

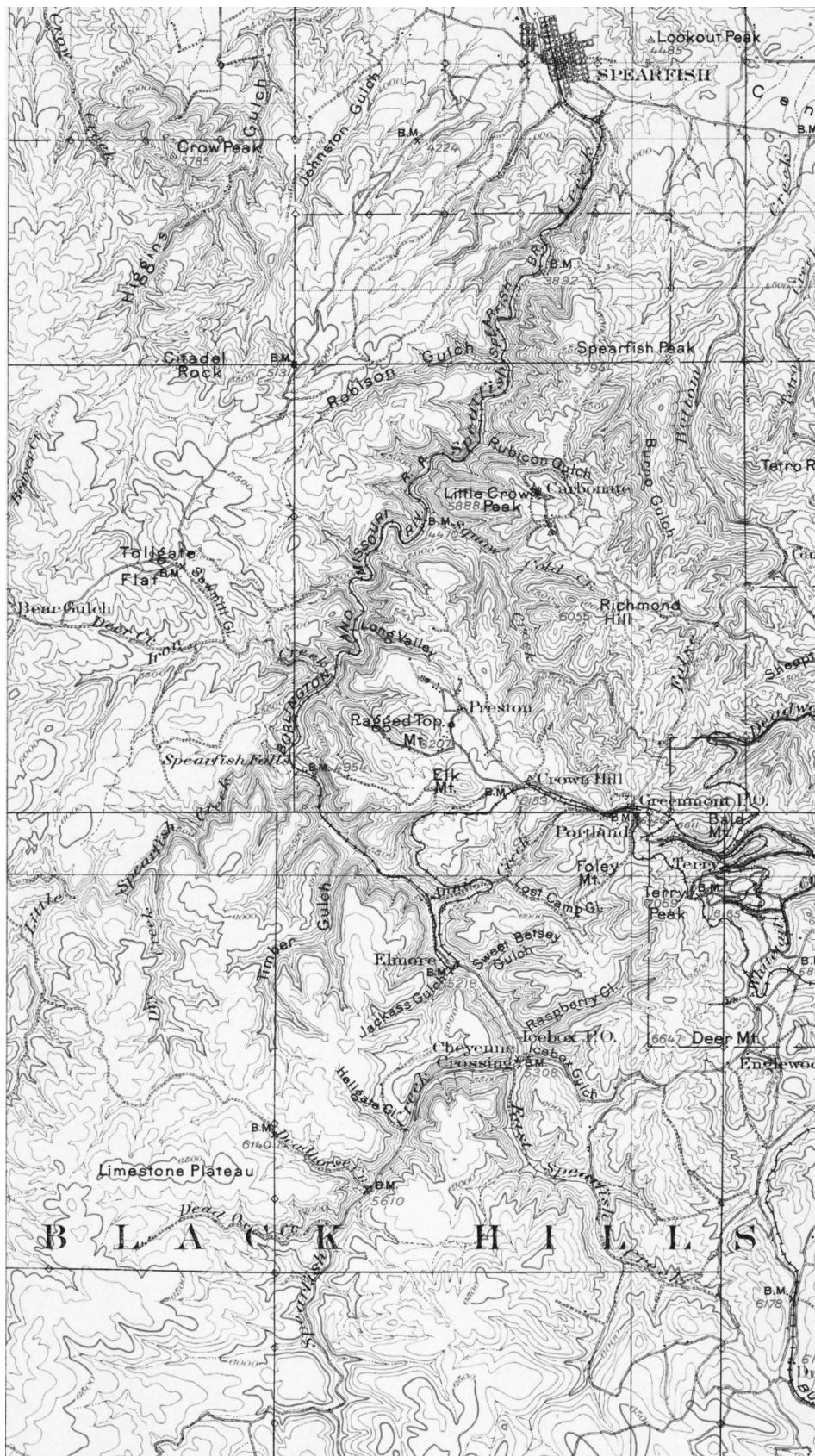
*“Trout Fishing Must Eventually Give Way
to Mining”: Cyanide Mills and Recreation
on Spearfish Creek in the South Dakota
Black Hills, 1898–1910*

By
John R. Henris

On 7 May 1908 Dewitt Clinton Booth, superintendent of the federal fish hatchery in Spearfish, South Dakota, wrote to Donald McPherson, chairman of the board of county commissioners for Lawrence County, South Dakota, concerning the escalating conflict between mining and fishing interests in Spearfish Canyon. In April, a court-ordered injunction forced the closure of the Reliance Gold Mining Company's cyanide mill on Annie Creek in the upper reaches of the canyon for polluting the waters of the mountain stream and causing the destruction of fish. At the time, rumors had been circulating throughout the northern Black Hills that individuals, whose motives remained unclear, had dynamited the settling dam of the Spearfish Gold Mining and Reduction Company in Johnson Gulch.

Booth decried the crisis in the Spearfish Canyon, confiding that “a few men, representatives of small mining interests, have expressed the opinion that trout fishing must eventually give way to mining and mention the former as a mere incident and the latter as essential to the business interests of the Black Hills.” Booth wrote that “it would be interesting to compare the amount of money brought into the Black Hills and expended annually by tourists and travelers attracted by the trout fishing and clear beautiful streams with that produced by the few small mines causing such serious annoyance.” Booth assured McPherson that he had no desire to interfere with “legitimate mining or other business enterprise in the Black Hills,” but that “in preventing the pollution of the streams and preserving the trout fishing the people are simply protecting one of the attractions and assets of the country.”¹

Mining has often conflicted with recreational and conservation interests in the American West. Historian Andrew Isenberg, for example,



A map of Spearfish Canyon showing the Carbonate Camp, Squaw Creek, Johnson Gulch, Ragged Top, and Annie Creek mining operations. Fish planting locations included the federal hatchery in Spearfish and the railroad stations at Maurice, Iron Creek, Savoy, and Elmore in Spearfish Canyon. (U.S. Geological Survey, "Deadwood," 1:125,000, Topographic Quadrangle Map, Reston, VA, 1901.)

writes of how the mining industry in California destroyed native trout and salmon habitats in the inland waterways of the Pacific Coast as early as the 1870s; while hydrologist David Stiller similarly elucidates how recreational trout fisheries remained threatened by mining operations in Montana a century later, during the 1960s and 1970s.²

Conflict between mining interests and fishermen on Spearfish Creek in the spring of 1908 was not the oldest such instance of conflict between mining and fishing, and it certainly would not be the last. However, the contest between advocates of mineral extraction and the proponents of recreational fishing on Spearfish Creek during the first decade of the twentieth century was unique. Unlike the development of mining districts in California, Montana, and other western states, there were no native trout populations in Black Hills streams at the time gold mining operations began in the 1870s. In one of the most significant environmental contests in western mining during the Progressive Era, however, mining interests, utilizing the new cyanide process, vied with federal technocrats, conservationists, and recreational fishermen, determined to create an artificial trout fishery in western South Dakota, for control of the waters of Spearfish Creek and other streams in the South Dakota Black Hills between 1898 and 1910.³

During the late 1870s and early 1880s prospectors explored Spearfish Canyon and the surrounding region of the northern Black Hills but seldom found gold or silver deposits in scale or grade that would pay to be worked by traditional amalgamation and chlorination processes. During the early 1880s, however, prospectors discovered silver in paying quantities near Squaw Creek and Rubicon Gulch. The height of the silver boom at Carbonate Camp in Spearfish Canyon lasted six years, from 1885 to 1891, before declining silver prices, and the Panic of 1893, ended significant mining in the district and Spearfish Canyon was again largely absent of the mining interests.⁴

Mining resumed in Spearfish Canyon during

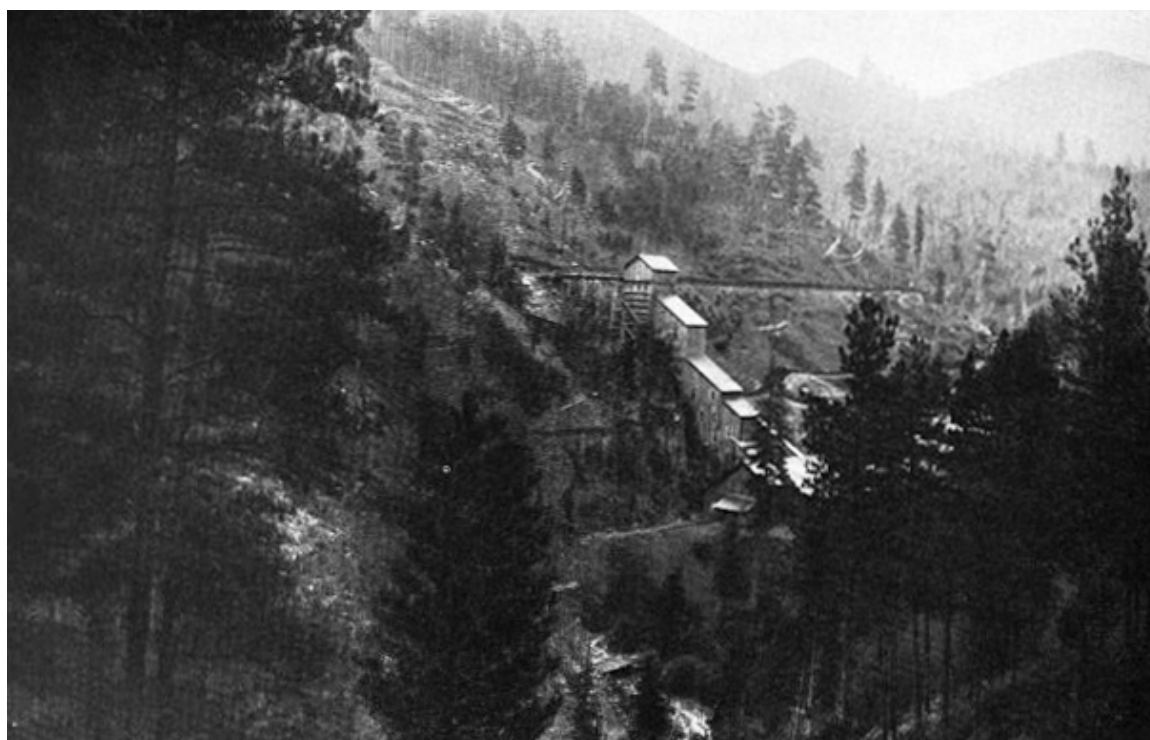
the last years of the nineteenth century, after it was discovered that the cyanide process could make profitable gold and silver ores too low grade to be mined by more traditional methods of amalgamation and chlorination. In 1898 investors converted an abandoned chlorination mill in Spearfish, South Dakota, to a twenty-ton cyanide mill and began processing low-grade ores from Calamity Gulch in Spearfish Canyon between Iron Creek and the settlement of Savoy.

This first mill burned down two years later, in 1900, but it operated for sufficient duration to demonstrate the practicability of using the cyanide process on Spearfish Canyon ores. More significant experimentation with the cyanide process began along Squaw Creek, eight miles up Spearfish Canyon, and along Rubicon Gulch near Maurice in the summer of 1899.⁵

In August of 1899, the *Queen City Mail* reported that "near the shaft of the Cleopatra ground W. E. Sharpe is putting up a battery of cyanide tanks." The *Mail* confided that "if the plant is a success, a larger plant will be put up in the same place."⁶ The owners of the Cleopatra Mine constructed a thirty-ton plant and the operation proved such a success that the original mill was expanded to fifty tons in 1900, and again to one hundred tons by 1901.⁷

On neighboring property in the old Carbonate mining district, in 1900, Allen Brothers and Soule constructed a small thirty-five-ton plant, operated only during the summer months, using the cyanide process to rework the tailings from the Iron Hill Company's old silver amalgamation mill active in the 1880s during the first Carbonate Camp mining boom.⁸ This operation was also unique in that it was the first of its kind in the Black Hills to use the cyanide process in an attempt to extract silver from tailings rather than gold.

Large-scale old extraction became possible once the cyanide process was introduced in Spearfish Canyon in the Ragged Top District near the Iron Creek station in 1900. Ragged Top Dis-



The Cleopatra Cyanide Mill on Squaw Creek was the first of its kind in Spearfish Canyon. (Cleophas O'Harra, The Mineral Wealth of the Black Hills [Bulletin No. 6, Department of Metallurgy, South Dakota School of Mines] (Rapid City, SD: Rapid City Daily Journal Steam Print, 1902), after p. 56.)

trict's gold-bearing ores were unusual in that they were locked in limestone and, to a large extent, surface quarried rather than mined.⁹ In 1900 the Spearfish Gold Mining and Reduction Company constructed a 250-ton cyanide mill at the head of Johnson Gulch and the Deadwood Standard constructed its own 250-ton cyanide mill just to the southeast.¹⁰ With this new technology, the Spearfish mining districts boomed and the aptly named town of Cyanide grew up in the shadow of Ragged Top Mountain to cater to the needs of local miners who worked these ores with the cyanide process.

In 1899, as the first experiments were taking place with Spearfish Canyon ores, federal officials were engaged in an ambitious experiment that would also transform the ecology of Spearfish Canyon. With a constant and swift stream flow, a maximum water temperature no greater than sixty-five degrees, a gravelly bed, and vegetation

including "watercress, moss, wild celery, and native grasses," Spearfish Creek was a perfect habitat for the propagation of non-native game fish such as the eastern brook trout or black-spotted (western cutthroat) trout.¹¹

When the Custer Expedition first explored the Black Hills in 1874 observers discovered, however, that these waters were devoid of trout. Later men of natural science concluded that the Black Hills, truly an island in the plains, were naturally inaccessible to trout because they could not transit the warm alkaline waters of the high grass prairie to gain access to the cold water habitat of Black Hills streams. The "shallow, muddy, alkaline character" of the lower Cheyenne River, wrote investigator Barton Warren Evermann, "seems to be a reasonable explanation of the absence of trout from the Black Hills."¹²

Evermann explored the waters of the Black Hills in 1892 and 1893 and recommended the

construction of a federal cold water hatchery for the rearing of trout in the Black Hills of South Dakota. In 1896 the Federal government approved funding for a hatchery in Spearfish, and in the summer of that same year, the U.S. Fish Commission likely introduced the first trout into Spearfish Creek by way of the railroad that paralleled its course through much of Spearfish Canyon.¹³

Construction of the Spearfish federal fish hatchery did not begin in earnest until the spring of 1899 and most of the initial work was completed by autumn of that year. Federal officials placed the new Spearfish hatchery under the capable direction of Dewitt Clinton Booth and over the next decade Booth and his staff transformed the streams of the Black Hills into the largest artificial

recreational fishery in the West.¹⁴

Booth and his staff planted the first fish from the Spearfish hatchery in April of 1900. Records show that in 1900 federal hatchery employees introduced 45,000 eastern brook trout and 6,000 black-spotted trout into Spearfish Canyon. Federal hatchery workers released 14,000 brook trout and 160,000 black-spotted trout in Spearfish Canyon in 1901, and 29,500 brook trout and 155,000 black-spotted trout into Spearfish Canyon in 1902. By 1903, as the cyanide process expanded throughout the upper reaches of Spearfish Canyon, federal hatchery officials, undeterred by the quickening cadence of mining operations, placed another 45,000 brook trout and 155,000 black-spotted trout into the waters of Spearfish Creek between the railroad flag stops of Maurice and



A man fishing at Keller's Cabin near Elmore, South Dakota, in Spearfish Canyon in 1908. Not far from here the Reliance Gold Mining Company would be shut down by injunction for polluting the water and causing the destruction of trout on Spearfish Creek. (Stimson Collection, Wyoming State Archives Photo Collection, Cheyenne.)

Elmore.¹⁵

During these early years there was some hope that mining and fishing could coexist in Spearfish Canyon. In 1901, for example, promotional literature for the Gold Hill Mining Company—the property of which was located below the Spearfish Gold Mining and Reduction Company on the east bank of Spearfish Creek—touted both the mineral wealth and the recreational value of Spearfish Canyon. The pamphlet concluded by reminding potential investors who might want to visit the property that Spearfish Creek was “stocked by the government with fine trout, and has the grandest scenery you ever saw.”¹⁶

Others in the canyon began to discover, however, that mining by the cyanide process and recreational fisheries were not always compatible with one another after all. The trouble began in 1901, when Allen Brothers and Soule was accused of killing fish by emptying cyanide into Spearfish Creek while working tailings from the old Iron Side Mills through its thirty-five-ton plant on Squaw Creek, a tributary of the Spearfish.

The Allen Brothers and Soule operation was small but particularly lethal because it was using an especially strong cyanide solution to extract silver from old tailings. The *Queen City Mail* reported that “a communication from Allen Bros. of Carbonate, in relation to the pollution of Spearfish [C]reek by cyanide tailings, stated that they were using every endeavor to prevent it, so far as the plant is concerned.”¹⁷ This was the first such instance in a gradually escalating conflict between miners and fishermen over pollution of the stream and the destruction of fish, but it would not be last such instance in Spearfish Canyon between 1901 and 1908.

In 1900 proponents of turning Spearfish Creek into a recreational trout fishery faced a much greater challenge than the Allen Brothers’ operation when the 250-ton cyanide mill of the Spearfish Gold Mining and Reduction Company at the head of Johnson Gulch became operational.¹⁸ In May of 1901 the first significant

fish kill occurred in Spearfish Canyon and blame for the disaster was quickly placed at the door of the Spearfish Gold Mining and Reduction Company.

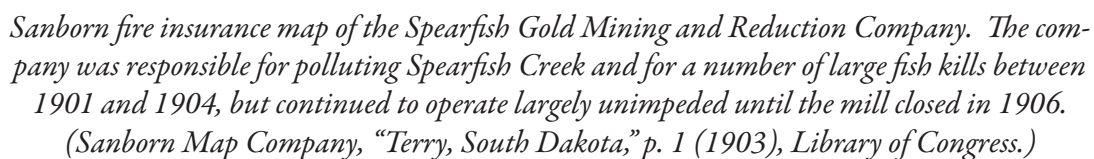
Representatives of the mining interests in Spearfish Canyon and associates of the Spearfish Gold Mining and Reduction Company, in turn, quickly shifted the blame to poachers who, they claimed, were using the company’s cyanide reduction works as cover to take trout illegally by dynamite and then cast suspicion upon the mill for destruction of the fish.

Spearfish residents and other northern Black Hills community members were, understandably, skeptical of this dynamite-poaching theory and, in June 1901, held a meeting in the mining town of Lead, the first of its kind in the hills, “for determining upon steps for the protection of the trout in Spearfish and other streams of the county” from the cyanide processing corporations.¹⁹

In response to growing angst over the pollution of Spearfish Creek, John Vannatta, president of the Spearfish Gold Mining and Reduction Company, agreed to meet with Spearfish residents to discuss complaints “regarding the cyanide tailings from his plant being dumped into tributaries to the Spearfish [C]reek and thence washed into the main stream, and which has been contended is the cause of so many fish dying.”²⁰

When Vannatta met with Spearfish citizens in late June of 1901 he assured them that the Spearfish Gold Mining and Reduction Company was in the process of constructing a settling dam across Johnson Gulch “about thirty feet in height [that] will obviate all trouble so far as the tailings from the mill are concerned.”²¹ Supported by the press of Lead and Deadwood, President Vannatta continued to blame dynamite-wielding fish poachers, while also insisting that the destruction of fish in Spearfish Canyon could not have been caused by the Spearfish Gold Mining and Reduction Company on practical scientific and business grounds as well.

Vannatta explained through the Lead and



Deadwood papers how the cyanide concentration in Spearfish Creek was too low to kill fish or the biota that they fed upon, and, further, that the cyanide used in the gold-extraction process was so expensive that no self-respecting operator of a cyanide mill would allow toxic concentrations of cyanide to escape into local streams because the expense would quickly put the mill out of business.

Vannatta was not incorrect, but he obfuscated the true cause of the fish kills on Spearfish Creek. It was not the cyanide that killed fish but the fine sands and slimes created as a byproduct of the cyanide leaching process. These fine tailings and slimes slowly made their way down Johnson Gulch by gravity and when they entered Spearfish Creek in concentration they covered the gravel stream beds—the breeding habitat for trout—and the bank grasses that supported the insects that the trout fed upon. Often, these fine sands became trapped in the gills of fish and suffocated them directly. It was the tailings, rather than cyanide itself, that posed the true threat to the burgeoning game fisheries of the northern Black Hills.²²

During these first years of conflict between mining syndicates and fishery advocates in Spearfish Canyon a sizeable majority of Spearfish Valley residents sided with the fish interests even though much of the profit of their irrigated farms came from the sale of produce directly to northern Black Hills mining communities. That there was animosity against mining interests from Spearfish farmers was perhaps unsurprising, as Spearfish Valley agriculturists had organized in 1889 and again in 1899 to protest against the acquisition and diversion of hundreds of miner's inches of water from the headwaters of Spearfish Canyon by the powerful Homestake Mining Company.²³

Cyanide reduction works in Spearfish Canyon posed more direct challenges to valley farming, however, during the first decade of the twentieth century. The same fine sands and slimes that killed trout also made their way down to the Spearfish Valley during floods and into the irrigation ditch-

es of Spearfish agriculturists. Spearfish resident John E. Walton, for example, remembered how Spearfish farmers would race to their head gates to close their ditches whenever there were heavy rains or flooding in Spearfish Canyon, "especially when the report comes that the cyanide dams are broke on the stream and are flooding down, we shut down the headgate."²⁴ We do this, continued Walton, "for the reason that there is so much sediment coming down the stream it would fill up our ditches and cause us a great deal of work to clean them out."²⁵

In the summer of 1903 ongoing complaints from a coalition of fisheries advocates and Spearfish agriculturists culminated with an investigation of the Spearfish Gold Mining and Reduction Company by M. B. Ocumpaugh, the first game warden for Lawrence County, South Dakota. After examining the mining interests in Spearfish Canyon in early July, Ocumpaugh optimistically concluded that the cyanide threat to the Spearfish fishery was over because the Allen Brothers and Soule mill was no longer in operation and local interests had compelled the Spearfish Gold Mining and Reduction Company to construct settling dams for its tailings in Johnson Gulch.²⁶ D. C. Booth, superintendent of the Spearfish federal hatchery, apparently concurred, for three months earlier he had authorized the stocking of Squaw Creek, the former site of the troubled Allen Brothers and Soule mill, with ten thousand brook trout for the first time.²⁷

Less than one month later, however, a storm in the northern Black Hills produced a flood that destroyed the Spearfish Gold Mining and Reduction Company's settling dam and, much to the chagrin of farmers and trout advocates, sent sand and slimes sweeping all the way down into the community of Spearfish, killing trout, for the first time, within the city limits.²⁸ Deadwood's *Weekly Pioneer-Times* prosaically reported that "the supposition at first was that the fish had been poisoned by the cyanide from the plants along the upper stream, but careful examination revealed



The Spearfish Mining and Milling Company operated a 250-ton mill on Johnson Gulch in Spearfish Canyon blamed for fish kills between 1901 and 1903, and allegedly in 1908. (Charles H. Fulton, The Cyanide Process in the Black Hills of South Dakota [Bulletin No. 5, Department of Metallurgy, South Dakota School of Mines] (Rapid City, SD: Rapid City Journal Print, 1902), opposite p. 40.)

the fact that their distress consisted of an accumulation of sand in their gills which was strangling them.”²⁹

In Spearfish, the *Queen City Mail* took a much more indignant stance on the pollution of Spearfish Creek by mining interests, a stance that elucidated just how important fisheries had become to the economy of the community in just the three years since the federal hatchery began operation in 1900. “It is not the desire of the Mail”, wrote the editor, “to work hardship on anyone, but some means must be found to prevent absolutely this cyanide nuisance.” The *Mail* reminded readers that “it is against the law to kill trout in any way except by catching them,” and that “negligence, as well as ignorance of the law, is no excuse.” The editor stormily concluded that “thousands of people visit the Spearfish stream every year for the sport of fishing” and that “this must not be interfered with by any corporation’s neglect.”³⁰

Despite the anxiety of Spearfish residents, the Spearfish Gold Mining and Reduction Company continued to operate largely bereft of local or state oversight of pollution of Spearfish Creek until, its ores at Ragged Top exhausted, the cyanide mill concluded operations in 1906 and burned to the ground under mysterious circumstances

the following year.³¹ It seemed that during these first years of silver and gold cyanide extraction, in Spearfish Canyon at least, the fishing interest would always give way to mining.

The plight of the Reliance Gold Mining Company between 1903 and 1910, however, suggests that local opposition to the pollution of streams or the destruction of fish and a burgeoning tourist industry could dramatically shape the mining interests in Spearfish Canyon and the northern Black Hills. Reliance began development in 1903 and the property consisted of 7,500 feet of workings with the potential to produce 750,000 tons of cyaniding ore valued at four to eight dollars per ton.³² In May 1906 the company, under the supervision of General Manager F. W. Medbery, began constructing a 150-ton wet-crushing cyanide mill on Annie Creek, a tributary of Spearfish Creek, just two miles downstream from the railroad station at Elmore, one of the major trout distribution points, in Spearfish Canyon.³³

A year later, in May 1907, the *Lead Daily Call* reported that “the slimes from the Reliance [M]ill near Portland have overflowed into Spearfish Creek” and acknowledged that “thousands of trout could be seen floating down the stream, killed by the cyanide.” A “settling dam” meant to stop the polluting of Spearfish Creek

failed, according to the *Call*, because “this dam has been allowed to fill up until it overflowed into Annie Creek, being carried from there into the Spearfish.”³⁴ The Reliance Gold Mining Company attempted to remedy the pollution of Spearfish Creek’s waters by constructing or enlarging two settling dams on Annie Creek during the summer and autumn of 1907.³⁵

In March 1908, however, Lawrence County game warden Jack Hall investigated the Annie Creek watershed and “made a thorough investigation of the supposed cause of the trouble along Spearfish [C]reek, whereby the stream has been discolored for several weeks.” Hall concluded that the Reliance Gold Mining Company had “used every effort to prevent the escape of cyanide into the stream.”³⁶ Just a month later, however, the Reliance’s settling dam on Annie Creek failed to prevent slimes and sands from entering Spearfish Creek after several days of heavy rain in the northern Black Hills. The crew of the Chicago Burlington and Quincy’s Spearfish-Deadwood local discovered the resulting fish kill, gathering eighty-seven dead fish from Spearfish Creek while transiting the canyon.³⁷

After word of the fish kill reached Deadwood via the railroad crew, Judge William G. Rice of the Eighth Circuit Court of Appeals granted an injunction on 28 April 1908 against the Reliance Gold Mining Company to prevent it “from permitting the tailings from its cyanide mill on Annie [C]reek to pollute the waters of Spearfish [C]reek.” Petition affidavits claimed that trout had been killed for “several miles below Annie [C]reek;” while “the waters of the Spearfish were rendered muddy” from its confluence with that aforementioned stream.³⁸ The injunction against the Reliance Gold Mining Company satisfied no one. “The damage has already been done,” concluded the *Queen City Mail*, “and it will require years to repair it, so far as restocking the stream is concerned.”³⁹

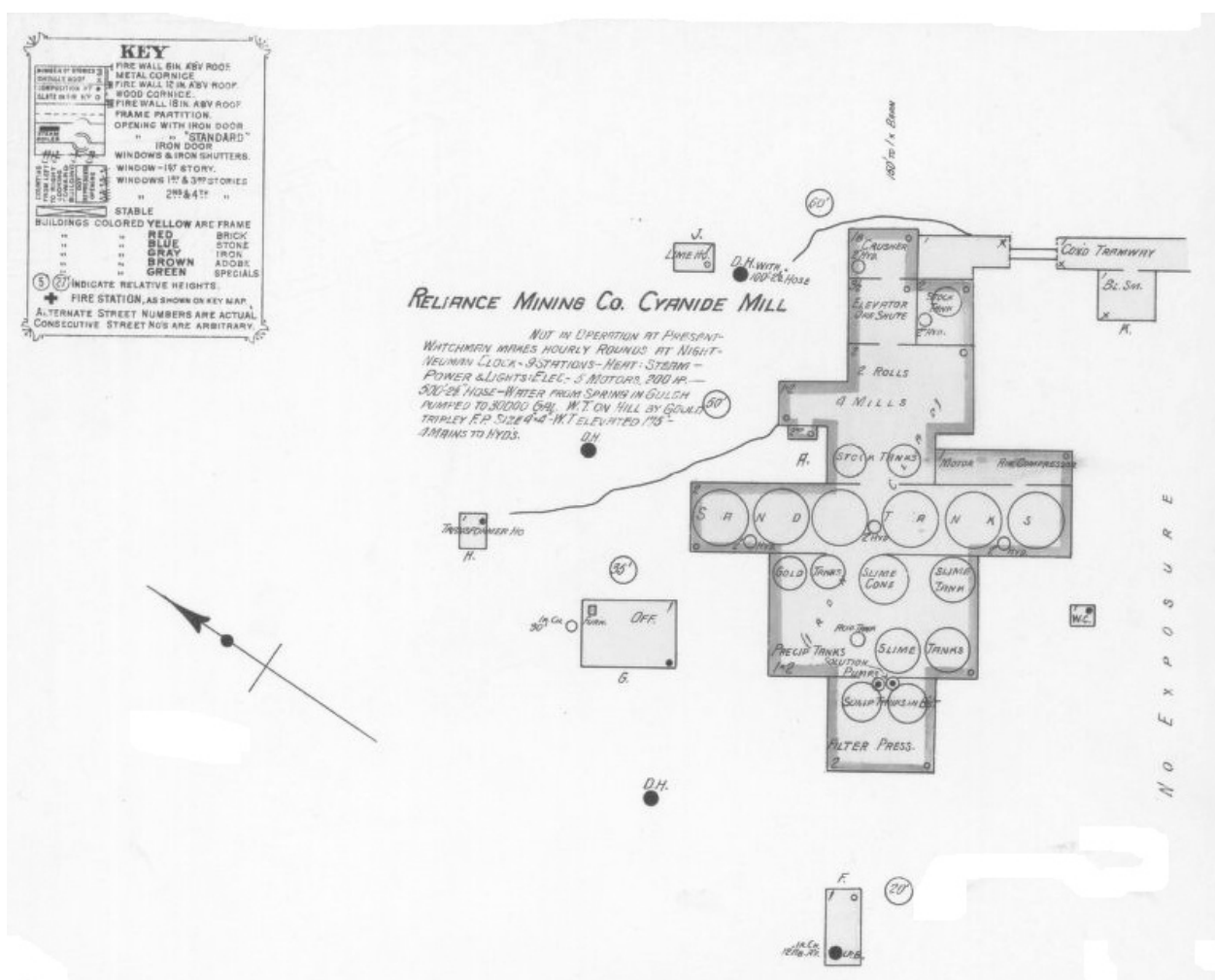
A week later, on 6 May 1908, advocates for the Reliance Gold Mining Company made a more

public and controversial claim that the destruction of fish was not on account of the Reliance at all, but instead was caused by the destruction of the old settling dam in Johnson Gulch of the defunct Spearfish Gold Mining and Reduction Company, which had ended active mining operations in 1906.

Investigators made their way up Johnson Gulch and reported that the settling dam of the old Spearfish Gold Mining and Reduction Company had indeed failed, and more ominously, it appeared to them that the dam face had been laid open by dynamite “by some miscreant for the purpose of killing fish and causing trouble to innocent parties.” The *Queen City Mail* reported that the managers of the Reliance company “feel greatly relieved over this discovery as they have made every effort and at large expense to protect the fish of Spearfish [C]reek.”⁴⁰

The sabotage of the Spearfish Gold Mining and Reduction Company’s settling dam in 1908 remains one of the most enduring mysteries of the conflict between the mining and fish interests in Spearfish Canyon between 1898 and 1910. No one was ever found responsible for the destruction of the dam and it remains unclear if the motive was to damage the Spearfish fishery, to provide cover for the Reliance Gold Mining Company for its polluting of the stream and destruction of fish, or if it was simply a random act of vandalism with unintended consequences for all parties involved.

The injunction against the Reliance Gold Mining Company unleashed a contentious debate in the Black Hills about the futures of mineral extraction and recreational fishing in the region. The *Daily Deadwood Pioneer-Times* of 3 May 1908 described the situation as “unfortunate,” and hoped that the solution would not ultimately be reached by “doing away with one of them.” If, however, “the conflict between the fisherman and the mill operator reached a point where the extermination of one or the other became necessary, the fisherman would have to give way.” “The Black Hills people,” concluded the newspaper,



Sanborn fire insurance map of the Reliance Gold Mining Company. The company began operations along Annie Creek in Spearfish Canyon in 1906 before being shut down by judicial injunction in 1908 for polluting Spearfish Creek and destroying fish. (Sanborn Map Company, "Terry, South Dakota," p. 1 (1909), Library of Congress.)

“do not depend on fishing for a living but they are dependent on the mining industry and without it there would be no one here to indulge in the sport of fishing.”⁴¹

A year later, in May 1909, Deadwood's *Weekly Pioneer-Times Mining Review* wrote that "when it comes to a question between mining and milling ore and the preservation of a few fish in the streams of the Black Hills, the preponderance of opinion is that the fish must go." The author lamented that the region's mining companies made "sincere efforts" to protect "a few measly fish" at

an expense to the company “not warranted by the grade of the ores.” The mines, continued the author, “should not be subject to the penalties imposed by the statutes” for the destruction of fish and concluded that “any mine giving employment to twenty or more miners and mill men is worth more to the Black Hills than all the fish turned out by the Spearfish hatchery.”⁴²

Despite ostensive hostility toward the fishing interests, a compromise that might be called the “headwaters solution” appeared to gain traction among proponents of mining operations in the

Black Hills during the spring of 1908. The *Black Hills Weekly Journal* reluctantly admitted in April 1908 that cyanide reduction works on streams such as Spearfish Creek might “render the waters unfit for trout,” but also noted that the “headwaters of such streams” above the reduction works remained relatively pristine and that “there will probably always be many miles of creeks in the limestone [ridge country of the Black Hills] offering safe and pure waters for trout.” “For those who hope to enjoy good fishing in the Hills” concluded the *Journal*, “give some attention to the stocking of the streams above the probable sources of pollution.”⁴³

By this reasoning the main branches of major streams such as Spearfish Creek would be given over to the cyanide mills of the mining companies and essentially abandoned by fishermen. In turn, however, fishery resources for planting and protecting fish could be consolidated—and their effects maximized—in the smaller headwaters streams of the high limestone plateau in the sections of the Black Hills National Forest well above the then-current centers of mineral extraction and cyanide reduction in Spearfish Canyon and on other streams.

Although this headwaters compromise never became official policy of the U.S. Fish Commission in the Black Hills region, there is some evidence that the Spearfish hatchery’s superintendent, D. C. Booth, pragmatically supported such a compromise and quietly shifted fisheries resources toward the Spearfish headwaters during these years. Between 1906 and 1909, for example, records show that Booth and his associates planted fewer trout in Spearfish Canyon along the main stream between Maurice and Savoy and, instead, increased plantings in the Little Spearfish Creek and headwaters branches of the East Fork and West Main Fork of Spearfish Creek above Elmore.⁴⁴

During these same years Booth also made a number of unusual authorizations to plant smaller numbers of brook trout into headwaters

streams of Spearfish Canyon tributaries closer to mining communities on the southeastern margins of the Bald Mountain Mining District, but not in the lower reaches of these same streams at their confluence with Spearfish Creek.⁴⁵ If Booth was compromising with mining interests, he was doing so from a position of increasing strength as the tourist industry blossomed in the Black Hills during the decade prior to the start of the Great War in 1914.

In 1908, for example, the Victoria Mining Company completed a new one hundred-ton cyanide mill along Spearfish Creek and, recognizing the increasing importance of the Spearfish trout fishery to the recreational tourism economy of the northern Black Hills, the *Weekly Pioneer-Times* assured its readers that “the location of the mill makes it an easy proposition to dispose of tailings without polluting the waters of Spearfish [C]reek,” while also reporting that “across the gulch” from the cyanide mill lay a “natural sand bar which acts as a filter.” If that were not sufficient, the proprietors of the Victoria’s mill also promised that “the company will construct a dam which will effectually confine the sluicings in a most effective manner.”⁴⁶

The decision of the Victoria Mining Company to advertise the lengths to which it was willing to go to protect the Spearfish Canyon fishery might well have been influenced not just by the ongoing injunction against the Reliance Gold Mining Company on Annie Creek, but also by changing public attitudes in the Black Hills toward the region’s nascent cold water fisheries. By the autumn of 1908 the Chicago Burlington and Quincy Railroad regularly shuttled fishermen through Spearfish Canyon even while litigation continued to be brought against cyanide mining interests in the Black Hills for polluting fishing streams. In the spring of 1909, a statewide push to bolster fish and game laws during the upcoming session of the South Dakota legislature gained momentum.⁴⁷

Unlike the Spearfish Gold Mining and Reduction Company, which had operated with little re-



A Chicago, Burlington and Quincy excursion train near Savoy, South Dakota, in Spearfish Canyon in 1908. Between 1900 and 1910 the railroad supported mining interests in Spearfish Canyon but also helped each season to plant trout in the canyon and to convey fishermen to their favorite spots along the creek. (Stimson Collection, Wyoming State Archives Photo Collection, Cheyenne.)

gard for or consequence from the fishing interests in Spearfish Canyon just five years earlier, the Reliance Gold Mining Company found itself incapable of extricating itself from legal entanglement or public pressure to avoid polluting the stream. The Reliance was unable to get the injunction against it lifted and the property remained largely unproductive between April 1908 and June 1909. During that time, company investors constructed expensive new siphon systems to settle the tailings and expended even more resources to construct a new and seemingly indestructible settling dam across Annie Creek.

In June of 1909, when the Reliance Gold Mining Company was finally ready to get out from under the injunction and resume active mining operations, fate intervened again, as a devastating rainstorm struck the headwaters of the Spearfish Canyon watershed, sweeping away the company's

new settling dam. In the aftermath of the destruction of their improved dam across Annie Creek, the investors in the Reliance Mining Company turned on one another and the company collapsed into bankruptcy and reorganization proceedings in the spring of 1910.

Reorganized as the New Reliance Gold Mining Company in the summer of 1910, company officials were never able to successfully solve the issue of pollutants entering Spearfish Creek. The *Mining World* reported that the company—"idle for nearly 2 years since the mill was shut down, when trouble over the tailings occurred with the wash-out of the dam"—was preparing to resume operations in June 1911.⁴⁸

Three years later, however, in 1914, the New Reliance was still expanding the height its tailings dam on Annie Creek by twenty feet "to prevent the overflow with the spring waters."⁴⁹ By

that point the New Reliance Mining Company's tailings settlement dam across Annie Creek was 50 feet high and 160 feet long in the company's continuing attempt to "impound the tailing[s] so that none shall escape" into Spearfish Creek.⁵⁰ In 1914, however, the outbreak of the Great War in Europe would drastically alter the mining scene in the northern Black Hills and effectively end mining by the cyanide process in the low-grade Spearfish Canyon mining districts.

In the end it is hard to know with any certainty to what degree the creation of a fresh water trout fishery in the northern Black Hills shaped the corresponding development of mining by the cyanide process in the Spearfish Canyon mining districts between 1898 and 1909. It is clear, however, that during those years the profits from mining investment predicated on using cyanide technology to extract profitable amounts of gold and silver from low-grade ores must have suffered due to the costs incurred in protecting trout fisheries from tailings and fighting litigation.

Some mining interests in the Black Hills went so far as to suggest that fear of litigation over stream pollution actually kept investors from developing properties during those years in the much larger Bald Mountain District that bordered the

Spearfish watershed. One mining advocate went so far as to conclude that several mining ventures in the "Bald Mountain country" collapsed "because it was discovered that in the operation of the mill it would be necessary to allow the tailings to find their way, directly or indirectly, to Spearfish creek and that the pollution of that stream to the slightest degree would be met by an application for an injunction."⁵¹

While it is impossible to know for sure if the fishing interest stymied mining's development in the northern Black Hills during those years, this early conflict foreshadowed clashes to come. For miners and fishermen would continue to compete for control of water resources in the Black Hills and in the mining districts of the West more broadly in the decades to follow.

John Henris is an assistant professor at the University of Arkansas at Monticello who is interested in the environmental history of the Black Hills and the Northern Great Plains. He has published about recreational fisheries in the Black Hills of South Dakota in South Dakota History (2015) and in the Black Hills of Wyoming in Annals of Wyoming (2019), and his study of the apple industry in the Spearfish Valley is forthcoming in Agricultural History. He would like to thank the Mining History Association for funding this work.

Notes:

1. Dewitt Clinton Booth to Donald McPherson, 7 May 1908, Letterpress Book Spearfish Hatchery, 29 Jan.-8 Aug. 1908, 217-18, Box Fish 156, Catalog no. 6200, D. C. Booth Historic National Fish Hatchery and Archives, Spearfish, SD [hereafter: "Booth Papers" for Booth correspondence and "Hatchery Archives" for other materials].
2. Andrew C. Isenberg, *Mining California: An Ecological History* (New York: Hill & Wang, 2005), 46-7; David Stiller, *Wounding the West: Montana, Mining, and the Environment* (Lincoln: University of Nebraska Press, 2000), 78-80; 113-7.
3. Historians have traditionally explored the intersections between mining, conservation, and recreation in terms of forestry rather than fisheries. See, for example: Richmond Clow, "Timber Users, Timber Savers: Homestake Mining Company and the First Regulated Timber Harvest," *South Dakota History* 22 (Fall 1992): 213-37; Martha Geores, *Common Ground: The Struggle for Ownership of the Black Hills National Forest* (Lanham, MD: Rowman & Littlefield, 1996); John Freeman, *Black Hills Forestry: A History* (Boulder: University Press of Colorado, 2015).
4. Richmond Clow, *Chasing the Glitter: Black Hills Mining, 1874-1959* (Pierre, SD: South Dakota State Historical Society Press, 2002), 97.
5. "Brief Local Items," *Queen City Mail* (Spearfish, SD), 5 July 1899. For discussion of the working of neighboring Bald Mountain ores by the new cyanide process see: David Wolff, "Mining Ground on the Fringe: The Horseshoe-Mogul Mining Company of the Northern Black Hills," *Mining History Journal* 2

- (1995): 21-3; Richmond Clow, "The Bald Mountain Mining Company and Cyanide Gold Recovery in the Black Hills," *Mining History Journal* 13 (2006): 49-51.
6. "Brief Local Items," *Queen City Mail*, 5 July 1899.
7. "Semi-Local Paragraphs," *Queen City Mail*, 4 Apr. 1900; "Wheels Set in Motion," *Queen City Mail*, 26 Sep. 1900; Charles H. Fulton, "The Cyanide Plant of the Cleopatra Gold Mining Company," *The Cyanide Process in the Black Hills of South Dakota* [Bulletin No. 5, Department of Metallurgy, South Dakota School of Mines] (Rapid City, SD: Rapid City Journal Print, 1902), 55-7; Burlington and Missouri River Railroad Company, *Mines and Mining in the Black Hills* ([Chicago?]: Passenger Department Burlington Route, 1901), 12; George Baldwin (ed.), *The Black Hills Illustrated: A Terse Description of Conditions Past and Present of America's Greatest Mineral Belt* (Philadelphia: Baldwin Syndicate, 1904), 172.
8. J. D. Irving, "Ore Deposits of the Northern Black Hills," *Contributions to Economic Geography, 1903* [Department of the Interior, United States Geological Survey] (Wash., D.C.: USGPO, 1904), 138-9; Charles H. Fulton, "The Tailings of the Allen Bros. & Soule at Carbonate, S.D.," *The Cyanide Process in the Black Hills of South Dakota* [Bulletin No. 5, Department of Metallurgy, South Dakota School of Mines] (Rapid City, SD: Rapid City Journal Print, 1902), 52-4.
9. Irving, "Ore Deposits of the Northern Black Hills," 138; Clow, "Bald Mountain Mining Company," 47.
10. Cleophas O'Harra, *The Mineral Wealth of the Black Hills* [Bulletin No. 6, Department of Metallurgy, South Dakota School of Mines] (Rapid City, SD: Rapid City Daily Journal Steam Print, 1902), 48-9; Charles H. Fulton, "The Cyanide Plant of the Spearfish Gold Mining and Milling Company," *The Cyanide Process in the Black Hills of South Dakota* [Bulletin No. 5, Department of Metallurgy, South Dakota School of Mines] (Rapid City, SD: Rapid City Journal Print, 1902), 40-1; Baldwin, *Black Hills Illustrated*, 172-3.
11. D. C. Booth to Charles Coolidge, 24 Jan. 1912, Letterpress Book Spearfish Hatchery, 26 Nov. 1911-8 July 1912, 118, Box Fish 156, Catalog no. 6197, Booth Papers.
12. Barton Warren Evermann and Ulysses O. Cox, *Report Upon the Fishes of the Missouri River Basin* (Wash., D.C.: USGPO, 1896), 384.
13. Evermann and Cox, *Fishes of the Missouri River Basin*, 325-6, 384; John Henris, "No Finer Trout Streams in the World than These": The Making of a Recreational Fishery in the Black Hills Forest Reserve," *South Dakota History* 45, no. 4 (Win. 2015): 276-82.
14. Dewitt Clinton Booth, "Fish Culture in the Black Hills," *Pahasapa Quarterly* 1, no. 4 (June 1912): 13-7; Henris, "No Finer Trout Streams," 283-93.
15. For trout statistics for Spearfish Creek, 1900-02, see: Letterpress Book Spearfish Hatchery, 26 Nov. 1911-8 July 1912, 30-1 (for brook trout), and 35 (for black-spotted trout), Box Fish 156, Catalog no. 6197, Hatchery Archives.
16. Richard C. Patterson, *The Gold Hill Mining Company* [pamphlet] (Omaha, NE: [the Company], 1902), 16.
17. "City Council," *Queen City Mail*, 6 Nov. 1901.
18. During these years the company was known variously as the Spearfish Gold Mining and Development Company, the Spearfish Gold Mining and Reduction Company, and the Spearfish Gold Mining and Milling Company. *Queen City Mail*, 13 June 1900; "South Dakota," *Mining Reporter* 46, no. 22 (27 Nov. 1902): 453; "South Dakota," *Mining Reporter* 48, no. 7 (13 Aug. 1903): 153.
19. "City," *Lead [SD] Daily Pioneer-Times*, 1 June 1901. Interestingly, no brook or black spotted trout were planted in Spearfish Creek until after July 1901 and then only above Savoy, a station a few miles up the canyon from Johnson Gulch, the location of the Spearfish Mining and Reduction Company's cyanide plant. See: Letterpress Book Spearfish Hatchery, 26 Nov. 1911-8 July 1912, 30, 35, Box Fish 156, Catalog no. 6197, Hatchery Archives.
20. "Cyanide and Dead Fish," *Weekly Pioneer-Times* (Deadwood, SD), 1 Aug. 1901.
21. "Cyanide and Dead Fish," *Weekly Pioneer-Times*, 1 Aug. 1901.
22. Another potential cause of the pollution of Spearfish Creek during these years was the destruction of the first Spearfish Gold Mining and Reduction Company cyanide mill by fire in October 1901, as reported by Frank Carpenter. In the aftermath of this fire the cyanide mill was rebuilt. See: Frank Carpenter, "South Dakota" in: *Report of the Director of the Mint Upon the Production of Precious Metals in the United States During the Calendar Year 1902*, 58th Congress, 2nd Session, House of Representatives, Document No. 351 (Wash. D.C.: USGPO, 1903), 198.
23. Spearfish Citizens, "To the Black Hills Canal and Water Company, The Homestake Mining Company, and Thomas J. Grier," November, 1882, Cook Evans Box 5, Folder 5.17, Homestake Adams Cultural Resource Center, Deadwood, SD [hereafter: Cultural Resource Center]; "Homestake Water Ditch," *Daily Deadwood [SD] Pioneer-Times*, 14 Mar. 1890, 2; "Minor Mention," *Queen City Mail*, 19 Feb. 1890, 2; "Testimony of William P. Lindley," Trial Transcript v. VIII, *Cook et al. v. Evans et al.* (1918) Water Rights Case, 146, Cook-Evans Collection, Box 8, Folder 8.1, Cultural Resource Center; Steven Mitchell, *Nuggets to Neutrinos: the Homestake Story* (Bloomington, IN: Xlibris, 2009), 187-90, 208-10.

24. "Testimony of John E. Walton," Trial Transcript v. IV, *Cook v. Evans*, 290, Cook-Evans Collection, Box 3, Folder 17, 97.2.3.17, Deadwood City Archives, Department of Planning and Preservation, Deadwood, SD.
25. "Testimony of John E. Walton," 290-1.
26. "Fish Guardian is Industrious," *Weekly Pioneer-Times*, 9 July 1903; "The Fish Question," *Queen City Mail*, 5 Aug. 1903.
27. For the stocking of Squaw Creek with ten thousand brook trout on 10 April 1903, see: Letterpress Book Spearfish Hatchery, 26 Nov. 1911-8 July 1912, 31, Hatchery Archives.
28. "Fish Strangled With Sand," *Weekly Pioneer-Times*, 13 Aug. 1903; "The Fish Question," *Queen City Mail*, 5 Aug. 1903.
29. "Fish Strangled With Sand," *Weekly Pioneer-Times*, 13 Aug. 1903.
30. "The Fish Question," *Queen City Mail*, 5 Aug. 1903.
31. "Spearfish Cyanide Mill Burned Down," *Lead [SD] Daily Call*, 16 Sep. 1907; Untitled, *Queen City Mail*, 25 Sep. 1907.
32. "American Mining Congress: A Brief Resume of Its Sessions at Deadwood and Lead, South Dakota," *Mining Reporter* 48, no. 12 (17 Sep. 1903): 256; "In the Bald Mountain District of the Black Hills, South Dakota," *Mining Reporter* 53, no. 26 (28 June 1906): 635. E. P. Porter suggests that the Reliance Mining and Milling Company may have been working toward the erection of a 300-ton cyanide plant as early as the autumn of 1903 or spring of 1904, but the first active plants seems to have been constructed in 1906. See Porter's report on South Dakota in: David Day, *Mineral Resources of the United States, Calendar Year 1903*, 58th Congress, 3rd Session, House of Representatives, Document No. 20 (Wash., D.C.: USGPO, 1904), 190.
33. "Reliance Mill," *Queen City Mail*, 2 May 1906; "South Dakota," *Mining World* 25, no. 15 (13 Oct. 1906): 477.
34. "Spearfish Creek Damaged," *Lead Daily Call*, 21 May 1907.
35. "Lawrence County," *Mines and Mining Weekly* 15, no. 12 (20 Dec. 1907): 21.
36. "Local Brevities," *Queen City Mail*, 18 Mar. 1908.
37. "Not Tailings from Reliance," *Queen City Mail*, 6 May 1908.
38. "Court Restrains Reliance Company," *Queen City Mail*, 29 Apr. 1908.
39. "Court Restrains Reliance Company," *Queen City Mail*, 29 Apr. 1908.
40. "Not Tailings from Reliance," *Queen City Mail*, 6 May 1908.
41. "Question of Mills or Fish," *Daily Deadwood Pioneer-Times*, 3 May 1908.
42. "Mines vs. Fish," *Weekly Pioneer-Times Mining Review* (Deadwood, SD), 13 May 1909.
43. "Friday, April 3, 1908," *Black Hills Weekly Journal* (Rapid City, SD), 3 Apr. 1908.
44. Letterpress Book Spearfish Hatchery, 26 Nov. 1911-8 July 1912, 31-3; 36-8, Hatchery Archives.
45. See, for example, consignments for brook trout for three Terry, South Dakota, residents—Edward Manion, Roland Garton, and Frank Burkit—that could only have been destined for small headwaters streams in the Spearfish or False Bottom watersheds. D. C. Booth to Edward Marion, 2 May 1908; D. C. Booth to Roland Garton, 2 May 1908; D. C. Booth to Frank Burkit, 2 May 1908, Letterpress Book Spearfish Hatchery, 29 Jan. 1908-8 Aug. 1908, 185-7, Box Fish 156, Catalog no. 6200, Hatchery Archives.
46. "Victoria Mine to Soon Resume," *Weekly Pioneer-Times*, 11 June 1908.
47. For development of the Victoria Mining Company and its cyanide plant see: Baldwin, *Black Hills Illustrated*, 137; Walter Ingalls (ed.), *The Mineral Industry[:] Its Statistics, Technology and Trade During 1905*, v. 14 (New York: *Engineering and Mining Journal*, 1906): 289; "South Dakota," *Mining World* 27, no. 9 (31 Aug. 1907): 371. For litigation against other cyanide mining operations in the Black Hills in 1908 for polluting fishing streams see, for the Safe Investment Mining Company: "Sentence Deferred," *Lead Daily Call*, 4 Mar. 1908; "Found Guilty of Killing Fish," *Weekly Pioneer-Times*, 5 Mar. 1908. For litigation against the Gilt Edge-Maid Mining Company see: "Courts Restrains Reliance Company," *Queen City Mail*, 29 Apr. 1908; "Suspends Work to Prepare for Building," *Daily Deadwood Pioneer-Times*, 17 Jan. 1909. For litigation against the North Homestake Company see: "Court Restrains Reliance Company," *Queen City Mail*, 29 Apr. 1908. For cyanide pollution and efforts to improve South Dakota game and fish law for the protection of trout during the Eleventh Session of the South Dakota State Legislature in 1909 see: Henris, "No Finer Trout Streams," 297-300.
48. "South Dakota," *Mining World* 24, no. 22 (3 June 1911): 1152 (quote, *sic*); "South Dakota in 1910," *Engineering and Mining Journal* 91, no. 1 (7 Jan. 1911): 58; "Black Hills, South Dakota," *Mining and Scientific Press* 102, no. 3 (21 Jan. 1911): 148.
49. "South Dakota," *Mining and Engineering World* 40, no. 17 (25 Apr. 1914): 799.
50. Jesse Simmons, "New Reliance Mill Practice, With Particular Reference to Continuous Decantation," *Mining and Scientific Press* 109 (7 Nov. 1914): 724.
51. "Question of Mills or Fish," *Daily Deadwood Pioneer-Times*, 3 May 1908.