



Wyoming and Southeastern Montana Road Trip (W22A)

I have had plans to visit Wyoming's Yellowstone National Park on the way home from October visits to Midwest relatives three times now that I ended up dropping due to winter storms moving in – most recently last fall. So, I figured that I'd plan a trip up to Yellowstone this summer, with additional Wyoming and Montana sightseeing included.

But then it rained. A lot. Yellowstone was hit by extensive flooding, which closed the park for a bit. Although much of the park has since reopened, its north and northeastern entrances remained closed. As I had planned to stay in Livingston, Montana to the north for the Yellowstone part of my trip, I decided to once again postpone visiting Yellowstone.

However, I still headed north to visit Wyoming and Montana. Some sites I wanted to see, especially along Montana's Dinosaur Trail, are very seasonal, closing for the year in September.

I headed north along I-15 to Provo, Utah, and then northeast to Rock Springs, Wyoming, making only a couple minor photo stops in Utah – at the state's old territorial capital (and now a museum) in Fillmore, and at Bridal Veil Falls, northeast of Provo.

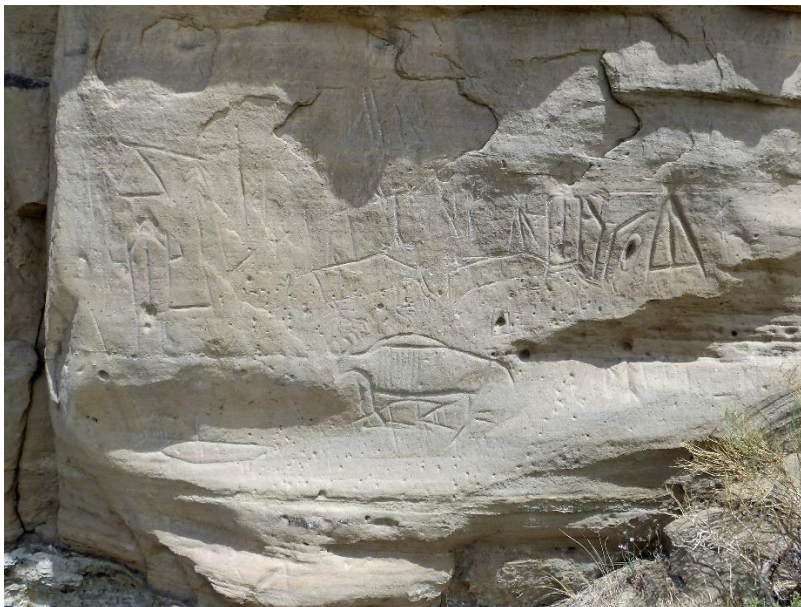


Utah territorial statehouse (left); Bridal Veil Falls drops 607 feet to the Provo River below (right)

I had plans to visit the White Mountain Petroglyphs site along a 17-mile dirt and gravel road north of Rock Springs on my 2019 trip through Wyoming, but they were winter-weathered out of the plan. Rock art at the site ranges from about 200-1000 years old. They're found on the side of a bluff about 2/3-mile hike from the parking area.



Petroglyphs surround the opening into this small cave, which Native Americans apparently had used as a shelter, given the soot buildup on the ceiling of the cave.



Several older petroglyphs have geometric shape. In historic times, petroglyphs often looked more like modern drawings, such as the buffalo depicted lower-center.



A few miles away is the Boars Tusk formation, a dormant volcanic structure that rises about 400 feet above the valley floor. Beyond that are the Killpecker Sand Dunes, one of the largest dune fields in the country, extending for 55 miles. They're known as "singing dunes" due to the sound made as sand rolls down the dunes, one of seven "singing dunes" dune fields in the country. There's a lot more for me to explore in this region, known as Wyoming's Red Desert.



South Pass doesn't look like much, but that was the point. This was one of the easiest places for west-bound emigrants along the Oregon, California and Mormon trails to cross the Rockies, so – along with the Pony Express – they all passed here before beginning to go their separate ways.

Thermopolis, Wyoming is famous for its mineral hot springs, the world's largest. But it is also home to the excellent Wyoming Dinosaur Center, which has its own fossil dig sites in the region. The center features a large collection of fossils from the earliest signs of life through the Dinosaur Age. The collection is well-displayed with informative signage.



Wyoming Dinosaur Center's *Hesperornithoides miessleri*, a very small troodontid dinosaur nicknamed "Lori", is one of the museum's recent finds.



Legend Rock State Petroglyph Site is northwest of Thermopolis and features some of the oldest and best examples of Dinwoody rock art, a style unique to Wyoming. There are 92 panels featuring over 300 figures that may range from about 500 to 4500 years old.

Cody, Wyoming was co-founded by William Cody, better known as Buffalo Bill. Located about 50 miles from the east entrance to Yellowstone National Park, the town serves as a base for park visitors. Among its own attractions is the Buffalo Bill Center of the West, a large museum and exhibition complex that includes five museums. I toured four of its museums – Plains Indian Museum, Buffalo Bill Museum, Draper Natural History Museum and Whitney Western Art Museum.



The Buffalo Bill Museum features several artifacts owned by Buffalo Bill or that were related to his *Buffalo Bill's Wild West Show*.



Bighorn Canyon National Recreation Area straddles the Wyoming-Montana border. As I was sightseeing my way through the park, I came across some bighorn sheep, including this ewe and lamb pair.



Devils Canyon Overlook features views from 1000 feet above the lake that fills Bighorn Canyon at its confluence with Devils Canyon in Bighorn Canyon National Recreation Area.



The Medicine Wheel, found at almost 10,000 feet elevation near the summit of Medicine Mountain in the Bighorn Range, is an archaeological site sacred to several tribes in the region. It is one of about 150 known medicine wheels in the upper Great Plains, extending into Canada.

This Medicine Wheel is about 80 feet in diameter and has 28 spokes that lead out from the center. There is a cairn in the middle and six more along its rim. Its age is unknown – oral traditions of regional tribes suggest that it predates their stories. Although it may be as much as 3000 years old, much of the evidence found at the site suggests that it is likely less than 1000 years old. It is still used as a ceremonial site.



Upper elevation summer wildflowers in the Wyoming's Bighorn Mountains



I can't count the number of times I've said that about Dayton over the years.

After spending a night in Sheridan, Wyoming, I headed up into Montana for a couple days. My first target was a visit to Little Bighorn Battlefield National Monument, site of "Custer's Last Stand". I was here once before, back in 1991. The park includes several sites associated with the battle along a 5-mile road, with signs explaining the events related to the battle that occurred at each stop.

In June 1876, Indians from several Plains tribes left their reservations to gather for their annual Sun Dance, the most important religious event of the year for them. At that same time, the U.S. Army was using infantry and cavalry units to force the Lakota Sioux and Cheyenne back to their reservations. Among them was the Lt. Col. George Custer-led 7th Cavalry, which had previously defeated Black Kettle's Southern Cheyenne in the Battle of Washita River, which the federal government's Indian Bureau had labeled a "massacre of innocent Indians".

Custer's plans for a surprise attack on the Indians still encamped at the Little Bighorn site assumed that there were about 800 Indians at the camp when in fact there were thousands, and he seriously underestimated the number of warriors at the camp. He thought he might capture women, children and the elderly, and hold them hostage as he negotiated the surrender of the warriors.

His bad assumptions led to a two-day battle – June 25-26 – in which five of the 7th Cavalry's twelve companies were completely annihilated, and Custer, two of his brothers, a nephew and a brother-in-law were killed. It proved to be an overwhelming victory for the combined forces of the Lakota Sioux, Northern Cheyenne and Arapaho tribes, although Congress responded by providing funding to reconstitute the 7th Cavalry and expand the size of the U.S. Army for the so-called Indian Wars, which continued into the early 20th century.



Markers on Last Stand Hill show where Col. George Custer (red arrow) and several of his men died.



Part of the Indian Memorial at Last Stand Hill. Although there were dozens of people at the Last Stand Hill overlook, just across the street I had the Indian Memorial to myself for several minutes.



Pictograph Cave State Park near Billings, Montana features a bluff-side alcove with three shallow caves that had been used by Native Americans as shelters, one of which had several pictographs. Many of the pictographs were documented at the time of their discovery, but have since faded away, although some like these remain.



Northwest of Billings is a small unit of the Nez Perce National Historical Park – the Battle of Canyon Creek site. The Nez Perce were attempting to make their way to Canada rather than be forced to settle on a reservation away from their traditional homeland. They engaged in several battles with the U.S. Army in their three-month journey. This was their next to last battle during their journey – their final engagement and ultimate surrender took place to the north, just short of the Canadian border at Bear Paw Battlefield, which I visited last fall.



I-94 through eastern Montana follows the Yellowstone River, as did part of the Lewis & Clark Expedition as it made its way back east in 1806. Pompeys Pillar, which William Clark named after the nickname he had given to the son of their guide Sacagawea, is a Hell Creek Formation sandstone tower that rises about 150 feet above the nearby Yellowstone River.



Pompeys Pillar's Lewis & Clark significance is that William Clark carved his name and date into the rock. It is regarded as the only surviving physical evidence of the Lewis & Clark Expedition along its entire route. A short hike and more than 100 stairs take visitors to Clark's signature.

The Hell Creek Formation dates back to the late Cretaceous period (145-66 million years ago). Due to uplifts, anticline formations and erosion, there are ribbons of this formation at or near the surface across the Upper Great Plains. It has proven to be a rich source of Cretaceous period fossils, including those from the Tyrannosaurus Rex, Triceratops and Hadrosaurids. In fact, T Rex fossils are only found in the Hell Creek Formation.

Montana's Dinosaur Trail highlights 14 dinosaur-related sites in the state, including two museums and a state park in Glendive and Ekalaka, Montana, in the far southeastern part of the state. I headed for Glendive, where I checked out its Frontier Gateway Museum. A ribbon of Hell Creek Formation in the area has produced numerous dinosaur fossils, including at nearby Makoshika State Park.

I was surprised to find the Glendive Dinosaur and Fossil Museum right next door, especially as it was not included in the dinosaur trail. I found out why as I was paying my entrance fee. The clerk alerted visitors that the museum puts its dinosaur fossils in a Biblical context – which proved to be specifically a young earth-creationism context.

Still, there were quite a few interesting fossils presented on the ground floor that were worth seeing, such as this display of teeth and other T Rex-related fossils.



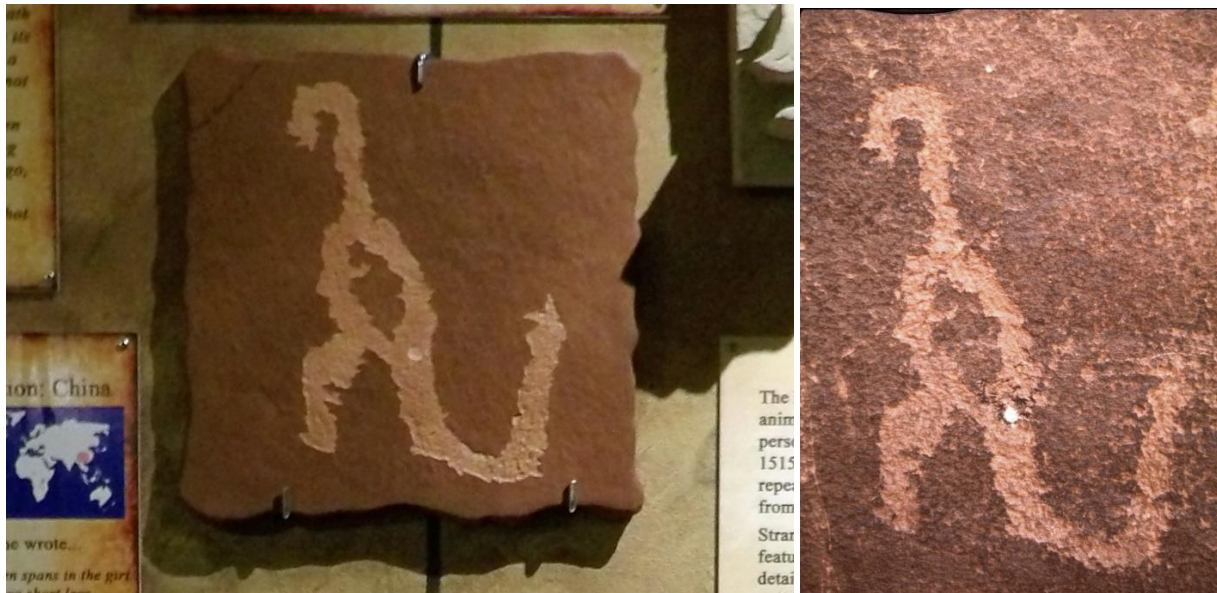
However, the second floor was pretty much given over to young earth-creationism, with many displays having nothing to do with dinosaurs, such as discussion of the Grand Canyon as evidence of the Great Flood.

But I was there for the dinosaurs, so I'll comment on a couple of the second-floor dinosaur items.

The Alvis Delk track purports to show a dinosaur track that intrudes on a human footprint. Some have used this to argue that dinosaurs and humans coexisted. But even other creationists are skeptical. E.g., Creation Ministries International has raised several concerns: no photos of the tracks at the site were taken before they were removed; neither print was part of a trackway (a sequence of prints made while walking or running); it was eight years from when this was reportedly collected and when the human footprint was noticed; the human print is unnatural in both its structure and when compared to how people actually leave tracks when they move (folks really study such things); and the dinosaur track doesn't closely match any genuine dinosaur tracks.

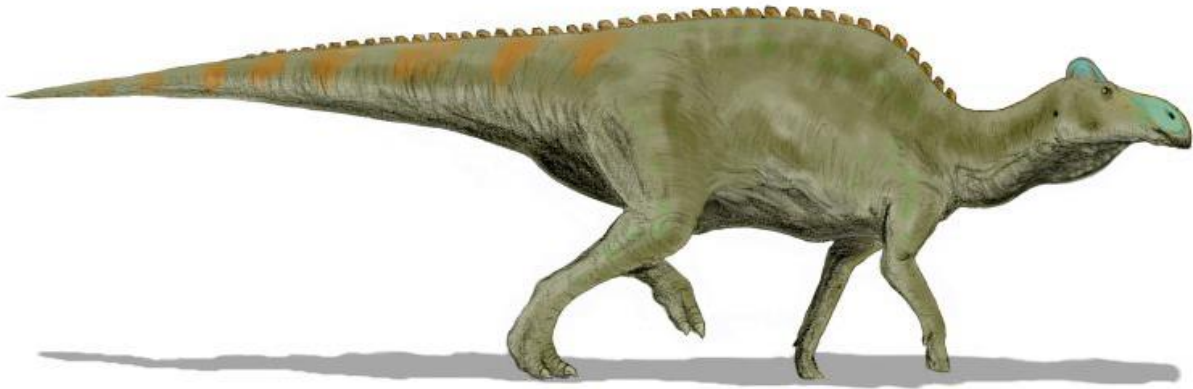


The Alvis Delk track (this a reproduction; the original is in Texas)



The museum has a reproduction of a petroglyph in the Grand Canyon's Havasupai Canyon (left; photo of the actual petroglyph on the right). In the 1800s, the curator of archaeology at the Oakland Museum found it and said he believed it to be an ancient drawing of a dinosaur. Creationist author Paul Taylor went further, suggesting that it was an *Edmontosaurus* (a type of hadrosaur). This petroglyph was cited as proof that people and dinosaurs coexisted – perhaps as recently as just a couple hundred years ago.

I've seen and photographed thousands of petroglyphs. Seeing this reproduction, and I see no reason to think it's an animal of any sort, let alone a dinosaur (it actually reminds me of "waterhole map" rock art I've seen). There are no dinosaur-specific features, and it's generally not how animal legs were represented in petroglyphs. As for being a hadrosaur, due to their bone structure, hadrosaurs didn't walk upright like this and they certainly couldn't contort their tail or posture to this shape, something that a Native American petroglyph carver seeing an actual hadrosaur would have noticed.



The actual posture allowed by a hadrosaur's bone structure (Wikipedia)

Imaginative beings, geometric shapes and things that seem to be little more than doodling are routinely found in Native American rock art (e.g., see the White Mountain and Legend Rock examples I included above). I think that it's safe to say that no one really knows what if anything this petroglyph was intended to depict – and thus it has nothing interesting to say about evolution, creationism or dinosaurs, one way or the other.

Fossils from more than 10 different dinosaur species have been found in the Hell Creek Formation layers visible in nearby Makoshika State Park. This includes the 5 ½ feet wide skull of a triceratops on display in the park's visitor center. To a casual visitor, though, the park features some colorful badlands scenery, with camping and hiking trails.



The view from Makoshika State Park's Eyeful Vista

Today, it is generally believed that dinosaurs – and about 75% of all species in the world – were wiped out when a giant asteroid slammed into the earth just off of Mexico’s Yucatan Peninsula. More than 100 years ago, researchers observed that a thin sedimentary (clay) layer could be found at sites all over the world at the boundary between Cretaceous and Paleogene (formerly called Tertiary) layers in the geologic record. Fossils from most Cretaceous species, including dinosaurs, generally stopped at this layer, evidence suggesting a mass extinction event.

In 1980, researchers discovered that this thin layer had a level of iridium 100s of times greater than normal. Iridium is very rare on Earth, but it is common in asteroids, meteors and comets. Their observation was immediately confirmed by other scientists with access to this layer all over the world. This suggested that there had been a major impact event, such as an asteroid hitting the earth. The vaporization of at least part of the asteroid and the kicking up of a lot of dust that circulated around the globe and eventually settling down would explain the creation of this iridium-rich layer. But where was the impact? A lot of impact craters have been buried or eroded away over millions and billions of years.

At about this same time, oil explorers in Mexico found a geologic structure located partially on and off Mexico’s Yucatan Peninsula. It was confirmed as an impact crater in 1990. Other evidence dated it to the boundary of Cretaceous and Paleogene periods. Evidence from a core sample obtained in 2016 further supports this. That said, a second impact crater found in west Africa dating to the same time raises the question of whether the planet was hit by a sequence of asteroids or perhaps by large pieces of a disintegrating asteroid.



The K-Pg (formerly K-T) Boundary is easily spotted as a thin black layer in Makoshika State Park, where it separates the dinosaur fossil-rich Hell Creek Formation below from the dinosaur fossil-lacking Fort Union Formation above. A fossil bone from an unknown bird species found in the Fort Union Formation is identical to some fossil bird bones found in the Hell Creek Formation, making it the only species in this region known at this point to have survived the Cretaceous-Paleogene mass extinction event.

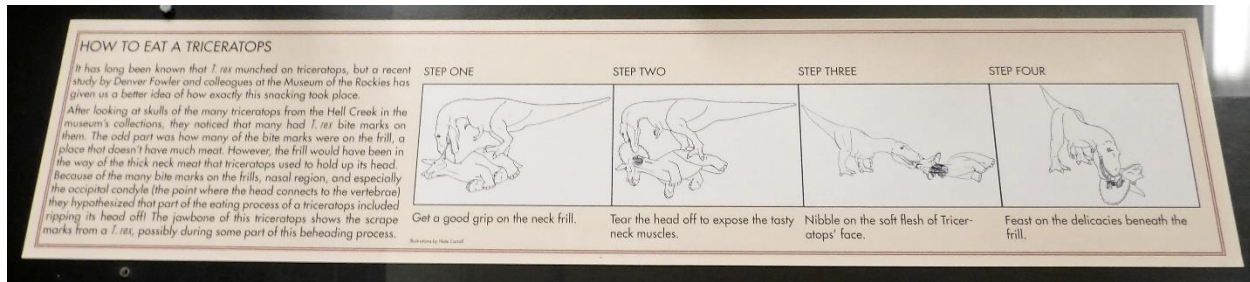


On my way to Ekalaka, I stopped at Medicine Rocks State Park to check out the park's unusually eroded sandstone rock outcroppings. No dinosaur fossils here, though – this is a Fort Union Formation site.



There's a good dinosaur fossil exhibit at the Carter County Museum, a Montana Dinosaur Trail site in Ekalaka that features dinosaur fossils, Native American archaeological artifacts from the nearby approx. 9,000-year-old Mill Iron site, and pioneer items found in the county.

The museum also hosts its Annual Dino Shindig, which includes a day of paleontology lectures, a day at an active fossil dig site to help excavate real fossils... and a night of dancing.



The museum displays these instructions on “How to eat a triceratops”, although they seem more geared for a T Rex than for any of us who might have the opportunity.



Heading south back into Wyoming, I passed Devils Tower – made famous in the movie *Close Encounters of the Third Kind*. This time, I only made a quick photo stop here from the passing highway, as I have visited the park and hiked around the tower a few times over the years.

And with the annual Sturgis (South Dakota) Motorcycle Rally underway, I saw dozens of motorcycle riders enter the park while I was in the area, so there would have been quite a line to get in.



Continuing south, I made a half-day side trip into northwest Nebraska to visit the Toadstool Geologic Park, a badlands area that includes a small area of toadstool formations. There is a prehistoric bison kill site in the area, too, but it is open only a handful of days each year.

Further south, I reached the North Platte River, where my route then turned west. Most of my stops along this westward route were related to the western emigrant trails – Oregon, California and Mormon, as well as the Pony Express route. My first stop was at Fort Union National Historic Site, an old U.S. Army post whose mission included providing some protections along the emigrant trails. This was the site of the oldest white settlement in Wyoming.



The fort's surviving Old Bedlam building, pictured, is the oldest surviving building in Wyoming, and dates back to 1849.



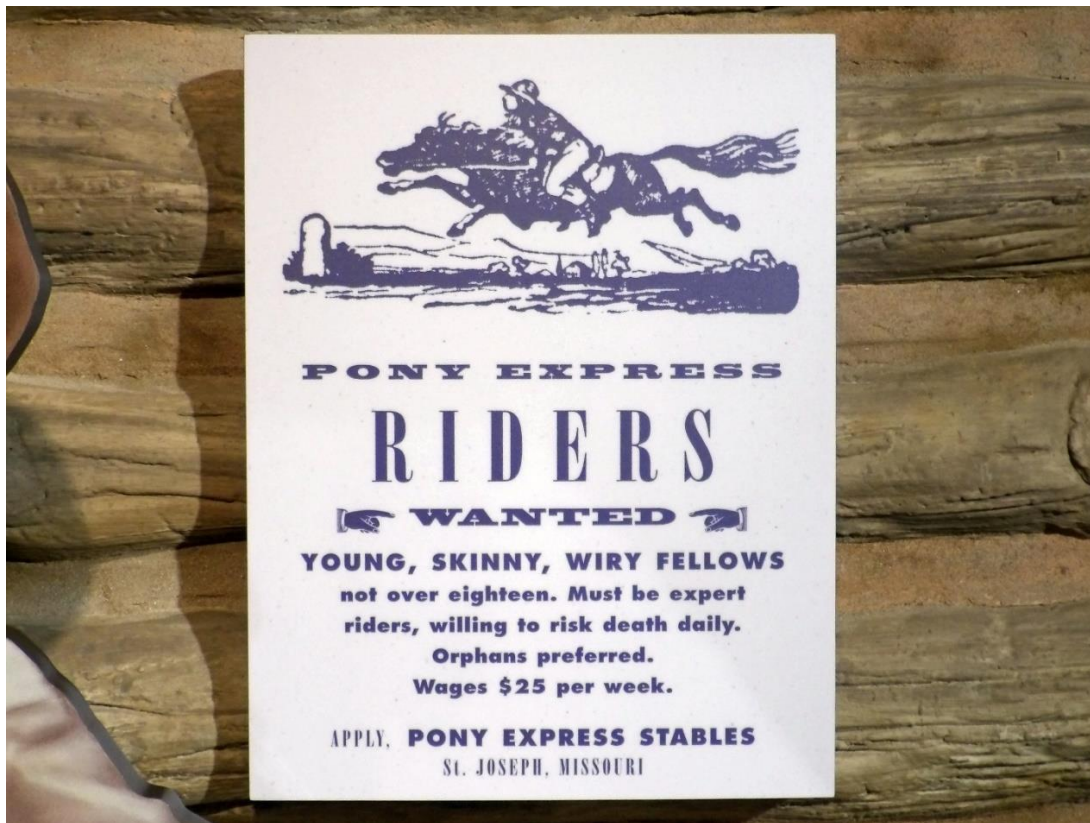
Further west is Register Cliff State Historic Site, where a number of people following the emigrant trails carved their names or initials into the sides of a bluff.



Just to the west of there, so many covered wagons made their way over another sandstone outcropping that their route and ruts are permanently carved into the sandstone.



In Casper, Wyoming, I visited the Tate Earth Science Center and Mineralogical Museum, although its focus seemed to be far more on Wyoming's fossil record than on its minerals. In addition to its dinosaur and other fossils, their mammoth fossil, named Dee, was prominently featured.



I also stopped at the National Trails Center in Casper, which provided introductory overviews of the Oregon, California, Mormon and Pony Express trails. It was a bit too introductory to be of much interest to me at this point, but it was also a great place to pick up a bunch of brochures to inspire future travels.



With plenty of time left in the afternoon, and not wanting to start out on my next day's plans (due to the lack of hotels along that route), I decided to take a drive north of Casper to the Teapot Rock formation, pictured here. It doesn't look like much of a teapot, but apparently rocks resembling its spout and its handle have collapsed since it was named. The rock's "Teapot" name was applied to other nearby geological features, such as Teapot Creek and Teapot Dome. History buffs may recall that Teapot Dome was the site of an oil field that was at the heart of a huge scandal during the 1920s.

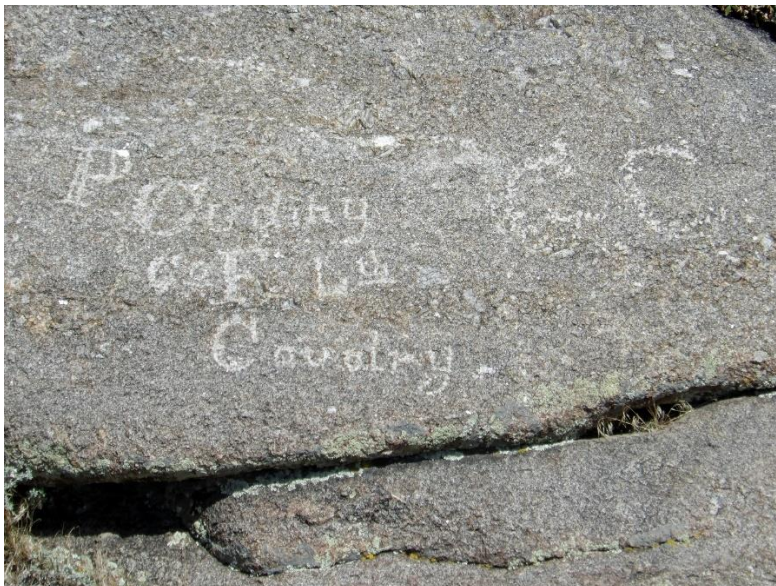


At the 1864 Sand Creek Massacre in southeastern Colorado, Colorado troops attacked a peaceful Indian village, killing 135 people, more than 100 of which were women and children. This led to revenge attacks and reprisals from both sides across the Northern Plains. Near here in 1865 at Red Buttes and the Platte Bridge Station, the Cheyenne, Lakota Sioux and Arapaho led two attacks, killing 28 U.S. Army soldiers.

It wasn't far from there that emigrants stopped following the North Platte River and started following the Sweetwater River, which would take them towards South Pass, the easiest route across the Rocky Mountains.



Independence Rock was a prominent feature along the emigrant trails and the Sweetwater River. Emigrants hoped to reach Independence Rock by July 4 (Independence Day, thus the name of the rock) as an indication that they were on track to reach their final destinations before the first mountain snowfalls.



As they did at Register Cliffs, many emigrants carved their names or initials into Independence Rock.



The Sweetwater River carved this gap – Devils Gate – through the rocks just west of Independence Rock. The gap was not suitable for the emigrants and their wagons, so all the emigrant trails used Rattlesnake Pass, a bit to the right of this picture.



Sun Ranch is adjacent to Devils Gate, and was started in 1872. It was the ranch of Tom Sun, who among other things was a frontier scout who took on William Cody (Buffalo Bill) and taught him the ways of life in the wild west. The ranch was in the family until 1977 when it was sold to the Mormon Church. Many original ranch buildings survive, including the ranch house, pictured, which has been converted into the site's visitor center.

The Mormons bought the ranch because of an incident that occurred nearby along the emigrant trails, an incident that has ties to a park in Iowa City, Iowa, where I went to college.

Some Mormons emigrated to the United States from Great Britain and Scandinavia before heading on to Utah. Lacking the funds needed to acquire a full team of oxen, nearly 3000 of these Mormons made the journey on foot pushing their own handcarts – the Mormon Handcart Pioneers. Ten handcart companies made the trek to the Salt Lake Valley, with many of them starting near Iowa City at what is now Mormon Handcart Park. In 1856, two of the companies – led by James Willie and Edward Martin – got off to a very late start, first leaving England in May, and then leaving Iowa City in late July, where they weren't expected and thus had to wait for hastily (and ultimately poorly) assembled handcarts to be built.



Sign in Iowa City's Mormon Handcart Park

They reached Florence, Nebraska in August, nowhere near Wyoming's Independence Rock by Independence Day. They expected to be able to resupply at Fort Laramie when they got there in early October, but no supplies were available that late in the season. The handcart pioneers had to jettison many of their limited belongings and cut food rations. A blizzard and bitter cold hit the region on October 19. The Willie Company was about 110 miles ahead, and soon encountered rescuers sent from Salt Lake City near South Pass. The Martin Company had halted near Red Bluffs for nine days, but three scouts from Salt Lake City found them and encouraged them to go on. The scouts helped lead them to Devils Gate. More severe weather stopped them there, but they decided to move to a weather-protected area a couple miles further ahead, an area now called Martin's Cove. That's where a contingent of rescuers from Salt Lake City eventually found them and helped the survivors complete the journey. About a quarter of the emigrants in the Martin Company died along the way.

Martin's Cove is on Sun Ranch. The handcart pioneers and especially the Willie and Martin companies are an important part of Mormon culture, as they represent the sacrifice of the pioneer emigrants and provide a strong sense of the power of the church's faith.



View towards Martin's Cove at Sun Ranch, a couple miles west of Devils Gate

Continuing to follow the Sweetwater River at this point would have taken me back to South Pass, which I had visited early in the trip. Instead, it was time for me to head south and start my way back home. I decided on a route following Wyoming Highway 789 and Colorado Highway 13 because I hadn't taken those stretches of highway before – as good a reason as any.



I stopped along Highway 789 to check out these fading Overland Stage Line ruts.



I found this house/museum in Baggs, Wyoming, just north of the Colorado border. Butch Cassidy and his Wild Bunch gang sometimes holed up around Baggs. They hung out here at the Gaddis Mathews House, which functioned as a road house that doubled as a dancehall on Saturday nights. Butch Cassidy and a local named Tom Vernon played music there for dances that would last until dawn.

It was while he was fishing on nearby Battle Lake that inventor Thomas Edison got the idea for the first light bulb filament. A marker near the site commemorates this inspiration.



It is believed that Native Americans used these – a volcanic ridge known as Fortification Rocks along Highway 13 – as fortifications before battle.



The Yampa River along Highway 13 near Craig, Colorado

For the rest of my drive home, I took a favorite non-interstate route from Green River, Utah, through Page, Arizona and then onto St. George, Utah.



A classic monsoon season downpour, this one near Green River, Utah. Lots of clouds, but a very heavy, very concentrated downpour at a small spot. The heavy rain cools the air so quickly that the storm rapidly loses its source of heat energy and soon collapses. Monsoon storms can lead to flash flooding in places, and yet they can be so hit-and-miss that the average amount of rain across an entire region can still be fairly small, even when very specific spots get inundated.



A bit of morning sun highlights part of the San Rafael Reef north of Hanksville, Utah



The Hite Overlook in Glen Canyon National Recreation Area provides several views of what was once northern Lake Powell. The boat ramp (green arrow) at Hite no longer comes anywhere close to the northern end of the lake, which in this area is now reduced to the narrow channel of the Colorado River (red arrow).

Water was released from some upstream reservoirs to help ensure that the park's dam could continue to produce electricity, so water levels at Wahweap appeared to be up a little bit from when I was there three months ago, but most of the lake's boat ramps are high and dry – and closed – like the one at Hite. And that has really diminished business in the surrounding tourism-dependent towns.



Cheesebox Butte is a beaut. Bears Ears National Monument along Highway 95.



The distant Bears Ears mesas, also seen from along Highway 95



View of the Wahweap Marina near Page, Arizona (right) from the Wahweap Overlook. A good-sized storm was dumping a lot of much needed rain just to the west at Grand Staircase-Escalante National Monument.

The rest of the drive home was sunny, dry and uneventful.