"Men of Scope": The Assayer and the Western Mining Community, 1848-1920

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Frank Linderman's novel *Quartzville*, set at the ghost town's assay office of old Ab Ely, provides a sample portrait of Western mining camp life. Ab is dying and old friends visit and recount the early days of the camp. The assay office in Quartzville was the heart of the town's dreams, the place of secret knowledge of the many prospectors' claims, and the repository of records of the one big mine's daily samplings of ore. Ab had been a trusted friend to many and hung on through the boom and bust. He was an honest assayer, accurate, and close-mouthed, as was his creator Frank Linderman, an assayer himself in Montana mining communities, the composite camps of his "Quartzville."[1]

Many historians have defined the character of the mining camp: Charles Howard Shinn, Duane Smith, Rodman Paul, Paul Fatout, and Michael Malone, to name a few.[2] They describe a social milieu composed mostly of restless young, single men with aspirations to great wealth, the hope for a lucky strike that will allow their return home "in style." Smith described the camps as hurried in nature and transient, with most lasting a few seasons before eventual decline. There were only a few towns like Prescott, Arizona, or Helena, Montana, or Juneau, Alaska, which survived the boom and bust cycles of the mining economy. Novelist Linderman caught the spirit of the assayer's place in the mining community.

Historians have not paid particular attention to the assayer. He was a businessman tied to the economies of the camps. His survival depended upon the production of metals or the belief in the soon-to-be-made strike by the prospector bringing in samples. A prosperous camp or one merely booming because of speculation could support several assayers, while a camp lingering in hopes of revival could barely sustain one. Small

camps (one hundred to two hundred in population) rarely had assayers; those of medium size (Austin, Nevada; Ouray, Colorado; or Elkhorn, Montana; those with a thousand to fifteen hundred people) had one, briefly two; the large camps (Leadville, Butte, Tonapah) might have a dozen or more during their boom years. But as the flush of the boom passed, one or two remained, the survivors easily handling the tasks of testing ore from prospects, sampling ore from mine dumps, and acting as umpire for custom ore buyers.[3]

The Assay Office

The assay shop was usually an inconspicuous building, probably unpainted, near the camp's main street. Contemporary descriptions and historic photographs indicate that, like most buildings in mining camps, assay shops were one-story, wood-frame, false-fronted structures. Henry Wood and Maurice Hayes' assay shop in Leadville was a long, narrow building, fifty feet by eight, with a counter up front, where sat the customers and loungers (waiting for someone to slip the word about a new strike).[4] Behind the counter were the desk area and scales. The back room was the work area, containing a small crusher and furnace.

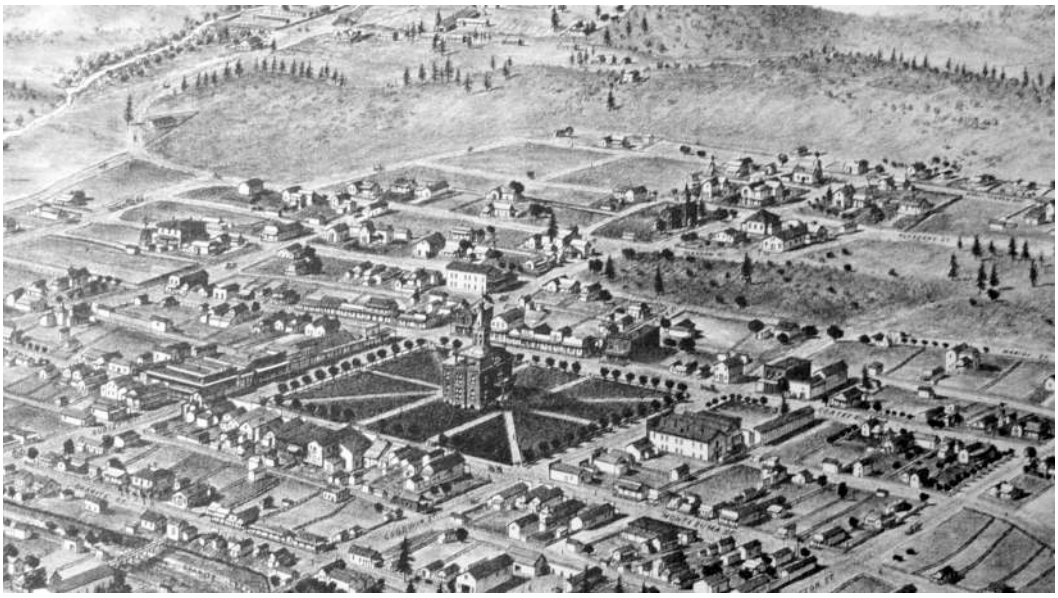
The ordinary assay shop was a small structure that fit into the mining camp scene, just another of the unpretentious shops along dirt streets. An assay office could be distinguished by its "tall brick chimney," as well as the pile of "used and broken crucibles, scorifiers, old cupels, and slag" outside its back door.[5] Children of the camps would search the pile for the strangely colored glazed dishes for their play.

Surveyors and assayers "Cornwall and Craven" operated out of a two-story log house, twenty-five by thirty-five feet, on the main street of Irwin, Colorado, in 1880. The ground floor contained offices, with a large sleeping room above. Next door stood a barber shop and Charley Utter's gambling hall.[6] "My building was a plain two-story affair," wrote another assayer, "unpainted outside but well-fitted up as to assay office equipment."[7] He had bedrooms upstairs where he lodged others who took their meals at the nearby Charleston Hotel. These one- or two-story offices were inconspicuous compared to the bigger hotels, saloons, and dance halls. Larger works, such as E. E. Burlingame's two-story brick building in Denver, were rare and were always found in supply towns—Denver, San Francisco, Salt Lake City, and El Paso—or the larger mining camps—Virginia City, Cripple Creek, Butte, Leadville.[8]

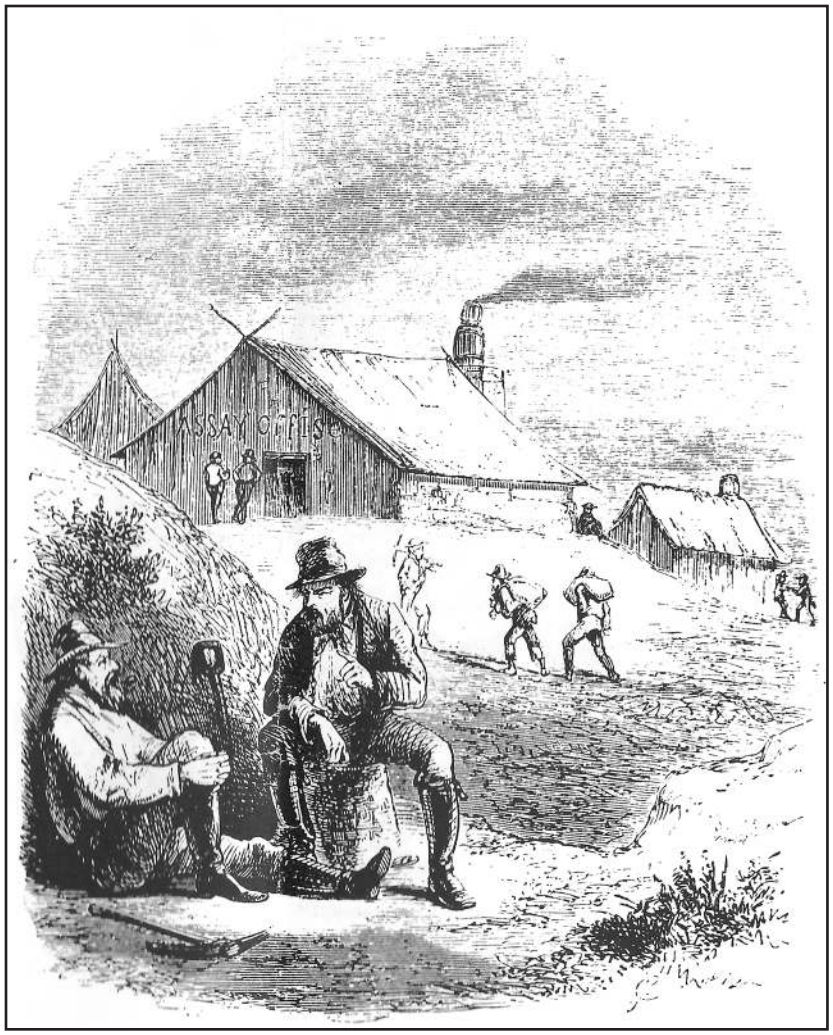
Leadville's early Chestnut Street, its main and only thoroughfare in 1878, stretched four blocks. It began at the Harrison Smelter and was lined with "one and two story frame structures of the most primitive kind, about every third one of which was a saloon, the balance being restaurants, dance halls, merchandise shops and rooming houses."[9] The ore teams cut deep ruts into the dirt street. At the head of the street "stood a one story frame [building] with a high gable to the front where Patrick and Bridge held out for a time as assayers, and did a roaring business."[10] Maurice Hayes opened the first assay office in the district in a small shop squeezed next to Tom Walsh's Grand Hotel.[11] With the growth of the camp, other assayers appeared.

Like other businesses, assay shops clustered in districts. In Leadville, half of the twelve shops gravitated to Fourth and Fifth streets, nearer the mines. In Cripple Creek they centered along Bennett Avenue, and in Helena along Broadway or Main near the banks and brokerage offices. In Deadwood they clustered near the Lee Street stairs, one block off Main Street and near the town's banks. As the boom wore on and property values rose, the assayer was eased off a camp's main street.[12]

Choice locations were often determined by proximity, alliance, and association. The lone shops in smaller camps stood in the commercial district, not far from the saloons, bathhouses, and hotels catering to the camp's patrons. The pros-



Assayer and sometimes artist C. J. Dyer created a "birds-eye" view of mining center and territorial capital Prescott, Arizona, c. 1880. Francis Blake's assay office stood on the southwest corner of the town square facing the courthouse, shown above at lower center and below with loungers along Montezuma Street, a typical shop of the period. (Courtesy of the Sharlot Hall Museum, Prescott.)



The beginnings of an assay business, a tent in Virginia City, Nevada, with a wood barrel chimney. (From J. Ross Browne, A Peep at Washoe*, 1860.)*

pector arriving in town with his samples might stop first at the assay shop. It usually took until the next day to get his results from the assayer, so his next stop would be the bathhouse, hotel, or the local watering hole. Proximity to such businesses was desirable to the assayer, but usually unaffordable. Often they were back one block from Main Street, where rents were lower, but still near the town center. For forty years the Downer brothers' shop tested prospectors' ores one block off Goldfield, Nevada's, Main Street.[13]

Another favored site for an assay shop was in the back of a Main Street bank. The location showed an important alliance, as banks used assay shops to test bullion. These assay offices were relegated to the rear or back room of these brick or stone buildings, usually the only substantial structures in a camp. Rare was the assayer like James J. Ott, who owned his own brick business building on one of the main streets of Nevada City, California.[14]

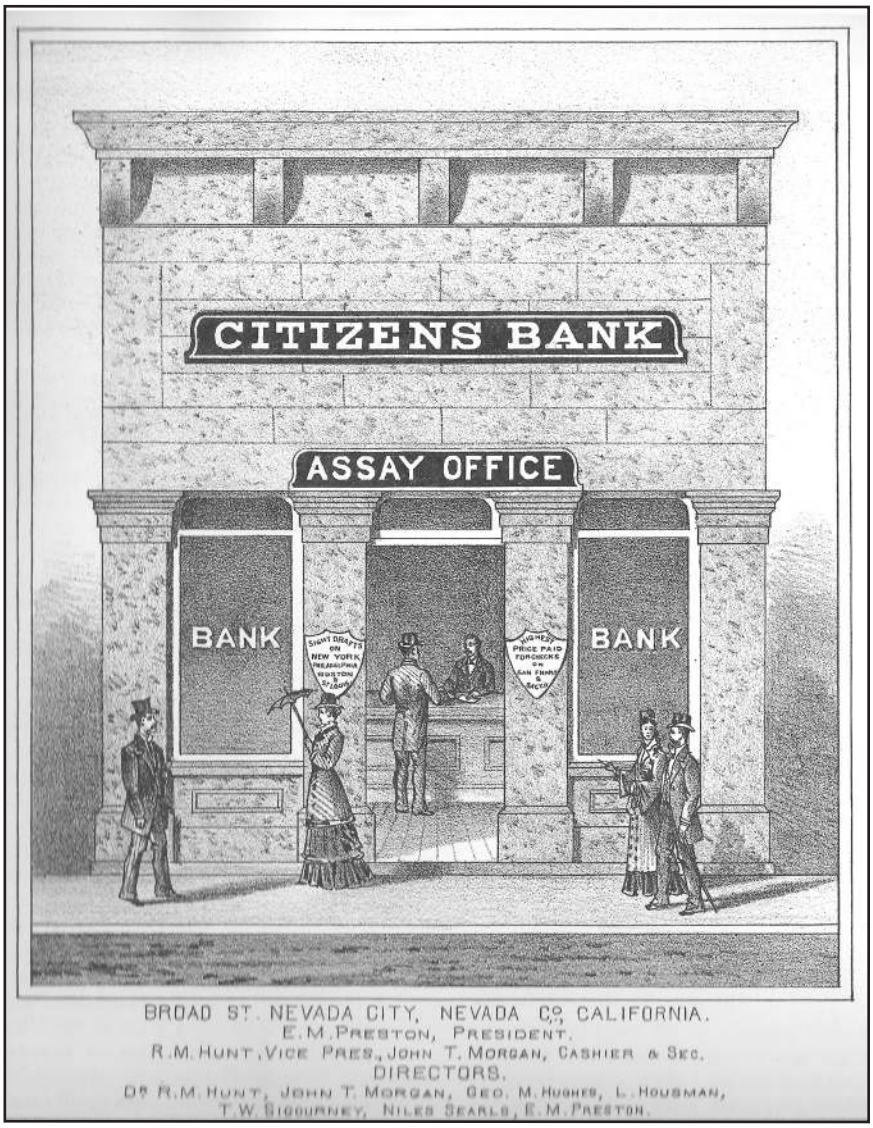
Lesser assay shops, in smaller mining communities, could be found sharing the main street business front of a newspaper office—a number of assayers doubled as editors or "mine reporters"—drug store, post office, dry goods store, or express or stage office.[15] Such space sharing occurred during mining camp boom years, when building space was at a premium, as well as during the decline, when the assayer took on additional business to make financial ends meet. In hard times, as one assayer observed: "My prices were very satisfac-

tory to all but not a soul could or did raise a dollar to pay the charges."[16] For want of a dollar this assayer worked as part-time telegrapher, clerk at a general store, and fill-in newspaper editor at the same time as he assayed in Sunshine, Colorado.

The assayer usually rented his space, paying mining camp rates ranging from highs of one hundred dollars per month reported at bustling Leadville to a low at Idaho Springs of twenty dollars a month for a basic small shop in a false-fronted building. Henry Wood paid fifty dollars for his small shop located on Leadville's main street in 1880. The Downer brothers of Goldfield rented first, then built their own shop, a twenty-foot wide wood frame structure, worth five hundred dollars, on a lot adjacent to the town's center. Like their mining camp business counterparts, assayers sought to own their own shop and, if the camp prospered, built or bought a small, wood frame, false fronted building.[17]

Assaying Equipment

Once housed, the assayer had to "set up." The most expensive pieces of equipment were the scales and the furnace. A good scale cost one



Citizens Bank and Assay Office, Nevada City, California, a common business combination in the gold camps. Director L. Housman was a local assayer and "amalgamater." (From Thomas H. Thompson and Albert A. West, History of Nevada County, California *(Oakland: Thompson and West, 1880).)*

hundred to two hundred dollars. While the price of a basic furnace varied widely, advertised at fifty to five hundred dollars, the freight charges on the heavy brick could double or treble the cost. An assayer who lacked capital could build a furnace from fire brick taken from an old scrap pile, if fortunate to have one nearby, while his well-heeled contemporaries could order one from Taylor and Co. of San Francisco for five hundred dollars, complete with tongs and forceps. Other initial outlays were also necessary—crucibles, chemicals, fuel, furnace tools and clothes, and furnishings. Several assayers kept records of costs, while contemporary catalogs and advertisements provide the costs of equipment. A person could set up a basic operation with two hundred dollars and expand from there.[18]

The experience of Eugene Burlingame shows the progression of quarters of one successful assayer. He had rushed to Colorado in 1866, where he opened in a wood-frame shop in Central City, then joined the silver strike near Silver City, New Mexico, installing his basic furnace, scales, and apparatus in a simple frame office. In the mid 1870s he established himself in a brick office in Denver. After expansion and moves, his final base of operations, located in the Mile High City as well, included two substantial brick structures and a test mill along railroad tracks.[19]

Most assayers, however, remained in typical mining camp structures, false-fronted shacks. Fire insurance maps for nineteenth-century Colorado mining camps testify to the scale of structures, their outlines duly noted with special reference because of their assay furnace's potential fire hazard. The small structures were tinder-boxes. All too easily, the unfortunate assayer could lose his total investment—two hundred to three thousand dollars for a small shop —in one of the too common mining camp fires.[20]

The Assaying Process

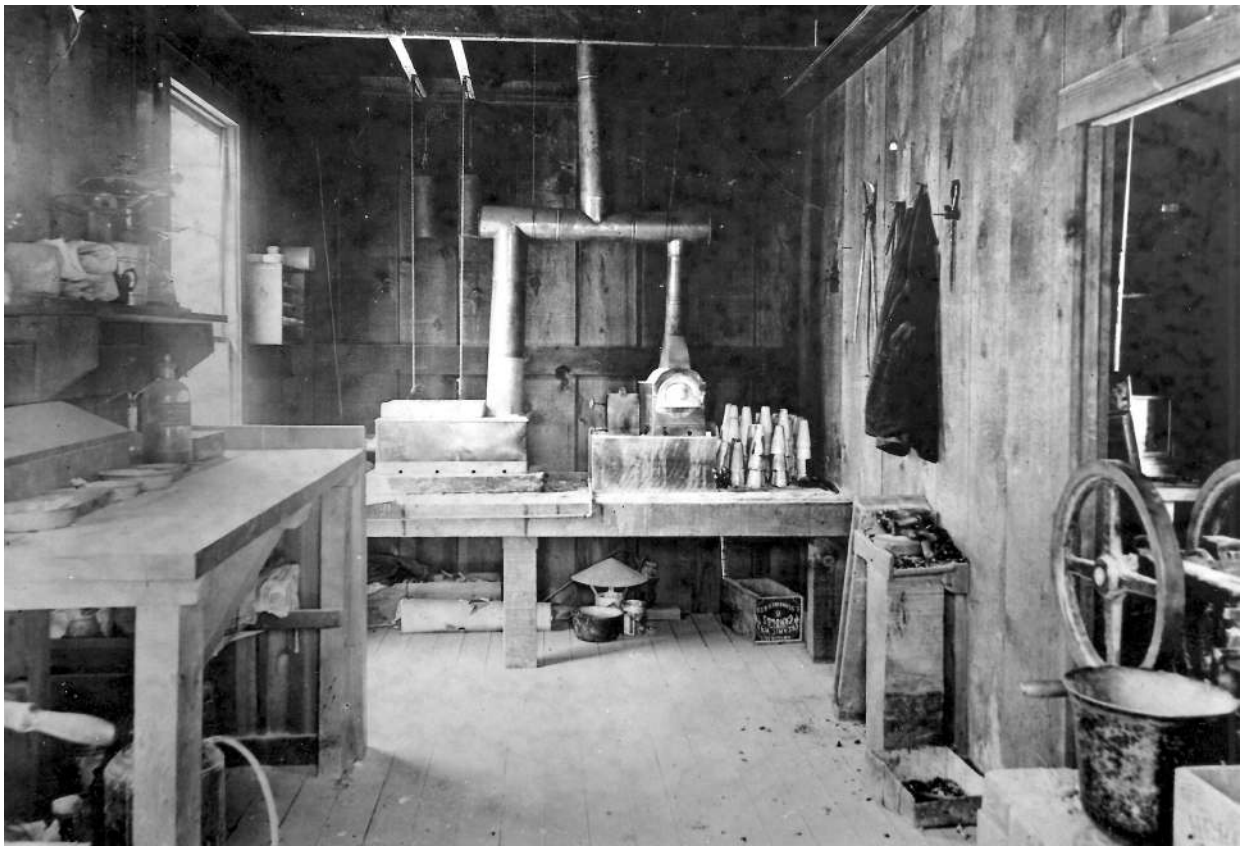
The assayer's main service function was to test the value of mineral within a sample of ore. A prospector with samples walked along the boardwalk until he came to a small building, noted by its simple sign, "Assaying" or "Assay Office," and entered. Before him was the scene well described by miner Mark Requa:

> Inside, a wooden railing; behind the railing a desk, some books, a pile of old sample sacks, specimens, more or less covered with dust; in all, a space perhaps twelve by fifteen feet, and a partition with four half-sashes of window-glass giving view to the room beyond, chemicals and rock-crushing paraphernalia. Seated at a desk, entering some figures in a book, was Hans Randt, a chemist.[21]

At the back of the building, in the third and last room, was the furnace. The building might contain living quarters besides the scale room, laboratory, and furnace room. To the unaware, the Randt place might seem, as Requa put it, "in a state of fearful disorder."

The assayer took the samples from the prospector, labeled them, then went about his test. First he weighed the rock, then noisily crushed it and divided the powder into manageable size. He placed the powder with lead or litharge, borax, soda, salt, and flour—fluxes—in a bone-ash crucible and, as his predecessors had done for centuries, put the crucible in his furnace. When the fair red heat was reached, the assayer poured the melted metal into an iron mold. A small button of lead holding the precious metals formed at the bottom of the mold.

After it cooled, the assayer broke off the slag or waste, placed the button in a cupel, and placed it back in the furnace to burn off the litharge. A small button of gold and silver remained. It was weighed and then dropped into nitric acid, the alchemist's "aqua fortis," which removed the silver under a low heat. Liquid silver nitrate formed, as did a small button of solid gold. This was mea-



An assay shop back room included a work bench with chemicals, rock crusher, and an assay furnace. Unidentified shop, Como District, Nevada, c. 1902. (Author's collection.)

sured in the scales, as was the silver precipitated out of the silver nitrate. The assayer then calculated the weight ratio of the gold and silver at the end of the process against the earlier recorded weight of the sample to get the "dollar value of metal per ton" estimate. The assayer's accuracy and honesty was essential for the task.[22]

With high expectations, the prospector arrived the next day for the results. The assayer's certificate and the fee, usually one dollar per sample, were exchanged. Sometimes a prospector got joyous news, but most often, as Frank Linderman recalled of his own experience, the assayer's job was that "of blasting the dreams of prospectors and miners."[23]

During a boom an assayer's business might be flush. In flourishing Leadville, Henry Wood assayed 20 samples on a light day, 50 on a busy one, and on one record day did 112. Forty- and fifty-dollar days were not uncommon. However, fully 80 percent of the assays, Wood noted, came up with no mineral or evidence of anything of value. At that time, 1879, Leadville had "10 or 12 assay offices" working full time.[24]

The Downer brothers were as busy at boom town Goldfield, where they shared the tasks. Other assay offices had assistants or helpers crushing ore, firing furnaces, making chemical tests, or keeping the shop clean, especially the scales room where the dust from the mining camp's streets forever got into the "airtight" glass cases and spoiled unchecked results from dirty balances. Other tasks might include making charcoal for the furnace or collecting the town's bones for crushing, burning, and pressing into bone-ash crucibles. But these were tasks for the more isolated assayer. Coal and

assay supplies were ordered less expensively from San Francisco or Denver as a camp grew and acquired railroad access.[25]

The Assay Office as Business Center

Around the assay office lurked a particular strand of loungers. They were prospectors, miners, brokers, anyone eager to overhear the first news of a new strike. Strike news was the mainspring of the camp and was rarely kept quiet. Everyone in on a secret had a partner or friend willing to pledge his silence. Even the discoverers, who often had most to gain from silence, could not keep quiet. The early assay book from the first office in Leadville, used when the first big bonanzas were being struck, is nice evidence, with its bent cover and stained pages, "that many of the higher assays were rather promptly celebrated and accidently discovered."[26] Spills of drink and shouts of joy attracted crowds. Loungers around assay shops, waiting for news of new strikes, passed the time recounting adventure tales or hitting up others for a grubstake.

In the larger camps, miners of different immigrant groups divided among the assayers, the Cornish at one shop, the Germans at another, and the Irish at yet another. This distinction helped or hindered an assayer at a new camp. Henry Wood, partnered with Irishman Maurice Hayes, became friends with the early discoverers of Leadville and made connections with its Irish community, which helped him acquire some good mine leases. While Wood did the assay work, Hayes' main function was to "entertain the gang which made the joint their headquarters." The loungers had other benefits, as Wood noted: "I never heard so many good original Irish stories."[27] The assayer, wrote Frank Linderman, "was the confidant and advisor of a veritable tribe of recluses who sought their fortune in the hills."[28]

The mining broker, investor, or engineer also frequented the assay office to learn news of the district or deal with claim owners. The office offered "strict privacy" for promoters dealing with prospectors in negotiating for claims. The prospector probably felt more comfortable in the assay shop as the assayer—who already knew the value of the claims—was more likely to ignore the proceedings than the saloon man or restaurateur. The mining man might also better trust the assayer, as one wrote at Leadville during 1881: "I made the acquaintance of some of the assayers, as they knew what was going on better than most people on the claims. One of them proved to be exceptionally nice, a University man for whom I did some work, to let him get out round a bit."[29] The assayer became trusted and a confidant or he lost business to his competitors.

Assayers by Training and Type

Assayers were "important men, men of scope," more educated than most. During the 1880s, one writer noted that:

> Among the first to hasten to every new camp is an enterprising graduate from Freiberg or some American school of mines, eager to put his newly acquired learning to practical use. He is a mere boy, perhaps. His hands are soft, his tongue unused to all the rough phrases and quaint slang of the diggings, his frame so slight that one of those brawny pick-swingers could hurl him over a cliff with a single hand; but they are glad to see him, and, however much they may laugh at his greenness in mountain manners, hold in high respect his scientific ability, and wait with ill-suppressed eagerness for his report upon the samples they have brought to him for analysis, impatient to hear the word that shall pronounce them rich men or send them out again, disappointed, to search still longer for the glittering prize the rocks so effectually hide.[30]

This portrait of the "Freiberg" or American School of Mines trained assayer was typical of the assayer of the 1870s to 1900s. The assayer was male, white, and, after 1875, predominantly American born. Of the 8,887 "chemists, assayers and metallurgists" in the 1900 census only 248 were female, all but a few of whom were located in the East.[31]

A few women assayers worked in or had their own shops in the West, however. "Miss Hilton" worked as assayer at her uncle's mine in Arizona and was described as "the only woman gold miner and prospector in the Southwest" in 1896. Another woman, Nellie Neal, operated a Cripple Creek shop during her assayer husband's absence, and census records indicate that more than a few women worked with their husbands as partners in assay shops. Nellie was drawn to the Klondike and later worked as Alaskan miner, assayer, and as "Alaska Nellie" became a famed trail-side roadhouse operator in the Far North.[32]

The Boomer Assayer

The assayer was just as mobile as the miner and prospector, rushing from one mining district to the next. Business directories reveal this mass mobility. Colorado had the largest number of assayers in the 1880s. After the silver crash in 1893, of the sixty-two assayers listed in the 1882 directory for Colorado, none remained at their original mining camp shop. Only a handful of these individuals were in business in another Colorado community; the majority of names disappeared from the directories, though the number of assay shops in the state had increased to eighty-one.[33]

The Black Hills of South Dakota had seven assayers in five towns listed in a 1909-10 directory. Only one of these shops appears in the next directory, 1911-12. At a few long-established towns, one assayer would gain public confidence and thus be able to stay in business in the same location for two decades or more—James J. Ott of Nevada City, California; Conrad Wiegand of Virginia City, Nevada; L. Hart of Tombstone, Arizona; the Downer brothers of Goldfield, Nevada; the Molitors of Deadwood, South Dakota; Thomas Buggy of Butte, Montana; Washington Michael Jacobs and Sons, Tucson, Arizona; and four in Colorado: G.K. Thomson of Kokomo, A.W. Hare of Aspen, Wesley Neal of Cripple Creek (Alaska Nellie's ex-husband), and S. F. Jordan of Silver Cliff.[34]

The custom assayer, a businessman in the transitory mining West, rarely lived in the same camp for over a decade or even remained in the business that long. The boom-and-bust cycle of mining dictated his constant removal. In the decade from 1876 to 1886, Henry Kearsing moved from Caribou, Colorado, to Silver King, Arizona, then to Tombstone, and finally to White Oaks, New Mexico. During the same period Jay G. Kelley moved from Georgetown, Colorado, to Prescott, Arizona, to Leadville, becoming one of its "Carbonate Kings." During the 1870s Thomas Maddock followed the crowds to Eureka, Nevada, to Silver City, Idaho, then to Bodie, California, where he gave up assaying to superintend a mill. Similarly, Titus Molitor moved from San Francisco to Salt Lake City to Helena, Montana, then briefly ventured into general merchandising at South Pass City, Wyoming, and silver lead smelting at Argenta, Montana, before returning to Helena, only to be off again for the Black Hills in the late 1870s. And, one more example, Albert Wolters, educated at the Mining Academy at Clausthal, worked in 1860s Georgetown, Colorado, before accepting a rare Federal assayer position at the new U.S. Assay Office in Boise, Idaho. In and out of office because of politics, he would rush to the Wood River country, or elsewhere in Idaho, spending his last years in Hailey.[35]

The assayer changed his occupation as often as his location. The majority of those who learned the bare essentials just as willingly learned the bare essentials of some other business. Thus, assayer Frank Linderman bought a newspaper on an impulse and put out the *Sheridan* [Montana]

Albert Wolters opened the U. S. Assay Office in Boise, Idaho, in 1872 and beautified its grounds. A half dozen towns in the West had branch mints or assay offices under the U. S. Mint, Department of the Treasury. The building still stands, with the State Historic Preservation Office occupying its first floor. (Jack Boucher photographer, Historic American Building Survey collections, Library of Congress.)

Chinook. Ernest Sticht sold life insurance before learning the assay business, but gave up assaying for a pharmacy in New York City, only to abandon that to return west and set up an assay office in Butte—all within eight years. W. H. Williscraft, resident of various northwestern Arizona camps, operated a boot shop, assay shop, and then a photography studio, before settling down as a farmer. John H. Boalt learned assaying at Freiburg and opened an office in Austin, Nevada, but gave it up for a law practice in San Francisco.[36]

Some assayers operated several businesses at once, especially during slack times or when the assayer left the operation of the office to his apprentices. W. J. Howard of Silver City, New Mexico, operated a combination assay office and jewelry store. C. J. Dyer, one of Charles H. Aaron's partners, drew bird's eye views and sold lithograph prints of Prescott, Phoenix, Jerome, Tempe, and Howell, Arizona. One of the more ambitious assayers, Francis W. Blake, from his earliest days in Sacramento, California, to Unionville, Nevada, to Silver City, Idaho, and Prescott, Arizona, operated at one time or another in conjunction with his assay shop a jewelry store, dry goods mart, stage office, Wells Fargo agency, sewing machine outlet, optical office, insurance agency, offices for mining companies, and a banking house.[37]

The assayer played an integral part in the mining industry and often snuck away from the assay shop to speculate in mines. Although our focus here is on the role of the assayer in the community, they were primarily in the business of profiting from mining. They prospected, bought and sold

claims, and built and operated mills and smelters. Some hit bonanzas while others went broke. Assayer Richard Gird helped discover Tombstone, while Frank Hicks threw away the ore samples that would have led to his receiving a cut of the Tonopah discovery. Usually, though, they failed to reap fortunes in the mines, failed in discovering some metallurgical key to unlocking troublesome ores, and when the mines went bust sometimes went bankrupt.[38]

Dislocation was common on the mining frontier, as camps lasted only as long as mines paid or as long as investors were willing to fund work in hopes of future returns. The number of assay offices also reflected general prosperity or interest in a mining district. However, while the number of assay shops in mining camps peaked just after 1900, there was a definite trend away from private practice toward work with larger corporations. Especially evident by World War I, as the old mining camps declined, the number of assay shops in the camps declined. The assayer, therefore, either made his money and got out of the business, went to work for a large company, or stayed on as one of the few residents of a declining camp.[39]

Frank Linderman was a resident of one such declining camp. With a wife and four children and a business so poor it "could not meet my grocery bills," he was forced into the editorship of the *Sheridan Chinook*, the town's weekly newspaper. He was well-known among the town of old bachelors, miners from the 1860s gold rush, and just as poor. Yet they considered him one of the better citizens of town. He became police-judge, and was elected to the legislature.[40]

The Assayer in the Community

A continuing comment about the assayer was his membership in that undefined group of people known as the "better element." However, he was not among those on Mark Twain's list of exalted residents of the Nevada camps of the 1860s: gambler or saloon keeper.[41] His job required trust and public confidence, which meant more sobriety, though a number of assayers were well-known topers. As one of the more cultured members of a community, he had an inclination to church and tamer entertainment. He sought and found other stabilizers of the community. As one assayer later wrote: "It must not be thought that there were no real family life and no better element in Leadville. Always, in every mining town I have been in, were men who respected law, order and decency."[42] Another assayer, who arrived in Pioche, Nevada, in 1870 at the start of its boom, wrote to his mother in 1872: "You must not believe the stories circulated in the newspapers about the desperate and bloodthirsty character of the inhabitants. Mining towns are no longer what they used to be in early days and the peaceable and well disposed portion of the community is largely in the majority. The shooting and cutting affrays occur almost exclusively among the roughs."[43]

The educated assayer might join religious organizations to stimulate intellectual activity. As one noted, "the great drawback to these mining camps is the lack of intellectual recreation." One spent time, he wrote, "twidling one's thumbs," discussing "the merits or detriments" of some mine, or reading. Other assayers helped organize churches. George E. Marsh of Georgetown, Colorado, was a "substantial churchman." Judge Lovell of Virginia City, Montana, helped organize its Episcopal Church, and Henry Wood did the same at Leadville. The Downer brothers were active in their Catholic and Episcopal churches.[44]

While all mining camp residents sought entertainment, too often in the saloons and gambling halls, the "better element" organized other diversions. Eager professionals, especially those from the same college, formed societies for friendship and cordial get-togethers. In the 1850s the German Freiburg graduates in San Francisco, which included the majority of the town's assayers, formed the "Deutscher Naturwisseuschaf tlicher Verein," a social and science club. In Leadville, eleven graduates of the Columbia School

of Mines formed an alumni club to foster cultural stimulation. Berkeley graduates organized a group at Tonopah-Goldfield, and a Colorado School of Mines group gathered at Cripple Creek. Of course, such social groups only appeared in the larger boom camps, where adequate numbers of young mining engineers started their careers as assayers.[45]

The assayer also participated in the camp's recreations. He joined fraternal lodges, helped organize libraries and churches, participated in amateur plays, and sang in the church choir. Some indulged in more earthy amusements. Augustus L. Simondi was grand master of Idaho's Odd Fellows Lodge #2; Charles Rumley actively supported Helena, Montana's amateur theatrics and its library; F. W. Blake was active in Prescott, Arizona, lodges and churches. As one assayer noted, "[we all] did our stints at entertainments in the school house once a week. Debating societies, dances, lectures. There were all kinds of religious cranks in the community, so we had a variety in that line." Again, these men were small-town businessmen joining groups or organizations acceptable to their peers, the other members of the camp's "better element."[46]

One miner compared the boom mining camp's atmosphere to a crowd of school children at the beginning of summer recess. The activities of young assayer and later Columbia professor Arthur L. Walker are in accord with this statement. From 1883 to 1885, while assayer for the Old Dominion Copper Company at Globe, Arizona, he helped organize the Globe baseball team and donned his blue and white uniform with pride. He also served as a director of the Globe roller rink and was the fastest thing on eight wheels—able to fly around the rink a total of one mile in six minutes and one second. He participated in holiday masquerade parties, his slender figure attired like a barber pole, and when spring fever filled the air the Walker cottage was the scene of social gatherings for Victorian ladies and gentlemen, all enjoying cards and dancing and partaking of food and drink. Walker rounded out his social accomplishments by purchasing a photo apparatus and becoming a "Kodak fiend" in the days before instant photography.[47]

The young assayers found a pleasant social circle in the older established camps where, because of their degrees and future possibilities, they were invited to the dances and socials where they might meet the "sisters and cousins" of married residents. They moved, like young Theodore Van Wagenness at Central City, Colorado, among the civilized: bankers, mine owners, and lawyers. Because of their backgrounds—Van Wagenness was a Columbia graduate—and their possibilities of good fortune, educated assayers socialized with the few women of standing.[48]

Other assayers sought such associations as well. Young Louis Janin wrote to his father from Virginia City, Nevada, in 1862: "I am leading such a monotonous existence. I pass month after month in the same manner, making time fly fast by keeping constantly occupied; making plenty of money and spending it, because I have no wife to help me keep it. . . . It is my firm intention to get married next year, or at least, engaged to some girl or other, and I want to start in with a well furnished house."[49] He lived in a shanty improved with carpet, wallpaper, and "costly engravings."

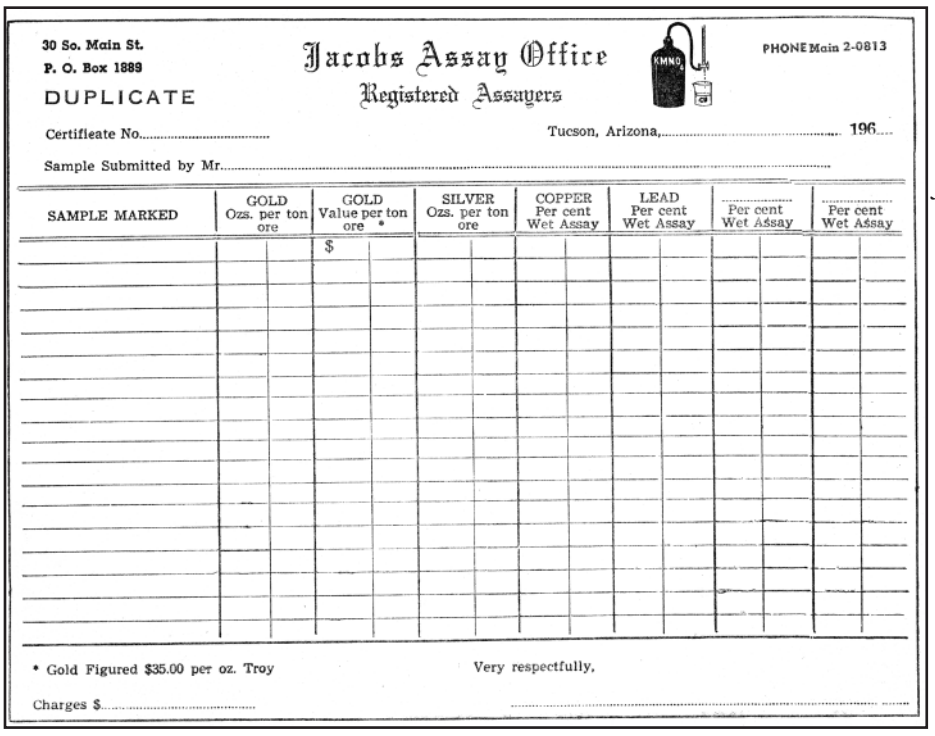
Henry Wood met his wife while she was visiting Leadville. He wooed her and they were married in New York in 1881. Finally, Wood brought his wife to Leadville and set up house. "Life in Leadville was not at all bad for a young couple," he noted. They entertained Eastern friends and a host of young mining engineers. "Entertainments were given on every possible pretext": balls, dinners, church socials, as well as all-night poker games. The young couple had "the time of their lives." "Arthur and Mary Halleck Foote were among our best friends," he noted, and the family married into Colorado's elite. His wife's cousin married J. B. Grant, later Governor of Colorado. Their little social group developed interests in art history, botany, and, of course, mining and fi-

nance.[50]

Also important in the mining camps, assayers initiated or identified themselves with public drives for schools. They sat on the board of education. They were among the few educated people in the mining camp, hence were prompted to action by a combination of responsibility, benevolence, their own family pressure, and community spirit. Early schools found funding scarce if not nonexistent and, in more than one camp, an assayer worked to resolve this situation by starting a subscription drive in order to build a school house and buy supplies. By sitting on the board of education, the assayer passed judgment on teachers and fought county commissioners for school funds. As individual camps grew in size and became more reliant on a few large mining companies as a tax base, company assayers or some other company employee often served on school boards.[51]

Newspapers and other chronicles of mining camps show the heavy cultural, social, and political involvement of assayers. F. T. Freeland, whose "close attention to business affairs leaves little leisure for society," was not typical of the assayer community.[52] Presumably most assayers paid attention to town affairs as well as to business. Assayers, for their small number in the mining camps, were noted as active in school boards, served as legislators, and were treasurers or other county officers.[53]

As each mining camp rarely had more than one or two custom assayers except during boom periods, lawyers and merchants dominated local politics. Yet a few assayers did enter the political arena. John H. Boalt of Austin, Nevada, and W. J. Lovell of Virginia City, Montana, served as probate judges in their respective communities. W. A. Langley of Mineral Park, Arizona, and A. H. Webb of Silver City, Idaho, ran for and won election as county treasurer. Francis W. Blake in Prescott, A. H. Emanuel of Tombstone, and William H. James in Leadville became mayors. Other assayers can be found serving in legislatures. These politician-assayers reflect the changes and transformations assayers brought upon themselves, little else. Such assayers did not long remain assayers. In the case of the politicians, the assaying job was only a brief interlude for individuals looking for the main chance.[54]



30 So. Main St.
P. O. Box 1889

Jacobs Assay Office
Registered Assayers

PHONE Main 2-0813

DUPLICATE

Certificate No..... Tucson, Arizona,..... 196....

Sample Submitted by Mr.....

SAMPLE MARKED	GOLD Ozs. per ton ore	GOLD Value per ton ore *	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	..... Per cent Wet Assay	..... Per cent Wet Assay
		$					

* Gold Figured $35.00 per oz. Troy

Very respectfully,

Charges $.....

An assay certificate. The Jacobs Assay Office opened in Tucson in 1880 and closed in 2011. (From Michael Jacobs, author's collection.)

Adventures in Assaying

This effort to acknowledge the contributions made by assayers to their communities should not be taken as an argument that all were paragons of virtue. Frank Crampton, a resident of the boom town of Goldfield, Nevada, affirmed that "my days were occupied with assaying and surveying." But at night he played cribbage with his partner over supper then wandered the saloons, where they played poker or faro or twenty-one. He also visited the "dance halls, and parlor houses" and "the street where cribs were located," because no other social life with women was available. He left us a rare description of the cribs and one of its residents.[55]

The ranks of assayers included the usual proportion of cranks, frauds, and ne'er-do-wells found in any occupational class. An entire book could be written on fraudulent assayers, bogus gold dust sellers, assayers as fences in high-grade thefts, "seller's assays," and the assayer's part in the world of easy money. In the community, the focus was on the assay shop as good neighbor, or not. When such unsocial manifestations occurred other community members were not slow to cry out against them. Being a tester of gold did not give a person immunity from society's criticisms. Thus the Pioche, Nevada, newspaper vilified assayer Thomas R. Butler, who left unattended his red-hot assay furnace, which set his building on fire and threatened the town.[56] Although the hook and ladder boys saved the town, Butler's name was used in vain for a long time.

Criticism and assaults against Conrad Wiegand, superintendent of the Gold Hill (Nevada) Assay Office, were somewhat singular because he doubled as editor of an odd newspaper, *The People's Tribune*. A newspaper editor lived a more perilous life than most assayers or other citizens, even where his masthead announced devotion to

The company assayer at his gold scales, Fairbanks, Alaska, 1910s. (Herbert Heller Collection, University of Alaska, Fairbanks.)

"the betterment of all things, to the Defense of Right and to the People."[57] Although Wiegand's purpose was to be the moral conscience of Virginia City, he did not escape a beating from one angry reader and a celebrated blast from Mark Twain. Twain wrote:

> If ever there was a gentle spirit that thought itself unfired gunpowder and latent ruin, it was Conrad Wiegand. If ever there was an oyster that fancied itself a whale; or a jack 'o lantern, confined to a swamp, that fancied itself a planet with a billion-mile orbit . . . [that was Wiegand][58]

Wiegand was superintendent "and [the] entire force" of the Gold Hill Assay Office, as well as a street preacher of a mongrel religion of his own invention, and finally an editor. Poor Wiegand suffered from even worse than the fierce words of Twain. In the early 1880s he invested in a tailings mill which failed, contributing to the deterioration of his health and, finally, his suicide.

For the most part the assayer fit compatibly into the mining camp, unless his furnace threatened his neighbors. The dried-wood framed structures lining the main street were kindling for anyone with a careless flame. Whole business districts were destroyed by one candle left unattended. No wonder the assayer's red-hot furnace was constantly watched, and even then several assay shops were destroyed by fire. When a Prescott assayer wished to build a larger works in that town he could not locate a site because of "the indisposition of some owners of property to permit J. M. [Wilson] to run fires close to their homes." Other assayers found themselves similarly blocked by community fears.[59]

When Henry Wood moved to Denver, he found opposition. "As business increased rapidly I had to get quarters," but the smoke from his assay furnace bothered the local bishop who requested "the City Council to have me declared a public nuisance." The bishop failed, but Wood moved to larger quarters elsewhere shortly thereafter.[60]

The Passing of the Independent Assayer

During the 1890s a notable change occurred in the mining camps. Some assayers removed their shops from the business district when the transition occurred to one-mine dominance of a district. Such an assayer usually worked for the company and did a little custom assay work—serving the community, not the company—on the side. In the hierarchy of the company, as in the mining camp community, he held a unique place because of his skill, knowledge, and required honesty. As one assayer wrote, "nobody knows as much about the pay in a mining property as its assayers," thus he was also close-mouthed.[61]

But the company assayer was separated from the loungers on the main street and a "Keep Out" sign often hung over the entrance to his office, since information about a mine was the strictly held knowledge of its board of directors. The assayer's work, thus, became a job apart. He was no longer one of the mining community's businessmen. He was a company man living and working on company property.

In Ely, Nevada, young F. Sommer Schmidt worked as assayer for the Nevada Consolidated Copper Company. He wrote: "You amused yourself by studying or playing at something connected with your work or laying plans for the following day's work." Once a month, on pay day, he went to nearby Ely for diversions in its saloons. He also passed his time by forming a baseball team, the best "in that part of the country." However, he remarked, "there was no social life at the mine."[62] Another company assayer confirmed this, writing: "There is no social life, except for the few families that live at the mine. The time is well spent studying and for recreation, playing tennis and hunting."[63] Assayers in other company-owned camps also noted the limited social life, or the entertainment offered by the company—tennis courts, recreation halls, and theaters by the

1910s. This was a different world.

In the boom camps, the assayer, as a mining camp businessman, was respected as part of the better element. Given their small numbers in each camp, assayers were remarkably active in organizing or participating in churches, schools, and fraternal organizations. They were involved in politics, but not in a way that would indicate that being an assayer was a step along the path to a career in politics, nor that assayers made better political leaders than others in the business community. They were held in esteem by prospectors and miners unless proven too unreliable, incompetent, or just plain fraudulent quacks. They served an important economic function and contributed to the social fabric of their communities. Some became small-town heroes, as exemplified by the case of assayer Ernest Sticht at the one-time gold camp of Republic, Washington.

Sticht rushed to Republic in 1899 and grew with the town. His assay office was a success and he attained a notable popularity. Upon his death in 1911, the twelve-year-old community held a grand wake for the loss of a "pioneer citizen." The mines closed, the opera house was crowded for the funeral, and a miner's band played and a selected choir sang; an editorial in the local paper declared that "the world would be a better place to live in if there were more Ernest Stichts in it."[64]

Robert L. Spude retired in December 2012 after thirty-five years with the U. S. National Park Service. He has been interested in mining since growing up visiting ghost towns in Arizona in the 1960s, and has worked in the field of historic preservation, especially of historic mining sites, since then. He is a graduate of Arizona State University and of the University of Illinois at Urbana-Champaign, has published a number of essays on mining history topics, including in the Mining History Journal, and recently co-authored History of New Mexico *(University of Oklahoma Press, forthcoming). Dr. Spude is one of the founders of the MHA, was its first secretary, and has received the MHA's Rodman Paul Award and Distinguished Service Award.*

Notes:

1. Frank Bird Linderman, *Quartzville* (Larry Barsness, ed.), (Missoula: Mountain Press Publishing Company, 1985), v-x; Portfolio 1, Frank Bird Linderman Memorial Collection, 1885-2005, University of Montana, Missoula.
2. Charles Howard Shinn, *Mining Camps: A Study in American Frontier Government* (New York: Charles Scribner's Sons, 1884); Duane Smith *Rocky Mountain Mining Camps: The Urban Frontier* (Lincoln: University of Nebraska Press, 1967); Rodman Wilson Paul, *Mining Frontiers of the Far West, 1848-1880* (New York: Holt, Rinehart and Winston, 1963). For examples of specific camp studies see: Paul Fatout, *Meadow Lake: Gold Town* (Lincoln: University of Nebraska Press, 1969); W. Turrentine Jackson, *Treasure Hill: Portrait of a Silver Mining Camp* (Tucson: University of Arizona Press, 1963); Malcolm J. Rohrbough, *Aspen: The History of a Silver Mining Town, 1879-1893* (New York: Oxford University Press, 1986); Michael P. Malone, *The Battle for Butte: Mining and Politics on the Northern Frontier, 1864-1906* (Seattle: University of Washington Press, 1981).
3. See Table 1 in: Robert L. Spude, "To Test by Fire: The Assayer in the American Mining West, 1848-1920," (Ph.D. diss., University of Illinois, Urbana-Champaign, 1989), 195-200.
4. Henry E. Wood, "I Remember," manuscript, 30, Henry E. Wood papers, Huntington Library, San Mareno, California.
5. The quote, though from Lindeman's novel (*Quartzville,* 104), is typical.
6. Harry C. Cornwall, "My First Year in the Gunnison Country," *Colorado Magazine* XLVI (Sum. 1969): 220-44.
7. Theodore F. Van Wagenen, "Colorado," manuscript, 36, Theodore F. Van Wagenen papers, Denver Public Library.
8. Spude, "To Test by Fire," directories used for table 1, p. 195-200.
9. Van Wagenen, "Colorado," 35.
10. Van Wagenen, "Colorado," 36.

11. Wood, "I Remember," 30.
12. Business Directories combined with Sanborn-Ferris Fire Insurance maps reveal this shift and clustering.
13. *Ibid*.; Helen Downer Croft, *The Downs, the Rockies, and Desert Gold* (Caldwell, ID: Caxton Printers, Ltd., 1961), 16.
14. The building still stands and is preserved by the city as an "assay office" exhibit.
15. Theodore Van Wagenen edited a newspaper at Georgetown, Colorado; Frank Linderman edited the Sheridan, Montana, *Chinook*; Henry Wood wrote articles for the Sunshine, Colorado, newspapers; John Veatch edited briefly the Austin, Nevada, *Reese River Revelle*. Again, business directories show the other associations.
16. Wood, "I Remember," 24.
17. Wood, "I Remember," 30; Croft, *The Downs,* 125-33; Ledger Book, unnamed assay office, Idaho Springs Collection, Special Collections, University of Colorado, Boulder.
18. Ledger Book, Idaho Springs Collection; Colorado Mining Supply firm catalogues, Special Collections, University of Colorado; Taylor & Co. catalogues, Bancroft Library, University of California, Berkeley.
19. Eugene Burlingame, clippings files, Denver Public Library; "Necrology," *Transactions of the American Institute of Mining Engineers* (1908): lvi.
20. Maps of Silverton (1883, 1886, 1890, 1895, 1902), Telluride (1886, 1890), Durango (1883), Georgetown (1886, 1890), Alma (1886, 1896), Breckenridge (1883, 1886, 1890, 1896), Leadville (1895), Red Cliff (1895), Idaho Springs (1907), Ouray (1908), Cripple Creek (1900), Buena Vista (1908), and Aspen (1904), Sanborn Map & Publishing Company, Colorado Historical Society collections, Denver; *Helena [MT] Daily Herald*, 9 and 10 January 1874.
21. Mark L. Requa, *Grubstake: A Story of Early Mining Days in Nevada Time—1874* (New York: Charles Scribner's Sons, 1933), 33.
22. Otis E. Young, *Western Mining* (Norman: University of Oklahoma Press, 1970), 33-9; Walter Lee Brown, *Manual of Assaying Gold, Silver, Copper, and Lead Ores* (4th ed.), (Chicago: E. H. Sargent & Co., 1892), *passim*; C. H. Aaron, *Assaying in Three Parts* (5th ed.), (San Francisco: The Mining and Scientific Press, 1904), *passim*; thanks to assayer Fred Mosely in Deadwood, South Dakota, who showed me a classic fire assay of gold ores.
23. Frank B. Linderman, *Montana Adventure: The Recollections of Frank B. Linderman* (H. G. Merriam, ed.), (Lincoln: University of Nebraska Press, 1968), 138.
24. Wood, "I Remember," 38.
25. Wood, "I Remember," 38; Croft, *The Downs,* 108; Frank A. Crampton, *Deep Enough: A Working Stiff in the Western Mine Camps* (Denver: Sage Books, 1956), 59.
26. Wood, "I Remember," 31-2; the original of the assay book from the first Leadville assay office is in the Huntington Library, with a copy in the Denver Public Library.
27. Wood, "I Remember," 31-2.
28. Linderman, *Quartzville*, 105.
29. E. T. McCarthy, *Incidents in the Life of a Mining Engineer* (London: E. P. Dutton & Co., n. d.), 48.
30. Ernest Ingersoll, *Knocking Round the Rockies* (New York: Harper & Brothers, 1882), 116; Requa (*Grubstake*, 33) contrasts the old German assayer of the 1870s with the young school-of-mines graduate; John Hays Hammond was one of the young school-of-mines graduates and, briefly, an assayer, see: John Hays Hammond, *The Autobiography of John Hays Hammond* (New York: Farrar & Rinehart, 1935), 74-9.
31. U.S. Bureau of Census, *Occupations at the Twelfth Census* (Washington, D.C.: USGPO, 1902), 7.
32. *Arizona Republic* (Phoenix), 10 Mar. 1896; Nellie Neal Lawing, *Alaska Nellie* (Seattle: Seattle Printing and Publishing Co., 1940), 4-7.
33. The first business directory (1875) listed 17 assayers, a number which quickly rose with the silver boom. See: *Colorado Business Directory and Annual Register* (Denver: J. A. Blake, 1875), *passim*, and subsequent editions.
34. Information based on contemporary business directories. See: Spude, "Test by Fire," Table 1.
35. For Kearsing see: Hiram C. Hodge, *Arizona as It Is* (New York: Hurd & Houghton, 1877), 262; *The Tombstone Epitaph*, 1 Dec. 1881; Morris B. Parker, *White Oaks* (C. L. Sonnichsen, ed.), (Tucson: University of Arizona Press, 1971), 82. For Kelley see: *Weekly Arizona Miner*, 28 June, 6 July, 5 Oct., and 9 Nov. 1877, and 19 Aug. 1881; Don L. Griswold and Jean Harvey Griswold, *The Carbonate Camp Called Leadville* (Denver: University of Denver Press, 1951), inside front cover. For Molitor see: *Mining & Scientific Press*, 29 Nov. 1872; (Virginia City) *Montana Post,* 18 Aug. 1866; 28 Mar. 1868; *Helena Daily Herald*, 13 Sep. 1872. On Wolters see: Clark C. Spence, *For Wood River or Bust, Idaho's Silver Boom of the 1880s* (Moscow: University of Idaho Press, 1999) 38, 66; Lewis Publishing Co., *An Illustrated History of the State of Idaho* (Chicago: Lewis Pub. Co., 1899), 91-2.
36. Linderman, *Montana Adventure*, 120; "Biographical Notes," *Bulletin of the American Institute of Min-*

ing Engineers 56 (August 1911); xxxiv; *Reese River Reveille* (Austin, NV), 8 June 1868, 2 Sep. 1870; "Biographical Notes," *Transactions of the American Institute of Mining Engineers* 26 (Feb.-Oct. 1896): 537-44. Boalt Hall at the University of California, Berkeley law school was named for him.

37. *Southwest Sentinel* (Silver City, NM), 16 May 1883; *Prescott [AZ] Weekly Courier*, 19 Jan. 1884. For Blake see: *Mining & Scientific Press*, 16 Mar. 1861; *Humboldt Register* (Unionville, NV), 25 Mar. 1865; *Owyhee Avalanche* (Silver City, ID), 1 Sep. 1866, 12 Jan. 1867; *Weekly Arizona Miner* (Prescott), 11 Aug and 1 Sep. 1876; *Prescott Weekly Courier*, 19 Jan. 1884.
38. These topics are expanded upon in Spude, "Test By Fire," *passim*.
39. The career biographies of 47 assayers indicate this trend; see: Spude, "Test by Fire," Table 1.
40. Linderman, *Montana Adventure*, 112-21.
41. Samuel Clemens (Mark Twain), *Roughing It* (1872; reprint, New York: Harper and Row, 1962), 255: "the lawyer, the editor, the banker, the chief desperado, the chief gambler, and the saloonkeeper occupied the same level of society, and it was the highest."
42. John Bolton Farrish, "Reminiscences," manuscript, 112, John Bolton Farrish Collection, Colorado Historical Society, Denver.
43. Alex Janin to "Dear Momma," Pioche, 19 Mar. 1872, Janin Family Papers, Huntington Library, San Mareno, CA.
44. Janin to "Dear Momma," 19 Mar. 1872, Janin papers; John Willard Horner, *Silver Town* (Caldwell, Idaho: Caxton Printers, Ltd., 1950), 66; Croft, *The Downs*, 169-75.
45. *Daily Scientific Press* (San Francisco) 4 May and 7 Sep. 1861; Wood, "I Remember," 26; Columbia School of Mines, *The Quarterly* 2 (1881): 151-2; Mary Halleck Foote, *A Victorian Gentlewoman in the Far West: The Reminiscences of Mary Halleck Foote* (Rodman W. Paul, ed.), (San Marino, California: The Huntington Library, 1972), 163-207.
46. (Silver City) *Idaho Avalanche*, 4 Jan. 1879, 29 Apr. 1882; *Montana Post*, 16 Dec. 1865; *Helena Daily Herald*, 2 and 3 Jan. 1877; Wood, "I Remember," 26.
47. (Globe) *Arizona Silver Belt*, 11 Oct. 1884, 31 Jan., 21 Feb., 25 Apr., and 2 May 1885.
48. Van Wagenan, "Colorado," 11.
49. Louis Janin to "My Dear Father," Gould and Curry Mill (NV), 20 Nov. 1864, Janin Family Papers, Huntington Library.
50. Henry Wood to "My Dear Belle," Leadville, 8 Feb. 1880, Henry E. Wood Collection, Huntington Library; Wood, "I Remember," 33-40.
51. *Eureka [NV] Daily Sentinel*, 13 Aug. 1871; *Owyhee Avalanche*, 21 July 1866, 1 Nov. 1873; *Tombstone [AZ] Republican*, 22 Jan. and 6 Oct. 1883; *Corbett & Ballenger's Eighth Annual Leadville City Directory* (Leadville: Corbett & Ballenger, 1887), 39; *Ibid.* (1888), 39; *Ibid.* (1889), 39.
52. Chapman Publishing Company, *Portrait and Biographical Record of Denver and Vicinity, Colorado* (Chicago: Chapman Pub. Co., 1898), 128.
53. Based on biographical data on 47 assayers; see: Spude, "Test by Fire," Table 1.
54. *Montana Post*, 20 July and 30 Dec. 1865; *Reese River Reveille*, 2 Sep. 1870; W. C. Disturnell, *Arizona Business Directory and Gazetteer* (San Francisco: Bacon & Company, 1881), 146; *Owyhee Avalanche*, 15 Oct. 1870; Griswolds, *Leadville*, 114.
55. Crampton, *Deep Enough,* 60-3.
56. *Pioche [NV] Record*, 9 Mar 1873.
57. *Territorial Enterprise* (Virginia City, NV) clipping files, Nevada Historical Society.
58. Clemens, *Roughing It,* 432.
59. Quote from the *Prescott Weekly Courier*, 24 July 1885; (Tucson) *Arizona Weekly Star*, 14 July 1881; (Tucson) *Arizona Weekly Citizen*, 9 Feb. 1884; *Pioche Record*, 9 Mar. 1873.
60. Henry E. Wood, "Denver Incidents," 1, Henry E. Wood Collection, Huntington Library.
61. Linderman, *Montana Adventure*, 103.
62. F. Somner Schmidt, "Early Days at the Nevada Consolidated Copper Company, Ely, Nevada," manuscript, 7, 17, Mark Requa Papers, University of Wyoming.
63. E. H. Clausen to Louderback, Campo Seco, CA, 19 Apr. 1913, George D. Louderback Collection, University of California.
64. "Biographical Notes," *Bulletin of the American Institute of Mining Engineers* 56 (Aug. 1911), xxvi-xxvii.