Anatomy of a Mine Report: John H. Marks's Report on the San Juan Placer Operations, San Juan River, Utah, 1909

By Robert Sorgenfrei

Over millions of years, gold has washed down into the San Juan River from tributary rivers in Southwestern Colorado. The San Juan's major tributary, the Animas River, supplies more than half of its water, and a great deal of its gold. From Colorado, the San Juan flows southwest into New Mexico, and then briefly returns to Colorado near the Four Corners before it finally flows into Utah, where it empties into the Colorado River in Glen Canyon. In all, the river is about three hundred miles long and drains an area of about 25,800 square miles. Although its annual flow of two and a half million acre–feet of water is over twice that of the Rio Grande, the San Juan has remained a relatively unknown river, flowing through an isolated region. After the river reaches Utah, about 8.3 miles downstream from the town of Bluff, it enters a canyon where it largely remains until it reaches the Colorado River.

From the start of this San Juan River Canyon to the Colorado River, as the crow flies, is a distance of sixty–three miles. But because of the canyon's twists and turns, one must travel 133 miles through the San Juan River Canyon to reach its mouth in Glen Canyon. Except for short distances where the river flows through open country, the canyon has precipitous walls as much as a half–mile high. The region around the San Juan River Canyon is rough, broken, arid country that even today is difficult to access, with few good roads. Over time, placer gold deposits have formed in the San Juan River Canyon. However, gold is not all the San Juan River carries. It is a very silt–laden river and any gold ending up in the canyon's placer deposits after its long journey from Colorado has been ground down to fine dust by the abrasive silt. This "flour gold" is notoriously difficult to recover.[1]

In 1883, gold was discovered on the Colorado River not far from the mouth of the San Juan in Glen Canyon, and a minor gold rush began in the region. This paved the way for gold discoveries along the San Juan River in 1892, and by the end of that year the San Juan region was full of gold seekers. The Gabel Mining District was organized on 28 November 1892. The district's boundaries extended from the Utah–Arizona border to a point fifty miles north of the San Juan River between 110 degrees and 112 degrees west longitude. The lengthy rules and regulations drawn up for the mining district are on file at the recorder's office in Monticello, the seat of San Juan County, Utah.

In 1892, the *Salt Lake Tribune* carried numerous articles about the San Juan country that fueled the gold rush. For a while in that year, more than two hundred men a day came into the region. However, this was a short–lived gold rush. The gold found was mainly flour gold, so fine that most miners could not recover it in sufficient quantity to justify the effort. The boom was over by the end of January 1893, and men started to head for more promising areas in Glen Canyon and in the Henry Mountains. After the 1892 rush, mining continued in the area on a small scale for most of the first decade of the twentieth century. Most of this activity was confined to a twenty–mile stretch of the river below Clay Hill Crossing extending as far as the great bend

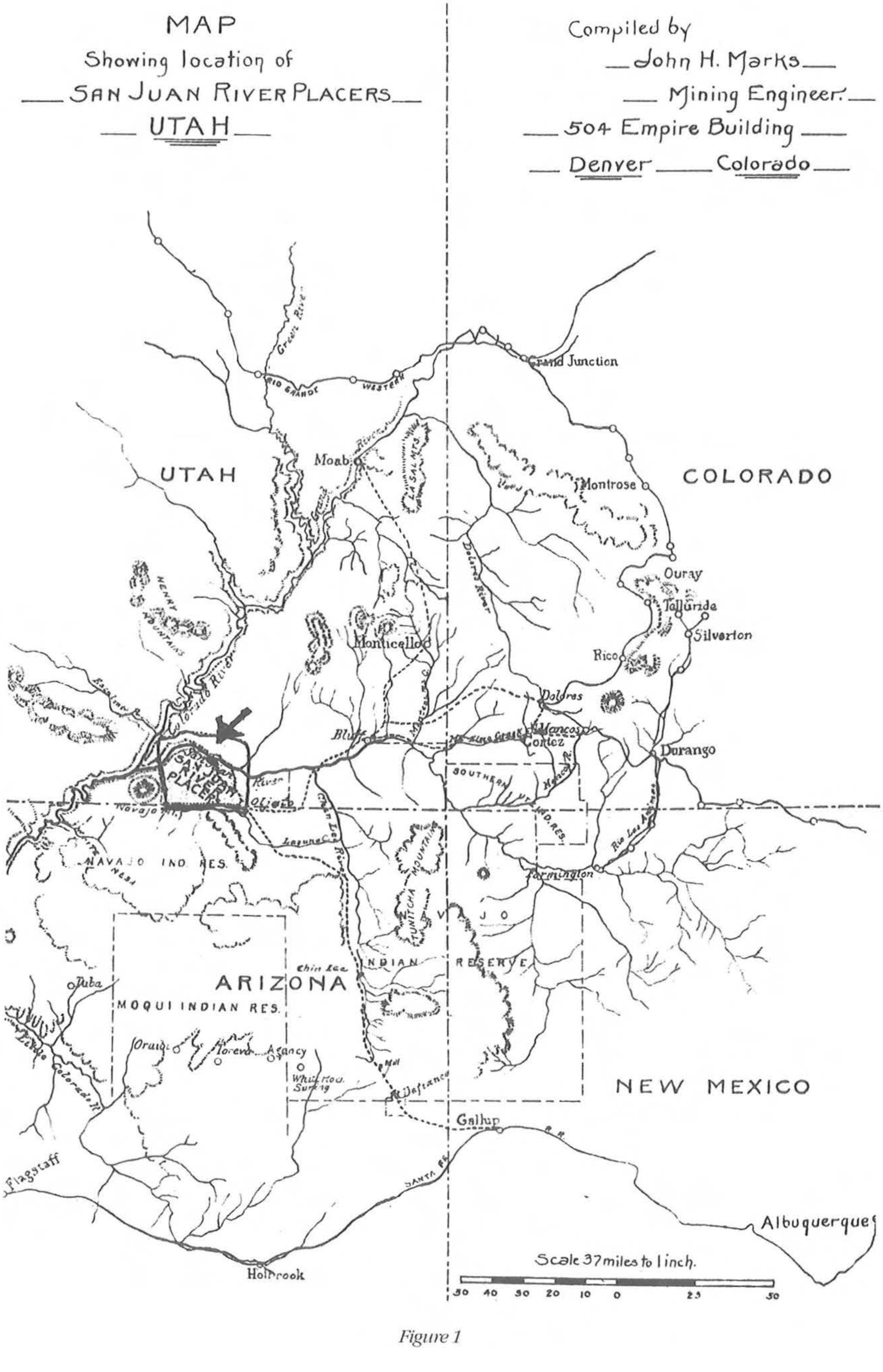
MAP
Showing location of
SAN JUAN RIVER PLACERS
UTAH
Compiled by
John H. Marks
Mining Engineer.
504 Empire Building
Denver Colorado
Grand Junction
UTAH
COLORADO
Moab
Montrose
Ouray
Telluride
Silverton
Rico
Monticello
Dolores
Mancos
Cortez
Durango
Bluff
Farmington
ARIZONA
MOQUI INDIAN RES.
NAVAJO IND. RES.
NEW MEXICO
Tuba
Gallup
Flagstaff
Holbrook
Albuquerque
Scale 37 miles to 1 inch.

Figure 1

of the San Juan River. In the early twentieth century, two prominent mining operations worked the San Juan Canyon. The Otto Zahn Family of Los Angeles owned and operated the first of these at a place called Zahn's Camp. They bought the placer claims at the camp in 1902 and conducted mining operations there intermittently until at least 1915.[2]

A few miles away from Zahn's Camp, Charles H. Spencer ran a second mining operation. Spencer, known to all who knew him simply as Charlie, would be associated with ambitious mining schemes for over fifty years. He was born in Colorado in 1872 and became a teamster, delivering freight by wagon in the Durango area. Spencer was first drawn to the San Juan country in 1892, when his freighting firm was engaged to haul supplies to the gold fields along the San Juan River. He later claimed that he celebrated his twentieth birthday by driving a wagon and team of oxen over terrain in the San Juan region that had never seen a wagon wheel. He was an expert bullwhacker, a special brand of teamster who could get a team of oxen to go places few other drivers could. Long after Spencer stopped freighting, stories were told in the San Juan country of how he got oxen to keep going through seemingly impassable terrain. In a rugged country with almost no real roads and few trails, this was a valuable and much–appreciated skill. It turned out that Spencer not only had a talent for handling pack animals, he also had a skill at dealing with his fellow man.

Spencer started to pick up knowledge of mining by watching and conversing with miners along the San Juan River as he delivered freight. Although he had little formal schooling, he was a quick learner and very personable. As he learned about mining, he became adept at using mining terms and jargon in ways that impressed would–be investors. Spencer soon developed a sales pitch that he used for years to entice money from would–be investors. Albert H. Jones, who worked for Spencer, wrote of him: "As a promoter he was an unqualified success. His Western manners and the magnitude of his projects and their fabulous possibilities seemed to have an irresistible appeal to the small investors, and when one operation failed or was inconclusive, he always managed to raise more money and try again."[3]

When he made what he thought was a discovery, Spencer spent little time with scientific testing. Instead, Spencer turned his considerable talents of persuasion to convincing others that his schemes were valid and, with financial backing, would be lucrative. Since he was a born salesman and truly believed everything he claimed, he

***Figure 2**. Charles H. Spencer at about the age of 30. Spencer got his start in the San Jan Country freighting supplies with teams of oxen and was known as the "Last of the Bullwhackers" because of his skill with animals.*

***Figure 3**. A team of oxen at Camp Ibex or Spencer Camp along the San Juan river. Even feed for the animals had to be brought in due to the lack of grass.*

was a real threat to the pocket book of any naive investor. Yet Spencer was not a fraud; he believed everything he told potential investors. He was also a hard worker, not afraid of doing his share of the manual labor in a camp. Perhaps because of his willingness to work along side of his crews, Spencer got along well with the men hired to work for him, even if he could not always pay them on time.

In about 1903, Spencer and his older brother, George, procured a modest grubstake and an outfit of riding and pack animals. They started to locate and develop claims along the San Juan River. Sometime during this period, Spencer developed a theory that the gold in the San Juan River came from the Wingate Sandstone Formation located along the river. He had tested for gold in gravel bars along the river and had found nothing, but he did find gold in eighteen–inch–thick layers of red sand that ran through the gravel bars. This red sand came from the Wingate Sandstone Formation. Spencer believed that he had discovered the source of the gold in the San Juan River. With this "discovery," he became convinced he had an answer to gold recovery that had eluded other miners along the river. Why dig flour gold out of placers, he reasoned, when you can get it from the source? Immense formations of Wingate sandstone lie along the San Juan River. Over countless years, this sandstone had exfoliated and fallen as talus piles, sometimes in gigantic heaps along the San Juan River. This material did not have to mined, it could simply be crushed and chemically amalgamated in order to recover the gold. To Spencer, the Wingate Formation provided an unlimited source of "ore at hand." All he had to do was convince others of the truth of his theory and vision for mining gold on the San Juan, and get them to finance it.[4]

About 1905, Spencer set up an operation a few miles west of Zahn's Camp, between Copper Canyon and Nakai Canyon, near the Great Bend of the San Juan River, about thirty–seven miles above the San Juan's confluence with the

Figure 4. *Supplies had to be brought in almost two hundred miles over poor or nonexistent roads. Here men are pulling on a rope so that the wagon will not tip over on this slope as it is tranversing it.*

Figure 5. *Spencer's mill operation consisted of a one cylinder gasoline engine powering a Samson Crusher with an amalgamating table. Here it is during its brief operation crushing Wingate Sandstone.*

Figure 6. *View of the San Juan Country during the winter. This illustrates the difficulty of getting supplies over the rough terrain.*

Colorado. Spencer began to promote his gold mining scheme after 1905, and obtained limited backing from some Chicago investors. His operation ran intermittently, depending on its cash flow from investors. Spencer called the area along the San Juan River where he ran his mining operation Camp Ibex, because, as he put it, "only a mountain goat would attempt to reach the place." However, it was commonly referred to as Spencer Camp, and maps that show its location use that name.[5]

In November of 1908, Spencer was able to recruit the services of mining engineer John H. Marks and his assistant, Albert H. Jones, a civil engineer. Both worked out of Denver and came to the San Juan country to survey and mark Spencer's claims for him. They worked for about three months doing this survey work while Spencer was away purchasing machinery to bring to the camp. He returned in mid–February and told them that a road would have to be constructed to get the machinery down to the camp along the river. With Marks and Jones surveying the route, Spencer employed a pick–and–shovel force of Navajos and Paiutes to construct the road. A one–thousand–foot rise from Nakai Creek to the rim of the San Juan River Canyon had to be traversed before the road could be built down to the river bottom. Grades ran as high as twenty–five percent in places on the road, which was completed in March of 1909. Spencer was then able to get the heavy machinery to his camp using ox–drawn wagons.[6]

The camp itself consisted of three rock walled structures covered with canvas tenting. Two of these buildings served as bunkhouses and the other as a cookhouse. Spencer located his mill a short distance downstream where Wingate sandstone "ore" was easily accessible. The mill used a Samson crusher and a rotary screen and a shaking screen to crush and size the sandstone, which then passed over amalgamating tables. Power to operate the mill came from a steam boiler that powered an air compressor and a large single-

cylinder Otto gasoline engine ran the crusher. It took five teams of oxen to haul the Otto engine into camp from Gallup. Aside from sampling placers, the company did no assaying before setting up the process. Spencer's operation was essentially a stockholder–financed experiment to see if gold could be mined from the Wingate Formation. This operation was also the first of Spencer's many ambitious attempts to make money by mining in the region.[7]

Even though supplies could now reach the camp on the wagon road, it still lay about as far away from a railhead as possible in the early–twentieth–century United States. Gallup, New Mexico, and Mancos, Colorado, the nearest railheads, were both about two hundred miles away. A man on horseback with pack animals could make the trip in six days. It took considerably longer for supplies to reach camp in ox–drawn wagons. Food for men, oxen, horses, and other pack animals had to be brought in. Only extremely poor grazing areas existed at the mining camp. The long distances over rough roads subject to periodic washouts by flash floods, posed a major limitation on this mining operation. Indeed, simply keeping the place provisioned with food was a major undertaking, and, at times, a source of discontent among the men working for Spencer.[8]

By the time Spencer got his road built and his machinery hauled and put in place, he had exhausted most of his funds. Operations had to be suspended and the crew disbanded and transported to the railroad at Gallup around the end of March 1909. At the same time, however, Spencer engaged Marks to write a report on his San Juan mining operation. Marks completed this report on 26 April 1909 and it was doubtlessly used by Spencer in Chicago that May as a tool to get investors to put more money into his operation. The report—entitled *San Juan Placers, Gable Mining District, San Juan County, Utah: Report for C. H. Spencer, General Manager*—survives to this day. The rest of this essay will analyze that report, examine how it fits into the pattern of mine reports of the day, and discuss how it was used to promote a mining operation that was, at best, a dubious proposition.[9]

Mine reports are documents written by professional mining engineers after careful scrutiny of a mineral property. The purpose of such reports is to make a judgment of the current economic worth and future economic potential of a

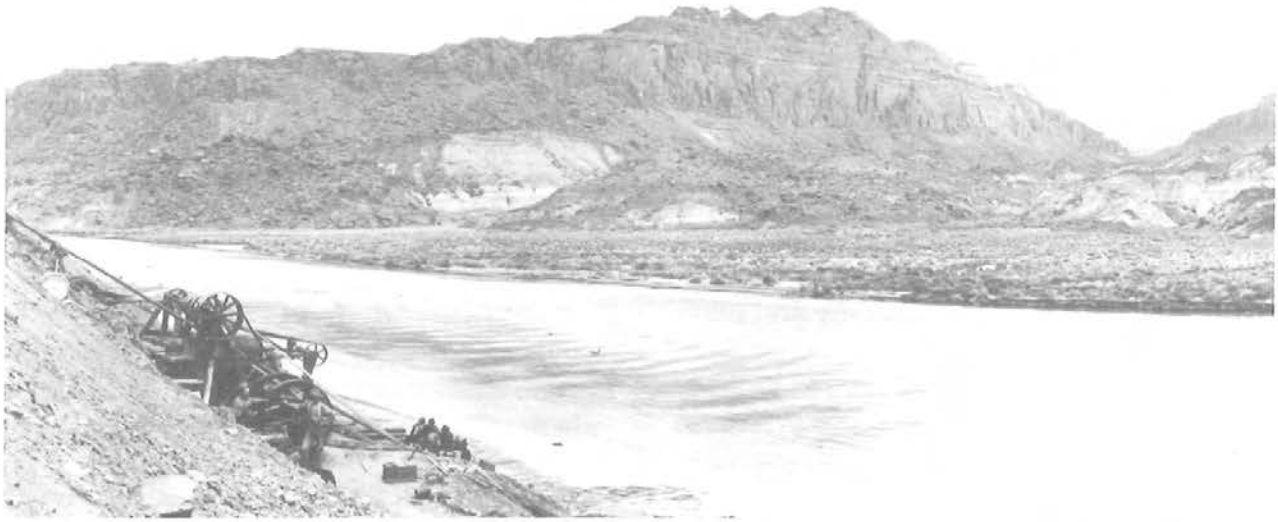

Figure 7. *Looking across the San Juan River from Camp Ibex or Spencer Camp.*

property. These reports were products of a professional consulting service rendered to whomever was willing pay. Charles H. Baxter and Roland D. Parks, in their book *Mine Examination and Evaluation* (1939), classified mine reports as either preliminary or formal. Marks's report would fall under their preliminary category, as it was a rapid survey of the property covering only its essential features. Baxter and Parks thought that the important question in a mine report was: What chance did the mine have to become profitable? They felt that in answering that question, it was important to be conservative while at the same time guarding against being too timid. But in the end, they believed the final evaluation in a report should be slightly conservative. After all, as they pointed out, "the average individual does not realize the many slips that may occur between the ore in the ground and the realization of profit from this ore."[10]

Baxter and Parks also discussed the qualifications desired of a person writing a mine report, these being:

1. Sound reasoning.
2. Honesty, integrity, and straightforwardness.
3. A working knowledge of geologic principles and the ability to apply them to local conditions.
4. An understanding of sampling theory and practice.
5. A thorough knowledge of mining methods and their effect on production costs.
6. An ability to compute production costs and estimate profits.
7. A knowledge of economic principles and business conditions and their effect on the mining industry.
8. A thorough understanding of money values.

Ethics were also important. A mining engineer examining a property should have no personal or financial interest in that property. He should act as an impartial arbiter retained to render a professional opinion. An engineer inspecting a mine should always be paid in cash and never in scrip dependent upon the future earnings of the mine.[11]

Mine reports varied greatly in size, although it was generally thought the shorter, the better. The engineer's conclusions were supposed to be the first thing to appear in the report. After that, several generally–agreed–upon subjects had to be covered, their order of treatment being of no special importance. Usually these topics included the geographic situation; the surface extent of the claims; the property's title and history; discussions of the ore–bearing zone, the character of the deposit, and its geology and mineralogy; the extent of development, including workings, production, the ore's developed, values, and treatment, both in terms of handling and processing; the operation's plant, working methods, assays and sampling, and costs and proceeds; and maps, appendices, and an index. Some reports also covered labor issues, availability of sources of water and fuel, transportation infrastructure, and sources of supplies. The wealth of information in mine reports make them excellent primary sources for historical research on mining operations. Today most of the area around Camp Ibex, or Spencer Camp—indeed most of the Gabel Mining District—is under 160 feet of water in Lake Powell. John H. Marks's report on the San Juan placers is one of the very few written and visual records remaining of this interesting, albeit flawed, experiment in mining.

Marks started his report with his conclusions, as was customary. These were written in the form of a letter, addressed to C. H. Spencer, Esq., which reads as follows:

Dear Sir—

As a result of my work for yourself and associates on your various holdings in the San Juan River country Utah, I am able to make the following report, which I believe to be correct in every sub-

Figure 8. Charlie Spencer (far left) with crew at Oljato Trading Post, probably taken during the winter of 1909-10.

stantial particular.

I trust you will find everything in this report self–explanatory.

The great extent of the region covered by the gold bearing red rock formation has made it necessary to compile portions of the map and report from statements and information obtained from others. To yourself, associates and all connected with the work, I am greatly indebted for valuable assistance and information during the progress of the work.

I desire to commend your mining proposition as one worthy of thorough investigation and development and see no reason why it cannot be made a profitable commercial undertaking and believe your ideas of how mines should be operated are along right lines.

While Marks gave a positive recommendation for Spencer's mining operation, one sees that he did some hedging if one reads the letter carefully. He stated that he had to rely upon information obtained from Spencer and his associates in writing the report. Marks also hedged on the operation's profitability, conceding that the operation was not profitable at the time he wrote the report, but suggesting that it could become profitable at some unspecified time. He also thought that Spencer's ideas about how mines should be operated were sound, and perhaps they were. Spencer knew how to get a day's work out of a crew, but unless his idea that Wingate sandstone contained commercial values of gold was sound, his ability to manage a mining operation was irrelevant.

After stating his equivocal conclusions, Marks divided the report into sections where he dealt with subjects typically found in mine reports. The report contains a general description of the locality, in which Marks stated that government reports on the region were scanty, and that they give little or no information on mining. He next

gave information about title to the claims, briefly explained how placer claims work, and discussed how federal and state mining laws applied to mining in the San Juan country. Marks then described the operation's physical setting along the San Juan River, concluding that section by writing:

> *The bed of the stream is from three hundred feet to one–half mile wide between banks and contains treacherous quick sands. The channel of the stream is continually moving from bank to bank, the entire course of the stream often changing in a few hours, making it absolutely unreliable and dangerous to cross. Those who have known the river the longest, fear it the most. It is subject to sudden floods due to violent storms, rising several feet in a few hours, and receding as quickly.*
>
> *The water is extremely muddy carrying in suspension an enormous percentage of mud and silt. From the color of the water the Indians tell where a storm has occurred; in the mountains, near adobe hills, red sand stone, white sand stone, etc.*

Marks went into some detail about the possibility of dredging the San Juan. He noted the miners' claim that fine gold is carried in suspension with the mud and sand carried by the stream. To test this claim, Marks proposed that Pierce amalgamators be put on a scow and water and sand pumped through them by means of a current wheel to test for gold in paying amounts. This seems to be a reasonable method of testing an unsubstantiated claim. But by the time of Marks's report, miners had determined that the flour gold found in both the Colorado and San Juan Rivers was difficult, if not impossible, to recover in paying amounts by dredging. Engineer and Colorado River surveyor Robert B. Stanton had formed the Hoskaninni Company to dredge gold in Glen Canyon on the Colorado River, not far from the San Juan country. His efforts to build and operate a dredge on the Colorado River between 1897 and 1902 cost somewhere between

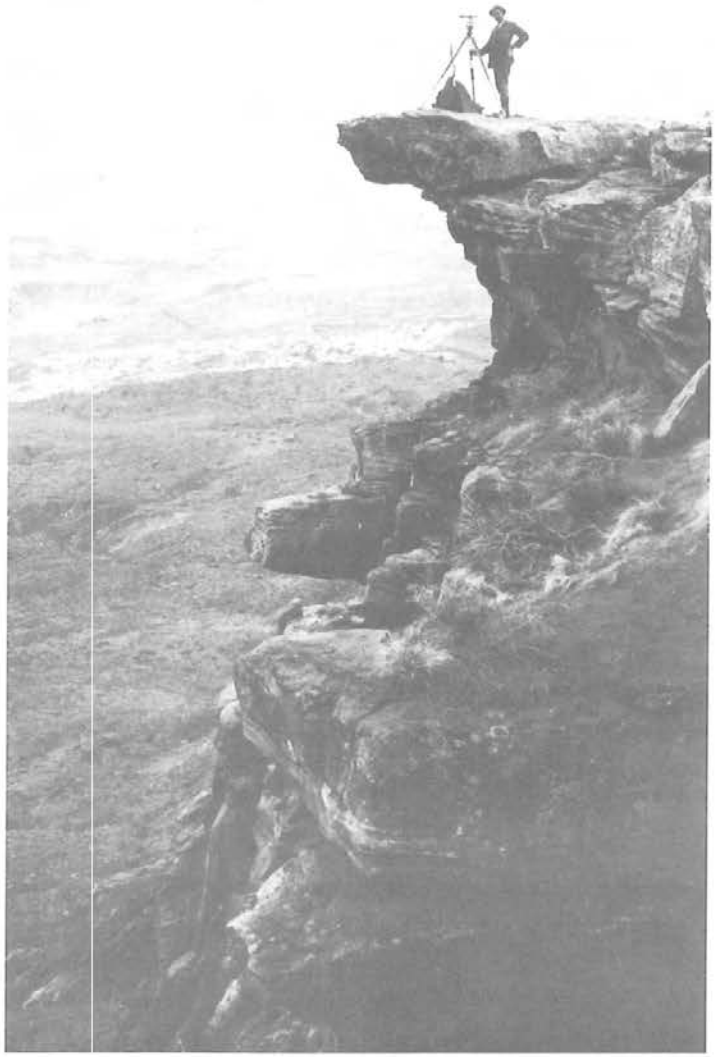

Figure 9. Mining engineer John H. Marks on an overlook in the San Juan Country. A number of the photographs in Marks's Mine Report were taken simply to show the beauty of the region.

$100,000 and $300,000 and never recovered gold in significant amounts. Marks doubtlessly was aware of Stanton's operation, but did not mention in his report the difficulties encountered in dredging for gold in the region.[12]

Marks's report includes an interesting section on the Navajo Indians, one that shows a remarkable respect and admiration for a Native American culture not always found among mining engineers of the day. Marks wrote that the Navajo had proven themselves to be "capable, efficient, and willing laborers." They could be hired for a dollar a day and would do more work, proportionally, than a white laborer. The key to dealing with the Navajo, Marks said, was to treat them fairly and honestly. He also recommended that the mining company should gain some control over the trading posts, as some of these refused to cash checks made out to Navajo workers at face value. This caused discontent at the mining camp, since it seemed to the Navajo that they were not being paid the wages that they were promised. Marks ended his section on the Navajo by mentioning that they were willing to sell corn and beef directly to the mining company, which would let the company avoid paying the higher prices charged by the trading posts.

Marks next discussed timber and building materials. He recorded that the nearest timber for lumber was at Navajo Mountain, some 35 miles away, and that lumber could also be found in the Lukachukai Mountains, 125 miles away. Marks reminded his readers about the distances involved when he stated that the nearest lumber mill was 150 miles away. He indicated that building stone and roofing slate existed in abundance not far from the camp. He mentioned that cedar and pinion trees grew nearby and could be used for fuel, and that immense quantities of driftwood could be gathered along the river and used to fire the boiler. He also noted that juniper and piñon trees were harvested on the rim of the canyon and thrown down to the camp below.

Marks briefly discussed coal and oil, both of which could be useful to the mine operation. The nearest known coal deposit was forty miles away to the south on the Navajo reservation. Oil had been discovered in the San Juan country as early as 1882, and serious drilling began in the region in 1904, mainly in the area around Mexican Hat. By 1909, eight rigs had drilled eighty holes, with eighty percent of them producing oil. Marks noted indications that oil might be found near Spencer Camp.[13]

The report included two maps. One small map shows the mining district in relation to the entire Four Corners Region. A larger map is mentioned, but is missing from the report. This is unfortunate because it showed the locations of all of Spencer's mining claims, carefully surveyed by Marks and Albert H. Jones. In addition to the maps, the report contains sixty-four black and white photographs of areas at or around Spencer's claims. Most of the photographs are numbered and their locations recorded on the missing map. Without the map, it is difficult to determine the exact location of some of the photographs, especially the spectacular panoramic photographs of scenes along the San Juan River. Jones took the photographs as he and Marks surveyed Spencer's claims. They appear to have been taken from November of 1908 through March of 1909. This visual documentary record of Spencer's mining experiment shows his camp and the machinery he set up for his mill. Many of the photographs show Spencer leading teams of oxen pulling wagons laden with supplies through the rough countryside to camp. These pictures emphasize how difficult it was to get goods into this very rugged, isolated area, and they provide evidence of just how good a bullwhacker Spencer was. In addition to documenting Spencer Camp, the report includes photographs of Oljato Trading Post, Monument Valley, the mining crew, and vistas taken to show the stark beauty of this slickrock canyon country.

Marks next considered the agricultural potential of the area to feed the mining operation. He stated that crops could be grown and easily irrigated along the San Juan River, and he mentioned that the Navajo had indicated a willingness to increase their food production if they could obtain modern agricultural implements. Marks proposed that implements be provided in exchange for labor, and that the Navajo could then supply the mining operation with food, cutting out the middlemen at the trading posts. Although Marks did not state it, this search for local sources implies the considerable expense of shipping in food and other supplies. He also suggested that reservoir sites could be constructed to impound water from watersheds both north and south of the river to use for irrigation, power, and to supply the milling operation. He noted the climate—its mild winters, early springs, and hot, dry summers—recording that its variable weather made all kinds of clothing necessary.

Marks discussed roads, transportation, and the related development of the region in detail. The two hundred miles of rough roads between Spencer Camp and the nearest railheads was a critical problem that had to be addressed. Marks mentioned that the railheads at Mancos or Dolores, Colorado, and Gallup, New Mexico, lay about the same distance from camp. From these stations, it took five to six days for a pack outfit, and considerably more time for an ox–drawn freight wagon, to reach the camp. Marks preferred the Gallup railhead. He termed the Rio Grande railroad's service to Mancos poor, while finding that the Santa Fe railroad ran fast trains through Gallup with excellent equipment. Marks held that the transportation infrastructure—especially the roads from Gallup—would have to be improved before extensive development of the San Juan River region could be undertaken. Under the present circumstances, Marks noted, plans had to be made ninety days ahead of time to get equipment delivered. This statement underscores how far out in the middle of nowhere Spencer Camp was, and the difficulties of keeping it supplied. Marks's report provided no information about how much it cost to ship supplies into the camp. That would have been very relevant information to have in judging the economic viability of the operation.

When writing the section of his report on the mineral development at Spencer's Camp, Marks assumed as valid Spencer's claim that gold could be extracted from Wingate sandstone in commercial values. Marks called the Wingate sandstone "an immense body of milling gold ore." He wrote that "the ore does not have to be mined, but is practically ready for milling in enormous quantities amounting to many millions of tons; consequently less money should be required than would be necessary if ore reserves had to be blocked out." While money could be saved by not having to use traditional mining practices, large expenditures of capital were still necessary in order to recover the gold values estimated by Spencer. Marks, believed that electric power was essential to such an operation and thought that the oil found in the region could be used to produce electricity at a power station for distribution to the area's mining operations.

Marks ended his report with a letter from Spencer describing the latter's experiences mining along the San Juan and how he had arrived at the idea that the Wingate Formation was the source of the gold along the river. Spencer explained that he had sampled gravel bars along the San Juan, but was not able to find gold. The gold only occurred in the thin layers of red sand that ran though the gravel. This red sand came from the Wingate Formation, which the river had cut through over time to form the San Juan River Canyon. These facts convinced Spencer that the gold in the San Juan and Colorado rivers had come from the Wingate Formation, and not from the mountains of southwest Colorado.

Spencer concluded his letter by stating that his recovery averaged fifty cents per cubic yard. He mentioned that he had arrived at this figure after extensive sampling, but indicated that no assays had ever been done. After Spencer's letter, Marks created two pages of largely meaningless tables which give figures showing the value of gold to be recovered should the deposits run five, ten, or fifteen cents per cubic yard or ton. The report ended with some tables, showing how many tons of sandstone could be milled in a given time by a crew of men. Marks completely accepted Spencer's statements and sampling methods and used them as the basis for his report. Marks did not do any sampling or assaying himself—tests typically done by a mining engineer in the course of writing a mine report.

John H. Marks made a career out of writing mine reports from at least the time of this report in 1909 until as late as 1948. In other mine reports, Marks records how samples were taken under his supervision and sent to a qualified assayer for analysis. He then included that data in his report. In his other reports, Marks also gathered his own information and did not rely upon the mine's owner or operator to provide all of his data. This raises the question: Why did Marks deviate from the way he ordinarily wrote reports when he wrote this one? No one can ever know for certain, but it is likely that Marks was under Charlie Spencer's spell. It appears that Marks—like many other people who knew Spencer—completely accepted Spencer's ideas and data. The report is accurate and detailed in many respects. It realistically covers the operation's difficulties with transportation and supply, and it details the amount of development the region needed in order for this mining operation to be successful. Indeed, except for the fact that Marks uncritically accepted Spencer's idea that gold could be recovered from the Wingate Formation, this is an accurate and very detailed preliminary report.[14]

To a reader with a practiced eye, the flaws and discrepancies in this mine report are apparent. But to a naïve investor, unfamiliar with how mine reports were written, this professional–looking document, written by a mining engineer, gave credibility to Spencer's operation. Coupled with Spencer's talents of persuasion, this flawed report doubtlessly impressed some investors. In essence, Marks ignored a basic tenet that a mining engineer must keep in mind at all times when writing a mine report. That tenet was aptly summed up in the *Engineering and Mining Journal* in 1905: "That mining is the business of making money out of ore should never be lost sight of. No personal bias or feeling should enter. All should be cold, hard facts, and the conclusions such as can be justly drawn from the facts stated." Marks did not use cold, hard facts to reach his conclusions. He used information from Charlie Spencer that was rich with wishful thinking but lean on factual information.[15]

What happened after Marks wrote his report and Spencer took it and his sales pitch back East? Spencer was able to squeeze more money out of his investors and returned to his camp in June of 1909. Some technically trained men, including a mining engineer and two amalgamation men, accompanied Spencer on his return from Chicago. The party started toward the camp in a car and got about as far as Oljato before changing over to horses. Theirs was the first automobile to enter this part of the Navajo Reservation and it caused some excitement in the area. After the men arrived at the camp, they put the plant into operation and made tests and assays. After about a week, the mining engineer from Chicago became convinced that the operation lacked commercial value. The plant was closed down, the crew's wages were settled, and the men transported to Mancos or Gallup.

Spencer then returned to Chicago and tried with all of his powers of persuasion to convince the investors to fork over more money. He had a series of stock answers to explain why things had

turned out as they had: the test runs had been too short; the technical observers were either prejudiced or incompetent; some people were trying to gain control of the operation for another group of investors. After all, he said, the road was built, the plant in place, and with a little more time and money, it would all work out. Spencer's former backers turned a deaf ear and refused to contribute any more money. But just when things looked bleak for Spencer, he met a man representing another group of investors. This was Dr. Herbert Parkyn, a psychologist and mine promoter in his own right. Parkyn was the author of several books on auto–suggestion and hypnosis, and, according to Albert H. Jones's recollections, had also written a small pamphlet entitled: *How to Get Back the Money You Lost in Mining.* This pamphlet appears to have not survived. Spencer convinced Parkyn of the merits of his mining scheme and Parkyn, in turn, interested a group of investors in the operation, money from whom was soon forthcoming. In some ways, Spencer and Parkyn were kindred spirits who fed off of each other's ideas about mining. Both men were totally convinced that mining provided the way to fabulous riches.

In December of 1909, Spencer hired another crew for Camp Ibex and put the plant back into operation. The investors sent mining engineer W. H. Bradley out from Chicago to observe the operation, take samples, and make tests. Measured quantities of sandstone were crushed and put through the amalgamator. Bradley cleaned the amalgamator plates after each test and bottled the mercury for later testing by chemists in Chicago. These test results indicated that the operation had no commercial value and the camp shut down.

Although Spencer's mining operations on the San Juan River were over, his mining ambitions were not. While at the camp, the new mining engineer, Bradley, became interested in the shale deposits of the Chinle Formation. Bradley took samples from the Chinle Formation, known locally as "San Juan silts," and had them assayed in Denver and Chicago. The results showed as good or better gold values in the shale than in the sandstone they had been milling. This gave Spencer new hope. Chinle shale was easier to treat than Wingate sandstone, as it required no crushing, and could be dissolved by water. At the same time as these developments were occurring, two prospectors on their way to Glen Canyon on the Colorado River came through Spencer's Camp. They told Spencer and the others that the Chinle Formation ran right along the Colorado River at Lee's Ferry in Arizona. There were also coal deposits along the Colorado upstream of the San Juan in Glen Canyon. Since the shale occurred along the shore of the Colorado, it could be easily mined hydraulically, and there appeared to be ample coal to power pumps and machinery. The new site also lay a shorter distance from a railhead at Flagstaff, Arizona, although the journey over would still be a formidable passage over rough roads. With these new developments, money flowed in from Dr. Parkyn's group of investors and the mining operation was removed from the San Juan to Lee's Ferry, marking the end of Spencer's San Juan River mining operations, but the beginning of his activities on the Colorado.[16]

Spencer's Colorado River operation has been much better documented than his one on the San Juan River. But it too ended in commercial failure when it was discovered that little or no gold could be recovered from the Chinle Shale. Undaunted by these setbacks, Charlie Spencer went on to promote bigger and better things, including a scheme a few years later to transport water from the mountains near Flagstaff to the south rim of the Grand Canyon. That also ended in failure and financial loss to its investors. In the early 1960s, Spencer, then in his nineties, was still promoting mining operations, including another venture at Lee's Ferry.

The eternal optimist when it came to mining, in the end Spencer mined far more wealth from investors than he ever did from the ground. He died in 1968, having lived long enough to see the Glen Canyon Dam built, and the region he knew so well transformed from a remote, isolated area into a tourist destination. Before he died, Spencer expressed doubt that the sandstone and shale formations upon which the Glen Canyon Dam is built would long support such a structure. It may turn out that he knew something about these shale and sandstone formations that the dam engineers missed. In 1983, after a period of heavy rain and runoff from a larger than usual snow pack, the tunnel spillways of the dam came close to structural failure due to erosion of the tunnel linings caused by cavitation from the large volume of water rushing through them. Spencer may yet have the last word about the sandstone and shale formations he knew so well. The dam has yet to experience a one–hundred–year flood.[17]

All of the photos are taken from the John H. Marks Mine Report. Although no attribution is given, the photographer was Marks's assistant, Albert H. Jones. The Mine Report and its photographs reside permanently in the Russel L. & Lyn Wood Mining History Archive, Arthur Lakes Library, Colorado School of Mines.

Notes

1. Donald L. Baars, *Geology of the Canyons of the San Juan River* (Durango, Colo.: Four Corners Geological Society, 1973), 1. Hugh D. Miser, "The San Juan Canyon Southeastern Utah: A Geographic and Hydrographic Reconnaissance," United States Geological Survey, Water Supply Paper 538 (Washington D.C.: USGPO, 1924): 1. James M. Alton and Robert S. McPherson, *River Flowing From Sunrise: An Environmental History of the Lower San Juan* (Logan, Utah: Utah State University Press, 2000), 1.
2. C. Gregory Crampton, *The San Juan Historical Sites*, Anthropological Papers no. 70. (Salt Lake City, Utah: University of Utah Press, 1964), 6–11, 26–28.
3. Albert H. Jones, *Review of Mining Operations on the San Juan and Colorado Rivers Promoted and Conducted by Charles H. Spencer, et al, 1908, 1909, 1910, 1911* (1960). Unpublished manuscript in the P. T. Reilly Collection (NAU MS. 275), Cline Library, Northern Arizona University, 2.
4. John H. Marks, *San Juan Placers Gable Mining District, San Juan County Utah: Report for C. H. Spencer, General Manager.* (Denver, 1909), 13–15. Unpublished manuscript in the Russell L. & Lyn Wood Mining History Archive, Arthur Lakes Library, Colorado School of Mines. Spencer explained how he arrived at his theory that gold could be recovered from Wingate sandstone in a letter included in this mine report.
5. C. Gregory Crampton, *Ghosts of Glen Canyon: History Beneath Lake Powell.* (Salt Lake City, Utah: Cricket Productions, 1994), 114.
6. Jones, *Review of Mining Operations*, 1–4.
7. Crampton, *The San Juan Historical Sites*, 42–44.
8. Jones, *Review of Mining Operations*, 1.
9. It should be noted that Marks misspelled the name of the mining district. It should read "Gabel," not "Gable."
10. Charles H. Baxter and Roland D. Parks, *Mine Examination and Evaluation*, 2nd ed. (Houghton, Mich.: Michigan College of Mining and Technology, 1939), 2, 4.
11. Baxter and Parks, *Mine Examination and Evaluation*, 5–6.
12. Robert B. Stanton, *The Hoskaninni Papers: Mining in Glen Canyon, 1897-1902* (edited by C. Gregory Crampton and Dwight L. Smith), Anthropological Papers, 54 (Salt Lake City, Utah: University of Utah, 1961). This is the best account of the failed dredge operation in Glen Canyon.
13. Alton and McPherson, *River Flowing From the Sunrise*, 120–22.
14. The Russell L. & Lyn Wood Mining History Archive at the Colorado School of Mines contains a number of mine reports written by Marks from 1909 to 1948 that may be compared to his report on Spencer Camp. As an example, see *Lucky Irish Grubstake*, 1935.
15. Chester F. Lee, "Notes on Mine Reports," in: T. A. Rickard, *The Economics of Mining* (New York: Engineering and Mining Journal, 1905), 392–93. The original article appeared in the 8 June 1905 issue of *The Engineering and Mining Journal*.

16. The preceding discussion of Spencer's activities and operations after Marks issued his report is drawn from: Jones, *Review of Mining Operations*, 3–5.
17. P. T. Reilly, *Lee's Ferry from Mormon Crossing to National Park* (Logan, Utah: Utah State University Press, 1999). W. T. Rusho and C. Gregory Crampton, *Desert River Crossing: Historic Lee's Ferry on the Colorado River* (Salt Lake City: Peregrine Smith, 1975). Valeen T. Avery, *Free Running: Charlie Spencer and His Most Remarkable Water Project, Being an Account of Speculative Investment in the Golden West of the 1900's* (Flagstaff, Ariz.: Flagstaff Corral of Westerners International, 1981). Toni Carrell, James E. Bradford, and W. L. Rusho, *Submerged Cultural Resources Site Report: Charles H. Spencer's Mining Operation and Paddle Wheel Steamboat, Glen Canyon National Recreation Area* (Santa Fe, NM: Submerged Cultural Resources Unit, Southwest Cultural Resources Center, Southwest Region, National Park Service, U.S. Department of the Interior, 1987).

    For a summary of the problems at Glen Canyon Dam in the spring of 1983, see: Steven W. Carothers, and Byron T. Brown, *The Colorado River Through the Grand Canyon* (Tucson: University of Arizona Press, 1991), 26-28. For information on the Glen Canyon Dam controversy, see www.glencanyon.org and www.livingrivers.org for opposing viewpoints.