

Dry Lands

Rebecca Solnit

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The supply of stories has perhaps been the American West's only reliable bounty. The difficult thing has been finding people to notice them, let alone tell them well. The Indian wars, still unfinished as tribes continue to struggle for rights, territory and cultural survival; the resource rushes, the Gold Rush in particular, which turned San Francisco into a cosmopolitan city standing alone in the wilderness; the once astonishingly abundant salmon runs that sustained soil and trees, as well as birds, bears and humans; the timber wars; the rangeland wars; the radical labour and environmental movements; the attitudes people adopted towards a harsh, unfamiliar, often sublime landscape; the evolution of European cultures in a non-European terrain and the arrival of Asian and Latin American immigrants to shape a hybrid culture: all these have had their occasional historians, though most Americans were raised to believe that history happened somewhere else. The San Francisco Public Library has an overflowing case of books on the East's Civil War, but only a handful on the war that transferred a million square miles or so of Mexico to the United States, including California and most of what we now call the West.

The central thread in this story of the West is the story of the Colorado River and the attempts to determine what dreams it licenses and which must be left unwatered, as it snakes through much of the major non-fiction of the West. The river begins in Colorado with tributaries reaching up into Wyoming and they gather force and volume as they rush through the magnificent canyons they carved in Utah and Arizona, through Nevada's southern tip and down California's backside to – well, thanks to Yankee rapacity the river doesn't usually reach the Gulf of California or water much of Mexico anymore. It's the story of the inter-mountain West: could it be domesticated for agriculture and settlement or would its inhabitants become feral, nomadic peoples scattered lightly in a belt of un-European terrain that would divide the West Coast from the sedentary, verdant East? Of the Hoover Dam and the rise of the extraordinary hydraulic engineering that since the 1920s has come to alter the world from Iceland to India, largely for the worse. Of the rise of industrial tourism as the Grand Canyon became part of the railroad-based restaurant and hotel empire of Fred Harvey. Of the rise of the modern environmental movement; the evolution of ideas about landscape, aesthetics, the public good and the battles between a boom-town, resource-rush mentality and a minority more interested in long-term planning. And it's the story of the rise of the big cities of the South-West, notably Phoenix and Las Vegas, whose optimism is inscribed in their names (the immortal bird

whose name will surely become ironic during the course of this century; the vegas, or meadows, watered by an aquifer that Vegas sucked dry early in its short history). And of the City of Angels, whose situation is not quite as precarious as that of the desert towns, but whose thirst has long outstripped its regional resources and reached the Colorado River, far to its east.

T.S. Eliot's Mississippi was a 'strong brown god': the Colorado River is more like a ruddy writhing serpent. Or was, since the snake has now been chopped into segments by dams, notably by Glen Canyon Dam above the Grand Canyon, and Hoover Dam south of Vegas, each with a gigantic reservoir backed up behind them. Even its red colour, its Colorado, has changed; the sandstone sediment settles behind Glen Canyon Dam and what was once a hot red river emerges as a cool green one, too cool for many of its species of endangered fish. Occasionally a thunderstorm over a tributary sends down enough sediment to turn it red again for a day or two. Along the way, the river is grabbed and squeezed for water to make the cities explode in the dry lands and to allow the endless arid-land agriculture to produce iceberg lettuces and rice and alfalfa and cotton fields, though in some of those places there is hardly enough rainfall to raise an agave plant. The water is heavily subsidised so that farmers – mostly large-scale agribusiness enterprises, not Jeffersonian yeomen – can also collect

subsidies to grow stuff that would grow better in lush places elsewhere. Eighty per cent of the Colorado River's water goes to agriculture. Twenty per cent of California's agricultural water goes to grow low-value alfalfa. The river, in its climate-change-driven decline, will strangle all these projects and make a mockery of the two great dams and the reservoirs that were once signs of triumph over it and over nature. The reservoirs and dams are failing now, long on silt, short on water, products of the short-sightedness that has made the West a place littered with projects that seemed like a good idea at the time.

No one holds a monopoly, but Americans have proved very good at junk science. It's a speciality field, in which the claims about Iraq's weapons of mass destruction, aluminium 'centrifuge' tubes and the like, are only the most widely noted. The Panglossian 'rain follows the plough' was the motto used to dispatch hapless would-be farmers to the arid lands of the American West, where rainfall is inadequate to raise crops and irrigation started as a corruption racket and ended up as an environmental disaster. Its agenda is short-term convenience. Its methodology is lies. An atmospheric scientist once told me that he had checked Edward Teller's projections of the amount of fallout that would reach Americans during the years of above-ground nuclear testing in southern Nevada. The great genius had somehow left off some zeros, reducing the impact a hundred or a

thousandfold, while other scientists created arbitrary standards of exposure safety and schoolchildren were taught to duck and cover to protect themselves from atomic blasts. Scientific facts about the environment – water flow, radioactive half-lives, principles of containment etc – were jiggled until they could be used to justify the dumping of nuclear waste near the atomic test site.

Junk science might be too generous a label for the way conclusions have been reached about the water of the Colorado River: how much there is and how much and how securely it can change the arid landscape around it. The water has transformed that landscape. Without it, Arizona and southern Nevada would still be barely populated and a lot of the agriculture in the South-West wouldn't exist. But the supply was always precarious and overcommitted, and it is already running out. Water limitations were noticed from the beginning, when Major John Wesley Powell and his crew became the first white men to float down the Colorado. Powell's 1875 *Exploration of the Colorado River and Its Canyons*, an expansion of his magazine reports, is still in print. It is a gorgeous book about adventure, geology, anthropology and hydrology, with illustrations carrying captions like 'The Great Unconformity at the Head of the Grand Canyon' and chapters such as 'From Flaming Gorge to the Gate of Lodore'. But it was the sobering *A Report on the Lands of the Arid Region of the United States, with a*

More Detailed Account of the Lands of Utah of 1878 that makes Powell matter even today. A Civil War veteran and government explorer, he saw that there wasn't enough water to irrigate people's visions of a big agricultural society and that the limits on water would ultimately be the limit on everything else. Ignoring Powell has been the basis of almost everything that has come since, except the literature on the river, which Powell presides over as a kind of god.

James Lawrence Powell's *Dead Pool* tells the story of the Colorado well and moves it forwards to speculate on what the era of climate change will bring. He isn't optimistic: in his account climate change is just one more factor that the engineers and hydrologists responsible for plotting the river's fate refuse to face. He begins with two crises at Glen Canyon Dam: one of a sudden abundance of water that nearly destroyed the dam in the 1980s, another when the water level fell, in 2005, lower than the official scientists had calculated it would ever go. (A disaster for water managers, it was a miracle for explorers, who got to see canyons and cliff faces that were thought to have been lost for ever.)

Dead Pool then doubles back to begin the story at the beginning, with Major Powell and his warnings on the finitude of the South-West's water:

To a man of Powell's principles and background, that his nation encouraged thousands of poor farmers to move to

lands so dry that the settlers were bound to fail was a tragedy. He would spend most of the rest of his career trying to save them from that fate ... By March 1888 one of Powell's scientific facts was undeniable: the West had too little water to irrigate all the land. To collect and best use what water did exist would require a system of dams and reservoirs.

Building those dams and reservoirs would, in theory, be a co-operative enterprise; in practice it was a big-government project for the benefit of Westerners who for the most part considered themselves individualists and independents. This delusion of self-sufficiency, along with the fantasy that enough water could be found to supply the region, launched the eco-tragedy now unfolding.

Towards the end of his book, Powell points out that the US Bureau of Reclamation has decided not to take climate change into account when planning water management and allocation for the 21st century. Instead, it has been basing its projections on what we now know was the unusually wet 20th century. No shortage, no problems to plan for. Powell points out that climate change is not something that may happen to the American West or that is now happening only in the Arctic. It is here, now. And at the end of *Dead Pool* he describes what a post-climate-change South-West might look like – the book's title, incidentally, is the term used to

describe a reservoir when its water level drops too low to feed the intake valves for hydropower generators.

'Mistakes were made' is the locution politicians like to use, and it could be used for a lot of the plans for the South-West, which have left follies in their wake. The Salton Sea, for example, a little west of the tail end of the Colorado, became the biggest lake in California when it was accidentally created around the time the Tulare Lake was drained into non-existence. It was the result of an attempt early in the last century to divert a little irrigation water. The whole river raged into the new canal, ripped it into a broad channel and for two years emptied itself into the low point that in another climatological era had been a lake and now became one again, full of the salts of the desert. Only one force in the West was mighty enough to do battle with the river: the Southern Pacific Railroad, the monster corporation that dominated California politics and land for decades. It took the SP two years to stuff enough rubbish into the gap to send the river back into its usual bed. The Salton Sea is recharged by farm run-off and other filthy waters; it has become a major bird sanctuary because their old wetland habitat, the delta where the Colorado runs into the sea, has largely dried up. Most of the attempts to develop resorts around the lake have turned into ruins; the most famous site there is Salvation Mountain, a folksy one-man religious complex made of concrete poured a few bags at a time and

painted with discarded house paint.

The Salton Sea is already a conundrum, a toxic bird sanctuary in a place where water doesn't belong, and the reservoir-dam systems will go the same way. But not all the strange phenomena that have arisen from the long wrestling match with the Colorado are situated near it. Take the San Francisco-based, family-owned Bechtel Corporation, which is to the United States what the Bin Laden construction firm is to Saudi Arabia, a colossus itself and a maker of colossi. Bechtel emerged from the building of the Hoover Dam to become a major force in reshaping the West and then the world: it is responsible for nuclear power plants and infrastructure for mining in hitherto roadless jungle and for triggering Bolivia's water war earlier this decade when its attempts to privatise Cochabamba's water backfired; it was one of the more visibly problematic contractors in Bush's Iraq. (The Bin Laden family was earlier this decade a 'substantial investor', with \$10 million in a private equity fund owned by Bechtel, but that's another story.)

No one opposed the Hoover Dam, built at the height of the Depression and of hope in technology, but Glen Canyon Dam, built 30 years later, was controversial from the outset. The Sierra Club's fury at the development transformed it from a genteel regional mountaineering society into the most powerful environmental group in the country. The canyon

that would be dammed was one of the most beautiful places in the South-West, as the Sierra Club knew when it originally signed off on it as a replacement for a dam upstream, then changed its mind and began to fight – in vain, ultimately – to save the canyon and the river ecology downstream. Yet the struggle produced the soul-searching and rabble-rousing out of which came the modern environmental movement. The logic for the dam was hard to find, but the junk science – basic errors concerning the rate of evaporation (creating a big lake in a desert entails giving a lot of the water to the sky), squirrely figures about costs, the amount of water the river collects annually – was not. Powell concludes that the dam and Lake Powell exist because a powerful Colorado representative wanted them and because the Bureau of Reclamation 'needed new dams to burnish its reputation and justify its funding and staff levels'.

The battle over the damming of Glen Canyon is one of the great epics of 20th-century America, and out of it came two classics. One was Eliot Porter's elegiac photographic book *The Place No One Knew: Glen Canyon on the Colorado*, a book that helped create the genre of colour nature photography. The other was by John McPhee, the *New Yorker's* science writer. *Encounters with the Archdruid* recounts what transpired when McPhee managed to get the dam's chief advocate, Floyd Dominy, and its bitterest opponent, Porter's publisher and the Sierra Club's executive

director, David Brower, to float together down the Grand Canyon below the dam, arguing all the way. Neither of them imagined the fate the dam now faces. But others hoped. Two classics, or maybe three. The insurrectionary environmental writer Edward Abbey's 1975 novel *The Monkey Wrench Gang* coined the verb 'monkey-wrenching' for a certain kind of ecological sabotage: its four central characters plot to float a houseboat full of explosives to the dam. The book helped prompt the formation of the radical environmental group Earth First!, which announced its arrival on the scene in 1981, when some of its founders unfurled a vast line of black plastic resembling a crack down the 700-foot-high face of Glen Canyon Dam. 'Surely no man-made structure in modern American history has been so hated for so long by so many with such good reason,' said Abbey, speaking to a crowd in a parking lot with a good view of the dam and the prank. It was Earth First! that came up with the optimistic bumper sticker about all this: Nature Bats Last. But Bechtel keeps the profits.

The docks and ramps at both reservoirs have had to be relocated and rebuilt in pursuit of the fleeing waterline, and one simply closed. One ramp at Lake Powell grew to 1300 feet long, another to more than 1500 feet, new additions to the collection of landscape follies across the American West. Phoenix and Vegas seem fated, Powell argues, to become dusty ruins, for the water to sustain them is already

vanishing (though Vegas has a murderous scheme to drain much of the rest of Nevada for its golf courses and casino fountains, to the detriment of rural communities and wildlife). If the lack of water doesn't get them, climate change might: Powell predicts that summer temperatures in the 120s (above 48°C) will be routine in Phoenix. Aridity, he proposes, could well kill off much of the agriculture and two of the biggest cities of the South-West by the middle of this century. (In California, my local paper reports that a severe drought, now into its third year, is forcing state and federal water agencies to cut water deliveries to farmers in the Central Valley, perhaps the world's single richest agricultural region, by '85 to 100 per cent'. A 100 per cent cut would be a death sentence in this Mediterranean climate without rain between May and October.)

'When all the rivers are used, when all the creeks in the ravines, when all the brooks, when all the springs are used, when all the reservoirs along the streams are used, when all the canyon waters are taken up, when all the artesian waters are taken up, when all the wells are sunk or dug that can be dug in all this arid region, there is still not sufficient water to irrigate all this arid region,' Powell the prophet told an audience gathered in support of large-scale irrigation in Los Angeles in 1893. Booed and shouted down, Powell retorted: 'I tell you, gentlemen, you are piling up a heritage of conflict and litigation over water rights, for there is not sufficient

water to supply these lands.' The day he spoke, Las Vegas did not yet exist; Los Angeles had 50,000 residents and Phoenix a tenth of that. The other Powell, the author of *Dead Pool*, confirms that the Earth First! bumper sticker is correct. The waters that are insufficient for this desert civilisation will continue to flow anyway. The river that carved a canyon a mile deep will eventually remove all the concrete in its way and scour out the massive piles of silt built up behind both megadams. The process will be catastrophic at some point, but in geological time it will mean restoration of the live, continuous river. Long before then, Phoenix will be like Jericho or Ur of the Chaldees, with the shrivelled relics of golf courses and the dusty hulls of swimming pools added on. The snake may break up into dead pools in this century, but unlike Phoenix it will rise again.