsequent park naturalists, including Dorr Yeager, who took over in 1928, continued Skinner’s approach with few material changes. Bird and wildlife observations, provided by various park staff or consolidated by the editor, were routinely provided, as was the occasional staff- or park resident-written poem and drawing. Reports on geysers and hot springs appeared regularly. As time passed, articles got longer and more and more voices were heard, often with bylines. Articles on park history were added as early as 1925. Book reviews, hiking tales, and quotable quotes became regular features.

Yellowstone Nature Notes seems from the beginning to have served as an “offi-

cial” voice for the park administration. Whether exhorting readers to enjoy wildflowers or not feed the bears, staff members who wrote the articles were treating the pages of *Nature Notes* as an extension of their public contacts in evening campfire programs, along park roads, and anywhere else that they worked. At times some important management issue, such as elk population controversies, would be covered in considerable depth. All of these materials, representing as they did the park service leadership’s views, make *Nature Notes* an important source for administrative history, complementing a variety of other materials such as monthly and annual reports, and official correspondence.

At the same time, the shorter notes on wildlife sightings, the “leaves from our diaries” and other brief notes, each of which might seem so slight by itself, gradually piled up into a formidable miscellany, providing a surprising volume of information on many species of park wildlife. The most popular species, such as bears and elk, were ultimately mentioned in hundreds of short notes, some quite informative and all intelligently reported. Any researcher newly engaged in studying some species of park wildlife would be well served to start by cruising through the excellent indexes that were periodically issued for *Nature Notes*.

But perhaps the least appreciated aspect of *Nature Notes* is its relevance to social history. The moods and ideals portrayed in these gentle reports, notes, and observations—about nature, about life in wild country, about the place of national parks in society—make *Nature Notes* a fine source of impressions about social values, as well as about the day-to-day textures of park residence. We can imagine some enterprising graduate student in recreational sociology or environmental history using either *Yellowstone Nature Notes* or the entire set of series from all the parks to examine changing values and ideas in national parks over four decades. In a lighter mood, the senior author of this paper used many of the short anecdotes and stories from *Yellowstone Nature Notes* as chapters in *Yellowstone Bear Tales* (1991), a book of readings that represented dozens of individuals’ experiences with park bears before World War II.

Similar compilations about wildlife or other park lore would probably also be well received.

Among the subjects that we have not adequately researched is the apparently general demise of *Nature Notes* around the park system. In Yellowstone, it occurred at the end of 1958. The final issue included a report on Firehole thermal basin hot spring activity in 1958, and another on Mammoth Hot Springs by Chief Park Naturalist David deL. Condon. Former Yellowstone Park Historian Aubrey Haines recently responded to our query about the abrupt cessation of publication of *Nature Notes* after so many years:

“*Yellowstone Nature Notes* died quietly with V. XXXII, No. 6 (November–December 1958), and without a hint that was to be the last issue. I was in engineering at the time, so do not know what was behind the decision to stop. There is no clue in the header, which solicits articles and carried the usual statement of purpose.”

Aubrey suggested that someone may just have decided that *Nature Notes* had become “superfluous.” Changing attitudes about interpretive style or the perhaps old-fashioned tone of the publication may have been factors. In the late 1950s, traditional observational “natural history” was falling out of favor perhaps even more than it had been in previous decades, replaced by more rigorous scientific techniques. For many years, park service naturalists had been jokingly referred to as “Sunday supplement scientists” for their simple nature lessons, and perhaps the criticisms were part of the reason for the end of *Nature Notes*. On the other hand, perhaps it was just practical needs, or bureaucratic whim, that one day led to a decision (either in the National Park Service or in each park individually) to invest limited staff resources in other things. So far our inquiries among park service people who recall the period have not yielded many clues about why *Nature Notes* disappeared. Perhaps one of our readers may know more. John Good, who would later serve as Yellowstone’s chief of interpretation, recalls that in 1959 he was working in the service’s Washington office, where he would have heard if there had been any

general order to cease producing *Nature Notes*, and no such order was given. Linda Eade, librarian at Yosemite, tells us that when *Yosemite Nature Notes* ceased publication in 1962, it was said to be the result of “rising costs, diminishing manpower, and the changing times.”

A variant form of the newsletter appeared very quickly. Again, Aubrey Haines:

“After I became park historian, I did attempt a resurrection in the form of *The Yellowstone Interpreter*, which had during its two-year life the purpose that always appeared on the title page: “The purpose of this publication is to provide scientific and historical data for the use of Park personnel engaged in interpretive activities.”

The Yellowstone Interpreter was published occasionally through 1963 and 1964. It was to “appear at random, depending upon availability of suitable material, and employees are urged to contribute articles.” Most of it was written by Aubrey himself, who was then researching *The Yellowstone Story* (1977), his history of the park, and who provided a series of authoritative sketches of historical characters and events. Its intended audience, park interpreters, was more limited than that of the original *Nature Notes*, and it is not nearly as well known, though the writing was of higher quality. It ended when Aubrey was transferred to another position.

Since then, several attempts have been made to revive some form of newsletter for Yellowstone’s interpreters. Between December 1969 and November 1980, the interpretive division under chiefs William Dunmire and Alan Mebane occasionally issued an off-season newsletter, usually with a mixture of natural history and administrative news. These seem to have been produced almost exclusively for communicating with seasonals who were elsewhere at the time. The park’s research library has files of these, but of course because of their intermittent publication schedule (never more than two a year) it is difficult to know if the set is complete. During the administration of George Robinson, the interpretive division produced an occasional newsletter known as “Out of Touch,” especially for the faraway seasonals, to keep them posted

on new developments in the park. The library holds one or two of these per year from 1983 to 1992. One of the chief distinctions between these later permutations on the *Nature Notes* then and the original is that the latter are progressively more candid about matters of budget and agency politics.

The desire for something more like the old *Nature Notes* never went away. In 1974, Mammoth Subdistrict Ranger Secretary Chris Judson started a new “Nature Notes” by including it in the biweekly employee newsletter, *Yellowstone News*. The first issue, January 25, 1974, encouraged employee contributions and summarized a number of wildlife observations by park staff (including the winter waterfowl count) who already were in touch with her. Chris maintained a large network of contacts throughout the park, and eventually persuaded a number of people, including veteran seasonal ranger Wayne Replogle and Gardiner, Montana, tackle shop owner Richard Parks, to contribute substantial series of items. On May 16, 1974, she changed the name to *Field Notes*, with the hope that this would “better express what we’d like this section to be. Hopefully it will serve as one more avenue of communication, providing information on what’s happening in Yellowstone. This is of interest to everybody, but will be especially useful to those who meet the public and need to keep as up-to-date as possible on many aspects of the park . . .” It included announcements about new employees, observations of wildlife, and reports on snow conditions, among many other matters. Though Chris moved to Bandelier National Monument (from where she recently provided us with information) in April 1976, *Field Notes* continued to appear in the employee newsletter fairly regularly until November 24, 1976, under unknown editorship.

In August of 1995, the Grant Village interpretive staff under the leadership of Matt Graves, issued a continuation of the original *Yellowstone Nature Notes* (Volume 33, Number 1), quoting the original *Nature Notes*’ masthead for its purpose. This single issue contained articles about the history of *Nature Notes*, the newly arrived wolves, elk observation, and swan nesting. A “Leaves from our Diaries”

section contained reports in the style of the original *Nature Notes*, brief observations on wildlife sightings of note. As far as we can determine, no subsequent issues were produced, and the effort was redirected to an annually updated information book; Yellowstone Assistant Chief of Interpretation Linda Young recalls that “what began as a sort of *Nature Notes* revival turned into what we nowadays call the ‘Interpreter’s Handbook.’” A variety of even smaller circulation newsletters, such as the South District Interpreter’s Newsletter (known during part of its 1985–1986 run as “Chautauqua”) have come and gone with the staff who created them.

By far the most important and durable descendant of *Nature Notes* appeared in May 1985, with the appearance of a newsletter entitled *Resource Management*, edited and in good part written by Sue Consolo (now Sue Consolo Murphy), resource management biologist with an interpretive background. Sue, now editor of both this newsletter and *Yellowstone Science*, remembers the plan this way:

“The original hope was monthly in summer and bimonthly in winter, and I came close to meeting that goal for some years. It was [Supervisory Resource Management Specialist] Stu Coleman who, witty weird-humor guy that he was, named it *The Buffalo Chip*, beginning with the January–February 1988 issue.”

The Buffalo Chip, which has had a steadily growing mailing and in-house reading list, reports in more depth than did previous newsletters on a great variety of natural and cultural resource management projects and concerns. Almost entirely staff-written, it has now tracked fourteen years of park management issues, making it an important source of the month-to-month concerns of management, and a treasure chest of information.

The latest and most publicly visible chapter in the *Nature Notes* saga is *Yellowstone Science*. The idea seems to have resulted from conversations in 1990 and 1991 among then-superintendent Bob Barbee, then-chief of research John Varley, and then-resource naturalist Paul Schullery. As the park’s many resource-related controversies grew more and more heated and complex, and as the public’s

appetite for information about the park grew not only larger but also more sophisticated, all agreed that there was need for a publication that could do justice to the growing amount of research conducted in the park. The first issue appeared with Paul as editor in Fall 1992, and it has remained a (fairly faithful) quarterly publication since then. Sue Consolo Murphy assumed the editorship with Volume 4, Number 3 (summer 1996), and publication costs are largely covered by a grant from the Yellowstone Association with additional donations by readers.

In contrast with previous publications, *Yellowstone Science* has been almost entirely written by the researchers themselves. Except for the news and notes at the back of each issue, most of the feature articles were submitted by the researchers themselves, who came from a wide variety of universities and other institutions. To vary the presentation, most issues have included one interview with some noteworthy researcher, visiting scientist, or, in one case, a retiring administrator (Bob Barbee).

A thorough listing of informational newsletters about Yellowstone would have to include quite a few others. One especially long-lived and valuable contribution has been a concessioner’s *Commentary Newsletter*, originated by Gerard and Helen Pesman under the transportation division of the Yellowstone Park Company in 1973. Produced for the company’s bus drivers, commentators, and snowcoach drivers, this publication has long been a primary source of information on natural and cultural history, with many extended articles based on extensive study by the editors. Lee Whittlesey assumed the editorship in 1978 and continued it until 1980, when publication ceased. It has since been revived by Leslie Quinn, and is still regularly produced. And now that there are literally dozen of Yellowstone-related web sites, any bibliography of *Nature Notes* descendants (whether conscious or inadvertent) will become a very complicated thing.

Nature Notes and its children have left us an impressive volume of information and have revealed a remarkable devotion to education of staff and the public. These obscure publications have also tracked

park issues and social scenes across almost eighty years of Yellowstone’s history. Very few modern researchers, though perhaps well aware of *Yellowstone Science*, have ever heard of its “original” ancestor, and are missing a wonderful opportunity. Perhaps it will contain nothing of use to your project, but you’ll never know until you look. We can almost guarantee that you’ll spend more time with it than you expected to. All of the publications mentioned here are in the Yellowstone National Park Research Library, in the basement of the Horace Albright Visitor Center at Mammoth Hot Springs.

We believe that there are a number of graduate research or writing projects waiting to be extracted from *Nature Notes*. One would be a history of the *Nature Notes* program throughout the National Park Service: who originated it and why? How specific were the marching orders given to individual parks about the production of their *Nature Notes*? Did managers perceive it as a public educational tool, and, if so, how did they use it? Did it just die a “natural death” in each park for local reasons, or was its departure centrally decreed? This sizeable and fascinating documentary resource has much to teach us, not only about natural history but also about the culture of the National Park Service and the people who came to the parks to enjoy nature.

We would like to thank Sue Consolo Murphy and Linda Young, Yellowstone National Park; Linda Eade, Yosemite National Park; Aubrey Haines, Tucson, Arizona; Chris Judson, Bandelier National Monument; and Richard Sellars, National Park Service Southwest Regional Office; for helpful suggestions and information.

Paul Schullery works part-time for the National Park Service as a writer-editor. His Yellowstone books include Mountain Time, The Bears of Yellowstone, and Searching for Yellowstone. Lee Whittlesey is Yellowstone’s archivist-historian. His Yellowstone books include Yellowstone Place Names, Death in Yellowstone, and A Yellowstone Album. Paul and Lee are currently collaborating on a history of wildlife in greater Yellowstone. ✨



NATURE NOTES

A Wolf-Coyote Interaction

by Betsy Robinson and Steve Gehman

Wednesday, May 5, 1999, dawned partly cloudy and cold on Yellowstone's northern range. At 6:30 a.m. we watched two grizzly bears foraging, one at the base of Specimen Ridge and the other north of the Lamar River. We then made our way to Slough Creek to look for the Rose Creek wolf pack. At about 7:00 a.m., we joined a small group of friends at an overlook above Slough Creek where they were watching six members of the Rose Creek pack. The wolves had made a kill the previous night along the banks of Slough Creek and were resting after feeding. The kill was at the bottom of an embankment, out of sight from where we were standing. Two of the wolves made their way northwest over a ridge and out of sight, leaving three wolves lying on a sage-covered hillside about one-quarter mile from the kill.

At approximately 7:30 a.m., the alpha male, #8, appeared carrying a chunk of meat and made his way west to where the other wolves were lying. Two of those wolves joined him and they slowly made their way up the ridge and into the trees, disappearing from view. The remaining black wolf, one of last year's pups, walked over to the kill and fed for approximately 10 minutes. The wolf then walked a short distance to a shallow pond and drank some water.

At that point, a coyote appeared along the shore of the pond and approached the wolf. We all tensed and waited expectantly for the wolf's reaction. Wolves and coyotes are competitors, and we have witnessed wolves chasing and harassing coyotes. Also, wolves have killed a number of coyotes in the park since the wolves were released in March of 1995. The wolf looked at the coyote, which continued to approach. When it got within 20 meters of the wolf, the coyote assumed the "alligator gape" posture, with tail tucked, back arched, and mouth gaping open. The wolf stood its ground and continued to watch the coyote. The coyote then did a surprising thing—it adopted a playful attitude which we have seen many times before among dogs. The coyote dropped down on its front legs, tail out and wagging, seemingly inviting the wolf to play. The wolf continued to watch, and the coyote repeated the display. After the second time, the young wolf responded and trotted off after the coyote.

For the next five minutes, the coyote led the wolf through the sagebrush, back and forth, up and down. A pattern emerged, with the coyote running ahead at a faster pace than the wolf, then waiting for the wolf to catch up and get within 10 or 20 meters before running ahead again. There never appeared to be menace in the situation, and the wolf never appeared to actually pursue the coyote with any seriousness. Several times the coyote and the wolf stood face to face at a distance of less than 10 meters.

All the while it seemed to those of us observing that the coyote was leading the wolf somewhere, and had a motive. After about five minutes, the coyote had led the wolf to the top of a small rise where another coyote appeared, and the situation changed very quickly. The two coyotes abruptly turned on the surprised wolf, chasing it and trying to bite its hindquarters. The wolf ran away at full speed, with its ears back and tail between its legs. The two coyotes pursued for several minutes as the wolf dodged through the sagebrush and finally escaped up the ridge and out of sight into the trees, at which point the coyotes broke off the chase.

It appeared to those of us watching that the entire thing had been a setup, and that the first coyote deliberately waited until only one wolf remained in the area. It then lured the wolf to the vicinity of the second coyote. Perhaps there was a coyote den in the area and the coyotes wanted to drive off the lone wolf, or perhaps the coyotes were merely bullies. We'll never know the real story, but this time the coyotes turned the tables on the wolves.



An original drawing by Harold J. Broderick that appeared on the cover of a 1946 issue of Nature Notes.

Betsy Robinson and Steve Gehman are self-employed wildlife biologists based in Bozeman, Montana. Steve has worked on various research projects in greater Yellowstone since 1984. Betsy has worked on several bird and mammalian research projects since 1992. They lead natural history tours in the western United States and Alaska and have instructed college-level field ecology courses for the Wildland Studies program of San Francisco State University. Currently their non-profit research and education organization, Wild Things Unlimited, is focusing on an ecosystemwide survey of wolverine, fisher, and lynx.

A Ride to the Infernal Regions:

An Account of the First Tourist Party to Yellowstone

by Lee Silliman

Photo by William H. Jackson taken in 1872 of Mary's Bay, Yellowstone Lake, on the east shore of the lake showing a beautiful "L" curve. YELL 36086. NPS archives.

Accounts of the wonders to be found at the headwaters of the Yellowstone River, long regarded as trapper and prospector hyperbole, became more seriously entertained when attested to by the esteemed members of the Washburn-Langford expedition of 1870. Montana Territory newspapers and word-of-mouth, as well as some nationally circulated periodicals, spread the party's intelligence that descriptions of the Yellowstone region—far from being exaggerated—had, in fact, been understated. To dispel all doubt, in the summer of 1871 Congress dispatched a scientific exploration party under the leadership of Ferdinand V. Hayden, chief of the U.S. Geological and Geographical Survey of the Territories. The exploits and renown of the Hayden Survey have long been acknowledged.

Before Hayden's party had left the future park, however, another group—hitherto mostly unknown and the subject of this discussion—conducted a sightseeing excursion to "Geyserland" in August of 1871. Because their avowed goal was to retrace the steps of the previous year's Washburn expedition—this time to enjoy the sights, rather than explore new territory—these six men are considered Yellowstone's first known tourists. Meeting up in Montana Terri-

tory from across the country, they sought the curious and the sublime that subsequent legions of visitors have been drawn to ever since.

The Party

Rossiter W. Raymond: While accounts of the trip do not reveal who organized the party, a reasonable conjecture is that Raymond, being the most educated and well-traveled member, was its de facto leader when decisions were demanded. Fellow party member C. C. Clawson referred to him as "Professor."¹ Raymond's duties as U.S. Commissioner of Mines and Mineral Statistics from 1868 to 1876 brought him west on frequent inspection tours. His 1871 trip to Helena and Virginia City, Montana Territory, was a pretense to enable him to see the real object of his desire: the mythical environs of the Yellowstone headwaters. Raymond wrote a lengthy account of this sojourn, which was published in contemporary periodicals and in his 1880 book, *Camp and Cabin, Sketches of Life and Travel in the West*. A widely traveled man with a distinguished career, Raymond sentimentally referred to his 1871 trip to "Wonderland" as the high point of his life.

Calvin C. Clawson: C. C. Clawson was

a writer on the editorial staff of *The New-Northwest*, a weekly newspaper published in Deer Lodge, Montana Territory. Growing up in Wisconsin, he attended Waynesburg College in Pennsylvania and sought his fortune in the newspaper business in Kansas, Colorado, and Montana. In addition to owning newspaper interests, Clawson became involved in Idaho mining ventures.² He eventually settled with his wife and son in central Idaho in the late 1870s.

Raymond described Clawson as a shrewd reporter, "interviewing people against their will, following with an intent nose the trails of scandal, picking up scraps of information around the doors of public offices . . ." Raymond went on to compliment him for taking notes "in secret as a gentleman should," for being a "jolly companion," and for his culinary skills in the preparation of "dough-gods" and "bull-whacker's butter."³

Clawson's 17 installments describing the Yellowstone trip appeared in the *New Northwest* from September 9, 1871, to June 1, 1872, under the titles "Notes on the Way to Wonderland; or A Ride to the Infernal Regions" and "In the Region of the Wonderful Lake." Each section must have been penned not long before its publication, for in the last installment,

published three months after President Grant signed the park into law on March 1, 1872, Clawson facetiously whined that he could not preempt and thereafter sell a mountain of brimstone in Yellowstone because “the Park Bill put an end to the negotiations.”

August F. Thrasher: A. F. Thrasher was an English-born daguerrean photographer and owner of the “Sun Pro” Gallery in Deer Lodge, Montana. Drifting into the state from the California and Idaho gold camps in 1868, Thrasher was an itinerant photographer whose peregrinations took him to the many fledgling post-Civil War mining camps that had sprouted up in southwestern Montana. Raymond praised Thrasher, “He invests the profession of photography with all the romance of adventure If there is a picturesque region where nobody has been, thither he hastens”⁴

Gilman Sawtelle: Gilman Sawtelle, the first settler of the Henry’s Lake region, 15 miles west of present-day West Yellowstone, was the party’s local guide. Sawtelle’s ranch, 60 miles from the settlements at Virginia City, was an outlier of civilization on the periphery of the Yellowstone Plateau, where he was visited by many travelers. Raymond described him as “a stalwart, blond, blue-eyed, jovial woodsman,” and his accompanying dog, Bob, “an excellent spirit and a companionable soul.”

Josiah S. Daugherty: A prominent businessman and citizen of Wabash, Indiana, Daugherty



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A photo (1800s) of Sawtelle’s ranch near Henry’s Lake, Idaho. YELL 33378. NPS archives.

mind with a general knowledge of what is going on in the world about him.”⁶

Anton Eilers: Not much is known about Raymond’s assistant and fellow mining engineer. He must have filled a niche, for Raymond wrote that regarding character and accomplishment, “what one of us lacked another was sure to have.”⁷

The Group’s Itinerary

The group (six men, eight horses, one mule, and one dog) departed on August 10, 1871, from Virginia City, one of Montana Territory’s more populated and vigorous cities. Up the Madison Valley they traversed, crossing the Continental Divide via Raynold’s Pass to reach Sawtelle’s ranch on Henry’s Lake for a three-day respite. Via another low pass they returned to the Madison River and progressed to the East Fork (Gibbon River) confluence, where they saw their first geyser. Continuing up the other branch, the Firehole River, the wanderers came to the Lower Geyser Basin, which they erroneously supposed was the Upper Geyser Basin as described by Nathaniel Langford in his *Scribner’s* articles. The thermal features amazed them, but did not fit with Langford’s descriptions. For reasons unfathomable, they bypassed the Upper Geyser Basin in a brash, two-day thrust to reach Yellowstone Lake on a miserable route blazed by one of Hayden’s scouting parties. Their toil was rewarded with the beauty of the lake and the thermal features of the West Thumb Geyser Basin. They moved north to the lake’s outlet and followed the Yellowstone River downstream to the Grand Canyon, where they encountered Lt. Gustavus Doane of the Hayden Expedition. He informed them that they had inadvertently detoured around the Upper Geyser Basin with its

magnificent spouters and pools. Except for Thrasher and Sawtelle, who stayed to photograph the canyon, the rest of the party struck southwest over Mary Mountain back to the Firehole River and upstream to the Upper Geyser Basin. After enjoying the latter, they descended the Firehole and Madison rivers to Virginia City and dispersed homeward.

Encounters With Wildlife

Mid-nineteenth century Western travelers were accustomed to shooting wildlife as their larder or whim dictated, and Clawson’s party was no exception—especially considering the fact that no legal strictures against it were in place in 1871. The park’s 1872 founding act contained a vague directive for the Secretary of the Interior to “provide against the wanton destruction of the fish and game found within said park,” but it would be 20 years before effective checks against killing park wildlife were in place. While traveling up the Madison River outside the park, Clawson lamented that “as yet we had taken no game—not even a chicken killed or a fish caught—and there was a stife among us to see who would get the first blood.” An eagle was their first victim:

“

In a short time the eagle hunters made their appearance, with their hats bedecked with trophies in the shape of eagle feathers, and an eagle hanging to the horn of each saddle, while the wings dragged the ground. The old one showed fight when she saw the hunters approaching, and settled down by the nest to protect her young. After several shots from a rifle, she was disabled, and Mr. Raymond climbed the tree as far as

possible, threw a rope over the limb, and shook the two young ones out, then brought them to camp. They were monsters of their age, and after admiring them a while, we turned them loose to shift for themselves.⁸ ”

Before we condemn them for a crime against nature, let us ask ourselves what we are perpetrating today with no compunction that our great-great-grandchildren will find odious. As Henry Louis Gates, Jr., phrased it, “History is, in no small part, a chronicle of formerly acceptable outrages.”⁹ On the whole, however, the party apparently restricted itself thereafter to shooting elk and fowl to augment their food supplies.

Clawson noted that Yellowstone was a virginal hunting and fishing ground, “where elk and moose and deer and bear have maintained their rights to this their Eden since the day they were given possession.”¹⁰ Raymond concurred, “The forest and the wave alike teem with legged and winged game.”¹¹ Clawson corroborated other early travelers’ observations that wolves were native to the Yellowstone Plateau. On their first night at the lake, when Clawson drew night guard duty, the horses were uneasy.

“ A band of hungry wolves sat upon a point some distance away and howled and yelped a most heartrending war song that seemed to terrify even our dog, who was a wolfhunter by profession. But with my back to a geyser and the dog and Ballard [a single-shot rifle] in front of me, I gazed into the dark dismal woods and dared either devil or wild beast to ‘tackle me.’¹² ”

This excursion party offers testimony that Yellowstone abounded with wild game prior to the onslaught of subsequent visitors. Some people have contended that Yellowstone was essentially devoid of mammals (especially elk and wolves) until the late nineteenth century, when white hunting pressure “pushed” the remnant animals up into the mountains. This claim was effectively refuted by Paul Schullery and Lee Whittlesey in

their survey of 168 historical accounts of visits to the Yellowstone Plateau prior to 1882.¹³ They found that 90 percent of the remarks relating to wildlife were claims of abundance. As C. C. Clawson wrote, “Elk in bands flew away at sight of us or stood in groups until the crack of the rifle admonished them that they stood in dangerous places.”¹⁴

Notes Upon the Scenic Wonders

C. C. Clawson’s responses to the scenic wonders of Yellowstone were atypical. Whereas many visitors to the park would place Old Faithful Geyser and its companion thermal features in the Upper Geyser Basin as the defining, requisite Yellowstone experience, Clawson devoted a scant seven tepid lines to their description—even though they had spe-

cifically looped back to see them. Likewise, the majestic Lower Falls of the Yellowstone and its incomparably colored and sculpted Grand Canyon have transfixed millions of visitors with their sublimity. Of the two, Clawson penned a mere eight terse lines! What *did* grip Mr. Clawson?

The first feature to endear itself was the Madison Canyon. Waxed Clawson, “For wild canyons and grand scenery, the Madison River is not equaled by any stream of its size in the mountains.” He went on to describe the volcanic palisades which hem this river at its second canyon just outside the park: “The mountains of rock run thousands of feet in the air, and form picturesque sights compared with the smooth, tame valley in front.” Probably not one in a hundred modern tourists stops for a minute’s con-



Photo taken by William H. Jackson in 1871 of the Grand Canyon, looking down from over the lower Falls, west side. YELL 36070. NPS Archives.

templation of the pleasures of this canyon, in their determined pursuit of the geyser basins upstream. Perhaps a leisurely day-long horseback ride through the Madison Canyon, as opposed to a 45-miles-per-hour passage entombed in a steel and glass conveyance, enabled Clawson to deduce that “here is another great field for artists; and photographers and landscape painters will here find food for the camera and easel.”

Clawson wrote of the varied and sometimes dangerous thermal features of the Lower and Midway geyser basins, but the curiosities which in some would ignite wonderment elicited from Clawson only guidebook descriptions. For exhilaration of spirit the author would have to wait until the party topped the divide between the geyser basins and Yellowstone Lake:

“ Sitting on our horses we gazed and gazed in silent wonderment at the outstretched world below. We were beyond the flight of the Muses . . . We could not help feeling that we were lifted up BETWEEN HEAVEN AND HELL, for while the seething, sulphurous lakes were on each side and far beneath us, the placid sky hung in grandest beauty above us.¹⁶ ”

Clawson went on to note that since four great rivers—the Yellowstone, Missouri, Snake, and Green—debouched from the highlands of this massive volcanic plateau, his ken literally encompassed the apex of North America. “This will be one of the most interesting features of Wonderland when Congress shall have set aside one hundred square miles here as A WORLD’S PARK, which it no doubt will.”¹⁷

When Clawson looked upon the vast ultramarine expanse of Yellowstone Lake lying below him to the east, he effused with poetic timbre:

“ We were at last rewarded for all the trouble and dangers of the journey, when, from a high hill, on which was an open space in the timber, we looked down and out over the grand and beautiful water, clear as glass of finest finish, lying

calm and still as death in the evening sun. The like of Yellowstone Lake has not yet come under the eye of or within the knowledge of civilized man. The curious and marvelous sights that encircle it, the wondrous beauty of the mighty peaks that overshadow it as they stand arrayed in gorgeously painted garments of red and purple and yellow like gigantic sentinels guarding the precious treasure entrusted to their care and keeping; its romantic shores, fringed with forests of richest green, which the frosts of winter or the heats of summer cannot fade; the unequalled beauty of its outline—all unite to enveil it in an unnatural, indescribable appearance; unlike any other spot or place seen or heard of—as if not of this world—something spiritual, beyond the reach of pen or tongue. The eye must behold the glory thereof to believe;

And even then,
Doubting, looks again.¹⁸ ”

Clawson concluded his impassioned portrayal of the lake—which he envisioned as the center of a forthcoming national park—by contrasting its present serenity with its past geologic turmoil:

“ It is hardly possible to realize that it was once a VOLCANO OF WONDERFUL MAGNITUDE, so great, in fact, that it hurled forth from its terrible maw rivers of lava and mountains of fiery substance, which, intermingling as they fell, formed these richly colored peaks that stand to the south and south-east.¹⁹ ”

While Yellowstone’s magnetic renown has always included its rare geothermal spectacles and plentitude of wildlife, many tourists, like Clawson, leave the reservation thoroughly enthralled with the sublimity of Yellowstone Lake.

The Party’s Attitude Toward Native Americans

C. C. Clawson displayed an antagonistic attitude toward Native Americans—

the norm among whites in Montana Territory then. His references to them indicate that white people still assumed the Yellowstone headwaters was a prime locale to encounter their darker-skinned enemies. This presumption contradicts the myth propagated by some Yellowstone travelers that Native Americans dreaded and shunned this spirit-haunted highland of geysers, hot springs, and cold. Earliest among such sources was fur trapper Warren Angus Ferris, who visited Yellowstone in 1834 and reported that his Pend d’Oreille Indian companions “were quite appalled, and could not by any means be induced to approach them [the geysers] . . . they believed them to be supernatural and supposed them to be the production of the Evil Spirit.”²⁰ A careful evaluation of the historical record reveals that the supposed Native American fear of Yellowstone’s geysers was complex and, at best, only half true.²¹

But fear of encountering Indians on this 1871 trip was pervasive and well founded. According to Rossiter Raymond, their party numbered only six men because a recent raid by Sioux Indians into the Gallatin Valley had unnerved many would-be participants. “When the critical day arrived, there was an amazing pressure of business in the usually somewhat dull town [Virginia City], which hindered every one of our distinguished friends from starting,” Raymond noted sarcastically.²²

Raymond was perhaps unfairly ridiculing the settlers’ fear of Indian attack when traveling far from the mining camps, for Montana in 1871 was still a battleground between the races. Blackfoot depredations had been checked only a year prior by the Baker Massacre, while the Battle of the Little Bighorn and the Nez Perce War were still five and six years into the future, respectively. As Clawson’s narrative demonstrates, precautions against Indian encounters were standard operating procedures then, and for good reason.

Guards were posted every night during the trip to secure the camp against a surprise attack by Indians or a marauding bear. Clawson professed, “In the mountain countries man has three great enemies he is liable at times to meet with, all of which I acknowledge I fear exceed—

ingly, especially at night. They are the rattlesnake, bear, and noble Red Man.” He mused that at least an Indian’s silent tomahawk to the brain would be a painless and swift deliverance, “for you lose your life without being aware of it.” Still, he slept with his head against a tree as a safeguard against having his hair “snaked” off in the midst of pleasant dreams.²³

Indian sign was noted on the Madison River near present-day West Yellowstone, where a large grove of quaking aspens was marked with a well-executed deer cut into the bark, presumably to advertise good hunting thereabouts. That same day, “we stopped on the Madison, near where the eight Indians made a camp while on their flight with the twenty-seven head of mules stolen down on the Snake [River] the year before.”²⁴ The most direct contact with Indians occurred outside the park, on the party’s homeward ride down the Madison River. Discovering a dozen Indian warriors laying in ambush for them on the opposite bank, the party (reduced to four men by then, since Thrasher and Sawtelle stayed to photograph the Grand Canyon) cinched their animals tightly and galloped toward Virginia City. “On they came like demons, but the water was between us.” In a 10-mile race the Yellowstone tourists outdistanced their pursuers. “I shall never forget how nicely we fooled those Indians,” bragged Clawson.²⁵

The Indian threat was real. In fact, Clawson, whose scalp might well have been lifted by pursuing Indians, was, by the standards of his contemporaries, fairly mild in his damnation of Native Americans. More vitriolic in comparison was the editor of the *New North-West*, who opined two years earlier that the Indian was a “base, bloodthirsty, cruel, treacherous being,” whose extermination was the most expedient solution to the racial enmity then gripping the territory.²⁶

Another incident revealed both the vividness of Clawson’s imagination and the presumed omnipresence of Indians throughout the Yellowstone Plateau. Not far from the shore of Yellowstone Lake, the tourists chanced upon a small, dilapidated log hut with a collapsed roof. While Clawson could entertain the possibility that it was used by white trappers or road agents,

“ I am inclined to think that in the first place that homely habitation was none other than a lover’s retreat, constructed by some bashful red son of the forest . . . in anticipation of taking unto himself a dusky partner for life There used to be a custom, among the native Americans, for a newly-married couple to take a jaunt of a month to some beautiful lake or river, where the bride would be allowed to accompany her hunter to the fishing and hunting grounds, and take part in the excitement of the chase.²⁷ ”

Clawson also conjured up the notion that “the region of the Wonderful Lake is moreover the ‘Happy Hunting Grounds of the Red Man.’ It answers his description of it exactly. Here he expects his spirit to wing its way when it leaves the body. A land he pictures in his imagination is abounding in choicest grass for his favorite ponies and fish and game of endless quantity and delicious quality. It is his heaven.” By contrast, Clawson imagined that the thermal basins of the Firehole River were the antithetical Indian hell. “On the other side of the great hill, in the Geyser Basin, where the bunch grass is ever short, no fish, game lean, and ponies lank is the ‘Unhappy Hunting Grounds,’ made ready for his enemies . . . there their spectral forms, on skeleton cayuses, continually chase, through the alkali swamps, by boiling lakes and sulphurous pits, the fleeing phantom deer.”²⁸ Perhaps Clawson’s conjecture of happy and unhappy Indian hunting grounds in the park was based upon unmentioned dialogue with Indians or “common knowledge” among area frontiersmen.

Commercial Uses of Yellowstone

C. C. Clawson viewed the unusual geology of Yellowstone through the lens of a former prospector. At first sight of a thermal area near present-day Madison Junction, with its rivulet of hot water discharge, he lamented, “It is enough to make the heart of a miner ache to see so much clear hot water running to waste when so many banks of good ‘pay grit’

have to be laid aside during winter on account of frost.” Upon observing that geyserite waters precipitate and adhere firmly to submerged objects, Clawson suggested the making of grindstones by throwing round disks of wood into hot springs, but bemoaned that, “freight is rather high at the present to make this branch of business profitable.” He also suggested—perhaps facetiously?—the possibility of employing geyser water for embalming. “It is much pleasanter to ‘shuffle off this mortal coil’ with the thought that you are going to be embalmed, petrified—*turned into stone*—than to crumble back to mother earth.” He jested that we would soon see “the ancient Egyptian mode of preserving the dead not only equaled but eclipsed.”³⁰

Clawson’s most fanciful, humorous burst was reserved for the Fountain Paint Pots of the Lower Geyser Basin, which he dubbed “the Cosmetic Fountains.” He postulated that the economic value of the oil springs of Wyoming would “sink into insignificance when compared with the everlasting fountains of Cosmetic,” the latter of which would enrich the treasures of Montana. (Did he think the territorial boundaries had been moved? There was agitation among Montanans to re-adjust their territorial boundary to include Yellowstone. Then, and for many years thereafter, access to Yellowstone was possible only through Montana, but the effort was in vain.) On he babbled about this cosmetic mineral deposit:

“ But in a year or two the natural production manufactured under the immediate supervision of Dame Nature herself (who is supposed to know what is best for her daughters), will be all the rage. The same quantity that now costs \$2.00 can be delivered at your doors for five cents, (half white and half pink) perfumed with Extract of Bumblebee, with a picture of a geyser in full blast on one side of the bottle and on the other the inscription

This is the stuff we long have sought

And wept because we found it not.³¹ ”

Real or imagined commercial uses of Yellowstone were subsumed under the compelling need to declare the newfound wonderland a national park. Throughout his rambling narrative Clawson assumed that Yellowstone would become a pleasuring ground for America and the world. For example, he expected that the shores of Yellowstone Lake would become a resort locale favored by newlyweds, who “wish to get away from the bustle and fuss of home to spend the first sweet month of their new life alone among ‘Nature’s wild, enchanting bowers,’ out of reach of the clatter and bang of the *charivari*.”³² The December 23, 1871, issue of the *New North-West* (three months before the park bill was signed into law) contained an unsigned editorial—strongly bearing the literary fingerprints of C. C. Clawson—describing the wonders of this newly realized “Arcana Inferne.” It concluded:

““ No soul has permanently shrouded itself from the world within its weird confines: But to it will come in the coming years thousands from every quarter of the globe, to look with awe upon its amazing phenomena, and with pen, pencil, tongue and camera publish its marvels to the enlightened realms. Let this, too, be set apart by Congress as a domain retained unto all mankind, (Indians not taxed, exempted), and let it be esto perpetua. ””

If this essay was not composed by Clawson, it surely expressed his earnest sentiments. Perhaps this editorial was written by Clawson’s superior, James H. Mills, the newspaper’s editor and publisher, who also ventured into Yellowstone one year later. Like Clawson, Mills published his narrative serially in the *New North-West*.³³ Its stylistic and ebullient manner equals, if not excels, that of C. C. Clawson.

The Missing Photographs of A. F. Thrasher

Perhaps C. C. Clawson and his “Ride to the Infernal Regions” would have been more than a footnote to the history of

Yellowstone had the journey’s photographs taken by A. F. Thrasher survived and been widely disseminated. Thrasher’s images could have rivaled those of William Henry Jackson, whose national fame was established when his extensive photographic views of Wonderland were displayed to Congress and the public during the debate over the park bill. Clawson’s narrative detailed Thrasher’s conscientious efforts to photograph Henry’s Lake, Yellowstone Lake, and the Grand Canyon of the Yellowstone. (Did he photograph the geyser basins?)

No dilettante, Thrasher had his mule heavily laden with the accoutrements of wet plate photography: fragile glass plates, processing chemicals, portable darkroom, heavy camera, and tripod. Each image required an on-the-spot darkroom session to coat the plate with the light-sensitive emulsion. Little wonder then, that he often entered camp late at night “weary, hungry, irate, but victorious.” Cohort Raymond devoted two pages of his memoirs to the indefatigable efforts by Thrasher to “wrestle” with the views. In fact, so “entirely unmanageable” did Thrasher become with his time-consuming photography that the party split up at the Grand Canyon, with Sawtelle remaining to assist Thrasher, while the other four crossed the Central Plateau to take in the Upper Geyser Basin. Raymond extolled Thrasher’s perseverance in “pursuing with tireless steps the spirit of beauty to her remotest hiding-place!”³⁴

In the September 23, 1871, issue of the *New North-West*, the following brief item appeared under “Local Brevities:”

““ Mr. A. F. Thrasher’s outfit collided with a fire near the Geysers: Result, outfit destroyed, save negatives and camera: Sequence, he has returned to complete the series of views. ””

This cryptic report was corroborated by Raymond: “He got ‘burned out’ by a forest fire, losing everything *but his negatives* [Raymond’s italics] and that after returning to Virginia City, and procuring a new outfit, he posted back again, this time alone, to ‘do the rest of that country, or bust.’”³⁵ Thrasher died within four years of the trip.

Where are Thrasher’s prints and negatives of Yellowstone in 1871? As a professional photographer Thrasher must have realized the commercial value of these earliest photographs of Wonderland—pictures which he so painstakingly wrought from the wilds and rigors of the upper Yellowstone—yet none are extant today (except for one purported image described below). The crescendo of interest in Yellowstone’s wonders would have created a demand for Thrasher’s images in Montana Territory and beyond. Had he printed and distributed a goodly number, some likely would have survived to the present.

One Thrasher picture of Yellowstone potentially exists. According to Mary Horstman, Forest Historian for the Bitterroot National Forest, a county historian in Wabash, Indiana, examined a Thrasher Yellowstone picture in the possession of the elderly widow of Josiah S. Daugherty’s grandson. Unfortunately, the print could not be produced when Horstman visited the woman in the late 1980s.

At least one person held expectations that A. F. Thrasher’s Yellowstone quest would achieve memorable results—his mother, who, as an 80-year-old resident of Grass Valley, California, wrote the following poem for the *Virginia City Montanian* of March 28, 1872:

*News of my wandering son, whose first essay
Through Wonderland its treasure to survey
By fire arrested, were resumed again.
Mid dangers drear from savage beasts and men.
To seek for boiling springs and geysers grand
Amid the perils of that far-off land.
And reproduce them in their bright array
With pencil sharpened by the god of day.*

Yellowstone was first photographed in 1871 by four individuals, yet only the images by William Henry Jackson (who accompanied the government’s Hayden Survey) were widely disseminated to the public which so hungered for them. A Chicago photographer named Thomas J.

Hine accompanied U.S. Army Captain John W. Barlow's reconnaissance of Yellowstone, but his negatives were destroyed in the Chicago Fire of 1871. Recently, seven Hine prints were identified in the Print Room of the New York Historical Society, including the first known photograph of Old Faithful in eruption. A Bozeman photographer, J. Crissman, also accompanied Barlow, but his pictures were not widely distributed and were often misattributed to others. Three men—Thrasher, Hine, and Crissman—were poised to exploit their presence in Yellowstone on the eve of the park's birth, but fate turned its hand against them.³⁶

The First of Many

These first six Yellowstone tourists had much in common with the succeeding multitudes: an appreciation of the unique and awe-inspiring geological phenomena that undergirds the region's appeal; an awareness of the varied wildlife heritage native to the plateau; and a cog-

nizance that Yellowstone's commercial potential would be best managed through the mechanics of public ownership. Most telling, however, was their poignant, emotional response to this place where "the gates of the Infernal Regions were not only ajar but clear off their hinges," as Clawson emphatically phrased it. How fitting it is that Wonderland's first tourist could verbalize the elixir that still permeates the air and imbues itself upon the visitor:

“Those who may hereafter visit this strange land will bear me out in the assertion that a peculiar sensation takes possession of the visitor which cannot be dispelled, that he feels he is in a land akin to spirit-land. Why this feeling, I am unable to explain; but it being the old pleasure grounds of the aborigines for many ages, and the place designated by them as the eternal abiding place of the spirits of their departed good, as well as

*the peculiar effect the exceedingly light air (barring the hurricanes) has upon the respiratory organs, the wild and fascinating scenery—all may have something to do with this strange feeling taking possession of the stranger.*³⁷ ”

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¹See Mary C. Horstman, *Taking Up the Tools: The Early Career of Rossiter Worthington Raymond, 1867–1876* (University of Montana, Master's Thesis, 1989).

²The Calvin C. Clawson Collection (Manuscript 165) is housed in the Idaho State Historical Society, Boise, Idaho.

³Rossiter W. Raymond, *Camp and Cabin: Sketches of Life and Travel in the West* (New York: Fords, Howard and Hulbert, 1880), p. 157–159.

⁴Raymond, p. 157.

⁵Raymond, p. 155, 159.

⁶*History of Wabash County, Indiana* (Chicago: John Morris, Printer, 1884).

⁷Raymond, p. 159.

⁸C. C. Clawson, "A Ride to the Infernal Regions," *New North-West* (Deer Lodge, Montana Territory), September 30, 1871.

⁹Henry Louis Gates, Jr., "Men Behaving Badly," *New Yorker*, August 8, 1997, p. 4.

¹⁰Clawson, January 27, 1872.

¹¹Raymond, p. 169.

¹²Clawson, January 27, 1872.

¹³Paul Schullery and Lee Whittlesey, *The Documentary Record of Wolves and Related Wildlife Species in the Yellowstone National Park Area Prior to 1882*, (Yellowstone National Park, Division of Research, 1992).

¹⁴Clawson, May 18, 1872. For an overview of nineteenth century human influences on Yellowstone wildlife, see Paul Schullery, *Searching for Yellowstone: Ecology and Wonder in the Last Wilderness* (Boston and New York: Houghton Mifflin Company, 1997), p. 68–88.

¹⁵Clawson, October 14, 1871 and November 18, 1871.

¹⁶Clawson, January 13, 1872.

¹⁷Clawson, January 13, 1872.

¹⁸Clawson, January 27, 1872.

¹⁹Clawson, January 27, 1872.

²⁰Warren A. Ferris, *Life in the Rocky Mountains 1830–35* (Salt Lake City: Rocky Mountain Bookshop, 1940) p. 205.

²¹See Ake Hultkrantz, "The Fear of Geysers Among Indians of the Yellowstone Park Area" *Lifeways of Intermountain and Plains Montana Indians*, edited by Leslie B. Davis (Bozeman, MT: Montana State University, 1979); Joel C. Janetski, *Indians of Yellowstone National Park*, (Salt Lake City: University of Utah Press, 1987); and Joseph Weixelman, *The Power to Evoke Wonder: Native Americans & The Geysers of Yellowstone National Park* (privately printed, July 19, 1992).

²²Raymond, p. 154.

²³Clawson, September 16, 1871 and October 14, 1871.

²⁴Clawson, November 11, 1871.

²⁵Clawson, June 1, 1872.

²⁶*New North-West*, August 27, 1869, p. 2, col. 1 & 2.

²⁷Clawson, February 10, 1872.

²⁸Clawson, February 10, 1872.

²⁹Clawson, November 18, 1871.

³⁰Clawson, November 25, 1871.

³¹Clawson, December 2, 1871.

³²Clawson, February 24, 1872.

³³James H. Mills, "The Grand Rounds. A Fortnight in the National Park" *New North-West* (Deer Lodge, Montana Territory), September 28–November 30, 1872.

³⁴Raymond, p. 156–157.

³⁵Raymond, p. 157.

³⁶Consult *Montana, the Magazine of Western History*, Summer, 1999, p. 2–37, for an extensive discussion of Yellowstone's earliest photographers.

³⁷Clawson, May 18, 1872.

The National Park as Museological Space

by Thomas Patin

In the early nineteenth century, American cultural elites were in the habit of comparing American culture to European culture. They felt an “embarrassment” of a comparative lack of a national cultural identity based on a long and established artistic, architectural, and literary heritage.¹ Nevertheless, it was obvious that what America lacked in cultural treasures it more than made up for in natural wonders. A perceived missing national tradition found a substitute in the American landscape. By the middle of the nineteenth century, cultural nationalists took pride in the fact that the western environment, especially places like Yosemite, Yellowstone, and the Grand Canyon in Arizona, were unparalleled. Scenery began to be understood as a form of cultural redemption (see photo right).²

But this redemption could only be accomplished if parts of the natural world could be converted into cultural heritage. How was such a conversion possible? Only figuratively, of course. This conversion has been carried out through the use of a number of extraordinarily effective rhetorical devices. These devices have been so effective that they have become invisible. I am thinking here especially of conventions of landscape painting and techniques of museum display that allowed for the natural world to be presented as a natural culture. My primary concern is with the various techniques borrowed from museums and used again in the presentation of nature in the national parks. Using Yellowstone as an example, I want to suggest that national parks are essentially museological institutions, not because they preserve and conserve, but because they employ many of the techniques of display, exhibition, and presentation that have been used by museums to regulate the bodies and organize the vision of visitors. Such a strategy produces a so-called “vignette of

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America,” insinuates the museum into the wilderness, produces specific understandings of the natural world, and furthers the idea that natural wonders are part of America’s *cultural* heritage.³

When F. V. Hayden returned from his expedition to the Yellowstone region in 1871, he arranged for an exhibition of a number of specimens at the Smithsonian Institution in Washington, D.C. These “specimens” included photographs by William Henry Jackson and sketches by

Thomas Moran. These images are more than decoration or pretty scenery. They are more like samples of a nation’s heritage. In the same way, the geological specimens on exhibit were more than rocks. In the Smithsonian, the nation’s curiosity cabinet, the watercolor sketches, photographs, and geological specimens worked in a supportive interrelationship. Natural fact was claimed as cultural heritage through the aesthetic conventions bound up in landscape painting and in

the exhibition of geological samples. At the same time, culturally specific aesthetic preferences were presented as natural fact, since the exhibition and depictions of the natural world seemed to echo art and culture.

Of course, nature cannot be enclosed within a museum, no matter how many rocks, photographs, and paintings are used to represent it. It is possible, though, to enclose nature—so to speak—within the logic of the museum by presenting nature through conventional exhibition techniques. In other words, if you can't bring nature into the museum, bring the museum into nature. There are many general similarities between the ways that museums and galleries present their objects of display and the ways the parks present nature to visitors. Most museums and national parks have grand or otherwise extraordinary entrances. Both institutions use roads, trails, directional signs, architectural elements, or other means of traffic control. Views and vistas are commonly framed by landscaping or architectural elements. In both parks and museums we find an abundance of signs and text panels explaining the importance of particular items on exhibit. Finally, restaurants and shops are abundant in both places, complete with a selection of reproductions of the contents. Rather than gloss over these similarities, however, I would like to be more historically specific and examine two typical nineteenth-century methods of display, the cyclorama and the moving panorama.

In the cyclorama, viewers stand on a raised circular viewing platform in the center of a circular exhibition space and look at a dimly lit 360° landscape painting. These huge paintings are often housed in their own circular buildings. Cycloramas are very similar in principle to the IMAX theatre we are all familiar with today, except they completely surround



A two-layer panorama, London 1798.

the viewer. Cycloramas were once popular forms of entertainment, numbering around 400 in Europe and America in the late 1800s, with visitation numbers between 1872 and 1885 reaching 200,000 per year.⁵ Cyclorama exhibits were considered to be extraordinarily realistic, as well as morally instructive.⁶ Many visitors to cycloramas have described the sensation of being transported to those places depicted in them, such as Niagara Falls, the Alps, volcanic eruptions, or the Holy Land.

The moving panorama combines the cyclorama with the control of vision used in dioramas, another popular mode of viewing scenes in the mid-nineteenth century. The moving panorama requires viewers to sit as an audience facing one direction as the painted scenery passes before them in the form of a theatrical backdrop stretched between two rolls of canvas.⁷ Henry Lewis' *Mammoth Panorama of the Mississippi River*, 1849 was painted on 45,000 square feet of canvas and toured several cities in the east and midwest. The unrolling of this painting took several hours, and quasi-scientific commentaries, anecdotal material, and piano music accompanied the images.⁸ Despite the obvious artificiality, panoramic presentations have been generally held to be completely convincing.⁹ In fact, some nineteenth-century visitors reported experiencing dizziness and seasickness.¹⁰

What I would like to suggest is that the cyclorama as an exhibition technique has been insinuated into nature in the form of the overlook, the viewcut, and some visitor centers in the national parks, while the moving panorama has been incorporated into the parks as roadways. One early tourist to the Grand Canyon in Arizona explicitly likened his experience on the south rim to standing in the middle of a cyclorama looking at a well-executed painting of mountains and gorges.¹¹ In a similar fashion, the windows and "reflectoscopes" at the Indian Watchtower at Desert View, designed by Santa Fe Railroad's architect Mary Colter in 1932, condense, simplify, and separate sections of the canyon for viewing as if they were framed pictures.¹² According to historians Marta Weigle and Kathleen Howard, a controlled access to the rim

and the regulation of vision were crucial components of the "viewing apparatus" set into place at Grand Canyon by the Santa Fe Railroad and the Fred Harvey Company.¹³

In Yellowstone, the cycloramic exhibition technique is also found at overlooks, viewing platforms, and viewcuts at roadside turnouts. As early as 1897, platforms and sidings were built for tourists to use to get out of coaches or other vehicles at different points on regularly traveled routes.¹⁴ Starting about 1910, "vista cuts" began to be made along roads, such as one on the West Thumb to Old Faithful road that allows for a view of Duck Lake, and another east of Mammoth Hot Springs used to view Wraith Falls.¹⁵ The CCC continued such work into the 1930s, clearing stumps and dead trees, building more guardrails, and creating more turnouts, viewcuts, and exhibit shelters like the one at Obsidian Cliff.¹⁶ The construction of turnouts and viewcuts along the roadways continued since the late 1950s. There are numerous turnouts and viewcuts in the park, of course, but ones that have historically exemplified the cycloramic function include those at the Grand Canyon of the Yellowstone, such as Artist Point and Inspiration Point.



Some of the overlooks allow for a nearly 360° view of the canyon and its surroundings. The view is an elevated one, allowing for a view of the depths of the canyon, as well as some of the landscape above the rim. There are, of course many other examples in the park.

As a digression, it is interesting to note how the view beheld by visitors to the canyon is similar to that depicted in Thomas Moran's painting of the canyon. Moran even provides two "staffage figures" or "surrogate viewers," which act as stand-ins for the viewers of the picture, allowing viewers an imaginary immediacy and presenting an idea of the scale



The viewing platform at Tower Falls (top) and the Thomas Moran painting with “surrogate viewers” looking at the falls (right). Photos in this article taken by author unless otherwise noted.



of the scenery. The overlooks at the canyon explicitly repeat the view depicted by Moran and beheld by his figures. This happens elsewhere in the park, most obviously at Tower Falls. At Tower Falls, the viewing platform is an excellent example of cycloramic presentation, and there is a reproduction of a Moran painting with two surrogate viewers in it looking at the falls (photos above).

There are also numerous roadside turnouts that are examples of both cycloramas and large-format panoramic paintings, such as the one at Shoshone Point, between Old Faithful and West Thumb, near DeLacy picnic area (photo below).



It presents the Tetons to the south and the view is framed by trees to either side (the stumps of trees cleared for the view are visible if you look for them.) It is obvious from the design of the parking lot and the arched rock wall where the view is best appreciated, and, if viewers stand in the prescribed spot, they are offered a framed view of natural beauty as if in a

picture painted from an elevated point. The point of view made available from such a design produces what art historian Albert Boime has described as the “magisterial gaze.” To Boime, this viewpoint embodies the exaltation of the nineteenth-century American cultural elite before an unlimited horizon that they identified with the “manifest destiny” of the American nation.¹⁷ In the parks, the magisterial gaze is reenacted millions of times each year. The elevated position of the park visitor allows for a commanding view of the land, a land that—once seen, claimed, and surveyed—can become part of a nation’s heritage.

The convention of the cyclorama continues to be implemented in national park construction, especially in visitor centers and viewing platforms. In addition to an actual cyclorama painting installed in its own building at Gettysburg, there is a viewing tower at Clingman’s Dome in Great Smoky Mountains National Park that presents a completely cycloramic viewing opportunity. My own favorite example of an explicitly cycloramic presentation is atop the Mission 66-era Henry M. Jackson Memorial Visitor Center at Mount Rainier National Park. In a large, circular viewing room, a 360° view of dramatic mountainous scenery is provided. The room includes benches, handrails, viewing scopes, and information

panels. Some items in the scenery are nearby, such as some small trees, rocks, and shrubs, and in some instances frame the view and help to break up the seemingly unlimited view into smaller segments. These smaller and more immediate objects also serve to set the remainder of the scenery into a spatial relationship with the viewers and the visitor center.

The moving panorama has been repeated in Yellowstone and in most of the national parks in the form of the road system. In the early years of Yellowstone tourism, the Northern Pacific Railroad (NPRR) suggested in their promotion literature a sequence for park visitors: Mammoth, Obsidian Cliff, Norris Geyser Basin, Gibbon Canyon, Gibbon Falls, Lower and Upper geyser basins, Yellowstone Lake, and the Grand Canyon of the Yellowstone.¹⁸ Businessman Nathaniel Langford also proposed roads in the figure-eight system similar to the NPRR scheme and similar to what we now have in the park. Early park superintendent Philetus Norris was concerned with providing visitors with scenic and interesting views along the roads of the park and built the road around the base of Bunsen Peak to provide views of Gardner Canyon.¹⁹ I don’t want to suggest that building a kind of moving panorama was the explicit intention of early park promoters and administrators, only that the moving

panorama and the road system performed similar functions: to make available to visitors, or viewers, a sequential presentation of designated wonders and natural beauty.

Since the 1950s, however, the project of exhibiting natural wonders has been more explicit. In 1958, NPS Director Conrad Wirth issued his *Handbook of Standards for National Park and Parkway Roads*, in which he stated that the purpose of roads in the national park system was “to give the public . . . lei-



surely access to scenic and other features. Thus [the roads] become principal facilities for presenting and interpreting the inspiration values of a park . . .”²¹ Wirth also instructed that roads be fitted to the terrain, and that shoulder widths allow for turnouts and overlooks at frequent intervals. The current systemwide road rebuilding program provides an opportunity to explore a more self-conscious implementation of exhibition techniques in the park.

The cyclorama has been reconstituted in the form of turnouts, viewcuts, observation platforms, and visitor centers, while the moving panorama has been repeated in the parks as roads. To a greater or lesser extent, these techniques have had the effect of regulating the vision of park visitors and managing their physical relationship to natural wonders. Park visitors have been put into positions not unlike

visitors to museums and galleries exhibiting art and other objects. These techniques, along with many other important conventions, have been, in my opinion, crucial to the successful conversion of natural wonders into cultural heritage. This is constantly suggested in the repeated references to national parks and wilderness areas as “treasures” and as our “national heritage,” terms more commonly used for works of art in museums.

*Thomas Patin teaches art history in the School of Art, Ohio University. He became interested in this project on a visit to Yellowstone while working on his Ph.D. dissertation on art museums (University of Washington, 1995.) This essay is a revision of a paper first presented in 1997 at the 4th Biennial Science Conference on the Greater Yellowstone Ecosystem.*²²



¹Runte, Alfred. *National Parks: The American Experience*, revised edition, Lincoln: Univ. Nebraska Press, 1987, p.11.

²Runte, p.7–8, 18, 41.

³The phrase “vignette of America” is paraphrased from the so-called “Leopold Report,” as quoted in Alston Chase, *Playing God in Yellowstone: The Destruction of America’s First National Park*. New York: Harcourt, Brace, Jovanovich, 1987, 33. The 1963 “Leopold Report,” a report to the National Park Service from the Advisory Board on Wildlife Management, that was adopted as part of NPS management policy, states that a national park should represent “a vignette of primitive America.”

⁴Hales, Peter, *William Henry Jackson and the Transformation of the American Landscape*, Philadelphia: Temple Univ. Press, 1988, p. 108; Haines, Aubrey L., *The Yellowstone Story: A History of Our First National Park*, vol I., Niwot, Colorado: Colorado Associated Univ. Press, 1977, pp. 166–169.

⁵Miller, Angela, “The Panorama, the Cinema, and the Emergence of the Spectacular,” *Wide Angle*, v. 18, no. 2, (April, 1996), 36.

⁶Parry, Lee. “Landscape Theatre in America,” *Art in America*, November–December, 1971, p. 52.

⁷Parry, p. 57–58.

⁸Novak, Barbara, *Nature and Culture: American Landscape and Painting, 1825–1875*, New York: Oxford Univ. Press, 1995, p. 23; Miller, Angela, *The Empire of the Eye: Landscape Representation and American Cultural Politics, 1825–1875*, Ithaca: Cornell Univ. Press, 1993, p. 86.

⁹Novak, p. 27.

¹⁰Weigle, Marta, and Kathleen L. Howard, “‘To experience the real Grand Canyon’: Santa Fe/Harvey Panopticism, 1901–1935,” Marta Weigle and Barbara Babcock, eds., *The Great Southwest of the Fred Harvey Company and the Santa Fe Railway*, Phoenix: The Heard Museum, 1996, p. 16.

¹¹Weigle and Howard, p. 16.

¹²Weigle and Howard, p. 19.

¹³Weigle and Howard, p. 16.

¹⁴Culpin, Marcy Shivers, *The History of the Construction of the Road System in Yellowstone National Park, 1872–1966*, Denver, Dept. Interior, National Park Service, Rocky Mountain Region, 1994, p. 45.

¹⁵Culpin, p. 110.

¹⁶Culpin, p. 195–196.

¹⁷Boime, Albert, *The Magisterial Gaze: Manifest Destiny and the American Landscape Painting, c. 1830–1865*, Washington, D. C.: Smithsonian Institution Press, 1991, p. 38.

¹⁸Meyer, Judith L., *The Spirit of Yellowstone: The Cultural Evolution of a National Park*, Lanham, Boulder, New York: Rowman and Little Field Publishers, Inc., 1996, p. 85.

¹⁹Haines, p. 192.

²⁰Culpin, p. 11.

²¹Culpin, p. 178.



10th Circuit Court Overturns Order to Remove Wolves

On January 13, 2000, the Tenth Circuit of the U.S. Court of Appeals in Denver, Colorado, issued its ruling on multiple appeals filed by parties concerned with the reintroduction and management of gray wolves. The original plaintiffs—including the Idaho, Montana, Wyoming, and American Farm Bureau Federations and Cat and James Urbigkit—challenged how the U.S. Department of the Interior, U.S. Fish and Wildlife Service, and other agencies used section 10(j) of the Endangered Species Act (ESA), regarding a “nonessential, experimental” population of wolves in Yellowstone National Park and central Idaho. In December 1997, the District Court for Wyoming held that wolf reintroduction rules lessened protection for naturally occurring wolves (such as those migrating south from Canada, or born in the Glacier National Park area) in the experimental population areas. The lower court judge ordered that wolves be removed from the reintroduction areas; but he immediately stayed his order pending appeal.

The three court of appeals judges found no conflict between the challenged experimental population rules and the ESA, and unanimously reversed the district court’s order and judgment. The court acknowledged that occasional disperser wolves from another geographic area might enter areas in which wolves designated as experimental populations exist, but determined that “the paramount objective of the Endangered Species Act [is] to conserve and recover species, not just individual animals.” The opinion also said that “the rules did not present complicated law enforcement obstacles . . .

the legal protection afforded any particular wolf is clearly known, depending entirely on where the wolf is, not where it might once have been.”

The court found that the Urbigkits’ claims that wolf reintroduction influenced an existing population of a distinct subspecies “boil down to a disagreement over scientific opinions and conclusions . . . [but] simply does not constitute a National Environmental Policy Act violation . . . Agencies are entitled to rely on their own experts so long as their decisions are not arbitrary and capricious.”

Visitors Found Guilty of Removing Natural Features

On October 13, 1999, Toby P. Brown (aged 21) and Katrina M. Usher (aged 19) of Upton, Massachusetts, and Andrew S. Trick (aged 19) of Beaver Creek, Ohio, pled guilty before U.S. Magistrate Stephen E. Cole in Mammoth Hot Springs to the charge of removing natural features from Yellowstone. The party had dug up and collected over 150 pieces of petrified wood around the Petrified Tree, about three miles west of Tower Junction.

On October 8, Tower rangers received two visitor reports of two men and a woman digging in the ground with a screwdriver on the slope above the petrified tree. A park ranger responded to the scene and, after observing two people digging in the area, contacted the third member of the group at one of the two vehicles the group was travelling in. An investigation uncovered one bag of about 100 small pieces of petrified wood in one of the vehicles, and a large number of pieces of petrified wood in a small backpack. Several other mineral specimens and fossils were also found in the car. One of the men said he had taken pieces of travertine and geysirite from one of the thermal areas earlier in the day but denied finding the fossils and other minerals in the park. All of the specimens were seized and will be returned to their natural setting if possible.

Each individual was fined \$750, placed on three years probation, and prohibited from entering the park for three years.

NPS to Produce EIS on Commercial Use of Research Knowledge

As a result of a lawsuit filed by the Edmonds Institute, et al., a federal judge in Washington, D.C., last March suspended the 1997 agreement between Diversa and Yellowstone National Park (YNP) that allowed the company to survey the park’s hot springs for commercially valuable microbes. The plaintiffs claimed that the National Park Service (NPS) violated the National Environmental Policy Act (NEPA) when they developed a Cooperative Research and Development Agreement (CRADA) with Diversa without first soliciting public opinion or evaluating the environmental impacts of the program. In entering into the agreement, the company had agreed to provide the park with \$175,000 in cash and equipment over five years, plus 0.5 to 10 percent of the profits from any Yellowstone discovery.

Last summer, the NPS agreed to produce an Environmental Impact Statement (EIS) that addresses the CRADA process (agreements developed solely to capture revenues that result from commercial use of the knowledge derived from research conducted at YNP). Using NPS guidelines, research on varied topics has been permitted at no charge for decades in Yellowstone with what managers perceive as no harm to the park and great benefit to science.

Former YNP Researchers Honored for Book

Two former Yellowstone scientists, Dr. Mary Meagher and Dr. Douglas B. Houston, have won the prestigious Joan Patterson Kerr Award for their 1998 book, *Yellowstone and the Biology of Time* (Univ. Oklahoma Press.) The award, given for the year’s best illustrated book on the history of the American West, was announced at the Western History Association’s annual meeting in October 1999.

The book features 100 sets of comparative photographs that represent how the Yellowstone landscape has and has not

changed over the past 130 years. The original images date to the 1870s and 1880s, many of which were taken by noted photographers William Henry Jackson and F. J. Haynes. Starting in the 1970s, Meagher and Houston relocated the points from which the pictures were taken and rephotographed the same locations then and, in some cases, again after the 1988 wildfires. They analyzed the photographs to note long-term changes in vegetation patterns and in other features. The authors also describe the park's soils, vegetation, and geology, and discuss the "agents of change" that shape Yellowstone: climate, fire, humans, and other forces still active in the ecosystem.

Dr. Meagher began her long association with Yellowstone in 1959 and held a variety of research-related positions, including chief biologist. She specialized in studying bison ecology, and retired in 1997 from the former National Biological Service (NBS), now the U.S.G.S. Biological Resources Division. Dr. Houston studied ungulates in Yellowstone from 1970 to 1980, and wrote the award-winning *The Northern Yellowstone Elk: Ecology and Management* (Macmillan, 1982.) He subsequently transferred to Olympic National Park where he studied mountain goats, salmon, and other topics. He, too, retired from the NBS in 1997.

Region Gets New Research Coordinator

Dr. Kathy Tonnessen, formerly an ecologist and Director of Biological Effects for the NPS Air Resources Division, has been named Research Coordinator for the Rocky Mountain Cooperative Ecosystem Studies Unit at the University of Montana, Missoula. Tonnessen's previous experience includes studying water geochemistry in Sequoia-Kings Canyon and Yosemite national parks and administering air pollution research for the state of California. She has also held affiliated faculty positions with Colorado State University and the University of Colorado.

The NPS has established a network of cooperative ecosystem studies units at universities across the country to provide support to parks in the biological, physical, social, and cultural sciences. The

intent is for the units to provide resource managers with high-quality, independent and objective research and technical assistance, and to facilitate interdisciplinary problem-solving at multiple scales and in an ecosystem context. Participating agencies include the Bureau of Land Management, the Bureau of Reclamation, the U.S.G.S. Biological Resources Division, the U.S. Forest Service, the Department of Energy, and the National Oceanic and Atmospheric Administration.

Another Geologist Joins Yellowstone's Staff

Yellowstone is pleased to announce the hiring of another geologist, Dr. Nancy Hinman, currently of the University of Montana, Missoula. Hinman, who will arrive in Yellowstone full-time after the completion of the university's school year in June, will serve as the park's geothermal specialist.

New Discoveries from the Floor of Yellowstone Lake¹

Recently completed high-resolution surveys of the northern part of Yellowstone Lake show a lake bottom covered with dozens of circular depressions and hundreds of spires and pinnacles protruding from the floor. The circular depressions are 25–800 meters in diameter, have steep inner walls, and may be the remnants of explosive events similar to explosion craters exposed on land nearby. The spires are composed primarily of silica, up to 35 meters high and up to 50 meters in diameter. They occur singularly, in clusters, and in north-south-trending lines up to 400 meters long. These linear features may sit astride fissures on the lake floor. In many areas, spires occur around the margins of circular depressions. In at least one case, spire development appears to have both preceded and followed formation of a circular depression.

Formation of both spires and circular depressions is related to deep-seated fluid circulation, and occurred over the past 12,000 years. Explosions such as those responsible for these craters result



from the transformation of water to steam, often due to changes in confining pressure that result from (and accelerate) failure and fragmentation of overlying cap rock (hydrofracturing). Venting processes similar to those that form black smoker chimneys on the ocean floor form the spires in Yellowstone Lake.

Other features recognized in the July 1999 survey include vents through which deep circulating fluids exhaust onto the lake bottom, recent faults, and submerged former shorelines. Further analysis of the data and additional investigations using a submersible, remotely operated vehicle may define the relationships between fluid-circulating features, and fish and other lake-dwelling fauna.

These surveys were conducted jointly by the U.S. Geological Survey, Eastern Oceanics, the National Park Service (Yellowstone National Park), and the University of Wisconsin at Milwaukee. They cover about 20 percent of the lake floor, focusing entirely on the northern part of the lake, which is within the 630,000-year-old Yellowstone caldera. Objectives of this work include understanding the geologic processes that shape the lake and how they affect present-day aquatic populations, as well as examining this modern analog for the deep-fluid circulation systems responsible for many important types of mineral deposits. Future surveys, covering the remainder of the

lake floor, should demonstrate similarities and differences within and outside the caldera boundary.

¹Contributors: L.A. Morgan, W.C. Shanks III, K.M. Johnson, S.Y. Johnson, W. Stephenson, S.S. Harlan, K.L. Pierce, and E. White; U.S. Geological Survey, Denver; D. Lovalvo; Eastern Oceanics; and J. Waples and J.V. Klump; University of Wisconsin-Milwaukee, Great Lakes Water Institute.

Federal Agencies Move Forward on Bison EIS

In a statement released December 14, 1999, the NPS, the U.S. Forest Service, and the USDA Animal and Plant Health Inspection Service (APHIS) advised the state of Montana that they were moving ahead to complete an environmental impact statement (EIS) on the management of the Yellowstone National Park bison herd. Because negotiations with Montana reached an impasse, agency officials decided to move forward on their own to complete the EIS and take other steps to protect cattle and minimize the lethal control of bison.

“We all agree that protecting Montana cattle is critical,” said Michael Dunn, Undersecretary of Agriculture for marketing and regulatory programs, “but we believe significant adjustments can be made to the current bison test and slaughter policy.”

“We have spent countless hours combining the best science, experience, and practicality to protect both cattle and bison,” said Don Barry, Assistant Secretary of the Interior for Fish, Wildlife and Parks. “Unfortunately, we have reached an impasse with the state and we feel we must move forward on our own.”

The federal agencies’ proposal is designed to address both short-term and long-term goals, including the eventual eradication of brucellosis from the Yellowstone ecosystem. In the short term, it would provide spatial and temporal separation of bison and cattle through a zoned approach. The proposal would allow bison outside of YNP only in three very limited and well-defined areas west and north of the park. Only 100 bison would be allowed in the Horse Butte/west boundary area; only 100 in the Reese Creek area, northwest of Gardiner, Montana;

and only 200 in the Eagle Creek/Bear Creek area near Jardine, Montana. Adjustments would be made as more is learned through daily operations. These zones would be buffered by additional zones into which no bison would be permitted. Cattle would be permitted back in the zones 45 days after bison have returned to the park. Given that the brucella organism survives for only approximately 17 days in spring conditions, this 45-day separation would allow more than ample time for the organism to expire.

In the long-term, the agencies are committed to developing and using a safe and effective vaccine in the park until brucellosis is eradicated from the herd. Safety studies for calf vaccination should be completed by the winter of 2000–2001. Studies on vaccine effectiveness, and on a safe and effective delivery mechanism for the vaccine should be developed by late 2002. The NPS has agreed to vaccinate bison inside the park. The Forest Service has adjusted grazing allotments to help maintain critical separation between bison and cattle. APHIS has clearly stated that the federal plan will not jeopardize Montana’s brucellosis-free status for livestock. Furthermore, the recent \$13 million purchase of lands north of the park has provided significant additional potential for bison winter grazing.

As the agencies move forward, they indicated they would continue working with Montana on daily bison management issues.

Rare Plant Found in New Sites

While conducting a special plant survey along lakeshores during the summers of 1998 and 1999, YNP staff discovered three new sites containing the very rare plant known as Yellowstone sand verbena (*Abronia ammophila*). Though this plant is probably noticed by very few visitors, its discovery was exciting news in Yellowstone’s unusual landscape.

Yellowstone sand verbena is a multi-stemmed perennial herb that grows in low mats along sandy lakeshores. Prior to the discoveries the past two summers, only one population was known to exist. Because the known population was comprised of only a few thousand of these

small plants in a very limited area, there has long been concern about the viability of the species. Management attention focused on surveying all likely areas within the park for the presence of this unique species. Funding to conduct the survey was made available by the Canon U.S.A. “Expedition into the Parks” grant through the National Park Foundation, and an additional Native Plant Conservation Initiative matching grant from the National Fish and Wildlife Foundation.

The presence of the sand verbena in a total of four known locations in the park lessens the possibility that a single catastrophic event or adverse weather could cause the possible extinction of this species. Determination of whether large sand verbena mats were composed of one or more individuals was difficult, but among all four sites, a minimum of 8,325 plants were found, most of which are in the originally known population. Counts from the early 1990s showed approximately 1,000 individuals. The more recent count suggests that the species is successfully maintaining its presence as a unique part of the Yellowstone ecosystem.



Missing a Beat...

Alert readers may have noted that *Yellowstone Science*, usually a quarterly magazine, skipped an issue in 1999. Unexpected delays put us well behind our normal production schedule, and, much though it pained us, we decided to omit Vol. 7 (4).