

to recognize the historical significance of Ludlow in preparation for the tragedy's centennial. It is divided into three sections: Continuing Ludlow, Remembering Ludlow, and Teaching Ludlow. In the first section, lineal descendants and local community members give voice to the people of Ludlow, describing family and community gatherings to pay homage to those lost. The gatherings also became a time to celebrate their shared life experiences, including their labors related to the social and political effort to erect a monument and garner historical recognition.

Section two, Remembering Ludlow, explores academic and scholarly collaboration to present the importance of social memory through preservation of memory. Working together, historians, archeologists, authors, playwrights, artists, and composers have illuminated the massacre's historical significance with narratives, plays, music, and exhibits. Scholars collaborated to gather oral histories and conduct scholarly research to place the event in the context of its national importance. Deeply personal relationships developed between community and academia.

Part three, Teaching Ludlow, explores the "goal of education in the spirit of collaboration." Three essayists offer tips and strategies, as well as cautionary tales, for practicing public scholarship. With money provided by endowments and grants, summer teachers' institutes train teachers who—along with traveling trunks and exhibits—currently present labor history in Colorado to elementary and high school students. Even so, a survey by one essayist found that labor history continues to be marginalized in college-level history textbooks. Another explains how he has taken the Ludlow story into the digital realm to allow virtual visits to the site. This virtual mapping opens the site to the world.

In *Communities of Ludlow*, editors Fawn-Amber Montoya and Karin Larkin present a well-written collection of essays to guide others who are interested in collaboration to further the story of mining and labor history. While the history of

the creation of the commemoration commission can be dry, the individual stories of the participants provided by their descendants are compelling. The appendices contain documents relating to the creation and tasks of the Centennial Commemoration Commission. Illustrations highlight the site, the memorial, and the people who played a significant role.

Dawn Bunyak
Littleton, Colorado

Brad T. Clark and Pete McCormick (eds.). *Gold Metal Waters: The Animas River and the Gold King Mine Spill*. Louisville, CO: University Press of Colorado, 2021; 300 pp., 10 b&w photos, 5 maps, 4 tbls., 10 figs., notes, ref., ind., cloth, \$45. ISBN: 9781646421749

Gold Metal Waters is a must read for anyone interested in the problem of acid mine drainage in the American West. Editors Brad Clarke and Pete McCormick have used a multidisciplinary approach to understanding the 5 August 2015 unintentional release of over three million gallons of underground mine water from the Gold King Mine on Cement Creek north of Silverton, Colorado. The water released contained over 880,000 pounds of heavy metals which turned the water in the Animas River a golden-yellow color from Silverton into New Mexico. The editors have included the works of twenty-four multidisciplinary authors.

The introduction provides an overview of hard rock mining in Colorado and a detailed history of the Gold King Mine from its founding in 1887 through the most recent spill in 2015. The terms "acid mine drainage" (AMD) and "acid rock drainage" (ARD) are defined, and the problems for the river environment caused by each are discussed.

The Animas River is divided into upper and lower watersheds. The upper watershed begins with the source of Animas River near Animas

Forks and continues to the so-called Baker's Bridge location roughly twenty miles north of Durango. The Lower Animas Watershed begins at Baker's Bridge and continues for eighty-one miles to the river's confluence with the San Juan River. The two watersheds are discussed in terms of the differences between La Plata County (lower watershed) and San Juan County (upper watershed). Issues discussed include human history, demographics, politics, local government, and economic factors.

The book next looks at the impact the Gold King Mine spill had on water quality and aquatic life. The heavy metal load into the Animas River came mostly from the mobilization of the waste rock piles outside the mine and not from the mine itself. The spill caused a drop in pH (meaning more acidic water), which dissolved the heavy metals in the waste rock. As the plume traveled downriver its pH increased and the heavy metals were deposited on the river bottom. Dilution caused the metal concentrations in the Animas River to return to pre-spill levels in two to three weeks. The event did not have a measurable effect on the aquatic life.

The Town of Silverton and San Juan County had for over forty years resisted any EPA Superfund designation for mines in the Upper Basin. Residents reasoned that such designation would foreclose future mining and that the bad publicity would discourage tourism. The Gold King Mine spill caused an abrupt about face, and six months after the accident both the town and the county voted to request Superfund designation for the Gold King Mine. Front and center in local and national news reports of the spill was a picture of three kayakers floating in an orange river. The turnabout was based on the negative publicity rather than environmental damage.

The hydrology and ecology of the Animas River drainage, including a discussion of ground water versus surface water, is discussed. Also addressed is the issue of metal-containing deposits in flood plain areas where human agriculture and

housing has been developed. Ironically, although little ecological damage occurred due to the spill, it drew public attention to the long-term effects of acid mine drainage.

The chapter entitled "Watershed Consciousness: The Animas River and the Sense of Place" looks at the meaning of the old mining sites to many local residents. It makes the point that these sites, no matter how ugly they might appear to visitors, are central to the identities of the residents of the area. Silverton residents see the old mining sites as part of their heritage. Durango residents felt a historic sense of place to the town's old smelter and only allowed it to be torn down and reclaimed because it could be detrimental to their health.

The authors of Chapter 6 look at the importance of tourism to the economy of La Plata County and how the various tourist industries fared after the spill. Tourism accounts for 20 percent of Durango's economy. Fortunately, the spill occurred late in the tourist season. The spill did not have much of an effect on restaurants and lodging, but it did affect retail spending. Of the recreational businesses, fishing and rafting guides were the most affected by the event.

The psychological and social effects of the Gold King Mine spill on area residents are covered in chapters 7 and 8. The authors held multiple public events where community members were asked to provide anonymous written responses to a series of prompts addressing the social and emotional impact of the Gold King Mine Spill on the participants. The results for residents of Durango, Shiprock, and Farmington are discussed in detail. Unfortunately, the authors included only eight respondents who provided written comments, but they were a diverse group. The authors conclude that "paying attention to the well-being of the community is as important as studying the physical data of an environmental disaster."

The problems of litigating the consequences of hard rock mining are dealt with in Chapter 9. There are about 161,000 abandoned mines in the

twelve western states, with 33,000 of them leaking contaminated water. In 2012 Colorado listed seven mines that needed cleanup. The cost per year for the cleanup of each of these mines ranged from fifty thousand to one million dollars. Current laws tend to deter most cleanup efforts because groups that make some progress in cleaning up a site can still be sued and held responsible for the entire cleanup. Numerous bills have been introduced in Congress to address this problem, but none have been enacted. The authors discuss potential solutions to this litigation problem.

The divergent perspectives on the acid mine drainage problems on the upper and lower Animas River Watershed among stakeholders are discussed in Chapter 10. Historically, Silverton, in the upper watershed, has opposed any federal intervention, while Durango, in the lower watershed, has supported it. The work of several groups trying to address the problem is discussed.

The final chapter sums up the overall problem of acid mine drainage with its title “We All Live Downstream.” As Andrew Gulliford states: “The Old West of no rules, no regulations, and every man for himself has left a legacy of 161,000 abandoned mines, 33,000 of which leak acidic toxins. . . . We learned the hard way that there is municipal water, agricultural water, recreational water and tribal water and it is all the same.”

Since the book contains a dizzying array of acronyms, a glossary would have been useful. While this book does not provide a solution to the problem of acid mine drainage in the American West, it does provide a new framework for how we might react to future spills.

Donald Paulson
Ouray, Colorado

Eleanor Herz Swent. *One Shot for Gold: Developing a Modern Mine in Northern California*. Reno: University of Nevada Press, 2021; 254 pp., 20 b&w illus., 1 map, append, ref., ind., cloth, \$45. ISBN: 9781647790066

Eleanor Herz Swent’s *One Shot for Gold* chronicles the first attempt at full-scale mining in California after the enactment of federal and state environmental laws late in the twentieth century. The book offers a riveting account of how the open pit McLaughlin Mine in northern California produced 3.4 million ounces of gold while setting a new standard for American mining. And it is fun to read!

Having said fun, one hastens to add that the book draws from a lode of primary materials, including contemporary articles and publications, company and public documents, and thirteen volumes of interviews with the active participants—corporate executives, geologists, engineers, attorneys, government officials, academics, environmentalists, mine workers, merchants, and neighbors.

A table of references reveals that the materials come from the University of California, Berkeley’s Oral History Center, where Swent herself directed the oral history series on western mining. Many of the excerpted interviews are available online from the history center. Swent was the sole interviewer for this book.

Thus, one hears the story of modern mining and reclamation from a hundred voices, each singular and clear, entering on cue from the conductor’s baton. Swent bridges the vocals with transitions and themes, harmonizing the whole.

One voice no reader will forget belongs to Billy Wilder, a hard scrabble entrepreneur turned miner who developed a mercury mine near the junction of California’s Lake, Yolo, and Napa counties. Good natured as he was, he allowed geologists from Homestake Mining to drill core samples which validated their ideas about the nexus of mercury, hot springs, and gold. Even as he