

THE SECRETS OF HISTORICAL MINING RESEARCH An Understanding of Selected Early Mining Publications

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Introduction

The use of historical mining research has played an immensely important role in exploration for economic ore deposits. A basic understanding of the foundation of mining research in America is necessary to fully exploit these resources. Two important series of publications were undertaken by the government from 1867 to 1885 that form the foundation of mining history research. These publications were the *Reports of Mineral Statistics West of the Rocky Mountains* (1867-1876) and *Reports of the Director of the Mint* (1880-1885.)

California Gold Rush Brings Intense Interest To The West

The world thought California exploded in gold with the California gold rush. As thousands and thousands of people from all over the world heard or read reports published in newspapers of the fabulous discoveries, they yearned for more information. At first it was to read the unbelievable: that gold was really there, and that some people were really getting rich. Others despaired. Unable to cope with the tremendous physical hardships cast upon them in their search for gold, they went home, back to a safe, but potentially poorer life.

As the California wealth developed, so developed prospecting. Soon, enormously important gold and silver ore deposits were found in Nevada at the Comstock (1859), in Montana (circa 1875), Lead, South Dakota (circa 1877), then Leadville (circa 1879) and Cripple Creek (circa 1894.) With these discoveries came an intense interest in the investment into these mines, and, in a world not yet in the television age, a need for quality news about the mines. The investment world needed information from which to make sound intelligent decisions. The banking community soon learned that reading puffed up reports in newspapers was not good enough. Even Mark Twain bragged about some of the lousy mines he wrote up just so he could receive a few shares in the company that he might be able to sell in the saloon later that day.

As this new financial world began to develop, the United States government realized that there were very few, if any, experts in the mining field, and that there was a definite need to educate the public about the western mines. While several noted geologists were employed at various prestigious positions on the eastern seaboard, few were mining men. Very few of the eastern mining engineers and geologists such as William Hickey and Ben Silliman ever set foot on western soil. The country needed strong data, and the one chosen to lead the way was J. Ross Browne, a man who had worked loyally and steadfastly for the government as a tax collector in California during the gold rush. There, it was his job to reform the tax collecting business, which he did. He wasn't popular with the crooks, however, and soon was asked to leave by a powerful lobbying effort in Congress from business interests whose operations he upset. Browne was known for his candid honesty, and it may have been that attribute that got him the job over others such as Hitchcock or the likes of Josiah Whitney or Clarence King, if they were ever candidates.

Born in Ireland in 1821, he came to the U.S. with his parents in 1833. Browne loved to write, and began writing using his own illustrations for *Harper's Monthly Magazine*, *The Overland*

Monthly and other journals that would pay him for his efforts. His writing of whaling and other adventures in *Etchings of a Whaling Cruise* in 1850 was popular. His sketches were well done even for a trained artist, which Browne was not.

Through *Harper's*, he became popular with his famous sketches of Washoe (the Comstock) printed in *Harper's Monthly* in 1860, 1861, and 1862. He rewrote or reformatted his articles into numerous books on the west which contain great information on California, Nevada, and Arizona as they were in their infancy. Works such as *Adventures in the Apache Country. A Tour through Arizona* (Harper & Brothers, 1868) is an example of reformatted and compiled magazine articles. Browne's funny, fast reading style is thought to have influenced Sam Clemens (Mark Twain), who would have been reading his works when he was an aspiring reporter for the *Territorial Enterprise* in Virginia City. The two later became friends, and in 1866 Browne invited Clemens to stay at his home in Oakland, while he gave a lecture on Hawaii (the Sandwich Islands) at a nearby university.

Browne Appointed Commissioner of Mineral Statistics

After an arousing article on Bodie Bluff appeared in *Harper's* in 1865, Browne was asked and appointed as one of two commissioners for a National Bureau of Mining that was established by a Congressional group from Nevada. While Browne had no specific training in mining or geology, he was known as a seat-of-the-pants kind of guy, with good powers of observation, and an honest disposition:

"Although I do not claim to possess a scientific knowledge of mining operations, or of the geological peculiarities of these mineral districts, I have had so much practical experience in the examination of mines that I do not feel altogether incompetent to form a correct judgment on the subject."

In July, 1866, Congress appropriated \$10,000, to be split in some uncertain manner between Browne and James Taylor, an educated mining engineer, who was put in charge of gathering information on mines east of the Rockies. Browne eagerly compiled a 371-page report within two months and shipped it to Washington, which became the basis for the first report published in 1867. Though Taylor was similarly charged with compiling information on the mines east of the Rocky Mountains, his report was short, and Congress decided to bind the two together. Browne's initial report contained mostly information from California and Nevada, the sites of the two greatest gold and silver rushes in history.

The Mineral Resources (or Statistics) West of the Rocky Mountains series was the first endeavor to educate the public about the western mining frontier. Congress, never really sure if the wealth was indeed present, was forced to listen to screaming delegates and lobbyists that wanted good data on the mines. At the time, not even Wells, Fargo & Co.'s bullion shipping reports were summarized in detail.

It was Browne's nature to be incredibly well organized and he sought insight from all the top scientific experts. By March, 1867, the government had issued four editions, each slightly different. Congress had greatly misjudged the public's interest in western mines. It became a "bestseller" overnight. The initial order of 1,000 copies made on January 29, 1867, was increased to 31,000 total copies by February 25, nearly matching the future sales of Sam Clemens' *Roughing It*, one of the top selling books of its time, which sold nearly the same number of copies in 1872, and 100,000 copies by 1875, after being on the market for three years.

Browne, still full of excitement from a fast start, desperately wanted to complete the task assigned him, which was to cover all the western states and territories. He spent the majority of his time in California and Nevada, and had hoped to cover Colorado, New Mexico, Arizona, Montana and others later. The project assigned him by Congress was more work than they could have ever imagined. It was difficult for those in Washington to understand the importance of mining and the need for accurate reporting of production statistics. The west was literally exploding in development, but few in Washington took the time to see it for themselves.

With the success of the first report in hand, the battle in Congress began. Browne asked Congress for another \$10,000 to complete the report for the other states, but really thought it might cost \$25,000. Congress refused the \$10,000. Congressman Washburn, of Illinois, led the opposition, and said the study was finished. It was sufficient. The western Congressmen, naturally, wanted the studies to continue. But the eastern factions, similar to today, had very little understanding of how important the study was to western mining, the development of the west, and its importance to western communities and commerce. They were also naive about how the information would affect the financial marketplace. The bill failed.

But Browne decided to continue anyway, even though he knew he might not get paid. He was of the opinion that this work was of paramount importance to the nation, and continued with a vengeance. He had a difficult task, as his office was swarmed with mine owners and legislators, using their influence in an attempt to get favorable reviews regarding their own mine interests.

Browne used his influence in an effort to establish a national school of mines. He enlisted the help of the powerful senator William Stewart of Nevada, who was working on a national mining law. While the issues were important to the west, the eastern interests, this time fueled by the *New York Times*, defeated Stewart and his bill for a national mining school and national mining laws. Though Stewart would later be successful in establishing the 1872 mining law, Congress rejected the idea of a "national" university.

Browne had asked Congress for 2,000 copies of the 1868 work to compensate his helpers and pay his costs. Congress liked his second report so much that they authorized 15,300 copies be printed. It immediately "sold out" at \$1 per copy. An additional 10,000 copies were printed, but only 100 given to Browne, which was his only compensation for his year's work from the Federal Government. Congress wasn't used to bartering for services, and suggested he take it up with the Compensation Committee who rejected his request. The stereotype plates of the 1868 work were loaned to Browne a few days later so that he could make his own printing, and in so doing, made some much needed money. Thus the document reached the public in two ways: through the government printing office, and through one of two private printers, Ford & Co. and Appleton & Co. in New York. (See the list of reports at the end of this paper.)

One of the few legitimate criticisms his work received was the lack of an index in a review by *Harper's*, which was remedied in succeeding volumes.

Browne Moves On

With the completion of two massive works, Browne proudly felt he had served his country well, and went on to another pursuit, a cherished appointment by President Andrew Johnson as

Minister to China in 1868. His tedious work in this new endeavor exposed serious problems, and here too, he met with political trouble, which ultimately unseated him. His blatant honesty and belief in an honest government got him into trouble all his life, first with the tax collection job on the west coast, and finally in China. His exposure of corruption and waste was not acceptable to the powerful men in office that created it, and it was his undoing. Browne died suddenly of appendicitis at a friend's home in Oakland at the age of 54.

Raymond Appointed Commissioner

Raymond was immediately succeeded by Rossiter W. Raymond; a young, unknown but well-educated mining engineer, with extremely high standards.

Raymond was born in 1840, and educated at the mining school in Freiberg, Germany, considered one of the top mining schools in the world. He joined the army upon his return to the United States, and became Captain. He served until 1864, resigned, and opened an office in New York as a mining consultant. Just a lad at 28, Raymond was appointed as Mining Commissioner after Browne's departure in 1868. With little or no practical experience, Raymond used the same energy, intellect, and ability that Browne had used to gather and sort meaningful mining information from the promotional puff of the Wall Street sharks, each promoting his company's "great" or "fabulous" mine of "untold" riches. Though thrown into the political lion's ring at a tender age, Raymond emerged a giant.

His instructions from Congress were quite limiting, in comparison to the massive job that Browne was entrusted with. "it will be unnecessary for you to enter into similar investigations in detail, except in cases where omissions may have occurred, or where the information obtained may appear to be erroneous or imperfect."

These words may have been used to defuse a delegation from Montana, whose congressmen felt Browne had previously reported Montana's statistics incorrectly. Naturally, they felt Montana had more potential than the Comstock and California's Mother Lode, deserving of more favorable reviews. But Browne's conclusions were generally borne correct through history.

The new emphasis would be on metallurgical processes, extraction techniques, machinery, as well as what direction the government should go to help the industry, including the possible establishment of a mining school.

Raymond's first report was critical of the government's slow means by which they released money. He couldn't get any; and, like Browne, had to rely on various companies for transportation to mining regions, and friends of the industry for assistance. As a result, his first report postponed the discussions of metallurgy, mechanics, and processing, concentrating instead on precious metal production. Perhaps to satisfy political fires, Raymond's first report has extensive discussions of Montana and Idaho, but lacks significant factual references to support his increased production estimates of \$15 million for Montana.

Raymond did, however, begin discussions of mining laws and of mining schools, a topic he felt was too important to ignore. He published what would later prove to be an important list of American and English students attending or graduating from the Freiberg School of Mines. This list (through 1865) was comprised of some of the most qualified mining engineers to work the mines of America. Among them were: Raphael Pumpelly, Louis and Henry Janin, John Taylor, Sam Emmons, Arnold Hague, and a host

of others. Many of these men went on to glorious careers in the mining and geologic industries.

His first report also published US Mint statistics, in what would lead to a split of departments in 1873. Mint statistics had always been published annually in separate forums. Congress, trying to combine several jobs - Mint, mining statistics, and geology - would fight for more than 10 years on budget division, what information was important to publish, and who should publish it.

Raymond wrote eight volumes of the *Mineral Resources* before the budget crunch hit. He left his office after the 1876 volume was completed, though it was not published until 1877, and bears that date. He had become fed up with Congressional politics and Congress' lack of interest in educating the public. Congress completely broke down in disagreement of how or if the three agencies should exist, who should lead them and what their budgets would be. As a result, the period between 1876 and 1879 no mining or geologic work was produced of any significance other than the annual mint report, which remained short, dealing only with coin and bullion production. Thus, with Browne's works, there are ten volumes covering the eleven-year span from 1867 to 1877. During that time, Raymond became friends with Browne, and consulted for Browne on at least two mine investments near Silver Peak, Nevada.

Both Browne and Raymond were well known to the mining industry. Both had undertaken their tasks seriously. Browne, the first Mining Commissioner, used his background as a Federal tax agent in California to research meaningful bullion statistics. To determine actual production, he did not rely on newspaper or other secondhand reports, but instead visited each mine, studied their production reports, and matched the receipts with the Wells, Fargo & Co. or other shipping agents' own records. In this way he got a clear picture of the real amount of gold and silver shipped. The only quantities he would miss would be private shipments from small or remote mines, which may have been privately, rather than publicly, owned, and hence wished confidentiality. Raymond, the well-schooled mining engineer, would follow in these footsteps, and also reported on remote districts, but generally made no production reports unless he could back them up with Wells, Fargo & Co. shipping receipts.

Raymond was one of the original founding members of the American Institute of Mining Engineers, and went on to a distinguished career. He was the senior editor of the *Engineering and Mining Journal* from 1868 through his retirement in about 1890. He wrote many books and articles, among them a touching mining fiction work *Camp and Cabin*, published in 1879, a tale reminiscent of Twain's writing, but probably a story of some truth from Raymond's early years wandering through the western mining camps as Commissioner of Mining Statistics.

Congress Struggles For Direction

After Raymond's departure, Congress couldn't decide what to do. There was opposition in Congress to a continuation of the *Mineral Resources* series because the members felt the same thing was being done over and over again. They did not understand the need for constant and vigilant oversight. Earlier, in 1873, H. R. Linderman was appointed by the Treasury Department as Director of the Mint, and charged, under the Coinage Act of 1873, with producing an annual report of metals produced for use in coinage, both foreign and domestic. A young assistant, Horatio Burchard, who may have been a political appointee, worked under Linderman to help prepare the statistics. Linderman and Burchard

published volumes from 1873-1879 that contained these mint statistics, and in so doing, relieved Raymond of this task. His work to produce *Mineral Resources* was enough, and the new division was a welcome relief of an extra burden. There was also talk of forming a more scientific body to study the ore deposits, which became the United States Geologic Survey (USGS), which was formally enacted and approved April 3, 1879.

Reporting on the western mines had been a constant source of irritation for Congress. The tremendous need for information was evident when Browne first published the 1868 and 1869 volumes. Congress decided that a more scientific study should be commenced, but couldn't quite decide who to lead it, or where they should start. The result was the formation of the United States Geologic Survey of the Territories, which in 1873 published three Annual Reports for the years 1867, 1868, and 1869 by Ferdinand Hayden.

Hayden had just completed extensive geologic studies for the Corps of Engineers in Yellowstone and other areas. Congress had appointed J. Ross Browne, and later Rossiter Raymond, as Commissioner of Mining Statistics under the Treasury Department, and had authorized another report on coins and bullion production from the Director of the Mint, H.R. Linderman, also under the Treasury Department. Clarence King had been conducting geologic studies for the Smithsonian. With five competing Federal agencies, all scrambling for money to report on the western mines, separate political factions developed in Congress, resulting in a division of funds, and a lack of leadership and foresight.

"Tension had grown between the various scientific surveys of the government during the later years of King's work on the Fourtieth Parallel. As a result of the rapid settlement of the west, he (Clarence King) wrote 'the expeditions had assumed a sudden prominence. Their results were eagerly looked for, and the Corps were brought into an ambitious rivalry, both as to the territories that were to be assigned to each and the appropriations which were sought in Congress. What may be termed the Feudal Period of Federal scientific works was at its height.' There was a need for improved policies and organization."

Mint Begins Publishing Mining Data

The first years of *Mint Statistics* were confined to coinage related issues. But in 1880, things changed. With the absence of Raymond writing *Mineral Resources*, there was a strong need for the technical information that had previously been provided by Browne and Raymond, even though some members of Congress thought it repetitive. Burchard was appointed Director of the Mint in 1879, and charged with delivering a report that met both the needs of the mining industry in *Mineral Resources* and the needs of the Mint in *Mint Statistics* under the Treasury Department, but not the geologic detail and study expected under Clarence King's new USGS under the Interior Department. The result was a series that lasted for five brief years, 1880-1885.

Burchard thus began the compilation of data where Raymond left off, publishing a series of books in the style of *Mineral Resources*, but entitled *Production of Gold and Silver in the United States* as Director of the Mint.

Burchard undertook the challenge for the paltry sum of \$5,000, just half the sum Browne had been given fourteen years earlier, and in his letter to the Secretary of the Treasury, took a political shot at the skimpy budget which did not allow him to visit the mines:

“(this report) is based upon information obtained from officers of the mints and others in the mining regions, and upon statements of the depositors as to the locality of production of the gold and silver received at the various mints and assay offices. From the incomplete data approximate estimates have been annually made, which, although probably inaccurate in many details, have been found exceedingly useful for statistical purposes.”

In the preparation of his work, he was forced to rely on other published reports or make estimates when companies would or could not provide timely factual data. The result, as Burchard noted, was work of less detail and lacking the overall quality of the Browne and Raymond reports, yet it retained a great deal of information about the mines of the west. Congress, however, must have liked his work because they published these volumes until 1885.

Other Mining & Geology Series Developed

Within a few years, the Mint publications would again shift because of the development of another new agency, the United States Geologic Survey. By 1886 the emphasis was on bullion produced and shipped for coinage at the various U.S. Mints. Detail on mining became lacking.

After the new U.S. Geological Survey was formed in 1879, the series *Mineral Resources* began publication again in 1883, but this time as a mineral commodity guide. The new format discussed commodities, such as gold, silver, copper and coal and their relative annual productions in certain states, with very little identification of mining districts or specific mine production. There was crossover in data with the *Report of the Director of the Mint* and the USGS, and the result was a *Director of the Mint* series specializing in issues pertinent to the minting of coins and receipt of metals at the mints or U.S. Assay offices, and a discontinuation of the detail of mining information. The *Mineral Resources and Director of the Mint* series both continue to be published. After 1879, much of the detail of the individual mining districts fell to the US Geological Survey, who published technical discussions of mines and districts in various Monographs, Bulletins and Professional Papers. Clarence King, the first Director of the USGS, and Congress felt that the USGS should operate as an independent agency. Rossiter Raymond, and to some extent J. Ross Browne, had done mine evaluations privately. The potential for conflict of interest was present, thus King and his staff were not allowed to “have personal or private interests in the lands or mineral wealth of the regions under survey, and shall execute no surveys or examinations for private parties or corporations.

Summary

The *Mineral Resources* series remains an important research tool today. There is no similar series containing as much important historical production and exploration information. With the advent of modern science and new production techniques, production of America’s gold and silver mines, as well as copper and other commodities, has increased beyond the realm of the old style reporting. Technical reports on each mine or district today are the standard tools of the mining trade. The detail in the modern reports was impossible 130 years ago, but the need for quality data and information has never been greater.

For those researching historical mines in the United States, particularly those of significant production, the 1868-1885 volumes of *Mineral Resources West of the Rocky Mountains*, and

the five volumes of the *Report of the Director of the Mint* remain necessary companions. These are indexed by mine, district, and geographic locality, and are an invaluable historical asset. Careful use in conjunction with sound modern scientific techniques may even lead the exploration geologist to targets that might have been otherwise overlooked.

List of Reports of the Mineral Statistics West of the Rocky Mountains – see page 281 for list.

In 1880, Congress authorized the publication of the same form of data to be released by Horatio Burchard as Director of the Mint. The new title was *Report Upon the Production of the Precious Metals of the United States During the Calendar Year...* His first report in 1880 was published three years after the last Raymond report, titled *Mineral Statistics West of the Rocky Mountains*, which was completed in 1875. The Burchard and Kimball reports contain limited information on mines in the eastern U.S., but their production was so insignificant in comparison to the western mines that little was written. See page 281 for list.

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- Letter of Transmittal, March 2, 1881, Burchard to John Sherman, Secretary of the Treasury.

Specific footnotes available by request.

LIST OF REPORTS OF THE MINERAL STATISTICS WEST OF THE ROCKY MOUNTAINS

Date	Annual Report	Report # of Author	Date on Title Page	Date on Binding	Date of Trans. Letter	Congress Exec. Doc.
1867	1	1 (Browne)	1867	none	1/1867	not present
1868	2 ^a	2	1868	1868	3/1868	not present
1869	3 ^b	1 (Raymond)	1869	1869, 1868-69	1/1869	3rd. Session 40th, Congress Document #54
1870	4 ^c	2	1870	1870, 1869-70	3/1870	1st. Session 41st. Congress Document #207
1871	5	3	1872	1871	3/1871	1st. Session 42nd. Congress Document #10
1872	6	4	1873	1872, 1873	3/1872	not present
1873	7	5	1873	1872, 1873	2/1873	3rd. Session 42nd. Congress Document #210
1874	8	6	1874	1874	2/1874	not present
1875	9	7	1875	1875	2/1875	2nd. Session 43rd. Congress Document #177
1876	10	8	1877	1876, 1877	4/1876	not present

a Also published as *Resources of the Pacific Slope*; D. Appleton & Co., New York, 1869

b Also published as *Mines of the West*, J.B. Ford & Co., New York, 1869

c Also published as *Mines and Mining of the Rocky Mountains, Inland Basin, and the Pacific Slope*, J.B. Ford & Co., New York, 1871

LIST OF THE DIRECTOR OF THE MINT REPORTS

Year of Data	Author	Report#	Date on Title Page	Date on Binding	Date of Trans. Letter	Congress Exec. Doc.
1880	H. Burchard	11	1881	1880	3/18 81	Document #144
1881	Burchard	2	1882	1881	6/1882	not present
1882	Burchard	13	1883	1882	2/1883	Document #441
1883	Burchard	14	1884	1883-4	6/1884	Document #1 77
1884	Burchard	15	1885	1884-5	2/1885	48th. Congress 2nd. Session Document #268
1885	Jas. P. Kimball					not seen
1886	Kimball					not seen
1887	Kimball	8?	1888	1887	7/1888	not present