Into the Crucible: Mining's Lasting Impact on the Native American Great Basin

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For a century and a half, the words "Great Basin" have conjured up images of a wide–open, desolate landscape surrounded by mountains. In reality, this huge area of interior drainage consists of almost one hundred closed basins alternating with mountain ranges that run in a generally north–south direction. To mining historians, the mountains are sites of much interest, for many are mineralized, their ore–bearing rocks often yielding gold, silver, and copper. The salt–filled lake bottoms here are among the most desolate places in North America. They are truly desert places, and with good reason: Throughout much of the Great Basin, the climate is semi–arid to arid, but these valleys receive the smallest amount of precipitation in the region. In contrast, the mountains rise several thousand feet above the valleys, and therefore receive higher precipitation, either in the form of rain or snow. They are thus often vegetated islands, clothed in piñon and other pines, whereas the drier valleys are dotted with sagebrush, shadscale, and desert shrubs. Although commonly considered unpopulated, this region is home to Paiute and Shoshone Indians.

Picture the Great Basin region in the early 1880s, when travel writer Phil Robinson wrote about his experiences as he journeyed on a Central Pacific train bound from Salt Lake City to California. As the train rattled westward across sagebrush–covered plains, Robinson attempted to heighten his readers' sense of adventure by observing that "there are plenty of Shoshonees [sic] to make the desolation perilous to travelers by waggon [sic]" here. Robinson contended that these Indians were as mysterious as "hieroglyphics altogether," and that there was "something 'uncanny' about them." For a considerable portion of his journey, Robinson traversed the Humboldt River Valley where nearly perpendicular cliffs dwarfed the train. Upon reaching one of the Humboldt Valley's larger towns, Palisade, Nevada, Robinson witnessed several men— "one Englishman, one Negro, three Mulattoes, and a Chinaman"—laughing at an Indian woman and her baby on the railroad platform there. Robinson found the railroad town of Palisade bleak enough; he called it "a group of wooden saloons haunted by numbers of yellow Chinese." But he had even more scathing words regarding the ethnically charged encounter he experienced in Palisade, when those men mocked the Indian woman. A self-proclaimed cynic, Robinson noted that "the white man looks down on the Mulatto, and the Mulatto the Negro and the Chinaman reciprocate a mutual disdain." But Robinson gleefully noted that he "laughed heartily at them all—at them all except the Shoshonee [sic]." The reason, Robinson admitted, lay in the Indians' antiquity. He confessed that "I cannot, for the life of me, help venerating these representatives of a prodigious antiquity, these relics of a civilization that dates back before our Flood."[1]

Robinson's suggestion that the Indians were descended from earlier races of people who inhabited the world before whites was fairly common, actually part of a growing folklore about American Indians as "lost tribes of Israel," as the Mormons imagined them. Robinson's fascination with the Shoshone was typical, in that he both

romanticized their mysterious past and predicted their imminent demise. At the time he recorded his observations, Robinson had pretty good reasons for his prediction. American Indians were often regarded as vestiges of lost civilizations, and their populations were decreasing precipitously in the late nineteenth century. By 1881, the Indians had suffered through more than a generation of abuses, watching their status decline from rulers of the Great Basin to marginalized tenants, as mining and ranching interests transformed the landscape.

Palisade, Nevada, was certainly a good place to observe the contact between native peoples and newcomers. Crammed into a canyon whose chocolate–colored walls recalled the similarly basalt–defined Palisades along the Hudson River, Palisade stood on the south bank of the enigmatic Humboldt River. Palisade was not only an important water and fueling spot on the nation's first transcontinental railroad. It was also an important railroad junction, where the Central Pacific mainline connected with the Eureka and Palisade, one of Nevada's now–fabled narrow gauge railroads. As the E&P's name honestly suggested, this three–foot gauge railway had one terminal in Palisade, the other in Eureka. Located about eighty miles south of Palisade, the booming town of Eureka had already earned the sobriquet "Pittsburgh of the West." Like its eastern counterpart, Eureka's prosperity was evident in the smoke that poured from industry's furnaces. In Eureka, however, it was lead and silver, rather than iron and steel, which smoked up the heavens. At about this time, Italian–American entrepreneur Lambert Molinelli described Eureka as prosperous and building toward an even greater future. Located prominently at both the northern and southern edges of town, two of Eureka's sixteen smelters served as bookends that underscored the context of life here: mining was the alpha and omega of the economy. Eureka's mines lay scattered about the landscape, creating dumps and tailings that would last into the twenty-first century.

As one might expect, the moralistically high–minded Phil Robinson also had a lot to say about Nevada in relation to mining. He began by noting that Nevada "is abominably rich, I know." Disgusted by the Silver State's wealth, Robinson opined "there is probably more filthy lucre in it per acre (in a crude state, of course) than in any other state in the Union, and more dollars piled up in those ghastly mountains than in any other range in America." When a fellow traveler noted that "that hill over there is full of silver," Robinson sarcastically fired back "Is it?" Robinson then characterized the hill as "'the *brute*'" (his emphasis), confessing, "I really couldn't help it" for "its repulsive appearance was against it, and the idea of it being full of silver stirred my indignation." Robinson's reason? He compared these barren, mineralized hills with the fertility of pastoral regions elsewhere, including irrigated lands in Utah, which put to shame "ugly, wealthy Nevada." Indeed, Robinson was so totally enchanted by the agrarian beauty of California's golden hillsides and fertile farms to the west, and Utah's disciplined agrarian beauty to the east, that he summarized the region's geography as succinctly—and as harshly—as anyone ever has: "Nevada," he wrote, "lies under the disadvantage of having on one side of it the finest portion of California, on the other the finest portion of Utah, and sandwiched between two such Beauties, such a Beast naturally looks its worst." I suspect that Robinson inherited his belief in the Indians' antediluvian origins and his distrust of mineralized desert places like Nevada from the Bible. Their "filthy lucre," won by luck and arcane knowledge rather than by the constant, disciplined work required to sustain agriculture, invited such invidious comparisons. I also suspect that Robinson despised the miner's signature on the land—the overturned mountains and bound–up streams that everywhere characterize mining.[2]

Although Robinson did not visit Eureka itself, one can imagine the vituperative language he would have thrown at it. Fueled by mining, Eureka was an industrial boomtown of several thousand souls. Its sixteen furnaces figure at the center of an ecological and cultural drama that unfolded in the late nineteenth century Great Basin. As miners moved into the area, they had a profound effect on the region's environment and peoples. In addition to claiming areas to mine, mining demanded materials from its surroundings. Among the items that mining craved and required to satisfy its voracious appetite was wood, for both construction and fuel. While the pine forests that cling to the higher elevations supplied some structural lumber, most of it was shipped in by rail over the CP and E&P railroads. Although marginally suited to providing lumber, the piñon pine trees that dotted the hillsides did yield some dimensional timber for that purpose. One report described miners' housing built of "short piñon logs, squared and set in the ground stockade style." This piñon lumber was called "Reese River Lumber" to distinguish it from the better lumber from the Sierra Nevada. In addition to providing lumber, piñon pine served another purpose. The demand by the smelters for charcoal soon led to a thriving trade in harvesting and converting piñon pine into smelter fuel. Historical photographs and other records confirm that a charcoal industry thrived in this area shortly after miners arrived about 1860. Much has been written about the charcoal industry, but I would like to interpret it from the Native American perspective. By so doing, I hope to show that piñon pine harvesting by mining communities had not only environmental consequences, but cultural consequences as well.[3]

Consider again the Indians that Phil Robinson encountered back at Palisade. To him, the "listless" Shoshone men's faces resembled "masks" which conveyed an emptiness of expression, and the women were as "burnished and painted and wooden as the figure–heads of English barges." Robinson may have considered the Indians' countenance to be timeless—his reference to the antediluvian suggests continuity over eons—but their faces also likely conveyed the traumatic change that they had witnessed in their lifetimes. In addition to being moved off their ancestral lands, the Shoshone and Paiute had watched their resources dwindle as grazing and timber harvesting removed plants and altered habitats.[4]

The piñon pine trees that were disappearing from the hills had a central role in Native American spiritual ecology. Perhaps as a distant memory of the end of the Pleistocene period, when the region was better watered, a Shoshone story relates that "Blue Crow flew to the north and found the pine–nut trees," and that "he brought pine nuts back with him and planted them all around here in the mountains." Tellingly, "those pine nuts were a lot bigger than the ones we have today," yet those pine nuts still form an important part of Indians' diet, providing both protein and carbohydrates. The Washo Indians tell a story about how the piñon pine came to possess its "dwarfed" stature: After droughts and fires burned up the piñon trees, Wolf–god "then scattered pine nuts on the hills and caused them to grow up into a new forest." The Washo were too weak to harvest these nuts, however, so Wolf–god "tore off the treetops and dwarfed all the pines." Upon harvesting these nuts, the Washo became strong.[5]

The Indians' lifestyle was closely tied to the piñon pine, but miners were also dependent upon its use in the smelting of ores. So great was mining's interest in, and reliance on, the piñon, that Rossiter W. Raymond addressed the subject in his 1872 report to the United States Congress. Raymond considered the piñon pine to be a premier charcoal-producing species. In 1873, Raymond again commented on Nevada's piñon pines, noting that Eureka produced a superior charcoal—far better than the charcoal being made in Utah. Raymond's words confirm what was

widely known: The smelters had an insatiable appetite for charcoal, which is a highly efficient fuel, burning hotter than wood with considerably less waste. If Eureka's furnaces worked at or near capacity, 17,850 bushels of charcoal would have been consumed daily—very close to the 16,000 bushel figure provided in 1877–78 by Nevada's surveyor general. In his seminal book on the piñon pine, Ronald Lanner notes that a typical yield was ten cords per acre, and that a cord made about 30 bushels. It is estimated that the furnaces at Eureka devoured over 530 cords of piñon wood per day, the yield from more than fifty acres. Historical archaeologist Charles D. Zeir refined these figures somewhat, noting that Eureka's consumption was reported to be as high as 1.2 million bushels of charcoal per year. This would have required 42,857 cords of piñon, or "somewhere between 3,571 acres (at 12 cords per acre) and 5,357 (at 8 cords per acre) acres of woodland." He also recorded that "between 51 and 77 ovens would be needed to reduce the piñon contained in one square mile [640 acres] of woodland. Zeir estimated that "some 430 ovens would be required to supply one year's worth of charcoal for the Eureka smelters."[6]

In his 1879 book on Eureka, Lambert Molinelli noted that "the fuel used for smelting is charcoal of most excellent quality, weighing over 17 1/2 lbs to the bushel." This charcoal, Molinelli observed, "is burned from nut pine (*Pinus monophylla*) within a radius of forty miles of Eureka" and "the price per bushel for the past five years has averaged about 28 cents." Although noting that "the manufacture of charcoal is a necessary adjunct to mining," Molinelli conceded that "it is impossible to obtain correct statistics of the charcoal manufacture of Eureka." True, Molinelli wrote, "Its production has so far kept pace with the requirements of smelting ," but he also concluded that "the supply . . . is limited, and before long our smelters will look to the illimitable forests of the Rocky Mountains and the Sierras for their [char]coal." The deforestation precipitated by Eureka's charcoal burners had environmental consequences, and the impact was exacerbated by the fact that other towns like Austin and Battle Mountain also demanded charcoal. According to most contemporary sources, this important ingredient was transported thirty, even thirty–five and more miles to help smelt ores in Nevada's metals mining districts.[7]

The ores in this area were notoriously refractory, and considerable energy and experience was required to coax the metals out of them. When discussing the complex "lead ores that contain varying percentages of gold and silver" in the late 1870s, the peripatetic and observant Don Maguire noted that "the furnaces of Nevada are fed entirely with charcoal produced in the mountains round about." Maguire further stated that "these charcoal kilns are owned and run mostly by Italians who sell their product to the smelters at from fifteen to thirty cents per bushel." Maguire was correct in suggesting that charcoal production demanded skilled labor, which is to say a specialized force, and it is here that the *Carbonari* of Italy found their place on the Nevada mining frontier around 1875. Their presence added yet another thread to the complex ethic fabric of the Great Basin.[8]

Picture, if you will, men whose trade was the transformation of trees into a product of industry. Working in small groups, they cut down piñon trees and used one of two methods to produce charcoal. The first, generally called surface ovens, involved constructing piles of wood that would smolder at just the right rate to produce charcoal. The second system—kilns—was more elaborate and expensive. Constructed out of masonry, kilns required considerably more investment and were fixed in place; they were, however, the most efficient method of producing charcoal. There is evidence that most of the ovens were not used repeatedly, and that charcoal producers moved to new sites rather than hauling

wood long distances. That means that permanent kilns were fairly rare; though the examples that remain in Nevada and Utah are certainly impressive features in the landscape of the Great Basin. Much of the final product—high quality charcoal—was shipped by teamsters using horses and wagons, but some was also likely shipped via the Eureka and Palisade Railroad, which reportedly used wood from the piñon–juniper woodlands for fuel. We can envision an elaborate transportation network connecting the charcoal industry to mining communities, though many of these roadways have been nearly obliterated with the passage of time.[9]

How severe was the impact of charcoal production on the natural and Native American habitat? Production generally lasted for a decade or more, starting in the 1870s and lasting until cheaper fuels could be obtained. Archaeologist Zeir concluded from his study of Mt. Hope, Nevada, that "the notion of an ever expanding ring of denuded hills around Eureka is overstated," as is the belief that "a wave of frenzied Italian Carbonari rolled across the countryside, leaving denuded hills in their wake." And yet, the prospect of Carbonari cutting down about nine square miles of piñon pine woodlands per year, for about a dozen years, is sobering. That production translates to a total of about 100 square miles of piñon pine woodland. Although this was a relatively small portion (roughly ten percent) of the wood available, given the widespread distribution of piñon pine in the mountains of central and eastern Nevada, that figure should be considered in context. For the Shoshone Indians dependent on these resources, this destruction of trees would have meant a reorientation to new areas where pine nuts were still available; but that reorientation would affect other bands of Indians who used those resources. Then, too, a shortage of piñon pine nuts could have been exacerbated in years of lower than normal precipitation: Even today, many of the region's native peoples pray for good conditions to ensure a bountiful crop of piñon nuts.[10]

Much has been written about the use of piñon pine as the preferred wood for smelting charcoal, but it found other uses in mining here in the Great Basin. In his classic *Illustrated Sketches of Death Valley* (1892), John Randolph Spears described the Nevada Salt & Borax Company's works at Rhodes Marsh, Esmerelda County, Nevada, in relation to freighting operations. These borax and salt mining activities were centered in the dry valley bottoms that are such a characteristic aspect of the Great Basin's "basin and range" landscape. But consider the impact of mining here, too. Spears recorded that "the works for producing borax from the crude material, found in the marsh there, used nut–pine as fuel, and the wood was cut on a mountain–top, twelve miles away, piled up on a bench at the end of a cañon, and drawn thence in wagons to the works." Spears also observed similar operations elsewhere, all involving "more wagons of the same kind" that supplied wood for fuel. These included Teel's Marsh and Columbus, Nevada, where borax mining was underway, as well as the hard rock mining town of Candelaria. Originating in the nearby mountains, these were called "wood–trains—all loaded—trains, so to speak of two great wagons and coupled together and piled high with wood." No figures are available to indicate how much wood was consumed, but Spears made a point of noting that "the wood-hauler piles from five to six cords on each wagon, couples two of them together, and draws the train down the rocky defiles and winding cañons of the mountainside and across the sandy plains"[11]

Spears devoted an entire chapter to "gathering desert fuel," in which he revealed much about mining's voracious appetite for wood. Consider first that desert mining communities often used *any* combustible vegetation available, including sagebrush and greasewood. Spears describes wagon loads of fuel being hauled to the borax

works at Columbus Marsh, Nevada, that "had been gathered on the desert, some eight or nine miles from the works, the brush within that radius having all been burned off." This brush "was dumped in great heaps handy by the mouth of the furnace, and there pitched under the boilers by the pitch-fork full." To the newcomer, this brush might have seemed like so much cheap fuel, but the native peoples differed in their opinion. They knew that the brush that the miners pitched under the boilers provided habitat for smaller animals—rabbits, lizards—that they consumed at different times of the year. This brush was also a source of herbal medicines, food—the berries were often eaten—and ultimately had spiritual significance: Sagebrush, for example, was the strongly rooted plant that one could hang onto in order to survive when the earth tipped during some great disturbances. Symbolically, the natives' world was tipping, as the very sagebrush that had been part of their spiritual ecology vanished in places.[12]

That disorientation was rooted in the exploitation of vegetation from the plains and mountains of the Great Basin. Like others traveling through the region, Spears recognized the exceptional value of piñon pine as fuel. Let us journey with him for a moment as he visited a woodcutter's camp in the mountains of southwestern Nevada. The camp would be occupied in the early spring where, "long before the snow is gone, the wood–cutters, usually in pairs, go up among the trees and prepare for their summer's work." Such wood–cutting, Spears discovered, "is not hard work, as wood–cutting goes." That, he tells us, is because "the nut–pine is a peculiar wood," and "the cutting is done chiefly with the pole of the ax—the men break the limbs instead of chopping them to pieces." As Spears put it succinctly, "The wood is very brash," and "the end of a broken dead stick looks very much like the end of a rotten stick." Even though "to a man accustomed to the maple, birch, hickory and other hard fuel woods of the East, the nut–pine looks like a rank imposition on the wood–buyer," that impression quickly changed, for "if one will open a furnace where it is burning he will find such a mass of flame as nothing short of sugar–maple could produce." As one Nevada miner told Spears, "It is a fuel that 'stays by the furnace.'" How quickly might such wonderful wood be harvested? Spears found that "an ordinary wood–cutter can cut 2 1/2 cords of nut–pine a day." Mexican leñadoras (wood cutters) commonly "packed" the wood "down the cañons in loads of from ten to twelve cords each ." In one camp, Spears "saw 300 cords piled ready to be hauled to the [borax] works in wagons" adding that "in the production of borax at Teel's Marsh no less than 1,500 cords of nut–pine are required every year, besides the sage–brush used in the out–works."[13]

In one telling passage, Spears mentioned that "the Piutes, the Arabs of this portion of the American Desert, look with disfavor on the cutters of nut–pine trees," for they destroy "a good crop–producer, a crop that enables the Piute to live all fall in comfort by the sweat of his squaws." Prophetically, if in the racist tone typical of his era, Spears also noted that "should the nut–pines ever be exterminated, the unfortunate buck will have to rustle somewhat in the fall as well as at other seasons." Then, too, although Spears noted the impact of the cutting down and root–hogging of brush over wide areas, he only assessed that impact in terms of the mining companies. In discussing areas stripped bare of vegetation, Spears wrote that mining companies sometimes resorted to using other fuels, notably "crude petroleum" because "the gathering of any kind of desert brush for fuel ultimately becomes a pretty heavy drain on the profits of an industry, [and] for the reason that the brush, being grubbed up by the roots, does not readily replace itself in the territory from which it was taken." Tellingly, Spears made no mention of how such wholesale

harvesting of vegetation affected the native inhabitants, but we can safely speculate that it was disruptive at best and disastrous at worst.[14]

Consider, too, mining's direct impact on sites where ore was extracted and settlements built. Here Native Americans would be dispossessed initially as miners crowded into the site. And yet, the very establishment of mining camps served to draw native peoples. Research by Don Hardesty, Ron James, and others reveals a substantial Native American presence in mining communities like Virginia City. Spears recorded that Paiutes constituted most of the workforce at a borax mining operation he visited in Nevada. According to Nevada historian Sally Zanjani, at least two of Sarah Winnemucca's brothers worked in a mine as early as the late 1850s. Although some Indians found work in the mining industry, life was not especially good for most of them. There is considerable evidence showing that the Native Americans occupied a very low socio–economic level in these mining towns. Photographs from that era reveal that many Shoshone and Paiute were reduced to begging—an ironic twist for once independent hunters and gatherers who scoured the landscape for sustenance. True, begging may have been preferable to starvation, but their new role corresponded to what the early white travelers recorded—persons living from hand to mouth, dependent on the vagaries of the environment, eking out a living, as it were, from the rugged Great Basin landscape. These Indians had commonly been called "diggers" by whites in the nineteenth century, but at the same time many whites respected their good work habits and considered them an asset rather than a liability. In places like Virginia City, Paiutes worked in a wide variety of jobs, including rug weaving and house cleaning.[15]

From the above, it may seem that Native Americans merely reacted to conditions precipitated by newcomers. But there is another interesting aspect of the relationship between Native Americans and mining that needs to be explored in more detail—the strong possibility that Native Americans actually aided prospectors in their search for metals. According to some fragmentary records, Indians served as informants, guiding prospectors to mineralized areas. Although native peoples were less likely to search for and develop mineral resources, they might indeed assist prospectors—provided that they knew what prospectors sought. It has been said, for example, that a Paiute assisted in Jim Butler's strike at Tonopah, Nevada, in 1900. A generation earlier in east–central Nevada, Albert J. Leathers was reportedly aided by a Paiute known as Jim, who presented Leathers with a piece of silver ore as payment for stealing some beans a few days earlier—thus the creation of Nevada's White Pine Mining District. These stories may be apocryphal, but they are persistent enough to suggest that Native Americans may have had a role in prospecting, just as we know they had a role as informants in exploration and discovery.[16]

Conclusion

I have brought Native Americans into this discussion to remind mining historians that the activity we study had a significant impact on both native habitats and peoples. Although it is too simplistic to suggest that mining wrought total catastrophe on both, the experiences played out in nineteenth century Nevada and Utah should give us pause. Here, as in countless locations throughout the Americas, mining had a tremendous impact on Native Americans. Almost always, some part of the historical record—a journal entry, a photograph, a published report—suggests a native presence that came into conflict with a potent, capitalistic, colonialist, mining industry. Yet, we now know that some Indians found employment in the mines, meaning that they learned to adjust to and benefit from mining activities.

We need to look more closely at the impact of mining on native peoples, for I suspect that what happened in the Great Basin was more typical than we might realize—though, of course, that impact would play out differently in different places. This article urges that we put ourselves, if only for a moment, in the shoes (or sandals, or moccasins) of Native Americans. Mining irreparably changed their lives and landscapes. Mining in the Great Basin was not as catastrophic to native peoples as that carried on in the Mother Lode, even though California miners helped fight the Pyramid Lake War in the Great Basin. That 1859–60 war devastated a number of Paiute bands, yet it did not totally destroy their civilization. Likewise, the Shoshone somehow survived some very difficult encounters with white miners. Because some of the descendants of those Shoshone are miners in Nevada today, I choose not to call their ancestors victims, but rather a tenacious people who survived and adapted as their world changed both ecologically and culturally.

The environment also survived, though it, too, was altered. Although scars can still be seen, the sagebrush has returned in many places, as have the piñon pines. Even though none can deny that mining's long–term effects altered both environments and cultures, the question is what this change means in the long term. If mining forms one of the crucial chapters in the histories of both peoples and places in the Americas, then the text and images of those chapters is still everywhere visible in the Great Basin. For a period in history, both native peoples and the native environment were thrown into mining's crucible. Like everything else associated with mining, they emerged transformed by the experience.

Notes

1. Phil Robinson, *Sinners and Saints: A Tour Across the States and Round Them, with Three Months Among the Mormons* (Boston: Roberts Bros., 1883), 278–81.
2. Robinson, *Sinners and Saints*, 260–61.
3. Ronald M. Lanner, *The Piñon Pine: A Natural and Cultural History* (Reno: Univ. of Nevada Press, 1981), 118–19.
4. Robinson, *Sinners and Saints*, 280.
5. Lanner, *The Piñon Pine*, 82–83.
6. Rossiter W. Raymond, *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains for the Year 1870* (Washington, D.C.: 42nd Congress, 1st Session, House Rep. Ex. Doc. No. 10, U.S. Government Printing Office, 1872). Lanner, *The Piñon Pine*, 124–25. Charles D. Zeir, "Historic Charcoal Production Near Eureka, Nevada: An Archaeological Perspective," *Historical Archaeology* 21 (1): 86 (1987).
7. Lambert Molinelli, *Eureka and Its Resources; A Complete History of Eureka County Nevada* (San Francisco: H. Keller & Co., 1879), 25, 30–31.
8. Gary Topping, ed., *Gila Monsters and Red-Eyed Rattlesnakes: Don Maguire's Trading Expeditions, 1876-1879* (Salt Lake City: University of Utah Press, 1997), 22.
9. Zeir, "Historic Charcoal Production," 83. See also: David Myrick, *Railroads of Nevada, Vol. 1 The Northern Roads* (Berkeley: Howell–North, 1963), 90–112.
10. Zeir, "Historic Charcoal Production," 95. For distribution maps of piñon pines, see: David Alan Charlet, *Atlas of Nevada Conifers: A Phytogeographic Reference* (Reno: University of Nevada Press, 1996), 236–69.
11. John Randolph Spears, *Illustrated Sketches of Death Valley* (Douglas Steeples, ed.) (Baltimore: John Hopkins University Press, 2001), 83–84.
12. Spears, *Illustrated Sketches*, 110–12.
13. Spears, *Illustrated Sketches*, 114–17.
14. Spears, *Illustrated Sketches*, 119–20.
15. See Ron James, *The Roar and the Silence* (Reno: University of Nevada Press, 1998); and Donald Hardesty, "Industrial Archaeology on the American Mining Frontier: Suggestions for a Research Agenda," *Journal of New World Archaeology* 6 (4): 47–56 (1986), and *The Archaeology of Mining and Miners: A View from the Silver State*, Special Publication Series No. 6., Society for Historical Archaeology, 1988. Personal communication with Sally Zanjani, Butte Montana, 16 June 2001.
16. W. Turrentine Jackson, *Treasure Hill: Portrait of a Silver Mining Camp* (Reno: University of Nevada Press, 1963), 5–7.