

Chapter 10
The Business of Mining:
Essential, Redoubtable Worker, Wages & Unions,
Size of Labor Force, Tenure of Worker

No topic relating to mining on the Comstock in particular or across the West in general stirs as much passion as the role of the workers (save, perhaps, the environmental legacy). Hundreds and at times thousands were employed in the mines and mills and ancillary enterprises such as logging, railroading and building. Work in mining camps by any measure was always hard and often dangerous. My father was a Western Pennsylvania coal miner, and for some years he and his brothers worked a slope mine that was dug several hundred feet into a hillside. From time to time as a child I was permitted to take a trip “down” into the mine. It consisted mainly of a single tunnel with a single track from the mouth to the interior where the tunnel and the track branched out in several directions to follow coal seams. My recollections (certainly distorted by my age then and time since) were of chilling dampness (summer trips only), nauseating odor (I knew nothing then about ventilation), and unrelenting darkness (except for carbon lamps). The two keenest memories are the incessant noise, even though there were few machines, and the confined space even around the coal seams. I have no recollection of any reaction to how the coal was extracted or how difficult and dangerous the work was, but I certainly never entertained any idea of following in my father’s footsteps. It is somewhat ironic, of course, that I have followed his path as a writer of mining history instead of a laborer.



Illustration 1: Interior View

Although the underground complex at Comstock was grander in scale and construction than the foregoing, all mines share certain characteristics. The interiors of the Comstock mines were described at times as spacious, well-lit and clean. They could

also be cramped, full of dust and perilous. What came to distinguish Comstock mining from earlier underground ventures was how mechanized it had become. Elevators or hoists were built in the vertical shafts to transport workers, ores and supplies, and they became larger, faster and even safer. Rooms or stations were constructed at designated levels next to the shafts, and in addition to facilities for loading and unloading the elevators these stations contained water tanks, assay labs and other facilities for maintaining the mines. While mining companies bought hundreds of sledges, picks and shovels every year for their workers, some also invested heavily in compressor-driven drills with diamond heads or bits to cut away the hard rock. Large ventilators were installed to improve air quality and circulation, and large pipes were installed to remove the water. Several mine fires, the worst being the Yellow Jacket fire in 1869 that closed most of the operations in that mine as well as surrounding mines and killed at least 37 workers, prompted discussion and implementation of safety procedures and yet because maintaining the underground demanded constant attention that some companies could ill-afford. There was a general recognition among mine owners that it was in a company's interest to prevent worker injuries or deaths and yet there was an equally powerful incentive to keep the work progressing in spite of apparent risks.

Despite efforts to modernize the mines (at least in late-nineteenth-century terms) mining for the worker remained daunting, dangerous and debilitating. Mining ore with hand tools or with machines that increasingly replaced them was strenuous if not grueling work by any measure. Digging through tons of rock or clay or quartz and then shoveling ore and waste into cars in damp, poorly ventilated and cramped conditions required strength, and fortitude. What made work on the Comstock even more strenuous was that these became some of America's deepest mines. Very little profitable ore was found below 1,700 feet (a third of a mile), but prospecting continued to 4,000 feet (two-thirds of a mile) before mining companies abandoned their searches. At such depths the elements of temperature, air and water combined to make mining perilous and unpredictable. Weekly company reports



Illustration 2: Cave-In

on underground operations make frequent reference to operations being slowed or stopped because of poor ventilation and scalding water. Generally the solutions to these problems were larger fans and bigger pumps. In addition ventilation could be improved by keeping passageways as uncluttered as possible and by cutting new passageways for better circulation. But even if air flow or water drainage could be improved, workers especially those at the lower depths had to work in excessive heat. Underground temperatures were more constant than surface temperatures that were subject to changing climatic conditions. The underground is often considered to be a cool and damp environment, and while the underground of the Comstock was certainly damp, it was not always cool. Temperatures in the drifts and the winzes or along the stopes could exceed 100 degrees. W. H. Smith, the superintendent at the Belcher Mine, noted in an 1872

report that the southern drift at 1,000 feet with veins as wide as 65 to 70 feet was being worked slowly “owing to the excessive heat....”¹ “Excessive heat” was a common refrain in the weekly or annual reports. The pools of scalding water in and around the ore deposits helped to push up the temperatures. In 1876 Crown Point’s superintendent, S. L. Jones, dispatched a report to the company president in which he said that all work had ceased at 2,000 feet because the heat from the flow of hot water was too intense.² Water drained from the mines through the Sutro Tunnel over a four-mile stretch registered one morning at the mouth from 90 to 114 degrees F.³ In various drifts and winzes between 2,500 and 3,000 feet in Belcher and Imperial mines on the southern end of the Comstock Lode water temperatures ranged from 138 to 152 degrees, and as a consequence ground temperatures were as high as 168 degrees.⁴ Miners often disrobed except for their undergarments and shoes as they labored in such high temperatures. Tons of ice were lowered each day to provide workers ice water (as much as three gallons per man per shift). A notebook, handwritten in pencil and kept by C Pollack, the superintendent of the Savage Mine, at an unspecified time in the late 1860s or early 1870s, contained the phrase “got down ice” as the lead sentence in many daily entries along with how many prospecting holes were drilled or carloads of rocks were lifted or hours worked by miners.⁵ Cooler water from surface ponds or underground storage tanks was also sprayed into the shafts and tunnels to moderate the temperature of the air or water. For the workers, after laboring in such temperatures, the trip to the surface could cause of “nausea and dizziness”.⁶ In the case of the construction of the Sutro Tunnel, Superintendent H. S. Safford explained to the company Secretary, P. W. Ames, in his October 1873 report why the September ice bill was so high: “I know it foots up [sic] largely” but without ice especially in the summer when the water is so bad that the “men can’t drink it without ice.” It is hard to imagine that underground water was at all potable, but, if it were to be drunk, it had to be cooled since it reached temperatures that exceeded 100 degrees. Safford regretted that he had to pay as much as four cents per pound, which during the summer months was the market rate.⁷

Even if the heat and the air could be managed, there were further tests of the miner’s stamina. Tons of rock had to be cut out, broken up and carted away. Those who

¹ Letter from W. H. Smith, Supt., to J. D. Fry, Pres., 30 June 1872, NC92/1/1, Special Collections, Library, University of Nevada at Reno. This collection of Belcher Mine material is not a letterpress book, but rather handwritten copies of daily progress reports along with copies of outgoing mail.

² Letter from S. L. Jones, Supt., to C. E. Eliot, Sec., 8 April 1876, recto 137, verso 139, Crown Point Gold and Silver Mining Company Letterpress Book, Feb 1875-Jul 1877, NC85/3, Special Collections, Library, University of Nevada at Reno.

³ Letter from A. Sutro, Supt., to P. W. Ames, Sec., Sutro Tunnel Company, 30 Jun 1879, Letters & Letterpress Copies, Sutro Tunnel Company, 1878-1885, MS/NC3, Bx 3, Nevada Historical Society.

⁴ Mark Wyman, *Hard Rock Epic, Western Miners and the Industrial Revolution 1860-1910* (Berkeley & Los Angeles, CA: 1979), 109-110; James, *The Roar and the Silence*, Chapter 6, which he calls “The Workers, Labor in an Industrialized Community”, makes an important contribution with respect to his analysis of 1870 and 1880 Census data. Also interspersed in his text are some wonderful reprints of Frank Leslie’s drawings of miner workers, originally published in *Illustrated Weekly* in 1878.

⁵ Notebook kept by C. Pollack, [perhaps foreman], Nevada Mining Company Collection, Savage and Hale & Norcross Mining Cos., C2, II, IV-VI, Bx 22, Huntington Library; Wyman, *Hard Rock Epic*, 113.

⁶ Wyman, *Hard Rock Epic*, 111.

⁷ Letter #218 from H. S. Stafford, Supt., to P. W. Ames, Sec., Sutro Tunnel Company, 30 October 1873, MS-NC3, Bx 2, Nevada Historical Society.

extracted the ore were called muckers and those who hauled it were trammers. The level of dust that these activities created was heavy and constant, and according to some drawings and photographs, workers used scarves and masks to protect their mouths. The miners worked, relaxed and ate in a perpetual dustbin. Furthermore, whether wielding picks or operating drills or loading cars, workers were subjected to noise that was jarring and deafening nearly all the time. Some underground facilities were by mining standards quite roomy - seven or 10 feet high and nearly as wide – and yet much of the work of extracting the ores or upgrading the tunnels had to be done crouched over or in other contorted positions. Despite advances for supporting the underground networks of drifts, winzes and upraises, removing layers and layers of subsoil and vein matter left huge open areas that even when framed extensively could not withstand the weight of the ceiling or the perpendicular walls. Cave-ins occurred frequently with death and injury to those working in the area, but perhaps a more persistent danger than cave-ins was small objects falling from the ceilings or walls and striking the workers below. Eliot Lord calculated that falling objects accounted for 16 percent of the accidents on the Comstock between 1863 and 1880 compared to 10 percent for cave-ins.⁸ Main shafts were always dangerous, and as the depths increased, so too did the dangers. To manage the hoisting of ores and wastes or the transporting of workers and supplies over longer distances, the companies installed bigger cages with stronger cables. Traveling at higher speeds the elevators reduced the time that workers had to spend in transit. Despite efforts to improve the safety of these operations and in some cases to test them periodically for safety, the truth was that at any time cables could break, safety clutches fail and timbers buckle without warning or recourse, and, as Grant Smith observed, accidents in the shafts usually killed more workers in a single event than cave-ins, flooding or other accidents within the tunnels themselves.⁹ Retimbering the tunnels and shafts was an endless task. In their weekly or yearly reports superintendents and managers described in detail the location and the distance of the retimbering as well as the cost and the time devoted to the task. Retimbering the main shaft usually required that part or all of it be shut down, and since the main shaft often functioned as a primary ventilation system any major repairs to the main shaft could adversely affect the quality of air underground. Others, of course, were killed or injured from malfunctioning machines or personal missteps. And finally (but not to exhaust the list) there was noise. Everywhere in the mine sounds of machines, hoists, cars, picks and water cacophony of unrelieved noise. The physical effects from noise may have taken years to evolve, but the psychological effects may have been daily in the form of distractions, unheard warnings and discontent. Although we have focused on underground work, we should add that work on the surface, especially in the mills, had its risks as well. The clatter of the machines, the toxicity of the mercury and pollution from the smokestacks surely affected the health of workers and residents alike.

Thousands of people who flocked to the Comstock in search of employment, and some, perhaps a majority, had little appreciation of the perils that awaited them in the mines and the mills. The learning curve, however, must have been quick and steep. Deaths were episodic, but injuries were daily, and newcomers like the old-timers around

⁸ Lord, *Comstock Mining and Miners*, 414; Ronald Brown, *Hard-Rock Miners, The Intermountain West, 1860-1920* (College Station, TX: Texas A&M University Press, 1979), Appendix A.

⁹ Smith, *The Comstock Lode*, 243.

them had to come to terms with that calculus. Care for the injured or maimed and support for the families of deceased was taken seriously within the community. Although the mining companies assumed some financial responsibility regarding these matters, they played a modest role. On the front lines were the local labor unions and charitable institutions. The unions used their dues to support medical facilities and to pay medical costs. Union by-laws called for injured workers to receive as much as \$10 per week and death benefits of up to \$100, although how often unions could meet these commitments has not to my knowledge been analyzed. The largest of the unions, the Miners' Union (of Gold Hill and then Virginia City) had a membership fee of \$2.00 and a monthly assessment of 25 cents that could yield several thousands dollars per year (a figure that depended on the size of the roster).¹⁰ Over time unions transformed themselves from simply organizing and representing workers into "benevolent societies" for the welfare of the workers.¹¹

This transformation may well have had the blessing of mine owners, whose responsibilities for the care of the workers and their families diminished as the role of the unions increased. The companies' obligations did not end completely. Superintendents had the authority to approve funds for medical costs and death benefits. Apparently these payments were made at a company's discretion and not automatically granted to workers who were injured in the mines or mills or to families of deceased workers. In one such case C. P. Holmes, as assistant to and on behalf of Superintendent S. L. Jones, wrote a letter in 1875 to the Board of Crown Point Mining Company in support of further assistance for a worker with a good record and a long tenure but injured so badly that he would be crippled for life. The company had contributed about \$1,200 in payment of wages and bills from doctors and nurses, some of whom, in an aside, were said to be incompetent. But company officers declined further support on the grounds that it had been generous enough.¹² In another case involving employees of Consolidated Virginia James Fair's assistant advised Sister Ann Sebastian at a local religious hospital that checks were enclosed for board and medical attention of William Dempsey (\$40) and Edward Miller (\$60). The letter stated Edward Miller should be moved immediately to the ward if he desired more care since he was nearly recovered from his injuries. A third patient, William Miller, was admitted without company approval, and while the company assumed no responsibility for him, it was willing to cover his costs. But, the letter added, the company would pay no future bills of those admitted without cards from us.¹³ In case of a deceased worker James Fair, then superintendent of Consolidated Virginia, was less charitable. Fair's assistant wrote a letter to the Postmaster in Marshall, Michigan, to ask about the financial condition one Helen Shellenberger, whose husband was killed in a

¹⁰ Anne Hyde, "The Comstock Lode or, A Crucible of Militant Unionism," (Paper Submitted for Degree of A. B. with Honors, Department of History, Mt Holyoke college, 1982), 48. A copy is available in Special Collections, Library, University of Nevada, Reno. Also Dan De Quille, *The Big Bonanza....* (New York: Alfred Knopf, 1947, [reprint of 1876 edition]), 340.

¹¹ Smith, *The Comstock Lode*, 243.

¹² Letter from W. P. Holmes to Charles Eliot, Sec., 18 Jun 1875, recto 38-verso 40 in Letterpress Book, Feb. 1875-Jul. 1877, Crown Point Gold and Silver Mining Co, NC85/3, Special Collections, Library, University of Nevada, Reno.

¹³ Letter from J. Minor Taylor to Sister Ann Sebastian, 7 Jul 1876, verso 124 in Letterpress Book, 24 May-17 Aug 1876, Consolidated Virginia Mining Company, NC99/2/6, Bx 6, Special Collections, Library, University of Nevada, Reno.

mine accident. The company had given her money for her return to Michigan plus another check for \$106 or \$107. It was rumored in Virginia City that she left with bank drafts of \$2,000 to \$12,000 and in addition she owned a large farm in Michigan. Without knowing the outcome of the inquiry or more about the dispute one can presume that the company's position was that if she were a woman of means she did not deserve any remuneration for her husband's death.¹⁴

An overall assessment of how well the program of medical and death benefits available to miners and their family worked is hard to make based on the research to date. Medical care in particular was largely the responsibility of religious foundations, charities, unions and eventually local government. From the mid-1860s there was a Story County Hospital for which numerous statistics appeared in Eliot Lord's book. From 1865 to 1880 about 30 percent (1,591 of 5,062) of the patients treated were classified as miners, by far the largest occupational group. Of the 362 deaths recorded at the Hospital 10 percent were attributed to pneumonia, a disease that commonly resulted from working long hours underground. Six percent of the recorded deaths were attributed to miscellaneous injuries, which may also be related to mining because of the dangers of working in mines or at the mill. Of the 5,262 diseases treated at the Hospital 14 percent were diagnosed as venereal diseases, which may have affected all levels of society including mine workers who constituted a very large demographic. Following venereal diseases were rheumatism (11 percent), chest and throat diseases (10 percent) and fevers (9 percent), all of which may have had a close linkage to underground work.¹⁵ By all accounts, even though Virginia City had acquired a cosmopolitan air, life on the Lode was full of hazards in part because of its geographic location and in part its major industry. Obviously from the above statistics some diseases and afflictions occurred over time induce by the very extreme conditions that workers had to confront daily. But the most horrifying mishaps were accidents in which bodies were crushed, limbs severed and faces burned. From the outset the unions understood that they would have to assume a major role in caring for their patrons. Unions demanded investigations of accidents and improvements in operations, they provided "medicine, crutches, transportation, [and] nursing care..." and they organized visiting committees that "made weekly rounds to ascertain the needs and progress of the victims." They donated funds to St Mary Louise Hospital of the Daughters of Charity. Over the life of the Comstock miners' union in Virginia City and Gold Hill may have paid more than a half million dollars in benefits for death and injury to its members and their families over a nearly a half century.¹⁶ Help in

¹⁴ Letter from J. Minor Taylor to Postmaster, 14 Apr 1878, verso 143 and Letter from J. Minor Taylor to Helen Shellenberger, 14 Apr 1878, verso 144 in Letterpress Book, 15 December 1878-3 January 1881, Consolidated Virginia Mining Company, NC99/2/13, Bx 7, Special Collections, Library, University of Nevada, Reno. Two different check amounts are referred to in these letters: one for \$106 and another for \$107.50. Unions could also deny benefits and request restitution on misappropriated payments. Wyman, *Hard Rock Epic*, 181-182.

¹⁵ Lord, *Comstock Mining and Miners*, 436-441.

¹⁶ Hyde, "The Comstock Lode or, A Crucible of Militant Unionism," 56, 105 and 112, and Wyman, *Hard Rock Epic*, 182. Hyde cited Wyman's figure of \$400,000 for Virginia City but fails to be precise about the time – "during the Comstock's active period" versus Wyman specific 45 years. The annual average outlay would be about \$9,000. At 25 cents per union member or \$3 per year that would require contributions from about 3,000 members on average. The contributions may have been higher than that, and other sources of revenue may have been available. These averages are simply presented to indicate that support in the range

times of need and distress was apparently available through a combination of public and private efforts, but the role of the mining companies was at best modest, although some managers and owners appeared to follow an enlightened path, the actual outlay of dollars to build facilities or support workers and their families appeared to at best modest. This was not a company town (as was true of other mining towns east and west), and therefore the mendicant undertakings of the mining companies were (in accord with prevailing laissez-faire doctrines) strictly voluntary. Mining companies may have been less hostile toward unions in part because they saw the value of having unions perform certain services that without the unions might be forced upon them.

Comstock was the first Western mining camp to be successfully unionized. Unionization did not occur without incident, but once in place it was judged as a *fait accompli* within the community. The most celebrated conflicts between the companies and the workers came in the fall of 1864. Previously through the Story County Miners' League the workers had negotiated a minimum wage for underground workers and other benefits. In September, after the unions had resisted efforts to reduce their daily wages from \$4 to \$3.50, they issued a new demand for a "closed shop" without which they would stop all underground operations. The governor, James Nye, reacted by requesting the cavalry from Fort Churchill be dispatched to the Comstock. Although Nye may well have had some sympathy for the goals of the workers, his forceful response, which he justified in terms of the need for the new state to maintain public order, killed off the League but not ironically unionization. New unions, organized during the next few years, had absorbed the lessons of 1864. Over the next twenty years they succeeded in holding the line on hours to be worked and wages to be paid for many employees both underground and on the surface. Over the next 20 years unions filed grievances against the companies and from time to time actually organized protests in behalf of their workers, but labor and management preferred accommodation to strife. As Guy Rocha, a well-regarded Nevada historian, who has written a fine overview of Comstock labor history, points out, after the initial confrontations many of Story County's most prominent citizens were union members and organizers.¹⁷ Becoming active participants in community or state affairs, union members had enlarged their stake beyond the workplace. And on the other side of the economic spectrum the business community, not just the mine and mill owners but also the local merchants, understood that the general

of a half million dollars over a half century required a larger active union roster or higher annual member contribution than some of the facts cited. The Gold Hill reference could not be verified. Dan DeQuille also discussed union benefits and miner dues in *The Big Bonanza*, 340, but he noted the widespread practice of voluntary contributions by workers to families in need of help. The point remains, however, that voluntary contributions, union benefits and public charities rather than company benefits were the main sources for supporting families and individuals in need of assistance. The Daughters of Charity is the subject of an essay by Anne Butler, "Missions in the Mountains, The Daughters of Charity in Virginia City," in Ronald James and C. Elizabeth Raymond, eds., *Comstock Women, The Making of a Mining Community* (Reno & Las Vegas, NV: University of Nevada Press, 1998), Chapter 7. The article is concerned with the role of religious women in ministering to public needs but offers few financial details on Daughters of Charity programs. She noted that the wives of John Mackay and James Fair were active contributors. Apparently the Mackays were among the most generous supporters (160-161). She also cited examples of individuals helped by the Daughters.

¹⁷ Rocha, "The Many Images of the Comstock Miners' Unions", on-line essay at www.nevadalabor.com/rocha.html, 20.

economic well-being depended on amicable relations between the mine owners and laborers. Owners continued to grumble publicly about unreasonable terms dictated by the unions, and in kind the unions condemned the owners for being irresponsible and selfish, but neither party seemed to be willing to do battle over what they perceived to be unjust. Whether this conjuncture of interests between owner and worker within a communal framework actually existed – and it is difficult to demonstrate that empirically – all the parties were more pragmatic than doctrinaire over how their interests should be viewed.

The success of post-Nye unionization underscored an important consideration: the



Comstock labor movement appeared to have accepted the tenets of capitalism. At least, one could argue, they were not so philosophically opposed that they were prepared to close down the Comstock. Labor historians, who have written about western labor movements, are in disagreement about how to label these movements. Some emphasize the overall moderate character of unionization on the Comstock and others its episodic militant character. Comstock contemporaries were divided as well over how to interpret unionization. Eliot Lord, for example, was both critical of the power of the unions and admiring of the skill and tenacity of the workers. Imbued as he was with nineteenth-century laissez-faire principles, he saw unionization and in particular union insistence on a minimum wage for all regardless of the state of the operation as a denial of the right of

the entrepreneur, who assumed all the financial risks, to allocate his resources according to his needs. William Wright, the reporter who wrote under the name of Dan DeQuille for the *Territorial Enterprise*, defended the workers and their unions for pursuing a constructive course that helped to insure many years of relative calm in labor-management relations on the Comstock. Lord could be read in the context that union demands had altered the natural distribution of property, while DeQuille could be read in the context that unions had instead helped to preserve property. It remained, however, for Lord, the “number-cruncher”, to analyze the available data on miners’ wages.¹⁸

Entrepreneurs purchased labor at a cost (abstractly based on what the marketplace determined the supply of workers and the demand for workers to be) not unlike the purchase of machines parts or timber supplies. If an influx of people led to a surplus of workers, skilled and unskilled, then the purchaser of that labor, the entrepreneur, should be permitted to bid for that labor at whatever price could be negotiated. Conversely, if the population declined, then he should be prepared to raise his bid in order to secure the

¹⁸ For summaries of DeQuille and Lord, see Rocha, “The Many Images of the Comstock Miners’ Unions” at www.nevadalabor.com/rocha.html, 8, 9-10.

labor he needed from a smaller population pool. Changes in demographics were not the only things that affected wage rates. If a boom ensued without much increase in the population, then the demand for labor would probably push up wages as employers bid for workers, and if a boom turned into a bust, then the surplus of workers would allow the employer to reduce wages. Lord recognized that many unknowns could interfere with the actual operation of the labor market, but what he objected to most strenuously was the minimum daily wage because it imposed a standard that ignored how the market for labor might need to adjust. He found the evidence in the city streets and in the vacant mines.

A careful comparison shows that there is no mining district in the world where the general condition of the laboring class has been better during the past twenty years. No where has so large a guild been their own paymasters for so long a time, and in no mining district are more varied and excellent supplies offered for sale to men who can afford to buy, not only the necessities of life but its luxuries as well.

He then described a spread grand enough for a gourmand: beef fed on the “succulent grasses of the Truckee Meadows”, wild game from the Sierra Nevada foothills, fresh fish and fresh fruit (apricots, strawberries, figs to name a few) from the Pacific seaboard. Lord constructed two tables of nearly 100 items that showed in the first instance the volume of goods shipped to Virginia City and the prices that they sold for. Five million pounds of flour were shipped in 1876 and again in 1879, and the price of flour per hundredweight was from \$4 to \$5. One million pounds of whiskey (presumably reflecting weight of the bottles and cases) sold for \$2 to \$5 per gallon. More than 130,000 pounds of oyster that sold for \$1 in a 5-pound can or for \$3.25 for 12 2-pound cans. But Lord’s tables included more than food and drink. Furniture, machinery, clothes and luxuries traded locally in large quantities. In a third table Lord compared food prices for three Januarys: 1864, 1871 and 1881. Without exception prices had fallen. Moreover, the cost of room and board had fallen as well. Thus, the message was that with their wage rates fixed but their costs for food and other items in decline the workers were the clear beneficiaries. Their living standards were on the rise in large measure because their wages were set at artificially high levels. Surely Lord did not oppose rising living standards but only that wages like prices should be allowed to fluctuate according to changing economic conditions. To their credit, insisted Lord, these “well fed, well clothed and well lodged” miners were more frugal than vain in their consumption. Nonetheless they owed part of their “well-offness” to a union that had covered mining companies into agreeing to pay inflated wages.¹⁹

In Lord’s mind mandated wages were unfair and unsound. By citing prices and products, some of which seemed exotic for mining towns, that were traded around the

¹⁹ Lord, *Comstock Mining and Miners*, 368-371. Let me note that wages for Comstock workers were not higher on average than wages in other western mining camps. Along the Pacific slope except for California \$4 a day for underground workers and \$3 a day for surface workers were standard, necessitated by the fact that the cost of living was higher, higher than agricultural regions and higher than the East Coast, according to Clarence King, noted US geologist, who analyzed the 1880 mining statistics for the Census Bureau’s own publication. On-line at http://www2.census.gov/prod2/decennial/documents/1880a_v13-01.pdf, ix. He added that even with higher wages the cost of living was such that workers could seldom save.

Comstock he highlighted a presumed link between an overpaid workforce and a lifestyle undeserved and unsustainable. To be fair to Lord he did not believe that Comstock workers were a slothful and unproductive crowd. He marveled at their resourcefulness and industriousness. Fixing wages was such an anathema to him that it had to have the worst of outcomes. In fact we cannot determine from his illustrations and examples what link was between wages and prices and standard of living. What we need to analyze how well off Comstock workers were is what we do not yet have: series of prices and wages in constant rather than nominal dollars. We have more data on wages and wage levels (I will show) than we currently have on prices. The existence of mandated wages can distort any such analysis. What wages would have been paid without the intervention of unions? Would they be marginally or significantly different? What effect would the remoteness of the area and the harshness of the work have had on Comstock wages relative to national wage scale? More than likely there was a premium connected with employment in the mines and mills, but what that premium was or should be is not obvious. We can actually show what wage scales were and how they changed over time. On the other side – prices and the products that were traded and consumed – we are on less solid ground. We have no data on consumption patterns, household size or most importantly schedules of wholesale and retail prices over time. A few snapshots, like the data collected by Lord, but not much else. So, how well off the Comstock worker was under conditions when many daily wages were agreed remains to be studied.

Did minimum wages constrain managers and owners from making investments to open new mines or to expand old mines to the long-term detriment of Comstock mining? Even Lord had to acknowledge that the fate or future of Comstock mining was more complicated than the issue of minimum daily wages. He wrote that unlike many other business undertakings mining “skill, energy, foresight, and industry, aided by ample capital will not command a measure of success.”²⁰ Bonanzas could not be declared until they were discovered. What he argued, however, was that in these endeavors, which entailed high costs with low returns, the laborer, assured a minimum daily wage, was not asked to share in the risk. Indeed entrepreneurs were to be faulted for not practicing more prudence and discipline in negotiating or endorsing compensation packages. For Lord the cost of labor remained “disproportionately high” compared to other costs. In two tables drawn from a report from Hale & Norcross (then a Mackay and Fair property) Lord found that the cost of extracting a ton of ore dropped 38 percent and the cost of reducing that ton declined 21 percent. At the same time per-ton yields fell by 26 percent. Economies were necessary to manage the lower yields, and they came in other areas besides worker remuneration, which remained fixed. It was likely, claimed Lord, that wages like other expenses would also have been adjusted downward to achieve cost-savings if the owners had been free to do so. At the same time, it should be pointed out, the company realized net profits in excess of \$900,000. At first blush one may ask, what difference did it make? Everyone made money from the stockholder to the laborer. But those who took a hard line, at least for the sake of argument, returned to the theme of shared responsibility. It was unfair and untenable that in times of rising costs and declining yields wages and salaries should be immune from adjustment.

²⁰ Lord, *Comstock Mining and Miners*, 360.

Sharing Lord's ideas was another entrepreneurial hardliner, James Flood, one of the principals of Hale & Norcross. He wrote that since daily wages were mandated, "labor could claim no participation" in the savings that were realized mainly through lower freight rates and management skills. It was a "free-ride" for labor, but a free-ride, he continued, that stockholders and officers condoned to avoid a dispute that might interfere with the profits and dividends that were already flowing to them.²¹ It was an argument over principle in terms of how nineteenth-century corporate capitalism should function. If the Hale & Norcross workers had conceded on wages, would that have lengthened the life of the company or assured the permanence of their employment? Probably not.²² By 1871 Hale & Norcross had reached the end of its profitable ores. Although speculators would continue to buy and sell its shares, Hale & Norcross as a profitable mining company ceased to exist. And



Illustration 4: Working Stopes

its principal owners lost no time in launching a new venture with money made from Hale & Norcross.

What happened at Hale & Norcross was repeated many times across the Comstock. Booms eventually became busts. Some mines had no profitable ores, and even if labor had been *free*, that would not have turned barren mines into profitable one. Other mines had marginally profitable ores, and perhaps lower wage and salary levels could have improved those margins. And still other mines had rich deposits that generated huge profits, and the cost of labor was hardly relevant. Lord certainly understood the dynamics of the local mining industry. And he was as harsh with the extravagance of mine owners and managers as he was with the obstinacy of labor unions. Despite his vast knowledge of mining conditions and operations his unyielding embrace of *laissez-faire* principles left him with no choice but to reject the concessions that the owners had granted the unions. These concessions were bad for the unions and for the owners. He had no doubt as to the "effect this arbitrary standard of wage has had upon mining operation in the Comstock Lode". While he recognized that the minimum wage had not "impeded" the development of the mines, he insisted that it had robbed the companies and their stockholders of their proper return. Under these circumstances, argued Lord, to protect

²¹ Lord, *Comstock Mining and Miners*, 361-364.

²² It is difficult to see how adjustments in wage scales as opposed to adjustments in employments levels, which occurred all the time, could have helped to extend the life of the Comstock. The fact is the Lode ran out of profitable ores. A more serious matter, indirectly related to employment, had to do with the speed by which companies removed ores. Lord, Smith, DeQuille and other commentators at times criticized owners for hoisting more ore than was prudent. Investors and their thirst for dividends were blamed for mining operations that were reckless and unsystematic. Had greater attention been given to how the underground was exploited companies might have been able to salvage veins and deposits that were lost. Employment played a role only to the extent that in their rush companies assigned as many workers as possible to insure speedy extractions and hoists. The validity of this viewpoint is hard to demonstrate empirically.

investments management would wherever possible install “labor-saving machines” to replace “highly-paid workers”. Lord observed ironically that while unions objected to reducing wages, they did not object to machines replacing workers. Indeed at the time he was preparing his manuscript (ca. 1880) diamond-pointed drilling machines, first used in the Sutro Tunnel, were now in evidence in many mines. Prior to that miners with hand-drills cut away the rock and ore. He went on to cite other technological changes, not all of which had an obvious and immediate savings in labor costs, to illustrate the point that as the Comstock entered its third decade the maintenance of minimum daily wages in the face of shrinking ore bodies would simply mean fewer jobs and fewer workers.

Lord’s warning was not a scholar’s lament. In a letter dated 13 June 1878 to the Mechanics Union of Story County in 1878 J. H. Patton, then assistant superintendent of Consolidated Virginia and the C&C Shaft, which Mackay and Fair were building, issued a similar warning. In response to a protest from the Mechanics Union Patton wrote that unless the Union ceased protesting about wage adjustments made at the request of the stockholders who had “complained bitterly of the heavy expense attached to the mine”, he would be “obliged” to replace workers with machines.²³ Patton pointed out that all workers for whom he was responsible received compensation in accord with wage schedules cited in the latter from the Mechanics Union except for 12 timber framers. Why these 12 framers (and some other workers not specified), assigned to the C&C Shaft and the Consolidated Virginia Shaft, had their wages reduced was not explained. Patton’s reply did not indicate what their status was nor did it explain why they had been selected for reduced wages. And how the matter was resolved is not known. With respect to Patton’s threat it is not easy to envision how the framers could be replaced with machines. Other union jobs might be lost to mechanization, but carpentry was not a ready candidate. While labor and union documentation are more limited than company records, we can assume that disputes like these were common and frequent and yet never serious enough to result in protests and strikes that might have shut down the mines and mills and led to further retaliations by both parties. The comity that existed between companies and union did not end the disagreement; it simply prevented something worst from happening.

The industrializing of mining is a much-discussed topic among labor historians because the great mineral discoveries occurred during a period of technological innovation. Deep mining more so than other types of mining embraced the new technologies mainly out of need. Many have commented on the Comstock technology, but the story of how the Comstock was mechanized remains to be written. Mechanization never could have replaced manual labor, although owners constantly used it as a threat against union militants. Some innovations made work in the mines or mills safer, and others like explosives added a dangerous element. Mechanization was an aspect of industrialization. More fundamentally industrializing the Comstock referred to the combining or the consolidating of business operations in such a way as make size an imperative for efficiency. Workers organized to counter the power of a business

²³ Letter from J. H. Patton to Mechanics’ Union of Story County, 13 Jun 1878, verso 201, 202 in Letterpress Book, 14 Mar 1877-27 Jul 1878, Consolidated Virginia Mining Company, NC99/2/9, Bx 7, Special Collections, Library, University of Nevada, Reno.

oligarchy that was largely driven by optimizing returns or rewarding investors.²⁴ Over time unionization was more or less accepted as the norm – primitive form of countervailing-power theory – primarily to avoid disrupting the oligarchy’s control of the Comstock economy. To be sure, small businesses and modest enterprises outside the boundaries of the oligarchs existed and even prospered, but they were peripheral not central to the history of the Comstock. The Comstock required technology, but it also required labor. As much of an obsession as bigger and faster machines became with some owners and managers, especially to deal with ever-increasing depths and the challenges that they posed, not every task could be mechanized. Workers were a part of the equation, and as they sought to protect their economic turf as much as the owners, investors and managers. And if those who have written the history of the Comstock from a wider perspective than the economics of mining are correct, what might have been a fractured community over issues of wages or hours or conditions enjoyed a degree of solidarity.

On 18 July 1878 two representative of Mining Superintendents Committee and three from the Mechanics Union of Story County hammered out a new agreement. These were underground workers (not miners) who performed what was broadly-defined as “mechanical” task. The contract set wages to be paid and the hours to be worked in each of the several different job classifications. In addition the union agreed not to interfere with assistants and helpers, whose wages and hours were not fixed in the agreement, even though they might work underground along side of the mechanics, and the companies agreed to recognize all mechanical workers who qualified to join the union as being in good standing. The “mechanical” occupations cited in the document were carpenters, blacksmiths, machinists and “runners” of hoisting engines and mill pumps. Carpenters did work that required the use of tools to frame timbers, make rollers and sharpen saws, and they were to work 10 hours per day for no less than \$5 per day. Timber framers, who were the subject of the aforementioned dispute between Superintendent Patton and the Mechanics Union, were actually considered to be carpenters, and therefore they were entitled to \$5 per day for a 10-hour shift, even if, as in the grievance against Patton, they had not joined the Mechanics Union. Blacksmiths hired for “pick and tool sharpening”, and while \$5 per day was the minimal wage for all blacksmiths, “tool sharpening” blacksmiths put in an 8-hour per day and all others a 10-hour day. Machinists also earned \$5 per day (minimum) for a 10-hour day. Runners (operators) of hoisting machines were to be paid \$5 per day for 8 hours of work except if the shifts in the mines were 10 hours the runners would work 10 hours. Operators of engines for mill pumps worked the longest day – 12 hours – for the same minimum of \$5 per day. The document closed with the sentence that the superintendents agreed to aid the Mechanics Union in every legitimate way.²⁵

²⁴ It has been noted that Lord and other commentators criticized companies for being more dedicated to extravagance and profligacy than efficiency and productivity, but the essential point is that rewarding owners was the uppermost concern.

²⁵ “Agreement entered into between the Mining Superintendents and the Mechanics Union...,” 17 July 1878, Mechanics Union, Story County, Nevada, NC48, Special Collections, Library, University of Nevada, Reno. The document that I came across was not signed by the respective parties, and therefore I cannot say with absolute assurance that it was fully implemented.

The year before, on 28 August 1877, the Committee of Comstock Superintendents and the Miners' Union of Storey and Lyon Counties produced a different kind of document with the date of 29 August. The opening sentence indicated that this document contained "certain agreements entered into, some in writing and others verbally." Although the matters agreed to verbally are not known, what can be clearly discerned from the written section as well as an addendum is that this was an agreement entered into mainly to preserve labor-management peace. The cause for concern was not spelled out in the agreement, but it may have arisen from growing unemployment as the bonanza of the first half of the 1870s petered out. Even though it was the second best year as measured by bullion value between 1865 and 1885 and even though it actually registered more tons than any other year, more than 80 percent of the came from two mines – California and Consolidated Virginia. California was at its zenith at \$19 million dollars worth of bullion while Consolidated Virginia was in retreat with \$14 million from \$17 million. Except for Justice with about \$2 million no other mines reported more than \$500,000. Workers were being laid off as mines curtailed their operations or closed their shafts. How much unemployment the Comstock had in 1877 is not known, but downsizing was underway and would continue through the next decade. This agreement appeared to be addressing the possibility of unrest because of job losses. The Superintendents agreed, starting on 10 September 1877 (12 days after the meeting) that they "use their influence to induce all men in their employ, as underground miners to join the unions". If a union worker should file a complaint against a non-union worker (nature of complaint not specified) the Superintendents agreed to fire the non-union man and not in any way censure the union man. The rationale behind this was "to avoid the necessity of the Union sending any committee on that day [10 September] to prevent a non union man from going underground." This did not mean that companies were expected to hire only union men, for the Union agreed not to "dictate to the manager of any mine" whom he should hire or fire. Technically this provision did not absolutely impose a closed shop, but it clearly favored the union workers over the non-union laborers. The Union also agreed not to demand any changes in the system of hours and wages and not to refuse "good, worthy" miners from becoming Union members, that is, "not to make a closed corporation of it." The final paragraph addressed the security question directly: "The superintendents would respectively ask the Union as a body or any individual member thereof, to give them their aid in case of any trouble arising from the discharge of any non union man or set of men." Such a *quid pro quo* in which superintendents were to further the interests of the Union and the Union was to help to protect the companies' properties was necessary according to the document because all were aware that "in our midst [is] a class of men who would be only too glad to see a disturbance, and for that purpose would join with a few dissatisfied ones to commit some depredation or assault." In an attachment signed by the Secretary of the Joint Committee for the Miners Union on 5 September it was stated that the Gold Hill miners at a regular meeting on 3 September ratified the agreement and thanked the superintendents "for the courtesy shown their representatives" as had the Virginia City miners on 31 August and the Silver City miners on 4 September. Although figures on how many attended and voted (the vote was said to be unanimous) the rank and file, it would appear, had spoken. Whatever militancy was manifest in the creation of the unions had been replaced by a strategy, publicly at least,

that promised cooperation and harmony in the interest not only of companies and unions but also the community.²⁶

Many Comstock workers earned compensation that was negotiated between the companies and the unions. This did not include all Comstock workers but surely the majority of them. One thing for certain about Comstock wage scales was that once put into place, whether good times or bad were seldom tampered with. This was probably not true of prices since there is evidence of price controls. We can postulate that living standards were influenced more so by what workers had to pay rather than what they could earn. If the mining economy was booming, the daily wage would not change even though the price of the daily basket of goods and services might rise because of increasing demand. If the price rose, the worker would see his living standard shrink because his wage bought less; conversely if the price fell, the worker should be better off. There was a constant undercurrent of opposition (precisely for the reasons cited by Lord) to the standard wage scales, but even though companies and unions sparred over wages, the daily wage became almost sacrosanct.²⁷ Adhering to wage scales probably did not allow Comstock most workers to live an affluent life. In a well-written chapter on “The Workers” Roland James urges a proper perspective be maintained on the worker and the workplace. As easy as it is to dwell “on the sensational, dangerous or harmful aspects of mining”, for most miners their “employment consisted of monotonous monotony.” Most workers lived where they could walk to work. Some workers preferred ethnic neighborhoods such as the Irish quarters in Virginia City or the Cornish quarters in Gold Hill. They occupied houses or rooms, a choice that was determined by their marital status. One rooming house, the Werrin Building in Virginia City, has survived and been restored. An apartment consisted of two small rooms, each with a stove but no running water. One was a sitting room with a table and chair and the other a bedroom with a bed and another chair. Common bathrooms were located on each floor.²⁸ Not all the workers lived in such quarters – some better and some worse – and the well-to-do lived in neighborhoods with large, comfortable houses. Perhaps workers ate oysters once in a while, but they lived in cramped quarters most of the time.

One small study suggests that “well-offness” was related to occupation. According to data on the value of property owned by mine workers and property owned by mine managers some data (selected randomly) from the 1870 Census found that mine workers (559 names) owned approximately \$80 in real property and \$107 in personal

²⁶ Agreement between Miners Unions of Storey and Lyon Counties and Committee of Comstock Superintendents, 29 Aug 1877, NC1159, Special Collections, Library, University of Nevada, Reno. Unlike the previously footnoted document, this document was signed and notarized.

²⁷ Hyde, “The Comstock Lode or, A Crucible of Militant Unionism,” 103-105, and James, *The Roar and the Silence*, 140-142. The use of Chinese laborers in the construction of the Virginia and Truckee Railroad posed a threat to the power of the unions to maintain negotiated rates. James writes that the march of union members on Chinese camps during the building of the railroad in the late 1860s basically won a guarantee from William Sharon and the Bank of California, which owned and financed the railroad, not to permit Chinese workers into the mines, a guarantee that was never successfully challenged (141). The question of substituting Chinese workers at lower wages never appeared in hundreds of pages of weekly reports that I have read.

²⁸ James, *The Roar and the Silence*, 122. James said the rooms were approximately nine square feet. That is a measurement of three x three. That strikes me as unduly small.

property compared to \$7,900 and \$6,500 for mine managers (69). Mine workers did better than ordinary laborers (105) who had amassed about \$21 in real property and \$48 in personal property, and not as well as craftsmen (228) with \$246 and \$618 in each category.²⁹ Craftsmen had a higher wage scale than miners, and miners had a higher wage scale than laborers. As well paid as Comstock workers were compared to other American workers, their economic well-being ranged from precarious to modestly comfortable. Because mining towns were transient communities, dependent on production cycles, and they boasted a full cast of characters from the very rich, among the richest in the West, to the destitute, the dilettante and the desperado. In between the elite and the desperate were hard-working and civic-minded people who bought homes, raised families, attended services and participated in public activities. Virginia City had scores of bars and brothels along with brawls (sometimes with guns) over poker games and mining claims, but it also built an opera house, imported Shakespeare and opened schools and other educational or cultural centers.³⁰ Huge fortunes were made (and lost) on the Comstock, and yet for the majority of the residents who helped to create those fortunes the issue was livelihood. Wage scales did not exhaust the mines or their ores, but they did render the act of making a living more plausible.

The size of the labor force in the mining industry at any given time was a moving target. Levels of employment were often estimated, but counts were seldom made. The best sources are company payrolls, which only exist for a handful of companies and years. Pinning down the size of the labor force of an individual operation may be more relevant in the context of the economics of mining than industry-wide figures. Since total employment figures were and continue to be cited as indicators of the state of mining on the Comstock, we need to evaluate them in terms of what we know about the state of mining from other sources. Total employment is a function of total population. Higher population figures tend to ramp up total employment figures. Total population was reported in the three federal censuses of 1860, 1870 and 1880. Within a year after the discoveries the area of and around the Comstock Lode may have had a population of just under 5,000. By 1870 more than 11,000 were counted in Story County and in 1880 more than 16,000. A controversial state census in 1875 came up with nearly 20,000 in Story County. The county seat, Virginia City, had grown from 7,000 to 10,000 between 1870 and 1880. Gold Hill had an 1880 count of 4,531 and Virginia City 10,017 for a total of 14,548 or more than 90 percent of the county total. The trend suggested by the Federal and State Censuses was that the County population peaked with the Lode's most productive years, and by 1880 the local population in response to the production curve was shrinking. Like most mining communities, even those that became administrative centers such as Virginia City, once the ores were depleted, in-migration ceased and out

²⁹ Hyde, "The Comstock Lode or, A Crucible of Militant Unionism," 76 and footnote 13. Hyde, who has written a fine undergraduate honors thesis, took a sample of people from every fifth page of the manuscript census. This is perfectly acceptable, but to make her case more compelling she needed to provide more details about the results that emerged from her sample and the statistical tests that were imposed. Still it serves as an interesting benchmark for others that might want to expand on statistical-based demographic or economic analysis. Hyde used about 1,000 samples.

³⁰ James, *The Roar and the Silence*, Chapter 10, "Princes and Paupers".

migration increased.³¹ According to the next census in 1890, Story County, Virginia City and Gold Hill had lost half their population.³²

Within the total-population how many were employed? Roland James has assembled some figures from the aforementioned censuses, as shown below.³³

<u>Occupation</u>	<u>1860</u>	<u>1870</u>	<u>1875</u>	<u>1880</u>
Mining	1,956	2,686	4,937	2,466
Milling	4	351	378	105
Foundries	5	146	153	171
Construction	123	124	683	400
Railroad		44	43	69
Other	3	432	430	698
Total	2,091	3,983	6,624	3,909

The patterns, suggested by the first four categories, conform with what we have said about the Comstock ore cycles. As mining expanded, more workers were needed; conversely as it contracted fewer were hired. (Foundry employees unlike the other three continued to rise after 1875.) Railroading was linked to mining but it also had a non-mining function. “Others” is too non-specific to comment upon. Employment levels according to James’s compilation were similar in 1870 and 1880, but the mining and milling employment levels was notably different, down from nearly 3,000 to 2,600. It can be noted that tons worked in 1870 was 240,000 versus 190,000 in 1880. Employees per ton “worked” was about the same .013 to 014. The most striking changes in employment levels was the doubling of occupations directly associated with the mines between 1870 and 1875 followed by a halving between 1875 and 1880.³⁴ If the total population were close to 20,000, then the percentage of workers – one third – more or less matched up with 1870 and 1880. But the total of mining and milling employees – nearly 5,500 - is

³¹ Summary in Guy Rocha, “Myth #45 – Virginia City – The Biggest City West of the Rockies,” on-line at http://nevadaculture.org/nsia/index.php?option=com_content&task=view&id=717&Itemid=95. The 1875 State Census was attached to the *Appendix to Journals of Senate and Assembly*, 3 vols., 8th Legislative Session, 1877. Story County data was in Volume 2 of *Census of the Inhabitants of the State of Nevada 1875*, and that volume was published in Volume 3 of the *Appendix... (1877) with Recapitulations (totals)* 3:615. The 1880 Census with tabulations and tables for Story County available on-line in two different locations:

http://www2.census.gov/prod2/decennial/documents/1880a_v1-08.pdf

http://www2.census.gov/prod2/decennial/documents/1880a_v1-11.pdf

In an earlier posting I misquoted the Story County total as 10,116 instead of 16,115. The above is based on the correct figure.

³² On-line at http://www2.census.gov/prod2/decennial/documents/1890a_v1-10.pdf, *Report on the Population...*, Part 1, pp. 31 & 234. Gold Hill had become a part of Virginia City, but 1890 Census had separate figures for both.

³³ James, *The Roar and the Silence*, 139, Table 6:1. The footnote that follows this Table does not specify where in the censuses the data may be found. Therefore, with respect to the 1880 Census, which I have downloaded from the US Census Bureau, I cannot confirm the data for mining and milling occupation. I have not examined the two earlier federal censuses but I have examined the 1875 State Census, although I have not made a count where total do not exist, as James has done. I found so many inconsistencies in the State Census that I am reluctant to rely too heavily on it.

³⁴ A five-fold increase in construction workers in 1875 might be assumed to be related to the rebuilding required by the October 1875 fire except the State Census was conducted before the fire.

startling because the ratio of workers to tons worked falls to .009. Could that many workers be employed in the mines and mills even as the Comstock entered its peak years? Possibly, but surviving company payrolls cast some doubt.

The 1880 Census (much quoted by Lord for his chapter “The Laborers of Washoe”) was the first census to look closely at national employment patterns.³⁵ Although the Census Bureau declared that their efforts may only have captured about two-fifths of all person employed in America’s deep mines, it considered its findings an important starting point. Of the 20,000 Americans employed in deep mining, nearly 3,600 or one-seventh were from Nevada. The state actually ranked second to Colorado with a third of the employees and just slightly ahead of California with about the same percentage as Nevada. (Nevada’s lower ranking not surprising in light of its plummeting production.)³⁶ The Census Bureau compiled data on mines, occupations and employees on the Comstock. The Census Bureau counted workers on the Lode itself and workers on minor lodes near the Comstock and beyond into Lyon County. Known as the Comstock District (by some), it was geographically larger than the two principal mining districts of Gold Hill and Virginia City. The total number of mines for the so-called Comstock District was 33, of occupations 37 and of employees 2,840. Since the Census Bureau was interested in compiling numbers of all underground workers the count included operations that had underground facilities but were strictly speaking not underground mines: shafts on mining claims that did not have operating mines directly associated with them but instead facilitated operations (hoisting, ventilation, drainage, etc.) in adjoining mines and the Sutro Tunnel, a drainage system that also extracted some ores. Of the 2840 only a portion of them, the largest to be sure, were designated as miners: 1,974 or 70 percent of the total.³⁷ Figures just noted do not agree with James’s, cited above.

The surprise in the census data was the number of underground workers employed in non-producing mines. Of the mines identified in the 1880 Census fewer than a dozen had bullion to declare and appeared in the Story County 1880 Assessment Roll. This is worth underscoring because almost two-thirds of the operations with underground employees according to the census figures made no bullion declarations. Some of the non-producing mines listed in the 1880 Census were longstanding claims that seldom if ever appeared in the assessment rolls. Those with assessed ores accounted for more than

³⁵ Two sections of the US Census on-line (www.census.gov/prod/www/abs/decennial/1880.htm) and in print contain the mining data: Volume 1, *Statistics of the United States Population*, & Volume 13, *Statistics and Technology of the Precious Metals*. I am using the wage and employment data found in Volume 13, pp. 156-159. One of these tables includes numbers of employees in each occupation in each mine (p. 158). Lord published an occupational table not by mine but by nationality. The source is simply indicated in “Records of Special Agents, Tenth Census”, and its location, if it existed in the US Census, was not specified. Lord may have compiled his own table from “raw data” that the enumerators had gathered, or the table may have existed on some other Census Bureau publication. The Bureau’s published statistics and tables for the 1880 Census began appearing in 1882 and continued for several years thereafter. Eliot’s book was first published in 1883 so that some data appearing in his book may have been attained from sources and contacts inside the Census Bureau before the official tables were printed. For purposes of this study, however, employment by mine is more relevant than employment by nationality.

³⁶ For totals of surface-, river- and deep-miners, Nevada counted under 7,000, far behind California and Colorado with tens of thousands.

³⁷ On-line at www.census.gov/prod/www/abs/decennial/1880.htm, United States Census Bureau. *Statistics and Technology of the Precious Metals*, vol. 13, 156-158.

1,500 of the workers. That left between 1,300 and 1,400 in the non-producing operations – the mines, shafts and Sutro Tunnel. The average underground work force for these non-producing mines was between 60 and 70 (compared to several hundred in the producing mines). Non-producing mines, if they had ores, could have sold them instead of paying for refining them or operated primarily to facilitate movement of workers and ores in other mines, but little such evidence exists. One of the curiosities of mining was that operations with little or no profitable ore could continue in business as long as they could raise capital, and throughout the history of the Comstock any upsurge in one location or mine could attract investors for even the most dubious mines. Also a few workers were necessary to prevent a mine from being declared abandoned and subject to reclaiming. It is possible that when the enumeration was made, 2,000 to 3,000 persons were working along the Comstock. Even in 1880, notably in the second half after the completion of the census, surviving payrolls indicate contraction in employment levels. That will endure until most of the Comstock mines had been shuttered and the work force had moved out.

Of the 33 operations listed only seven declared ores at the end of the second quarter at Story County Assessor's Office. Three shaft were listed as independent operations as was the Sutro Tunnel, and they would not be expected to declare much or any ore. (Two other shafts were listed with their mines.) Most of the declared ore – more than 90 percent - was produced on the northern end of the Lode by Mackey & Fair operations - Consolidated Virginia, California & C&C Shaft, Mexican & Union Shaft and Ophir - which employed more than 60 percent of the workers. Most of the non-producing operations were situated on the southern end in Gold Hill or lower Virginia City. Both Belcher and Crown Point (allied with Kentuck) appeared with relatively small work force of 95 and 30 respectively, a further confirmation that the bonanza years of the early 1870s had not returned. The largest labor pool (220) on the southern branch belonged to Yellow Jacket, which had not declared any bullion since 1876. Nor would it declare any in 1880 or 1881. As suggested above Yellow Jacket's figure may have resulted from search efforts that would restore the mine. In 1883 and for the next two years, as the Comstock was gradually closing down Yellow Jacket produced tens of thousands of tons of ore with average low yields of \$13 to \$17 per ton. It too soon closed down.

FIGURE 1
MINES, WORKERS, TONS, VALUES, 1880

Mines	Total Workers	Total Miners	% Miner	Tons 2nd Q	Tons/ Miner	Total \$ Value
Alta	74	44	59.5%	128	2.91	\$1,869.84
Andes	13	7	53.8%		0.00	
Belcher	95	55	57.9%	1,271	23.11	\$15,541.55
Best & Belcher	50	33	66.0%		0.00	
Bullion	40	30	75.0%		0.00	
Caledonia	17	12	70.6%		0.00	
Consolidated Imperial	75	57	76.0%	3,530	61.93	\$41,470.00
Consolidated Virginia						
California & C&C Shaft	351	277	78.9%	23,850	86.10	\$821,013.53

Crown Point & Kentuck	50	22	44.0%		0.00	
Gould & Curry	50	26	52.0%		0.00	
Hale & Norcross	66	47	71.2%		0.00	
Julia	54	32	59.3%		0.00	
Justice	27	20	74.1%		0.00	
Lady Bryan	31	19	61.3%		0.00	
Mexican & Union Shaft	469	348	74.2%	7,958	22.87	\$223,173.19
Mint	11	6	54.5%		0.00	
New York	26	15	57.7%		0.00	
North Bonanza & Flowery	51	32	62.7%		0.00	
Ophir	360	297	82.5%	984	3.31	\$28,014.81
Original Keystone	31	15	48.4%		0.00	
Overman	46	30	65.2%		0.00	
Occidental	17	8	47.1%		0.00	
Savage	68	40	58.8%	100	2.50	\$1,912.33
Scorpion	46	28	60.9%		0.00	
Sierra Nevada	92	71	77.2%		0.00	
Silver Hill	46	26	56.5%		0.00	
Utah	67	44	65.7%		0.00	
Ward	39	28	71.8%		0.00	
Yellow Jacket	220	161	73.2%		0.00	
CNS Shaft	65	36	55.4%		0.00	
Forman Shaft	57	35	61.4%		0.00	
Osibiston Shaft	30	9	30.0%		0.00	
Sutro Tunnel	117	64	54.7%		0.00	
Totals	2851	1974	69.2%	37,821	19.16	\$1,132,995.25

Sources: Employment data from 1880 Census, see Footnotes 35 & 37. Tonnage data Story County Assessment Rolls, 2nd Quarter, 1880, The County Records Microfilm Project, ST 67 Story County. in Special Collections, Library, University of Nevada, Reno. Percentages & yields calculation are mine.

The Census Bureau's own observations that many deep-mine workers were idle during the year tend to cast further suspicion concerning the totals. The enumerators received extensive instructions about how and how not to record responses. Occupations were to be specified as clearly as possible. The enumerators also asked if job-holder had been unemployed during the previous six months. (The Census was taken in June, 1880.) How carefully the enumerator recorded the answers and how honestly (especially about unemployment) the respondent answered the questions must always be considered. Not having found among the published census statistics any tables or references to unemployment figures or levels, I am assuming that anyone who responded as having been unemployed was excluded from the totals. Hence, the figures for workers in the mines on the Comstock were derived from respondents who claimed to be employed. Whatever the status of these respondents, they represented a snapshot in time.

FIGURE 2
VOLUNTEER (UNIDENTIFIED) FIREMEN, VIRGINIA CITY
[MINE WORKERS OFTEN PORTRAYED AS CIVIC-MINDED CITIZENS]



The 1880 Census assigned the workers to 37 categories of occupations, although Lord's table counted 39 occupations. (Lord's list included machinist helpers and woodmen.) With more occupations Lord's grand total still had fewer workers by almost a 100 than what appeared in the 1880 Census. Even the totals for the occupations do not agree. By far the occupation with the most workers was "miners": 1,974 or 70 percent. Twenty-two (60 percent) of the 37 occupations had 10 or fewer workers, and half of the 22 had only a single worker. A standard occupational nomenclature to which all companies subscribed did not, to my knowledge, exist. How the Census Bureau chose these names is not explained, although many of them were in common usage. Some of the occupations with low enumerations concerned only the Sutro Tunnel, which used mules on its tunnel rail system and therefore needed grooms, harness-makers and teamsters that the mining companies did not necessarily hire. The next two largest categories were engineers at 162 or 6 percent and laborers at 124 or 4 percent. These three combined constituted 80 percent of the total respondents. There were several other large categories: 95 blacksmiths (and their helpers), 93 carpenters and 80 firemen (3 percent each). Other recognizable categories with moderately impressive numbers were 54 machinists (2 percent) and 38 shift bosses, 31 foremen, 30 watchmen, 27 pumpmen and 26 ropemen (all 1 percent each).³⁸

³⁸ On-line access, www.census.gov/prod/www/abs/decennial/1880.htm, United States Census Bureau. *Statistics and Technology of the Precious Metals*, vol. 13, 158, Table XLI. Lord's compilation appears in *Comstock Mining and Miners*, 385-386. Lord's occupational totals are different but significantly so only in a few instances.

Close Comstock observers did not always use precise language in describing employment occupations. Underground workers, for example, were not the same as miners who because of their assigned tasks qualified for compensation of \$4 per day. Not all underground workers were paid the wage, as I will discuss. In his 1877 Report (for years 1875-1876) the Mineralogist claimed that 2,000 miners were at work on the Comstock.³⁹ If he meant miners and not underground workers, then the number of miners in the 1880 was comparable to the number a half decade earlier even though mining circumstances were fundamentally different. Tonnage had peaked in 1877 at 634,000 tons and then plummeted to 188,000 in 1880. The dollar value of the ore in 1880 was put at about \$4 million or only 11 percent of what it had been in 1877.⁴⁰ Common sense would suggest that given 1880 output the mining companies hardly needed or could have afforded nearly the same number of miners at the Lode's peak. We simply don't know if the Mineralogist was using miner in the technical sense or the generic sense. If he used it in the technical sense, then the gap between his figure (only miners) and the State Census figure (mining employees) is irreconcilable because miners constituted the largest underground occupation with at most a couple of hundred in support staff. If he used it in the generic sense, then the problem is even worse. The difference between 2,000, however that is defined, and 5,000 cannot be easily bridged.

Payroll data for some Mackey & Fair properties from the middle 1870s are voluminous and detailed. So voluminous is payroll documentation for some properties that unless they could be scanned and digitized they would consume months and months of work. Since I could ill-afford that much time on a single topic, I worked with monthly and quarterly totals in order to try to determine employment levels and trends, if they existed. Comstock mining despite investment in technology and machinery was still heavily dependent on manual labor. Once ore discoveries were confirmed, the mines laborers of various skills. Despite the ruggedness and remoteness of the Comstock people flocked to it. Few labor shortages were ever acknowledged once the mining industry took hold. Labor surpluses may have been more perplexing to deal with than shortages. When shortages occurred they were usually confined to skilled labor. We do not know how large the total labor pool (employed and unemployed) ever was at any given time, and quite possibly some of the estimates that appear in the public press or governmental reports may have reflected some combined figure of the employed and unemployed. Company payrolls, however, even though limited to a few companies, allow for some deeper assessment of how employment levels changed within companies.

The initial payroll documentation coincides with the Comstock's worst disaster – the fire of October 1875 and its aftermath. The fire affected local employment levels in two ways: a temporary decline in mine (and probably mill) workers and a temporary rise in construction (and related fields) employment.⁴¹ Between January 1876 and June 1878

³⁹ As discussed in Chapter 2 tonnage was reported by the State Controller in his biennial legislative reports.

⁴⁰ "Biennial Report of the State Mineralogist of the State of Nevada for the Year 1875 and 1876" in *Appendix to Journals of Senate and Assembly*, 8th Legislative Session (1877), 121.

⁴¹ The Time Books exist in two forms: a monthly version and a "duplicate" version that combines two months – January-February, March-April, etc. I have used the duplicates, although I first compared them to the monthly accounts to assure accuracy. Time Books, Consolidated Virginia and California Mining Companies and The C&C Shaft, Duplicates from January-February, 1876 through April-June (an anomaly

vouchers for four entities - Consolidated Virginia, California, Utah and C&C Shaft – issued nearly 31,000 vouchers to underground employees. Although Mackay and Fair owned and operated other properties, the payroll accounts for these four often appeared in the same ledgers. The vouchers were issued at the end of the month for work covering the previous 30 or 31 days. If workers terminated their employment before the end of the month, they were paid on the day of termination. Otherwise all continuing workers were issued vouchers at the end of the month that could be converted to coin (no paper) at the pay window. The time sheets (daily, monthly or quarterly) contained information such as names of employees, days worked and wages received and sometimes the floors inside the mines where they worked and the jobs they performed. Knowing the number of vouchers and the period of time we can calculate that the average size of the work force in these four properties was about 1,000 workers per month. The highest monthly total was recorded in October, 1877, at nearly 1,400 workers, and the lowest in June 1876 at about 530. Even in the most productive years there was variability in monthly employment levels. These data are valuable precisely because they do not reflect a single snapshot. Covering a 30-month period they provide a baseline: the largest mining operations in the most productive period employed on average each month about 1,000 workers. If for the sake of argument, we assume mines producing 60 to 70 percent of the silver employed on average 1,000 workers, then the remainder of the producing mines might add another 300 to 400 workers to the average. But, as we learned with the 1880 Census, a large shadow work force might be active in mines not currently productive. That might add several hundred more. In the “good times” of the mid-1870s, 2,000 to 2,500 workers could have been employed monthly on average by mines across the Comstock. Such an estimate would match up with the Mineralogist’s figure miners plus others but widely missed the mark established in the 1875 State Census.

For the controversial year 1880 payroll data exist for two separate months for several properties cited in the Census. Consolidated Virginia had 160 employees in May and 127 employees in September while C&C Shaft had 95 and 103 respectively. In the 1880 Census these two properties appeared with California for a total of 351, and if we had data on workers from California the payroll total (May) and the Census total (June) may be close.⁴² But by August employment levels had fallen in the mine but risen in the shaft, although not by enough to compensate for the decrease in the mine. This will continue until a fire closed the operation the following year.

Mackay and Fair purchased several old-line but unproductive mines north of California in hopes that they would own any continuation of the ore seams that drove the bonanzas at Consolidated Virginia and California. This included Ophir, Mexican, Union and Sierra Nevada. The 1880 Census counted 469 employees at Mexican/Union (the

compared to other duplicates) 1878, NC99/3, Bx 9-11, Special Collections, Library, University of Nevada, Reno. These documents are not perfect. Some entries were crossed out and then added back, some were altered without explanation and some were empty. It is difficult to measure the margin of error without building a database of thousands of names. My best guess is that several entries in each year could be misstated in some fashion and therefore marginally affect the totals, which I have drawn from the documented and not independently counted.

⁴² Weekly Reports, Consolidated Virginia Mining Company, 14 May 1880-1 April 1882, NC99/1/1/4, Special Collections, Library, University of Nevada, Reno.

shaft at Union was more important than the underground), 360 at Ophir and 92 at Sierra. Payroll data from Ophir in 1880 covers two months: March with 366 employees, very close to the Census figure and 118 in August, a drop of two-thirds. Had the 1880 Census been conducted in the Fall rather than the Spring, it would have produced a very different number. In the case of Mexican/Union payroll data averaged for 1800 generate a figure of 69 workers, a far cry the recorded 460.⁴³ I cannot explain the discrepancy. No payroll data exist for Sierra.

Activity at Ophir is better documented than that at the other newly-acquired properties. In the course of rebuilding and expanding Ophir it became one of the Comstock's largest employers after the downturn took root. Ophir had 330 employees on average in 1875 and jumped to 405 in 1876. In 1877, when it Mackay and Fair acquired it, employment on average fell to 245 and then fell again to 240 in 1878. For 1879, with just one month of data, it rose to 378 and in the following year – the Census year - was with two months of data it dropped to an average of 242. Ophir's northern neighbors, Mexican and Union, according to payroll data, had much smaller work forces than might be assumed from the 1880 Census enumeration. In 1877 Mexican averaged 30 workers, in 1878 52 workers, in 1879 40 workers and in the crucial year 1880 53 workers. For 1880 Union had an average of 18 workers. Payroll data are not as comprehensive as they should be, but they provide a more realistic view of employments than the single snapshot of an official census.

FIGURE 3
TONNAGE, INCOME, EXPENSE FOR NORTHERN BRANCH MINES
1877-1884

Mine	1877	1878	1879	1880	1881	1882	1883	1884	Total	Tot Inc millions	Tot Exp millions
Ophir-Mexican	6,164	1,286	19,677	5,194	2,688	3,667	4,729	3,680	47,085	\$1.94	\$2.41
Sierra			4,083	1,640	6,079				11,802	\$0.45	\$1.27
Union				26,668		10,744	1,164		38,576	\$1.29	\$1.32
Totals									97,463	\$3.68	\$5.00

Notes: Total income and total expenses in millions of dollars. In the Story County assessment records Ophir and Mexican were treated as a single operation, and the Sierra Nevada and Union Consolidated as separate operations. This was different from the way in which the 1880 Census arranged the list with Mexican and Union combined and Ophir and Sierra Nevada as separate. Ownership of these mines continued to change in the 1880s, and that probably dictated how they were to appear in the county documents. Only Ophir-Mexican had registrations for each year from 1877 to 1884. 1885 assessments are too fragmentary to use.

Sources: See footnotes 41 and 42.

⁴³ Daily Payroll Report, 1 October 1879-31 August 1880, Ophir Silver Mining Company, NC99/1/1/1, Bound Volume, (actual title of payroll document is Ophir and Mexican Silver Mining Company), Special Collections, Library, University of Nevada, Reno. Mackay and Fair also acquired Mexican adjacent to Ophir in 1877.

How to measure the impact of these higher than usual employment levels on the very northern end on the collapsing mining economy or general economy is a more complicated question. Ophir payrolls are sufficiently detailed that we can make some estimates on average hourly and total monthly compensation. In January 1876, when still a Sharon property, Ophir had 373 workers and paid nearly \$35,000 in wages and 12 months later in December its 437 workers received \$43,000. In January 1877 the labor force numbered 291 with a wage bill of \$28,000 and by December (Mackay and Fair assumed ownership) it had fallen to 198 at a cost of \$19,000. Two years later in January 1879 work force had expanded to 240, the wage bill totaling \$26,000, and then to 378 by October but no total compensation as given. The average daily wage for these workers on these months was about \$3.28. The range was from \$3.12 to \$3.61. These averages were computed by dividing total monthly compensation by total monthly employment and then dividing that figure by 30 days (in a month). The average daily wage depends in part on how many days employees who received different wages actually worked. It can be noted for what it is worth that the averages were notably lower than the oft-cited standard of \$4 a day. Had the standard been abandoned more people at lower wages might have been hired. Without commenting on the fairness of reducing wages I would contend that lowering wages in order to hire more workers would have had no long-term effect. Two interesting and revealing features about work underway in Ophir according to the 1880 payroll data was that a fairly large number of blacksmiths and carpenters had been hired and the hoisted carloads were mainly waste - rock and other residue - and not ore. That suggests the work was almost solely expansion and maintenance and not extraction. The truth was that Ophir withdrew little ore in the second half of the 1870s and even less in the first half of the 1880s. Exploration was the goal, and had ore been located wage levels would probably have risen because the composition of the work force would have changed and car-loadings would have been ore rather than waste. Even under the "sure hand" of John Mackay (as Fair had sold his stake), whose fortune helped to finance these explorations at Ophir and related properties or to attract outside capital to finance them, the explorations lost money. Ophir and its neighbors never came close to being profitable undertakings. Between 1877 and 1884 these northern properties extracted nearly 100,000 tons of ore (annual average 12,000) worth about \$3.7 million with a per-ton yield of about \$4, but costs (as reported) reached \$5 million or \$5 per ton. The investors lost \$1 on every ton of ore declared for taxation. Without higher yields, say \$30 per ton and above, the cost of labor probably became onerous in the sense that to push more deeply and to search more intensely took people whose pay companies were not entirely free to negotiate. On the other side, without wage standards companies might not have been able to hire the people they needed. In the end, nature would resolve the dilemma.

When underground operations were mainly exploratory, labor may have assumed a greater share of the total mining costs than if they were hoisting high-yield ores. If we set a range based on the figures cited above, say from 200 to 300 workers who earned \$3.50 per hour over 100 (1877-1884) months, labor costs would come in at between \$2.1 and \$3.2 million, or 40 to 60 percent of the total costs (Figure 2). In the end yields per ton determined how costly operations were and in particular how onerous wage rates were. Probing depths of between 2,000 and 2,500 feet without any extractable ores since 1,600

these northern-branch mines had put underground operations at risk, both financially and technically. A labor force of a thousand paid at half the daily wage could not have saved Comstock mining.⁴⁴

By 1884-1885 employment levels in northern-branch mines had fallen to about 100. Daily-wage payments, however, were revised but in select categories and not across the board. Ophir’s payrolls in 1883-1884 (selected months) can be compared with a sample month from Consolidated Virginia’s in 1876. The stickiness of wage scales can be observed immediately. The most notable change – to be expected, of course – was the disappearance of many occupational categories with their own wage scales from the employment profile by the mid 1880s. Extracting a large volume of ore required a different set of occupations from exploring for ore. Cutting drifts and connecting them with uprisers and winzes did not require the construction of underground spaces and facilities that ore extraction did. What was left by the 1880s was the need for basic manual labor with a few skilled and supervisory personnel. Consolidated Virginia had more than 50 work categories; Ophir had under two dozen.

Of those occupations that can be compared the revision took different forms. In a few cases if a monthly salary were paid in the 1870s it was converted to a daily wage equal to or lower than the salary. Also daily wages were converted to monthly salaries. The salaries of foremen were reduced sharply as were the salaries of chief engineers. Foremen became among the lowest paid, but they may also have had other jobs for which they were compensated. Regular engineers were paid at a single rate rather than a range of rates. Salaries or wages of blacksmiths, firemen and carpenters were lower than a decade before. Machinists, blacksmith helpers, shift bosses, miners, laborers and watchmen did not change. One can presume that unions resisted any alterations to long-standing wage scales in spite of worsening economic conditions, but at the same time one can also assume that most mine owners were unwilling to confront the workers on the issue of lowering of their wages. Ironically, the payroll accounts from 1883 and 1884 reveal that while the workers had reached 3,300 feet, the few deposits of workable ores were actually within a few hundred feet of the surface.⁴⁵

**FIGURE 4
COMPARISON PAYROLL VIRGINIA CONSOLIDATED, JANUARY 1878, AND
OPHIR, OCTOBER 1883 AND 1884**

Occupations	Con Vir	Ophir		Ophir		Ophir		Ophir	
	Jan-1876	12 Oct 1883	19 Oct 1883	10 Oct 1884	17 Oct 1884				
	Wage/Day [Monthly]	No	Wage/Day [Monthly]	No	Wage/Day [Monthly]	No	Wage/Day [Monthly]	No	Wage/Day [Monthly]

⁴⁴ Daily Report, 1 October 1879-31 August 1880, Ophir Silver Mining Company, NC99/1/1/1, Bound Volume, (actual title of payroll document is Ophir and Mexican Silver Mining Company), Special Collections, Library, University of Nevada, Reno.

⁴⁵ Duplicate Payroll, Time Book, January-February, 1876, Consolidated Virginia and California Mining Companies and C & C Shaft, NC99/3/4, Bx 9, Special Collections, Library, University of Nevada, Reno; Report of Operations at Ophir Mine, 12 and 19 October 1883 and 10 and 17 October 1884, NC56/1/2/2, Special Collections, Library, University of Nevada, Reno.

Foremen	[\$200]	1	[\$100]	1	[\$100]	1	[\$50]	1	[\$50]
Timekeeper	\$5	0	[\$150]	0	[\$150]	0	[\$150]	0	[\$150]
Chief Engineer	[200]	1	\$3	1	\$3	1	\$3	1	\$3
Engineers	\$3.50-\$5	3	\$5	3	\$5	5	\$5	5	\$5
Machinists	\$5	1	\$5	1	\$5	0	\$5	0	\$5
Boss	ND	0	\$6	0	\$6	0	\$6	0	\$6
Blacksmith									
Blacksmith	\$6	0	\$5	0	\$5	0	\$5	0	\$5
Helpers	\$4	1	\$4	1	\$4	0	\$4	0	\$4
Firemen	\$4-\$5	2	\$4	2	\$4	ND	ND	3	\$4
Pumpmen	ND	2	\$5	2	\$5	2	\$5	2	\$5
Asst	ND	2	\$4	1	\$4	1	\$4	1	\$4
Pumpman									
Boss	ND	0	\$6	0	\$6	0	\$6	0	\$6
Carpenter									
Carpenters	[\$200]	1	\$5	1	\$5	0	\$5	0	\$5
Shift Bosses	\$5	1	\$5	1	\$5	3	\$5	3	\$5
Surface Men	ND	0	\$4	0	\$4	2	\$4	2	\$4
Miners	\$4	23	\$4	31	\$4	53	\$4	51	\$4
Laborers	\$3.50	2	\$3.50	2	\$3.50	0	\$3.50	0	\$3.50
Watchmen	\$4	2	\$4	2	\$4	2	\$4	2	\$4
Accountant	ND	1	[\$100]	1	[\$100]	1	[\$50]	1	[\$50]
Accountant	ND	ND	ND	ND	ND	1	[\$33.33]	1	[\$33.33]
Attorney	ND	1	[\$33.33]	1	[\$33.33]	1	[\$33.33]	1	[\$33.33]
Surveyor	ND	1	[\$50]	1	[\$50]	0	[\$50]	0	[\$50]
D.D. Men?	ND	ND	ND	ND	ND	2	\$6	ND	ND
Woodsman	\$3.50	ND	ND	ND	ND	1	OC	1	OC

Notes: Cells shaded in gray were not on the original printed form but were added; or the printed contents changed. ND=no data; OC=on contract. Some employees were paid daily rates and other monthly rates. Sources: See footnotes 41 and 42.

Although most of Ophir miners in 1883 and 1884 were assigned to work at the 250-, 500- and 1,500-foot levels, a half-dozen or more were assigned to the mine's deepest areas. But location did not determine their daily wages.⁴⁶ Eliot Lord stated that no owner ever begrudged the payment of the highest wages to the deep miners, but he further posited that an owner should then be allowed to adjust the wages downward for workers at the less dangerous upper levels. He publicized, although he did not directly endorse, a recommendation in the *Territorial Enterprise* from February 1881 that would revise the pay scale accordingly: from 250 to 500 feet \$2.00 to \$2.50 per day, from 500 to 1,650 feet \$3, from 1,500 to 2,500 feet \$3.50 and below 2,500 feet \$4.00.⁴⁷ The

⁴⁶ Report of Operations at Ophir Mine, 12 and 19 October 1883 and 10 and 17 October 1884, NC56/1/2/2, Special Collections, Library, University of Nevada, Reno.

⁴⁷ Lord, *Comstock Mining and Miners*, 387, citing *Territorial Enterprise* 15 February 1881 in footnote 3.

newspaper's proposal appeared to support the long-standing policy of pay scales, although by adjusting wage rates it might reduce wages and cut costs at a time of plummeting tonnage. Of course, the *Territorial Enterprise* could not have known in February that a fire would close down both Consolidated Virginia and California a month later and that tonnage in 1881 would continue to fall to the lowest level (below 100,000) in a quarter century. The fact remained that under the *Territorial Enterprise* plan the cream of the crop among pickmen would still only make what had been the standard for everyone for nearly 20 years. It certainly would not address the objections that Lord had expressed. Any pay scale violated the principles of competitive wages as he had defined them. He firmly believed and restated again that the best miners would and should be paid high wages, higher than the minimums now in effect, and conversely the least qualified would and should be paid lower wages. He claimed that even under the existing system the best pickmen at Consolidated Virginia were being paid \$4.75 per day in 1881. I cannot confirm that the wage of \$4.75 per day from the payrolls that I have studied.⁴⁸ The highest that I found was \$4.25 per day for 14 miners at Consolidated Virginia in July 1880, and nearly all the miners were assigned to levels from 1,750 to 2,300 feet.⁴⁹ To be sure there were exceptions to the \$4-per-day minimum wage, but by and large miners across the Comstock were paid the daily rate, not more or not less. If the wage scale proposed by the *Territorial Enterprise* had been implemented, wages across all Comstock occupations would have had to be adjusted, for it was unlikely that miners at the upper levels would ever accept wages lower than blacksmith helpers or surface laborers. Even as jobs were being lost in 1881, the prospects of negotiating such far-reaching changes without protests and disruptions would have been daunting to the business community. In any event there is no evidence that serious discussions about lowering wage scales or about another proposal by the *Territorial Enterprise* - to raise hours worked each day from eight to 10 - ever took place. Much-criticized minimum daily wages for miners and other skilled and unskilled occupations as well as eight-hour days had become, for better or worse, the way mining was done on the Comstock. The majority of the companies lost money not because wage scales were too high but because ore bodies were too inferior.

Although mine payrolls have been the focus of this discussion, mill payrolls confirm the basic findings about wage and salary patterns. Mills were more mechanized, and they needed to hire fewer workers per ton processed than the mines needed per ton extracted. One of the largest mills, California Pan, seldom hired more than 100 employees per month to process the ores from Consolidated Virginia and California Mines during their bonanza years. What is important about these payrolls is that the various occupations had wage and salary levels similar to those of the mines. Foremen and skilled laborers such as amalgamators, millwrights, blacksmiths, engineers, pan shoers and battery men were paid from \$5 to \$6 per day, and the rest of the labor force - tank men, agitators, laborers and rock breakers were paid from \$3 to \$4 per day. A few workers were paid as low as \$2.50 per day. By and large, though, the profile of wages and salaries in the mills was further confirmation that the Comstock labor market

⁴⁸ In another case Lord cited a wage for underground workers of \$4.05 per day. He took that information from the annual stockholders' report, and when I tried to verify that figure I found that it was calculated by using all workers at the mine instead of just underground workers.

⁴⁹ Time Book, Week Ending 9 Jul 1880, Consolidated Virginia and California Mining Companies and C & C Shaft, NC99/3/83, Bx 12, Special Collections, Library, University of Nevada, Reno.

functioned within accepted daily compensation rates whether or not those rates could be justified under freely competitive conditions. Although comparisons with national compensation rates are risky undertakings, mill workers like mine workers appear to be in a position to command higher pay than the average wage earner.⁵⁰

Although the number of hours worked per day ranged from eight to 12, as specified in negotiated contracts or based on accepted precedents, the number of days worked per week or per month was not prescribed. Although the status of the mine would determine how much labor was needed and how long it was needed for, a workweek of seven days and a work month of 30 or 31 days were not uncommon. For example, in May 1878 the Mexican Mine had 46 employees. Twelve (25 percent) of them, including the foreman and timekeeper, worked 31 days and another 12 worked between 25 and 30 days. The rest were spread between 1 day and 24 days.⁵¹ Some workers put in more days than the month contained. In December 1875 during the construction of the C&C Shaft one employee, E. P. A. Pyne, worked the equivalent of 35 days by accepting two shifts for three days and 1.5 shifts for 2 days.⁵² Major religious and secular holidays were not necessarily honored, and more than one payroll showed miners reporting to work on Christmas (Payne worked 25 December 1875), New Year's, Easter or Independence Day without being paid more than the standard daily wage. Holidays were celebrated, even though they were workdays. In June 1876 James Fair ordered assorted banners and flags plus "roman candles, Chinese flyers, triangular wheels, serpents and balloons" to celebrate the upcoming Fourth of July, the centenary of the Declaration of Independence.⁵³

Workdays could be shortened, usually because of interior working conditions, or simply scrubbed altogether. Employees were only paid for time on the job. Employees at the deepest levels where they confronted foul air, high temperatures and scalding water that made working conditions unbearable seldom put a full day. On the surface the weather could alter work schedules. Story County experienced extreme weather conditions from very hot and dry in the summer to very cold and snowy in the winter. Any of these extremes could shut down the mines (and the refineries) for one or more days. Hot and dry could raise temperatures in the mines and reduce water supplies in the city and especially at the mills; cold, icy, snowy weather made travel around the Comstock nearly impossible. By the same token it should not be ignored that mines could operate for long stretches – month after month – with only minor interruptions. It is not clear from the payroll accounts or other documents how much choice workers had with respect to the length of the workweek. Working underground seven days a week, even if just for eight hours per day for week after week, had to be grueling, if not debilitating.

⁵⁰ Payrolls, January 1874, Bacon Mill and Payrolls, July 1877, Omega Sluice, Mackay, Fair, Flood and O'Brien, MS-NC356/1/15 and 31, Nevada Historical Society; Payroll, Aug 1879, Records, 1865-1884, Pacific Mill and Mining Company, MSS P-G 207, Oversize Box 1, Folder 2, Bancroft Library.

⁵¹ Payroll, May 1878, Mexican Gold and Silver Mining Company, MSS P-G 295, Bancroft Library.

⁵² Time Book, December 1875, C&C Shaft, Consolidated Virginia and California Mining Companies and C & C Shaft, NC99/3/1, Bx 9, Special Collections, Library, University of Nevada, Reno.

⁵³ Letter James Fair to Messrs Church & Co., 12 Jun 1876, verso 65, Letterpress Book, Consolidated Virginia Mining Company, 1875-1876, NC99/2/6, Special Collections, Library, University of Nevada, Reno

Not all could manage it. The payrolls had frequent notations of workers whose tenure was no more than a few days. And of course all workers faced the prospect that a mine and its ancillary operations would be terminated without any advanced notice or severance pay.

The abundance of payroll records at Consolidated Virginia, California and C&C Shaft between 1876 and 1878 permit further analysis of the tenure of underground workers. Under harsh and severe conditions, even when paid by nineteenth-century standards at a good daily rate, how long did workers stay in their jobs? With the help of time books, discussed earlier, we can track workers over many months.⁵⁴ They contained the name of the worker, his occupational classification and the name of the mine or shaft where he worked. Time books exist for every month from January 1876 through June 1878. Some well-funded researcher could have all these data encoded into computers where thousands of names could be followed over a 30-month period. Not being so well-funded, I have limited myself to a much narrower search, more like a sample of what might emerge from a full inquiry. I have tracked all underground workers whose last names began with A through M at six-month intervals: January to July/August 1876 and then to January/February 1877. A major problem, as one might suspect, was consistency in name spelling. This was particularly troublesome when several persons with similar family names were recorded without the necessary surnames. Since bookkeepers changed over time, the system of entering names and other data could change as well. After these problems were dealt with, I was left with between 500 and 600 workers, all underground with various classifications, in the Consolidated Virginia payroll of January 1876. I decided I could work only with those classified as miners. Of the 547 I could positively identify as employees, I determined that 237 were miners. To make the sample more manageable I further narrowed the miner list to those with family names that began with A through M. The sample consisted of 164 names.⁵⁵ Another 11 names from the original list were held for further reference because they were persons who became miners after beginning in other jobs such as car-men, station-tenders or bulk-headers.

Beginning with the 164 I tried to determine how many names appeared on subsequent payrolls, July/(August) 1876 and January/(February) 1877. If names did not reappear on the July or on the January payrolls, I initially assumed that their employment with Mackay and Fair had ended. What I discovered upon further examination of payroll accounts of other Mackay and Fair firms was that names no longer on Consolidated Virginia actually showed on other Mackay and Fair payrolls. Finally over the course of the year as Consolidated Virginia lost employees for whatever reason had to hire new miners whose tenure could also be tracked through February 1877. Within the Mackay-Fair combine I was able to locate a majority of the workers who originally showed up on the payrolls of Consolidated Virginia.

The first relevant statistic is that only three (1.8 percent) of the 164 classified as miners in Consolidated Virginia in January 1876 appeared both in the mine's payroll of July 1876 and of January 1877. Only three had remained on Consolidated Virginia work

⁵⁴ See footnote 41.

⁵⁵ Only a third of the 237 names fell between N and Z.

force from January 1876 through January 1877. The second statistic is that 28 (17.1 percent) of the miners named on the original list did not appear on any subsequent list either at Consolidated Virginia or at other Mackay and Fair properties. It was possible, of course, that they were employed during the months not included in the sample. I am more inclined to accept the possibility that their absence was permanent and that meant that less than a fifth of the sample miners (miners only) were no longer employed six months later in any of the Mackay and Fair operations. They could have switched to other competing mining companies, but without more documentation that will never be known. Four-fifths of the employees identified in January 1876 were still working somewhere for Mackay and Fair. This suggests rather strongly continuous employment, not necessarily uninterrupted employment, over a period of one year and perhaps beyond. The Mackay-Fair work force was more stable than transient. The company probably regarded that as a positive.

As noted above 11 workers became miners after appearing on the original list as having other jobs and remained within the Mackay and Fair mining complex. Because they worked underground along side of the miners they received the same daily wage (\$4). What is not clear from the payrolls is why employees moved from one job classification to another within the same pay scale. What was the advantage, if not pecuniary, of changing from a car-man or a station-tender to a miner? One could envision that some of the jobs that these future miners moved from were less demanding or stressful than the job of miner. It is also worth noting that while 11 non-miner employees became miners, six miners migrated to other occupations. Again the reason for the migration is not known. Perhaps the most unvarnished explanation with respect to occupational changes in general was that management instituted such changes on the basis of need. It seems likely that the assignment of jobs to underground workers, especially where daily wage rates were unaffected, would be mainly the prerogative of management. So far as could be determined with this small sample, none of the half dozen who changed from miner to another underground occupation received a higher (or lower) daily wage. Other employees not included in the sample may have changed jobs with different daily wages, but that cannot be discerned from this sample.

By far the most obvious mobility involved not changing occupations but changing job-sites within Mackay and Fair's combine. (It would be even niftier, if the documentation were available, to study mobility of workers among companies.) As noted before four operations appeared in the payrolls: Consolidated Virginia, California, Utah and C&C Shaft. The first three were actual mining operations, although Utah near the terminus of the northern branch was only marginally productive. C&C Shaft was a joint undertaking by Consolidated Virginia and California to build a new shaft to provide better access to the deep ore bodies. The mining companies shared the costs, although in time the Shaft generated its own income that supplanted the companies' annual contributions. C&C was a separate operation even if the mines it served provided funding. Mackay and Fair maintained four separate payrolls for these four operations, and workers were apparently assigned to any of these sites. In addition since connections had to be made from the ore bodies to the shaft Consolidated Virginia and California each created separate sections in their mine-payroll accounts for those assigned to C&C work.

In effect these became separate another job-site with which workers could be identified. In tracking the Consolidated Virginia miner from January 1876 (A-M) over six months and then one year I have established the base number to be 136. This number comprises only those who were identified as Consolidated Virginia miners in January 1876 and who were still employed six months and one year later as miners in Consolidated Virginia and its C&C unit, California and its C&C unit, C&C Shaft or Utah.

Of the 136 after six months (January-July 1876) 28 percent (38) were listed as miners at Consolidated Virginia or in Consolidated Virginia C&C, while 66 percent (90) had moved to California or California C&C. Another 6 percent (8) did not show up on any payroll, although they will reappear on payrolls six months later. (38+90+8=136) None of the sample had moved to the independent C&C Shaft or Utah Mine. Most importantly, two-thirds of the Consolidated Virginia miner payroll had moved to California or California C&C. Consolidated Virginia without its C&C Shaft component was about a third smaller in July than January. It will recover during the second half of 1876, but beginning several months before the July count California had become the new bonanza. The demand for workers there was probably stronger than the demand at Consolidated Virginia.

Between July 1876 and January 1877 further changes occurred. How many of the 136 identified either at Consolidated Virginia or at the other properties continued to be working underground? In January 1877 none of the 136 showed up on the payrolls of C&C Shaft or Utah Mine. Almost the same percentage (29 percent) was employed in Consolidated Virginia and its satellite, Consolidated Virginia C&C, as in July 1876 (28 percent). The percentage of the sample employed at California and California C&C, however, dropped from 66 to 53 percent. An interesting statistics turns out to be the workers from the sample that do not appear on any payroll in July 1876 or January 1877. All eight of the persons who were absent from the July 1876 payrolls reappeared in January 1877. All 25 names absent in January 1877 were employed in the July 1876. In other words the absent names in January 1877 constituted a new list and not a carryover list from July 1876. Of the absent names in January 1877 they were nearly evenly split between miners who had been employed in Consolidated Virginia/C&C or in California/C&C in July 1876. As with the list of absent miners in July 1876 the absentees in January 1877 might well have been re-employed in future months.⁵⁶

In assessing the continuity, job and site of the original miner list I have compared the January 1876 payroll of Consolidated Virginia with the payrolls of several operations in July 1876 and then again in January 1877. Another revealing calculation is how many employees in July 1876 at Consolidated Virginia/C&C and California/C&C changed jobs or sites by January 1877? The answer was that 45 percent of those employed in July 1876 and again in January 1877 changed positions or locations. Far more changed location

⁵⁶ Some miners from the January 1876 list changed jobs from miner to bulk-header or car-man or shift-boss. Technically these miners should have been eliminated from the subsequent lists of active miners but have been retained because their job changes were not necessarily permanent, and they could show up later as miners again. They continued to be paid as miners. In the final analysis the number of changes from miners to another underground occupation was relatively small so that the elimination of names because of changes in underground occupations would have affected the percentages only marginally.

than position with employees moving between Consolidated Virginia/C&C and California/C&C. Again none of the employees entered the payrolls of C&C Shaft or Utah Mine.

The primary aim in tracking Consolidated Virginia miners over a year was to determine how much continuity existed in an occupation universally considered to be grueling and hazardous. Within the sample of 164 names 28 or 17 percent did not appear six months later on the July 1876 payrolls of the Mackay and Fair businesses or six months after that on the January 1877 payrolls. No Comstock comparisons exist so one cannot say if that is remarkably high or just average. I am inclined to conclude that from the standpoint of the companies it was a plus to have such high continuity within its work force. I am also inclined to accept the observation of contemporary writers like Eliot Lord that the hardiness of the laboring class (in spite of its occasional rowdiness) was to be admired. It is worth noting that major disasters with high mortality tolls like the Yellow Jacket fire were few and far between on the Comstock. Certainly on an almost daily basis workers were injured, and some of the injuries were severe or crippling. What the statistics do not reveal and what every mining community even in contemporary times must face is the debilitating nature of mining. Many who came to work on the Comstock understood the risks because they were experienced miners and the inexperience learned quickly how perilous the work could be. The presence and protection of the unions must have had an ameliorating influence over risks and fears that all mine laborers faced. It is not known to what extent mine workers considered the guaranteed daily wage rates just compensation for those risks and fears, but those rates may well have played a part in attracting and keeping workers. Or as my father used to say – it is in my blood.

A secondary observation that grew out of this scrutiny of payrolls was workers had mobility within Mackay and Fair's combine but probably not much beyond that. If workers were dissatisfied with their jobs, they may have had options within Mackay and Fair but few outside. It's a safe bet is that management made assignment and reassignments on the basis on need. It was probable that management was aware of differing skills and attitudes among its employees and moved workers in accord with evaluations about performance, and it was possible that it would try to accommodate workers who requested transfers. Some underground jobs were probably less grueling than others – a station attendant versus a drill operator. But constructing tunnels, drifts, winzes or upraises through rock, clay or water could not have been much different whether it was linking the C&C Shaft to the ore bodies or exploring for new ore bodies. Mobility within the underground labor force existed, but the criteria applied are known.

A final consideration is that workers disappeared only to reappear later. The evidence for this from these data is not overwhelming. And there were no explanation why workers took leave of absence. The leaves could have been instituted by management for financial or disciplinary reasons or accorded workers for personal or medical reasons, but whatever the reasons they apparently existed. Since shortages of workers (except for certain skilled laborers) were not often an issue, leaves did not necessarily handicap the companies in trying to meet their workday quotas.

I mentioned earlier that mine wages were paid in coin. Paper money violated the contracts. Workers were paid in gold and silver or by vouchers (checks) to be redeemed in gold and silver. Gold was the standard currency supplemented by minor silver coins. In some accounts the workers actually signed the payroll sheet upon receiving is pay. In the payroll of the Omega Mill, a Mackay, Fair *et al.* property, wages were paid in gold and silver, and the bookkeeper noted how much was paid in each: for July 1877 63 employees received payments totaling \$4,200 with \$3,340 in \$20-gold coins, \$240 in \$10-gold coins, \$297 in “halves” (\$5-gold coins) and \$323 in various silver coins.⁵⁷ Union members had their dues deducted from their monthly pay, but that did not show up in the company ledgers. Occasionally an “attachment” would be noted, as in the case of E. L. Wright, a fireman, whose wage was reduced by \$14.⁵⁸

Special Appendix: Below is sample pages from Duplicate Time Book, July & August 1877, California Mining Company, NC99/3, Bx 9-11, Special Collections, Library, University of Nevada, Reno. The Time Books included separate payroll sections for Consolidated Virginia and California Mining Companies and the C&C Shaft. There was a monthly Time Book and a duplicate Time Book covering usually two months. Time Books exist for several years, contain thousands of names and, if computerized, could be used for a fine-grained analysis of various employment patterns. survive for other companies and could be added to any database created from the above-described Time Books.

⁵⁷ Payrolls, Omega Sluice, July 1877, Mackay, Fair, Flood and O’Brien, MS-NC356/1/31, Nevada Historical Society.

⁵⁸ Payroll, Aug 1879, Records, 1865-1884, Pacific Mill and Mining Company, MSS P-G 207, Oversize Box 1, Folder 2, Bancroft Library.

DUPLICATE TIME BOOK,

January 31st 1877

NO. OF CHECK.	NAMES.	OCCUPATION.	TOTAL NO. OF DAYS.	RATE PER DAY.	AMOUNT.
1	Hugh Raub	Lead Foreman	31	250 ⁰⁰	250
2	John Abbot	Shift Boss	31	5	155
3	Alce Richards	"	29	5	145
4	Louis Freglin	"	31	5	155
5	Wm Harper	"	31	5	155
6	Albert Roughrin	"	31	5	155
7	J. Coyette	Store Keeper	32	350	112
8	John Baird	Watchman	31	4	124
X 9	G. B. Joy	"	22	4	88
10	Dames Hynes	"	9	4	36
11	W. King	"	9	4	36
12	James H. Kelly	Machinist	32	6	192
13	Dames Mc Kay	Knapp boy	31	350	11025
14	J. W. Rocklin	B. S. Helper	31	4	124
15	Audy Bahaw	Blk smith	31	5	155
16	Jas Johnston	Helper	31	4	124
17	Frank O'Neal	Blk smith	31	5	155
18	J. A. Reynolds	Assayer	31	150 ⁰⁰	150
19	W. J. Elder	"	31	250 ⁰⁰	250
20	A. P. Webster	Cupeller	31	550	17050
1	J. P. Jones	Clerk	31	5	155
X 2	A. H. Everett	On assayer	3	5	15
3	Chas Helman	"	31	5	155
4	H. Degeese	Melter	23	5	115
5	W. D. James	"	23	5	115
6	John Paul	asst "	23	450	10350
7	F. B. Fielding	" On assayer	27	4	108
8	J. Kruger	Grill Utility	31	350	10850
9	J. W. Brooks	Chf Eng	31	6	186
30	J. J. Murphy	"	31	5	155
1	Wm Wilcox	Brakeman	31	450	13950
2	J. A. Weaver	Fireman	31	4	124
3	A. C. Crossman	Engineer	31	5	155
4	J. S. Hancock	"	31	5	155
5	D. J. Cooper	Brakeman	29	450	13050

1445⁵⁰