

a23 Powell < 1875, Grand Canyon >

I have heard rumors of people who were disappointed. The same people will be disappointed at the Day of Judgement.
—J. B. Priestly.¹

The way in which the world is known to change is an example of how it has always changed.

This uniformitarianism principle of adequacy of existing causes² alters our feeling for Earth's age.

Explorer John Wesley Powell (**Figure a23.1**) called the Grand Canyon “the most sublime spectacle on the earth.” As to its origin, impressively for his time when others might have offered catastrophic explanations, this autodidact stressed river erosion. To paraphrase the first chapter of his book *The Exploration of the Colorado River*, 1875:³ “The Colorado river has as its source the clear water of Rocky Mountain lakes fed by melting snows when the summer comes. In its course through the arid plains of Arizona, there is little lateral degradation, but by bed corrasion the river deepens its course. The waters that were so clear above empty as turbid floods below. For more than a thousand miles along its course, the Colorado has cut for itself a canyon.”

Powell's crucial evidence: Clear water that enters leaves muddy.

Powell clearly understood the principle that rivers cut and transport and so excavate the valley systems that contain them (**Footnote a23.1**). On this point, he reported but did not agree with the fanciful account of the origin of the Grand Canyon in American Indian myth:

Long ago, there was a great and wise chief, who mourned the death of his wife, and would not be comforted until Ta-vwoats, one of the Indian gods, came to him, and told him she was in a happier land, and offered to take him there that he might see for himself, if, upon his return, he would cease to mourn. The great chief promised. Then Ta-vwoats made a trail through the mountains that intervene between that beautiful land, the balmy region in the great west, and this, the desert home of the poor Nu'-ma.

This trail was the canyon gorge of the Colorado. Through it he led him, and, when they had returned, the deity exacted from the chief a promise that he would tell no one of the joys of that land, lest, through discontent with the circumstances of this world, they should desire to go to heaven. Then he rolled a river into the gorge, a mad, raging stream, that should engulf any that might attempt to enter thereby.³

A man “of emphatic, extraordinary ambition” John Worster recounts in *A River Running West*, 2001. He had persuaded a motley group of nine mountain men to accompany him on his first river voyage. His war-learned habit of command was, he confesses in *Exploration*, ill suited to maintain the moral of that crew. Together, they launched in four boats (mail ordered from Chicago and inappropriate in design) upon the Green River and traveled south from Wyoming to voyage the Colorado in its canyon through the red rock, yet terra incognita, of Utah and Arizona. Powell, five half-starved crew, and two smashed and battered boats, emerged ninety-eight days, 5,500 feet lower, and 1,000 miles later where the Colorado debouches from the Grand Canyon's mouth in the Grand Wash Cliffs west facing fault-scarped edge of the Colorado Plateau. The absentees had defected. They, muttering objurgations having had enough of the terrors of the rapids and Powell, climbed out of the Canyon to be, it was later surmised, killed by Indians upon emerging.⁴

What thoughts did you bring to an understanding of the Grand Canyon? According to park wardens, David E. Nye informs us in *American Technological Sublime*, 1994, the most common questions asked of them assume that the canyon was made by human beings!⁵ □

Footnote a23.1 A test of this hypothesis is that the Colorado-excavated materials (water is 90% Rocky Mt. lake and 10% local cloud burst, load is 1 lb mud per 30 gals or 500,000 tons of carried silt a day—17 times the Mississippi's)⁶ can be identified as the Colorado-built delta that closes across the northern part of the Gulf of California.⁷



Figure a23.1 John Wesley Powell, (1834-1902)

Powell left home at eighteen. While adventuring in the Midwest and up and down the Mississippi, he took time to teach himself some geometry, botany and geology and may have gained knowledge of John Strong Newberry's 1861 description of the Grand Canyon as being the result of erosion.⁸ He soldiered in the Civil War (Shiloh, right arm amputee, veteran). Early in 1869, in mind to be the first to map the terra incognita of the canyon bound Green and Colorado rivers, he recruited for the adventure six other Civil War veterans, including his mentally unstable brother, and three others. Five of this group were hunters and trappers but none had run a single rapid and for the task they chose the wrong sort of boats. These they loaded with insufficient rations for what turned out to be a 98 day trip. Survivors (amazing! as explorers of these rivers and canyons who came after Powell, most of them, died or were badly injured) were Powell and five of his crew and Frank Goodman, who had quit early after almost drowning. (The Glen Canyon Dam, completed in 1935, has tamed the once

treacherous rapids through Black Canyon to Lake Mead of Hoover Dam, completed in 1968. Out of the Canyon, the Colorado flows south to Lake Mojave of Davis Dam, completed in 1953. By controlling the release of water—high flows are reduced and average flow is increased, but as hydroelectric power demands fluctuate, dam generator released water raises or lowers river levels two feet in an hour, at any time, and advice is to tether boats left pulled ashore.) The three non-survivors had left to climb out of the Grand Canyon. They had either died trying or were killed by Indians on the plateau. Any notes taken on the region's topography were all lost during the trip. However, "At a time when the rhetoric of Manifest Destiny made settling the West appear deceptively easy, Powell's [anecdotal journals] of his travels strengthened his certainty that science should ground public policy, and he became a voice for conservation," writes Diana Silver in her review⁹ of Edward Dolnick's *John Wesley Powell's 1869 Journey of Discovery and Tragedy Through the Grand Canyon*, 2002.¹⁰ With recognition gained, he later become director of several federal agencies that oversaw the exploration of the West.

Powell's first Colorado River expedition in 1869 was repeated in 1871 and is famous for the published image of his one-armed personage running the river rapids while seated on a chair nailed in the lead boat's middle compartment.

Powell helped found in 1879 the United States Geological Survey and became its second director.

Uncommon in his sympathy toward American Indians, Powell determinedly studied their languages and founded the federal Bureau of Ethnology and, for more than 20 years, was its first director. His credo: "driving the wildness out of the land, turning the continent into a more productive garden" (not the cry of current environmentalists) was for settlement that did not stress the land beyond which preparation can afford. Which, for him, meant the building of dams—lots of them—in semiarid regions of the West.

Western settlement followed a pattern: stake-out and register a townsite, print and send east its newspaper that described its (imagined) boom nature, wait for arriving homesteaders reluctant to travel on, who would build it.¹¹ And so to the parched American West, inhabitants moved in, drawn by exaggerated entrepreneurial claims and government incentive—coercive, in the Indians' case—of irrigation-born farm riches. Chronic water rights squabbles are still as Josh (the first *non-de-plume* of Sam Clemens, the later being Mark Twain) noticed in Nevada during his earliest journalistic forays to the far side of the 100th meridian: "Whiskey is for drinking, water is for fighting over."¹²