Although the book ends with Armstrong's journal entry of 31 December 1894, he continued his journal almost until the end of his life in 1928. Ending with the 1894 entries was a good decision, since the silver crash of 1893 severely curtailed mining activity in Colorado for some time. Armstrong was doubtless affected by the crash.

What ties this book together are illustrations and captions from contemporary magazines and newspapers, as well as historic photographs, that relate what was happening to the country as a whole while Armstrong was writing his journal. Armstrong bore witness to national events in his diary, and having a frame of reference to what was happening nationwide adds strength to the book. Editing someone's diary for publication can be tricky. Buys has successfully avoided the common pitfalls inherent in that undertaking.

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Jeffrey J. Safford. ***The Mechanics of Optimism: Mining Companies, Technology, and the Hot Spring Gold Rush, 1864-1868.*** Boulder: University Press of Colorado, 2004; 232 pp., 17 b&w photos, 3 maps, cloth, $34.95.

What possessed typically sober and cautious eastern capitalists to invest hundreds of thousands of dollars on unproven mining ventures in the remote mountains of Montana, a place where labor and know-how were scarce, basic milling machinery had to be shipped overland at exorbitant cost, and bitter cold winters could shut down operations for months at a time?

In this fascinating, fine-grained study of the rapid rise and even more rapid fall of one Montana mining district, Jeffrey J. Safford provides some answers, skillfully revealing how the "mechanics of optimism" of the 1860s too often led capitalists and their mine managers into financial disaster.

Safford takes us inside genteel eastern boardrooms and rough-hewn western mine offices, where extravagant hopes gradually bled away under the relentless attacks of inconvenient reality. Like witnesses to an impending car wreck, we cringe but cannot quite bring ourselves to look away. Safford is such a fine storyteller that we end up caring enough about these men and their grandiose dreams that we indulge in our own unwarranted optimism, hoping they might yet succeed in the end.

They do not succeed, of course, just like in the majority of other western mining ventures. Historians have long recognized that mining and mining investments in the American West were more likely to generate bankruptcies and lawsuits than wealth. Despite this realization, most mining historians have still preferred to attend at the birth of success rather than at the postmortem of failure.

Safford's book shows us why this prejudice for winners is such a mistake, demonstrating that the serious study of failure may tell us more about the history of the American West than do our traditional tales of success. Indeed, the historian Richard White has recently argued we might better understand the building of the transcontinental railways in just such a way, as most of these lines were feebly-managed financial disasters.

Safford begins his story by taking us deep into the world and the mindset of mid-1860s eastern financiers on the prowl for the next big thing. Flush with capital from lucrative Civil War contracts and mindful of the fortunes already made in California and Colorado mining, businessmen ensconced in the comfortable gentility of Hartford, Connecticut, or Rochester, New York, looked westward to the tantalizing new mining districts of southwestern Montana Territory.

The placer gold mines at Virginia City, Montana, had already proven very rich, so capitalists were perhaps all-too primed to accept early reports of similar conditions in the Hot Spring

Mining District some twenty miles to the north. Men who had made money in insurance, telegraphy, or newspapers now fancied themselves mining entrepreneurs and sent their "experts" westward to assess the possibilities. These people wrote back with glowing reports of fantastically rich gold-bearing surface ores, worth perhaps many hundreds of dollars to the ton. Surely fortunes awaited the first bold few who would invest the capital necessary for lode mining and quartz-milling equipment.

Safford weaves together the stories of several eastern mining companies that quickly formed and rushed into the Hot Spring District, but none better epitomized the "mechanics of optimism" than did the Midas Mining Company of Rochester, New York. Drawing on an extraordinarily rich cache of primary documents, Safford breathes life into the neglected history of two men who made the Midas their all-consuming passion.

Henry Ward, the company's field superintendent, was a highly educated naturalist who had traveled much of the world in search of specimens for museums. Ward also had some European training in geology and at least a passing familiarity with mineralogy, so his opinion on mining matters carried some weight. After a trip to the Hot Spring gold fields he encouraged his Rochester backers to invest heavily and quickly, and they all-too willingly complied.

Of these investors, Ward's most stalwart champion was his uncle, Samuel Selden, a man who had made his fortune, in part, by founding the Western Union Telegraph Company. Together, Ward and Selden convinced the company board that the surest path to fortune was to establish the most technologically advanced and efficient quartz mill in the new mining district.

Neither man, however, fully reckoned with the challenges of transporting twenty-three tons of milling machinery from San Francisco to the mountains of southwest Montana. Safford's account—aided by three excellent maps drawn by Dale Martin—of Ward's often Sisyphean efforts to get the milling machinery to Montana in time for the 1867 mining and milling season captures the many challenges of mid-century heavy transport. Constantly delayed by negligent teamsters, impassable roads, and heavy rain and snow storms, Ward's precious cargo arrived well after the prime mining season had ended.

Selden and the other Rochester capitalists nonetheless heartily celebrated the welcome news that Ward finally had his mill running that November, though the celebration was short-lived. To his deep dismay, Ward discovered that the quartz ore he had believed would deliver three hundred dollars of gold per ton had instead yielded a mere five dollars per ton. Equally alarming was Ward's gradual realization that the common wisdom of the day, that ore deposits always grew richer with depth, was badly mistaken. As Ward and his miners literally dug themselves ever deeper into the hole, they found the quartz seams actually declined in value or pinched out into nothing.

Safford is at his best in putting a human face on this potentially sterile tale of a business venture gone wrong. The letters between Ward and Selden—nephew and uncle—are the letters not of greedy opportunists, but rather of fundamentally decent men whose business failures are intimately linked to their own sense of personal and familial failure. "I would almost give my life to have this enterprise [be] a success," Ward confessed as the Midas venture began to falter and he fell into a despondency that bordered on suicidal.

After a final run the following March, Ward reluctantly shut down the mill and left the district. Selden beseeched him to return, writing to his nephew that "an utter & final failure of this enterprise is substantially the end of life with me. It is too late to retrieve my losses. . . . You must still go [back] for me." Ward, who knew the Midas would never turn a profit, perhaps did his desperate uncle a greater favor by refusing to

return.

Such were the very human mechanics of failure, which Safford evokes as skillfully as he does the technological, geographical, and economic dimensions of his story. Within a few years a visitor to the once bustling Midas mill site found that "grass grows in the great yard and bats are flitting at night through the offices." What had gone wrong?

Safford suggests a number of answers. Certainly the district's early promoters had, deliberately or not, exaggerated the richness of its ores, a mistake exacerbated by the widespread faith that ore always improved with depth. Sheer ignorance of conditions in Montana played an equal role. Any careful business man, then or today, would be shocked that Ward and his backers failed to realize and anticipate the vastly inflated costs they would pay for everything from transportation to labor to food in an isolated region like Montana.

Ultimately, though, Safford's tale suggests their greatest error was initial over-capitalization and over-building, followed by a panicked tightening of the purse strings and demands for immediate profits. Eastern capitalists, eager to dominate the district by being first on the scene, invested vast sums in mills to process ores from deposits whose extent and richness had yet to be proven. Like the transcontinental railroad promoters who would soon lay hundreds of miles of track well in advance of actual demand, so the Midas and other Hot Spring companies erected mills in the misplaced confidence that suitable ore would soon materialize to feed them.

The Mechanics of Optimism should win a wide readership. Historians of mining in the American West will find the book indispensable, but there is also much to interest historians of technology, business historians, and a general audience seeking to better understand the mining frontier. The book's one weakness is that Safford clearly prefers writing straight historical narrative to engaging in broader theoretical analysis. Yet this is a minor issue, and those interested in applying recent analytical insights from geography, the history of technology, and even environmental history will enjoy teasing out some of the broader implications of Safford's meticulous research. Indeed, that there is so much here that deserves further discussion testifies to the historical depth and originality of the book.

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Pete J. Dunn. ***Mine Hill in Franklin and Sterling Hill in Ogdensburg, Sussex County, New Jersey: Mining History, 1765-1900.*** Alexandria, VA: Dr. Pete J. Dunn, 2002-2005; 7 volumes, 1102 pages, paper, $75. (Available only from the Sterling Hill Mining Museum, Ogdensburg, NJ, or the Franklin Mineral Museum, Franklin, NJ.)

Several historians have researched and recorded the legal disputes and intrigue of famous mining districts such as Butte, Montana, or the Comstock Lode in Nevada. In this seven-volume series, Dr. Pete J. Dunn has accepted the challenges of a similar investigation concerning the world-class zinc deposits of Franklin and Sterling Hill, New Jersey. The culmination of some twenty-five years of research on the subject, this documentary study is broad in scope and rich with details.

Dunn, a mineralogist with the Smithsonian Institution, published a fine monograph concerning Franklin and Sterling Hill in 1995 that focused on the rich mineralogy of the two zinc mines. These localities feature hundreds of mineral species, many of them rare and fluorescent, which is why Franklin is known as the "Fluorescent Mineral Capital of the World." In that work Dunn included a limited historical section drawn from secondary sources. To tell the eighteenth- and nineteenth-century history, this new series draws heavily on primary documents such as