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The New Gold Rush - gold mining in Nevada

Rebecca Solnit

The forty-niners' lust for gold devastated California's foothills.

Now it's Nevada's turn.

THE MUSEUMS OF CALIFORNIA'S GOLD COUNTRY (as the Sierra Nevada foothills are still called) are full of picturesque sepia-toned photographs of those who made a killing in the Gold Rush, and visiting schoolchildren dress up in historic costumes and play at panning for gold. For a more up-to-date education, though, they should play at testing contaminated water, treating mercury-caused madness, or surveying for vanishing wildlife. By 1857, miners had extracted 760 tons of gold from these hills--and left behind more than ten times as much mercury, as well as devastated forests, slopes, and streams. The profits were quickly spent, but the costs are still rolling in, and if you want to know who's picking up the bill, look in a mirror. * Until recently, gold was the measure of value for all other things. Gold was money, and money in its material form was gold, the fulcrum between the concrete world of commodities and the abstraction that is their exchange value. Gold anchored national economies, providing the basis for their currencies. Until 1933, higher-denomination U.S. coins were still made of gold; paper money was originally just a receipt that could be exchanged for governmental gold and silver upon demand.

In the 1970s the United States went off the gold standard though, and now none of the world's major economies are tied to hoards in vaults. (The Economist calls these national stockpiles the "spent fuel of an obsolete monetary system.") The scramble by Australia, Britain, and other nations to sell off much of their gold reserves has contributed to the rapid decline in gold prices in recent years, which has had the benefit of curtailing some mining companies' operations and the detriment of bankrupting others before they've cleaned up their messes.

Unlike most other products of extractive industry, gold has little practical use. Of the 2,500 tons produced worldwide each year, 85 percent goes into jewelry. All the gold ever mined--an estimated 125,000 tons--would form only a 60-foot cube. Of that amount, 80 percent is still around, in bank vaults, personal jewelry boxes, and jewelry stores. Ninety percent of the gold ever mined has been mined since 1848.

How do you measure gold against a landscape? How do you weigh 760 tons of cold metal against the splendor of a 400-mile-long mountain range teeming with grizzly, elk, antelope, and spring-run salmon? How do you weigh it against clear, fast-flowing rivers, an enormous bay full of wetlands, aquatic life, and edible fish? How do you compare it to the dozens of small Indian nations who for thousands of years had woven their local places and creatures into marvelous stories?

When the Gold Rush ended in California, it moved across the Sierra to Nevada, with the usual effects: The indigenous inhabitants displaced and slaughtered, and Native food sources--fish, game, and pinon pines--devastated. To feed the smelters of Eureka in central Nevada, all the pinon and juniper for 50 miles was cut down by 1878.

Today Nevada produces nearly three-quarters of the nation's, and 10 percent of the world's, gold supply. The state's modern gold rush began when geologists located the Carlin Trend--a 50-by-5-mile belt across northeastern Nevada's Humboldt Basin bearing "invisible gold" in particles too small to be seen. The Trend's first open-pit mine came in 1965, but it was the steep rise of gold prices in the 1980s and the introduction of cyanide heap-leaching that made mining such low-grade ore profitable.

The history of gold mining is about technology making it profitable to go after ore of lower and lower grade. High-grade ore is still refined in roasters and mills, but the low-grade stuff goes into leach heaps, huge hills of pulverized ore mounded atop plastic liners. Cyanide solution is poured through the pile, and the gold particles it carries with it are then extracted from the poisonous runoff. This allows gold to be mined from low-grade ore on a scale none of those men in the sepia-tone photographs could have imagined. Modern gold mining follows a law of diminishing returns, displacing earth and water on a gargantuan scale and producing poison on a large scale, all for the sake of the little ring on your finger. For example, the Mary Harrison Mine that opened in 1853 in Coulterville, near Yosemite, yielded from one-third to one-half an ounce of gold per ton. In 1997 the Barrick Corporation's Betze-Post Mine in the center of the Carlin Trend moved 159 million tons of rock and earth to produce 1.6 million ounces of gold--a mere hundredth of an ounce per ton. Its pit is now up to 1,600 feet deep, a mile wide and a mile and a half long. Ironically, points out Nevada activist Chris Sewall, this so-called invisible gold leads to colossal pits that can be seen from space, with 350-foot-high leach heaps covering as much as 300 acres.

(Carrie Dann, a Western Shoshone leader battling a gold mine in her own backyard, once said that everyone who buys gold jewelry should have to deal with the consequences too. Ever since, I've pictured a truck driver ringing the doorbell of a home to say, "Ma'am, about that new wristwatch: Would you like your seventy-nine tons on the front lawn or the back? You'll want to keep the kids and the dog off 'cause of the acid and arsenic.")

Modern mining is intensely toxic: A teaspoon of 2 percent cyanide solution would kill you. In the beginning, cyanide-laced drainage was left to break down in open ponds where waterfowl would sometimes land and die; nowadays, mines are obliged to cover the ponds with nets. Gold ore often contains sulfur, which forms sulfuric acid when exposed to air and water. The acid draws other heavy metals--including arsenic, antimony, lead, and mercury--out of the ore heaps and into the environment. At the Yerington pit in western Nevada, a toxic plume is moving toward the well field that supplies water for the Yerington Paiute Reservation. The mining corporation that created the catastrophe has gone bankrupt, and the Paiutes are trying to get Superfund designation for the site.

Nevada is the driest state in the Union, but profligate with water when it comes to gold mining. Its springs and mountain streams feed large aquifers and the slender Humboldt River, which meanders nearly 400 miles west from its beginnings in the northeast corner of the state. But 18 large mines in the Humboldt region are working below the water table, so they must "dewater" the mine sites by pumping out underground water at stunning rates. The Betze-Post Mine alone has pumped out more than half a million acre-feet, and the Lone Tree Mine northeast of Winnemucca pumps an amount equal to one-seventh of the Humboldt's annual flow.

Groundwater, remarks water historian Mark Reisner, "is as nonrenewable as oil." A 5 million acre-foot deficit is being created in the Humboldt Basin--1.6 trillion gallons, the equivalent of 25 years of the river's annual flow. Some of this water is pumped into the Humboldt River, where it generates higher stream flow and wetter wetlands before leaving the region. Some irrigates alfalfa fields. Some is used to process the ore, and becomes contaminated with cyanide, acids, and heavy metals. Some is "recharged," or put back into the ground, although it's not necessarily the same pure water that was pumped out, nor will it go back from whence it came.

Nevada hydrologist and Great Basin Minewatch director Tom Myers estimates the water table around the mines is being drawn down as much as 1,000 feet, creating deep subterranean "cones of depression." When the pumps stop, water will be drawn back to these areas to fill up the mine pits, creating a string of deep dead lakes, including the two largest man-made lakes in Nevada. Local springs, streams, and parts of the Humboldt River may dry up. The water table will be radically rearranged. Nobody knows exactly what will happen. Myers' models allow for various scenarios, none of them pretty.

Advocates for natural Nevada are unfortunately as rare as rainfall. "Nobody moves to northern Nevada for the scenery," says Myers. "You and I know how beautiful it is, but the public doesn't." Few writers and artists celebrate the Great Basin, which

may be one reason why so much of it is still unpopulated and unprotected. It is an austere country, with great seas of fragrant sagebrush and grass sweeping up to juniper and pinon at higher elevations, whose ranges conceal marvelous clefts and canyons where streams make small oases of wild rose, cottonwood, aspen, and willow alive with butterflies, songbirds, and the rare--but unlisted--sage grouse. Another endangered subspecies, the Lahontan cutthroat trout, lives in the Humboldt River. Pronghorn still range in the remoter places, but mining roads are making those places less and less remote. Between 1985 and 1997, new mining and prospecting roads carved up more than 350,000 acres of previously roadless national forest land. The figures for Bureau of Land Management land are probably greater, but no one has calculated them.

Mining is devouring Nevada, but the state gets little in return: 12,000 jobs and a one percent tax on the gross. About 25 percent of the gross is profit, most of which goes out of state or country. In 1994, Toronto-based Barrick Gold, the world's second-largest gold corporation, paid less than \$10,000 to the Department of Interior for land containing an estimated \$8.4 billion in gold, thanks to the 1872 Mining Act. That notorious legislation allows anyone to patent a mining claim on public land for nominal fees and then work it as they will. Newer regulations limit how much a mine can contaminate its surroundings and require a minimal cleanup afterward, but the land is still given away to all comers, foreign or domestic.

Yet it's an open question as to whether the land is the government's to give away. Just as the California Gold Rush took place on land that still legally belonged to its resident tribes, in Nevada's gold rush region, the Western Shoshone have never ceded their land nor accepted payment for it. The \$26 million the United States originally proposed to pay is laughable compared with the quantities of gold taken from the region every year, as were the diminutive payments California Indians received for their land long after the Gold Rush.

At any rate, all the gold in Nevada can't pay for a ruined ecosystem. In southern Crescent Valley, Nevada, a huge new mine has opened up, Cortez Gold's Pipeline Deposit Mine. For thousands of years there had been nothing here but sagebrush through which any creature might move freely, and even a few years back when I worked as a land-rights activist with the Western Shoshone it was open space threatened by nothing worse than a few cows. Now it is dominated by steep slopes of waste-rock piles and fenced-off cyanide leach heaps hundreds of feet high and thousands long, mounds for which a correspondingly large hole exists nearby. To allow it to work under the water table, the mine pumps 25,000 gallons per minute into black pipes that lead to a distant grid of rectangular "recharge" ponds, from which the water is supposed to drain back into the aquifer. But the recharge isn't working the way it's supposed to; much of it is spreading into the valley instead, making it unnaturally green and turning the family cemetery of the Danns, an extended family of Western Shoshones who have lived in the valley for generations, into spongy marsh.

Traditional Western Shoshones like Carrie Dann have been fighting to get their land back throughout most of this century. Her outrage about the mining in Crescent Valley is unblunted by 5 years of living with the Pipeline Mine and 30 years of living with the smaller Cortez Mine nearer her home. "Mining is against our culture, against our spiritual ways," she says. "They're pumping all the life out of the earth. It's not humane, it's not right. It'll be paid for by children not even here yet." Gold mining in California contaminated surface water, she says, but in Nevada the poison is underground. "How do you control that? Are they going to tell me that they're going to control underground water contamination when we can't clean aboveground contamination?"

"To me water is a gift of life."

GOLD HAS BEEN PRIZED BECAUSE IT IS the most inert metal, changeless and incorruptible. Water is prized for its opposite qualities of fluidity and mobility. To value gold over water is to value economy over ecology, that which can be locked up over that which connects all things.

The oldest story I know about gold is also about water. I thought of the story of King Midas when Chris Sewall, an organizer for

the Western Shoshone Defense Project, took me to look at the recharge ponds and acid mine-drainage of the shut-down Buckhorn Mine, just over the mountains behind the Danns' home. (Until a few embankments were bulldozed, acid from the mine ran down the road and into beautiful Willow Creek, leaving it covered with dead earthworms.)

When King Midas was first granted the golden touch, says Ovid, he was "delighted with the misfortune which had befallen him." But then even the water he tried to drink turned to gold as it touched his lips. Parched with thirst, he begged the god Bacchus to take back his gift. Bacchus sent him to a sacred spring to "wash away his crime" and recover his ability to drink, to touch, to live. Afterward, Midas hated riches and dwelt in the forest.

Midas is also the name of a tiny town just up the road from the Twin Creeks Mine, which in 1996 had proposed putting a huge tailings pile over the site of the 1911 "Shoshone Mike" massacre, in which the U.S. Cavalry murdered a family of eight traditional Newe people in the last Indian massacre of its career. Twin Creeks assured Western Shoshones that its tailings would "protect the site in perpetuity."

Last year I toured Barrick's Betze-Post Mine--the largest gold mine in North America and third-largest in the world--and was amazed how much the pit had grown since 1992 when I saw it last. I was equally amazed when Barrick's young tour guide told me and the leathery, upbeat Texas retirees who made up our group that "the first inhabitants of the Elko area were fur trappers in 1828." Another guide showed us a flint flush of green on one of the steep embankments and told us that it meant that the landscape had been restored to its natural condition. Before the mine, biologists noted that the site was an active "lek," or sage grouse dancing ground, where more than 100 of the imperiled birds used to gather. Now there are none. One day even the creek disappeared: Maggie Creek, which runs past Barrick's mines, vanished into a sinkhole.

Some states are seeking to avoid Nevada's fate. Last year in eastern Washington, the Okanogan Highlands Alliance got the Interior Department to interpret the 1872 Mining Act in the environment's favor for the first time. The law provides for a five-acre mill site per mining claim, but modern mining takes up far more room--so Battle Mountain Gold Corporation's permits for Buckhorn Mountain were denied on the grounds that the mill site was over the allowable size. Interior later reversed its decision, but this year, Washington State denied Battle Mountain water rights, effectively blocking the mine.

(As part of its campaign, the Okanogan Highlands Alliance started bottling Buckhorn water labeled with their slogan--"Pure Water Is More Precious Than Gold." This is literally true: The 2,000 gallons of water it would take to produce an ounce of gold worth about \$280 was itself worth \$3,540 bottled. Despite its defeat in Washington, Battle Mountain is still at work in Nevada.)

In eastern Montana, Pegasus Gold Corporation's Zortman-Landusky Mine, the world's very first large-scale cyanide heap-leach mine when it opened in 1979, will also be Montana's last. In 1996, the mine was fined \$37 million for its acid mine drainage and cyanide contamination, fined again in 1997 for stream contamination, and went bankrupt in 1998. That left the state to pay tens of millions for a cleanup that still won't create pure water or restore Spirit Mountain, now just a pile of poisonous powder. At the Fort Belknap Reservation next to the mine, cyanide flowed from taps. "Our worst nightmares have come true," says Rose Main, a White Clay Assinboine from Fort Belknap. "Now we're living in them." The mined land had originally been part of the reservation, but when gold was discovered on it in the 1890s, the boundaries were redrawn. Thanks to this disaster and many like it, Montanans recently voted to ban all new or expanded cyanide heap-leach mines.

IN THE END, GOLD MINING, LIKE ALL other environmental dilemmas, shows the consequences of valuing what can be pocketed and possessed over "the gift of life." Where will the modern Midases find a stream pure enough to wash away their crimes?

RELATED ARTICLE: Gold Fever

The forty-niners brought on California's original environmental disaster

AFTER 150 YEARS, THE ROMANTIC PATINA OF THE CALIFORNIA Gold Rush is finally wearing off. Beyond the sudden wealth, the celebrity criminals, and a few famous writers, the forty-niners ushered California into the modern age with an environmental disaster of the first magnitude.

In other parts of the American West, frontier families came to turn places into homes. (The places were often someone else's, but that's another story.) But the forty-niners came to grab and get out, and they laid waste to their surroundings with gleeful abandon. In *Roughing It*, Mark Twain's book about his mining years, he recalls how he accidentally started a colossal forest fire at Lake Tahoe, watched it burn as entertainment, then picked up and moved on without a backward glance. Tens of thousands of miners stormed the Sierra Nevada foothills with picks, shovels, and rifles, an army of mostly young men making war on the earth itself for its hidden treasure.

For the Native inhabitants of the mother lode, whose sustenance depended on intact natural systems, the Gold Rush was Armageddon. "For most Nisenan [the local Native tribe], the Gold Rush meant death from disease or violence," says a placard at Coloma State Historical Park, on the site where, in January 1848, James Marshall found the first few flakes of gold. "For the survivors, it spelled the quick destruction of their culture and habitat." Marshall himself was temporarily driven from Coloma because he tried to prevent a massacre of local Indians. In the first 20 years of the Gold Rush, the indigenous population of California declined by 80 percent.

In 1853, an Indian agent in El Dorado County reported that the local people "formerly subsisted on game, fish, acorns, etc., but it is now impossible for them to make a living by hunting or fishing, for nearly all the game has been driven from the mining region or has been killed by the thousands of our people who now occupy the once quiet home of these children of the forest. The rivers or tributaries of the Sacramento formerly were clear as crystal and abounded with the finest salmon and other fish... But the miners have turned the streams from their beds and conveyed the water to the dry diggings and after being used until it is so thick with mud that it will scarcely run it returns to its natural channel and with it the soil from a thousand hills, which has driven [out] almost every kind of fish." The mighty Sacramento River, says salmon historian Michael Black, had its last healthy spring run in 1852.

In the early years of the Gold Rush, a miner panning in a stream could work about a cubic yard of earth a day. Greed and a constantly diminishing ratio of gold to ore prompted new technologies that allowed more and more earth to be worked over with less labor, thus making lower-grade deposits worth working. As the technologies became more elaborate the capital costs increased, and the era of the rugged individualist rapidly gave way to corporate operations and distant investors.

If the Gold Rush was a war on the earth, the heavy artillery arrived when hydraulic mining was invented in 1853. High-pressure water cannons allowed miners to wash away gravel, earth, hillsides, entire landscapes. These operations required vast quantities of water, which were diverted from rivers into flumes and pipes and stored behind wooden dams, which in turn required vast quantities of timber. By 1855, there were 4,500 miles of canals running through the gold country. A wilderness had been turned into an outdoor factory: Rivers were washing machines, conveyor belts, and drains; hills became holes; forests were plumbing supplies. The only valued part of the landscape was that being sent to San Francisco as bars of bullion; the rest was turned into sludge and desolation.

Hydraulic mining, reported John McPhee in *Assembling California*, sent 13 billion tons of the Sierra Nevada downstream. More than a billion tons washed into San Francisco Bay, diminishing its wetlands and raising its floor. The Sacramento rose an average of seven feet, and the town of Marysville, which once sat securely above the Yuba and Feather rivers, began to build levees that rose higher than the housetops as the rivers rose above street level. (Despite these efforts, a torrent of toxic mud buried the town in 1875.) The Yuba was at one point 110 feet above its original bed and is still 65 feet higher than it was in

1849. Mine tailings were burying the rich farmland of the Sacramento Valley--about 40,000 acres were destroyed, and 270,000 acres severely damaged.

Finally, the farmers fought back. On January 7, 1884, hydraulic mining was outlawed by Judge Alonzo Sawyer. It was the first environmental victory in American legal history; the first time a U.S. court ruled that the general welfare outweighed individual profiteering.

Shawn Garvey, executive director of the South Yuba River Citizen's League, calls gold mining "the single most destructive event that's ever happened in the Sierra Nevada. There's no other environmental degradation that even comes close: not logging, not roadbuilding, not extirpation of species. Almost all the environmental issues we deal with are in some way related to the impact of hydraulic mining 140 years ago, whether it be flooding, a clean water supply, Superfund sites, or airborne toxins."

For example, about 7,600 tons of mercury entered California's lakes, streams, rivers, and San Francisco Bay just from the mining in the central mother lode. It's still there. Thousands of formerly forested hydraulic mining sites no longer support any type of vegetation, which still exacerbates flooding. Sierra dams keep mercury from moving downstream, says Garvey, but the bacteria in their waters turn it from inert to methylated mercury, which readily enters the food chain. The Gold Rush is still poisoning the Golden State.

--R.S.

RELATED ARTICLE: Stop Mines From Sucking Nevada Dry

NEVADA IS SACRIFICING PRECIOUS GROUNDWATER to its gold mines with no concern for future water needs. According to Glenn Miller, an environmental chemist and long-time Sierra Club mining activist, when the pumps are finally shut off, the 200-mile-long Humboldt River Basin west of the Ruby Mountains could end up millions of acre-feet short of water.

Three dozen gold mines now operate in the basin, some as much as 2,000 feet deep, several hundred feet below the water table; one mine will be two-thirds as deep as Lake Tahoe. In order to keep their open pits dry, the larger mines have to pump more than 30,000 gallons a minute--about the same amount used in the entire Reno-Sparks metropolitan area. The mines discharge the water into the Humboldt, temporarily increasing the river's flow. But when the gold is exhausted and the pump's are turned off, the pits will fill, pulling away precious groundwater from elsewhere in the aquifer to form contaminated pit lakes. Flow in the Humboldt will fall, and Nevada's lifeblood will evaporate into the dry Great Basin air. According to Miller, "More than ten thousand acre-feet per year, about five percent of the annual river flow, would evaporate from these pit lakes."

State officials are refusing to plan for this loss of water, or even study the effects of permitting so many mines. Under pressure from the Sierra Club, the U.S. Geological Survey has begun a long-term study, but meanwhile the state and the Bureau of Land Management continue to allow new mines.

TAKE ACTION:

Write to U.S. Secretary of the Interior Bruce Babbitt, U.S. Department of the Interior, 1849 C Street N.W., Washington, DC 20240 or e-mail him at bruce_babbitt@ios.doi.gov. and Nevada Governor Kenny Guinn, Capitol Building, Carson City, NV 89701 and tell them not to permit any new mines in the arid Humboldt Basin of Nevada until the cumulative effects of mine dewatering are known.

REBECCA SOLNIT is on the board of Citizen Alert, Nevada's statewide environmental group. Her book *Savage Dreams: A Journey into the Landscape Wars of the American West*, which deals in part with gold mining, has just been reissued by

University of California Press. In April, she was awarded a Guggenheim Fellowship.

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