The Notorious Hartsfeld, "Process Man"

By
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> "All great industries have their parasites, barnacles, and bloodsuckers, and the present activity in the mining industry has brought out several. . . . One is the notorious Hartsfelt [*sic*]."
> —*Mining and Scientific Press*, 30 May 1896[1]

The late nineteenth century was a period of inventing dramatic new processes to extract metals from ore. The mining industry depended on, and thrived because of, skilled metallurgists who, by science and craft, built and efficiently ran ore concentrators and smelters. Masquerading as the next mining revolution, however, were many men peddling useless and fraudulent processes. A Professor Benjamin Silliman, Jr., returned from a western trip to lament: "Colorado is a mining country cursed by 'processes.'"[2] But the problem was not confined to a single state.

The inventors of these new methods, called "process men," often promoted their useless methods with phrases more appropriate for the ancient alchemists. They often promised to recover even more gold than could be detected by the reliable fire assay. Their explanations were more imaginative than factual: the fire assay drove off the gold and silver as vapor; the gold existed in an unstable form sometimes called green gold, monatomic gold, or nonmetallic gold. Process men ranged from overoptimistic to fraudulent; investors lost money all the same.

Enter Charles Hartsfeld

One of the most persistent and fraudulent of the process men was Charles L. Hartsfeld. Although continually denounced by editors of mining magazines and by his former customers, he sold his faulty process-

es over a long career in the United States, Canada, and Mexico. His victims lost money to Hartsfeld for smelting furnaces, lost even more money trying to get the useless furnaces to work, and some were seriously injured—and two killed—by exploding Hartsfeld furnaces.

Charles Ludwig Hartsfeld was born in Stettin, Germany (now Szczecin, Poland), but he reported various birth years. The age on his marriage license placed his birth in 1851, but in the 1900 census, he reported that he was born in February 1849, and had immigrated to the U. S. in 1860. In the 1910 census, he said that he had been born in 1845, and had come the U. S. in 1870. Finally, his death certificate stated that he was born in 1844. He was also flexible in spelling his name. As did many immigrants, he Americanized it to different degrees. Commercially, he went by Hartsfeld, and in later years von Hartfield, but in census records and city directories he spelled his name variously as Hartzfeld, von Hartzfeld, and Hartzfelt.

There is no known record of him until 1884, when he married widow Sarah Klein in Newport, Kentucky, and started a smelting business there, across the Ohio River from Cincinnati, Ohio. Where he got his metallurgical knowledge is unknown. His publicity claimed that he had worked extensively in Colorado and other western smelting centers, but no one in the West seems to have remembered him. At other times, his advertisements emphasized his German origin, and implied that he had worked as a metallurgist in Europe. German technology carried very high prestige in the late 1800s, particularly in chemistry and metallurgy, and Germany was known for development of water-jacket smelting furnaces before they came to the United States.[3]

Water-Jacket Smelting Furnaces

In his 1877 report, *Statistics of Mines and Mining of the States and Territories West of the Rocky Mountains*, Rossiter Raymond wrote that the "principle of cooling by means of water the surfaces of metallurgical apparatus exposed to the highest temperatures is one of the most important in modern metallurgy."[4] Water-jacket smelting furnaces were smaller and lighter than standard furnaces, making them easier to transport to isolated mining camps. They were also simpler to operate. Water-jacketed furnaces replaced the old refractory furnaces throughout the western U.S. in the 1870s, and as they were adapted and improved over the original European design, they came to be known as the American system of ore smelting. With a smelting furnace nearby, mine owners could avoid the high cost of hauling ore to smelters many miles away.[5]

Hartsfeld organized the Hartsfeld Portable Smelting Furnace and Mining Company, and recruited Newport businessmen to serve as officers and directors. Having local businessmen as company officers gave the company credibility and a measure of legal protection. Locating the company across the Ohio River from Cincinnati gave the additional legal protection of being next to a major city, yet in a different state.[6]

Hartsfeld's prize company director—and vice president of the Hartsfeld Portable Smelting Furnace company—was R. W. Keim, editor of the *Kentucky State Journal*. In April 1885, his newspaper printed a worshipful article on Hartsfeld and his furnace, claiming falsely that Hartsfeld was a world-famous metallurgist, and that his new furnaces were successfully being used in nine European countries. The story quoted supposed endorsements of Hartsfeld from magazines such as *Engineering* and *Scientific American*, but which had never appeared in those journals. The article was reprinted by newspapers across the country. The *Black Hills Daily Times* skeptically put the entire article in quotes, but most papers copied it uncritically as a straight news story. Hartsfeld followed this publicity with a nationwide newspaper advertising campaign in November 1885.[7]

Hartsfeld applied for a patent for his furnace design in April 1885; the patent was granted in March 1886. Hartsfeld furnaces came in differ-

ent sizes to handle from five to fifty tons of ore per day. The five-ton model, apparently the most popular, was called a "portable smelting furnace," and was only seven feet tall and two feet, three inches wide. It weighed 1,600 pounds, and Hartsfeld advertised that it could be hauled by mules to the most remote mine. Hartsfeld's seductive publicity offered ore furnaces with lower operating cost and greater ease of operation.

The glowing newspaper articles and phony endorsements convinced a number of companies to order Hartsfeld furnaces. Newspapers across the West reported on the performance of Hartsfeld's portable water-jacket furnaces. One reporter remarked in 1888—with how much exaggeration we do not know: "It was stated, and perhaps truthfully, that a Hartsfeld smelter of five tons capacity might be found in any mining camp of the West, and that not one of them had proved a success."[8]

When the Woodburn Smelting Company of Idaho Springs, Colorado, bought a Hartsfeld furnace in 1886, the *Colorado Mining Gazette* headlined: "Our City Selected for Placing the New Hartsfeld Smelter." But by 1888, the same newspaper had changed its view, and called the Hartsfeld furnace "that gigantic humbug."[9]

The *Rocky Mountain Mining Review* published an ode to the Hartsfeld furnace so extravagant that it must have come from Hartsfeld himself. The news item quoted supposed endorsements from the journals *Scientific American* and *Engineering* to the effect that Hartsfeld furnaces were successfully treating ores in nine European countries, and that he had recently relocated from Germany to Kentucky. His furnaces could supposedly refine thirteen different metals, from bismuth to zinc, plus jasper. How anyone could—or would want to—refine jasper, a form of quartz, was left unexplained.[10]

In 1887, Hartsfeld persuaded two Colorado companies to buy his smelters. The Cornucopia smelter in Buena Vista did not operate as advertised: the capacity was only fifteen tons of ore per day, rather than the forty tons claimed by Hartsfeld, and too much silver and lead were lost in the slag. A Hartsfeld smelter was also installed at Idaho Springs, but never processed any ore.[11]

Hartsfeld smelting furnaces were mostly disappointments. A smelter in Cooke City, Montana, started up in December 1885, but shut down repeatedly because molten slag froze in the pipes, and after two weeks of experimentation, the furnace sprung a leak which could not be repaired. The company blamed the failure on bad design, faulty construction, and use of materials not strong enough for the purpose.[12]

> "In answer to your inquiry, we must say that the Hartsfeld furnace is a total failure, and Hartsfeld, together with his menial agents, a set of notorious frauds and imposters."—Gassert, Black and Company, Cooke City, Montana.[13]

A Hartsfeld furnace shipped to Gorman, South Dakota, in late 1886 was taken to Galena, where its owners spent a year of dedicated trial and error and modifications before they could coax the furnace to perform adequately. Another smelter at Milo, Idaho, kept freezing up, and had to be abandoned.[14]

In some cases, the furnaces worked with no complaints. A five-ton-per-day furnace at Tombstone, Arizona, worked well enough that its owners ordered a forty-ton version. A Hartsfeld furnace installed at a lead mine near Georgetown, Kentucky, also performed satisfactorily. But these were the minority. Users complained that the furnaces were crude and cheaply made. Hartsfeld himself did not make the furnaces. They were made by a firm of boiler manufacturers in Cincinnati and intended for smelting iron, with Hartsfeld making minor changes to them.[15]

Beyond Hartsfeld's hype and shady practices, the Hartsfeld furnaces, especially the five-ton-per-day model, may have been too small to be practical. Waldemar Lindgren, the influential mining

engineer and geologist for the U.S. Geological Survey, recalled: "The small water-jacket furnace was evolved and thought for a time to be a panacea against all evils; every mine with smelting ore must have one. Smelting works multiplied rapidly, but alas, the small furnace proved adept at 'freezing up' and many a company came to grief because of it."[16]

Cooperating with Swindlers

When ore samples proved too poor for profitable mining, Hartsfeld was not above reporting higher metal values than the rock actually contained, sometimes much higher. Swindling mine promoters learned that a successful test-run of ore could be arranged at the Hartsfeld's Newport smelter, whether or not the ore held any metal. Investors might have wondered why the promoter bypassed closer smelters to ship his ore all the way to Kentucky.[17]

In 1885, when promoter Samuel Aughey wanted to convince investors to disregard poor assay results from his Carbonate Belle prospect a few miles west of Cheyenne, Wyoming, he ignored the nearby Denver smelters, and shipped a load of ore 1,100 miles, to Newport, Kentucky. Hartsfeld obligingly reported that the barren rock was rich in gold. Miners at Farwell, British Columbia, shipped eleven tons of ore 2,500 miles to Newport, where Hartsfeld reported an astounding 1,981 ounces of silver per ton.[18]

Promoters of the Lost Louisiana mine in Arkansas, supposedly a bonanza mined by Spaniards before the Americans arrived, likewise shipped some ore to Hartsfeld, who in May 1887 reported twenty dollars in gold and thirty-four dollars in silver per ton of rock, while honest assayers failed to discover any trace of precious metals.[19] Hartsfeld's results elated the mining boom towns of Crystal and Bear City, Arkansas. Real estate values in Bear City jumped 25 percent overnight. Hartsfeld followed up with a trip to the Arkansas mines, and the company spoke of buying a Hartsfeld smelter to treat the Lost Louisiana ore, but bought another smelter instead. The Lost Louisiana mine never produced any gold or silver, and the central Arkansas gold and silver boom died after the Arkansas state geologist denounced it as a fraud in August 1888.[20]

Hartsfeld managed to recover gold and silver from the unlikeliest ore—from places never known to have precious metals, before or since. In 1887, Hartsfeld extracted 2.5 ounces of gold per ton from rock from Lewis County, Kentucky. Fortunately, potential investors chose to believe other assayers, who reported no gold in the supposed ore, and the gold excitement abated.[21]

A Silver Mine in Indiana

Legends of silver mines in Indiana made fertile ground for phony silver mines. Rumor had it that before they were removed, the Native Americans of the area had sold silver nuggets to French and American traders. "Uncle" Johnny Hoffman told of searching intensively in the early 1800s without success for the lost Indian silver mine in Dubois County.

John Seitz, who ran the saloon in the small town of Haysville, Jasper County, Indiana, became fascinated by some rock specimens he found while mineral prospecting on the Jacob Neukam farm, along the East Fork of the White River, at a place called Buck Shoals. Seitz was not the only prospector in the area, and every few years one of these optimists would mistakenly announce the discovery of a gold or silver deposit in southwest Indiana. Seitz and some friends leased the mineral rights from Neukam in 1884, and started sinking a shaft. His friends dropped out, but Seitz found assayers who told him that there was silver in the rock and persisted. In August 1887 he sent a load of rock to the Hartsfeld smelter at Newport, Kentucky.

Charles Hartsfeld reported that the rock contained fifty-nine ounces of silver per ton. It had no silver, of course, but Hartsfeld convinced Seitz

and some others to form the Buck Shoals Mining and Smelting Company. John Seitz was company president, and Hartsfeld vice-president and part owner. The landowner, Jacob Neukam, received one-quarter interest.

Hartsfeld was not the only one to report silver in the rock. This may be puzzling, but was not unique. Multiple assayers misreported high gold and silver values in worthless rock in other places in the late 1800s, for example in western Kansas and in the Wichita Mountains of Oklahoma.[22] There may be three reasons for this: first, some assayers deliberately reported gold and silver in their samples to generate more assaying business; second, samples may have been salted; or third, there may have been errors due to poor assay technique. For whatever reason, enough different assayers found enough silver in the samples from Buck Shoals to remove doubt in the minds of investors.

For many years thereafter, visitors to the mine site observed a pile of a few tons of ore, visibly rich in galena, a lead sulfide mineral, along with fluorite. But the source of the galena-fluorite ore is a mystery—such ore has never been found in Indiana, and is not found in place at Buck Shoals. The nearest source of such ore is about one hundred miles southwest, near Cave-in-Rock, Illinois, but the ore at Cave-in-Rock does not have any silver.

A Buck Shoals historian theorized that the fluorite may have been brought in years previously to use as flux in a local iron furnace, and for some reason left unused.[23] A drawback to this theory is that most iron smelting uses limestone as flux, which is much cheaper than fluorite and available locally. Another reason to question the flux theory is that the mine's output was reported to be much more than could be explained by a load of flux.

False reports of silver mines in Indiana were nothing new. Previous to 1878, at least eight other counties across the length and breadth of the state hosted supposed silver mines, which produced much excitement, but no metal.[24] Neighboring Pike County to the west was especially thick with false silver mines. The Indiana Geological Survey remarked of Pike County in 1872 that "fifty places are pointed out by Indian story as 'lead and silver mines.'"[25]

The news of silver at Buck Shoals set off a new frenzy of prospecting in southwest Indiana. One of the prospectors was a former territorial geologist of Wyoming, Samuel Aughey. Aughey had formerly worked with Hartsfeld to promote a worthless mining property west of Cheyenne.[26] The Buck Shoals claim set off another round of false discoveries, encouraging spurious reports of other silver orebodies elsewhere in Indiana, which, in turn, reinforced belief in the Buck Shoals Mine.

After spending $50,000, Buck Shoals Mining and Smelting Company blew in its Hartsfeld smelter in December 1887, and reported recovery of $1,200 per day in metals, mostly silver—for three days. The smelter restarted in January 1888, and ran for three weeks before the operation ran out of coke and the smelter shut down while the company built a larger coke shed. The promoters bragged that its ore averaged 58 ounces of silver and 4.1 ounces of gold per ton "according to United States mint reports," which was so much nonsense because mint reports for 1887 and 1888 show no silver at all being mined or smelted in Indiana.[27] The operation started again in February with plenty of coke, but the smelter seemed to be idle most of the time. The publicity attracted potential investors from Louisville and Frankfort, Kentucky, but they collected samples of what Hartsfeld called rich ore, and sent them to both the Kentucky Geological Survey and the U.S. Mint in Philadelphia. Both institutions found no more than traces of silver.[28]

Despite enthusiastic support from local newspapers, there were signs of popular skepticism. Hartsfeld and John Seitz organized an addition to the town of Haysville, the town nearest the mine, about doubling its size. They must have been disappointed when lot sales in 1888 brought in only

$413.[29] Another sign of doubt came in August 1888, when Jacob Neukam advertised in the Jasper *Weekly Courier* to sell his quarter interest in the silver mine.[30]

The smelter shut down in March 1889 because the ore had become flinty and the company needed to install a rock crusher. The operation restarted in July with the crusher, but shut down again in August 1889, with the explanation that the company needed to hire an expert smelter operator. By this time Hartsfeld was long gone. The last time Dubois County, Indiana, heard from him was in July 1888, when he wrote from Kentucky, threatening to sue the editor of the Huntingburg *Independent* for libel. Company president John Seitz never restarted the smelter after August 1889, but, for years after, insisted that the mine was rich in silver and had a glorious future.

Gold in Michigan

Prospectors on the upper peninsula of Michigan had been finding traces of silver for years near the town of Wakefield. In 1887, W. W. Warner located a silver vein with a dowsing rod, and sold the property to the Washburn Mining and Milling Company of Minneapolis, which sank a shaft. The property shipped a load of ore to Newport, Kentucky, where Hartsfeld supposedly extracted thirty ounces of silver and two-thirds of an ounce of gold per ton. Based on Hartsfeld's results and other high assays, the Washburn company built a mill, and in early 1889 was discussing installing a one hundred-stamp mill. Everything was supposedly going well as the company prepared to start production, other than a report that the ore was "somewhat intractable" and required special treatment. Then, in June 1889, the mine suddenly shut down without explanation and never re-opened.[31]

The Hartsfeld Aluminum Process

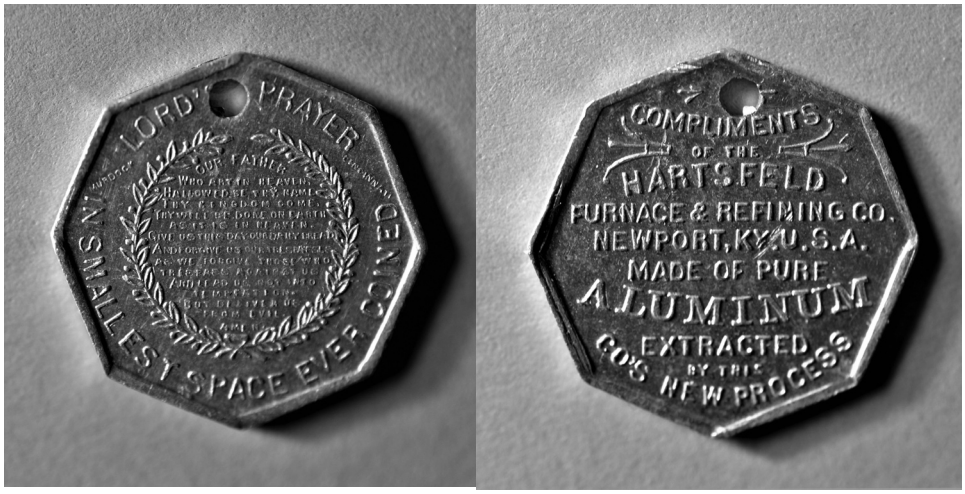
Hartsfeld's smelter business slumped after 1886, so he jumped on the latest metallurgical sensation. In 1888 he announced that he had invented a way to extract aluminum from common clay.[32]

Aluminum was the wonder metal of the late 1800s. It is the most common metal in the Earth's crust, but from its discovery in 1807 into the 1880s, could only be produced by expensive chemical processes, at a cost that made aluminum a precious metal. In the early 1880s, the U.S. Geological Survey quoted the price of aluminum per Troy ounce, like gold, silver, and platinum. In 1883 aluminum cost $0.88 per ounce, compared to $1.29 for silver. A cheap process to convert ore into metallic aluminum would be worth a fortune.[33]

Hartsfeld organized the Newport Aluminum and Cast Steel Company, the Newport Aluminum and Steel Company, and the Schmiedbarenguss Furnace Company, and advertised in Germany and the United States.[34] Hartsfeld claimed that his process was unique in that it could supposedly produce metallic aluminum metal from an ordinary metal smelter because of his secret flux. The *Engineering and Mining Journal* called Hartsfeld "a charlatan without metallurgical knowledge," and warned that the Hartsfeld process was incapable of producing aluminum.[35]

Hartsfeld promoted his phony aluminum process by minting small (17mm diameter, about dime-sized) aluminum medallions with the Lord's prayer on one side, and an advertisement for the Hartsfeld Furnace and Refining Company on the other. The medallions were supposedly samples of the high-quality aluminum produced by Hartsfeld's secret process, but in truth he bought the aluminum from the Frismuth metal works in Philadelphia, run by fellow German immigrant William Frismuth. We know this because, as was his habit, Hartsfeld did not pay his bills, and the Frismuth company had to sue to collect.[36]

Hartsfeld's promotion caught the attention of Selma, Alabama, businessman George Stuck. In 1892, Stuck and Hartsfeld established the South-



In the 1880s, aluminum products were still a novelty. Hartsfeld misrepresented these tokens as being of high-grade aluminum made by his own secret process. (Author's photos.)

ern Aluminum Reduction Company, with Hartsfeld supplying his secret aluminum process, and Stuck providing the bulk of the money to build its facility at Rome, Georgia, chosen for its proximity to bauxite deposits. Construction began in September 1892, and the plant was reported in full production in May 1893, with aluminum ingots piling up on the property. The *Atlanta Constitution* observed that at the claimed rate of processing of twenty-five tons of bauxite per day, the works was the largest aluminum producer in the United States, and perhaps the world.[37]

The plant was making lots of metal, but the metal was not aluminum or any alloy of aluminum. The plant was probably producing pig iron. By February 1894, Stuck had given up trying to get the furnace to produce aluminum, and shut down the operation. He appealed to Hartsfeld to reveal his secret process, but Hartsfeld refused, and went back to Kentucky. Hartsfeld also tried to promote companies to build his aluminum furnace in Texas and Illinois, but with less success.[38]

Hartsfeld was not alone in promoting a dubious aluminum process. Between 1886 and 1894, at least thirteen American inventors announced new processes to economically extract aluminum from clay, and at least three plants were built to produce aluminum from clay. In 1892, the U.S. Geological Survey named ten companies that claimed great success in extracting aluminum, but did not actually produce any. Most prominent among the aluminum process men was German immigrant Joseph M. Hirsch of Chicago, who falsely claimed to have invented a method of extracting aluminum metal from clay for only a few cents per pound.[39] Springing up to advertise the many phony aluminum-smelting processes was the periodical *Aluminum Age*, which the *Engineering and Mining Journal* described as "the finest assortment of humbugs we have seen collected in serious form in a single paper." Competition among thieves became so fierce that Hartsfeld took out advertisements denouncing his fellow aluminum-process swindlers.[40]

Aluminum swindles were ultimately put out of business by the Hall-Heroult electrolytic process, invented independently in 1886 by two young inventors: Charles Hall in the United States, and Paul Heroult in France. They were each only age 23 at the time. The process was put into commercial production in the United States in 1889, and the success of the process, which is still used today, sent the price of aluminum from $9.01 per pound in 1885 down to $0.50 in 1895. Aluminum became too cheap to excite investors, so Hartsfeld dropped his aluminum-process swindle.[41]

Trouble with the Law

Charles Hartsfeld was jailed in July 1888, charged with fraud for selling five nonexistent city lots in Chicago. After a couple of nights in jail, bond was reduced to an amount he could afford, and he was released pending the next grand jury. Hartsfeld presumably squared things sufficiently with his victim to settle out of court.[42]

Hartsfeld was well known for not paying his advertising bills, and the U.S. Post Office received complaints from swindled periodicals—even from a magazine aimed at postal employees. Postal inspectors had Hartsfeld arrested for mail fraud in April 1890, and brought witnesses to Cincinnati where his trial began in May. The assistant district attorney, however, had neglected to properly notify the defendant, and the federal judge directed the jurors to acquit Hartsfeld, which they did without leaving their seats. A grateful Hartsfeld gave each member of the jury one of his Lord's Prayer aluminum medallions.[43]

In 1892, Hartsfeld incorporated the Chicago Heights Wrought Iron Casting Company in Illinois, but the company quickly disappeared. The company presumably meant to use his patent, granted the previous year, for an iron alloy with supposedly superior properties. As later events proved, his process for manufacturing marketable iron was a complete failure.[44]

Saint Louis

After his aluminum fraud fizzled, Hartsfeld tried to return to his water-jacket smelters with a flood of newspaper ads in December 1893, but with little success. He also began casting about for a place to relocate. In February 1894, he was exploring the idea of building a large smelter at Auburn, California, but decided to move to St. Louis, Missouri, instead.[45] Hartsfeld persuaded St. Louis businessmen to invest fifty thousand dollars in the new Denverside Smelting and Refining Company of East St. Louis, Illinois, Charles Hartsfeld, president.

The *Engineering and Mining Journal* denounced the concern as a swindle "established by the notorious C. L. Hartsfeld."[46] His St. Louis shareholders quickly became dissatisfied with Hartsfeld's methods. Four significant shareholders calling themselves "the big four" tried to oust Hartsfeld at the annual meeting of Denverside Smelting in May 1895. Hartsfeld held a controlling number of shares and quickly appointed his chosen directors and company officers, but the dissidents came armed with clubs, took over the meeting by force, and ejected Hartsfeld and his allies.[47]

Hartsfeld and his opponents then traded blows in court. Hartsfeld swore peace warrants against two of the big four, saying that they had threatened to kill him at the annual meeting. The following month the big four had Hartsfeld arrested and charged with embezzlement, but a judge cleared Hartsfeld and released him. Hartsfeld thereupon charged his accusers with false imprisonment. He also charged that one of the dissidents had committed a federal crime by sending him a threatening card through the mail, but the man said that the card was a forgery, and in turn charged Hartsfeld with false swearing. In the end, Hartsfeld kept control of the company.[48]

In January 1896, Hartsfeld reorganized Denverside Smelting into the National Ore and Reduction Company, and he returned to the portable smelter business with a blizzard of newspaper advertisements in mining centers across the West starting in September 1896. Some mining magazines realized that this was another Hartsfeld scam, but their warnings did not stop him from selling furnaces. Hartsfeld's wife Sarah became president of National Ore Reduction, while he spent much of his time on the road, including in northern Mexico.

Red River, New Mexico

One buyer of a Hartsfeld furnace was the Red

River Mining Company in New Mexico. The equipment arrived from Saint Louis in September 1896. The first attempt at blowing in the furnace failed when the molten ore froze inside the furnace and had to be laboriously broken out with picks. The second attempt ended when steam pressure exploded the boiler jacket, seriously injuring five workers.

By August 1897, after more attempts in which the ore froze within the furnace, the owners abandoned the smelter, and resigned themselves to the high costs of shipping ore out of the district.[49] The failure of the Hartsfeld furnace ended the Red River Mining Company's efforts to smelt ores locally, and perhaps discouraged other companies in the district from building a smelter. The lack of a local smelter condemned the low-grade ores of the Red River district to unprofitability.

Marble, Colorado

The Hoffman brothers, Al and Leonard, operated gold and silver mines near Marble, Colorado, and saw that the cost of shipping ore out of the district was limiting profitability. In 1896 they shipped two loads of ore to Hartsfeld in East St. Louis, who—of course—assured them that a Hartsfeld furnace was just the thing to recover precious metal from Hoffman ore. The Hoffmans bought a Hartsfeld furnace with a money-back guaranteed recovery of 95 percent of the gold and silver.[50]

The machinery arrived at Marble in April 1897, and the furnace blew in in early August. Over the next four months, the smelter started and shut down at least six times. Hartsfeld's stepson, Henry J. Klein, arrived in Marble in September to get the furnace working. A local newspaper described Klein as a "smelter expert," though only nineteen years old. But young Klein was lying about his age: he was really only sixteen. He restarted the furnace, but it froze up the next day, and a new furnace had to be shipped from East St. Louis. The *Mining and Scientific Press* noted: "The notorious Hartsfeld and the International Ore and Reduction Co. are heard from at Marble City, Colorado, this week."[51]

Although the furnace had a nominal capacity of thirty tons per day, when it shut down for the winter it had processed only one hundred tons of ore—less than four days of nominal capacity. Klein returned to Marble and blew in the furnace in April 1898, but in July it was still not working steadily. The Hoffman brothers seem to have solved the problem by bringing in a smelting furnace from another manufacturer in August 1898.[52]

Oro Grande, California

Hartsfeld contracted to build and start up one of his furnaces at the Oro Grande mining district of San Bernardino County, California. Hartsfeld's contract called for him to spend thirty days to get the furnace working, but he stayed only five days before leaving it in the hands of an inexperienced worker. After two months of fitful operation, the furnace had created only ten tons of slag and no metal. The attempt ended when the water jacket exploded, scalding two workers to death.[53]

Despite Hartsfeld's explosive failures in California and New Mexico, his salesmanship attracted more mining companies. Hartsfeld turned up in Canada in 1898, as the co-proprietor of a smelter in Madoc, Ontario. His partner was a grocery salesman posing as a mining engineer.[54]

A Gold Mine in Nebraska

In the spring of 1895, J. S. Dillenbeck was excavating the side of hill to build a barn on his farm east of Milford and about eighteen miles west of Lincoln, Nebraska, when he dug into unusual-looking soil. He threw some of the soil onto burning coals, and saw a rivulet of silvery metal flow from the fire. Dillenbeck sent samples of the dirt to various assayers, and received word that his farm ran from $70 to $156 in gold per ton, plus

some silver. Supposed mining expert Professor Herbert Bartlett visited the farm and reported: "I found a gravel gold[-]bearing claim miles in extent and much of it fabulously rich, and taking it all together it is equal in extent, vaster in depth, and richer in value than any similar deposit in the world."[55]

Gold excitements were a common occurrence on the Great Plains of the United States in the late 1800s and early 1900s. Sometimes they fastened onto supposed gold-bearing shale; sometimes they were inspired by actual traces of placer gold. The gold shale excitements were based on phony assays; the gold placers were all too small to support commercial extraction. Gold shale excitements occurred near Sioux City, Iowa (1871), Hays, Kansas (1897-1903), New Cambria, Missouri (1908-1909), and Akron, Colorado (1896-1899). Placer rushes took place at Eldora, Iowa (1852), Augusta, Illinois (1866), Decatur, Illinois (1875), Fort Ransom, North Dakota (1884), and Denbigh, North Dakota (1908). None of the gold discoveries proved commercial.

Among the assayers confirming the high gold values was Charles Hartsfeld in St. Louis. Hartsfeld's assays were so favorable that J. S. Dillenbeck bought a five-ton Hartsfeld smelting furnace in March 1897, even though a smelting furnace is useless for working a placer deposit. Dillenbeck struggled with the Hartsfeld furnace through most of 1897 before giving up on gold mining. He was still convinced that he sat on a huge gold deposit, and in 1899 was in talks with a process man out of Colorado who said he had invented a method to economically extract the gold.[56]

Gold fever spread, and another supposed gold deposit was discovered ten miles south, on the farm of a Mrs. Muff, near Crete in Saline County, Nebraska. Here Hartsfeld met some stiff competition from the Beam Process, invented by Aron Beam of Denver, whose process frauds were regularly denounced by legitimate mining journals. Beam, as usual, reported good values of gold and silver in the dirt, but Hartsfeld's furnace had the supposed advantage of also recovering thirty dollars per ton worth of asbestos from the soil. The manager of the Muff farm spoke of installing a twenty-ton Hartsfeld furnace, but the gold excitement faded at the end of 1897, and it appears that no furnace was installed.[57]

In 1896 and 1897, Hartsfeld travelled to various cities to talk up the possibility of setting up large smelting operations. Perhaps, as in 1894, he was looking to relocate. Potential sites noted by newspapers included San Francisco, several places in the tri-state lead district of Missouri-Kansas-Oklahoma, and Perryville in the southeast Missouri lead belt. Availability of local investment appears to have been as important as the quality and quantity of ore. He did not find what he was looking for, however, and stayed in St. Louis.[58]

Ousted in Saint Louis

Changing its name to the National Ore and Reduction Company did not solve Hartsfeld's problems with its shareholders. Company secretary Herman Meinhard realized that Hartsfeld was a fraud, and led a shareholder revolt to take over the National Ore and Reduction Company. In October 1898, the company announced that Hartsfeld had been fired from his position as general manager. But Hartsfeld announced by letter from Chihuahua, Mexico, that he was in control of the company, and fired Herman Meinhard. Hartsfeld owned only one share of stock, but his wife was the largest single shareholder. However, for unknown reasons, Sarah Hartsfeld sided against her husband, and cooperated with the dissident shareholders in firing Charles Hartsfeld and keeping Herman Meinhard. By the following March, new management had bought Mrs. Hartsfeld's interest, and had full control of the company, renamed the Union Smelter Manufacturing Company to avoid the disrepute of its former name.[59]

While Hartsfeld battled long distance with shareholders, letters reached St. Louis saying that

he had suffered life-threatening injuries when his horse fell on a steep and remote mountain trail in Mexico. His recovery was said to be doubtful. The truth of the incident was questioned after some noticed that the letters, supposedly written by a J. Lanigan, all had handwriting strongly similar to Hartsfeld's.[60]

Hartsfeld landed in Durango, Mexico, where he organized the National Ore and Reduction Company of Mexico. Hartsfeld advertised his new company in American journals, but the *Mining Reporter* denounced the firm as a front for "C. L. Hartsfeld, a man notoriously unscrupulous in all his business affairs."[61] The *Mining and Scientific Press* identified the advertisements as the work of "the notorious Hartsfelt [*sic*], who has been exposed over and over again."[62]

After failing to gain any business since his exposure, in 1900 Hartsfeld advertised metallurgical services in American mining journals under the name Campbell Davies and Company. He promised that his new pyritic smelters could produce metal without even fuel or flux, and would extract enough energy from the ore to also supply steam power to an entire ore-processing facility. His attempt to promote a Mexican mining property was exposed when the *Mining Reporter* recognized in the scheme "the fine Italian hand of the notorious Hartsfeld."[63] Hartsfeld's partner, Campbell Davies, was an alcoholic Briton living in Mexico, and proved even less trustworthy than Hartsfeld, leaving Durango with Hartsfeld's money. The U.S. consul in Durango, who had been falsely advertised as a company director, took the unusual step of asking the Mexican government to deport Hartsfeld as an undesirable alien.[64]

Hartsfeld appeared in Detroit in early 1901, and sold shares in his newly organized American Wrought Iron Casting Company, promising that his furnace would produce a superior grade of wrought iron at half the price. Hartsfeld stretched out construction until investor money and patience were exhausted, but the big demonstration in front of shareholders produced iron of such poor quality as to be useless. He hurried out of Detroit, and was reported in Buffalo and some locations in Canada.[65]

In December 1901 he appeared in Milwaukee under the name Charles Hartfield, organized the Hygeia Manufacturing Company, and entered an entirely new line of work: patent medicines. He made and marketed Cel-Pep-Ko, a "nerve tonic" and antidote for intoxication. He travelled about the Midwest promoting Cel-Pep-Ko until it apparently ran afoul of the Pure Food and Drug Act of 1906. He returned to St. Louis in 1907, living in a hotel as Carl Von Hartzfelt, now promoting health elixirs made by his new company, Teddy Laboratories. He wanted to return to his process swindles, but perhaps he was too well known in St. Louis.

Wheeling, West Virginia

In early 1908, as Carl von Hartzfelt, he relocated to Wheeling, West Virginia—another river town—and began promoting more phony industrial processes. He stayed away from metallurgy, however, and no one seemed to connect Carl von Hartzfelt, later Americanized to Carl Hartfield, with the notorious Charles L. Hartsfeld.

Hartzfelt announced that he could make very cheap methanol (wood alcohol) from natural gas. Experts feared that the world's oil reserves would be exhausted within only a few years, and alcohol seemed a likely substitute fuel, but was too expensive. Lack of long-distance pipelines forced many oil wells to flare—burn off—the associated natural gas at the wellhead. Hartzfelt's process would enable oil operators to make a profit from this wasted by-product.[66]

Within a few months of Hartsfeld's announcement, he had formed the Continental Natural Gas Alcohol company, and promised to build gas-to-methanol plants at Wheeling, West Virginia, Tulsa and Muskogee, Oklahoma, Caney and El Dorado, Kansas, and Medicine Hat, Alberta, Canada. Hartsfeld apparently tried to profit

in two ways. The first was to sell exclusive territorial rights to his invention. He announced in June 1908 that he had already sold the exclusive rights to use his invention in Britain, Canada, and Mexico, and warned that unless investors acted quickly, that he would consider selling exclusive U.S. rights to the hated Standard Oil Company. The second way that he could profit would be by selling shares in the demonstration plants to local businessmen.[67]

In July 1909, Hartsfeld announced another breakthrough process for making alcohol, this time from sawdust. He built a demonstration plant at Cleveland, Ohio, where he showed the process to a group of businessmen and a federal revenue agent. He supposedly produced 91 percent alcohol at a cost of 7.5 cents per gallon, cost-competitive with gasoline as motor fuel. His Wood-Waste Distilleries built and sold small stills for home use of the process.[68]

Hartsfeld's alcohol venture followed shortly after Frank Hitchcock became Postmaster General in March 1909. The federal government had shown no interest in going after Hartsfeld since prosecutors bungled the mail fraud case against him in 1890, but Hitchcock's top priority was to vigorously prosecute mail fraud. Hartsfeld's sawdust stills, of course, could not produce alcohol at anywhere near the speed and purity of the demonstration plant when run by Hartsfeld. Complaints reached the Post Office, which went after Hartsfeld for mail fraud. He pleaded guilty in June 1912, and was sentenced to eight months in jail and fined one hundred dollars.[69]

Hartsfeld's motor fuel swindle was a precursor to a long list of fraudsters who took it a step further and promised to make motor fuel from water. The fuel-from-water swindle started with John Andrews in 1914, and was continued by countless others, most notably Louis Enrich (1916-1921) and Guido Franch (1951-1981).[70]

The collapse of his alcohol schemes threw Hartsfeld back on selling Teddy's Laboratory odds and ends through newspaper ads. He advertised weatherproof paint, business cards, ways to turn alcohol or gasoline into solids, root beer concentrate, and Daddy's Nervine Extract. The Postal Service stepped in once more, and in 1915 cut off first-class mail service to Hartsfeld and his companies.[71]

Cutting off mail service forced Hartfield and Teddy's Laboratories out of business, and Carl Hartfield retired. Old age was not kind to him. His home of twenty years in Wheeling burned in July 1929, seriously injuring his wife, Sarah. She died in April 1930, partly as a result of her burns. Carl Hartfield apparently lived with his son, Frank, until Frank and Frank's wife attacked him in June 1931, seriously enough that he required medical attention and pressed assault charges against them. Carl Hartfield was living at the Ohio County, West Virginia, poor farm when he died in March 1934.[72]

Legacy of the Process Men

American mining of the late 1800s and early 1900s was plagued by process men. They included Henry R. Cassel,[73] Charles Halt,[74] W. A. Konneman,[75] John A. Potter,[76] Thomas Allison Readwin,[77] A. G. Stephens,[78] John Sutphen,[79] George Thurber,[80] R. R. Waitz,[81] and many others. Most of them probably thought that they were legitimately on to something valuable, if only they could perfect it. But be they honest or crooked, the client always lost money.

One of the most famous process men was Aron M. Beam, who first appeared in Arkansas in partnership with Samuel Aughey promoting worthless mines with phony assays. Beam learned his lessons well and established himself in Denver, from where he used his phony assays and gold-recovery process in numerous swindles.[82]

Process men were not confined to the United States. Alfred Paraf was a French chemist who fled to South America after running a process fraud in California in 1875, then ran a gigantic process fraud in Chile in 1877, promising to extract gold

from copper.[83]

The influence of Hartsfeld and other process men has been neglected. As infamous as Charles Hartsfeld was among editors of mining magazines, few people of his time, and fewer today, are familiar with him or other process men. A 1986 book on the Red River District in New Mexico covered the Hartsfeld furnace, but blamed the failure on the local operators, apparently unaware of Hartsfeld's pattern of failures.[84] The Hartsfeld furnace in DuBois County, Indiana, is now the center of an impressive exhibit on the Buck Shoals silver mine in the county historical museum, and, as of 2021, the exhibit mentioned nothing of Hartsfeld's bad reputation. Any involvement of Hartsfeld or of his metal refineries in Newport, Kentucky, or East St. Louis, Illinois, should raise suspicion that not all was honest.

Process men and their alchemical ideas did not disappear with Hartsfeld, and are still popular with prospectors. Prospectors are a peculiar breed: incurable optimists and individual thinkers, always convinced that their ore is worth more than the assayer says. They are predisposed to believe in process men who promise to recover fantastic amounts of gold, silver, and platinum from worthless rock.[85]

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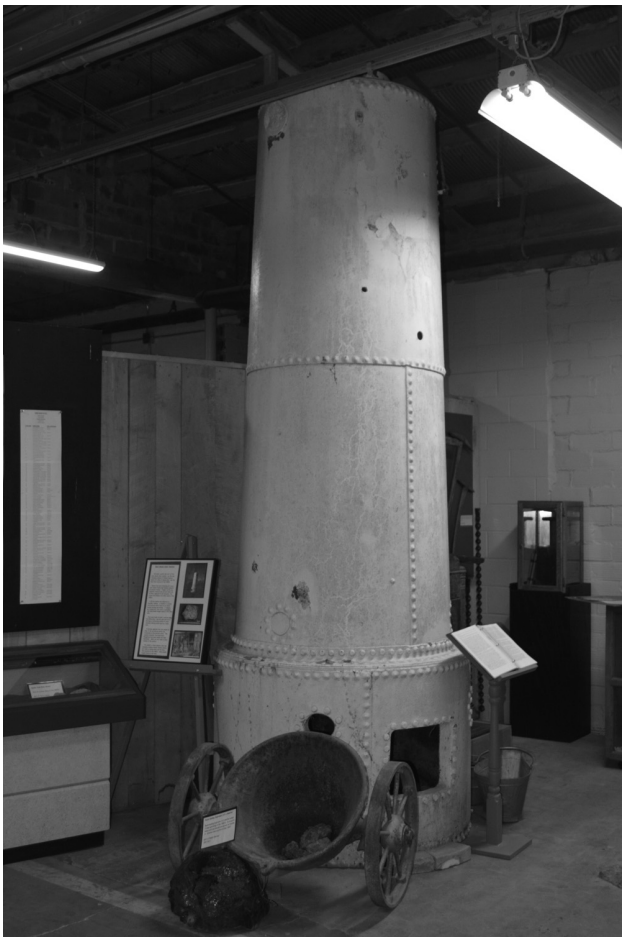
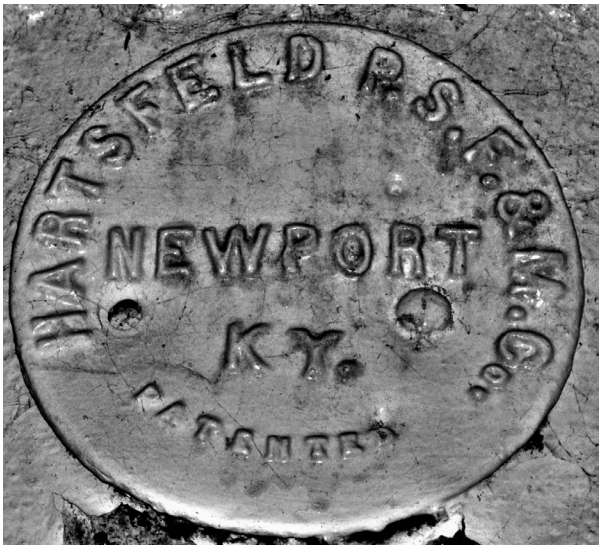


The Hartsfeld furnace built to treat supposedly rich silver ore at the Buck Shoals Mine, Haysville, Indiana. Now in the collection of the Dubois County Museum, Jasper, Indiana. (Author's Photo.)



The Hartsfeld nameplate on the furnace in the Dubois County Museum, Jasper, Indiana. (Author's photo.)

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