

BONANZAS & BORRASCAS – A COMSTOCK MINING HISTORY

[F]

Statistical Profile of Mining Industry: Third Stage 1875-1880, Final Stage 1880-1885

As the new year of 1875 opened, the Comstock appeared to be re-energized. If the first half of the 1870's belonged to Belcher and Crown Point, the second half belonged to Consolidated Virginia and California. The latter's holdings were so vast that sunny predictions of inexhaustible supplies seemed the only natural and rational position to take. After the pause of 1874 the value of bullion in Story County rose in 1875 by 16 percent to \$26 million. Tonnage, which had risen by 10 percent in 1874, increased by less than 5 percent in 1875 to 558,000. That meant, of course, the per-ton figure had gone up from \$42 in 1874 to \$47 in 1875. The latter figure was comparable to that reported in 1873. These changes were not spectacular when measured against the doubling of bullion values between 1872 and 1873 but nonetheless important as indicators of the resumption of growth in output. Behind the gross numbers for tonnage and bullion, however, was the most startling story: Belcher and Crown Point had lost their leadership role as their output plummeted by one-half and one-third respectively. By contrast Consolidated Virginia vaulted into first with nearly a three-fold increase in tonnage (169,000) and a five-fold increase in bullion (\$16.9 million). A ton of ore from Consolidated Virginia yielded about \$100 in bullion. Never before had the dollar value of a ton of ore in the course of a year reached \$100. Assays inside the mines were often reported to be in the hundreds of dollars per ton, and such assays had been reported in the press and other publications in the past but had never been realized once the ores were processed. The average for the Comstock between 1867 and 1885 was \$36 per ton while the median was \$25 per ton. In previous bonanzas such as Belcher the ratio was as high as \$60 to \$65 per ton. Consolidated Virginia's achievement had converted fantasies about the "gigantic scale" (in the words of the State Mineralogist) of the Comstock's ore reserves into realities.¹ And reports from Consolidated Virginia's companion mine, California, only affirmed what many were coming to accept as the new gospel – the ore bodies grew richer as the depths increased.

FIGURE 1
BULLION OWNERSHIP 1875

Mine or Mill	1Q	2Q	3Q	4Q	Totals		Yield	% Tons	% Yield
	Yield	Yield	Yield	Yield	Tons	Value			
Consolidated Virginia	\$96.81	\$89.68	\$102.60	\$119.66	169,065	\$16,916,006	\$100.06	30.28%	65.00%
Ophir	\$26.24	\$28.02	\$43.60	\$45.72	46,682	\$1,682,990	\$36.05	8.36%	6.47%
Belcher	\$26.11	\$21.66	\$31.19	\$33.03	123,780	\$3,383,874	\$27.34	22.17%	13.00%
Imperial			\$20.00	\$27.14	3,127	\$82,006	\$26.23	0.56%	0.32%
Justice				\$23.14	729	\$16,866	\$23.14	0.13%	0.06%
Crown Point	\$21.04	\$20.63	\$20.18	\$17.01	155,361	\$3,101,604	\$19.96	27.83%	11.92%
Andes			\$18.75		876	\$16,425	\$18.75	0.16%	0.06%
Hale & Norcross	\$16.57			\$17.47	5,797	\$98,722	\$17.03	1.04%	0.38%

¹ "Biennial Report of the State Mineralogist...1875 and 1876" in *Appendix to Journals of Senate and the Assembly*, 2 vols., 8th Legislative Session, 1877, 1:120 (1875).

Chollar Potosi	\$17.10	\$19.14	\$14.93	\$16.43	18,850	\$317,383	\$16.84	3.38%	1.22%
Yellow Jacket				\$16.00	761	\$12,176	\$16.00	0.14%	0.05%
Vivian				\$15.72	1,488	\$23,397	\$15.72	0.27%	0.09%
Empire	\$14.02	\$13.00	\$13.00	\$12.78	11,090	\$146,960	\$13.25	1.99%	0.56%
Express Mill [T]	\$15.22			\$9.50	4,400	\$56,679	\$12.88	0.79%	0.22%
Woodville	\$12.50				1,296	\$16,200	\$12.50	0.23%	0.06%
Bowers	\$11.38	\$11.67	\$11.33		955	\$10,950	\$11.47	0.17%	0.04%
Railroad Mill [T]		\$15.25	\$8.00	\$11.00	12,800	\$134,700	\$10.52	2.29%	0.52%
Stevenson, C. C. [T]		\$5.19	\$5.00		1,200	\$6,100	\$5.08	0.21%	0.02%
Calculated Totals	\$42.69	\$43.55	\$55.02	\$46.05	558,257	\$26,023,038	\$46.61	100.00%	100.00%
Recorded Totals					558,256	\$26,023,037			

The County Records Microfilm Project, ST 67 Story County. in Special Collections, Library, University of Nevada, Reno. T identified as tailings mill.

When production statistics are examined firm by firm, a less rosy and a more troubling future may be discerned. The number of firms with assessable bullion during the year remained small at 14. Nine firms paid taxes in the first quarter, seven in the second quarter, nine again in the third quarter and 11 in the fourth quarter. Tonnage and value rose between the first and second quarters; tonnage fell in the third while value continued to rise; and both tonnage and value fell in the fourth quarter. The October fire clearly had some impact on operations during the fourth quarter. The fire, confined mainly to Virginia City, destroyed buildings and facilities on the surface and timbering in several shafts, but most of the underground facilities were untouched. The ore was kept in the ground until the shafts could be repaired sufficiently to move the ore out of the mines and into the mills. The fire was certainly a major disruption but not a permanent one. It was encouraging that the fire did not bring Comstock production to a standstill, and it was equally encouraging that the bonanza on the northern end, now concentrated in Consolidated Virginia but rapidly being expanded to California and perhaps eventually even to include Ophir, was as big as it was. On the southern end the bonanzas appeared to be absolutely waning. Consolidated Virginia sprang to the top with only 30 percent of the ore but 65 percent of the bullion as yields came in at more than \$100 per ton. Second on the list in per-ton yields was Ophir, which had been among the marginal producers for several years. In tonnage and bullion both Belcher and Crown Point far surpassed Ophir but their yields had fallen to \$27 and \$20 per ton respectively, the lowest since 1870. Belcher's quarterly figures were more encouraging than Crown Point's. The former yields had fallen and then recovered during the course of the year whereas the latter's had steadily fallen. Without Consolidated Virginia's yield of \$100 per ton the average for the other operations would be \$23 per ton and the median would be \$17 per ton. These were not figures that could be predictive of long-term growth. But clearly it was difficult to look ahead and not to factor in the events surrounding Consolidated Virginia and California. In spite of the damage from the fire to the mine the yields from Consolidated Virginia were extraordinary: \$97 per ton in the first quarter, \$90 in the second, \$103 in the third and \$120 in the fourth. No operation had achieved such productivity. Success at Consolidated Virginia reinforced the expectations that greater wealth would be found in

deeper ground in a matter of time and with a sufficient application of capital and technology.²

In the final two quarters of 1875, based on information provided by the bullion owners, the yield in dollars per ton of ore was \$51 whereas the cost per ton to extract, transport and refine that ore was \$25.³ This was a healthy gross profit margin even if cost data were not verifiable. When data from Consolidated Virginia are stripped out of the bullion and cost figures, a somewhat different picture emerges. One point to observe is that although the fire may surely have boosted Consolidated Virginia's costs (surface buildings damaged or destroyed and its shaft filled with dirt to prevent an interior fire) between the third and fourth quarter, the overall operations may have suffered much less if at all. In the third quarter mines produced ores worth \$55 per ton at a cost of \$23 per ton. Gross profits of \$32 per ton was significantly influenced by the performance at Consolidated Virginia, which with bullion receipts of \$102 per ton and mining and milling expenses of \$28 per ton realized gross profits of \$74 per ton. When Consolidated Virginia's data are removed from the calculations, the other Comstock firms received on average \$24 per ton at a cost of \$21 per ton for a modest gross profit of \$3 per ton. Of this group Ophir, which ranked fourth in tonnage, had the highest gross profits of \$24 per ton followed by Belcher, which ranked third in tonnage, with \$6 to \$7 per ton gross profits. Among the worse performers was Chollar Potosi, which reported a loss of \$24 per ton on a few thousand tons. Crown Point, second in tonnage, just barely broke even with receipts and costs running at about \$20 per ton.

The fire of October 1875 could have closed down the Comstock if it had ignited the interiors of the mines. It did not, of course. While property losses on the surface were large, such losses inside the mines were small. Most severely affected among the producing mines were those like Ophir and Consolidated Virginia on the northern branch, where the fire began. Mines on the southern branch were unaffected for the most part. Total tonnage fell by 11 percent compared to the third quarter mainly because tonnage at Consolidated Virginia and Ophir were off by nearly half. Per-ton yields also declined to an average of \$46 (from \$55) while per-ton costs, not surprisingly, rose to \$28 (from \$23). Belcher became the largest producer in tonnage with a modest rise in per-ton income from \$30 to \$33. In contrast Crown Point with the second highest tonnage saw yields continue to decrease from \$20 to \$17 per ton. Belcher's gross profits more than doubled to \$13 per ton. Next door, Crown Point now officially dropped into the red with operating losses of more than \$3 per ton. Chollar Potosi, much closer to the fire, actually witnessed a drop in operating losses from \$23 per ton to \$8 per ton. The big question:

² "Biennial Report of the State Mineralogist...1875 and 1876" in *Appendix to Journals of Senate and Assembly*, 2 vols., 8th Legislative Session, 1877, 1:200-201, 208-209 (1875). Supplemental data found in Bullion Records, Consolidated Virginia Mining Company, Oct 1873-Nov 1875, NC99/1/3/2, and Dec 1875-Nov 1878, NC99/1/3/4, Special Collections, Library, University of Nevada, Reno.

³ The Mineralogist's Legislative Reports of company operations for 1873-1876 did not contain the cost and tax data that were included in the assessments rolls maintained by the county assessor and in the Quarterly Abstracts submitted to the State Controller. In the aftermath of the October 1875 fire the first complete assessment roll for Story County was for the third quarter of 1875. That was possible because the registration of data and the payment of taxes for the third quarter were not due until the end of the fourth quarter of 1875, more than two months after the fire.

how did Consolidated Virginia perform? The upper part of the shaft had to be repaired and the housing, cables and other equipment had to be replaced. But Consolidated Virginia could maintain underground operations by using the network of tunnels that connected its operations with other mines and shafts. During the quarter the company reported that 27,000 tons of ore were lifted and refined at an astonishing per-ton yield of \$120. Company costs rose, as one might expect, to \$62 per ton from \$28 the previous quarter, but even so that left a gross profit of \$57 per ton, down from \$74. These were extraordinary numbers by historic standards and even more so against the backdrop of a devastating fire. The performance of the Comstock absent the Consolidated Virginia data was about the same as the third quarter: receipts dropped to \$24 from \$25 per ton but costs also dropped from \$21 to \$19 per ton. There was understandably a certain exuberance about the speedy recovery of the mining sector after the fire, although the underlying patterns observable in the yearly data should have advised caution.⁴

During the next two years 1876 and 1877 Comstock production of gold and silver achieved its historic highs. In 1876 more than \$38 million worth of bullion was registered to Comstock companies, and in 1877 a slightly smaller figure of \$37 million was registered. The first figure represented a 46 percent increase over 1875, and the second figure represented less than a 3 percent decline. Twenty-five names of mines, mills or individuals appear as taxpayers in the 1876 assessment rolls, the highest such number in several years. Half of the names were mining companies, reporting bullion from ores produced in their own mines. The other half consisted of bullion from tailings mills. On the tailings list were names identified as mills and names identified only as individuals, who may well have operated tailings mills. Tailings, as discussed earlier, were ores that escaped amalgamation, and to be processed required special milling procedures outside of the common milling operations. The rise in the number of tailings mills in 1876 was most certainly related to the unprecedented volume of ore being extracted and processed. Compared to the previous year, which set a record for Comstock production, about 3 percent of the tonnage was treated in tailings mills. That jumped to between 5 and 6 percent in 1876. The actual number of mines reporting taxable bullion was one less in 1876 than 1875. Four mines from the 1875 list did not show up on the 1876 list while three mines, not new to the Comstock but not on the 1875 list, appeared in 1876. The newcomer that mattered, of course, was California, the property between Consolidated Virginia and Ophir that shared the ore body that made Consolidated Virginia the Comstock's richest mine. Consolidated Virginia and California along with Ophir accounted for 55 percent of the ore and 85 percent of the bullion. California's performance in its "official" first year (actually 10 months) almost matched Consolidated Virginia's performance after three years: it had one-fifth of the ore and one-third of the bullion compared to Consolidated Virginia's 23 percent and 44 percent. Consolidated Virginia's per-ton yield rose to \$114 in 1876 (up from \$100 in 1875), and California had a yield of \$106 per ton. Ophir was far behind at \$34 per ton, a decline of several dollars per ton from 1875. Belcher had the second highest tonnage after Consolidated Virginia

⁴ The discussion concerning the third and fourth quarters drawn mainly from assessments in The County Records Microfilm Project, ST 67 Story County. in Special Collections, Library, University of Nevada, Reno. The actual ledgers can be consulted at the Assessor's Office, Story County Court House, Virginia City, Nevada.

and ahead of California, but it could only muster \$21 per ton, the lowest since the 1860s. Other former major producers – Chollar Potosi and Crown Point – came in under \$20 per ton. Three small operations in Gold Hill reported yields between \$27 and \$36 per ton. The annual average yield based on the tax rolls reached \$61 per ton, the highest ever recorded. If the yields at Consolidated Virginia and California were backed out of the calculation, the Comstock average remained in the lower twenties (\$23 per ton). Clearly what drove the Comstock to new highs in registered bullion were Consolidated Virginia and California.⁵

On the cost side the picture demands some explanation. A ton of ore cost on average about \$26 to extract, refine and transport against the \$61 per ton in bullion noted above. That left \$35 per ton in gross profits. But the data from Consolidated Virginia and California strongly influenced those numbers. In cost per ton Consolidated Virginia and California ranked third and fourth respectively behind Overman and Chollar Potosi. In reality only a few cents separated Overman from Consolidated Virginia. California, on the other hand, at \$29 per ton was \$6 under the top three. Both Consolidated Virginia and California had operating costs per ton that were higher than the Comstock average. On the other side of the comparative ledger their per-ton return (receipts minus expenses) was double the calculated average for all Comstock operations. Again to remove Consolidated Virginia and California from the calculations provides a different perspective on the Comstock cost structure. Bullion remittances for all the operations minus Consolidated Virginia and California averaged \$23 per ton and the expenses amounted to \$21 per ton. Under calculations the gross profit margins were about \$2 per ton, a far less impressive figure than \$35 per ton. Other former major producers operated at losses. Chollar Potosi had a loss of \$15 per ton and Crown Point \$6 per ton. Belcher had a slight profit of between \$1 and \$2 per ton. Ophir continued to show reasonably good profitability at \$11 per ton, and Imperial (in Gold Hill) on only 4,300 tons of ore reported a favorable difference between receipts and costs of about \$17 per ton. Seventeen of the assessed operations had ratios of expenses to receipts that exceeded 80 percent and nine of them had ratios in which expenses were greater than receipts. The average for all the operations was 43 percent. Although expenses per ton at Consolidated Virginia and California were high compared to the other operations, their receipts were so much higher than the rest that their ratios of expenses to receipts were the lowest: 27 percent at California and 30 percent at Consolidated Virginia. Consolidated Virginia, California and several other small mines were profitable in 1876 along with a handful of millers. But the bonanzas at Consolidated Virginia and California, as spectacular as they were, remained isolated events.

FIGURE 2
BULLION OWNERSHIP 1876

Mine or Mill	1Q	2Q	3Q	4Q	Totals	% Yield		% Value	
	Yield	Yield	Yield	Yield	Tons	Value	Yield	Tons	Value

⁵ Even though the 1877 Mineralogist's Report contained the 1876 production figures from the tax rolls, it did not include the fourth quarter (taxes not due until the end of the first quarter 1877 after the Legislature had met and adjourned) and did not include costs. I have used instead the data from the actual assessment rolls on microfilm. See above footnote.

Consolidated Virginia	\$128.00	\$109.00	\$97.00	\$95.00	146,384	\$16,657,165	\$113.79	23.35%	43.79%
California		\$155.00	\$97.00	\$83.00	126,936	\$13,400,841	\$105.57	20.25%	35.23%
Imperial (C. C. Stevenson)	\$14.00	\$30.42	\$62.00		4320.35	\$159,387	\$36.89	0.69%	0.42%
Ophir	\$40.00	\$36.00	\$35.00	\$24.00	71,095	\$2,386,891	\$33.57	11.34%	6.27%
Overman		\$30.29	\$25.00		1,918	\$56,169	\$29.29	0.31%	0.15%
Justice		\$31.00	\$31.00	\$26.00	30,730	\$856,592	\$27.87	4.90%	2.25%
Belcher	\$26.00	\$21.00	\$18.00	\$16.00	131,223	\$2,821,076	\$21.50	20.93%	7.42%
Chollar Potosi	\$20.00	\$20.00	\$19.00	\$19.00	24,637	\$485,360	\$19.70	3.93%	1.28%
Courser, J. C. [T]		\$22.00	\$13.00		182	\$3,375	\$18.54	0.03%	0.01%
Lady Bryan	\$17.00				225	\$3,940	\$17.51	0.04%	0.01%
Ames, John [T]		\$16.00			250	\$4,225	\$16.90	0.04%	0.01%
Vivian	\$16.00				673	\$10,768	\$16.00	0.11%	0.03%
Crown Point	\$16.00	\$15.00	\$13.00	\$11.00	56,921	\$905,947	\$15.92	9.08%	2.38%
Watson & Co. [T]			\$5.00		80	\$1,200	\$15.00	0.01%	0.00%
Yellow Jacket (C. H. Golding)	\$13.00				863	\$11,668	\$13.52	0.14%	0.03%
Jennings, G. N. [T]	\$14.00	\$11.00	\$8.00	\$13.00	538	\$7,025	\$13.06	0.09%	0.02%
Empire (C. C. Stevenson)	\$13.00				2,525	\$32,850	\$13.01	0.40%	0.09%
Elholm, Andrew [T]	\$13.00		\$9.00		600	\$7,070	\$11.78	0.10%	0.02%
Omega Mill [T]			\$13.00	\$9.00	1,607	\$15,205	\$9.46	0.26%	0.04%
Express Mill [T]		\$9.00		\$9.00	9,833	\$86,770	\$8.82	1.57%	0.23%
Railroad Mill [T]		\$7.00		\$9.00	13,276	\$112,175	\$8.45	2.12%	0.29%
Dickman, E. [T]				\$8.00	28	\$224	\$8.00	0.00%	0.00%
Russell Bros [T]	\$9.00	\$10.00	\$8.00		591	\$4,725	\$7.99	0.09%	0.01%
Partridge Hayes [T]		\$7.00			149	\$1,043	\$7.00	0.02%	0.00%
Stevenson, C. C. [T]		\$5.00	\$7.00		1,290	\$6,450	\$5.00	0.21%	0.02%
Calculated Totals					626,874	\$38,038,141		100.00%	100.00%
Mean							\$60.68		
Median							\$15.92		

The County Records Microfilm Project, ST 67 Story County. in Special Collections, Library, University of Nevada, Reno. **T** identified as tailings mill.

The centennial year, 1876, was a triumphal year for the Comstock and for Virginia City in particular. After the fire the city had rebuilt quickly, and since the mines had escaped interior damage, they resumed operations almost immediately. Journalists, officials and visitors wrote glowingly of what was ahead for the Comstock against the backdrop of the productivity of Consolidated Virginia and California, the properties of what came to be known as The Bonanza Firm. More than once did the pundits predict that the Lode could produce as much as \$50 million in bullion a year for a decade or more.⁶ As so often happened during flush times, however, the optimism in Virginia City turned into a bear trap on the stock market in San Francisco. For 1876 Lord listed about six-dozen Comstock companies whose stocks traded that year on the San Francisco Exchange.⁷ The majority of the companies with stock trades as listed in Lord's Table could be matched up with companies with claims (or patents) as shown on maps and

⁶ Both Lord and Smith cited articles and reports, which proved to be exaggerated and unfounded as time passed. Lord, *Comstock Mining and Miners*, 314-321, and Smith, *The Comstock Lode*, 182-186, 197-199.

⁷ Lord, *Comstock Mining and Miners*, Table V, 430-432. Smith stated that as many as 135 stocks were quoted, although he did not provide a list. *The Comstock Lode*, 199.

surveys of Comstock from the period.⁸ Of those so identified 11 had bullion declarations. Consolidated Virginia with nearly \$17 million saw its stock prices drop from \$90 in March to \$35.50 per share in December. Its yield fell from \$128 per ton to \$95 per ton (still a most handsome return) from the first to the fourth quarter as its cost (as reported to the county assessor) rose from \$24 per ton in the first quarter, to \$39 in the second and to \$73 in the third before falling back to \$31 in the fourth. At its companion mine, California, the story was similar although of a different magnitude. Per-ton yields dropped from \$155 in the second quarter (its first full quarter) to \$83 in the fourth while per-ton expenses rose from \$27 to \$32 per ton in the same period. Belcher had an annual yield of \$22 per ton and an annual cost of \$20 per ton, but in each quarter yields had dropped and costs had increased per ton. The stock had a high price of \$40 in March and a low of \$8.50 in December. For Crown Point it was even worse as yields plummeted and costs skyrocketed during the four quarters. Its stock declined from \$29 in January to \$5.50 in December. The only company to end the year with a higher stock price than at any time during the year was Overman, and it is not clear why this should have happened. Its stock rose from \$53.50 in June to \$122 in December. It produced about 2,000 tons of ore during the second and third quarters at a combined loss of \$6 per ton. It is worth noting that several dozen other companies had stock transactions, in most cases at lower prices at the end of the year than at the beginning, and no ore or bullion registrations. They could have produced ores that were sold to millers who processed them and then paid taxes on them. The tailings millers on the 1876 assessment rolls accounted for less than 4 per cent of the total ore. Three companies – Consolidated Virginia, California and Belcher - paid dividends in 1876, and many of the rest of the mining companies were imposing assessments rather than paying dividends. But the San Francisco bears, led by James Keene, had already taken aim on the stocks of Consolidated Virginia and California, and their declining prices set the tone for the market. The bears had a more favorable view of California than Consolidated Virginia on the grounds that the former was just starting to lift ores from levels that had made Consolidated Virginia rich and the latter had observed a diminution of ores and yields below the 1,550- or 1,600-foot levels. Although California's ores were somewhat deeper, they were nonetheless an extension of the Consolidated Virginia ore body, and presumably California like its companion would by some estimates within a year or two also be in contraction. Several companies whose stocks were traded did business in Lyon County, adjacent to Story County's southern boundaries, around Silver City, and their assessments, of course, would not appear on Story County's rolls. As a matter of record, however, for the year 1876 Lyon County's assessment rolls revealed almost no ore or bullion production from the mines around Silver City and south of it even though stocks in some of the companies located there

⁸ A popular 1876 publication that has appeared in many Comstock histories was "Graphic Chart of the Comstock Mines, State of Nevada", compiled and drawn by J. B Treadwell, C. E., for the *San Francisco Newsletter*, 3 June 1876. On file in Special Collections, Library, University of Nevada, Reno, G4352 C6 1876 T7. There was also the later, official survey by the team under the direction of G. F. Becker and published as *Atlas to Accompany the Monograph on the Geology of the Comstock Lode and Washoe District*, 1882, Atlas Sheet 3. The two surveys were in basic agreement concerning the principal mining claims on the Lode itself. The Becker survey covered more of the surrounding area (since it included the Washoe District, which was larger than the Comstock Lode, and it also distinguished between claims or patents approved and those applied for.

traded in San Francisco.⁹ Little light can be shed on the dozen or so companies with stock transactions but no identifiable Comstock claims. With 300 to 400 claims on the various surveys as well as changes in names and titles some errors can be expected. Moreover there is no assurance that despite his diligence Lord correctly copied from the stock-reporting services that he used the names of the companies under which the stocks were issued.

As the speculators in San Francisco declared the Comstock vulnerable, the citizens of Storey County and particularly Virginia City enjoyed one of the most prosperous years in their short history, perhaps the most prosperous ever. Thousands were employed in the mines, albeit most of them in the two bonanza mines; new construction was in evidence along the city streets and in the surrounding hillsides; throngs of citizens mixed with conveyances of every sort and description that filled the city streets; the mood by numerous accounts was upbeat and high spirited. By any historic standard 1877 was another banner year on the Comstock. Tonnage rose by 1 to 3 percent (two sets of figures exist), and bullion fell slightly by about 3 percent. The per-ton yield also fell to \$58 (give or take a few cents), down from \$61 the previous year. Taken together the two years 1876 and 1877 saw ore production worth about \$76 million or about 30 percent of the total known bullion product of the Comstock. The devil, of course, was hidden in the details.

California rocketed ahead of Consolidated Virginia with a record 214,000 tons worth \$19 million. The yield was between \$88 and \$89 per ton, not a record for these bonanza mines but extraordinary nonetheless. The per-ton yield of between \$89 and \$90 at Consolidated Virginia actually beat California's yield, but compared to the previous year Consolidated Virginia's return in bullion per ton dropped more than California's. On the cost side California's per-ton expenses fell by 7 percent from \$29 to \$27, while Consolidated Virginia's fell by 14 percent from \$35 to \$30 per ton. Consolidated Virginia's overall costs remained higher than California's as it had the previous year. On a quarterly basis both mines had mixed results in terms of yields. California's returns in bullion was \$110 per ton in the first quarter, followed by two declining quarters - \$92 in the second and \$74, the lowest to date, in the third - and finally ending with a recovery up to \$82. Consolidated Virginia's pattern was different: a first quarter figure of \$73 per ton, probably the lowest or among the lowest in three years, was followed by a rise to \$95 and then to \$106 in the second and third quarters with a decline to \$78 in the final quarter, about where it had begun in the first quarter. In terms of costs California continued to do better with quarterly per-ton costs ranging between \$25 and \$30 compared to Consolidated Virginia's \$26 to \$35. It is well known, of course, that after

⁹ My figures for 1876 come directly from The County Records Microfilm Project, ST 67, Special Collections, Library, University of Nevada, Reno. State Mineralogists Report covering only three of the four quarters in 1876 listed one company, Silver City Mining, with 100 tons worth about \$2,300. Silver City appeared on the aforementioned surveys but not as a company trading stock at least under that name compiled by Lord. Lyon had a substantial quantity of bullion from tailings, and that was not unusual since the county had a large concentration of tailings from amalgamation mills. The Mineralogist did not list the tailings production by mill. "Biennial Report of the State Mineralogist...1875 and 1876" in *Appendix to Journals of Senate and Assembly*, 2 vols., 8th Session of the Legislature of the State of Nevada, 1877, 218-219, 222-223 (1876) and Lord, *Comstock Mining and Miners*, Table V, 430-432.

paying out more than one million dollars per month in dividends Consolidated Virginia suspended such payments for four months in 1877. For the market bears and perhaps for many other close observers there was little doubt what was happening. Consolidated Virginia had peaked, and unless new discoveries were made at much greater depths the Comstock's greatest mine would fade into oblivion. And California, even though it broke several records in 1877 and in particular paid nearly \$15 million in dividends, would eventually follow the course of its companion. Stocks prices certainly reflected these eventualities. The high price for Consolidated Virginia stock in 1877 was set in January at \$55 and the low in November at less than \$22. California fared no better: \$55 was its high and \$23 its low.¹⁰

FIGURE 3
BULLION OWNERSHIP 1877

Mine or Mill	1Q	2Q	3Q	4Q	Total	Total	Total	%	%
	Yield	Yield	Yield	Yield	Tons	Value	Yield	Tons	Value
Consolidated Virginia	\$73.00	\$95.00	\$106.00	\$78.00	153,166	\$13,726,251	\$89.62	24.16%	37.06%
California	\$110.00	\$92.00	\$74.00	\$82.00	213,682	\$18,893,843	\$88.42	33.71%	51.01%
Overman				\$26.00	283	\$7,453	\$26.35	0.04%	0.02%
Ophir	\$18.00	\$29.00	\$21.00	\$37.00	6,164	\$158,016	\$25.63	0.97%	0.43%
Belcher	\$28.00	\$23.00	\$24.00	\$15.00	16,147	\$413,742	\$25.62	2.55%	1.12%
Justice	\$20.00	\$13.00	\$17.00	\$16.00	127,378	\$2,338,057	\$18.36	20.10%	6.31%
Crown Point				\$18.00	4,185	\$76,120	\$18.19	0.66%	0.21%
Chollar Potosi	\$18.00	\$15.00	\$15.00	\$15.00	30,607	\$511,589	\$16.71	4.83%	1.38%
Andres			\$15.00		936	\$14,040	\$15.00	0.15%	0.04%
Mariposa Mill [T]	\$15.00	\$14.00	\$15.00		9,056	\$134,136	\$14.81	1.43%	0.36%
Stevenson, C. C.[T]	\$13.00	\$14.00			3,830	\$55,802	\$14.57	0.60%	0.15%
Imperial				\$14.00	2,997	\$41,958	\$14.00	0.47%	0.11%
Empire (C. C. Stevenson)			\$13.00		3,968	\$55,274	\$13.93	0.63%	0.15%
Trojan	\$9.00			\$11.00	3,003	\$33,842	\$11.27	0.47%	0.09%
Omega Mill [T]		\$8.00	\$11.00	\$9.00	35,537	\$361,051	\$10.16	5.61%	0.97%
Railroad Mill [T]		\$9.00	\$11.00		7,692	\$77,991	\$10.14	1.21%	0.21%
Jennings, G. N. [T]		\$10.00	\$8.00		1,090	\$10,546	\$9.68	0.17%	0.03%
Express Mill [T]	\$9.00	\$9.00	\$11.00	\$9.00	10,177	\$95,825	\$9.42	1.61%	0.26%
Partridge Hayes [T]				\$9.00	3,686	\$33,184	\$9.00	0.58%	0.09%
Bassett Bros [T]				\$10.00	281	\$2,181	\$7.76	0.04%	0.01%
Calculated Totals					633,866	\$37,040,901		100.00%	100.00%
Mean	\$31.30	\$27.58	\$26.23	\$24.93			\$58.44		
Median	\$18.00	\$14.00	\$15.00	\$15.00			\$14.69		

The County Records Microfilm Project, ST 67 Story County. in Special Collections, Library, University of Nevada, Reno. **T** identified as tailings mill.

But the Comstock's malaise was greater than was revealed in the deteriorating finances at Consolidated Virginia and California. Twenty companies appeared on Story County's assessment rolls for 1877, and again as in 1876 close to half of the reporting

¹⁰ Yearly and quarterly data from The County Records Microfilm Project, ST 67 Story County, Special Collections, Library, University of Nevada, Reno, and stock prices from Lord, *Comstock Mining and Miners*, Table V, 433.

operations were tailings mills. Although the mean bullion value for all operations was \$58 per ton, the median was only \$15 per ton. Remove Consolidated Virginia and Consolidated from the calculation, and the mean falls to \$16 per ton and the median to \$14 per ton. Among the well-known, well-established mining operations Belcher recorded an 88 percent decline in ore production to 16,000 tons although yields rose about 20 percent to \$25 per ton. Two other mines – Ophir and Overman - with reasonably high yields of between \$25 and \$26 per ton reported sharp declines in ore output by as much as 90 percent. The other major mines – Chollar Potosi, Crown Point, Justice and Imperial – had yields between \$15 and \$20 per ton. One interesting piece of data was that Justice, a Gold Hill mine on the southern branch, accounted for a fifth of the tonnage and if Consolidated Virginia and California were excluded for half of the tonnage among the remaining operations. Its yield was \$17 per ton for a total of \$2.3 million or the third highest bullion total. But Justice declared that its costs were almost equal to its receipts. Consolidated Virginia and California, of course, had costs of under \$30 per ton and gross profits of \$60 per ton. The average cost per ton for all operations was \$23 per ton against the average return of \$58 per ton. The two bonanza mines clearly pushed up the Comstock-wide gross profits. Without Consolidated Virginia and California the average cost was \$17 per ton against the average receipt of \$16 per ton for a loss of \$1 per ton. Even though Justice had a calculated loss of about 15 cents per ton, the performance of the other mining operations, based on similar calculations, was even less positive. Belcher claimed a huge loss of \$15 per ton while Chollar Potosi and Crown Point claimed smaller losses of between \$5 and \$6 per ton. Ophir had a profit of \$6 to \$7 per ton on 6,000 tons, which represented a decline of more than 90 percent from the previous year. It was not clear where the next discoveries would occur to sustain ore production at the lofty levels set in 1876 and 1877.¹¹

By 1877 the geological configuration of the Comstock Lode and the surrounding ground was far better understood than a decade before when Baron von Richthofen and others had made their predictions. Recurrent cycles of bonanzas and *borrascas* every few years had, quite naturally, inspired hope that the cycles would continue as the companies probed more deeply. The new twist, of course, was that the main core of the Comstock Lode had been squeezed out of existence at the 1,000-foot level, and the new discoveries below the 1,000-foot level had occurred in an eastwardly shift, that is, away from the footwall toward the hanging wall. The angular nature of the ore-bearing quartz vein posed a conundrum: what direction would the Lode take as the explorations breached the 2,000-foot level and below. Miners knew where they had been and what they had found, but they knew far less about where they were going. To many it was inconceivable that the richness of the Comstock would simply cease, for as the previous 15 years had amply demonstrated the Comstock had reinvented itself repeatedly. The State Mineralogist summarized the history of Comstock bonanzas with details about location, size and value in his 1877 Legislative Report by quoting a long passage from what he described without a full citation the *Mining Review*.¹²

¹¹ Assessment Rolls on microfilm in The County Records Microfilm Project, ST 67 Storey County, Special Collections, Library, University of Nevada, Reno.

¹² Not clear from his report what the *Mining Review* was.

Ophir and Mexican: surface discovery extending 500 feet underground; width of ore body 15 feet; cubical content 112,000 tons; value \$22 million.

Gould & Curry: surface discovery extending 500 feet; width 15 feet; length 500 feet; cubical content 190,000 tons; value \$37.5 million.

Savage: continuation of Gould & Curry but less rich; ore extending to the bottom of the mine, now 2,300 feet.

Hale & Norcross: strike at depth of 450 feet [550-foot level] extending to 1,200-foot level; width 10 feet; length 200 feet; cubical content 75,000 tons; value \$5 million.

Chollar Potosi: strike at depth of 500 feet extending 1,700 feet with few interruptions; cubical content 1,500,000 tons; value \$22 million.

Gold Hill: surface discovery extending 500 feet; cubical content 300,000 tons; value \$10 million.

Yellow Jacket: surface discovery extending 700 feet; ore body poor and unprofitable; value \$5 million.

Kentuck: 300 feet long; 20 feet wide; 400 feet deep [approximately 600-foot level to 1,300-foot level with intervening barren space]; 100,000 tons; value \$10 million.

Crown Point and Belcher: discovery at 1,400-foot level extending downward 600 feet; Belcher still producing; cubical content 1,500,000 tons; value \$50 million.

Consolidated Virginia & California: still developing; discovery through drifting eastward at the 1,500 foot level; ore body extends above and below drift; length 700 feet; height 600 feet; width 100 feet; in two years value \$30 million; expected total value \$140 million.¹³

It was obvious from these summaries (as I have noted several times) that the Comstock's great ore bodies were not contiguous or uniform across the Lode. More of these ore bodies populated the area between the surface and the 1,000-foot level than below the 1,000-foot level even though the latter were far richer. Experience had taught miners that vast stretches of the Lode and the related areas were barren or uneconomical. Some of the comments were puzzling. In the case of Chollar Potosi working "without interruption" down 1,700 feet was misleading because almost no profitable ores had been found below the 700-foot level even though the main shaft and its connecting incline had reached the 1,700-foot level. Indeed when the Mineralogist was collecting the data the mine was actually losing about \$2 per ton on every ton of ore converted to bullion. Even though the superintendent expressed the hope that a significant ore body was in the "neighborhood", the prospects were bleak. From some of the estimated dimensions of the ore bodies – hundreds of thousands of cubic feet – one can begin to appreciate the grounds for continuing optimism about the future of the Comstock. It is doubtful that the Mineralogists quoted these passages to raise alarms but rather he did so to allay fears that had begun to surface in 1876 over the long-term future of Consolidated Virginia and the failure despite renewed activity to locate new bodies between the 1,000- and 1,500-foot levels and below.

If the unraveling of the latest Comstock bonanza began in 1877, it gathered speed in 1878. Ore tonnage dropped 40 percent to 386,000 tons and bullion income 45 percent

¹³ "Biennial Report of the State Mineralogist...1875 and 1876" in *Appendix to Journals of Senate and Assembly*, 2 vols., 8th Legislative Session, 1877, 1:120-121.

to \$21 million. The yield remained historically high at \$53 per ton, due mainly to the productivity of Consolidated Virginia and California. These bonanza mines represented 68 percent of the tonnage and 93 percent of the bullion. Their dominance continued although with a less spectacular imprint. Consolidated Virginia had a yield of \$64 per ton, down nearly 30 percent from 1877, and California at \$80 per ton suffered only a 10 percent decrease. Costs per ton actually fell by 20 percent to \$24 at Consolidated Virginia and by a much smaller 4 percent to \$26 at California. Unmistakably the growth in production at both bonanza mines had stopped and reversed. This was the second year of downturns at Consolidated Virginia and the first at California. The possibility existed especially at California that the reversals were temporary, except the news from Consolidated Virginia more or less affirmed what the data indicated. California might yet surprise the pundits and the markets, although the evidence for a turn-around was hardly compelling. The companies' stock sold for as low as \$6 to \$7 per share during the course of the year.¹⁴

In 1878 eight mines and seven mills reported taxable bullion for a total of 15, one of the smallest in recent years. A fifth of the tonnage belonged to the tailings mills with 90 percent of the bullion product from two mills – Mariposa and Omega – both of which were owned by The Firm – Mackay, Fair *et al.* In addition The Firm owned or controlled Ophir, which only registered 1,300 tons but at a yield of \$92 per ton. In short the remaining operations not a part of Mackey-Fair's combine produced about 49,000 tons worth about \$665,000 or \$14 per ton, which was not sufficient to cover their costs of \$17 per ton. Belcher had disappeared from the assessment rolls, and Chollar Potosi and Crown Point between had about 6,500 tons that yielded about \$16.50 per ton at a cost of \$23 per ton. Except for Consolidated Virginia and California, which paid dividends of \$1.4 million and \$7.0 million respectively, all the Comstock in operation, those producing and those not producing any taxable, had to impose assessments on their stockholders or issue more stock in order to raise capital to stay in business.¹⁵

As the curtain descended slowly but relentlessly on the Comstock drama, now two decades old, some continued to hold out hope for a new bonanza. The most successful Comstock miners – Mackay and Fair – turned their attention to Ophir, which they added to their holdings in 1877. During the bonanza at Consolidated Virginia and California Ophir had remained in the hands of William Sharon even though some of its underground works had connected into The Firm operations at California and had served as a conduit for various functions in the restoration of the two mines. After the acquisition of Ophir a vein of ore (named the Hardy Vein after Superintendent William Hardy) was located between the 1,700- and 1,900-foot levels. It lay in a fissure and sloped downward from west to east toward the hanging wall. What excited the

¹⁴ Assessment Rolls on microfilm in The County Records Microfilm Project, ST 67 Story County, Special Collections, Library, University of Nevada, Reno.

¹⁵ Assessment Rolls on microfilm in The County Records Microfilm Project, ST 67 Story County, Special Collections, Library, University of Nevada, Reno. See Lord, *Comstock Mining and Miners*, 433-435 for stock prices of all the companies that traded on the San Francisco Exchange. Dividend payments by the bonanza mines show up in their Annual Reports for 1878. For Consolidated Virginia see 9 January 1879, NC99/1/5/1, p. 47, and for California 8 January 1879, NC99/1/5/6, p. 21 in Special Collections, Library, University of Nevada, Reno.

discoverers, according to Grant Smith, was that configuration was not unlike that which led to the Consolidated Virginia bonanza.¹⁶ The 1878 California Mine Annual Report made reference to a “joint Ophir and California cross-cut” that had been run from Ophir into California on a line corresponding to the location of the Hardy Vein in order to test whether it extended “south and upward” into the California mine. It did not, of course. Furthermore the Annual Report made clear that on both the Ophir side and the California side it proved difficult at these depths to prevent the loss of ore simply “from the caving of the ground and the crushing of the timbers.”¹⁷ In 1878 Ophir ore came in at an average \$92 per ton, but that calculation can be misleading. Ophir only reported bullion in three of the four quarters. For the year it had total tonnage of less than 1,300 tons. In the first quarter the per-ton yield was \$120 on less than 100 tons, and by the fourth quarter the per-ton yield had dropped to \$80 on less than 900 tons. More telling, however, was the cost per-ton. In 1878 it reached \$159 per ton. It was possible, as past experience had shown, that such outlays were necessary in the early stage of a potential bonanza and would be justified in the following years. In 1879 output rose to nearly 20,000 tons. Per-ton yields dropped to about \$64 but so too did per-ton costs to about \$57. That left an operating profit of about \$7 per ton. Unfortunately profitability was short-lived. By the fourth quarter 1879 expenses surpassed receipts, and that trend continued into 1880. The ore body was limited in scope and expensive to extract. The hope of making a new strike at 2,000 feet in Ophir or in the two former bonanza mines to the south had faded by 1880.¹⁸

As the bonanza years of the early and middle 1870s receded, the Comstock entered a period of freefall unlike anything experienced before. Between 1877 and 1881 tonnage fell 83 percent from 634,000 to 109,000 while the value of bullion from the ore fell even more by 96 percent. In a matter of four to five years the Comstock had slid to levels that had not know since the early 1860s. Story County, long the leader in ore and bullion production, had never witnessed a year when its share had dropped below 50 percent of the totals for all the counties, and in 1881 while it remained first it was no longer the dominate player with 27 percent of total tonnage and only 17 percent of total bullion. This downturn had a ring of finality to it. It was both rapid and severe. In 1878 tonnage fell 39 percent and bullion 45 percent; in 1879 41 percent and 35 percent; in 1880 18 percent and 43 percent and finally in 1881 42 percent and 66 percent. On a per-ton basis the figures were more startling: from \$58 per ton in 1878 to \$13 per ton in 1881. There was not even any pretense of profitability in these numbers. It is important to underscore that during these four years Consolidated Virginia and California continued to be the leading producers even as their own operations were in contraction. No other operating mine or no newly discovered mine appeared in the role of savior of the Comstock. In the spring of 1881 a fire in Consolidated Virginia closed both mines more or less permanently, and with no other emerging bonanzas the Comstock saw the sharpest

¹⁶ Smith, *The Comstock Lode*, 213. Some of references that I have found concerning this discovery do not agree fully with what Smith described in pp. 213-215.

¹⁷ Annual Report, Ophir Mine, 16 January 1878, NC99/1/5/6, p. 17, in Special Collections, Library, University of Nevada, Reno.

¹⁸ Assessment Rolls on microfilm in The County Records Microfilm Project, ST 67 Story County, Special Collections, Library, University of Nevada, Reno.

declines ever in tonnage and bullion. The ore produced in 1881 on average lost for its owners \$7 per ton.¹⁹

The mining and investing community could not have found any encouragement in the fact that the State Mineralogist issued his last report to the 9th Session of the State Legislature in 1879. It was his last because the position was abolished as a cost-saving effort by a state government whose revenues, so closely tied to taxes on mining proceeds, were rapidly evaporating. His 1879 report that covered the two-year period, 1877-1878, had a strong historic flavor in that he wrote enthusiastically about past successes on the Comstock and across the State and rather more guardedly about future prospects. He noted that in 20 years (since 1859 presumably) \$350 million in gold and silver had been produced, and two-thirds of that since 1871. He also noted that 1877 was a record year for mining in Nevada. He cited a figure of \$51 million in gold and silver, a figure that was higher by several million dollars than the Controller's total of \$47 million. In this regard the Mineralogist duly noted without apparent concern that in the following year 1878 total bullion had declined to \$35 million (a drop of one-third). In his view the supply of ore was "without limit".²⁰ As the succeeding years will demonstrate "without limit" proved to be an overstatement. His summaries of individual mines accentuated both the positive and the negative. It was becoming more costly to mine a ton of ore as the depths increased, and although many capital projects required assessments against the stockholders the potential results were thought to justify the investments in their minds. The new Requa Shaft (known as Combination Shaft on various surveys), in his words "a model of engineering skill and design," built by Chollar Potosi, Hale & Norcross and Savage Mining Companies, eastern toward the hanging wall from the original outcroppings, had reached 2,400 feet (between 2,500- and 2,600-foot level) at a cost of \$1 million. It had four compartments. One was assigned to pumping equipment, and the other three to lifting ore. The influx of water at the lowest levels required the pumps to remove nearly 100,000 gallons of water per day in order for the work to proceed. It was envisioned that the flooding, which had plagued these mines for years, would be more or less permanently solved. A huge tank was to be built at the bottom of the shaft to collect the water that could then be pumped to the surface or drained into the Surto Tunnel. The Mineralogist did not predict what would be found. But he was as in the past sanguine.

The completion of this pumping system will form a new era in the history of the flooded mines. It will lessen the extreme heat of the lower levels by a more thorough ventilation; it will remove the water at present so great as to interfere with the workings; it will insure the mines against any future repetition of the flood. It will make prospecting more easy [sic], developments more valuable, labor more beneficial and thorough. The successful completion...will be one of the greatest engineering triumphs of the Comstock.²¹

¹⁹ Assessment Rolls on microfilm in The County Records Microfilm Project, ST 67 Storey County, Special Collections, Library, University of Nevada, Reno.

²⁰ "Biennial Report of the State Mineralogist...1877 and 1878" in *Appendix to Journals of Senate and Assembly*, 9th Legislative Session, 1879, 5. The discrepancy between his figure and the Controller's totals cannot be explained.

²¹ "Biennial Report of the State Mineralogist...1877 and 1878" in *Appendix to Journals of Senate and Assembly*, 9th Legislative Session, 1879, 133.

Indeed, the shaft was completed, the connection was made and the mines were (more or less) drained, but despite the triumphal accomplishment no ore was found. Over the next half-dozen years the three mines lifted in combination several tens of thousands of tons of ore that generally returned less in bullion than it cost to extract and refine.

By far the Mineralogist devoted as much attention to the Sutro Tunnel than any other event during the final two years that his report covered. This project, to build a tunnel for drainage and other services from the present-day location of the town of Sutro four to five miles underground at increasing depths until it connected with the Comstock in the Savage Mine at the 1640-foot level. More will be introduced concerning the tunnel and its creator and promoter, Adolphe Sutro, in the following chapter. When the connection was made after almost a decade of planning and building, the drainage of the Comstock began not through pumps and compressors but through gravity. The water flowed downhill through the tunnel into a small stream that connected with the Carson River about 20,000 feet to the east. This was a daring and controversial project that led to considerable acrimony within the Comstock community. As one can readily observe, the main drawback was that it opened too late. It may well have functioned as Sutro envisioned it had it been built more quickly. Sutro like many others believed that vast reservoir of ore resided at the depths that the tunnel would serve directly as well as at greater depths through a network of tunnels and pumps that would move the water into the main tunnel. Not only did the tunnel arrive too late but also the ore was never found. The Mineralogist wrote his account of the tunnel in an upbeat tone. The operation of the tunnel, he estimated, would permit the extraction of low-grade ores, estimated to be worth between \$50 and \$500 million dollars and would offer savings for deep mining of \$3 million per year.²² Neither of these along with many other hoped-for results was realized even though the tunnel proved that the primary goal of draining million of gallons of water per day was possible.

In the final years covered in this study, 1881 to 1885, efforts to restore and expand the Comstock continued but generally failed. Tonnage actually rose in each year after 1881: 5 percent in 1882, 27 percent in 1883, 32 percent in 1884 and 24 percent in 1885. From 110,000 tons in 1881 to 239,000 tons in 1885 the increase was 119 percent. The value of the bullion derived from the ore told a different story. Since the tonnage rose each year the value of the bullion would also be expected to rise. In 1882 it grew by 14 percent, in 1883 by 21 percent, in 1884 by 28 percent and finally in 1885 by 14 percent. Overall it doubled between 1881 and 1885 from \$1.5 million to \$3.0 million. But the yield per ton actually fell during the period. In 1882 it rose from \$13 per ton to \$15 per ton and then fell to \$14 in 1883, \$13 in 1884 and in the final year \$12. On costs, as reported by the firms, they exceeded receipts in every year by as much as 10 percent and by as little as 1 percent. For all intents and purposes the Comstock was operating in the red. There were some interesting individual stories. Consolidated Virginia and California were almost completely out of picture. These mines accounted for no more than a few thousand tons of below average ores. Other Virginia City mines such as Ophir, Hale & Norcross, Savage, Chollar Potosi (specifically Potosi) and even Gould & Curry might

²² "Biennial Report of the State Mineralogist...1877 and 1878" in *Appendix to Journals of Senate and Assembly*, Legislative Session, 1879, 84-85.

have combined totals in the thousands or tens of thousands of tons, but their per-ton yields often fell below the aforementioned annual averages. The notable operations were in Gold Hill on the Lode's southern branch. The quartet of mines (Yellow Jacket, Kentuck, Crown Point, Belcher), which were so instrumental in launching the bonanza years of the early 1870s, was producing again. Their recovery was not due to new discoveries but rather to reworking old stopes.

Their profit margins, however, were dangerously thin or nonexistent. Between 1881 and 1884 (1885 is excluded because the assessment rolls are difficult to untangle) these four mines reported about 346,000 tons or two-thirds of the total tonnage from all the operations. Their bullion was value at \$5.1 million. Discouragingly it cost \$5.2 million to extract and process the ore. In 1881 receipts exceeded costs by approximately 43 cents per ton, in 1882 by 48 cents and in 1883 by 3 cents. In 1884 costs outpaced receipts by 49 cents per ton. Although these figures must be treated as estimates since the actual receipts and expenses of any of these mines cannot be independently verified, they reveal nonetheless the risk that the Comstock now posed. Without new, large, rich discoveries working old seams and stopes was a venture in diminishing utility. They could not be made profitable enough to reestablish the Comstock to its former glory.²³ When Joseph Tingley added his Epilogue to a new edition of Grant Smith's *History of the Comstock Lode* in 1997, he wrote that even with better technologies and greater resources every effort to recover the Comstock had more or less failed.²⁴

LINKS:

²³ Assessment Rolls on microfilm in The County Records Microfilm Project, ST 67 Storey County, Special Collections, Library, University of Nevada, Reno. Even though problems were encountered in organizing the assessment data for 1885, there is no indication that the ratio between revenues and costs underwent any significant reversal among the producing mines, in particular the Gold Hill quartet.

²⁴ Smith, *History of the Comstock Lode*, 307.