

## **Chapter 19** **An Assessment**

“Big strikes” of precious metals unfolded in a predictable path. Populations swelled in remote areas with few civic or legal institutions. Ad hoc arrangements among the participants preceded the establishment of a more orderly political, economic and social order. Early locators and stakeholders gave way to entrepreneurs, bankers and investors who supplied the capital and organization that deep mining required. Scattered claims were consolidated in the name of efficiency, and over time several mining behemoths emerged to control the industry and reap the rewards. To support these enterprises a camp evolved into a city, and mining assumed an urban character in the form of processing mills, commercial suppliers, transportation systems, banking operations and labor pools. And to function properly a city needed public agencies, infrastructure and elected officials. At some point, sooner for some cities than others, when the ores gave out, the economy (in the absence of any other industries to take up the slack) collapsed and the population shrunk. If a formerly robust mining center survived (many simply disappeared) it did so mainly as an administrative center (e.g. a county seat) and perhaps eventually as a tourist center.

Dan DeQuille, the most famous of the *Territorial Enterprise* journalists (except perhaps for Samuel Clements whom he hired) described the discovery of Peter O’Riley and Patrick McLaughlin:

The manner in which the grand discovery was made was not very romantic. What our miners found was a great bed of black sulphuret of silver, a decomposed ore of silver filled with spangles of native gold. This gold, however, was alloyed with silver to such an extent that it was more the color of silver than of gold.

When the discoverers struck into the odd looking black dirt, they only thought that it was a sudden and rather singular change from the yellowish gravel and clay in which they had been digging. They at once concluded to try some of the curious looking stuff in their rockers.

The result astounded them. Before, they had only been taking out a dollar or two a day, but now they found the bottoms of their rockers covered with gold as soon as a few buckets of the new dirt had been washed. They found they were literally taking out gold by the pound. In a few weeks after the discovery had been made, and the work had been advanced further into the croppings of the lode they were taking out the gold at the rate of one thousand dollars per day. This they were doing with the rockers. Taking the harder lumps left on the screens of the rockers, one man was able to pound out gold at the rate of 100 dollars per day in a common hand mortar.

After specimens had been assayed in Grass Valley, California, and news of the richness of the discovery spread across the region, the rush commenced.

The mines at Virginia town and Gold Hill are exceeding the most sanguine expectations of their owners. At Virginia town, particularly, the claims on the main leads promised to excel in richness the far-famed Allison lead in California in its palmiest days.

Claims are changing hands at almost fabulous prices. No fictitious sales, either, but bona-fide business operation. The main lead, on which is the celebrated Comstock and other claims, appears to be composed of ores producing both silver and gold, and the more it is prospected the richer it is proving.<sup>1</sup>

A decade later the Comstock Lode boasted one of the West's largest cities with amenities and attractions that few other mining cities ever had. In *The Roar and the Silence* Ronald James described Virginia City's progress:

When enumerators for the 9<sup>th</sup> U. S. Census began working on the Comstock in June 1870, they found a mining district radically different from the one documented ten years earlier. Gone were the Mexican packers, the prospectors, the thrown-together buildings, and the society in which women were a scarce curiosity. The Comstock was now a place of industry and engineers, boasting almost four hundred men employed in milling, nearly three hundred in the manufacturing industries, and roughly three thousand working in the mines.

And after combing through the census he found many non-mining occupations that testified to the diversity and variety of life in Virginia City (and to a more limited extent Gold Hill).

...the census recorded twenty-two bakers, forty-nine butchers, five people operating confectionery stores, two oyster vendors, a coffee vendor, and one man who ran a peanut stand. There were also nineteen people involved in the theater, including actors, actresses, managers, and a "tragedian". The census recorded fourteen musicians and two gymnasts, and there were gardeners, a librarian, photographers, milk dealers, tailors, stockholders, politicians, federal tax agents, doctors, lawyers, and several people in jail.<sup>2</sup>

The history of the Comstock has been written from many angles. The statistical approach may be the least interesting for the general reader, and yet the numbers, so highly important to many of the contemporaries, confirm the monumentality of the

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<sup>1</sup> DeQuille, *The Big Bonanza*, 24-25.

<sup>2</sup> James, *The Roar and the Silence*, 91-92.

Comstock venture. Its broadly-understood history, as assembled over the decades, will not be extensively modified by examining production trends, daily hoists, wage schedules or tax collections. Economists, when analyzing numbers, often ask how big, and in the case of the Comstock it was big. It may not have been the biggest – that’s not the point – but it generated some very large numbers. Numbers work both ways. They illustrate how fast the rise was as well as how fast the fall was. They testify to both grandeur and folly, lure and power that accompany the relentless search for two lustrous metals. Perhaps no figures are more startling and revealing than how many miles of tunnels and shafts were built and how many tons of ore, rock and waste were extracted, transported, hoisted, milled and abandoned through the combination of laborers and machines but most especially by laborers.

Mining entailed hard work and constant risk, and yet despite the demands and imponderables the Comstock like the phoenix rose repeatedly from disappointments and disasters until the inevitable occurred – the ground would yield no more shine. The forecasts of charlatans and professionals that the Comstock had an almost inexhaustible supply of ore, like the grand mining centers of Potosí and Zacatecas, whose mines were productive for more than 300 year, eventually dissolved in the face of ever greater depths that were barren of ore. The nature of the Lode was confounding from the outset. It was not a solid ledge of profitable ore that extended downward for thousands of feet. It appeared and disappeared and finally vanished altogether. In a curious way, however, the unpredictability of the Lode inspired hope rather than despair until there was no longer any basis for hope. Once the Lode’s upper region was mined the mining community came to the realization that the Lode’s lower region was made up of pockets of rich ores that had to be found. As one pocket of ore after another was picked clean, the hope if not the conviction grew that the pockets would keep appearing at random at ever-greater depths. Neither the vast distances between the pockets nor the deep explorations were ever regarded as hindrances by the most active entrepreneurs. When new pockets failed to materialize as companies explored areas twice as deep as the last great bonanza the numbers told the story that no one wanted to hear – the Comstock was finite.

The most important numbers from the Comstock related to production. Such figures from the earliest years are scarce. A few companies had bookkeeping systems that captured the output of their mines and the value of their bullion, but not much of that documentation has survived. As companies replaced individuals in the extraction of ore, the need for bookkeeping systems became an imperative. Companies had investors, and investors had a proprietary interest in knowing the financial soundness of mining operations in which they had invested. The largest companies like Consolidated Virginia and California instituted managerial policies and financial controls that covered virtually every aspect of their mining operations, not only to please their stockholders but also to make management more effective. In addition, as governmental oversight increased, companies large and small had to comply with certain rules on financial reporting. The quantity and quality of extant documentation, private and public, are surprisingly solid. Given the richness of the documentation it is possible to trace in considerable detail mining trends for the Comstock as a whole and by individual companies.

In the aftermath of the initial discoveries nearly all the land along the Comstock and for miles beyond the Lode was claimed. Tens of thousands of claims may have been posted, although the number of legally registered claims was surely smaller. But under the system of *parole*, a spoken or verbal claim, the conveyance of a claim without a deed was accepted in court. It is not known how much ore was removed from all of the claimed areas between 1859 and 1885 – a figure that will remain permanently unrecoverable – but it can be stated with some accuracy how much was extracted from the Lode itself. In the final analysis very few productive or profitable mines were found outside of the Lode. The history of mining in Story County and surrounding counties during the third and fourth quarters of the nineteenth century was really the history of mining on the Lode.

At the most basic level was the tonnage of ore hoisted and crushed for processing at the mills. To reach the ore, of course, vast quantities of rock, soil and waste had to be removed through construction of shafts and excavation of tunnels. Then the ore itself was removed and after being hoisted was shipped to the mills where it was crushed in preparation for incorporation with quicksilver. A few scattered figures may be found in some company documents on the amount of so-called “waste” removed but never enough data from which to create a dataset. And in a few cases company records included both the quantity of ore hoisted and shipped to the mills and the quantity of ore hoisted and shipped that was actually worked before incorporation began.<sup>3</sup> The difference could be thousands of tons per month in the large operations, but again the standard tonnage that companies reported was worked or crushed ore. The laws under which companies paid net-proceeds taxes required companies to declare tonnage (worked as opposed to gross) along with the value of the bullion (as determined at a federal mint). From these two figures an average yield was calculated for tax purposes. Tonnage is a straightforward figure that is not complicated by monetary conversions as is the case with bullion values. What is not clear is how the tonnage was determined. There is no evidence that scales were used to weigh the ore. More than likely it was derived from the number of ore cars, each of which could be loaded with 1,600 to 1,800 pounds, which moved the ore from the mine to the mill.

Based on the public record compiled from 1867 through 1885 nearly 12 million tons of ore were declared across the state and seven million in Story County. The average for this period was about 611,000 tons per year for Nevada and 358,000 for Story County. For the period 1860 through 1866 one can add several million tons to the totals for the state and for Story County. Since most of the early mining was concentrated in Story County the overall totals could reach 14 million tons for the state and 9 million tons for Story. Throughout the period Story accounted for 60 percent or more of the reported ore tonnage. Statewide the peak in tonnage at more than 900,000 tons occurred in 1877, when Story County topped 600,000 tons as a result of the high output of The Bonanza mines. Although Story County represented nearly 70 percent of the state total, more than 10 percent above the average from 1860 to 1885, but this was not the highest. In 1867

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<sup>3</sup> The ledgers of Consolidated Virginia and California had columns for hoisted and worked ores, but the former was not filled in consistently. Also daily hoist records occasionally listed the amount of waste removed from the areas of the mines yielding ore, but such records have not survived in a form that allows for the creation of a dataset.

and 1868 Story County accounted for more than 95 percent of the state total, but by the mid-1870s Story County's share fell as mining spread across the state. But the long-term success of Nevada mining was tied to the Comstock. Only in the late 1870s and early 1880s when Comstock output was contracting rapidly did mining in other areas help to pick up the slack and slow the slide. Comstock's share fell below 50 percent for the first time and reached its nadir at slightly more than 25 percent. Story County's decline amounted to as much as 40 percent in some years, but the state's decline was far less than that. The capacity of other mining regions to fill in for the Comstock, which never recovered, was short-lived. In 1885 total state tonnage was even less than what had been reported in 1867, the first year with official data.

If Comstock mines extracted from 7 to 9 million tons or more (20 billion pounds) between 1860 and 1885, what estimate can be made for the removal of ore and the residue? Twice as much? Three times as much? Obviously without actual data any figure that is advanced is speculative. Not even the few entries found on removal of residue can be extrapolated. Given the miles of tunnels dug underground and the depth of the shafts to serve those tunnels an estimate of 20 to 30 million tons extracted in both ore and waste was a plausible figure. In the end the actual number may not matter since the officially reported ore tonnage of nearly 10 million was itself huge.

Another way to think about total tonnage is to try to envision it in terms of output per miner. Company records from Consolidated Virginia and California indicated that on some days miners extracted as much as 3 tons per person. This was probably only possible when miners were working in some of the widest sections of the richest ore veins where the material was easily removed. Digging through various rock strata, some very hard and some dangerously soft, plus clay, heat and water could slow removals significantly. Despite these challenges worker output was remarkable and at times extraordinary. On average the Comstock mines hoisted about 400,000 tons of ore per year, and if one assumes on average an underground work force between 500 and 1,000, the output per worker per day would be between 1 and 1.5 tons, that is, 2,000 to 3,000 pounds. Even one half of a ton (1,000 pounds) per day (i.e. day in and day out) would tax the average person. (Compare to digging a garden or a foundation 1,000 feet underground.) But, imagine, if the ore and waste were totaled, would underground workers face twice the above figure – 2 to 3 tons per day? The speculation is endless, but since contemporaries spoke highly of the work ethic of the Comstock miner, that reputation may well have been honed on a daily output in the thousands of pounds.

Tonnage as an example of Comstock performance is less “sexy” so to speak than bullion values. Bullion, which was the term that was used in the official and company documentation to represent what the owner received from the mint, was always expressed in dollars. Millions of dollars were more eye-catching than millions of pounds. The custom was to assign Comstock ore a monetary value even though much of the output, especially silver, was never coined. That monetary value was then recorded by the company and declared to the assessor. Since gold could be coined and often was, its ascribed value was fairly reliable. In the case of silver, however, its coinage was either limited or prohibited for most of the Comstock period, and the ascribed values were often

artificially high compared to market values. Whether coined or not, the gold or silver bullion (bars or ingots with prescribed a weight and finesses) that emerged at the end of the process had a value that was entered as such into the public records and the companies' accounts. And those figures, for better or worse, expressed the triumph of the Comstock. For the years (1867-1885) when the official records can be consulted Nevada produced \$390 million worth of gold and silver, and of that amount Story County produced \$250 million or 64 percent. Some estimates exist for the period from 1859 to 1867, and perhaps another \$50 million worth of ore could be added to the Comstock and slightly more to Nevada totals: \$300 for the Comstock and \$450 million for the state. The extent to which these figures may overestimate or underestimate the production of ore in Nevada and on the Comstock will continue to be debated, but even with that uncertainty these were big numbers. Comstock ore probably contained more gold than most other mining regions so that of its projected \$300 million silver was worth about \$180 million and gold \$120 million.

While hundreds of individuals made claims and opened mines, the original locators found little if any profitable ore. Small pockets of ore on or near the surface encouraged miners and their backers to push ahead with expensive explorations that soon entered endlessly barren ground. As outcroppings gave way to lode mining, entrepreneurs who operated from the premise that the Comstock needed control, consolidation and capitalization soon replaced the early locators. The Comstock turned out not to be a solid ledge of gold and silver ores hundreds of feet deep but rather a series of pockets of ores unconnected to each other and surrounded by ground of little or no value. The pockets were mainly located along the Lode for about two miles from Ophir Mine in Virginia City to Belcher Mine in Gold Hill, and as the depths grow their locations angled eastward from Mt Davidson. There was no sure-fire way to locate these pockets, although some experienced miners had the uncanny ability to separate promising streaks of vein matter from the dead ends.

The element of concentration grew more apparent after lode mining replaced surface mining. For the period with the best documentation, 1875-1885, about 50 mining companies, tailings mills and a few individuals declared all the taxable bullion. Even within this capitalist/entrepreneur group only a handful - perhaps a half-dozen - struck it big. Based on more scattered documentation prior to 1875 the structure of the industry was not much different in preceding decade when the first large mining corporations appeared. Technically this was not monopoly but rather oligopoly. But for all practical purposes, however, the Comstock fell under the dominion of Sharon and Ralston for nearly a decade and then under Mackay, Fair, *et al.* for another decade. Their business networks included mines, mills, banks, railroads, water pipelines and logging tracts. Other prominent Comstock entrepreneurial figures from mine and mill owners to bankers and lawyers could be highlighted, but in the end the Comstock's economic and financial powerhouse was a small contingent. For at least half of the period under consideration the ore declarations before county assessors showed how concentrated the production of ore was in the hands of a few companies. Mining camps historically developed such entrepreneurial systems, and what can be observed about Comstock mining was that it

hardly qualified as unique.<sup>4</sup> Mine owners had to be risk-takers, but even the most successful risk-takers had to find the ores that would compensate for the risks. No doubt some miners were more skilled at finding the markers that led to underground riches than others, but even they could fail to anticipate the natural obstacles that surrounded all such undertakings. Moreover all faced additional risks even after locating new deposits because they could not muster the skills or the finances needed to make the operations profitable. Mining titans, even the most ruthless, had to bring a combination of talents to their tasks along with the elusive luck. In light of the formation of the Comstock Lode, which only came to be well understood after the Lode had given up most of its wealth, the surface or shallow (within a few hundred feet) mineral deposits were less than reliable indicators of deeper deposits. It made sense for more daring investors to try to collect groups of mines with potential under single ownership and to develop them under a joint plan, and additionally, if their potential came to fruition, it made sense for them or other investors to try to secure claims on adjoining mines. Claims traditionally could not exceed certain dimensions, although small parcels could be fused up to those limits. Few legal restrictions prevented entrepreneurs and their investors from buying up adjacent mining properties and consolidating the operations of these mines even if the claims themselves could not be merged. Consolidation was more about operations than properties. One might criticize the early rush to carve up the Comstock and the absence of a legal or political framework for the disorder that inflamed those early years and contributed to the rise of a situation that allowed a small oligarchy of owners and their backers to control the Comstock. In point of fact almost all modern gold and silver rushes began the same way and evolved toward a highly concentrated ownership structure as deep mining required increasingly larger doses of capital and expertise. The Comstock was not an exception.

Even if the argument can be made that precious-metal mining tended toward an oligopolistic structure (and that was what Comstock statistics indicated), driven in large by the financial considerations for developing high-risk operations, the argument must take into account other potentially controversial questions. The reach of the mining entrepreneurs did not stop with the mines themselves. Over time they came to dominate other essential businesses in and around the Comstock. Controlling the most important mines became a springboard to owning or controlling ancillary enterprises such as mills, banks, rails, water and timber. Along the Comstock money spoke volumes, and little stood in the way of those with the penchant and wherewithal to acquire or assemble a financial empire. The more of the mining economy that they could own or control the greater the potential to make more money. Milling operations could be spun off as separate corporate entities from the mining enterprises whose ores they processed because the business of milling was a potentially profitable enterprise on its own. These were seldom publicly-held companies like their mining clients, and therefore whatever profit from whatever efficiency of scale size provided accrued to the principals and their partners rather than to the mining companies' stockholders. Of course, bonanza stockholders could realize huge profits even without sharing in mill profits, but the principals of the mining and milling companies enjoyed dividends from the mining

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<sup>4</sup> Several examples could be cite from the period of Spanish colonial mining: Antonio López de Quiroga at Potosí and Conde de la Regla at Pachuca and José de la Borda at Zacatecas in Mexico.

operations and surpluses from milling operations. To be sure, the creation of milling empires by the founders of mining empires helped to break whatever dominance the custom millers had managed to exert over the necessary process of converting ore to bullion. Little documentary evidence on milling finances existed in or survived from those years so other than the anecdotal reporting that custom millers charged exorbitant rates for less than efficient services. Given the rush to build mills, even by mining companies themselves, it should not be unexpected that some would attempt to bring order to the milling industry by driving down prices while also controlling capacity. Whatever the actual financial relationships and conflicts among early miners and millers, the large and somewhat disparate custom-milling group could not survive as mining came to be controlled by the so-called corporate powers. As the size and power of the mining corporations grew, they had ample capital and leverage to take command of milling sector, and that was what happened under one of the earliest corporate titans, William Sharon, in the mid-1860s. The documentation is not sufficient, at least until the late 1860s, to confirm how many mills he purchased or how efficient these mills were, but his accumulation of milling properties began the process of shifting control from custom millers to new milling entities under the direction and ownership of prominent mining entrepreneurs. And that with new milling technologies began to push down milling rates. Prominent miners who followed Sharon pursued the same strategy. Custom mill probably did not completely disappear, and the documentation is so sparse that it cannot be said with any certainty what their role was after the new milling giants appeared. During the peak years of Consolidated Virginia and California Mackay and Fair had to secure the services of mills outside of those owned by Pacific Mill and Mining, the milling arm of their Comstock properties, but the documentation as to the exact status of these outside mills is sparse. Were they custom mills or mills owned by other mining companies? In the tailings business custom mills may have survived longer than in mainstream milling. It is no clear how much business was left for the unaffiliated amalgamation mills. There was a sharp increase in the number of tailings mills as the surplus of ores lost during crushing and refining continued to build. But independent millers outside of the network created by the important mining companies would seem to have be relegated to a insignificant role for most of the Comstock's triumphant years.

Tailings mills were of a different classification from amalgamation mills. They also entail far less documentation. Tailings millers dealt in ores that had been discarded, and therefore unlike amalgamation millers they paid the ore taxes instead of the original mine owners. Taxes paid on tailings were grouped in a different section of the assessment ledger, although the rates and deductions were the same as those applied to the mining companies. Some mining and milling companies operated their own tailings mills, and some mills were equipped to be both amalgamation and tailings mills. It is not easy to find detailed accounts of how tailings mills operated. What is known is that the discarded ores ended up as extremely hard, tightly packed mounds of ore and residue. The process of preparing these mounds to extract whatever gold or silver they contained was costly and time-consuming. The yields were small, and the trick was to balance the cost of hauling and processing against the improbably tiny yields. One of the largest tailings mill, built by Mackay and Fair's Pacific during the height of the Comstock boom, was Omega. Pacific also owned a second mill, Mariposa, with tailings operations. Presumably

most of the tailings came from Consolidated Virginia, California and adjacent mines, and it would appear that the construction of tailings mill in conjunction with the acquisition or construction of amalgamation mills was to allow for a quick-turn-around in recovering ores that escaped amalgamation. Mackay and Fair actually realized tens of thousands of dollars in bullion from their tailings stockpiles, and few of the mills that declared bullion from tailings could match the output of their mills. Tailings represented only a fraction of the bullion declarations, but Mackay and Fair operated on the basis that as little ore as possible should be lost for others to recover. The yields per ton from tailings compared to amalgamated ores generally came in under \$10 per ton. Often it was half that amount. For millers who bought tailings the price-paid component was important. With their own tailings mills Mackay and Fair made the price paid less crucial. In the case of Pacific, since Mackay and Fair owned both the mines and mills, the price that the tailings mills paid for the residues from Consolidated Virginia, California and other mines surely favored the mills. It is not known to what extent a market for tailings may have existed so that as stockpiles of tailings grew (as they did with rising output) some downward pressure on prices may well have come into play. From strictly a documentary angle there remains a large unfilled hole in how tailings mills were operated or financed. Not only is the process not spelled out, but also the cost structure, as is understood with the amalgamation mills, is lacking.

The bonanzas mines from the middle 1860s through the middle 1870s clearly made money for their investors. The cycle of profitability lasted no more than a few years for each mine. From the earliest years through the middle 1870s the Comstock experienced several profit cycles, but by 1880, as the mines reached unprecedented depths, the results were uniformly disappointing. There were no new discoveries and no new bonanzas. Much smaller operations (by comparison with earlier years) carried on the business of mining (and milling for that matter) along the Comstock. Small operations had come and gone throughout the period, and in the absence of detailed financial records one can only speculate about their profitability. The assessments indicate that the costs often absorbed all the revenues or exceeded them, but verifying the declared costs is nearly impossible without more data. No doubt some small operations at least for brief periods happened upon rich veins that were profitable in the short run. In the end, though, unless companies had large underground deposits to exploit they could not maintain a flow of capital that was necessary to support and expand their operations. Even some of the large bonanza companies, when they ran out of good ore, ran out of capital also. It was said that a company needed \$20 per ton of ore to break even, although that was not a figure to inspire much investor confidence. Many small operations with bullion declarations had yields below \$20 per ton. And while a few small operations with such yields could eke out profits, they had at best a limited role in Comstock mining history. The Comstock became a captive of big companies.

Mining and milling operations depended on a pool of labor that ranged from skilled to unskilled. Thousands of Americans made the journey to the Comstock in search of work (and fortune). In spite of the dangers associated with mining the work paid wages above those in other industries. In setting wage levels employers had to consider the higher-than-usual cost of living in a remote area like the Comstock. So much of what was

needed by companies and workers had to be imported over hundreds of miles. Even after the opening of the Virginia and Truckee Railroad the cost of transportation remained a large component of the retail price. In addition scarcity of housing pushed up lodging costs that employers had to be mindful of in determining compensation. And finally throw into the mix the presence of unions almost from the outset. Unions including some fairly radical ones were active in many western mining camps. The Comstock unions did not appear to follow a radical agenda, at least once they were organized and recognized, although they and the employers were from time to time at odds compensation, ours and other working conditions. But strikes were few and far between. Defending what the unions had won for the most part in the earliest years remained their chief goal. Unions made little effort to demand higher wages and better working conditions during the bonanza years, and conversely companies made little effort to change the contracts during the lean years. There may well be some truth to the assertion of those who have studied relations between companies and their unions that they needed each other. Certainly frequent interruptions, delays and closures would have jeopardized the companies' balance sheets as well as the unions' past gains.

The labor scene was more robust than the frequently-cited wage negotiations between the companies and their workers. Underground miners constituted the largest occupational category among all the employment categories. Although they performed various tasks, they were essentially involved with building the underground infrastructure and extracting and lifting the ores. Early in Comstock history they had won the wage of \$4 per day, and that remained the standard daily compensation in good and bad times. There are a few examples in the company accounts of miners being paid more or less than the standard, but the deviations were infrequent. Mining companies, especially the big bonanza mines, organized their labor systems around dozens of different job categories. These included skilled workers such as blacksmiths, carpenters, and engineers as well as less skilled workers such as laborers, carmen and assistants to various skilled categories. Hours worked per day were basically the same for all categories – eight hours per day – but wages ranged from \$2 to \$3 per day to \$5 to 6 dollars per day. Some employees - foremen, assayers and even watchmen – were generally paid a monthly salary rather than a daily wage, although when that monthly salary was translated into a daily wage the recipients might actually receive less than some of the most skilled wage-earners. Most of the employees had union representation. Except for minimum wages and hours and some other mandated working conditions, companies faced few other imposed contractual restrictions in dealing with workers. They were known to provide some health and death benefits and to make inquiries concerning the welfare of their workers. By and large, religious charities, public agencies and unions themselves provided the safety net and undertook the role of caring for workers and citizens who could not care for themselves. As well paid as Comstock workers were, they faced challenges from dangerous conditions to job losses to inflated prices. Many employees worked 25 to 30 days a month, and some worked double shifts a few days each month. If one can imagine a miner lucky enough to keep an underground job for a decade, say, from 1865 to 1875, his gross compensation for the year would only have changed if he agreed to work more hours. It cannot be said with certainty how many if any workers (below the supervisory or administrative staff) remained employed in Comstock mines (or for that matter mills)

for a decade or more. Even though some workers had won the battle for eight-hour shifts, an eight-hour shift for 25 to 30 days a month, month after month in the underground, had to take a toll. There is evidence that workers stayed employed for six to 12 months and perhaps longer, although they often changed mines or classifications during those months. The documentation is available to study tenure patterns up to three or five years but is tedious to analyze, involving, as it does, monthly accounts and hundreds and hundreds of names. (A ready-made PhD dissertation.) Any notion that the labor was so grueling that turnover within a mine's work force was frequent and massive should be tempered in light of the statistics for duration of employment in the mines of Consolidated Virginia and California, two mines with intense daily production regimens. People came to the Comstock to work in the mines not because the jobs were easy and mines were safe, but rather because the pay was high. It was also a gamble (in a state that hitched its economy to gambling) that they could survive and perhaps luck out by becoming a locator or discoverer. Many became and remained miners (as my father did) because they found some almost inexplicable satisfaction in doing just that. More than one observer commented on the capacity of the Comstock miner to perform their tasks well.

A more difficult question to answer is, with the hazards of the jobs and the goals of the companies, how well did management and labor get along? There are documented periods of strife and outbreaks of violence (mainly confined to the early years), and even after a partial rapprochement that institutionalized certain features such as wages and hours, a war of words could break out over any number of issues, some covered by contracts and other because of circumstances. Still, one cannot in any way describe relations as persistently hostile and disruptive. The work of the mines (and the mills) got done. Underneath the diatribes and outbursts was a general civility based, it would appear, on the economic and financial interests of both parties. Employers counted on a stable, reliable labor force and workers on a steady, predictable daily compensation. It should not be assumed that everyone who wanted work could find it or everyone who wanted to change his job could do so. But based on a small sample more of the labor force showed up month after month for work than those who disappeared. Although not the subject of this study mine workers perhaps more so than mine owners became a part of the fabric of the community. The Comstock social historians have found ample evidence workers joined community organizations (fire departments, local militias) because they were needed. They organized and managed their own benevolent societies and cared about schools, hospitals and churches. In short, this was a community in spite of the opportunity for friction that more or less worked for most of the quarter century after its founding. Of course as the mines became exhausted the friction grew, the community suffered and the disruption was far worse for the worker than the owner. Had the workers wanted to do battle with the owners at this stage, there was little in fact to fight over.

How should the Comstock be viewed in light of the economic transformation of America in the late nineteenth century? Of course, it played a role, but how important was that role? It is an historical event that merits mention in most textbooks – after all two presidents visited Virginia City and Mark Twain began his career here – but it is not

accorded a prominent place in the historical annals. Towns founded for extractive industries were like supernovas – extraordinarily bright before burning out. Mining camps sprung up out of nowhere, grew into towns with thousands of people and dozens of businesses and then simply disappeared. They are often the ghost towns that people love to visit and explore. Some mining towns, even after the flash was gone continued to support a minor extractive industry, and other mining towns hung on not because of mining but because of governmental and commercial functions that any surviving permanent population needed. Towns founded on extractive industries no matter how great the strikes had a feature of impermanence but perhaps more devastating to their historical significance they seldom could transform their economic structures in such a way as to insure future growth, good jobs and stable prosperity. No town or city, regardless of its economic foundations, can guarantee permanent, prosperous existence. But mining towns rose and fell with greater alacrity than most.

Let there be no doubt that the Comstock was a big event with big economic ramifications. The Comstock discoveries came a decade after the California gold rush. Some of the gold was extracted from large underground quartz mines, but most of it was lifted from surface veins or from shallow riverbeds. What distinguished the Comstock from California and other similar mining episodes was scale. In an age when American business was in transit from small-scale to large-scale producer size became the defining characteristic of the economic system. American entrepreneurs set out to create large corporate entities that by amassing investment capital could employ the latest mechanical improvements to enhance production and productivity and eliminate the inefficiency of competition. The emergence of monopolistic or near monopolistic enterprises became a troubling component of the economic transformation for Americans to deal with. The perception was that the economic power of these corporate monsters with operations in different cities and states, labor forces in the thousands and an unlimited appetite for control of the marketplace left some Americans bewildered. On the one hand they enjoyed lower prices that stretched their meager wages further, but on the other hand they had to accommodate to a new economic order that featured the emergence of powerful national corporations that disregarded the accepted market ground-rules. Small firms that had served local or regional markets continued in existence along side of the corporate giants for many decades, but the struggle for market share and financial survival tended to favor the national corporation. A policy of laissez-faire (as exemplified in the writings of Eliot Lord) dominated economic thinking with somewhat paradoxical results. Letting the market decide how best to allocate resources with little or no guidance from government resulted in an economic system of monopoly and oligopoly that limited the opportunity that the system was supposed to engender and protect. The industrializing of America, which began in the 1840s and continued into the twentieth century (with Comstock mining a participant), contained mixed messages. The transformation may have made Americans better off, statistically speaking, (although some scholars would disagree with that assertion), but at the same time it may have made them more vulnerable to vicissitudes that the changes engendered. The tension that resulted from the new economic order was evident to some degree on the Comstock.

The industrializing of America quite naturally focuses on manufacturing. Other economic sectors were changing as well, but according to statistics provided by Robert Gallman, the sector known as “manufacturing, mining and hand trades” grew from 17 percent in 1840 to 24 percent in 1870 and then to 31 percent in 1900 with respect to the sectoral distribution of the Gross National Product. Reorganization of industry (in general) and heavy reliance on mechanization to effect productivity gains began before the Civil War but made great strides in the decades after the Civil War. One driving force behind the growth and change in this sector was the exploitation of mineral resources: “...other features of the extraordinary U. S. environment were being exploited: enormous reserves of minerals of all sorts were discovered and technologies to put them to use.”<sup>5</sup> Another aspect of the sectoral growth underscored by Gallman was the regional matter. In 1840 the West “generated less than one-fifth of the total income...whereas in 1920 this figure had risen to 54 percent.” In explaining the redistribution that was taking place in the second half of the nineteenth century Gallman highlights economic opportunity: “the west clearly had superior agricultural resources, and as time passed, new resources were discovered in this treasure house – coal, iron, lead, copper, petroleum, silver, mercury, gold. Each discovery led to a boom, some modest, some enormous, as was the California gold rush.”<sup>6</sup> And one might add the Comstock in Nevada.

In trying to fit the Comstock into the industrializing of nineteenth-century America, several problems have to be considered. The most obvious difference between mining of gold and silver from other minerals and from manufacturing in general was the end-product. Gold and silver did not become products that manufacturers bought to produce other product (except for small quantities that had industrial or artistic applications) or consumers bought to use in their daily lives (except for jewelry or art). Gold and silver had commercial, financial and official uses, and as more gold and silver were produced they enlarged the available money stock both in the United States and across the world, and that contributed to increased capital flows to the very sectors that were helping to propel the American economy forward. A second matter has to do with pricing. Governments fixed gold and silver prices by determining how many coins could be minted from a unit of gold or silver. There was also a market price for both. The value of gold, because it was the most sought after metal seldom declined, but the price of silver did decline as more was produced. One could argue therefore that as the precious-metal mining industry became more efficient in mining and milling gold and silver ores, it could affect the market price by ratcheting up the supply of a metal. A final matter was that while costs played a role as to whether or not a mining site was to be exploited, a mining company might continue in operation even as the losses mounted in the anticipation that new deposits would be found and gains would quickly overcome losses. Precious-metal mining companies generally pursued a strategy of investing heavily in

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<sup>5</sup> Gallman, “Economic Growth and Structural Change”, in Engerman and Gallman, eds., *The Long Nineteenth Century, Cambridge Economic History*, 2:49-50. Table I:14 (p. 50) shows distribution by sectors, and although mining is included in manufacturing data from precious-metal mining are not included in the dataset from which the percentages were derived. The minerals included in the dataset were coal, iron ore, copper but not gold and silver. The point to be made is that the sector most closely related to business of the Comstock grew substantially during the period of the Comstock.

<sup>6</sup> Gallman, “Economic Growth and Structural Change”, in Engerman and Gallman, eds., *The Long Nineteenth Century, Cambridge Economic History of the United States*, 2:51.

exploring for ores and once found in removing as much as possible as quickly as possible. In a sense the end-product, gold and silver coins or ingots, always had a value and always had a market. Creating markets, as manufacturers had to do, and then allotting and pricing the factors of production in such a way as to realize a gain from that market was the reverse of what precious-metal mining companies did. The market for gold and silver was heavily regulated so that strategies to affect the price of the precious metal even in times of great strikes were less important than strategies to affect the cost of the extraction, reduction and transportation. If mining and milling operations could be made highly efficient, then regardless of the fixed price at the end point the mining company could make a profit with moderately rich ores. When one looks for the effects of an industrializing economy in precious-metals mining, one must mainly focus on operational performance.

The points where the evolution of Comstock mining agreed with the industrializing of America were several. First, as mining companies pursued consolidation in the extracting and the milling of ores, size became a predominate feature. Although scores of claims were laid out along the Lode at the time of discovery, the ownership pattern that emerged over the next quarter century was that a small group of owners came into control of the major ore assets. The pattern was reinforced by the fact that the small coterie of mine owners were also the mill owners, even though milling operations were sprung off as separate entities. By the middle of the 1870s with the Consolidated Virginia and California bonanzas Mackay and Fair and their associates owned or controlled most of the mines on the northern end of the Lode along with a dozen or more mills plus aforementioned ancillary companies. In the new corporate world that America was creating it was not unusual for companies to try to erect a vertical monopoly by controlling all of the operating units from the source of the product to its final sale through various legal entities created for that purpose. (John D. Rockefeller's Standard Oil, for example.) A similar force was at work on the Comstock. Comstock mining and milling companies remained local operations. Their owners did not try to expand their control to other mining camps in Nevada or in other western states. Controlling the precious-metal market was less the objective than controlling the inputs that produced the precious metals. Once the Comstock ore gave out, the companies went out of business or reorganized under new owners. Successful Comstock miners seldom staked their financial future on strengthening or diversifying the local or regional mining economy. They sought instead to organize their enterprises in such ways as to exploit the local wealth quickly and efficiently if possible, to transfer their gains to other places and investments (mainly San Francisco) and to abandon the Comstock when its primary assets, the ores, had been exhausted. Mining companies may have touted the long-term prospects of a rich-ore-bearing lode, but in reality they existed for the short or intermediate term. Recall that Mackay and Fair prize creation, The Firm, was gone in less than a decade after its founding. To a degree size was driven by the location and quality of the ores. As the ores became more widely dispersed at greater depths the investment in these underground explorations and operations grew accordingly. There can be no doubt, however, that successive generations of miners thought in terms of bigger corporate entities.

Organizing ever-larger business enterprises required a vision that served only a handful of miners well. If, as Eliot Lord, Dan DeQuille and Grant Smith have described, early mining companies squandered their gains through profligacy and greed, their successor, no less avaricious, manifested a sense of discipline and order. Early Comstock history is difficult to recover because the primary evidence (reports, accounts, letters) is missing. The general histories of this period seem to agree, however, on the basic outline that portrayed the industry acting like kids in a candy store than businessmen with financial acumen and managerial skill. As the riches of the Comstock became more widely understood, the helter-skelter approach gave way (probably earlier than assumed) to investors and managers who had sharpened their pencils. The excesses were never completely washed out, but removing the ores economically and rapidly required organization and capital. William Sharon left an indelible mark in this regard even though others had probably already begun the makeover. Sharon was more a banker and lawyer than the miner, but he had an astute sense of what had to be accomplished and how. For better or worse his goal was to dominate mining (and milling) on the Comstock and by so doing to make money for himself and his partners. His was not the only model for accomplishing these goals, and yet once the industry started down the path of consolidation and control there was no turning back. The grand entrepreneurs did not eliminate the competitive forces that not only drove them to launch new (sometimes bizarre) strategies to outwit their rivals, but they also understood the need for cooperation and compromise (although not always with the most altruistic motives). Dozens upon dozens of the earliest claims proved to be unprofitable if not barren operations, and that certainly opened the door for the emergence of oligopolists like Sharon, Ralston, Heywood, Jones, Mackay and Fair. The stakes were much too high to permit a competitive jungle irrespective of the prevailing theories.<sup>7</sup>

The stakes were high because the business of mining was costly and risky. The vast underground network could not have evolved without mechanization. This should be understood broadly. New products and processes made efficiencies possible on a scale never known before, but without transportation the Comstock would have been left on the sidelines. The Virginia and Truckee Railroad, controversial as its financing was, had the effect of opening the Comstock to the manufacturing world. Importing goods from raw materials to finished products for the purpose of making mining and milling more efficient could not have happened as cheaply and quickly as it did without inexpensive transportation. Nor could a quality of life, as social historians have written about, ever developed in Virginia City. It is difficult to imagine Comstock deep lode mining without the components fabricated from iron and steel and shipped thousands of miles even from overseas. That William Sharon like the great railroad barons connived to make the public pay for the VTRR does not diminish the importance of the railroad system itself to the

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<sup>7</sup> For a good summary of the role played by monopolies in America's post-Civil-War economy, see Stanley Engerman and Kenneth Sokoloff, "Technology and Industrialization, 1790-1914," in Engerman and Gallman, eds., *The Long Nineteenth Century, Cambridge Economic History of the United States*, 2:382-394. One can observe that the way in which monopolies came into existence in manufacturing and related industries did not absolutely apply to precious-metal mining. The essential difference was that the early claim lines had to be respected. Even though claim-holders could acquire adjacent properties, they usually did so in connection with discoveries of ore deposits rather than to assume ownership and control of the whole Lode.

mining industry. The multi-strand cables of several inches thick, weighing thousands of pounds that raised and lowered multi-tiered cages, also weighing thousands of pounds, were not produced locally or even regionally. Europeans may have produced the highest-grade cables, and certainly James Fair negotiated with European companies for these and other products. Even though rail transport was the cheapest and quickest mode for getting these products from factory locations or ports of entry to the Comstock, he implored his supplier to keep transport costs as low as possible and specifically reminded them that since his companies received rebates from VTRR (even though his rival's creation), it should be used to transport goods to the Comstock. Turn this upside down and think of the difficulty and expense if not the impossibility of moving capital (and consumer) goods by wagons and teams. Fans, pumps, drills, tracks, wheels, cages, pans and boilers, just to mention a few items, arrived by rail year after year. And railroads, of course, made it possible for the manufacturers of these products to be in business in the first place. The history of the VTRR and of the newly completed transcontinental (with a depot in Reno) its economic impact on the Comstock mining industry remains to be written.<sup>8</sup>

The mining companies for which accounts and records exist understood the importance of mechanization. Underground work still depended heavily on human labor, but human labor supplemented by mechanical support. What mechanization supported was greater output per worker. In the mining industry this simply meant that more ore per worker could be recovered and processed more quickly and more efficiently as more equipment was added to the operation. In the manufacturing world output was usually measured in man-hours, and higher output (productivity per worker per man-hour) helped lower the cost to produce the product and the price to sell the product. In the mining world, the volume of ore produced had little effect on the value of the bullion. Thus, for mining companies cost became a dominant issue. If the speed by which a cage could be elevated from or lowered to the diggings or the ore could be milled and amalgamated or the bullion could be shipped to the mint or the bank could be improved, it could have an immediate impact on the company's bottom line. Mechanization cost money, and the richer the mine's assets the more likely the company was to invest in mechanization. One revelation from the 1880 census that asked questions about machinery and equipment was how many of the less productive mines had invested in a degree of mechanization.<sup>9</sup>

One sure sign of the industrializing of America and the Comstock was the organization of the companies and in particular the bookkeeping and record-keeping procedures. Business accounting has evolved into an almost mysterious realm, and what was practiced in the late nineteenth-century was less mysterious. Still it required persons with bookkeeping or accounting knowledge. Since many of the new industrial companies were public companies with stockholders, annual reports based on certain accounting standards had to be prepared for the stockholders. Comstock companies were public

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<sup>8</sup> Scores of boxes of documents on VTRR and other rail connection exist in Special Collection of the University of Nevada at Reno Library, but I did not make it a subject of this mining history.

<sup>9</sup> The Sutro Tunnel Project stand as an exception because even though mechanization made it possible to complete the project, the delays and disputes made the tunnel obsolete before it was finished. Had it been finished in several years, unlikely given the distances and depths, it might have added to the efficiency of the mines by providing a much-needed drainage system. Not everything that embraced the new mechanical world necessarily resulted in more efficiencies. Some became wasted investments.

companies with stockholders and issued annual reports. The annual reports for Comstock companies that have survived went through their own evolution. The reports that basically listed receipts and disbursements were supplemented by reports that showed assets and liabilities, inventory accounts, cash flow and stockholder equity. These annual reports were drawn in the case of some companies from voluminous financial records. The surviving financial archives of The Firm of Mackay, Fair *et al.* are probably the most extensive of any company doing business on the Comstock. But impressive archives for Savage, Ophir and several other mining companies have survived as well.<sup>10</sup> In addition to the printed annual reports the Nevada Controller and Mineralogist often published in their biennial reports sections from the annual reports or from company accounts. The enactment of the Felton Act by Congress in 1877 required companies to keep records on certain aspects of their mining operations. All in all the extant Comstock financial archives are indeed substantial. One has to be impressed with the cost analysis that the Sutro Tunnel Company undertook as it weighed the advantages and disadvantages of changing from horse-drawn locomotion to steam or water even though the company had so little business and was sliding into bankruptcy. On the other hand, the accounting put forth in several versions of the distribution of the assets held by Mackay and Fair in the Pacific Milling and Mining Company was more sloppy than precise. More records did not necessarily eliminate bad record-keeping.

Industrialization had to be financed, and the change in financing was almost as revolutionary as the change in manufacturing and mining. Building industrial American required huge capital–investment pools that often exceeded the resources of conventional local banks. Investment banks and stock exchanges became important sources for underwriting industrial ventures including mining. The earliest investors in Comstock mining were Californians (mainly from San Francisco), and Comstock financing remained linked to Bay Area. Adolphe Sutro charted a different course by trying to arrange for financing through European investment banks. Indeed it has been estimated that in the last half of the nineteenth century hundreds of western mining companies were nominally capitalized with British capital in the hundreds of millions of dollars. Except for Sutro direct European financing of Comstock companies is certainly difficult to document. Perhaps Europeans invested through stock purchases and other conveyances. Being American or European made little difference with respect to outcomes. According to some surveys perhaps one in ten of these projects paid any dividends. British investors not unlike American investors “had fallen victim to ‘gold extraction with a vengeance’”. To quote the *Economist* “there is a pretty general belief that the profits were never honestly made; that, as a matter of fact, the ore bodies which yielded the dividends were planted by human hands and not by nature.”<sup>11</sup> Mining company stocks traded on various exchanges, and companies used stock issues to raise capital for new undertakings. Speculation in mining stocks was rampant, and outside of the principal owners stockholders were often stock-exchange traders and speculators. The main banking facilities in Virginia City were extensions of the mining companies. Sharon and Ralston

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<sup>10</sup> Most of these archives are in Nevada or California, but the bulk of the Savage Archive is in the Beinecke Library, Yale University.

<sup>11</sup> Quotes from Lance David and Robert Cull, “Capital Movements, Markets, and Growth, 1820-1914,” in Engerman and Gallman, eds., *The Long Nineteenth Century, Cambridge Economic History of the United States*, 2:759-760.

set up the Bank of California, which they used to collect an array of mining and milling properties by advancing loans that borrowers could seldom repay. Mackay, Fair *et al.* decided that instead of doing business with Sharon and Ralston, once their great bonanza began, established their own Bank of Nevada. Mining companies used these banks to borrow funds, to issue drafts and transfers, hold ores (an underground vault can still be visited in Virginia City) and to manage accounts. Local banking has not yet (to my knowledge) been thoroughly studied, but annual stockholders' reports often indicated that companies kept deposits in local banks. Weekly reports by mine officials also referred to transactions with local banks. One obvious question about local banks was how much if at all they served the banking needs of ordinary citizens. Under the contract mine workers were to be paid in gold coins (and silver for small coins), and while banks may have supplied coins to companies to meet payrolls, mining companies had another source – the federal mint, which could provide coins from their own bullion. What is unknown is how much consumer (retail) banking local offices engaged in. Banking on the Comstock would appear to be mainly devoted to the needs of the mining and milling companies.

Western mining earned special privileges because the land where the ores were usually discovered (certainly true of the Comstock Lode) belonged to the federal government. The assignment of mineral rights came under the purview of the national government, and even though states would eventually be organized out of the territories legal questions relating to mineral rights remained deeply embedded in federal authority. Federal oversight in mining was generally light and tended to favor the interests of the companies over the citizenry at large. In time some federal regulations evolved including some concern for health and safety, but the laissez-faire attitudes that pervaded American economic life tended to dictate a hands-off policy. The State of Nevada succeeded in asserting its legal right to assess and tax mining operations (not something that owners ever fully acknowledged) and to impose minimal safety standards. But Legislature was more often than not (as was true in other states) more attuned to the needs of the properties and entrepreneurial classes, and even though the Nevada Legislature and Governor as well as some local officials stood up to the powerful mining interests from time to time, the companies reigned with relative impunity.

Even though I have chosen to end this study in 1885 when Comstock production fell to the lowest level it had known since the early 1860s, I am fully aware that mining did not end in that year. In the second half of the 1880s a more optimistic outlook in the future of the Comstock could be detected in investment activity and newspaper reporting. Dan DeQuille published a small pamphlet-like reprise entitled *A History of the Comstock Lode and Mines* in 1889 in which he wrote of “The New Departure”. The two greatest bonanza mines – Consolidated Virginia and California – had been consolidated through re-incorporation as Consolidated California and Virginia with work resuming in the upper stories “where small streaks of low-grade ore...formerly...passed by led to deposits of fair milling ore.” Other deposits were found after the fire that had smoldered since 1881 and produced carbonic acid gas. The new company reported ore worth about \$8 million and actually paid dividends of \$2.5 million. Yields were in the \$20 to \$35 per ton range, and enough ore was lifted to keep several mills in operation. In fact, DeQuille asserted that more mines “were producing paying ores” than anytime in the history of the

Comstock. Most of those he listed were mines that had enjoyed small to large bonanzas in the previous quarter century. The point to be emphasized is that in this late mature cycle more mines were being worked but new bonanzas did not materialize. The assessments reveal that production rose from over \$2 million in the early 1880s to between \$5 and \$6 million in the late 1880s and then it began to slide until it bottomed out at less than a half million dollars by the end of the century. The new ore bodies found in the old mines that inspired DeQuille's optimism as well as others simply did not pan out. Mining had a way of deceiving and deluding: "In working these small bonanzas are sure to be encountered – scattered plums in the pudding – which will assist in sending up the average." And almost as an after-thought with new processes and new technologies "Present expenses will shortly be still further reduced."<sup>12</sup>

And the search has continued down to the present day. In an ironic twist, as Roland James has pointed out, the Houston Oil and Mineral Company began large-scale excavations in the late 1970s on the edge of Gold Hill. Over a period of several years the company created a huge open pit, the edge of which bordered on the old municipal boundary of Gold Hill. The irony is that "this new departure" (to borrow from DeQuille) was a form of surface mining, not lode mining, and was closer to how the Comstock began. The dimensions of the "hole" were almost as staggering in their own way as the Comstock true bonanzas were a century earlier: 450 feet deep, 800 feet wide and 1,600 feet long. This was dug at a time that gold was selling for \$600 an ounce, and mining companies like Houston thought that they could make a profit from small rivulets of ore. They could not make a profit, and in the early 1980s the project was abandoned followed a tiny reclamation effort. The hole, although overgrown, remains.<sup>13</sup> As I write this final chapter, gold has once again reached \$800-\$1,000 per ounce with market mavens predicting \$2,000 per ounce. Silver falls in the range of \$14 to \$15 per ounce. Will that be the launching pad for another "new departure" on the Comstock? Or has the Lode, often described in terms of infinite riches, come to its final repose?

The story of the Comstock stands as one of the extraordinary mining experiences in the American West and even in the New World. The Comstock was not the richest or the biggest strike, but to make the strike as big and rich as it was required that deep lode mining be pushed to a scale unknown before. Occurring at the time that it did the Comstock embodied the triumphs and excesses of an age driven by venture capital, mechanical and technological change and business concentration. For better or for worse Comstock miners extracted a third to a half a billion dollars in gold and silver (in many billions today) in a quarter of a century. The personal testimonies of the capitalist, the worker and the citizen defied the odds that a mining camp could create a mining economy that built a mining city that was as wealthy and cultured as any city in the West. But mining economies can exact a toll. Ore defined creation and growth, personality and behavior and accomplishment and power; ore would also define the demise. The exhaustion of the ore ended the economic system that the ore had spawned and endowed

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<sup>12</sup> DeQuille, *A History of the Comstock Lode and Mines....* (Virginia City, NV: F. Boegle, 1889), 92-93, 94-96.

<sup>13</sup> James, *The Roar and the Silence*, 269-270 with photograph on p. 270.

future generations with environmental burdens that in nominal dollars may exceed what was removed.

## APPENDIX

Several datasets used in the analysis of the Comstock can be downloaded:

Go to <https://home.comcast.net/~richardgarner09/databank.html> [ctrl-click]

Important: Users should take time to read explanatory notes attached to data files. I have rearranged the way in which the annual data are assembled.

- [Nevada Survey-General's Biennial Report, 1867](#)
- [Bullion Records, Consolidated Virginia Mining & California Mining Cos., by Mills, 1873-1881](#)
- [Story County Ore Assessments, 1875-1885](#)

Nevada Controllers' Biennial Reports:[1867](#)

- [1869](#)
- [1871](#)
- [1873](#)
- [1875](#)
- [1877](#)
- [1879](#)
- [1881](#)
- [1883](#)
- [1885](#)
- [1887](#)