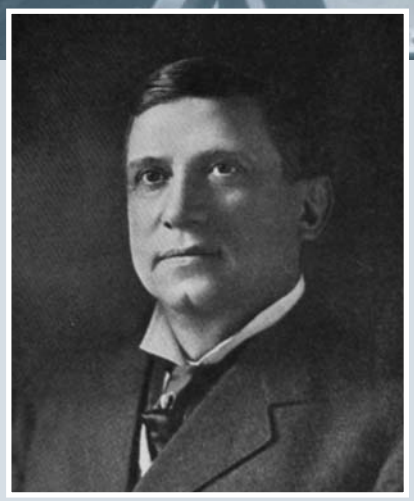

Around the World with Bethlehem Steel

by Sharon Ann Holt

Five blast furnaces still standing at the Bethlehem Steel plant in South Bethlehem cast long shadows over the site and the community. When slag was dumped from the furnaces at night, people living on the surrounding hills thought the flow looked like volcanic lava. At the peak of operations in 1957, the power of those furnaces provided employment directly for 165,000 people and ancillary livelihoods for hundreds of thousands more. As a corporation, though, Bethlehem Steel cast an even larger shadow than its tall furnaces, and the power of its products flowed far beyond the sightlines of those hills.

Top: Ben Franklin Bridge footwalk beams during construction, Apr. 1926. Philadelphia Record Photograph Collection.

Above: Charles M. Schwab. From Arundel Cotter, The Story of Bethlehem Steel *(New York, 1916).*

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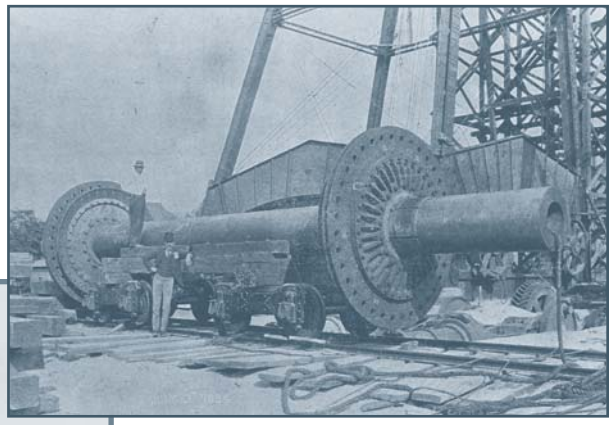
From its incorporation in 1904, Bethlehem Steel Corporation dedicated its operations to putting goods in motion. The Bethlehem Steel Company functioned as the steelmaking enterprise within a corporation that actually had more invested in shipbuilding. With Harlan and Hollingsworth yards in Wilmington, Delaware, Union Iron Works in San Francisco, California, two shipyards each in New Jersey and Maine, and one in Groton, Connecticut, the Steel started its corporate life already as a beast with many tentacles. Charles Schwab, the forceful personality behind the corporation in its formative and flourishing years, had an endless appetite for acquisitions, something he had learned in his youth working for Pittsburgh's legendary steel man, Andrew Carnegie. Whenever prices were down, Schwab bought, and in the end the empire of Bethlehem Steel Corporation stretched across the globe.

Steelmaking, in a certain sense, required this kind of global extension. Steel is a manufactured metal, not something that comes naturally from the ground like iron or copper; many different kinds, grades, hardnesses, and degrees of flexibility can be built into steel by carefully mixing a stew of specific ingredients. The great 19th-century oil magnate, John D. Rockefeller, had taught American capitalists to be wary of dependence upon other businesses for essential ingredients. Far better, in Rockefeller's opinion, simply to own not just the wells but also the drilling companies, the oil-drum makers, the railroads, and ultimately even the retail stations. In something as complicated as steelmaking, the same imperatives applied, and Charles Schwab followed Rockfeller's example in full.

The technology of steelmaking has three basic steps. First, iron ore is heated with other selected ingredients in blast furnaces to produce molten iron. Second, the molten iron is mixed and heated in a changing variety of processes to create steel. Finally, the molten steel is cast, shaped, rolled, drilled, or otherwise made into an almost endless array of useful forms. Steelmaking was grueling, hot, dangerous, and unforgiving; the skill and endurance required helped create dense bonds of camaraderie on shop floors throughout the company. Business success in steelmaking depended upon having the expertise and skill to manage all the varied mixtures, to find the most cost-effective manufacturing and transportation methods, and to guess which would be the most useful, and therefore profitable, final forms for each day's output. Each aspect of the business presented opportunities to reach around the world.

Nineteenth-century entrepreneurs began making iron in Bethlehem using the rich nearby veins of iron ore and plentiful supplies of fuel (wood and later coal) for the furnaces. By the time Bethlehem Steel Corporation began its industrial operations, though, those resources had been almost fully tapped. In less than a decade, Schwab acquired iron mines in Michigan and Minnesota and coal mines in West Virginia, as well as a variety of mineral sources in Cuba, Chile, Venezuela, Mexico, and Canada. Purchasing the struggling Pennsylvania Steel Company in 1916 brought Schwab more Cuban mines, plus rich coal deposits in central Pennsylvania.



Ferris wheel and its shaft made by Bethlehem Steel for the World's Columbian Exposition, 1895. Bethlehem Steel Corporation and Bethlehem Ship Corporation photograph collection, Hagley Museum and Library.

Iron ore does not move by itself, of course, so Rockefeller's principle required the acquisition of rail and shipping concerns to bring the resources to the furnaces in Bethlehem. The Beaver Shipping Company of Cleveland, Ohio, joined the corporation in 1916, its steamships carrying iron ore around the Great Lakes from Minnesota's Mesaba Range and Michigan's Gogebic. Starting in 1927, the Calmar Steamship lines operated along the coasts of North America and through the Panama Canal, supplying Bethlehem's furnaces with an international mix of mineral resources.

Iron ore, moreover, will not turn itself into steel without the labor of thousands of working men and women. The long geographic reach of Bethlehem Steel includes the places, in the United States and abroad, that laborers left behind to try their luck at the plant. The First World War (1914–18) created a great deal of anxiety among Americans about the loyalty of immigrant populations, especially those whose origins lay in countries

allied with the Germans. In early 1918, only a few months after the United States entered the war, Bethlehem Steel reported "that we have 10,500 foreign-born employees in the various departments of the Bethlehem plant alone, there being fifty-eight different nationalities represented in all." But the company newssheet, *Bethlehem Steel*, hurried to say that "over 2500 of these employees have their naturalization papers, and are citizens of the United States" while others, they assured readers, were in the process of becoming citizens. In general, they soothingly asserted, "there is great evidence that our foreign-born employees are fast realizing what it would mean if the Hun should win this war."

The same publication in later issues promoted the Hungarian-American Loyalty League, a federally sponsored effort to find Hungarians and their descendants and administer an oath of allegiance to the United States. It is not clear that Hungarians responded with any alacrity to this appeal. The editors of the newssheet hoped that Bethlehem's Hungarians might lead the way in showing other immigrants their duty.

It would be a hard job indeed to find a place untouched by Bethlehem Steel.

Hungarians were not the only concern, though. Americanization was actively promoted in these years, and Bethlehem Steel supported it directly for many immigrant groups and their descendants. On June 15, 1918, the company reported in its newssheet that "several hundred Italians and Spaniards," railroad workers who lived in bunkhouses behind the No. 5 shop in Bethlehem, "participated in the raising of an American and an Italian flag at the bunk house. . . . After the flags were raised [accompanied by an oration in Italian] . . . the men took the oath of allegiance and formed into line and paraded through the small village there. The Bethlehem Steel Company band was on hand and furnished martial music." Apparently "it was a joyous occasion for the men." The corporation also introduced its weekly readers to Professor Julian Korski Grove, a Polish-born American and political science professor from the University of California. Professor Grove had been engaged by the federal government to "take charge of Americanization in this city and suburbs." The editors hoped that workers would "render him all the assistance possible." To smooth the professor on his way, the editors printed his appeal in English, Polish, Hungarian, Slovak, Greek, Spanish, and Italian.

Bethlehem Steel also celebrated African American loyalty to the national cause, but not without overwhelming condescension. Black men, many of them migrants from southern states, found jobs at the Steel, but on the general labor crew and in the coke works, the dirtiest and poorest paid aspects of the business. In May 1918, the newssheet presented the accidental death of one member of the Northampton coke works crew, James Murray, untinged with any official sorrow, merely as an object lesson against laziness and deceit on the job. Murray's death occurred when hot coke was dumped in a way that sealed an alcove where he had lain down to take a rest, forcing him either to suffocate in the alcove or climb across the blistering hot coke. He chose to try to escape and died of his burns. The editors could scarcely have been more callous, mocking-up pictures of a man sleeping and then trying to escape the hot coke and then suggesting that "every employee should profit by James Murray's costly experience" and warn each other against sleeping on the job. One month later, the June 2 issue of the newssheet celebrated the patriotism of the men at the Northhampton coke works, noting in classic racist fashion that the men had cheerfully backed off their demands for a raise and especially liked working to the music of the company band.

Construction of the Golden Gate Bridge, 1934. Bethlehem Steel Corporation and Bethlehem Ship Corporation photograph collection, Hagley Museum and Library.

Bethlehem Steel Corporation acted like a gargantuan magnet drawing people and resources to the Lehigh Valley. But as wide as its geographic reach became in the work of producing steel, it is even more astonishing to map the places where Bethlehem's steel was put to use. It would be a hard job indeed to find a place untouched by Bethlehem Steel. New York City drivers routinely rely on Bethlehem Steel as they travel the George Washington Bridge, the Williamsburg Bridge, the Queensboro Bridge, the Verrazano Narrows Bridge, and the Holland Tunnel. The crowds of sports and music fans who gather at Madison Square Garden ought to know that the roof gets its strength from Bethlehem Steel. Traffic along I-78 rolls on Bethlehem Steel across the Newark Bay Bridge at Bayonne, headed to and from Jersey City. Rail traffic heading out of the mid-Atlantic toward New England crosses the Hell Gate Bridge, a gorgeous span over the East River designed by Austrian-born engineer Gustav Lindenthal, famous for his determination that modern industrial infrastructure ought to be, and could be, inspiringly beautiful.

In Philadelphia, Bethlehem Steel shepherds you across either the Ben Franklin or the Walt Whitman

Bridge, and will follow you across the Market Street bridge on the Schuylkill, the city's second river. Drivers who brave rush hour on Philadelphia's Schuylkill Expressway admire the river as they wait, thankful no doubt that Bethlehem Steel bridge spans are strong enough to stand up under the load. Anyone whose attention wanders may find reason to be grateful for the strength of the guard rails, the originals of which were made by Bethlehem Steel.

Further south, the Delaware Bay Bridge tips its hat to Bethlehem, as does the Millard Tydings Bridge across the Susquehanna at Havre-de-Grace, Maryland. Taking the train will not reduce your dependence on Bethlehem Steel. The Steel was as famous in its heyday for its rails as for its structural H-beams. Northeast Corridor rails and power towers, along with Madison Square Garden/Penn Station in New York and Union Station in Washington, DC, all began life as molten iron in Bethlehem's furnaces.

Elevated steel water tank, Garden City, Long Island, 1933, and transmission tower, both of Bethlehem Steel. Bethlehem Steel Corporation and Bethlehem Ship Corporation photograph collection, Hagley Museum and Library.

Heading west to escape the long shadow of Bethlehem Steel, you would need to avoid Pittsburgh, Cleveland, and Chicago, as well as Toledo, Ohio, all sites of Bethlehem Steel operations. In 1893, visitors to Chicago's World's Columbian Exposition thrilled to ride the Ferris wheel, turning on a colossal shaft of Bethlehem Steel and rising to heights that were breathtaking in the age before airplanes. Traveling north into Michigan, it might take your fancy to cross into Canada on Detroit's famously black Ambassador Bridge. On that bridge, you nearly escape the Steel; the Ambassador was built by McClintic-Marshall, Pittsburgh steel fabricators, and completed one year before McClintic-Marshall was bought up by none other than Bethlehem Steel Corporation. McClintic-Marshall also built locks for the Panama Canal, so do not think to cruise to the Pacific without being brushed by Bethlehem Steel.

As you continue westward, you may want to stop and see the famous Grand Coulee Dam, built with Bethlehem Steel, or cross the Golden Gate Bridge in San Francisco, built, like the Oakland Bay Bridge, with Bethlehem Steel. Perhaps Bethlehem's most dramatic bridge story concerns "Galloping Gertie," the nickname of the first Tacoma Narrows Bridge built and then blown down in 1940, to be replaced by a new bridge constructed of Bethlehem Steel, which stands to this day, connecting Tacoma, Washington, and the Olympic peninsula to the rest of the state.

Not only has Bethlehem Steel left imprints across the western hemisphere, since the dawn of the 20th century it has played an important role in a century marked decisively by global warfare. In the early 1890s, Bethlehem Iron Company delivered steel plates 16 inches thick to be used in armoring the Russian battleship *Petropavlovsk*, the flagship of imperial Russia's Pacific fleet. Charles Schwab competed worldwide for naval work, eventually winning part of the European market for armor plating in 1906 and, in 1910, a contract to equip the Argentine navy. The Fore River shipyard in Quincy, Massachusetts, capable of building the largest ships then known, mishandled part of the Argentine project, a setback that prompted Schwab to buy out the entire shipyard. Once in possession of the yard, Schwab went on to build, repair, and armor ships for the U.S. Navy through the two world wars.

In the early years of the First World War, Schwab created a scandal by contracting to build experimental submarines for the British Admiralty. To protect American neutrality, President Woodrow Wilson stepped in and stopped the sale. Schwab built the submarines anyway, in his Canadian yards. Though there must have been little affection between the straitlaced Wilson and the high-living Schwab, Wilson was not one to overlook talent. Perhaps bowing to necessity by 1918, Wilson appointed Schwab director of the unproductive Emergency Fleet Corporation. Schwab successfully reactivated the paralyzed agency. Bethlehem Steel shipyards built on this reputation during World War II, repairing nearly 38,000 vessels and building 1,085, including everything from landing craft to battleships.

Bethlehem Steel workers created beams, rails, components, and plates for many glamorous buildings, magnificent bridges, and powerful ships. But we are a land infused with steel. Steel also built things far more ordinary, things we might not notice at all, unless directed to see them. Bethlehem Steel controlled a huge

Steel in the Wind: The Story of Galloping Gertie

by Sharon Ann Holt

On July 1, 1940, the state of Washington proudly opened the Tacoma Narrows Bridge, a graceful suspension bridge perched high above a channel in lower Puget Sound. Surpassed in length only by the George Washington Bridge in New York and the Golden Gate in San Francisco, the new bridge linking Seattle residents with the vast lands of the Olympic peninsula had taken two years and $6.4 million to build.

Bridge workers and people who used the bridge's roadway and sidewalks quickly nicknamed it "Galloping Gertie" for its disconcerting tendency to buck and sway in the wind. And only four months and seven days after its grand opening, the bridge dramatically tore itself apart in a high wind, sending the entire roadbed crashing into the Narrows and creating what newspapers called "the most spectacular failure of an engineering structure the West Coast has ever seen."

Bob Owens, tolltaker for the bridge, recalled that on the morning of November 7, 1940, the bridge had been closed between 9:30 and 9:45, as it was "swinging very wildly from side to side and up and down." One car caught on the bridge bounced into the air and landed on its side. The driver, Leonard Coatsworth, and the driver of a truck also caught on the bridge scrambled to safety on hands and knees. Coatsworth's dog, a cocker spaniel named Tubby, could not be saved. Too panicked to leave the car, Tubby bit at least one would-be rescuer. At 11:10, Owens recalled, "there was one big heave to the North and then back to the South," then cables snapped and the center span plunged into the water.

Clark Eldridge, engineer for the bridge, defended his original designs, accusing penny-pinching bureaucrats of favoring a dangerous design innovation proposed by "an eastern firm of engineers, chosen by the money-lenders." Investigators, while not absolving Eldridge and his team, agreed that the bridge had been too slender and light, and that the innovative girders dangerously resisted and deflected wind that should have been allowed to pass through. They called for wind-tunnel testing of all bridge designs.

Bethlehem Steel Corporation took on the job of replacing the bridge. Replacement took ten years, thanks to legal maneuvers, insurance claims, and the extensive engineering studies called for by investigations of the collapse. Active outreach and education about plans for the new bridge helped to rebuild public confidence, as did a return to time-tested designs. After more than two years of construction work, the new bridge of Bethlehem Steel opened on October 14, 1950. Engineered to carry 60,000 vehicles per day, the "current bridge" as the state department of transportation calls it, has seen continually increasing traffic demands, spurring the department to build a second span alongside, set to open in 2007.

Galloping Gertie, 11:00 a.m., Nov. 7, 1940. From The Failure of the Tacoma Narrows Bridge *(College Station, TX, 1944). Hagley Museum and Library.*

Far below today's bridge of Bethlehem Steel, Galloping Gertie still plays a role in the story of Puget Sound. The collapsed roadbed lies more than 180 feet deep in the Narrows, playing host to barnacles, schools of fish, and colonies of octopi. While her far more stable sister carries the traffic, Gertie remains an object lesson in engineering classrooms, and an irresistible destination for scuba divers.

The story of Galloping Gertie is recorded in the Bethlehem Steel Corporation records at the Hagley Museum and Library, Wilmington, DE.

share of the market for steel bars used to reinforce concrete—the basic building material of every high-speed highway and the concrete floors of every skyscraper in the United States. Every morning millions of Americans drive to work on those roads and spend their days in those offices—thanks to the strength of Bethlehem Steel. Even out in the country, far from highways and office buildings, far from bridges and skyscrapers, the Steel is still there. Water towers stand on structural steel from Bethlehem, regulating pressure in the water supply. And many of the high voltage electric lines that hum overhead across the land rest on towers made, like so much else, of Bethlehem Steel.

Today the blast furnaces are silent and the machine shops echo, though the Lehigh Valley is filled with men and women who remember working at the Steel. But the ghost of the Steel shimmers in every turn of the faucet or flip of a switch. Steel is there behind every trip to the store or family vacation; it's there in naval service records, and it's there in the great dams that irrigate American farms. Bethlehem is the last remaining integrated steelworks still standing in America, the last place where people can see, feel, and touch this industry that circled the globe. Efforts to preserve and interpret the site depend in the end upon the ability of people around the world to understand and embrace how Bethlehem Steel, and the steel industry more generally, has indelibly marked our time and how deeply it reaches, even today, into our lives.