

them to the wider world. The artifact record is rich because virtually everything used in the camp was bought from distant markets and rarely carted out—except during war-time scrap drives, and by later “bottle collectors.”

The work is enhanced by photographs of many sites, but especially of the Cortez district, Nevada, a typical mining region, where Hardesty conducted archeological field work. His field data help us understand not only Cortez, but mining sites more generally, since his archeological work at this central Nevada mining district serves as a model for documenting mining districts throughout the West.

The most evident change in this revised edition is Hardesty’s thoughtful conclusion. The mining West was a scene of rapid change, alteration, and adaptation to new technology, similar to the present computer-age technology’s rapidly paced changes. Hardesty discusses well these adaptations and coping strategies.

Since the mining West continues to be the scene of superfund site clean-ups, federally mandated mining operation plans that include CRM, and other activities that impact the archeological record of historic mining sites, this will continue to be a must-have book for those in the field. All I can add for anyone doing such work is that Don Hardesty has set a high standard. Go and do likewise.

Robert L. Spude
National Park Service, Santa Fe

Steven T. Mitchell. *Nuggets to Neutrinos: The Homestake Story*. Bloomington, IN: Xlibris, 2009; 738 pp., numerous b&w illus., maps, glos., notes, bib., ind., cloth \$35, paper \$24. ISBN: 9781441570666.

The Homestake Mine in Lead, South Dakota, is certainly one of the greatest and most profitable mines of the United States. One might not be too far afield to claim it is one of the world’s greatest

mines. The life of a typical mine is measured in, at most, a few decades; the Homestake produced gold for over a century. Now the mine has become a base for scientific study.

Author Steven Mitchell had worked for the Homestake for nearly a generation when it finally closed in 2001. Mitchell’s long, detailed book covers every aspect of the operation, as well as the important individuals who are a part of this fascinating story. He focuses not only on the mine, but also on the development of the Black Hills around this mining operation.

The first ninety pages cover the era before the prospectors and settlers arrived, then attention shifts to the mine, its miners, and its people. After that the focus shifts completely to the Homestake and its fascinating story into 2009. The last chapter covers “Some Early Homestake VIPs.” Photographs add tremendously to this book. The reader will get an excellent vision of the mine and its people, from miners to staff to officials. A variety of tables are also included.

For those interested in this fascinating mine, and in mining, Mitchell covers its every aspect in great detail. Therein, however, lies a major problem. Detail after detail piles up on top of the details from previous pages. It will take a determined reader to make it through, even during a long, cold winter of reading. *Nuggets to Neutrinos* is not for a Sunday afternoon of relaxing with a book.

Duane A. Smith
Fort Lewis College

Sheila Kelly. *Treadwell Gold: An Alaska Saga of Riches and Ruin*. Fairbanks: University of Alaska Press, 2010; 271 pp., 103 illustrations, 3 maps, time line, notes, bib., ind., cloth \$35, paper \$18. ISBN: 9781602230750

To many readers, the mention of gold mining in Alaska brings to mind images of the frantic Klondike gold rush of 1896 to 1899 and that long

line of stampederers inching step by step over the infamous Chilkoot Pass. In reality, the Klondike gold fields were in Canada's Yukon Territory, and the first gold rush to Alaska actually began almost two decades earlier in southeast Alaska.

In 1880 prospectors Joe Juneau, Richard Harris, and Kaawa'ee, a Tlingit from nearby Auk village, found gold in coastal streams near where a mining camp named Juneau would soon develop. Word of the strike traveled south, and several San Francisco investors sent John Treadwell north to stake a claim. On 13 September 1881 he acquired property on Douglas Island, across Gastineau Channel from Juneau, for four hundred dollars, and collected sample bags of rock to carry back to California.

The assays showed promise; the lode of low-grade ore could be profitably worked on a large scale. Treadwell and the investors formed the Alaska Mill and Mining Company and he returned to Douglas Island in May 1882 with a five-stamp mill. By 1885 the company was able to process three hundred tons of ore a day and consistently make a profit. In 1889 a group of capitalists including the Rothschild brothers purchased the mine for \$4 million.

Over the next four decades the Alaska Treadwell Gold Mining Company, as the firm was renamed, continued to expand. At its peak, over two thousand workers from seventeen different nations toiled night and day turning chunks of rock into bars of gold. Three additional mines and two additional mining companies were established on property that spread two miles along the shoreline. The tunnels underground spread for forty-five miles and went down over 2,500 feet.

Disaster lay just around the corner, however. Instead of relying on underground timber supports in the working spaces, management determined that twenty-five-foot-wide pillars left in the ore body would be sufficient to support the roof. Then as production declined, those pillars were robbed. To prevent flooding and cave-ins,

the company developed a plan to start constructing bulkheads in the tunnels and using tailings to fill the empty spaces, but these measures came too late.

On 21 April 1917, six months into implementing the plan, an extraordinarily high tide poured into a crack in the surface and down into the underground chambers. The weakened pillars could not hold and in a few hours three of the four mines had collapsed and were flooded with seawater. Fortunately all the miners were evacuated in time and only one person was presumed dead. The only mine to survive, the Ready Bulion was saved by a bulkhead and continued to produce until 1922, when it too shut down. In 1926 a fire destroyed most of Treadwell, both the mine and the company town of the same name. Today Treadwell is a public park and a major archaeological site.

Although Treadwell's tale is a fairly common story of boom and bust in the American mining West, the story has several interesting twists which Sheila Kelly explores. One being that the site was in Alaska, almost a thousand miles north of Seattle, many years before Alaska became well known for its gold. Kelly also tells a very human story of the mine and company town using her own family's history, accounts from other pioneer families who worked at the mine, and other historical resources to bring the company town of Treadwell and the gold mines it depended on to life. This story has it all; we almost hear the roar reverberating off the surrounding mountains from the pounding of the 960 stamps that operated around the clock, crushing five thousand tons of ore each day except Christmas and Independence Day, when Treadwell fell unnervingly quiet.

Like the tourists of a century ago, we are taken on a tour of the Glory Hole, where it all started; the 300 Mill, so named for the number of stamps operating; the 240 Mill next door; and the assay office, where we glimpse the gold ingots ready for shipment. We see the amenities that the company

town has to offer: the five hundred-seat auditorium showing the latest theatricals, concerts, and moving pictures; the library; two full-sized bowling alleys; a billiard parlor; a tiled, steam-heated salt-water natatorium; a two-story emporium filled with the largest stock of merchandise in Alaska at the time; and the dining rooms, which could each seat four hundred to five hundred miners and served meals comparable to those offered at a fine hotel.

We read about baseball games, family picnics, and the grand celebrations on Independence Day, but also about the grueling life of the hardrock miners: the explosions, accidents, cave-ins, and deaths. And Kelly tells the story of the hard life of the mules and horses that lived and worked underground, often until they died. She covers labor troubles and the Western Federation of Miners, and writes about the native Tlingits who worked in the mines but lived in a separate community. Through first-person accounts we also experience the catastrophes that brought the mines and town down. In the epilogue we learn what happened to the place, the major players, and the gold after the twin disasters of the cave-in and the later fire that destroyed the mines and the town.

This book has a few minor problems. Although well illustrated, the illustrations are not numbered and there is no list of illustrations. It would also have been nice if some of the excellent photographs had been enlarged to full-page sized. The book does have a great two-page drawing of the process of turning rock into gold “taken from the dance program of the 1910 Cyanide Ball, which celebrated the start up of the new cyanidation plant.” If one wants a detailed description of the gold mining process and machines, however, one might want to look elsewhere.

Instead, Kelly chooses to immerse us in the place, the period, and the people. Her book is well researched, well written, and well illustrated,

with many photographs from the author’s own family albums. It is a fascinating, detailed, and very human account of this long-neglected piece of Alaskan history.

Karl Gurcke
Klondike Gold Rush
National Historical Park, Skagway

Ronald H. Limbaugh. *Tungsten in Peace and War, 1918-1946*. Reno: University of Nevada Press, 2010; 284 pp., 12 b&w illus., graphs, notes, bib., ind., cloth, \$45. ISBN: 9780874178203

Ron Limbaugh’s *Tungsten* is a major new work in mining history, well deserving of the Clark C. Spence Award it earned from the MHA in 2011. He masterfully situates a metal and its producers in overlapping technological, commercial, and geopolitical contexts, deftly moving from scales as small as a one miner in a stope in the Nevada desert to those as large as global trade and wartime manufacturing. Limbaugh weaves together compelling and complicated themes to produce an extensively researched and well-written example of mining history.

One of Limbaugh’s themes is the industrial uses of tungsten. The metal’s use in incandescent light bulb filaments is well known, but surprisingly accounted for only about ten percent of the total consumption of tungsten throughout the twentieth century. The rest was used in the steel industry, where the addition of tungsten—or other metals, such as manganese, chromium, or vanadium—created a stronger, more durable product perfect, nay essential, to producing the weapons of mechanized warfare instrumental in fighting two global conflicts, as well as a host of civilian technologies.

A second theme of the book relates directly to the first: Given the importance of tungsten in