

Chapter 16
The Biggest Bonanza:
Refining As Financial Bonanza, Other Mineral Mercury, Founders' Cash Flow

Pacific Mill and Mining made money for its principal and the small circle of investors. There is not much debate that it was organized to serve the refining needs of Consolidated Virginia and California Mining Companies, and when these mines reached the end of the road (as had Comstock mining in general) the milling business collapsed. By the middle of the 1880s, when Comstock production had fallen to a fraction of its 1870 levels, many of Pacific properties had been sold or abandoned. In the years between the creation of Pacific (1874) and the demise of Consolidated Virginia and California Mining (1881) milling operations enjoyed substantial profits even as milling rates dropped. It helped, of course, that Pacific was the exclusive refiner for the largest and richest mines in the history of the Comstock. In addition, though, these were Mackay and Fair properties that like the mines that they served were well managed. Mackey and Fair, even before they had joined forces with Flood and O'Brien, had acquired several mills in the late 1860s to process ores from their Kentuck and Hale & Norcross mines. They were not novices in the milling business when they organized Pacific. The dozen or so mills that can be verified as being under the Pacific umbrella included the mills Mackay and Fair bought in the 1860s plus mills purchased or built in the 1870s. Eighteen mills processed ores from Consolidated Virginia and California, and the ownership by Pacific of at least 12 of these mills can be firmly documented. They were Bacon, Brunswick, California, Consolidated, Empire State, Hoosier State, Mariposa, Morgan, Occidental, Omega, Sacramento and Trench. The ownership of six other mills - Devil's Gate, Kelsey, Mexican, Nevada, Rhode Island and Winfield - could not be so firmly documented. It could not be determined if Pacific owned all or part of these six mills, leased them or simply signed milling contracts with them on a per-need basis. Mill ownership can be difficult to trace because mills were sold, renamed and even dismantled and rebuilt. All of the mills can be identified on recent survey maps created by Nevada agencies responsible for the cleanup of toxic-waste sites. They stretched from Virginia City south (along what is now Highway 341) to the Carson River and then to Carson City and east through Six Mile Cañon toward Sutro.¹

The Bacon Mill was probably the first milling property that any of The Quartet acquired. In the 1866 state survey C. L. Lowe and James Fair were listed as the mill's owners. Lowe was also the principal owner of Hale & Norcross. More than likely ore from Hale & Norcross was processed at Bacon, since the mine apparently did not own any mills. Not only did Fair own part of Bacon, but he also worked for Lowe at Hale & Norcross for a few months in 1867. His departure occurred under somewhat cloudy

¹ See above footnote for sources on how much ore the mining companies shipped monthly to each mill. The mill survey has been published on-line at Bureau of Corrective Actions, Superfund Branch, Nevada Division of Environmental Protection - http://ndep.nv.gov/BCA/CarsonRiver/milm_opt.jpg. Handwriting in manuscripts can be challenging. According to this map Bacon and Trench mills were located on the same property. The map also shows a mill named French and another named Frenches. When I first came across lists of mills in manuscripts I could not be sure I was reading a capital F or a capital T, French or Trench. For a while I thought Trench was French, but then upon consulting this map I decided that the Pacific-owned mill was Trench next to Bacon.

circumstances, but he remained an owner of Bacon and perhaps became the sole proprietor. In 1868 when Mackay and Fair acquired Hale & Norcross Mackey may also have acquired part-ownership in Bacon. Although the details are scant, Bacon, it would appear, continued to be operated as a separate entity from the mine. In 1872 after the disposal of Hale & Norcross and before the founding of Consolidated Virginia Fair addressed a long letter to Flood and O'Brien concerning various financial matters. He noted that Bacon's improvements had cost \$8,490.25 in addition to the cost of the mill, which he did not specify. Bacon was in continuous operation until its dismantlement in 1883. Other mills cited in Fair's letter (without specific dates) were Trench and Mariposa. Trench, Bacon's neighbor, was apparently bought in 1870 at a cost of \$49,670.50. Improvements added another \$21,574.27 for a total investment of \$71,244.77. Trench did not appear on the 1866 survey, and its prior owner(s) cannot be identified. Mariposa's owner, on the other hand, was simply identified as McCurdy in the 1866 survey, and while it was purchased for only \$11,557.00, in 1870, it needed \$16,518.01 worth of repairs. A third mill, Marysville, was mentioned in the letter, but according to Fair it should not be listed as a property because no money had exchanged hands. The implication was that the transaction was never completed. In any event it never showed up the monthly milling accounts for Consolidated Virginia and California. What can be said was that Marysville was owned in 1866 by O'Neale, Rule & Glazier, was located in Gold Hill near other mining properties that Mackey and Fair acquired and was officially sited on Nevada's recently completed superfund survey.²

In the early 1870s Mackay and Fair along with Flood and O'Brien were actively purchasing more milling properties. Since they had not yet founded Pacific Mill and Mining, they may have acquired and operated the mills as separate entities (not yet incorporated) apart from their mining properties. Empire State Mill probably entered the fold in November 1870. Empire State was formerly a Sharon property, and while Sharon and the Mackay and Fair crowd were perennial adversaries, they were not averse to negotiating business deals and transactions that might advance their own financial goals. Occidental, whose previous owner is not known, was purchased next. In a letter to his partners Fair remarked that other parties (not specified) had an interest in Empire and Occidental and the transfers were not recorded in Virginia City. When Pacific Mill and Mining came into existence, the Quartet owned or controlled five or six mills. Once established, Pacific continued to be aggressively buying and building mills. That included the previously-discussed construction and reconstruction of Consolidated and California mills as well as the construction of Omega Mill. These three projects probably required outlays of approximately \$1.5 million. In 1875 Pacific Mill and Mining added Morgan and Brunswick (the latter also purchased from Sharon) at a cost of \$100,000 and \$250,000 respectively. A third purchase (without price or date) was Sacramento.³

² For data on mills from the mid-1860s see "Annual Report of the Surveyor-General of the State of Nevada for the Year 1866" in *State Journal and Appendix*, 3rd Legislative Session (1867), insert after p. 21. Letter from James Fair to James Flood and William O'Brien, 19 December 1872 in Mackay & Fair Company, Letters, July 1871-July 1877, #5, Special Collections, Library, University of Nevada at Reno. Marysville appears on the aforementioned survey.

³ Letter from James Fair to James Flood and William O'Brien, 19 December 1872 in Mackay & Fair Company, Letters, July 1871-July 1877, #5, Special Collections, Library, University of Nevada at Reno. Hoosier State Mill may also have been purchased in 1873 as a part of Hoosier Mine. Built in 1862 by

A few detailed financial records (i.e., daily or monthly accounts) of Pacific's operations have been found scattered among several archives. Pacific was one of several Mackey & Fair businesses held privately. The principals were The Quartet – Mackey, Fair, Flood and O'Brien – and perhaps several other minor investors. When Fair gave testimony at a 1878 hearing, he was asked who owned Pacific Mill and Mining, Pacific Wood, Lumber and Flume and Virginia and Gold Hill Water, and to each question he answered that Mackey, Fair, Flood and O'Brien were the principal owners, although in the case of the water company he added Hobart, Shae and Wells.⁴ For all intents and purposes, however, Mackey and Fair were the "principals of the principals." Transactions involving these companies were recorded in something known as the Mackay & Fair Account. These ventures were financed with money mainly subscribed by Mackay and Fair. When Pacific was organized its original assets included properties in which Mackay and Fair held substantial interests. Reorganization of Pacific Mill and Mining began in 1880 when a Supplemental List of company officers was filed in San Francisco. Mackay was listed as President, E. C. Platt as Vice-President and W. H. Lowell as Secretary, and Mackay and Platt were listed as directors along with three others. Fair's name was absent because he was preparing for his retirement from The Firm, to be fully completed in 1881. Also missing were others among the original organizers: Flood, O'Brien (died in 1878), William Barron and Solomon Heydenfelt.⁵ I have found no records that spell out precisely the financial or managerial roles, if any, of the non-principals in the original group. It was possible that Flood and O'Brien were included because they managed the mercury accounts (purchases and transfers) for The Firm, and mercury was crucial to refining. William Barron owned a large mercury mine in Alamen, California, from whom The Firm bought mercury. Heydenfelt was a transplanted southern who distinguished himself as a jurist and attorney in San Francisco. Both were members of the original Board of Directors for Consolidated Virginia. That said, it's not clear how any of the proceeds from Pacific benefitted anyone but the principals.

In connection with the Dewey-Burke suit J. H. Gager, who had served The Firm as an accountant, conducted a review of the milling company accounts. As Pacific was winding down business in 1883, he provided an addendum to an 1881 statement (less than an official audit) of what was entitled "Operations of Pacific Mill & Min. Co." The statement plus the addendum was mainly concerned with the period from 1874 to 1881 but also included some activities between 1881 and 1883. The account in question was something referred to in the document as The Account of Mackay & Fair. This was not

Clarke and Hearst, custom millers, it did not process any Consolidated Virginia ores until 1875. See Account of Supplies, Hoosier Mine, January 1873 in Mackay, Fair, Flood & O'Brien Archives, NC356/1/20, Nevada Historical Society.

⁴ Quote from testimony in Oscar Lewis, *The Silver Kings: The Lives and Times of Mackay, Fair, Flood and O'Brien, Lords of the Comstock Lode* (Paperback Edition, Reno NV: University of Nevada Press, 1989), 153. Unfortunately, no footnotes were provided.

⁵ Supplemental List of the Officers of the Pacific Mill and Mining Company, January 1880, NC80, Special Collections, Library, University of Nevada at Reno. The directors included George Congdon, Cornelius O'Conner and William Legle. Congdon and O'Conner were directors of Consolidated Virginia and California Mining Companies and would be among the founders of a newly established company through the consolidation of the two mining companies in 1884. See authenticated copy (1886) of Certificate of Consolidation, 1884, of Consolidated Virginia and California Mining Companies, Mackay, Fair, Flood and O'Brien Archives, NC356/1/42, Nevada Historical Society.

account in which the company's business was recorded, but rather was the account in which the principals recorded (or had recorded) their income from the milling operations. The details are limited and the figures cannot be reconciled in all instance. In Figure 1 (below) I have presented the entries as they appear in the Gager statement.⁶

Let me start with the most obvious question? Did Pacific make money, and if so what much accrued to Mackay and Fair? Of course is the answer to the first part, and millions is the answer to the second. But the exact amount is hard to discern from the aforementioned document. It would appear that gross profits – surpluses over and above operational costs – ranged between \$6 million and \$8 million as of 1883. A range emerged because the figures changed between 1881 and 1883 (because according to Gager who said he had reexamined earlier documents). In 1881 the surplus in the Mackay & Fair account was declared to be \$7.7 million, but by 1883 it had fallen to \$6.7 million (which were called dividends whereas in the 1881 version the document stated money was “turned over” to Mackay & Fair). Why the difficulty in arriving at a final figure? It boiled down to how capital was raised to acquire and renovate the company's facilities. By 1881 there were profits, but when Pacific started up there were no profits. Mackay and Fair advanced the capital for certain undertakings and then were reimbursed from the accruing profit. The difficulty in reconciling the two versions has to do with those reimbursements. .

Most of the financial information in the Gager document concerned what might be roughly called capital expenditures and surplus distribution. Operational expenses were not included, although later in this chapter I will make some estimate of the latter. The itemized list in the 1881 version was fairly straight-forward, From August 1774 to July 1881 the document stated that the company had “net profits” of \$8.8 million, or slightly more than one million dollars per year on average. Profits were derived from “working ores, slimes and tailings, slimes sold,” they were also derived from “dividends from Woodworth Mill (½) & dividends from Eagle Salt Works, etc.” The mill is something of mystery because it did not show up in any of the records of the ores milled. My first thought was that Woodworth was a timber mill, and that may be the correct assumption except a refinery by that name shows up in other mill records.⁷ The outlays

⁶ “Operations of the Pacific Mill & Mining Co. – at Virginia – from August 1st 1874 to July 1st 1881”, Pacific Mill and Mining Company Financial Records, 1874-1881, Mackay, Fair, Flood, O'Brien Archive, NC356/1/2 &13, Nevada Historical Society. This is a single document that summarized financial data to 1881 and then added another page of data up to 1883. Grant Smith (*The Comstock Lode*, 254) also analyzed Pacific Mill and Mining audits that he said that he found in the library of the Mackay School of Mines, University of Nevada Reno, where John Mackay's archives were first housed. Those archives were later transferred to Special Collection in the University Library. Smith did not provide a specific reference, and therefore the document that he used could not be located. It could still be in Special Collections but was not turned up during my research. The document that I am using has different figures, has fewer details and is housed in the Nevada Historical Society. “Net Profits” may be an inaccurate description as defined by contemporary accounting standards. The Mackay & Fair Account of which this was a part contained financial data from all the Mackay & Fair privately-held businesses. This account was separate from the accounts for the mining operations. More about this account later in this chapter.

⁷ In 1870 The Quartet purchased a half interest (\$12,000) in Woodworth Mine, its location unknown because it did not appear on any the previously discussed surveys. Nothing else is known about the mine. In the early 1870s a Woodworth Mill appeared on the Mineralogist's survey of mills in Lyon County, and it is possible that the mine and mill occupied the same property. The other possibility is that the mill was a

consisted of purchases such as property, construction and reconstruction of mills and inventory (i. e., value of unused supplies when the audit was made). That amounted to almost \$1 million, and when that figure plus the value of slime bullion and cash on hand were added up the deduction from the \$8.8 left \$7.7 in Mackay & Fair's account. Among the outlays were \$850,000 dollars for four milling facilities: Mariposa, Consolidated Battery & Pan, California Battery & Pan and Omega Tailings. (Consolidated was lost in the 1875 fire.) Eagle Salt (an ingredient needed to refine the ore) cost between \$33,000 and \$34,000 to acquire. The surplus of \$7.7 million, resting in the Mackay & Fair account consisted of the balance after operating costs were deducted from operating revenues (Pacific charged The Firm's mines at various per-ton rates) along with certain "capital" charges. (It was this surplus that provoked Dewey to sue.)

The 1883 addendum made for more confusion than clarity. The first difference with the 1881 statement came at outset: "Total net profits" was replaced by "Balance against Mackay & Fair" with the date of 1 September 1883 and the amount of \$8,101,122.90. This figure did not appear anywhere in the 1881 version. In two years Pacific's surplus (money left over after operational costs had been deducted from receipts) had dropped by three-quarters of a million dollars. No explanation was given. Were the prior figures incorrect or had business declined so much that the principals had to divert money from their own account to keep the company afloat? Total tonnage in 1883 had fallen to its lowest levels since the initial discoveries with yields between \$15 and \$20 per ton. Pacific had sold or abandoned most of its mills, and what of value remained of this milling colossus was an inventory (in excess of \$100,000) of a few properties plus supplies. In theory, at least, Mackay & Fair account should be worth less, although how that happened cannot be detailed. Next came an unexplained charge of \$425,478.43. The starting point for this second version of Gager's audit was \$7,675,644.47. This figure appeared in the 1881 version as the balance after deducting various expenditures for acquisition and construction for which Mackay and Fair were being reimbursed. In the 1883 addendum (and allegedly the reason it was prepared) the aforementioned construction costs (reimbursements not profits) were increased by an additional \$11,285.40: for construction (\$8,069.94) of the "Old Consolidated" mill, that was destroyed in the 1875 fire, and for construction (\$3,215.50) of the new California mill. The confusion arises because in addition to this minor revision Gager added other

separate property and closer to Virginia City. In the same letter concerning the purchase of the Woodworth Mine there was a reference to the fact that The Quartet also owned half an interest in a "Woodworth Sluice Property". The mill cost them almost \$39,000 and another \$85,000 to \$90,000 to improve the sluices and others facilities. If Woodworth was an ore mill two possible explanations can be suggested: it may have been purchased in connection with their ownership of the Virginia and Gold Hill Water Company, incorporated in 1871, or it may have been purchased in connection with the construction of the Omega Mill, which as a tailings mill had need for the sluices. In terms of analyzing Pacific finances, however, the Woodworth Mill is not especially crucial because no figures on the size of the dividend are given. "Operations of the Pacific Mill & Mining Co. – at Virginia – from August 1st 1874 to July 1st 1881", Pacific Mill and Mining Company Financial Records, 1874-1881, Mackay, Fair, Flood, O'Brien Archive, NC356/1/13, Nevada Historical Society; Letter from James Fair to James Flood and William O'Brien, 19 December 1872 in Mackay & Fair Company, Letters, July 1871-July 1877, #5, Special Collections, Library, University of Nevada at Reno; and "Biennial Report of the State Mineralogist of the State of Nevada for The Years 1871 and 1872," *Appendix to Journal of the Senate*, 6th Legislative Session, 1973, 100. Eliot Lord wrote a long section Virginia and Gold Hill Water Company, set up by Mackay, Fair *et al.* in 1871 without any mention of Woodworth in *Comstock Miners and Mining*, 322-333.

figures without fully explaining and in the process reports some figures differently from how they appeared in the 1881 version. Thus, the new figure for the “Balance against Mackay & Fair, July 1st, 1881” was \$7,664,359.03 after deducting the unexplained charge and the minor revision. He then listed a series of payments for purchases of mills and supplies in September, October and November of 1875 (at the time of the fire) and in December 1876 for a total of \$585,665.21 that did not appear in the 1881 statement. They involved costs for purchases of Morgan and New Brunswick mills and of machinery for Consolidated (lost in the fire) and California mills. The entry read: “Payments by J. H. Gager – per his statement up to July 1st 1881”. Having acknowledged these expenses Gager then declared that “Dividends from April 30, 1877 to May 31, 1881” [first time that either of these dates had appeared] was \$6,647,067.89. However, when this figure was added to \$585,665.21 plus \$218.49 cash on hand in 1883 the total is \$7,232,951.62 or \$431,407.41 less than the aforementioned \$7,664,359.03. And the difference was left unexplained. Finally, again without explanation, he listed “sundry mixed charges” of \$162,324.12. While the transfer of more than \$11,000 from profits to costs is understandable, the remainder of the 1883 addendum is not. (See Figure 1 below)⁸ In addition to the unresolved accounting problems the document did not explain how the surpluses or dividends or profits of \$6 to \$8 million were disposed of. The Mackay & Fair Account was used to deposit monies from their privately-held businesses listed in Fair’s testimony. If the other principals had accounts comparable to the Mackey & Fair Account, they did not surface in the archives I consulted. The money deposited in the Mackay & Fair Account may have been just Mackay and Fair’s share, or, this appears more likely, it may have been undistributed profits from the Quartet’s various businesses.

After numerous failed attempts to try to make sense of these accounts, incomplete as they are, I would propose that the gross profits (or surpluses) of Pacific Mill and Mining until its demise fell in a range of \$6 to \$8 million. Based on what I have found concerning receipts and costs (to be discussed) in the company’s operations, these profit figures are entirely plausible. It is important to underscore that most of these figures derive from operations prior to 1881, and between 1881 and 1883 Pacific was operating at a deficit. Gager’s audit was to satisfy inquiries about Pacific’s profitability and not to explain how the profits were distributed. The Mackay & Fair Account was not terminated after Fair’s departure because other transactions took place with respect to that account in the early 1880s. None of the businesses in which Mackay and Fair had a stake made money after 1880, and Pacific under the new Board of Directors, according to surviving accounts from 1883 through 1885, was occupied with disposing of remaining inventory and not to resurrecting the company.⁹ The Mackay & Fair Account survived into the 1880s, and these quasi-post-mortem audits, initiated mainly in response to lawsuits or other inquiries, open a small window into the principals’ private enterprises, operating independently of and yet making money from their publicly-owned companies.

⁸ “Operations of the Pacific Mill & Mining Co. – at Virginia – from August 1st 1874 to July 1st 1881”, Pacific Mill and Mining Company Financial Records, 1874-1881, Mackay, Fair, Flood, O’Brien Archive, NC356/1/2 &13, Nevada Historical Society.

⁹ Ledger #4, 1883-1885, Pacific Mill and Mining Company Records, 1876-1884, NC80, Special Collections, Library, University of Nevada at Reno.

FIGURE 1
FINANCIAL STATEMENT, PACIFIC MILL AND MINING, BY J. H. GAGER,
1881 WITH ADDENDUM 1883
Operations of the Pacific Mill & Mining Co. – at Virginia City
August 1st 1874 to July 1st 1881.

Total Net Profits:

derived from working ore, slimes and tailings, slimes sold;
 dividends from Woodworth Mill (1/2) &
 dividends from Eagle Salt works, etc;
 after taking out the amount expended in constructing
 the old Consolidated Mill & the old California Battery
 Mill (destroyed by fire) from and after Aug 1st 1874. \$8,821,711.66

These Profits were disposed of as follows:

[marked "Paid for" before each entry below]

| | | |
|---|----------------|----------------|
| Land Mill Slimes (1,487 tons carried/worked Omega Mill) | \$5,713.02 | |
| Real Estate in Virginia City & Silver City | \$16,908.70 | |
| Personal Property (2 sleighs @ \$290 & 1 horse \$150) | \$440.00 | |
| Mill Supplies on hand July 1 st 1881 | \$89,512.43 | |
| Removal & Reconstruction Mariposa Mill (net) | \$11,448.11 | |
| <u>Construction</u> | | |
| Consolidated Mill (Battery & Pan) | \$307,700.74 | |
| California Mill (Battery & Pan) | \$274,071.12 | |
| Omega Mill (with all appurtenances) | \$219,089.93 | |
| Omega Sluice (with reservoirs) | \$35,179.98 | |
| Eagle Salt Works (the whole property) | \$33,650.00 | |
| [No description but clearly total of above figures] | \$993,714.03 | |
| Slime Bullion on hand, July 1 st 1881, assay value | \$85,756.92 | |
| Cash remaining on hand (July 1 st 1881) | \$66,596.24 | |
| Turned over to the acct of Mackay & Fair | \$7,675,644.47 | \$8,821,711.66 |

[A long note follows in which Gager explained why an additional \$11,285.44 in costs should be deducted from the profits shown in Mackey & Fair's Account. What followed the note are the figures below.]

| | | |
|---|----------------|--|
| Charges against "Mackey & Fair from July 1 st 1881 to Sept 1 st 1883—net | \$425,478.43 | |
| [Total shown without description] | \$7,675,644.47 | |
| Credited for additional construction expense from Aug 1 st 1874 to Dec 31 st 1876 | \$11,285.41 | |
| Balance against "Mackey & Fair" July 1 st 1881--net | \$7,664,359.03 | |

Payments by J. H. Gager per his statement up to July 1st 1881

[statement referred to above not explained]

| | | |
|--|----------------|-----------------------|
| Cost of Morgan Mill (Sept 1 st 1875) | \$100,000.00 | |
| Machinery for Consolidated Mill (Sep 2 nd 1875) | \$93,234.76 | |
| Cost of Brunswick Mill (Oct 1 st 1875) | \$225,000.00 | |
| Cost of California Mill (Nov 12 th 1875) | \$150,000.00 | |
| Supplies at Brunswick Mill (Dec 23 rd 1876) | \$17,430.48 | |
| [No description but clearly total of above figures] | \$585,665.24 | |
| Dividends from April 30, 1877 to May 31, 1881 | \$6,647,067.89 | |
| Cash on Hand July 1 st 1881 | \$218.49 | <u>\$7,232,951.62</u> |
| [Difference not described] | | \$431,407.41 |

Sundry mixed charges by J. H. Gager from Feb 1st 1877 to Oct 18th 1880 - \$162,324.13
[Sundry mixed charges not explained]

J. H. Gager closed his acct-----Dec 20, 1876.
J. H. Gager opened his acct again Dec 26th 1876
[Not explained]

The acct of Mackay & Fair was credited for construction expenses-
Dec 31st 1876 \$ 993,580.30
Sept 30th 1881 \$11,285.44
Incurred between Aug 1st 1874 and Dec 31st 1876 \$1,004,865.74

Sources: See footnote 16. I have replicated the Gager statement as fully I could. I have corrected arithmetic errors and I have entered inside brackets comments about what is missing.

During The Firm's bonanza years about 1.4 tons of crushed ore from Consolidated Virginia and California passed through Pacific's amalgamation mills (most of it through mills that it owned) at an average rate of about \$11 per ton for a total of \$15 million. Tailings, slimes and ancillary business probably generated several hundred thousand dollars more in revenues. Based on Gager's figures of what accrued to Mackey and Fair it can be estimated that 40 to 50 percent of Pacific's receipts ended up as gross profits or perhaps more appropriately operating surpluses. Was that possible even as milling rates dropped from \$13 to \$9 per ton? A few surviving mill accounts allow that matter to be considered.

The reimbursements to Mackay and Fair for capital outlays shed some light on how they financed the expansion of Pacific's milling capacity. As discussed earlier Mackay, Fair *et al.* owned several mills that were incorporated into the new firm, Pacific Mill and Mining Company, in 1874. The audits confirmed the acquisition of (and the reimbursement for) Morgan Mill on 9 September 1875 for \$100,000 and Brunswick on 1 October 1875 for \$225,000, and the "removal and reconstruction" of

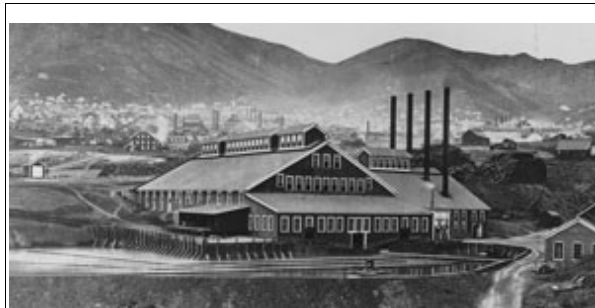


Illustration 1: California Pan Mill

Mariposa Mill, one of the original properties, for just under \$11,500. Mackay and Fair launched and underwrote the construction of a new mill, Consolidated (Virginia) in 1874 that won rave reviews from the State Mineralogist in his 1875 report to the state legislature. He described the battery building as 110 feet long by 10 feet wide, the pan building as 120 feet long and 92 feet wide, the engine room as 58 feet long by 92 feet wide, the agitator room as 20 feet long by 92 feet wide and the retort house as 24 feet long by 60 feet wide for a total of 26,000 square feet at a cost of several hundred thousand dollars.¹⁰ Consolidated milled about 60,000 tons of ore between January and October 1875 when the Virginia City fire destroyed it and adjacent facilities. The 1881 audit simply declared without elaboration that the money spent on the old Consolidated

¹⁰ "Biennial Report of the State Mineralogist...1873 and 1874" in *Appendix to Journals of Senate and Assembly*, 7th Legislative Session, 1875, 133.

Mill and old California Battery (a stamping mill) had been removed (the meaning of which was unclear). When Mackay and Fair acquired these works cannot yet be documented. One puzzling item was the purchase on 25 September 1875 of machinery (nearly \$93,000) for the Consolidated Mill, presumably the old mill, although it is not clear if this was a payment for machinery to be delivered (and therefore may have escaped the fire) or for machinery already delivered (and a casualty of the fire). A second new mill, California, close to completion at the time of the fire, escaped damage and was up and running as of 1 January 1876. Two California Mill entries appear in Gager's statements: an undated reimbursement of nearly \$275,000 and a dated reimbursement (12 November 1875) of \$150,000 for a total of \$425,000. In the aftermath of the fire Consolidated Mill was rebuilt at a cost (minimally) of \$308,000, and it began processing ore in the fall of 1876. Reimbursements for the new California Mill and the new (post-fire) Consolidated Mill totaled more than \$732,000, and if this total were added to the estimated expenditure for the construction of Consolidated Mill and the California Battery lost in the fire these four facilities cost Mackay and Fair more than a million dollars. In accord with the audits, however, only reimbursements for the new California Mill and the reconstructed Consolidated Mill were recorded. The remaining mill project to consider was the slimes or tailings mill Omega that Mackay and Fair built (and were reimbursed for) at a cost of more than \$255,000. Although the reimbursements to Mackay and Fair included outlays for mill supplies, property transfers (including Eagle Salt Works) and miscellaneous items, 90 to 95 percent of the reimbursements (which totaled between \$1.5 and \$1.6 million) were for the acquisition and construction of milling facilities. Even if Mackay and Fair alone or in partnership with several others expended, say, \$2 million to build Pacific Mill and Mining, the return on capital of \$5 to \$6 million certainly made it a highly profitable venture.¹¹

What made the return on investment several times greater than the outlay for plant and equipment was the revenue flow derived from milling operations. In modern parlance

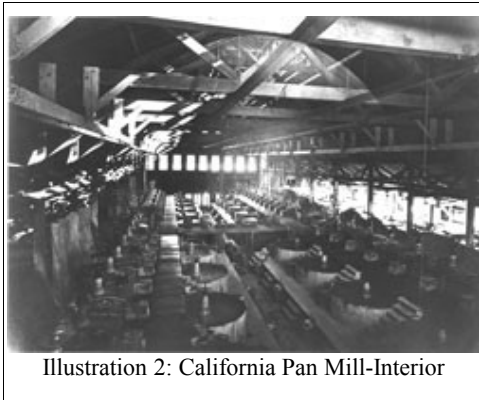


Illustration 2: California Pan Mill-Interior

Pacific was a "cash cow". Because of the richness of the ores and the efficiency of the operations Pacific generated large operating surpluses. This can be seen in a statement of receipts and expenses from 10 of the mills under the umbrella of Pacific Mill and Mining for June 1877.¹² Not all mills were equal in terms of comparative costs and potential profits. It will be recalled that 1877 was the best year for Consolidated Virginia and California combined with nearly \$32,000,000 worth of ore being extracted and processed. For Consolidated Virginia it was the second best year and for

California the best year. Ores from Consolidated Virginia in June yielded \$72 per ton

¹¹ The figures included in the text and the tables are from Pacific Mill and Mining Company Financial Records, 1874-1881, Mackay, Fair, Flood, O'Brien Archive, NC356/1/2 &13, Nevada Historical Society.

¹² The June 1877 account was not necessarily representative of the operational link between Consolidated Virginia and California and Pacific, but given the paucity of data on Pacific's finances, it provided as full an accounting as any of the surviving documents.

(crushed ore), the lowest yield for the year, while ores from California yielded \$82 per ton, close to the average for the year. The ores were split among the mills in the following manner: ores from Consolidated Virginia went to California (68 percent), Trench (16 percent), Bacon (12 percent) and Mariposa (4 percent); ores from California to Consolidated (41 percent), Brunswick (27 percent), Morgan (15 percent) and Occidental and Sacramento (8 percent each). The two tailings mills, Mariposa and Omega, processed about 12,000 tons for the quarter (April-June) and we can assume that perhaps a third of that was processed in June.¹³ How ore was allotted to the mills was not explained, and mills were regularly switched back and forth between Consolidated Virginia and California without explanation. The efficiency and availability of a mill may have played a role.

Mill accounts for June 1877 show the cost to reduce a ton of ore (for the moment I ignore the tailings facilities) and the profit to be realized from reduction. The mills did not own the ores. The reduction rate in June at all the mills was \$10 per ton. At the beginning of 1877 some of Pacific's mills charged a rate of \$12 per ton, but by the middle of the year all the mills had dropped their rates to \$10 per ton. A mill's expenses included supplies, labor, freight and repairs, and the difference between the total costs and the per-ton rate charged the mining companies was the gross profit. In addition, what the mill could earn from the bullion in the "slimes" would be added to the operating surplus. If the costs were \$7 per ton and the slimes yielded \$2 per ton (over and above their costs), then the profits would be \$5 per ton ($\$10 + \$2 - \$7 = \5). Without the slimes Pacific Mill and Mining's profits averaged \$2.19 or 22 percent on each ton of ore from Consolidated Virginia and \$2.64 or 26 percent on each ton from California. The slimes from Consolidated Virginia ores added \$2.56 per ton and from California \$2.48 per ton. In nominal terms (dollars and cents) the profit from the reduction of the slimes as measured by the value of the bullion could often equal that from the amalgamation of the ores. For this single month California Mill had the best profit record for those mills reducing ores from Consolidated Virginia, and Brunswick Mill had the best record for those mills reducing California ores. Mariposa proved to be the least profitable with Consolidated Virginia ores and Occidental with California ores. Labor costs per ton differed across the spectrum of mills. Average labor costs for the four mills processing Consolidated Virginia ores was \$1.60 per ton whereas California Mill spent only \$1.17 per ton. With respect to the mills processing California ores Brunswick had similarly low labor costs at \$1.16 per ton against an average for the five mills of \$1.59. The two-year-old California Mill may have registered lower unit labor costs because it was among the most efficient mills, and perhaps rebuilding Brunswick had raised its efficiency and lowered its per-unit labor outlays. Other factors such as grades of ores assigned to the mills may have played a role. In both Mariposa and Occidental labor was between \$2.00 and \$2.10 per ton. The cost of supplies per ton did not vary significantly from mill to mill. Apparently the mills paid the cost to deliver the ore from the mine, and that cost ranged from near zero in the case of Consolidated and California mills, which were next door to the mines, to \$1.75 per ton for mills along the Carson River near Carson City. Repairs were reported at three mills – Sacramento, Consolidated and California – but none

¹³ Bullion Records, June 1877, Consolidated Virginia and California Mining Companies, NC99/1/3/5 & 7, Special Collections, Library, University of Nevada at Reno.

at the other mills. Other expenses that one could think of – administrative and legal, for example – were not noted. The above calculations concern mainly operating costs.¹⁴

Among the items needed to do the refining including wood, castings (shoes and dies) and bluestone (copper sulfate), quicksilver was the most crucial ingredient. Quicksilver or mercury was first applied to the reduction of low-grade silver ores in sixteenth-century Mexico and Peru through a process invented by Bartolomé Medina. In colonial mines large stone were used to pulverize the ore before it was incorporated with mercury, salt and several other ingredients in open, round patios that had large wooden spatulas attached by a rod to a donkey that stirred the mixture by walking around the patio. Even individuals were known to walk around in the mixture with tragic consequences, of course. By the time of the Comstock bonanza the patio process had undergone important modifications. The plants still consisted of stamps along with batteries for grinding the ores and smashing the rocks, but a mechanized system of pans and agitators in a long building had replaced the patios. Mills were identified in terms of the numbers of stamps and pans. The process of amalgamating the ore with the mercury, which could take up to three months in the patios, had been reduced to weeks and even days. In general the higher the quality of the ore the more mercury was required to separate the metals. Mercury was bought from California and Arizona miners and as far away as Hong Kong. The quality of the mercury was important, and the higher the quality the greater the efficiency of the mercury in amalgamating with the ore. Only a portion of the mercury in the pan was lost with each incorporation, and what appeared as mercury expenses in mill accounts was mainly to recharge the amalgamation pans after a batch of ore had been successfully amalgamated. These recharges were unpredictable and could vary from pan to pan and mill to mill. Recovery of the mercury, which some Spanish colonial miners also practiced, consisted of heating the amalgam of ore and mercury to evaporate the mercury, which could then be condensed into a “retort” that was usable again. Devices for capturing and restoring mercury were far more effective in the late nineteenth century than 100 or 200 years before.¹⁵

Amalgamation had been invented primarily to make refining various ore grades profitable. In colonial Spanish America high-grade ores were often smelted rather than amalgamated because mercury sold through the royal monopoly was expensive. Along the Comstock and in the West generally, however, mercury was used even with high-grade ores. Mill superintendents had learned from experience how to adjust the quantity of mercury with respect to the quality of the ore. If manuals existed with the individual milling operations, they have not shown up in the archives that I have consulted. Frequent assays could provide some guidance on how much mercury should be incorporated with the ores. Those who have written about the Comstock have accepted as rough estimates the following: if the pans accommodated 2,000 to 3,000 pounds of ore, then they needed

¹⁴ “Comparative Statement of the Operations of Mills, June, 1877,” Pacific Mill and Mining Co, records 1865-1884, Bancroft Library, P-G 207, Oversize Box 1, Folder 11. The calculations in the text are mine based upon data from this statement.

¹⁵ Much has been written about Medina and the patio process. For example, see Peter Bakewell, *Silver Mining and Society in Colonial Mexico, Zacatecas 1546-1700*, (Cambridge: Cambridge University Press, 1971), Chapter 7. All the Comstock’s major historians – DeQuille, Lord and Smith - discussed aspects of the refining operations.

200 to 300 pounds of mercury with an expected loss of one pound per pan per operation. Such a loss amounted to 0.3 to 0.5 percent of the total. In addition to the experience in accommodating for grades of ores, some plants and crews were highly efficient at incorporating and reserving quicksilver and therefore minimized the loss and lowered the cost. A loss of one pound per ton was a yardstick based on all Comstock operations.¹⁶ The fact that mercury could be used more than once was what made amalgamation an economically viable procedure. If each pan required an average mercury charge of 10 percent of the ore or 200 to 300 pounds, and that charge had to be replaced in each pan after each operation, then amalgamation would have proved to be prohibitively expensive. For example, in 1877 the Pacific mills reduced over 366,000 tons of ore. To replace 200 to 300 pounds of mercury in each pan after each operation would have cost, at 50 cent per pound, from \$37 to \$55 million dollars. A total replacement would have translated into mercury costs reaching \$100 per ton. At \$100 per ton instead of \$10 to \$15 per ton mercury would have played no role in the milling business. Recharging the pans depended on ore grades, which could require recharges several times the average..

FIGURE 2
SUMMARIES OF MONTHLY QUICKSILVER TRANSACTIONS, 1877,
PACIFIC MILL AND MINING COMPANY

| [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] |
|---------------|----------------|------------------------|--------------|---------------------|---------------|--------------|-------------|---------------------|---------------|
| Jan | 21,535 | \$3,222,725.00 | 1367 | \$50,647.87 | \$0.48 | 980 | 3.49 | \$41,233.50 | \$0.55 |
| Feb | 20,333 | \$3,081,112.00 | 900 | \$32,647.85 | \$0.47 | 890 | 3.35 | \$34,042.50 | \$0.50 |
| Mar | 22,057 | \$3,408,014.00 | 675 | \$22,978.68 | \$0.44 | 1395 | 4.84 | \$53,358.75 | \$0.50 |
| Apr | 27,161 | \$2,709,443.00 | 1400 | \$46,536.98 | \$0.43 | 765 | 2.16 | \$29,261.25 | \$0.50 |
| May | 29,642 | \$2,106,886.00 | 895 | \$29,889.98 | \$0.44 | 1643 | 4.25 | \$62,844.75 | \$0.50 |
| Jun | 32,943 | \$1,923,481.00 | 675 | \$22,978.68 | \$0.44 | 1355 | 3.15 | \$51,828.75 | \$0.50 |
| Jul | 32,626 | \$1,628,698.00 | 450 | \$15,319.12 | \$0.44 | 1691 | 3.97 | \$64,680.75 | \$0.50 |
| Aug | 32,184 | \$1,627,880.00 | 2227 | \$83,582.81 | \$0.49 | 960 | 2.28 | \$36,720.00 | \$0.50 |
| Sep | 34,057 | \$1,794,641.00 | 2500 | \$99,730.19 | \$0.52 | 1450 | 3.26 | \$61,008.75 | \$0.55 |
| Oct | 38,368 | \$1,888,523.00 | 575 | \$19,708.31 | \$0.45 | 1190 | 2.38 | \$50,069.75 | \$0.55 |
| Nov | 39,566 | \$1,731,309.00 | 1375 | \$49,183.80 | \$0.47 | 1529 | 2.96 | \$58,280.37 | \$0.50 |
| Dec | 36,412 | \$1,715,623.00 | 1000 | \$36,383.50 | \$0.48 | 1255 | 2.64 | \$48,003.75 | \$0.50 |
| Total | 366,884 | \$26,838,335.00 | 14039 | \$509,587.77 | \$0.47 | 15103 | 3.15 | \$591,332.87 | \$0.51 |
| Mean | 30,574 | \$2,236,527.92 | 1,170 | \$42,465.65 | \$0.46 | 1,259 | 3.23 | \$49,277.74 | \$0.51 |
| Median | 32,405 | \$1,906,002.00 | 950 | \$34,515.68 | \$0.46 | 1,305 | 3.21 | \$50,949.25 | \$0.50 |

Legend: [1] Month; [2] Tons Crushed; [3] Bullion Returned; [4] Flasks Bought/76.6 Pounds; [5] Cost of Flasks of Mercury; [6] Price per Pound; [7] Flasks Sold to Pacific Mill and Mining; [8] Pounds Sold per Crushed Ton; [9] Cost to Pacific Mill & Mining; [10] Price per Pound.

Sources: See footnotes 16, 17.

The total quantity of mercury shipped to and consumed by Comstock millers or in particular by Pacific Mill and Mining cannot be stated with any degree of accuracy. This could only be determined if we had a full accounting of mercury purchases by all millers.

¹⁶ The reference to the Pacific mills based on data from "Comparative Statement of the Operations of Mills, June, 1877," Pacific Mill and Mining Co, Records 1865-1884, Bancroft Library, P-G 207, Oversize Box 1, Folder 11. Also see Smith, *The Comstock Lode*, 257.

A 1992 report on “Mercury Contamination of the Carson River” estimated that 15 million pounds (7,500 tons) of mercury entered the Carson River basin, mainly from mills located along or in the vicinity of the river.¹⁷ Comstock millers processed more than seven million tons of ore up to 1885. Based on the performance of the Pacific mills in 1877, each ton of crushed ore required a charge (to cover the loss) of about three pounds of mercury. If that figure were applied to seven million tons, then minimally 21,000,000 pounds of mercury was consumed up to 1885. The total figure must surely be higher than that. The presence of so much mercury in the Carson River would indirectly support an estimate of the consumption of 21,000,000 plus pounds, not only because many large mills were located on the river itself but nearly all the mills were located in the watershed that drained into the river. In addition, all the abandoned mills sites, of which there were scores, had mercury contamination so that the estimated volume of the residual mercury in the Carson River was incomplete with reference to all the mercury consumed. Using the 21-million figure we can also estimate the total cost, based on prices paid by Pacific. The cost of 21,000,000 pounds (275,000 flasks) at 50 cent per pound was \$10 to \$11 million or 2.5 percent of the total bullion value of gold and silver. A fairly straightforward calculation indicates that The Firm accounted for a fifth or \$2 million of the money spent on the mercury purchases plus the freight. For a single mill the quality of the ore would determine how onerous in percentage terms the cost of mercury was. Even though high-grade ores required more mercury, the yields themselves could be so high, as they were at bonanza mines, that increased mercury consumption had little impact on a company’s cost structure. If Pacific’s total mercury expenses were between \$2 and \$3 million, that amount equaled a fraction of a percent of the total value of the bullion declared. The legacy costs, however, in the form of contamination and rehabilitation of the environment will dwarf the price per ton paid for mercury to refine the ore.¹⁸

Pacific Mill and Mining purchased millions of pounds of mercury to maintain its amalgamation operations each year. It was by far the largest purchaser of mercury in the history of the Comstock. It did not purchase mercury directly, at least in a technical sense. Flood and O’Brien through their San Francisco offices signed the contracts for delivery of mercury in behalf of Mackay & Fair in Virginia City, which sold the mercury to Pacific Mill and Mining. (This was another section in the previously-discussed Mackay & Fair Account.) The account showed what Flood & O’Brien paid for the mercury and then what Mackay and Flood received for the mercury when it was sold to their own mills under Pacific Mill and Mining. One might assume that the volume of mercury purchased by The Firm gave it some leverage in negotiating prices, but, if that were the case, it cannot be verified from the transactions detailed in the accounts. It was entirely possible that using such leverage was never intended. During the middle years of the 1870s demand for mercury was higher than it had ever been, and that pushed up prices significantly by as much as a third to a half. Once the boom had ended, prices fell by a fifth or more. No serious mercury shortages were alluded to in The Firm’s

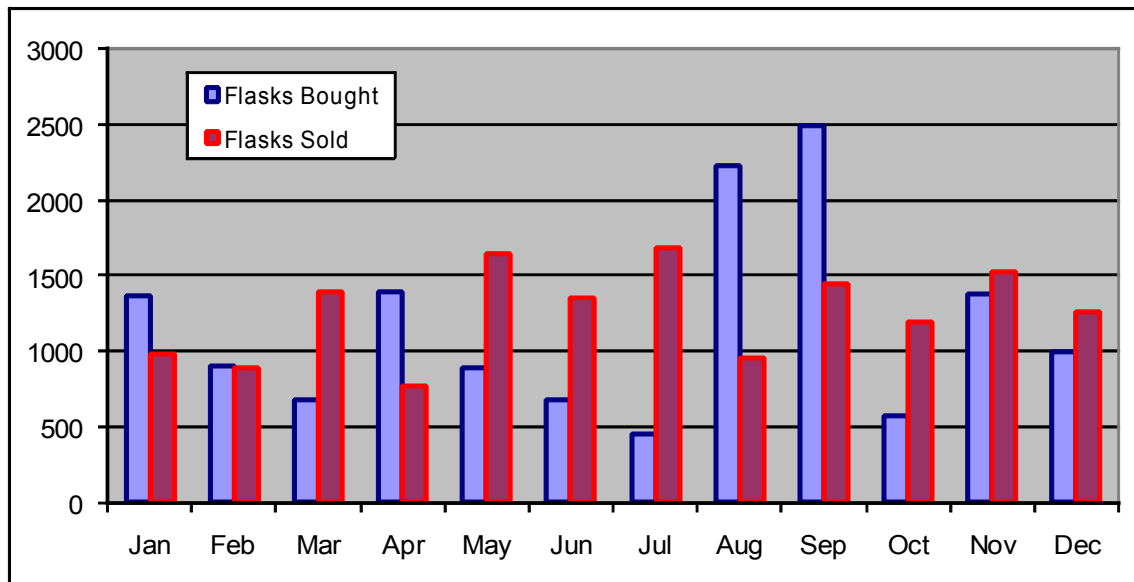
¹⁷ *Quarterly Newsletter of Nevada Bureau of Mines and Geology*, Winter, 1992. This figure was taken from a 1942 report that is not available on-line.

¹⁸ The number of flasks and the cost per flask from calculations made from the data in “Comparative Statement of the Operations of Mills, June, 1877,” Pacific Mill and Mining Co, Records 1865-1884, Bancroft Library, P-G 207, Box 2.

correspondence, although it occasionally contained references to dissatisfaction over quality, defective flasks and delays in shipments. Mercury from Hong Kong was more expensive by a few pennies per pound than western US mercury, and the cost of freight from Hong Kong added more to the final price than domestic freight. (Size of flask may have been different and therefore direct comparisons are not possible.) The Hong Kong purchases were undertaken to insure a substantial inventory at a time when California was at its peak and Consolidated Virginia was staging a comeback. In 1877 total purchases may have amounted to 5,000 flasks (383,000 pounds) but as many as 3,500 flasks and perhaps 4,000 flasks had not yet arrived in Virginia City by the end of the year. Because of the travail in completing the transaction, Hong Kong would not soon replace domestic suppliers. From the annual mercury statements maintaining an adequate supply was more of a concern than looking for the cheapest price.

At the start of 1877 during the final phase of the Big Bonanza the accounts of Mackay & Fair showed that 2,838 flask or 217,000 pounds were on hand in Virginia City. During the year Flood & O'Brien bought 14,039 flasks or 1.1 million pounds, which were shipped to Virginia City. Another 300,000 pounds, purchased in Hong Kong, never arrived except for a few thousand pounds. About 1.2 million pounds were distributed, and at the end of the year 136,000 pounds remained. At the rate ore was being delivered to Pacific mills, the quantity on hand was enough for a little more than a month. At the same time other mines were hoisting ore, and the mills processing their ores also needed access to a supply of mercury. The total demand was probably greater by several hundred thousand pounds than the totals drawn from the foregoing accounts.

FIGURE 3
FLASKS OF QUICKSILVER BOUGHT AND SOLD IN THE ACCOUNT OF
MACKAY AND FAIR, 1877



Sources: See footnotes 16.

There was a negative correlation (-.27) between the purchases of mercury in the account of Flood & O'Brien and the sales of mercury from that account to the account of Mackay & Fair. For the year flasks of mercury purchased averaged 1,170 per month while sales averaged 1,259. The local stockpile of quicksilver on the first of each month averaged 2,900 flasks in the first six months and 1,800 flasks in the next six months. For the year crushed ores from Consolidated Virginia and California rose from 21,535 tons in January to 36,412 tons in December, a rate of over 4 percent a month ($R^2=90$ percent). Purchases by Flood & O'Brien in the first half averaged 985 flask per month and in the second half 1,385 flasks, while sales to Pacific averaged 1,171 and 1,486 respectively. By the end of the year the stockpile of mercury was lower than at the start of the year. On 1 August the inventory of quicksilver in Virginia City had fallen dangerously low to 481 flasks (37,000 pounds) against the average inventory on the first of any month of about 2,400 flasks. As shown in Figure 4, almost 2,500 more flasks of mercury were sold to Pacific than Flood & Fair bought through July 1877.¹⁹ In the two months after July Flood & O'Brien sharply boosted purchases: they bought 2,227 flasks in August and 2,500 flasks (of which 1,000 arrived from Hong Kong) in September. For the rest of the year, while stockpiles were not fully replenished, they were less overdrawn.

FIGURE 4
QUICKSILVER TRANSACTIONS, PACIFIC MILL & MINING, JUNE, 1877

| Month | Tons Crushed | Bullion Values | Flasks Bought 76.6# | Total Cost | Price per lb | Flasks Sold to PMMC | Lbs Sold per Ton |
|----------------|-----------------|-------------------|---------------------------|---------------|-----------------|---------------------------|------------------------|
| Jan | 21535 | \$3,222,725 | 1367 | \$50,647.87 | \$0.484 | 980 | 3.49 |
| Feb | 20333 | \$3,081,112 | 900 | \$32,647.85 | \$0.474 | 890 | 3.35 |
| Mar | 22057 | \$3,408,014 | 675 | \$22,978.68 | \$0.444 | 1395 | 4.84 |
| Apr | 27161 | \$2,709,443 | 1400 | \$46,536.98 | \$0.434 | 765 | 2.16 |
| May | 29642 | \$2,106,886 | 895 | \$29,889.98 | \$0.436 | 1643 | 4.25 |
| Jun | 32943 | \$1,923,481 | 675 | \$22,978.68 | \$0.444 | 1355 | 3.15 |
| Jul | 32626 | \$1,628,698 | 450 | \$15,319.12 | \$0.444 | 1691 | 3.97 |
| Aug | 32184 | \$1,627,880 | 2227 | \$83,582.81 | \$0.490 | 960 | 2.28 |
| Sep | 34057 | \$1,794,641 | 2500 | \$99,730.19 | \$0.521 | 1450 | 3.26 |
| Oct | 38368 | \$1,888,523 | 575 | \$19,708.31 | \$0.447 | 1190 | 2.38 |
| Nov | 39566 | \$1,731,309 | 1375 | \$49,183.80 | \$0.467 | 1529 | 2.96 |
| Dec | 36412 | \$1,715,623 | 1000 | \$36,383.50 | \$0.475 | 1255 | 2.64 |
| Total | 366884 | \$26,838,335 | 14039 | \$509,587.77 | \$0.474 | 15103 | 3.15 |
| Average | 30573.67 | \$2,236,527.92 | 1170 | \$42,465.65 | \$0.463 | 1259 | 3.23 |

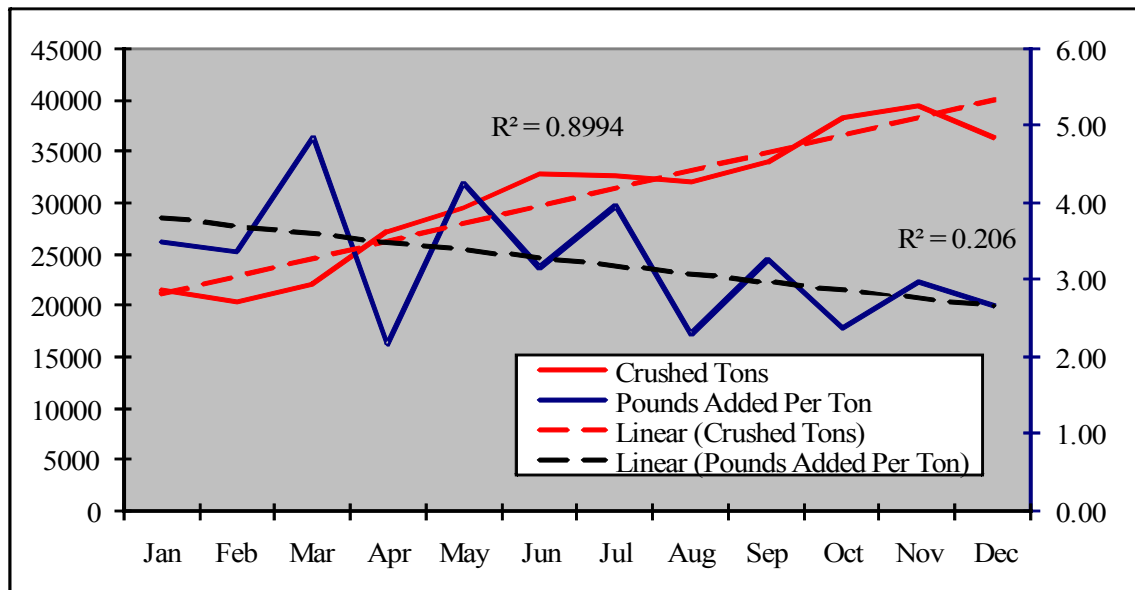
| Month | Total Cost | Price per lb | % Chg Tons | % Chg Flasks Sold | % Chg lb Sold | Index Tons | Index lb Sold |
|-------|---------------|-----------------|---------------|-------------------------|------------------|---------------|------------------|
| Jan | \$41,233.50 | \$0.549 | | | | 70.44 | 108.01 |
| Feb | \$34,042.50 | \$0.499 | -5.58% | -9.18% | -3.82% | 66.50 | 103.89 |
| Mar | \$53,358.75 | \$0.499 | 8.48% | 56.74% | 44.49% | 72.14 | 150.10 |
| Apr | \$29,261.25 | \$0.499 | 23.14% | -45.16% | -55.47% | 88.84 | 66.85 |
| May | \$62,844.75 | \$0.499 | 9.13% | 114.77% | 96.80% | 96.95 | 131.55 |

¹⁹ Calculating coefficients of variation for the first six months revealed that there was more than twice the variability on the purchase side (58 percent) as on the sales side (24 percent).

| | | | | | | | |
|----------------|---------------------|----------------|--------------|---------------|---------------|--------|--------|
| Jun | \$51,828.75 | \$0.499 | 11.14% | -17.53% | -25.79% | 107.75 | 97.62 |
| Jul | \$64,680.75 | \$0.499 | -0.96% | 24.80% | 26.01% | 106.71 | 123.01 |
| Aug | \$36,720.00 | \$0.499 | -1.35% | -43.23% | -42.45% | 105.27 | 70.79 |
| Sep | \$61,008.75 | \$0.549 | 5.82% | 51.04% | 42.73% | 111.39 | 101.05 |
| Oct | \$50,069.75 | \$0.549 | 12.66% | -17.93% | -27.15% | 125.49 | 73.61 |
| Nov | \$58,280.37 | \$0.498 | 3.12% | 28.49% | 24.60% | 129.41 | 91.72 |
| Dec | \$48,003.75 | \$0.499 | -7.97% | -17.92% | -10.81% | 119.10 | 81.80 |
| Total | \$591,332.87 | \$0.511 | 5.24% | 11.35% | 19.44% | | |
| Average | \$49,277.74 | | 9.26% | 19.93% | | | |

Sources: See footnote 18. Base for indices is series average.

**FIGURE 5
CRUSHED ORE IN TONS AND MERCURY SALES (REPLENISHMENTS) IN POUNDS, PACIFIC MILL AND MINING, 1877**



Sources: See footnotes 16.

Can the depletion of stockpiles of quicksilver in Virginia City be accounted for? In the first six months Flood & O'Brien bought less mercury on average per month (985 flask) than Mack & Fair sold on average per month (1,171 flasks) to Pacific. Suppliers may have been pressed to meet the demand (why else turn to Hong Kong) and yet given prices paid, as they appear in the accounts of Flood & O'Brien and Mackay & Fair, not much if any constraint on supplies of mercury can be observed. A more likely explanation for the decline in stockpiles may have resulted from sudden upturn in the extracting and milling of high-grades ores during the Spring 1877. Crushed tons yielded far more bullion in the first half than the second half. Ratios of pounds of mercury sold to Pacific Mill and Mining against tons crushed (a rough measure at best) indicated (Column 8, Figure 4), that sales of mercury by Mackay and Fair, presumably to replenish the pans, were higher in the first half than the second half of the year. The reason for this could be seen be the yields per ton in the first six months: 150, 152, 155, 100, 71 and 58. In the last six months the yields slid into the lows 50's and then into the mid-40's. High ore grade consumed more mercury and therefore demanded larger recharges for

successive batches. These yields, declared to the Story County Assessor, in the first half of 1877 were among the higher ever recorded for any bonanza.²⁰ Such yields may well have been unexpected, and thus for a brief few months mercury stockpiles declined normal levels. By the end of the year, even though Hong Kong purchases had been arranged for to restore the stockpiles and to anticipate any further upswing in yields, the yields had tuned in the opposite direction and the state of local mercury stockpiles was no longer a matter of concern. Mercury supplies would be ample as the Comstock moved from bonanzas to *borrascas*.

The average price paid by The Firm was \$0.474 per pound on the purchases of nearly 1.4 million pounds. (Hong Kong's purchases are included in this figure because they had been paid for.) The average monthly price for purchases by Flood and O'Brien ranged from \$0.434 to \$0.521 per pound. Only once, in September 1877, when they purchased more than 380,000 pounds of mercury in Hong Kong, did the average price exceed \$0.50 per pound. The cost of freight to Virginia City on average was 2.25 cents per pound. To buy and ship a pound of mercury from its source to Virginia City cost on average \$0.497, or 50 cent per pound. The price of the sale of a pound of mercury by Mackay and Fair to Pacific mills was higher by a few pennies than the combined average purchase and freight costs. Their accounts always showed how much was on hand after sales plus purchases. There may be an appropriate explanation for boosting the price paid by Pacific by a few pennies, such as covering office expenses, etc., but whatever the explanation was it cannot be found in the accounts themselves. What this meant in financial terms was that Flood & O'Brien paid approximately \$530,000 for 14,000 flasks and their freight, or \$0.495 per pound, for which they were duly reimbursed by Mackay and Fair, who then sold 15,000 flasks from the stock at nearly \$600,000 or \$0.511 per pound. Given the inconsistencies and inaccuracies that exist in these accounts it is probably wise not to make too much of the difference between figures for purchases and sales within the same operation. Still, based upon an examination of the accounts, each flask of the mercury sold by Flood & O'Brien to Mackay & Fair cost a few cents more per flask when sold by Mackay & Fair to Pacific Mill and Mining.²¹

From the beginning of the Quartet's tenure on the Comstock entailed the intertwining of separate companies to handle distinct tasks in the exploitation of the Lode. Owning an array of businesses did not begin with Mackey, Fair, Flood and O'Brien, but they may have carried the idea of integrating various enterprises farther than others did. Mining companies were incorporated with public stockholders besides the members of the Quartet and issued annual reports and other pronouncements on the state of underground operations. The other companies – logging, water, banking and refining – were privately held and therefore were less transparent, not being required to publish financial statements. How the Quartet allotted duties can be figured out even without any detailed job description - Mackay and Fair in operations and Flood and O'Brien in finances – but how the profits and surpluses were allotted is much harder to unravel. It is

²⁰The above text based on examination of the "Quicksilver Statement, 1877," in Miscellaneous Accounts, Mackay, Fair & Co., NC95, Special Collections, Library, University of Nevada at Reno.

²¹ "Quicksilver Statement, 1877," in Miscellaneous Accounts, Mackay, Fair & Co., NC95, Special Collections, Library, University of Nevada at Reno.

of interest because the Quartet's various businesses made money, at least the most important ones. All of the members of the Quartet except perhaps O'Brien were hands-on managers and administrators. Fair was the long-time day-to-day superintendent of Consolidated Virginia and California Mines, although Mackay was on the site most of the time and acted as superintendent when Fair was gone or indisposed. In addition to Mackay and Fair in Virginia City D. B. Lyman was the long-time superintendent of Pacific Mill and Mining Company and J. Minor Taylor was the equally long-term office manager. Taylor was more visible than the others because his initials appeared on almost all the correspondence emanating from Virginia City, starting in 1874. He was also responsible for maintaining the financial transactions under the previously-discussed Mackay & Fair account. (J. H. Gager was an auditor or accountant who reviewed and corrected their account.) From all indications he was a meticulous and conscientious manager. The mining company finances were elaborately recorded in bound volumes and in considerable detail. The accounts of the other businesses were on the basis of what have survived less elaborate and specific, although they can be informative. Flood and O'Brien managed what might be called the "corporate offices" since the two largest entities, Consolidated Virginia and California, were incorporated in California. When funds were transferred to San Francisco from the Virginia City Mackay & Fair account they entered the Flood & O'Brien account. Transactions could originate with Flood and O'Brien but be paid out of transfers from the Mackay & Fair Account and vice-versa could originate with Mackay and Fair and be paid out of transfer from the Flood & O'Brien account. In addition they dealt with the US Mint and Treasury on the disposition of the bullion or coin that the Quartet owned. I have found no records directly relating to their affairs, although I have come across documents that summarize some of their activities. Taylor made it quite clear that the Mackay & Fair account was the accounting umbrella for all the Virginia-City-based businesses except for the Consolidated Virginia and California Mining Companies. In response to inquiries that arose out of the Dewey litigation he wrote in a letter to Flood and Fair on 11 September 1881 that "[W]hen I entered your employ in December 1874 Mackay and Fair were the mediums (and have so remained) through which all transactions of the Pacific Mill and Mining Company with Flood and O'Brien and J. C. Flood and Co. were made." Taylor further noted that the Mackay & Fair account was actually recorded in their names as Quicksilver Accounts, and that was the title that appeared in the heading of each page for the 1877 document that has survived. It is unclear if Taylor regarded this as an error or a risk and, if so, whether he sought to change the accounts to fit more closely with what they reflected. This did not mean that Pacific Mill and Mining (of any other business entity) lacked financial records and ledgers to keep track of day-to-day operations. Indeed the financial documents relative to mill operations, discussed above, were highly detailed. The Mackay & Fair accounts or, as they were titled, "Quicksilver Statements", concerned the purchase and sale of quicksilver on the one hand and the remittance of funds, presumably gross profits, generated by the businesses that Mackay and Fair owned or controlled in association with Flood and O'Brien.²²

²² Copy of Letter to Messrs. Flood and Fair from J. Minor Taylor, Virginia City, 11 September 1881 in Grant Smith Archives, Binder 4, "Bonanza Firm", NC229, Special Collections, Library, University of Nevada at Reno.

Monthly Quicksilver Statements generally consisted of three parts contained within two pages. Most of the Statements were signed by J. Minor Taylor in behalf of Mackay & Fair in Virginia City and dated. The general format was consistent from month-to-month, but the entries themselves varied considerably. It was not always clear from the entries exactly what items were being referenced with respect to Mackay and Fair's Account. The first page concerned mainly mercury transactions between the accounts of Mackay & Fair and Flood & O'Brien. The quantity of mercury on hand at the start and the end of the month was noted along with purchases and sales and remittances in cash from Virginia City to San Francisco. These transactions were discussed above. The second part concerned the remittances of monies accruing to Mackay and Fair's Virginia City account from Pacific's milling operations to Flood and O'Brien's San Francisco account. The remittances were in the form of cash, bank drafts and bullion. This section was particularly interesting because a "running total" was calculated each month, and that figure closely approximated the "net profits" under review in the Dewey-Burke suit and the Mackay-Fair distribution in subsequent years (also discussed above). Finally the third section carried the heading of "Cash Receipts & Disbursements". This was a summary of cash transactions involving the Mackay & Fair account. The account received cash from the mercury business as well as the milling and logging businesses. The cash transferred from Virginia City to San Francisco was only a portion of the total transfers. The value of these Monthly Quicksilver Statements (which obviously dealt with more than quicksilver) even for just one year is that they make it possible to study the stream of income to Mackay, Fair *et al.* from their ancillary businesses. Let me underscore that these remittances did not include the ingots from the ore extracted from The Firm's mines. Most of milled ore was shipped from the Comstock to the Federal Mint in San Francisco for the final assay and the conversion into bullion or coin.²³ It was the bullion, of course, that came to represent the great wealth of Mackay, Fair *et al.* But, as can be seen from the monthly accounts, the ancillary businesses could also yield income for the principals.

The remittances involving Pacific Mill and Mining had the largest numbers and the most complicated entries. Total remittances as of 1 January 1877 were \$2,428,131.53. Pacific had been in operation since 1874, and in the first two or three years the mills had generated substantial operating profits. During 1877 total remittances rose to \$4,272,567.98, an increase of 72 percent. Total remittances continued to grow; by the end of 1879 they had exceeded \$7.2 million and by the middle of 1881 when the dissolution of the Pacific partnership was completed they had surpassed \$8.9 million. That figure is close to what the "net profits" were said in one of the two documents drawn up for the dissolution. Remittances continued after the middle of 1881 and may have pushed the total somewhere above \$9 million.²⁴ The remittances may not have been so much "net profits" as "operating surpluses". From the 1877 Monthly Statements and other documents it cannot be said that all of Pacific's operational and capital expenses had been met prior to the transfer of money from Virginia City to San Francisco. The Monthly Statements simply did no more than record what had been transferred. Still the "running

²³ A small part of the ore output was minted in Carson City and then shipped to San Francisco.

²⁴ The totals for the years between 1878 and 1881 were taken from a typescript copy by Grant Smith of a Letter to Messrs. Flood and Fair from J. Minor Taylor, Virginia City, 11 September 1881 in Grant Smith Archives, Binder 4, "Bonanza Firm", NC229, Special Collections, Library, University of Nevada at Reno.

total” through 1877 and beyond corresponded to what other sources declared to be “net profits”. While the figures themselves remain ambiguous, the entries for the year 1877 taken as a whole offer some interesting insights into how Pacific’s owners managed their affairs.

The manner in which the monthly remittances of Pacific Mill and Mining funds were entered into the Mackay and Fair accounts followed several different formats. Entries under Pacific remittances were stated in cash and drafts with no further description of the origination of the entries. Some entries were described more specifically as proceeds from sales of ore bars, mostly silver, and from sales of slime or mill bullion plus rebates on freight on the Virginia & Truckee Railroad. Other entries (equal to a quarter of a million dollars) were described as “Bullion in Transit in the account of PMM&Co” or “Fine Silver to be accounted for by PMM&Co” but were kept separate from the remittances and were not included in the running total. It is not clear from the Statements why this was so. It will be recalled that Pacific charged Consolidated Virginia, California and other mining operations a rate per ton to mill the ore and that gold and silver bullion was then registered under the mining company. Even as the rate fell Pacific was processing so much ores of high grades in efficient mills that it could make a dollar or two per ton over and above its costs. Some of those operating profits may have been remitted in the form of cash or bank drafts. But Pacific also earned money from processing slimes and other residues that remained in the possession of the milling company, and the entries concerned with income from sales of bars may well have reflected that side of the milling business. In any event Pacific, incorporated primarily to process ores from Consolidated Virginia and California proved to be a moneymaker in its own right.

The third part of the Quicksilver Statements, Cash Receipts & Disbursements, tracked the receipt and disbursement of cash and its equivalent as opposed to bars of silver and other similar non-liquid financial instruments in the Mackay & Fair account. Cash flowed in from previously discussed mercury sales and milling proceeds and from another ancillary business, Pacific Wood, Lumber & Flume Co and were listed as “debits” in the Mackay & Fair account. Cash from these businesses was disbursed to the Flood & O’Brien account and listed as “credits” to the Mackay & Fair account. The total cash entered as debits was almost \$2 million for 1877 and the total entered as credits more than \$1.6 million. Not surprisingly during the course of the year some cash was held in reserve in the Mackay & Fair account. Some of the cash or equivalent entries in Pacific Mill and Mining remittances also showed up in Cash Receipts & Disbursements (as they should). Of the receipts, actually in accounting terms a debit, the breakdown was as followed: \$1 million from Pacific Mill and Mining, \$600,000 from quicksilver and \$300,000 from Pacific wood, Lumber and Flume. Conversely on the disbursements, a credit of more than \$1 million in cash was disbursed from Mackay & Fair to Flood & O’Brien in the account of Pacific Mill and Mining and \$150,000 in the account of Pacific Wood, Lumber and Flume. Mercury disbursements were almost equal to mercury receipts. The Pacific Mill and Mining disbursements were greater than the receipts for 1877 whereas the Pacific Wood, Lumber and Flume were about half of the receipts. Cash transfers from The Quartet’s related business was only a fraction of what they gained

from their mines, but gross operating profits, which these disbursements may represent, of \$1 million in a single year was by any measure a highly valued business.²⁵

²⁵ "Quicksilver Statement, 1877," in Miscellaneous Accounts, Mackay, Fair & Co., NC95, Special Collections, Library, University of Nevada at Reno.