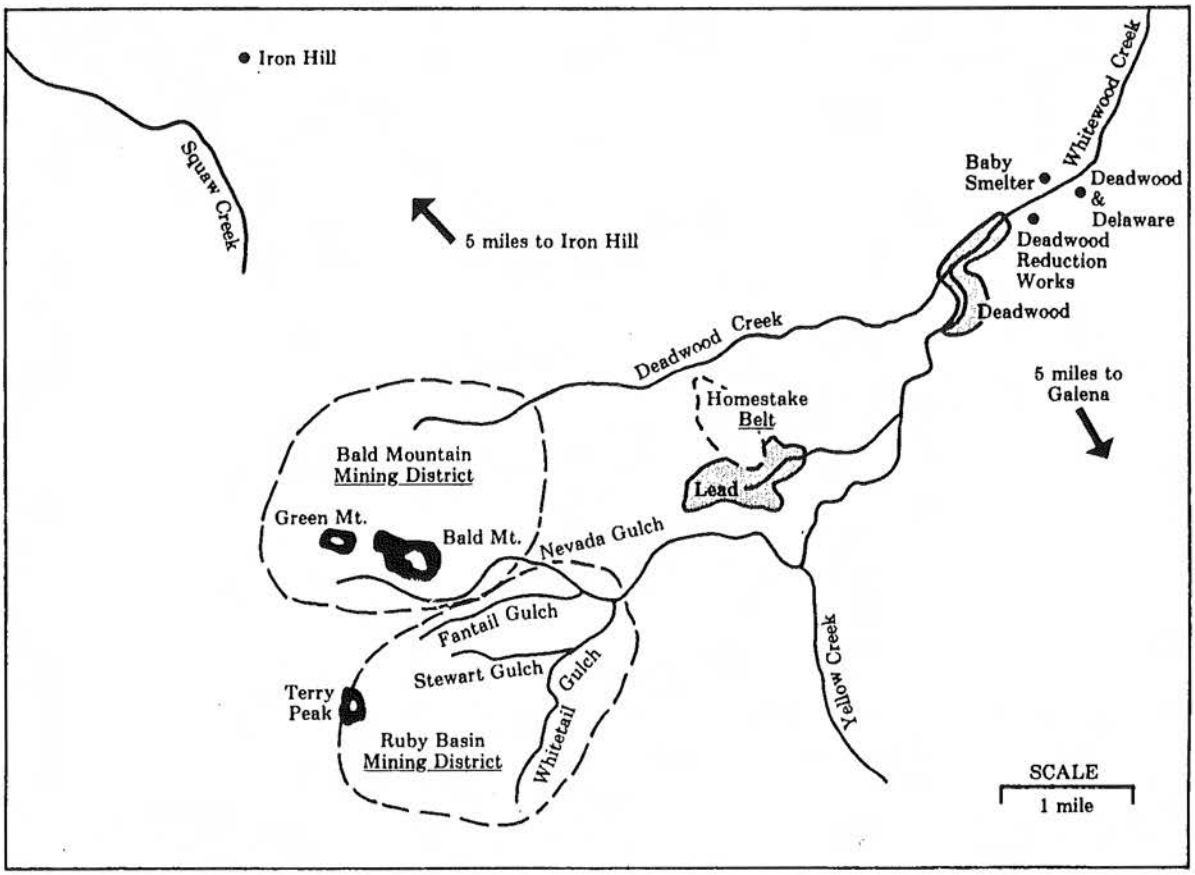
MINING GROUND ON THE FRINGE: THE HORSESHOE-MOGUL MINING COMPANY OF THE NORTHERN BLACK HILLS

David A Wolff

The concept, "mining ground on the fringe," developed as I examined mining operations in the vicinity of Deadwood, South Dakota. In particular, I focused on four mining companies - the Homestake, the Golden Reward, the Deadwood and Delaware, and the Horseshoe-Mogul - and attempted to determine how different types of entrepreneurship and varying financial practices affected mining operations. The Homestake, Golden Reward, and Deadwood and Delaware were easily understood. While each company was financed differently, all three had sound management, maintained a core group of investors, and operated successfully for a number of years.[1]

The Horseshoe-Mogul Company, however, did not fit this pattern. In some years, the mine did not operate, but in others, it produced more than the Golden Reward or the Deadwood and Delaware. Also, it passed through bankruptcies, ownership changes, periods of fraudulent operations, and bouts of litigation. Obviously, this operation was different from the others. But why was it different? When examined from an entrepreneurship - financial viewpoint, the ownership and management changes broke the continuity of the company's activities and an answer could not easily be found. In fact, a more fundamental question arose. Why did ownership and management change so often? Further, since the entrepreneurial elements were unstable, what could identify the Horseshoe-Mogul Mining Company over time and lead to an understanding of this operation? I came to realize that the answer lay in the ground itself, the property that was mined. The Horseshoe-Mogul Company had problems because of the nature of its mining ground. With this in mind, I reversed my approach and decided to abandon my search for continuity through mine entrepreneurship, and instead assess the company operations from the perspective of its property. This research strategy makes the Horseshoe-Mogul's history understandable, and explains why the Horseshoe-Mogul operation is indicative of "mining ground on the fringe" — a title applicable not only to this company, but to others in similar situations.

What then is mining ground on the fringe? This phrase, as applied to the Horseshoe-Mogul property, has at least three interconnected meanings. First, it represents property that initially demonstrated little or no value, but adjoined, or was in the proximity of proven or more valuable mining ground. In this situation, mining companies worked the fringe ground hoping to encounter the same mineralized formation that



Deadwood, Lead, and the principal mining districts in the Northern Black Hills: the Bald Mountain, the Ruby Basin, and the Homestake. The Horseshoe-Mogul mining property was located primarily in the Ruby Basin Mining District, approximately at the heads of Fantail Gulch and Stewart Gulch.

Source: David A. Wolff, "Pyritic Smelting at Deadwood: A Temporary Solution to Refractory Ores," South Dakota History *15 (Winter 1985): 315.*

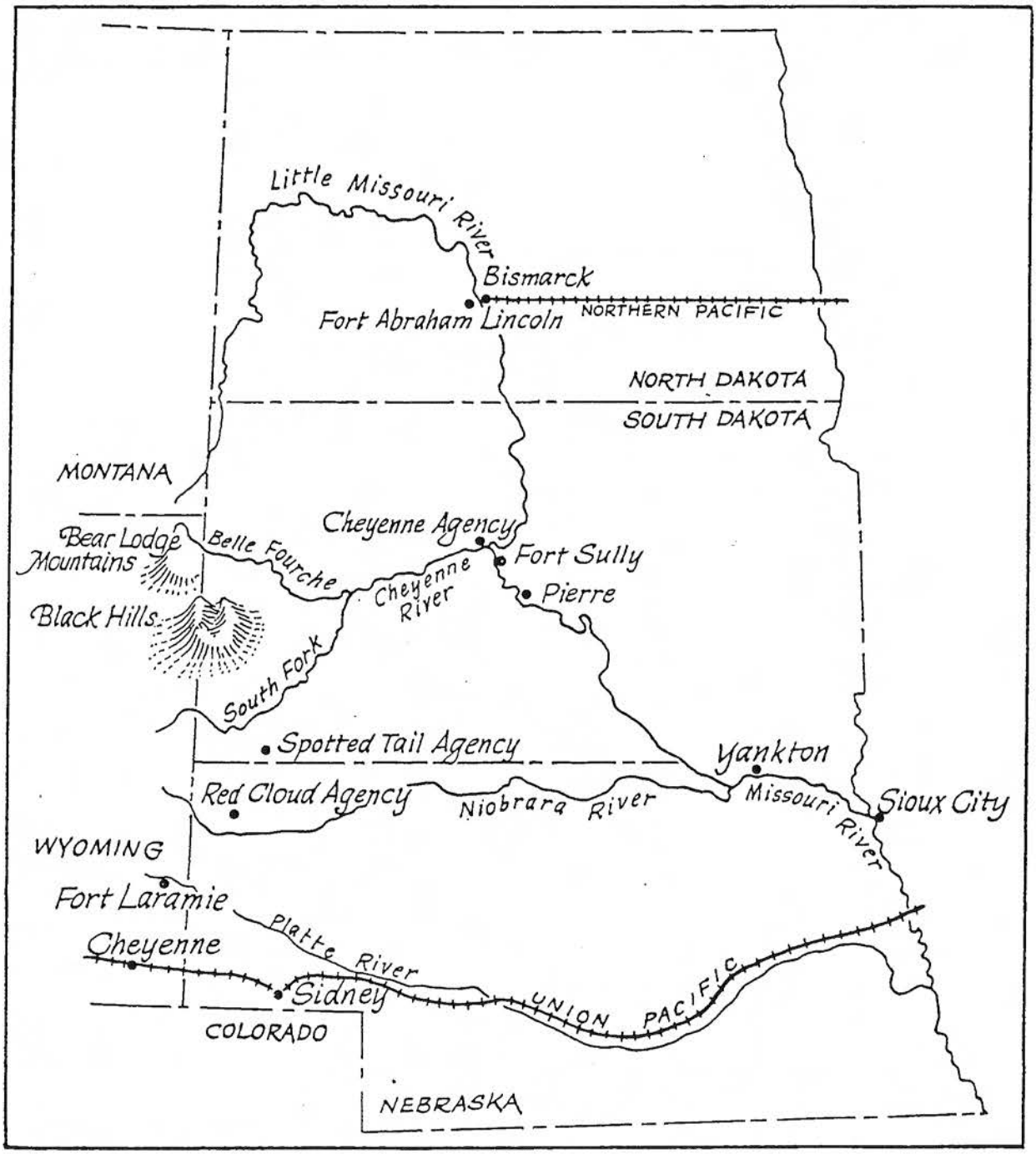
existed in paying, neighboring mines. Second, if ore was found on fringe mining ground, it was generally low grade, and companies that worked this property were usually marginally successful. In essence, these companies were on the fringe of economic success. And third, fringe ground was targeted by speculators and promoters for the sale of stock capitalized on the reputation of a neighboring mine. This questionable practice placed the mining ground on the fringe of investment legitimacy.

To make a profit from mining ground on the fringe, mining companies needed to resort to a number of tactics. Legitimate operators had to aggressively explore, experiment, and consolidate. Exploration was essential for locating the often elusive main ore body; experimentation uncovered the most effective and efficient means to mine and mill low-grade ore; and consolidation or acquisition of as many mining claims as possible was done in an effort to find rich ore, or at least to ensure a large quantity of low-grade ore. The less ethical operators, who hoped to reap profits from investors, centered their activities on promotion and surface development and building mills that appealed to the investing public. Regardless, companies that worked mining ground on the fringe were tenuous ventures, and continuous operation was never guaranteed. And as a result, ownership and management of such property changed frequently.

Most mining companies, of course, explored,

experimented, and consolidated. Many firms were involved in stock speculation, and a number operated intermittently, whether they operated on the richest or the poorest of grounds. A company working mining ground on the fringe, such as the Horseshoe-Mogul Mining Company, was more likely to initiate these practices.

The life of the Horseshoe-Mogul's mining



"The Black Hills of Dakota and Surrounding Settlements in 1875 with Present-day Political Boundaries."
Source: Watson Parker. Gold in the Black Hills *(Norman: University of Oklahoma Press, 1966), 43.*

ground can be broken into three phases: 1) ten years of consolidation, exploration, and experimentation, from 1892 to 1902; 2) four years of promotion and speculation, from 1902 to 1906; and, 3) thirteen years of cautious development and experimentation, from 1906 to 1919.

Before the story of the Horseshoe-Mogul can be told, however, it needs to be placed in the context of the Black Hills mining history. The most famous gold mine in the region was (and is) the Homestake at Lead. Discovered on April 9, 1876, it has been worked almost continuously to the present. While the Homestake Mining Company stands out as the single largest gold producer, other gold deposits were discovered in the region. In particular, a few miles southwest of Lead, gold was discovered in the Ruby Basin and Bald Mountain mining districts. First discovered in 1877, the ore proved to be highly refractory, and unamenable to the milling processes available. The district's mines lay dormant until new, more effective processes were introduced in 1887.[2]

By this date, the refractory gold ores of the northern Black Hills could be smelted or treated by the new chlorination process. Consequently, several Deadwood businessmen built processing plants to treat the Bald Mountain and Ruby Basin ores. One local firm, the Golden Reward Mining Company, confidently bought three claims in the Ruby Basin District. After initial failures, the Golden Reward group constructed a successful chlorination plant in lower Deadwood. The plant began operating on a small scale in 1890, and as the process improved, the company gradually expanded. By early 1892, the plant was treating 85 tons of ore a day, providing the Golden Reward the financial means to expand its operations in Ruby Basin.[3]

The Golden Reward Mining Company was bringing new life to the Ruby Basin Mining District, but it was not the only operator in the region. While the Golden Reward Company was developing its chlorination process, another company had formed in Deadwood that also hoped to treat Ruby Basin and Bald Mountain ores. Investors had formed the Deadwood and Delaware Smelting Company to build a custom smelter. The growth and development of this company greatly paralleled that of the Golden Reward. By September of 1890, when the Golden Reward Chlorination plant was treating 25 tons of ore a day, the Deadwood and Delaware Company (D & D) had opened its first plant and was smelting 30 tons of ore a day. Like the Golden Reward, this company expanded from there. In 1891, it constructed a much larger plant, and when the supply of custom ores proved inadequate to keep the plant operating at full capacity, the D & D began buying a series of proven claims in the Ruby Basin District.[4]

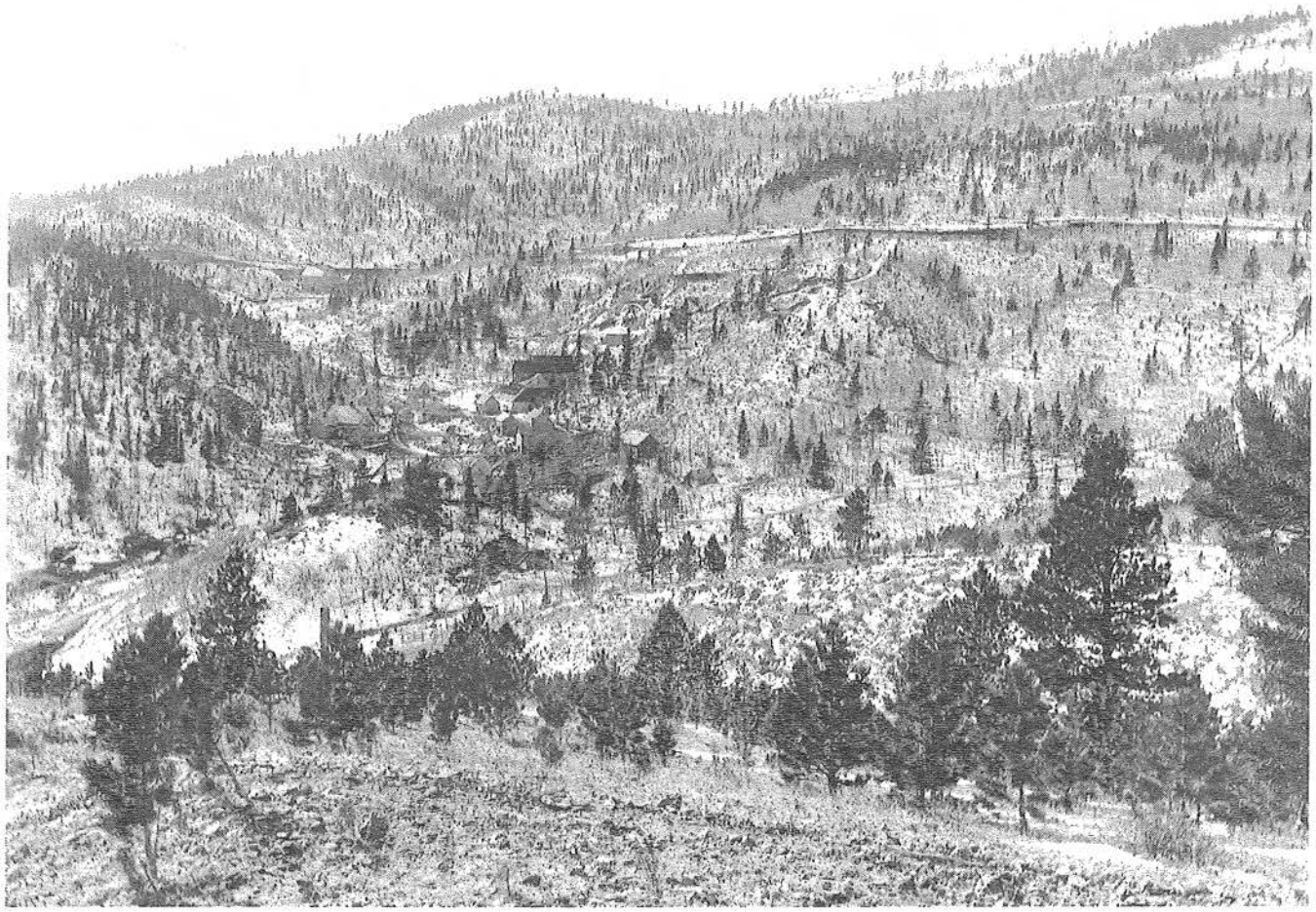
An understanding of the Golden Reward and the Deadwood and Delaware companies is essential to analyzing the mining ground on the fringe. By mid-1892, each of these companies had proven the feasibility of treating the refractory gold ores of the Ruby Basin and Bald Mountain districts. Both had acquired several mining properties to support their mill operations, and most of the claims they purchased had proven ore supplies. As production figures revealed, these claims were on some of the best mineralized ground in the districts. By mid-1892, in fact, these two mining companies were competing for the richest mining ground in the area. Their success did not go unnoticed. The *Engineering and Mining Journal*, for example, recognized the two mining companies as the most important producers in the Black Hills, behind only the Homestake mines.[5]

Their success attracted other investors into the region, making the mining of ground on the fringe a still greater factor in the local industry. On July 1, 1892, when interest in the Ruby Basin District was reaching a peak, the Black Hills *Daily Times* printed the headline: "Another Big Sale," and reported that two men from Canada, working through a local agent, had purchased the Horseshoe group of eight claims, paying $60,000.[6] This property was for the most part undeveloped and unproven. But undoubtedly reflecting the hopes of the new mining Company, the Deadwood newspaper stated that within a half mile of this ground, claims had been purchased "that were no better," but had since yielded from $15,000 to $50,000 each.[7] With no apparent mineralization on the surface, the company announced that it would sink a 300-foot shaft, the estimated depth of the ore. The Horseshoe shaft would hopefully encounter the ore body already

discovered in the neighboring mines, the first sign of a mine on the fringe.[8]

Simultaneously, the neighboring companies, the Golden Reward and the Deadwood and Delaware, were trying to consolidate as much good land as they could. To get its share, the Horseshoe company did the same. From July 1, 1892, to January 1, 1893, the company reportedly purchased 400 acres of mining ground, with one source estimating the cost at more than $300,000.[9] The state mine inspector, however, reported that the Horseshoe invested only $125,000. While this amount is considerably less than $300,000, it is still impressive, even though the state inspector noted that the Golden Reward spent $250,000 and the Deadwood & Delaware $275,000 during the same period. These companies were actually buying less ground than the Horseshoe, yet were paying more for proven ground. Consequently, the Horseshoe bought more undeveloped and unproven ground on the fringe and paid less than its competitors.[10]

Unfortunately, after a year of development and the sinking of a shaft of more than 350 feet, the company did not encounter sufficient quantities of paying ore. While exploration continued, the investors decided that they could not rely on the potential of unproven ground, and in November, 1893, the Deadwood agent of the Horseshoe Company bought controlling interest in a neighboring operation, the Welcome Mining Company. The Welcome Company had consoli-



The shaft house of the Horseshoe Shaft is in the upper left. Developed in 1892 and 1893, it was the first exploratory effort of the Horseshoe Mining Company. Below it, left-center of the photo, are the workings of the Welcome Mining Company. Developed in the early 1880s, the Horseshoe Company purchased the Welcome operation in 1893.

Photo Credit: Haynes Foundation Collection, Montana Historical Society, Helena, Mt.

dated several claims in the early 1880s, and constructed an amalgamation mill to treat the ore. The mill failed and the property lay idle until 1890 when new owners hoped to use the chlorination process to treat the ore. Unsuccessful into late 1893, the Welcome's owners were willing to sell. The agent for the Horseshoe hoped that this property would provide the ore needed for profitable operation.[11]

Profits did not come immediately, however. More than a year passed before the Horseshoe owners were confident enough in their ore reserves to announce the construction of a chlorination plant at Pluma. On November 3, 1895, the Black Hills *Daily Times* reported what they called "Another Gold Producer." The new Kildonan chlorination mill of the Horseshoe Company finally started operating, with a capacity of 150 tons of ore a day. The newspaper also reported that the company's development work on the Welcome property provided "sufficient ore to keep the mill in continuous operation."[12]

The mill, however, operated for only six months. The company did not have enough paying ore to keep the mill running, a continual problem for companies working mining ground on the fringe. The mill remained closed for at least four months. In 1897, the company restarted the mill on ore it had stockpiled from its various mines, and even expanded exploration. On the Mogul

The Horseshoe Mining Co. constructed The Kildonan Mill in 1895. Originally designed to use the chlorination process, it was later modified for cyanide. The plant operated intermittently until damaged by fire in 1912.

Photo Credit: Donald Toms, ed., The Gold Belt Cities. Deadwood & Environs: A Photographic History *(Lead, SD: G.O.L.D. Unlimited, 1988.), 142.*

Looking down Fantail Gulch toward the town of Terry, South Dakota in the heart of the Ruby Basin Mining District. To the far right, the building emitting smoke, is the Tornado Shaft of the Golden Reward Mining Company, one of the more productive mines in the district. The Horseshoe Company hoped to encounter the same ore body in its mines. The Horseshoe property sits out of the photo to the right, a little distance over the hill.

Photo Credit: Arvada Center Foundations, Inc. Arvada, Colorado.

mine claim, at the very edge of its property, the Horseshoe Company began sinking a shaft to intercept an ore shoot found in the Golden Reward's Tornado Shaft.[13]

The Tornado was supplying 150 tons a day to the Golden Reward, and correspondents had labeled it "one of the valuable mining properties of the Black Hills."[14] It was this vein in the Tornado that the Horseshoe hoped to find, and by early 1898, they apparently met with success. The company struck a body of ore, and was soon shipping from 140 to 150 tons of ore a day to the Kildonan Mill, leading the state mine inspector to declare that the Mogul shaft contained "one of the largest ore bodies in the Bald Mountain country."[15] Throughout the remainder of 1898 and then in 1899, the company pushed production at its mines and continued exploration. Its production for 1899 was valued at $562,000, making the Horseshoe the fifth largest producer in the Black Hills. But just as success seemed assured, the company again found itself short of paying ore. To counter this setback, the Horseshoe explored old claims and examined new prospects, including a claim in Spearfish Canyon.[16]

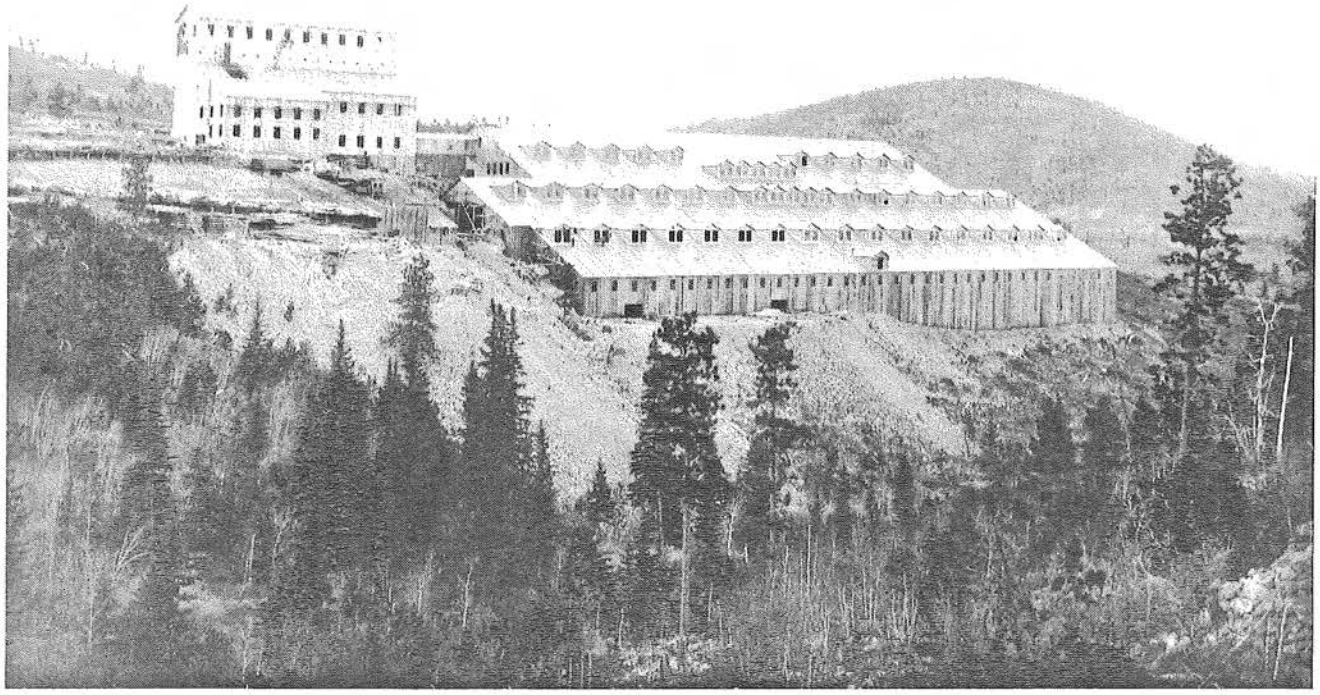
The management also decided to investigate other, more efficient ore-treating processes. The company considered placing a cyanide annex on the Pluma mill, and rumors circulated that the company was considering the erection of a smelter. But such talk was speculative, and the development work did not produce any signifi-

cant new finds. In May, 1901, the *Engineering and Mining Journal* reported that the Company had closed its chlorination plant "indefinitely."[17] And even though the company continued to ship highly refractory "sulphide" ore to the smelter in Omaha, the original operation was coming to a close. Consolidation of mining property, partial development of those claims, and experimentation with ores could not save the company. As a result, the first stage of the Horseshoe's life ended, initiating the second phase.[18]

The original owners of the Horseshoe sold the company to a group of investors from Milwaukee, Wisconsin, in March 1902. While purporting to be honest and promising to run a legitimate mining operation, the new company wished to use the mining ground on the fringe for speculation and stock manipulation. For them, the situation was perfect. The company held a large block of property; its ten-year operation, albeit sporadic, gave the company the appearance of permanence and stability; it could be purchased relatively cheaply; and it bordered a large, successful mining operation, the Golden Reward Company which had bought the Deadwood & Delaware in 1899, consolidating extensive holdings and creating the second largest company in the Black Hills.[19]

Coinciding with the announcement of the ownership change was a flurry of public statements regarding the future of the company and the investment opportunities of the Horseshoe Mine. Upon taking control of the ground, the new officers announced the complete remodeling of the Pluma mill, stating that they intended to con-

Developed in 1897 and 1898, this is the Mogul Shaft of the Horseshoe Mining Company. It was sunk with the intent of locating the ore body that the Golden Reward's Tornado shaft was working.



The Mogul Cyanide Plant under Construction in 1903. When first announced, the mill was to have a capacity of 1,000 tons of ore per day. The finished product purportedly could treat 500 tons a day, but usually worked at less than capacity.
Photo Credit: Arvada Center Foundations, Inc. Arvada, Colorado.

vert it from a chlorination plant to a cyanide mill. Shortly after this notice, the company announced that a new thousand-ton cyanide plant was going to be built, and proclaimed that it would be the largest such plant in the world. They further noted that the fifteen mines that the previous company had begun would supply the ore.[20] Simultaneously, advertisements appeared in the Chicago *Tribune* announcing the opening of the big mill and the chance for speculation in the Horseshoe. Capitalization was listed at $10 million, with stock selling at $1 a share. The revenue would fund construction of the new mill and acquisition of additional property. Furthermore, the company claimed that there was "no attempt to deceive."[21]

During the following months, news reports speculated where the Horseshoe Company would locate its new mill and how the converted chlorination plant would serve as a test for future operations. The company's primary mining activity, however, focused on shipping ore to outside smelters. Despite the limited activity, the company publicly displayed vitality. In late July, for example, it declared a dividend of $70,000, the Horseshoe's first ever. Also, it announced that it had gained control of the recently built National Smelter in Rapid City, and that it would enlarge the plant at Pluma. The three plants the Horseshoe anticipated operating gave it a potential capacity of 1,600 tons a day.[22]

In early 1903, all seemed glowing. The converted Kildonan plant was reportedly running at capacity, as was the smelter in Rapid City. Grading and timbering had begun on the 1,000-ton cyanide plant near the Mogul Mine site. And

better yet for the investors, since its first dividend in July, the Horseshoe began paying regular dividends of one cent a share per month, totaling a payout of $420,000.[23] Then suddenly, in February, 1903, President D. E. Murphy and Vice-president E. M. Holbrook resigned, and an announcement was made that their holdings of 5,000,000 shares, half of the stock issued, would be returned to the company — stock they had previously granted themselves at no charge. A major investor from Chicago, Charles Allis, took over the presidency of the company and immediately shut down the smelter and the plant at Pluma, and announced an end to dividend payments. He further stated that the available capital would be used to develop the mines and finish the cyanide plant. The company's stock fell to 35 cents a share, the *Engineering and Mining Journal* editorializing that the property was "considered a good one," but was being "operated for stock-selling purposes."[24]

The reality of stock manipulation became clear when the new managers hired a mine expert, Herman Keller, to examine the operation. Keller reported that the company's profits came from only one mine whose ores were sent to an outside smelter. Likewise, both the Rapid City smelter and the Pluma mill, which needed more work, did not operate at a profit. He also stated that building a new large mill offered the best hope for low-cost production. In relation to the mines themselves, exploratory work was still in the early stages, and a majority of the claims were unexplored. Instead of producing profits, Murphy and Holbrook had misled investors for the purpose of selling stock, which included paying dividends to attract more stock purchases. The proceeds for the dividends, in fact, did not come from earnings, but from stock sales. More significantly for Murphy and Holbrook, they received about $300,000 from the dividend payments because they held over 5,000,000 shares of stock.[25]

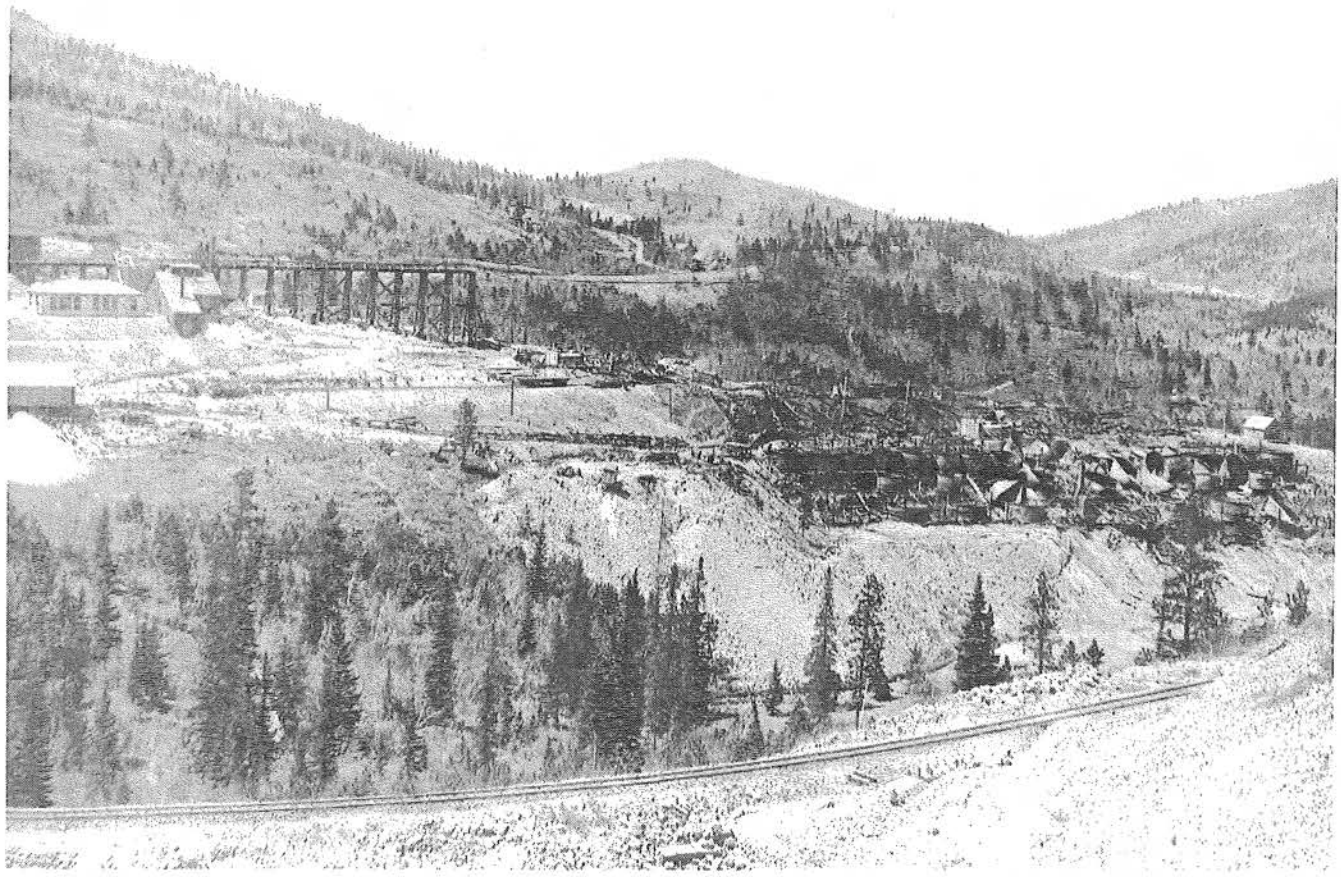
By the end of February, 1903, the Deadwood newspaper reported that the new management was making a "clean sweep" in an effort to legitimize the mining operation. But the transformation would be difficult because of the questionable promotional scheme of the previous management. One result was a lawsuit. Claiming fraudulent representation, Maurice Lindholm of Chicago filed suit for the recovery of his $3,750 investment. When the Horseshoe lost the case, the *Engineering and Mining Journal* featured it, stating that it was an important step in freeing "legitimate mining" from the "barnacles and slime of fraud." The court decided that a mining company must make accurate representations in its prospectus and newsletters, an ethical practice the Horseshoe had failed to follow.[26]

Another problem for the new management was the poor financial state of the company. Keller, the outside expert, believed that finishing the large cyanide mill offered the best hope for low-cost, successful refining. To finish the mill, the company decided it needed to sell $600,000 in bonds, a hard task for a company whose stock value had fallen to nine cents. After much dispute among the new board of directors, the company decided to give the task of selling the bonds to Holbrook, the former president responsible for the unethical stock speculation. Although most recognized his dubious record, he still held stock in the company, had a seat on the board of directors, and was recognized as a consummate salesman. The board made a deal with him: if he could sell the bonds, he would be reinstated as general manager.[27]

By May, 1903, Holbrook announced success in floating the bond issue, and on June 1 he was reinstated as general manager. With the proceeds, the company completed the cyanide mill. In August, mill workers began treating about 250 tons of ore a day. After two months, however, Holbrook suddenly resigned. Despite favorable conditions, he claimed that dividends on the bonds could not be paid and that the company had to borrow money to meet the payroll for October. He stated that new investors from Pittsburgh, Pennsylvania had stepped forward to save the company, on the condition that they control management. Nathan Halle, Deadwood's mining stock analyst, reported in his newspaper column that the change in management was viewed with suspicion, but no evidence of chicanery appeared in the press. Holbrook left the region for good, going elsewhere to profit from other mining enterprises.[28]

Over the next six months, the new Horseshoe mill operated intermittently, yet enough to lead Halle to state in May, 1904, that the Horseshoe was "now operating successfully" and that profits might be "derived from present operation."[29] The company was producing ore from several mines, often using open cuts to maximize efficiency. For 1903, the Horseshoe's production value was more than $350,000, making it the third largest producer in the Black Hills. Throughout 1904 and early 1905, the Deadwood newspaper gave favorable reports on the Horseshoe Company, citing it for doing excellent work on low-grade material. The doubtful day for the Horseshoe had passed, the reporter declared, and he praised the company's splendid milling facilities and large ore reserves. Such success was not long-lived, however, because the Mogul Mill burned to the ground in May, 1905, after operating only a year-and-a-half.[30]

The fire losses reached between $300,000 and $400,000, and the company carried only $250,000 insurance.[31] The shortfall in insurance money and the inability to produce gold drove the company into bankruptcy. From mid-1905 to mid-1906, the company struggled through bankruptcy and another reorganization. The court appointed a receiver, W. L. McLaughlin, to manage the affairs of the company; he had also been the most recent general manager of the Horseshoe Company. As receiver, he worked with the directors of the company to formulate a reorganization plan to restructure the company's finances and resume operations.[32] The reorganization dis-



The remains of the Mogul Cyanide Plant after it was destroyed by fire in 1905.
Photo Credit: Arvada Center Foundations, Inc. Arvada, Colorado.

solved the old company and formed a new one, with the old share and bond holders receiving new certificates at a much lower value. By the time the court-ordered sale occurred on May 26, 1906, the directors of the Horseshoe company had reorganized into the Mogul Company, taking the name of their best mine. At the court sale, the new company bought the Horseshoe Company for $500,000. The era of questionable speculation and over-construction on the mining ground on the fringe came to on end. Although the current management stayed on, they were the more conservative group that had only recently taken full control of the operation. With reorganization complete, they could distance themselves from the earlier fraud.[33]

While the reorganization committee was creating the new Mogul Company, it was also considering plans for the modification of the old Pluma mill. Instead of attempting to construct one of the world's largest cyanide plants for the sake of impressing investors as did the previous owners, the new company wanted to build one of the most efficient plants possible, a necessity when treating marginal ore from mining ground on the fringe. They employed J. V. N. Dorr, an innovator of the cyanide process, to help redesign the mill. Soon after reorganization, the new company converted it from a chlorination plant to a cyanide mill. By early 1907, the remodeled Pluma mill was ready to treat 300 tons of ore a day.[34]

From 1907 to the closing of the Mogul Mining Company in 1919, the story of this mining ground on the fringe is almost anti-climatic. Throughout these years the company sought to mine the low-grade ore with the most economical means possible, looking for ore that could be easily mined. With Dorr's assistance, the remodeled Pluma mill worked well, and from 1909 to 1911, the Mogul was the largest producing company in the Black Halls, aside from the Homestake.[35] The Mogul Company, however, suffered a major setback when in early 1912, fire damaged the mill to the tune of $75,000. While the mill was not destroyed, the company decided it made more sense to build a new plant nearer their mines. The railroad's 40-cents per ton freight rate was proving too costly to ship low-grade ore to the Pluma plant. Eventually the company built a 150-ton plant near the head of Nevada Gulch, a location where ore Could be delivered by short hauls or tramways from a number of producing properties. First placed in production in early 1914, the Blackmoon cyanide mill operated until 1919 when a labor shortage and increased production costs caused the company to suspend operations.[36] Throughout these years, the Mogul's production slipped until the company ranked between fourth and fifth in the Hills. The Horseshoe-Mogul Mining Company, however, was still successfully working the low-grade mining ground on the fringe. The earlier consolidation, previous exploration, and construction of the state of the art cyanide process used in the Blackmoon mill kept the operations going. But this could not guarantee permanence, as demonstrated by the closing of the mine in 1919.

The twenty-eight year history of the Horseshoe-Mogul Mining Company shows the variety of activities that mining ground on the fringe fostered. With a favorable location, yet showing limited ore values, mining ground on the fringe forced its operators to be innovative to succeed. For legitimate owners, this meant exploration, experimentation, and consolidation. For dishonest speculators, it meant promotion and development for the sake of fraud. If worked properly, however, the mining ground on the fringe could return a profit. Such success proved that marginal ores could be mined profitably. Mining companies of today, in fact, are working these old fringe properties on a regular basis. Technological and financial efficiency overcame the disadvantages of low-grade and refractory ores so that the mines are now producing successfully. The Horseshoe-Mogul Mining Company's earlier experience proved that successful mining ground on the fringe could become a reality.

David A. Wolff is a Ph.D. student in history at Arizona State University. Originally trained as a pharmacist, he initially studied the chemistry and history of ore processing. He quit pharmacy to pursue history full-time and earned an M.A. degree at the University of Wyoming. While at U.W. he shifted his search to labor in the coalfields and continues to explore that for his dissertation.

ENDNOTES

[1]The histories of Black Hills mining operations am scattered in several sources. Good places to look include: Mildred Fielder, *The Treasure of Homestsake Gold* (Aberdeen, SD: North Plains Press, 1970); Joel Waterland, *The Spawn & The Mother Lode* (Rapid City, SD: Grelind PhotoGraphics & Typesetters, 1987); Joel Waterland, *Gold & Silver or Sweat & Tears* (Rapid City, SD: Grelind PhotoGraphics & Typesetters, 1988); Watson Parker, *Deadwood: The Golden Years* (Lincoln: University of Nebraska Press, 1981); Watson Parker, *Gold in the Black Hills* (Norman: University of Oklahoma Press, 1966); Paul T. Allsman, *Reconnaissance of Gold-Mining Districts in the Black Hills.* S. Dak., Bureau of Mines, United States Department of the Interior, Bulletin 427 (Washington, D.C.: GPO, 1940); David A. Wolff, "Pyritic Smelting at Deadwood: A Temporary Solution to Refractory Ores," *South Dakota History* 15 (Winter 1985): 312-39. The best source on financing and entrepreneurship is Joseph E. King, *A Mine to Make a Mine: Financing the Colorado Mining Industry. 1859- 1902* (College Station: Texas A&M University Press, 1977).

[2]Fielder, *Homestake Gold,* 20; Allsman, *Reconnaissance of Gold-Mining Districts,* 11-2; Frank Clemes Smith, "The Potsdam Gold-Ores of the Black Hills of South Dakota," *Transactions of the American Institute of Mining Engineers* 27 (1898): 420-22.

[3]Black Hills *Daily Times,* 11, 19 June 1887; "Terry: South Dakota's Largest Ghost Town," *Wi-lyohi* 13, no. 5 (1 Aug. 1959): 9; *Engineering and Mining Journal* 50 (13 Sept. 1890): 318, 51 (27 June 1891): 752, 53 (12 March 1892) 312, and 54 (6 August 1892): 136.

[4]Black Hills *Daily Times,* 6 July 1890, 23 Aug. 1890, 30 July 1891, 16 July 1892; Wolff, "Pyritic Smelting," 319-20.

[5]Titus E. Corkhill, *Third Annual Report of the Inspector of Mines for the State of South Dakota* (Pierre: South Dakota State Mine Inspector, 1892), 47; Allsman, *Reconnaissance of Gold-Mining Districts.* 26, 39; *Engineering and Mining Journal* 55 (1 January 1893): 31.

[6]Black Hills *Daily Times,* 1 July 1892; *Engineering and Mining Journal* 54 (23 July 1892): 88.

[7]Black Hills *Daily Times,* 1 Jan. 1893.

[8]*Engineering and Mining Journal* 54 (9 July 1892): 41, and 54 (23 July 1892): 88.

[9]*Engineering and Mining Journal* 54 (8 Oct. 1892): 352; Black Hills *Daily Times,* 1 Jan. 1893

[10]Corkhill, *Third Annual Report of the Inspector of Mines,* 47.

[11]Black Hills *Daily Times,* 9 June 1893; *Engineering and Mining Journal* 56 (11 Nov. 1893): 505-6, 50 (13 Dec. 1890): 699, 52 (19 Sept.1891): 343, 53 (2 Jan. 1892): 59, 54 (2 July 1892): 16, and 55 (20 May 1893): 471.

[12]Black Hills *Daily Times,* 3 April 1895, 3 Nov. 1895, 5 Nov. 1895.

[13]Black Hills *Daily Pioneer-Times,* 14 Jan. 1897, 18 Sept. 1897, 24 Sept. 1897, 25 Nov. 1897, 1 Dec. 1897; *The Black Hills Mining* Review 4 (21 Mar, 1898): 40.

[14]*Engineering and Mining Journal* 64 (31 July 1897): 138.

[15]James Ten, *Eighth Annual Report of the Mine Inspector, State of South Dakota* (Pierre: State Publishing Co. 1899), 50; *Engineering and Mining Journal* 65 (29 Jan. 1898): 143; Black Hills *Daily Pioneer-Times,* 26 May 1898.

[16]James Cusick, *Annual Report of the Mine Inspector for the State of South Dakota for Year 1899,* Reprinted in *Black Hills Mining Review Special Edition* 6 (1900): 1; Black Hills *Daily Pioneer-Times,* 15 August 1899; *Engineering and Mining Journal* 68 (1 July 1899): 19, (15 July 1899): 79, (26 Aug. 1899): 259, (4 Nov. 1899): 559, and 70 (1 Dec. 1900): 650.

[17]*Engineering and Mining Journal* 69 (10 Mar. 1900): 299, and 71 (18 May 1901): 632.

[18]Black Hills *Daily Pioneer-Times,* 1 Dec. 1897; *Engineering and Mining Journal* 73 (11 Jan. 1902): 87; *The Black Hills Mining Review* 8 (31 Jan. 1902): 3.

[19]Thomas Gregory, *Thirteenth Annual Report of the State Mine Inspector of the State of South Dakota,* Nov. 1. 1901 to Nov. 1. 1902 (Aberdeen: New Printing Co., 1902), 14.

[20]*Engineering and Mining Journal* 73 (22 Mar. 1902): 427; Black Hills *Daily Pioneer-Times,* 23 Mar. 1902, and 28 Mar. 1902; *The Black Hills Mining Review* 8 (9 May 1902): 7.

[21]The Chicago *Tribune* ad reprinted in the Black Hills *Daily Pioneer-Times,* 12 Mar. 1902; *The Black Hills Mining Review* 8 (14 Mar. 1902): 3.

[22]*Engineering and Mining Journal* 73 (24 May 1902): 740, and 73 (21 June 1902): 875; Black Hills *Weekly Pioneer-Times,* 28 Aug. 1902; *The Black Hills Mining Review* 8 (26 July 1902): 12, and 8 (17 Aug. 1902): 10.

[23]*Engineering and Mining Journal* 74 (29 Nov. 1902): 725, 75 (10 Jan. 1903): 98, 75 (21 Feb. 1903): 311, 75 (14 Mar. 1903): 424; Black Hills *Daily Pioneer-Times,* 16 Jan. 1903.

[24]*Engineering and Mining Journal* 75 (21 Feb. 1903): 311, and 75 (28 Feb. 1903): 342; Black Hills *Daily Pioneer-Times,* 13 Feb. 1903.

[25]Black Hills *Daily Pioneer-Times,* 14 Feb. 1903; *The Black Hills Mining Review* 9 (27 Mar. 1903): 12.

[26]*Engineering and Mining Journal* 78 (7 July 1904): 2 - 3; Black Hills *Daily Pioneer-Times.* 20 Feb. 1903, and 20 Mar. 1903.

[27]*Engineering and Mining Journal* 75 (25 Apr. 1903): 647; Black Hills *Daily Pioneer-Times,* 29 Mar, 1903; *The Black Hills Mining Review* 9 (3 Apr. 1903): 9.

[28]Black Hills *Daily Pioneer-Times,* 8 Mar. 1903, 12 Mar. 1903, 23 Aug. 1903, 3 Sept 1903, 22 Oct. 1903, 29 Oct. 1903, 31 Oct. 1903, 5 Nov. 1903; *Engineering and Mining Journal* 75 (6 June 1903): 873.

[29]Black Hills *Daily Pioneer-Times,* 5 May 1904.

[30]Black Hills *Daily Pioneer-Times,* 28 Feb. 1905, 6 Apr. 1905, 13 Apr. 1905, and 25 May 1905; *The Black Hills Mining Review* 10 (27 May 1904): 8, 10 (2 Dec. 1904): 9-10, 11 (31 Mar. 1905): 18, and 11 (26 May 1905): 9.

[31]Black Hills *Daily Pioneer-Times,* 26 May 1905; *The Black Hills Mining Review* 11 (26 May 1905): 13.

[32]Black Hills *Daily Pioneer-Times,* 2 June 1905, 9 June 1905, 11 June 1905; *The Black Hills Mining Review* 11 (9 June 1905): 13, 11 (16 June 1905): 11-3, and 11 (13 Oct. 1905): 9.

[33]Black Hills *Daily Pioneer-Times,* 14 Feb. 1906, 24 May 1906, 31 May 1906, 14 June 1906, and 6 July 1906.

[34]Ibid., 5 Jan. 1906; *Engineering and Mining Journal* 81 (9 June 1906): 1119, and 83 (20 Apr. 1907): 785.

[35]Black Hills *Daily Pioneer-Times,* 1 Jan. 1909; *Engineering and Mining Journal* 93 (6 Jan. 1912): 65.

[36]*Engineering and Mining Journal* 108 (18 Oct. 1919): 670.