
Gambling on Ore: The Nature of Metal Mining in the United States, 1860–1910.

By Kent A. Curtis. Boulder: University Press of Colorado, 2013.
Pp. 252. \$39.95.

Gambling on Ore, a narrative history of copper mining in Montana in the late nineteenth and early twentieth centuries, is a strong addition to the growing literature on the environmental history of metals mining in the U.S. West. Inspired by debates in the 1990s over the origin of the arsenic superfund site at the Butte and Anaconda Superfund Complex, the location of one of the largest mining complexes of the twentieth century, Kent Curtis set out to study the history of copper mining in Montana to discover how this massive and fundamentally destructive industry could exist in a place popularly celebrated for its wilderness areas. The resulting book is a highly readable and detailed account of the establishment of industrial mining in Montana. It should be of interest not only to mining historians, but also to scholars of electrification and of industrialization more generally.

Curtis tells his story chronologically, beginning with the placer gold mining boom in the Deer Lodge Valley on the eastern slope of the Rocky Mountains in the 1860s. Even by the standards of gold rushes, this was a remote and challenging place for prospectors to reach. Despite this, it experienced the kind of almost unbelievable population explosion typical of a mining boom: during one eight-week period in 1862, the population of Bannack City, for instance, grew from 700 to over 4,000. Curtis re-creates the social and business ties of the motley multitudes that thronged the region attempting to strike it rich. This is impressive research, as Curtis not only describes the miners and their technological intervention in the landscape (which was significant), but also the environment they encountered, both ecological and political: the sudden appearance of so many Euro-Americans had a deleterious impact on the neighboring Shoshoni and Crow populations.

This compelling narrative is followed by chapters on the growth of industrial mining, which focus, naturally, on the explosive growth of industrial copper mining in Butte. As usually told, the history of Butte is of the happy marriage of capital and technology. The standard narrative is teleological: the massive production of low-cost copper at Butte (among other western copper resources) enabled the introduction of electricity into domestic and non-industrial settings. In turn, the hunger for copper in the United States was such that even complex ores, such as the sulfide deposits at Butte, could earn money for mining companies, thus spurring more mining development. Curtis writes against this standard narrative, arguing instead that the corporate practice of purposefully flooding the market to drive down copper prices and thus drive competitors out of

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business was responsible for ratcheting-up production in Butte. The technological breakthroughs of mining, then, occurred simultaneously with the growth of the electrical system, but were in some real sense separate from it, part of a financial and technological system that existed apart from that of the rest of industrializing America. Western copper production and electricity, Curtis finds, did not really align until the mid-1890s, a full twenty-five years after the birth of the western copper mining industry.

Although Curtis's arguments about the nature of the mining industry in Butte might seem a bit obscure to readers unfamiliar with the history of western mining, the deep research base of *Gambling for Ore* will draw in even those skeptical of mining history. The final chapter will be of particular interest to historians of technology, as it focuses on legal battles between Montana farmers and mining companies over industrial pollution and corporate responsibility. The terrain is similar to that of Timothy LeCain's *Mass Destruction* (2009), and Curtis offers a multiplicity of stories of corporate malfeasance, providing a broad-based picture of the copper mining industry. He delves into the legal system, highlighting how companies manipulated the law to explain that their technological interventions in the landscape, in the form of giant mines and their corollaries, toxic wastewater and slag heaps, were not damaging to neighbors or to the environment. This is not an uplifting history.

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Seeing Underground: Maps, Models, and Mining Engineering in America.

By Eric C. Nystrom. Reno: University of Nevada Press, 2014.
Pp. 320. \$39.95.

Seeing Underground makes a significant contribution to the history of mining and mining engineering. The novelty of Eric Nystrom's book is that it doesn't explore mines, per se; it explores *representations* of mines. Nystrom examines the creation and usefulness of what he calls the "visual culture" (p. 3) of mining. He credits mining engineers, working in the late nineteenth and early twentieth centuries, for devising mine maps and models that made it possible for people on the surface—whether investors, engineers, or juries sitting on trials—to "see" the underground and understand it. Nystrom emphasizes that in an era when mining became more complex, the ability to make and use maps and models allowed university-educated mining engineers to rise above practical, experienced miners in the hierarchy of mine management. Their special knowledge and skill set worked to their professional advantage.