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## Oberlin Smith: A Man, His Machines & the Mint

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THE ACCOMPLISHMENTS of inventors Thomas Edison and Alexander Graham Bell are well known, and their names, along with those of contemporaries such as George Eastman and Henry Ford, are synonymous with their inventions.

There is, however, a lesserknown, yet no less talented, innovator whose behind-the-scenes ingenuity helped catapult America to the leader of the pack during the Industrial Age and revolutionized the modern minting process. His name is Oberlin Smith.

Outside specialized academic circles, Smith has limited name recognition, but his technical prowess puts him in the same league with some of the greatest minds of the 19th century.

Smith's contributions to American manufacturing capabilities earned him both the presidency of the American Society of Mechanical Engineers (1889-90) and a customer list that included iconic entities such as Ford Motor Company, Eastman Kodak, Baldwin Locomotive Works and the United States Mint. He was inducted into the New Jersey Inventors Hall of Fame, which referred to him as a "consummate tinkerer"—a more than appropriate description for a man who held 70 patents.

### The Rise of Ferracute

Like Thomas Edison, Oberlin Smith (1840-1926) was an Ohio transplant to New Jersey. There, he developed ideas that impacted manufacturing across the globe.

Smith moved to Bridgeton, New Jersey, around 1857 and began his career at the venerable Cumberland Nail Works, where he observed successful manufacturing processes firsthand.

Formally honing his craft, he studied engineering at the Polytechnic College of Pennsylvania. Inventiveness was in his genes: Robert Longsdon, a partner of Sir Henry Bessemer and a co-inventor of the Bessemer steelmaking process, was Smith's cousin.

In 1863 Smith set up shop in Bridgeton, doing steamfitting, architectural ironwork and general repairs.

During this time, he often looked over pieces of machinery brought in for repair and uttered what became his signature catch phrase, "I can make a better one." (And he often did.)

In January 1864, the name of his company became Smith & Webb, with the addition of his cousin J. Burkitt Webb. This arrangement lasted five years and was dissolved when Webb left to take a position as a professor.

By 1873, Oberlin's brother Frederick had joined the firm, and they decided to concentrate on the press- and die-manufacturing business—a move that would gain them notoriety and customers around the world. In January 1877, the company was incorporated and formally changed its name to Ferracute Machine Company, with Smith serving as president and chief mechanical engineer.

Designing equipment for the canning industry gave Smith his initial customer base, but other enterprises quickly beat a path to his door. If a product was mass-produced and made of metal, chances were good that Ferracute played a role in its manufacture. The company not only helped feed America's increasing appetite for consumer goods, such as shovels, belt buckles and doorknobs, but also helped coin the money used to buy them.

As was the custom of the day, Ferracute displayed its wares at various exhibitions and fairs, including the Pennsylvania State Fair (1879), the World's Columbian Exposition in Chicago (1893) and the Paris Exposition (1900). At the latter, Ferracute took home a gold medal for a display featuring its latest toggle press, as well as a milling machine that would form edges on 400 coin planchets per minute. After the turn of the century, the

infant auto industry began to grow. By 1906, Ford, Cadillac, Chrysler and Packard had become substantial customers, with Ferracute Machine Company outfitting Ford's state-of-the-art Highland Park plant in 1910.

#### The Minting Process

Smith was a devoted student of the minting process and dedicated a fair amount of space in his 1896 book, *Press-Working of Metals*, to both the history and technical aspects of coining.

He reportedly harbored a desire to be Mint director, and, based on his manufacturing background, he would have been an excellent choice.

Smith obviously understood and appreciated the significance of the coins made by his presses, but was he a collector? Ferracute is known to have been one of 120 donors to the American Numismatic Society's coin cabinet in 1919. However, the mechanically minded Smith likely was more interested in the process than the product.

Ferracute had been impacting the numismatic industry for several years when, in 1892, it began a longstanding and high-profile relationship with the U.S. Mint that would last until the 1960s. In early 1892, the Mint was busy with the production of new coins designed by Chief Engraver Charles Barber; later in the year, Columbian half dollars rolled off the presses. That August, Ferracute shipped its first order to the Philadelphia Mint—a 38-ton punch press.

By mid-October, the company had supplied another, more powerful, high-speed toggle press for the production of cents, nickels, dimes and quarters. What set this press apart from others was the configuration of the dies. The upper die was stationary, while the lower die was forced into the blank. This design allowed for all machine maintenance and lubrication to be carried out below the strike zone, thus reducing the chances of die damage. The machine also ejected the struck coins in such a way that they ended up on their edges, thus protecting the designs on their faces.

Smith patented various press improvements in 1896, 1905 and 1909.

He noted in his book that the speed of an ordinary press was 120 strokes per minute for smaller coins, but that a machine he designed, with adjusted feeder and ram strokes, was able to strike 200 coins per minute "with scarcely perceptible jar or noise." By 1919, Ferracute was offering presses with significantly increased ram pressures for minting higher relief coins and medals. Because of the company's initial success in Philadelphia and the continual improvements in its presses, orders began to come in from other countries. Coin presses were proving to be a viable product line for the company, so much so that Ferracute aimed to provide all the equipment needed to successfully operate a minting facility—a feat it accomplished in a rather unlikely place.

Although this story has been told many times, it is worth repeating.

#### Trouble in China

In 1897 an equipment order came in through a sales agent, the American Trading Company, that would further elevate Ferracute's status as the world's premiere minting equipment manufacturer and would provide engineer Henry Janvier with the adventure of a lifetime. The Imperial Chinese Government ordered the construction of three mints. One facility was to be located in the Hupeh Province at Wu chang and dedicated to the minting of tsen, or "cash," coins. The other two were to be built as one facility at Chentu in the Szechuan Province, with one area for the production of cash coins, and a second for the striking of assorted silver denominations.

According to Janvier's personal account, the Chentu facilities were to be scaled-down versions of the Philadelphia Mint, with Ferracute personally handling everything from the design of the building to the installation of the equipment. Ferracute made the blanking dies, while the actual coining dies were believed to have been created by engravers at the Philadelphia Mint, with Charles Barber suggested as the most likely candidate.

The blueprints for the Chentu facility were shipped well ahead of Janvier's arrival so the Chinese would have ample time to construct the building. Meanwhile, a working mint was built in Bridgeton, with Philadelphia Mint officials present at test strikes of both Chinese cash and silver coins. (At auction, these test pieces have commanded significant prices, as seen at a 2008 sale conducted by Champion Auction of Hong Kong, in which an 1898 Szechuan Dragon silver dollar [Lot 92], graded Mint State-64 by Professional Coin Grading Service, realized \$36,800.)

After a few adjustments, the equipment was dismantled, lubricated and shipped to China a year in advance to help guarantee a smooth construction project. What ensued was anything but smooth, and it was a testimony to Janvier's ability to improvise his way out of one fiasco after another.

Unbeknown to Janvier, the building blueprints got hung up in Shanghai and never made it to Chentu, so when he finally arrived, he found a series of small, unconnected buildings as opposed to the large structure Ferracute's engineers intended to house both mints. As such, the entire layout had to be redesigned—and that was the good news.

When Janvier began his initial inspection of the equipment from Bridgeton, he saw more telltale signs the project was not going to be easy.

During shipping, some of the wooden crates had been tampered with, exposing the equipment to the elements.

While this was not good, it was the contents of the crates that gave Janvier and his assistant the most grief. Despite the machinery's intact appearance, the men found each crate was full of mud, and the once-pristine equipment was severely rusted. (Apparently, the crates had fallen overboard and lay submerged in a river for about six weeks.)

Through a rare stroke of luck, Janvier obtained a few gallons of kerosene and a small amount of oil and began the painfully slow process of reconditioning the machinery. To make matters worse, the Chinese officials took a look at the rusted equipment and accused Ferracuta of selling them secondhand junk!

After a long list of setbacks, the Chentu mints were ready to go online, despite that the dies also spent time at the bottom of the river and had corroded.

Janvier did his best to clean and polish them, then held his breath as the first examples minted were submitted to local authorities for approval. The coins readily were accepted, with one mint official happily declaring that the blisters on the coins (from the rust-pitted dies) would deter counterfeiting. (Janvier later related to a Bridgeton news - paper reporter the "amusing fact" that after Ferracuta's herculean effort to construct the facility, the local merchants refused to accept any of the Newly minted, silver coins.)

Back in America, Ferracuta Machine Company received both local and national acclaim for completing the project and was rewarded with additional commissions to construct mints in Potosí (Bolivia), Lima (Peru) and Honan (China). The Honan mint was completed in 1904, with the blanking dies once again supplied by Ferracuta. This time, however, Charles Barber's involvement in the die preparation is confirmed by his correspondence with Ferracuta.

#### The End of an Era

Aside from its direct role in the hobby of kings, Ferracuta played an important part in American history by aiding the war effort during World War I and II as a major supplier of equipment to the Frankford Arsenal (a U.S. Army ammunition plant located in northeast Philadelphia) and the U.S. Navy. Ferracuta closed its doors in 1968, ending an era for Bridgeton, the United States Mint and America.

Several years ago, a longtime BridgeTon resident told me that Ferracuta had built presses for the Mint. I stored that bit of information in the back of my mind and noted the sense of pride in his voice as he related the story. When I researched a Ferracuta token in my collection, I learned that the dilapidated, overgrown building in Bridgeton that I frequently drive past did a lot more than supply the Mint with state-of-the-art equipment. It stood at the forefront of America's golden age of manufacturing, when "The American System" was the envy of industrialized and developing nations alike, and the label "Made in USA" stood for high quality workmanship.

In an ironic twist, a century after Ferracuta supplied the Chinese government with equipment, the United States' role on the global manufacturing stage has been reduced to that of a supporting player, with China now taking the lead. One can't help but wonder how the man who always said "I can make a better one" would feel about that.

#### Acknowledgments

I would like to thank Ferracuta historian and author Arthur Cox, who took time to speak with me about Oberlin Smith, and also the staff of the Cumberland County (New Jersey) Historical Society's Lummis Library for their efficient housing of information and for providing an atmosphere conducive to research.

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Learn More . . .

Read all about Oberlin Smith and the Ferracute Machine Company in Ferracute: The History of an American Enterprise by Arthur J. Cox and Thomas Malim, available for loan from the ANA's Dwight N. Manley Numismatic Library (Catalog No.GA80.C68).

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