CLEVELAND TO AKRON: A GUIDE TO THE SITES

Society for Industrial Archeology
15th Annual Conference
Cleveland, Ohio
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Prepared by Carol Poh Miller

Cover: Hulett No. 4, C & P Ore Dock, poised in full open position over the hold of the George M. Carl, 1979. Jet Lowe photo for the Historic American Engineering Record.

CLEVELAND

Since Daniel M. Bluestone's Cleveland: An Inventory of Historic Engineering and Industrial Sites appeared in 1978, the city has suffered some major losses of its industrial and technological heritage.

Central Furnaces (p. 19*), a mammoth blast furnace plant in continuous operation for almost 100 years, was abandoned by U.S. Steel in 1978 and torn down several years later. At the City of Cleveland's Division Avenue Pumping Station (75), three vertical, triple-expansion water pumping engines built by Allis Chalmers between 1914 and 1917, among the last of their kind, have been replaced by electric pumps and sold for scrap. And two unusual bridges--the Abbey Avenue Bridge (84), a 1,092-foot-long Pratt deck truss, the last surviving section of the 1888 Central Viaduct; and the Rocky River Bridge (100), the last and the longest long-span concrete arch built with unreinforced ribs in the U.S.--have been demolished and replaced with steel girder spans. (The new Abbey Avenue Bridge is scheduled for completion in 1989.)

Perhaps even more significant have been the losses due to plant closings. Conrail's (formerly New York Central's) Collinwood Yards, the Fisher Body Co. (40), Westinghouse (11), and C. Schmidt & Sons (38), the city's last brewery, have all ceased operation, leaving huge physical plants that today are either vacant or underused. Warner and Swasey Co. (47), a manufacturer of machine tools located on Carnegie Avenue since 1881, this year moved its operations to suburban Solon, Ohio.

Despite these losses, some extraordinary historic industrial and engineering sites survive. Cleveland remains a manufacturing center, as the conference process tours will demonstrate. And the wealth of structures which prompted a reporter for Engineering News to dub Cleveland the "City of Bridges" in 1888 is still apparent today.

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*Page numbers denote references in the Cleveland Inventory.

C & P ORE DOCK
(Pennsylvania Railway Ore Dock)
Whisky Island

Cleveland South
17.43900.4593800

When built in 1911-12, the Pennsylvania Railway Ore Dock was the largest ore-unloading dock on the Great Lakes. The dock featured four Hulett unloaders with bucket capacities of 17 tons; a 15-ton-capacity ore stocking bridge; and a one-million-ton storage yard. The Hulett unloader, invented and developed by Clevelander George H. Hulett during the 1890s, revolutionized the handling of iron ore by reducing labor costs and unloading times. By 1913, Hulett unloaders were in use at almost every port on Lake Erie. Their widespread adoption led to larger boats especially designed to accommodate the Huletts.

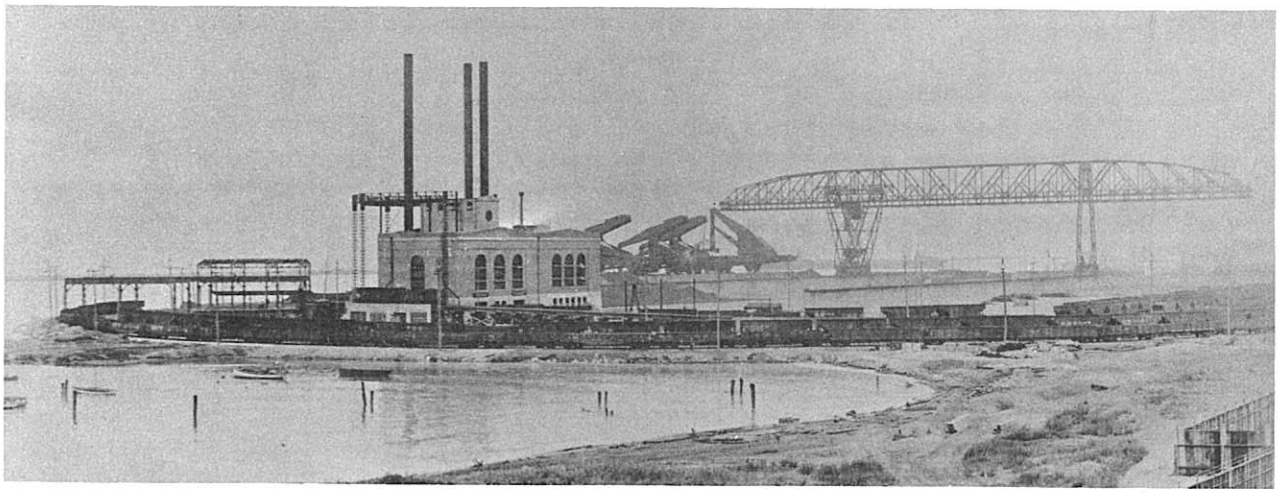
The movement of iron ore in the Great Lakes region is essentially the same today as it was in 1855 when the opening of the Sault Ste. Marie canal marked the beginning of ore shipments. Ore mined in the Lake Superior region is carried by rail to the shipping ports, then by ship to the lower lake ports, where it is rehandled into railroad cars for the trip to the blast furnace.

Three phases of iron ore unloading preceded the introduction of the Hulett unloader in 1899. Until 1867, ore was unloaded entirely by hand labor. Between 1867 and 1880, portable steam engines were used to hoist tubs of ore out of the hold, but men still carried the ore to the dock in wheelbarrows. In 1880 a young Cleveland engineer named Alexander E. Brown (1852-1911) developed a mechanical hoist consisting of two towers supporting a cableway. A steam-powered rope trolley suspended from the cableway traveled out over the ship's hold and carried hand-filled tubs of ore back to the dock. The Brown method was widely employed until about 1900.

While employed as an engineer with the Webster, Camp & Lane Machine Co. of Akron, George Hulett (1846-1923) made a radical improvement in ore-unloading machinery. Hulett's invention, first patented in 1898, did away with gangs of shovelers and substituted instead a 10-ton-capacity grab bucket. The first Hulett unloader was built for the Pittsburgh & Conneaut Dock Co. at Conneaut, Ohio, in 1898-99.

The Hulett unloader practically defies description, so unusual is it in appearance and motion. It consists of a main framework mounted on trucks which travel parallel to the dock. The main framework, perpendicular to the dock, is cantilevered at the rear so that it overhangs an ore storage trough. A trolley travels on rails mounted on the main framework. The trolley carries a walking beam from which a stiff vertical leg is suspended. There is a grab bucket at the lower end of the leg, and directly above the bucket is an operator's cab.

Late 19th-century view of Cleveland & Pittsburgh Dock No. 4 on Cleveland's Whisky Island, equipped with 12 "Brownhoists" built by the Brown Hoisting Machine Co. of Cleveland. Photo courtesy of the Ohio & Western Pennsylvania Dock Co.



General view of the Pennsylvania Railway Ore Dock taken in early summer 1912, shortly after the dock began operation. View is looking northeast. The dock's power house can be seen at center. At left is the steel frame for the machine shop, not yet completed. The ore stocking bridge (right) was destroyed by a storm in 1978. Photo courtesy of the Cleveland Plain Dealer.

The motions of the walking beam and bucket are controlled by cables at the rear of the trolley and powered by direct-current electric motors located in a small room, called the "dog house," at the rear of the walking beam. The walking beam may move forward and backward on the main framework, up and down from the vessel's hold, and laterally along the dock (to permit retrieval of ore from the various hatches of a ship). The bucket can be rotated in a complete circle, allowing it to turn in any direction to gather a load of ore. When the operator has grabbed a load, the leg is raised out of the hold, and the trolley supporting the walking beam is run back until the bucket is in position to deposit the ore into a dual hopper mounted on the main framework of the machine. The ore passes from the hopper into a "scale larry" suspended from the underside of the main framework. Here the ore is weighed, then run back in the larry and deposited into the ore storage trough or else directly into railroad cars positioned on tracks beneath the machinery.

Since the 1870s the Cleveland & Pittsburgh Railroad had operated ore docks at the western terminus of its line on Cleveland's Whisky Island, a strip of land sheared off from the mainland by the old Cuyahoga riverbed. In 1908 the Pennsylvania Railway, successor to the C & P, decided to build a new dock on the lakefront equipped with modern Hulett machinery. The new dock would eliminate the tortuous trip of bulk freighters around the hairpin curves of the Cuyahoga River. All of the dock machinery was designed by the Wellman-Seaver-Morgan Co. of Cleveland.

With a few exceptions, the C & P Ore Dock operates the same way today as when it opened in 1912. Narrow-gauge electric shunt cars equipped with "side pusher arms" move empty rail cars into place beneath the Huletts and move loaded cars to the east end of the yard, where they are assembled into trains. Each Hulett machine requires a crew of three: the Hulett operator, the larryman, and an oiler. The unloading operation is coordinated by a foreman stationed on the deck of the vessel. Although the dock was initially equipped with its own power house, power has been supplied commercially since the 1930s. The ore stocking bridge, which formerly transferred ore within the storage yard, was destroyed by a storm in 1978, and the task today is performed by front end loaders.

The C & P Dock has been the property of the Consolidated Rail Corp. (Conrail) since 1976. It is leased and operated by the Ohio & Western Pennsylvania Dock Co., a wholly owned subsidiary of M. A. Hanna Co. of Cleveland. With a depressed domestic steel industry, the dock today operates on a reduced schedule during the nine-month shipping season. In the future, 1,000-foot self-unloader boats carrying their own conveyor systems will eventually lead to replacement of the Huletts. [Carol Poh Miller, "Industrial Archaeology in the USA:

Documenting the Pennsylvania Railway Ore Dock at Cleveland, Ohio," World Archaeology 15 (October 1983):148-160; Ohio & Western Pennsylvania Dock Company, The Pennsylvania Railroad's Cleveland Docks (Cleveland: n.p., 1946); J. H. Stratton, "The Development of Ore Unloading on the Great Lakes," Journal of the Cleveland Engineering Society 6 (July):2-26.]

EUCLID LAMP PLANT, General Electric Co. (Brush Electric Light Co.; National Lamp Works, General Electric Co.)
1814 East 45th Street

Cleveland North
17.445300.4595160

The Euclid Lamp Plant of the General Electric Co. is located on the site of the Brush Electric Light Co., founded in 1880 by Cleveland inventor Charles F. Brush. Brush began experimenting with dynamos and arc lamps in 1878. Within two years he had a commercial system of arc lamps--used for street lighting and in public halls, theaters, hotels, and factories--on the market. By the end of 1880, over 5,000 Brush arc lights and dynamos were in operation, representing more than 80 percent of the arc lights in use at the time. His work made possible for the first time cheap, commercially salable electric light.

Between 1880 and 1890, the Brush Co. continued to expand its production of arc-light apparatus and began producing other electrical goods. By mid-decade, Brush began marketing an incandescent light system and an improved storage battery, and in 1889 brought out an alernating current system. That same year Thomson-Houston Co. purchased the Brush Co. Three years later, in 1892, Thomson-Houston and the Edison General Electric Co. merged to form the General Electric Co. The Belden (East 45th) Street plant was closed in 1895 and for six years sat idle or was leased to various tenants.

Between 1901 and 1913 the old Brush site served as headquarters of the National Electric Lamp Co., a federation of small independent lamp manufacturers organized by Franklin S. Terry and Burton G. Tremaine. The new company, with GE as principal owner, conducted basic lamp research and development and shared its findings with member companies.

In 1906 the company changed its name to National Electric Lamp Association (NELA), and in 1909 General Electric and National jointly adopted the name "MAZDA" (after the Persian god of light) as a mark of research and service that stood behind their lamps. Extensive advertising made MAZDA a household word synonymous with light bulbs.

The plant was substantially enlarged between 1909 and 1912 with the addition of several brick and reinforced concrete buildings designed by Samuel Austin and Son Co. These

included the new building housing the general offices and engineering department at East 45th Street and Commerce (formerly Hough) Avenue. In 1911, as a result of an antitrust suit filed by the Justice Department, GE purchased the remaining 25 percent of National common stock, and National became known as the National Lamp Works of General Electric.

In 1913 the National Electric Lamp Association moved to Nela Park, a handsome Georgian-style campus located in East Cleveland. Lamp manufacture continued at the East 45th Street plant. In 1916 the plant housed GE's Cleveland Mazda Lamp, Cleveland Carbon, Platinum Welds, Cleveland Wire, and Cleveland Miniature Lamp divisions and employed 1,600 workers. In 1925 the plant manufactured daily 100,000 miniature and 50,000 large MAZDA lamps, and 250 miles of tungsten wire for filaments.

Today, Euclid Lamp Plant's 700 employees manufacture over 1,200 different lamp types, including appliance, automotive, aircraft, rough service, hospital operating room, control indicator, and projection and flood lamps. Single-coiled, double-coiled, and straight wire filaments are used in manufacturing this wide variety of lamp types. Some of the filament mounting is still done by hand. Early equipment still in use includes E-3 flare machines (1924), rough-service stem machines (1920s), and sealing machines (1930s).
[Arthur A. Bright, Jr., The Electric-Lamp Industry: Technological Change and Economic Development from 1800 to 1947 (New York: The Macmillan Company, 1949), pp. 145-148, 155-159; Paul W. Keating, Lamps for a Brighter America: A History of the General Electric Lamp Business (New York: McGraw-Hill Book Company, Inc., 1954), pp. 49-86.]

Early advertisements for MAZDA lamps. Collection of Millie Boutall.

THE JOSEPH & FEISS CO.
2149 West 53rd Street

Cleveland South
17.439740.4591340

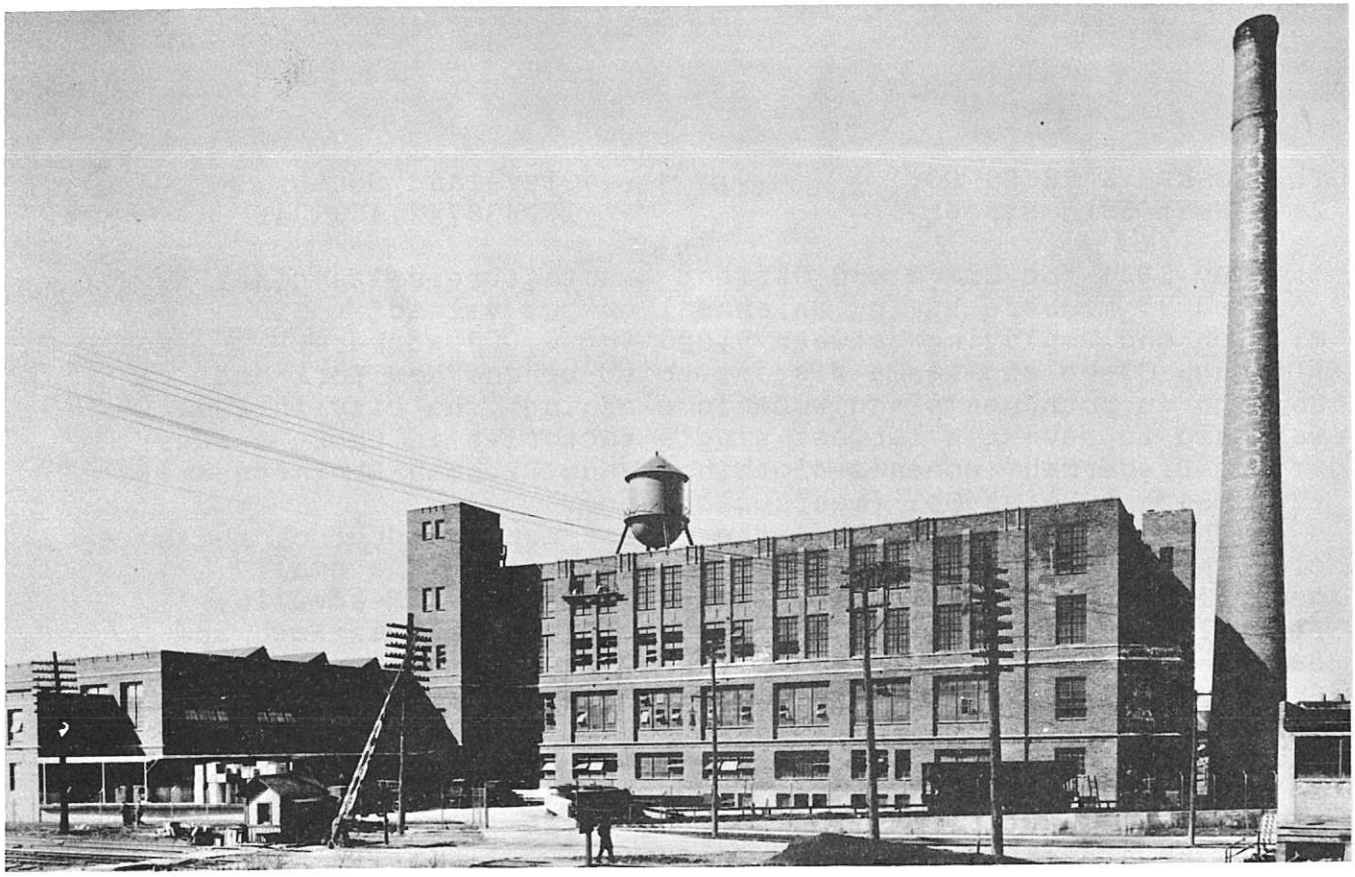
By 1921 the Cleveland Garment Manufacturers Association counted 35 members having an annual output valued at $50 million and employing between 5,000 and 6,000 workers. Although Cleveland was a distant third behind New York and Chicago in both men's and women's clothing, the city in 1927 was said to have the largest single factories in those trades: Printz-Biederman (women's clothing), and Richman Brothers and the Joseph & Feiss Co. (men's clothing).

The Joseph & Feiss Co., the oldest manufacturer of men's clothing in the United States, had its origin in a small general store, Koch, Kauffman & Loeb, opened in Meadville, Pennsylvania, in 1841. In 1845 proprietors Caufman Koch and Samuel Loeb moved to Cleveland, where they opened a store on Superior Street specializing in tailored men's clothing. As the business grew larger, it saw a succession of partners and successive changes in its name: Koch & Levi (1853), Koch, Levi & Mayer (1855), Koch, Mayer & Goldsmith (1867), Koch, Goldsmith & Co. (1871), and Goldsmith, Joseph, Feiss & Co. (1892). Moritz Joseph (1834-1917) and Julius Feiss (1848-1931) had both joined the firm in the early 1870s. When Jacob Goldsmith retired in 1907, the firm adopted its present name, The Joseph & Feiss Co.

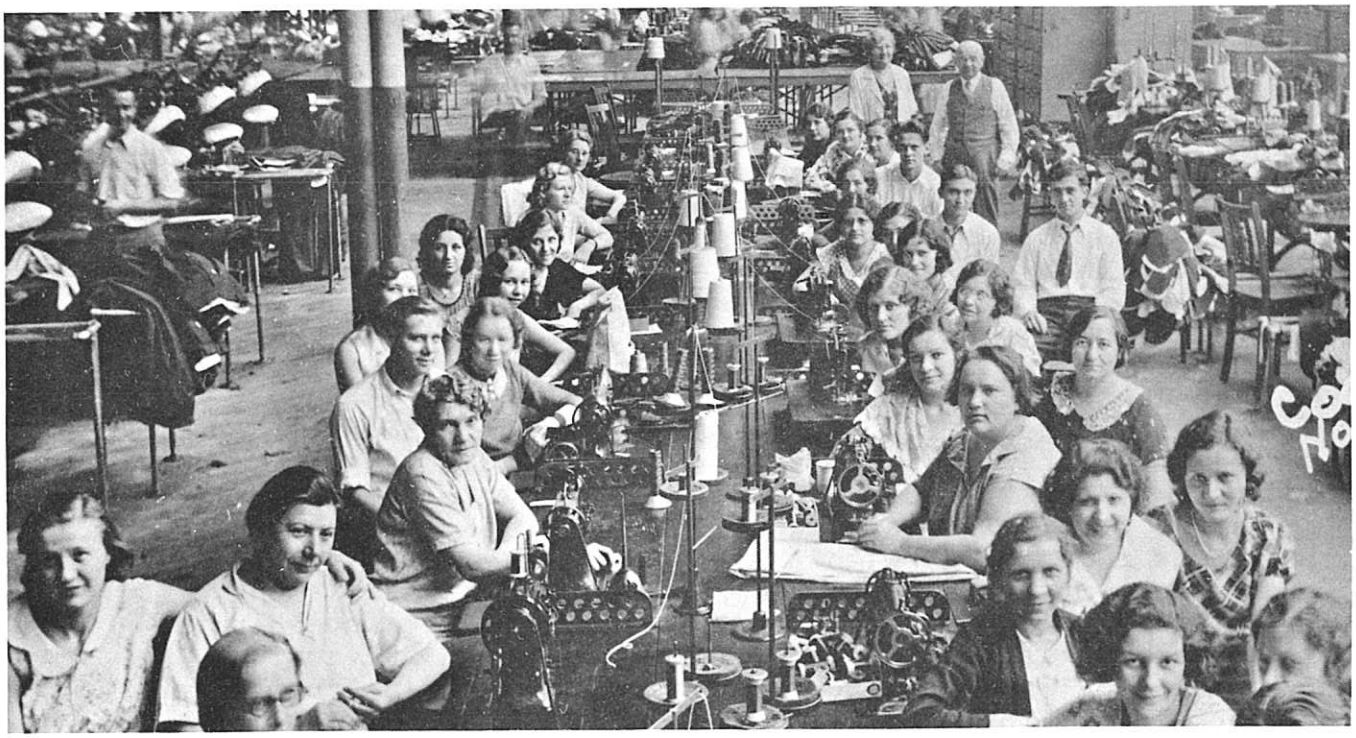
The firm's shift from retail to manufacture has not been documented. It is known that during the late 19th century the firm produced men's garments by the "contract method": goods were purchased, cut, and given out to contractors--almost all of German or Bohemian descent--who assembled the finished garments in small shops attached to their homes. About 1897, the company began a small inside shop at the rear of its building at 630-634 St. Clair Avenue. In 1900 the company built a one-story shop on Swiss (West 53rd) Street. This was enlarged with a two-story addition in 1905, and in 1920 the Joseph & Feiss Co. built what was claimed to be the largest clothing factory in the U.S.

The new "Clothcraft Shops" of Joseph & Feiss (named after the label used to market its products) were designed by Lockwood, Greene & Co., engineers of Chicago, and built by Stone & Webster, Inc. The factory, covering seven acres adjacent to the Big Four Railroad, was built of red brick with sandstone trim. The main manufacturing building, 300 x 420 feet, was two stories with a sawtooth roof. Ramps provided connection between floors. The lower floor housed, among other functions, the machine shop, box room, receiving and shipping departments, kitchen, dining rooms, 1,200-seat auditorium, swimming pool, handball court, checker and reading rooms, and locker rooms. The upper floor housed the cutting, trimming, sewing, and pressing departments.

The adjacent four-story warehouse, 80 x 200 feet, contained the boilers, the design and final examining



Joseph & Feiss Co. factory from the south, March 1921.



Joseph & Feiss Co., coat section, November 1932. Photos courtesy of the Western Reserve Historical Society.

departments, and a school for the instruction of new employees. The top two floors were used for the storage and packing of finished garments. Adjacent to the warehouse was a radial brick stack 200 feet high. The warehouse roof supported a 60,000-gallon water tank connected with the plant's sprinkling system.

Until the plant was unionized in 1932, the Joseph & Feiss Co. operated on the model of early 20th-century corporate paternalism, providing its 2,500 workers with extensive recreation and health facilities, classes in English and citizenship, a library, and organized athletic and cultural programs. The company was among the first to introduce the scientific management concepts of Frederick Winslow Taylor into its operations.

After World War II, the "Clothcraft" label was replaced by a series of branded specialties, and in 1957 the company purchased the Samuel Spitz Co. of Chicago, along with the name "Cricketeer." Today it markets five major brands of tailored clothing through department stores and specialty shops: Cricketeer, Country Britches, Geoffrey Beene, Cricketeer Tailored Woman, and Cricket Club. The company's West 53rd Street factory today houses the firm's corporate offices, the design department, and jacket manufacturing units employing 1,300 people. In addition, Joseph & Feiss Co. operates a pants factory on Tiedemann Road in Cleveland, and plants in Lorain, Ohio; Utica, New York; and Harrodsburg and Lawrenceburg, Kentucky. Since 1966 the Joseph & Feiss Co. has been a wholly owned subisidiary of Phillips Van Heusen Corp.

The industry today is still characterized by extensive hand operations, including cutting, sewing, and pressing. The company's warehouse and distribution center has been moved to an automated facility nearby in Brooklyn, Ohio, and computers now track inventory, sales, and the manufacturing process. [Special Supplement to the Cleveland Plain Dealer, May 15, 1921; "A Clothing Plant of High Efficiency," The Manufacturing Clothier, June 1920, pp. 19-23, 31; O. D. Foster, "He Found 'Short Cuts' to Long Steps of Progress," Forbes, October 27, 1923; "Making Suits for a Century," The Clevelander, October 1941, pp. 8, 22; Western Reserve Historical Society, Cleveland, Ohio, Joseph and Feiss Company, Records 1847-1960.]

84-INCH HOT STRIP MILL, LTV STEEL CLEVELAND WORKS (Republic Steel Co.)
1555 Harvard Avenue

Cleveland South
17.443620.4589200

Dalliba, Corrigan & Co. (later Corrigan, Ives & Co.) was one of the leading iron ore merchants on the Great Lakes during the late 19th century. Unable to sell the full capacity of its Lake Superior mines, the company leased or acquired blast

furnaces in Ohio, New York, and Pennsylvania, and in 1909 began construction of two stacks on the Cuyahoga River in Cleveland that became the nucleus of one of America's important independent steel companies, the Corrigan, McKinney Co.

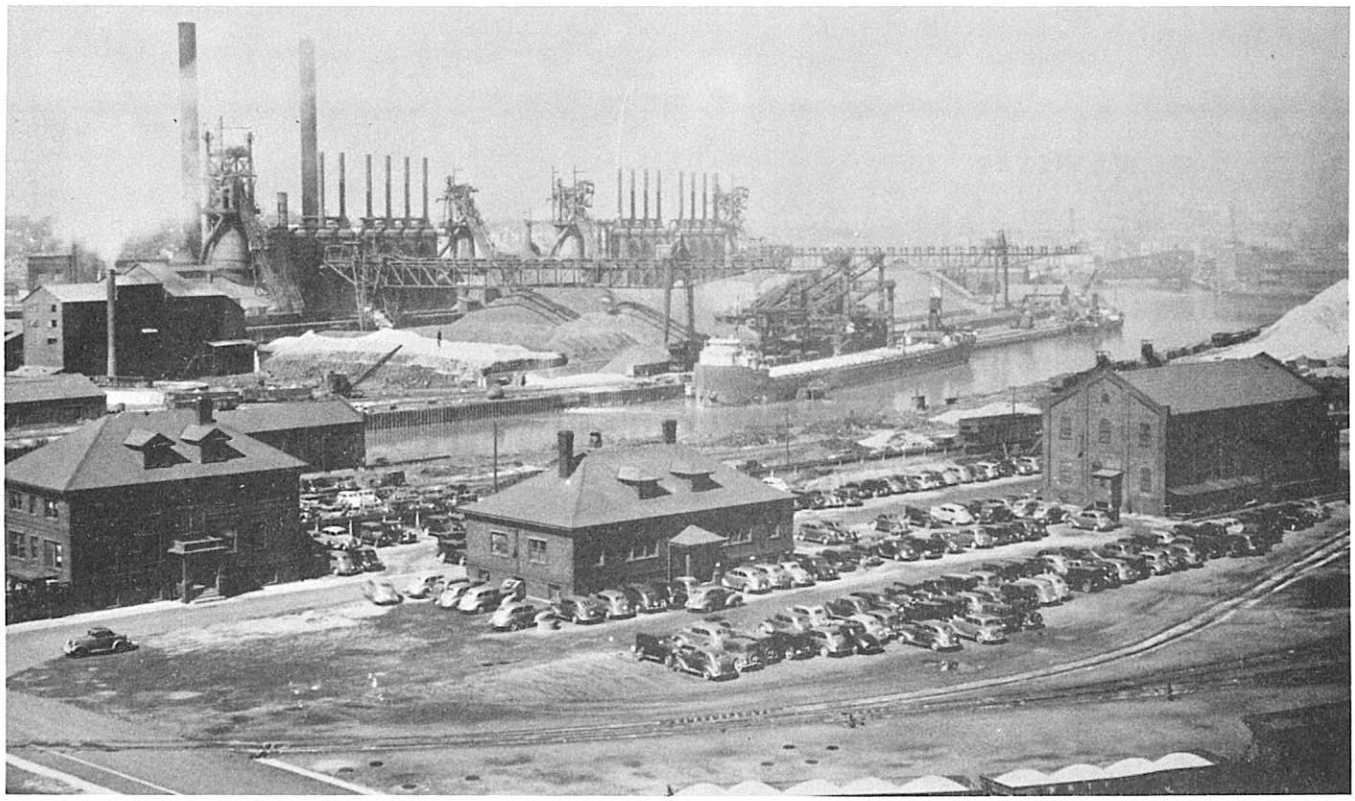
Between 1913 and 1916, Corrigan, McKinney built two additional furnaces and a steel works for the production of blooms, sheet bars, and billets. The problem of industry-wide integration led the company to add merchant mills--10-inch and 12-inch bar mills--for the production of finished steel in 1927. In 1935 Corrigan, McKinney was acquired by the Republic Steel Corp., which moved its headquarters from Youngstown to Cleveland. Republic continuously enlarged the plant, making it the largest of the company's six basic steelmaking plants and one of the ten largest in the country.

The 84-inch hot strip mill began production in 1971, replacing a 98-inch mill (then the largest of its kind in the world) built in 1937 as part of Republic's first major expansion of its Cleveland plant. Built by the Mesta Machine Co., the mill consists of three reheat furnaces, five roughing stands (3 two-high and 2 four-high), seven four-high finishing stands, and two down coilers. Computers control steel width, thickness, surface flatness, and temperature. Slabs from the plant's continuous caster (completed in 1983) are reheated, then pushed onto rollers that carry them through the roughing and finishing stands. At the end of the line, water sprays cool the strip as it is automatically coiled and bound.

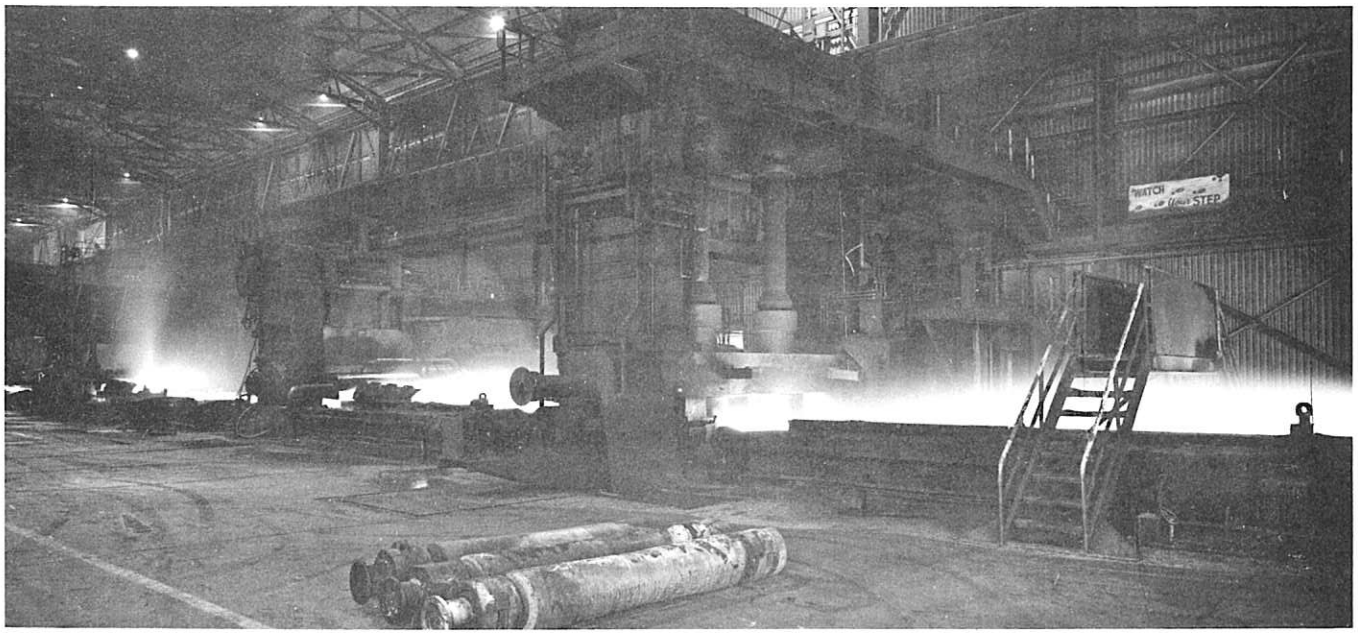
In the adjacent cold mill complex, the steel strip is pickled to remove iron oxides. It is then cold-rolled, annealed (softened), and passed through the 84-inch temper mill, which puts on the surface finish desired by the customer. Finally, the cold-rolled coils pass through a 76-inch multiple slitting line for correct sizing and packaging. Hot and cold-rolled steel is used in the manufacture of automobiles, appliances, office furniture, and other goods requiring a light-gauge steel of smooth surface.

The LTV Steel Co. was created by the 1984 merger of LTV Corp. (parent company of Cleveland's Jones & Laughlin Steel Corp.) and Republic Steel. Headquartered in Cleveland, LTV Steel is the nation's second-largest steel manufacturer. LTV Steel's Cleveland Works is part of the company's flat rolled steel division. Fully integrated from raw materials through finishing mills, the Cleveland Works sprawls across both sides of the Cuyahoga River. At full capacity LTV Steel employs 5,800 hourly workers, but shrinking markets and increasing imports have caused the company temporarily to suspend production at the former Jones & Laughlin plant, reducing hourly employment to just 3,500.

[Library of Congress, Prints and Photographs Division, Historic American Engineering Record No. OH-13, "Corrigan, McKinney Steel Company (Republic Steel Company)," prepared by Carol Poh Miller, October 1979.]



Republic Steel, looking north from the Clark Avenue Bridge, September 29, 1939. Newspaper Enterprise Association photo, courtesy of the Cleveland Public Library.



Republic Steel Co., Cleveland Steel Plant. Roughing stands, 84-inch hot strip mill, 1979. Jet Lowe photo for HAER.

CUYAHOGA RIVER TOUR

The Cuyahoga River follows a sinuous course through the flat, low valley, known as the "Flats," that separates the east and west sides of the city of Cleveland. Historically, the Flats was covered with rolling mills, foundries, lumberyards, factories, railroad tracks, and freight depots. Near its mouth, the river was lined with shipyards, docks, and warehouses. All this activity, and the connection of the west side of the city with the downtown commercial district, has required the construction of numerous bridges and viaducts. Today, some 22 highway and railroad bridges cross the six-mile stretch of navigable river within the city limits:

1 Conrail No. 1 Bridge (1947)
2 Main Avenue High Level Bridge (1939)
3 B. & O. R.R. Bridge #463 (1956)
4 Center Street Bridge (1901; last remaining swing bridge in Cleveland)
5 Detroit-Superior High Level Bridge (1917; widened 1968)
6 Union Terminal High Level Bridge (1929)
7 Columbus Road Bridge (1940)
8 Carter Road Bridge (1940)
9 Eagle Avenue Bridge (1931; first vertical lift bridge in Cleveland)
10 Lorain-Carnegie High Level Bridge (1921)
11 New York, Chicago & St. Louis R.R. Viaduct (1907; river span 1957)
12 Inner Belt Freeway High Level Bridge (1959)
13 West 3rd Street Bridge (1940)
14 Conrail (abandoned)
15 Jefferson Avenue Bridge (1907; superstructure removed 1959)
16 Newburgh & South Shore Ry. Bridge No. 1 (1904)
17 B. & O. R.R. Bridge #460 (1906)
18 River Terminal Ry. Bridge (1913)
19 Clark Avenue Bridge (1917; demolished 1985)
20 Norfolk & Western Ry. Bridge 184.50 (1959)
21 Norfolk & Western Ry. Bridge 2.22 (1953)
22 Newburgh & South Shore Ry. Bridge No. 2 (1969)

Old river:
23 B. & O. R.R. Bridge #464 (1907)
24 Willow Avenue Bridge (1964)

CUYAHOGA VALLEY AND AKRON

Between the cities of Cleveland and Akron, the Cuyahoga Valley National Recreation Area preserves 32,000 acres of pastoral valley along 22 miles of the twisting Cuyahoga River. There are two sites here of particular interest to the industrial archeologist: the Ohio & Erie Canal, opened between Cleveland and Akron in 1827, and the Jaite Paper Mill with its associated workers' housing and general store.

Akron has survived the exodus of the major industry that gave it the name of "Rubber City." Between 1950 and 1980 the city lost some 28,000 rubber industry jobs, and after 1978 none of the Big Four--Goodyear, Firestone, Goodrich, or General--made passenger car tires in Akron. Cheaper labor and newer, more efficient plants elsewhere, the surge in imported cars, and the rapid ascendancy of radial tires were among the factors leading to the end of tire production in Akron. But rubber remains a significant area employer; besides maintaining their headquarters here, the rubber companies operate extensive research and development facilities. Akron's successful, if difficult, transition from a blue- to white-collar economy is perhaps best symbolized by Goodyear's conversion of Plant II (1916) as the nucleus of a new technical center.

OHIO AND ERIE CANAL — Cleveland South 17.447500.4582420
Cuyahoga and Summit counties — to Peninsula 17.451280.4558860

The Ohio and Erie Canal, linking Lake Erie at Cleveland with the Ohio River at Portsmouth, was completed in 1832. This inland waterway, 309 miles long and built at a cost of over $4 million, laid the foundation for Ohio's industrial, commercial, and political development.

Ohio in 1820 was a state rich in natural resources but lacked a cheap and practical means of transporting its products to Eastern markets. The success of the Erie Canal in New York State prompted Ohio to consider a similar system of transportation. Ground was broken for the Ohio and Erie Canal on July 4, 1825, and exactly two years later the first section of canal, between Akron and Cleveland, was opened to traffic.

Ohio's river systems dictated the general plan of the canal. In the north, the Cuyahoga River reached from Cleveland to Akron. A short portage then led to the Portage Lakes, a natural reservoir of water that could supply the canal. These factors, and the persuasiveness of canal commissioner Alfred Kelly, led to Cleveland's selection as the northern terminus despite the claims of rival towns. The Ohio Canal Commission decided that the specifications for the New York canals should be adopted for Ohio's. Thus, the main channels were to be 26 feet wide at the base, 40 feet wide at the water line, and four feet deep.

The canal was in active operation from its completion until just preceding the Civil War. The principal goods transported by canal were wheat, corn, oats, coal, iron ore, pork, flour, lard, whiskey, lumber, and general merchandise. Canal packets also accommodated short- and long-distance travelers. By 1860, however, competition from the railroads was intense. Tolls dwindled from $190,000 in 1850 to only $16,000 in 1861. By 1900, the canal was regarded as a "historical landmark" and fell into disuse and decay. In 1904 the state legislature passed an act appropriating funds for the reconstruction of the northern division of the Ohio and Erie Canal. The locks were repaired with concrete and the canal was used, largely for pleasure boating, until 1913, when a flood brought the canal era to an end.

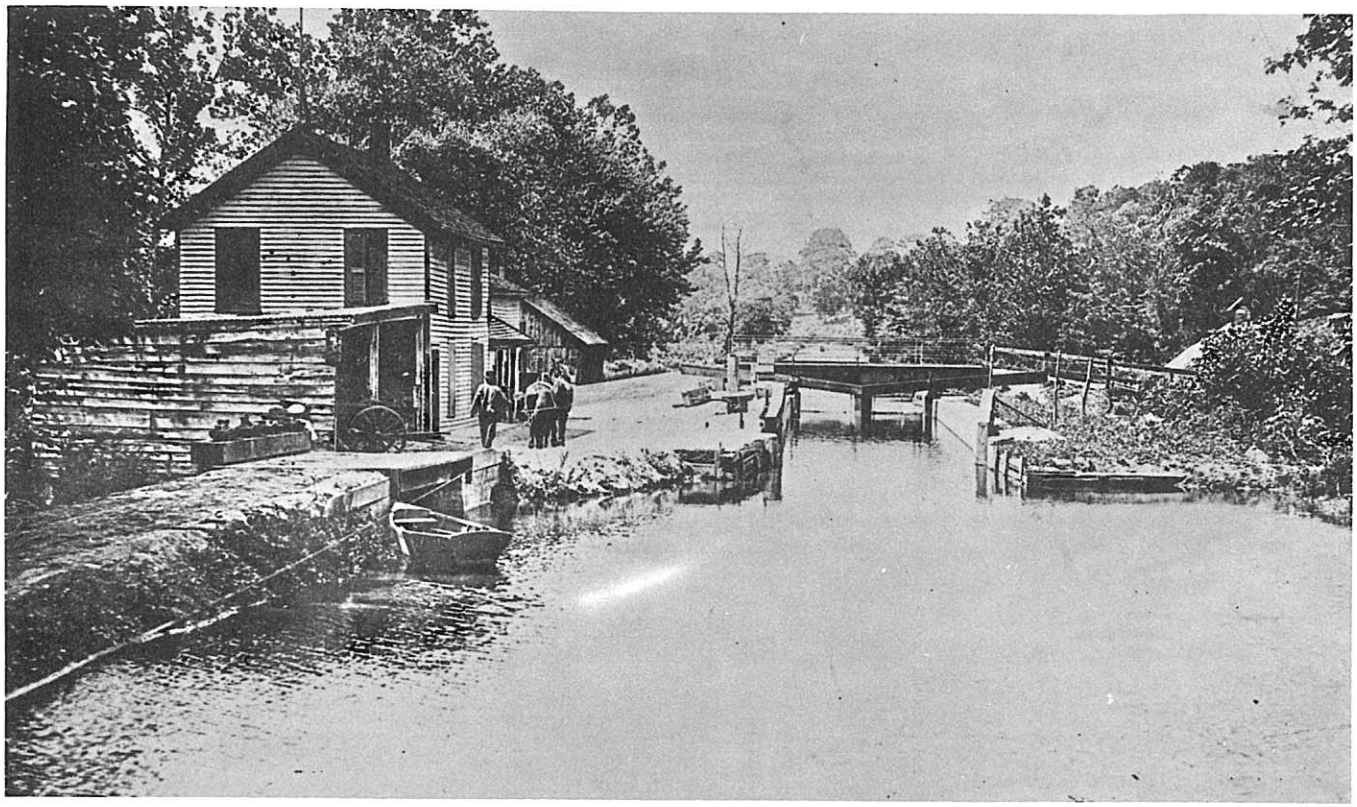
Considering its age, portions of the northern segment of the canal remain in a remarkable state of preservation. That section in the village of Valley View has been designated a National Historic Landmark, and two other large segments between Cleveland and Akron have been listed in the National Register of Historic Places. Today the Ohio and Erie Canal--and the remnants of the settlements it gave rise to--are the principal historic features of the Cuyahoga Valley National Recreation Area.

[Chester E. Finn, "The Ohio Canals: Public Enterprise on the Frontier," The Ohio State Archaeological and Historical Quarterly 51 (January-March 1942):1-40; Ohio State Archaeological and Historical Society, History of the Ohio Canals: Their Construction, Cost, Use and Partial Abandonment (Columbus, O.: Press of Fred J. Heer, 1905); Harry N. Scheiber, Ohio Canal Era: A Case Study of Government and the Economy, 1820-1861 (Athens, O.: The Ohio University Press, 1969).]

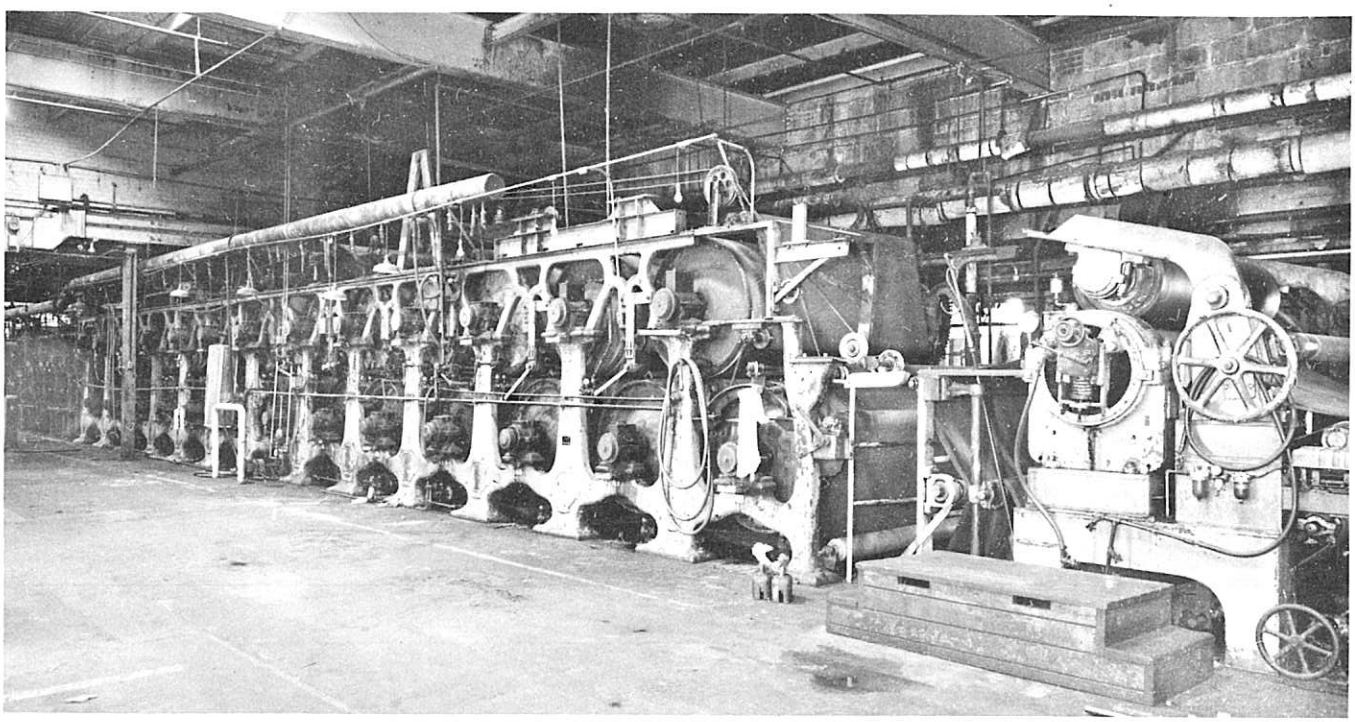
JAITE PAPER MILL — Northfield
Highland Road, Northfield Township — 17.452830.4570280

The Jaite Paper Mill is the focal point of the Jaite Mill Historic District, one of the few remaining company towns in northeast Ohio. Built by Charles H. Jaite in 1905, the mill was constructed of concrete blocks manufactured on site from sand dredged from the Cuyahoga River. Over time the original building was enlarged and altered as paper mill operations expanded and technology changed. The Jaite Mill eventually had a daily capacity of eight tons of paper, which was made into flour and cement bags and sold to the manufacturers of those products. The company later made fertilizer bags and bread sacks.

About 1926, the wet end of the mill was converted from the cylinder to the Fourdrinier process. In 1933 mill equipment included 13 beating and three Jordan engines, two 88-inch Horne Fourdriniers, and one combination Horne three-cylinder, capable



14-Mile Lock, Valley View, ca. 1895. View is looking north. Photo from the collection of James Cowles.



Fourdrinier papermaking equipment, Building #4, Jaite Paper Mill, 1985. Jet Lowe photo for HAER.

of making paper up to 79-3/4 inches wide. In 1928 the Jaite Mill manufactured the first multiwall cement bag, which later came into general use. The mill employed just over 200 people in 1929, some of whom lived in the small village of Jaite just across the Cuyahoga River in Brecksville Township.

The small, privately owned paper mill proved unable to compete with larger mills, especially those in the South. Beginning in 1951, ownership passed to a succession of companies. When the mill was closed in 1984, the Tecumseh Corrugated Box Co. was manufacturing recycled paper for use in corrigated mediums. Both the paper mill and the village of Jaite today are part of the Cuyahoga Valley National Recreation Area. Jaite, which still has the unmistakable appearance of a company town, serves as park headquarters. Three railroad service buildings nearby, built by the B. & O. Railroad in 1903 when Jaite (then called "Vaughn") was a train operating point, are no longer used.
["Jaite Mill Historic District," National Register of Historic Places Inventory-Nomination form prepared by Carol Poh Miller, August 28, 1978.]

QUAKER SQUARE and QUAKER SQUARE HILTON — Akron West
135 South Broadway — 17.456740.4547720

Oatmeal was chiefly sold by druggists as a "remedial agent" in 1856, when German immigrant Ferdinand Schumacher (1822-1908) began milling oats and thereby helped create a demand for oatmeal as a healthful and nutritious breakfast cereal. Twenty years later Schumacher operated four mills in Akron having a total capacity of 2,000 barrels a day and marketed oatmeal, barley, flour corn, farina, and cracked wheat over a wide area. Fire swept away much of his investment in 1886, and he consolidated his company with the Akron Milling Co. under the new name F. Schumacher Milling Co. The latter, along with six other of the nation's oldest and largest oatmeal millers, in 1891 combined to form the American Cereal Co. American Cereal was absorbed by the Quaker Oats Co. in 1901.

The Schumacher mills at Akron long remained second in size only to Quaker Oats' huge complex at Cedar Rapids, Iowa. When the company terminated production there in 1970, the once-bustling mills and elevators became an enormous white elephant in the heart of downtown Akron. Beginning in 1973, Quaker Square Associates redeveloped the abandoned mills as a retail and entertainment complex. The project was aided by a $1 million Urban Development Action Grant and a $5.5 million sale of industrial revenue bonds, and financed, in part, by the sale of the abandoned mill machinery. Architects for the reconstruction (and project principals) were Ted Curtis and Harold Rasmussen of the local firm Curtis & Rasmussen Inc.

Capstone of the project was the conversion of 36 grain silos, each 120 feet high and 24 feet in diameter, into a

Quaker Oats Co. mills at East Mill Street and South Broadway, looking east, ca. 1940s. Photo courtesy of Archival Services, Bierce Library, University of Akron.

Quaker Mills grain silos before and after their conversion to a hotel. Bruce S. Ford photos for the City of Akron Dept. of Planning/Graphics.

196-room Hilton Hotel. The conversion represented one of the largest concrete sawing jobs ever done on a commercial building project. Contractor for the four-month sawing operation was Dot Diamond Core Drilling, Inc., of Elyria, Ohio, which made the cuts with diamond-tipped saw blades continually cooled with water. Concrete was poured inside the silos to create the eight floors, and a new lobby and ballroom-conference center were built. The hotel opened in July 1980.

Quaker Square has received numerous awards for the innovative use of industrial buildings, while the Quaker Square Hilton was featured in the SIA film "Working Places" and is widely regarded as among the pioneers of adaptive reuse. [Harrison John Thornton, The History of the Quaker Oats Company (Chicago: The University of Chicago Press, 1933); "From Grain Bins to Hotel with Government Loan," Building Design & Construction, March 1981, pp. 52-57; The New York Times, October 5, 1980.]

Box Lunch at Lock 2 Park

Designed by Sasaki Associates, Inc. of Watertown, Mass., and completed in 1983, Lock 2 Park forms a key part of an overall economic redevelopment plan for downtown Akron. Sasaki Associates' design recognizes the role of the Ohio and Erie Canal in the city's history. A "dry dock" with a full-scale, stylized canal boat features enamel panels containing historical background.

From Lock 2 Park, tour participants will walk two blocks to the Akron Civic Theater to view several short films highlighting local aviation history, including construction of the Goodyear Airdock and the airships Akron and Macon. The Akron Civic Theater, designed by John Eberson and opened in 1929 as Loew's Civic, boasts an opulent Moorish Revival decor. The theater closed in 1964, but was rescued by local preservationists and reopened the following year.

En route to our final destination, the Goodyear Airdock, the buses will make brief "curbside" stops at Goodyear Tire & Rubber Co. Plants I and II.

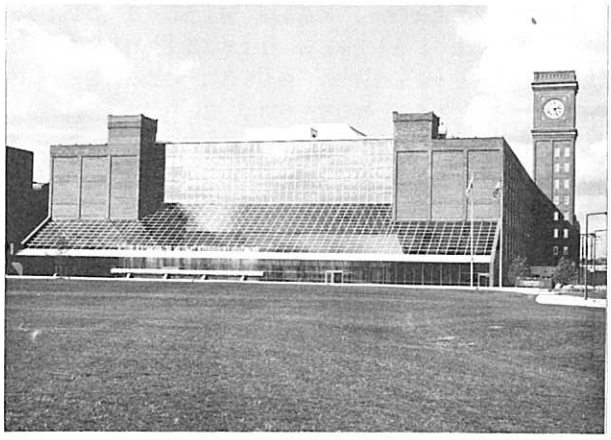
GOODYEAR TECHNICAL CENTER
(Goodyear Tire & Rubber Co. Plant II)
200 South Martha Avenue

Akron East
17.459900.4545200

In 1898 Frank Seiberling purchased seven acres of land in Akron, Ohio, to start a tire and rubber business. By 1916 the Goodyear Tire & Rubber Co. (named after U.S. inventor Charles Goodyear, who originated the process for vulcanizing rubber) was the largest tire company in the world. That year, the company began construction of a new plant for the manufacture of what were then called "Ford-size" (i.e., small) tires and mechanical goods. Unlike Plant I, which had grown in makeshift fashion as the company grew, Plant II was scientifically arranged to allow the most efficient movement of materials in process. Two large wings were added in 1927, and the adjacent rim plant was completed.

Plant II was closed in 1978 when Goodyear ended the production of bias tires. But it reopened five years later as the centerpiece of the 3,000-acre Goodyear Technical Center, containing offices, laboratories, and test engineering and design facilities, including a mini-production area with a capacity of 1,200 tires a day and a one-mile test track. City and state government supported the project, covering a portion of the costs of clearance and relocation of roads, bridges, and parks.

[Hugh Allen, The House of Goodyear: A Story of Rubber and of Modern Business (Cleveland: The Corday & Gross Company, 1943).]



Goodyear Tire & Rubber Co. Plant II before and after its conversion to the Goodyear Technical Center. Photos courtesy of Goodyear Tire & Rubber Co.

GOODYEAR AIRDOCK
1210 Massillon Road

Akron East
17.460420.4542200

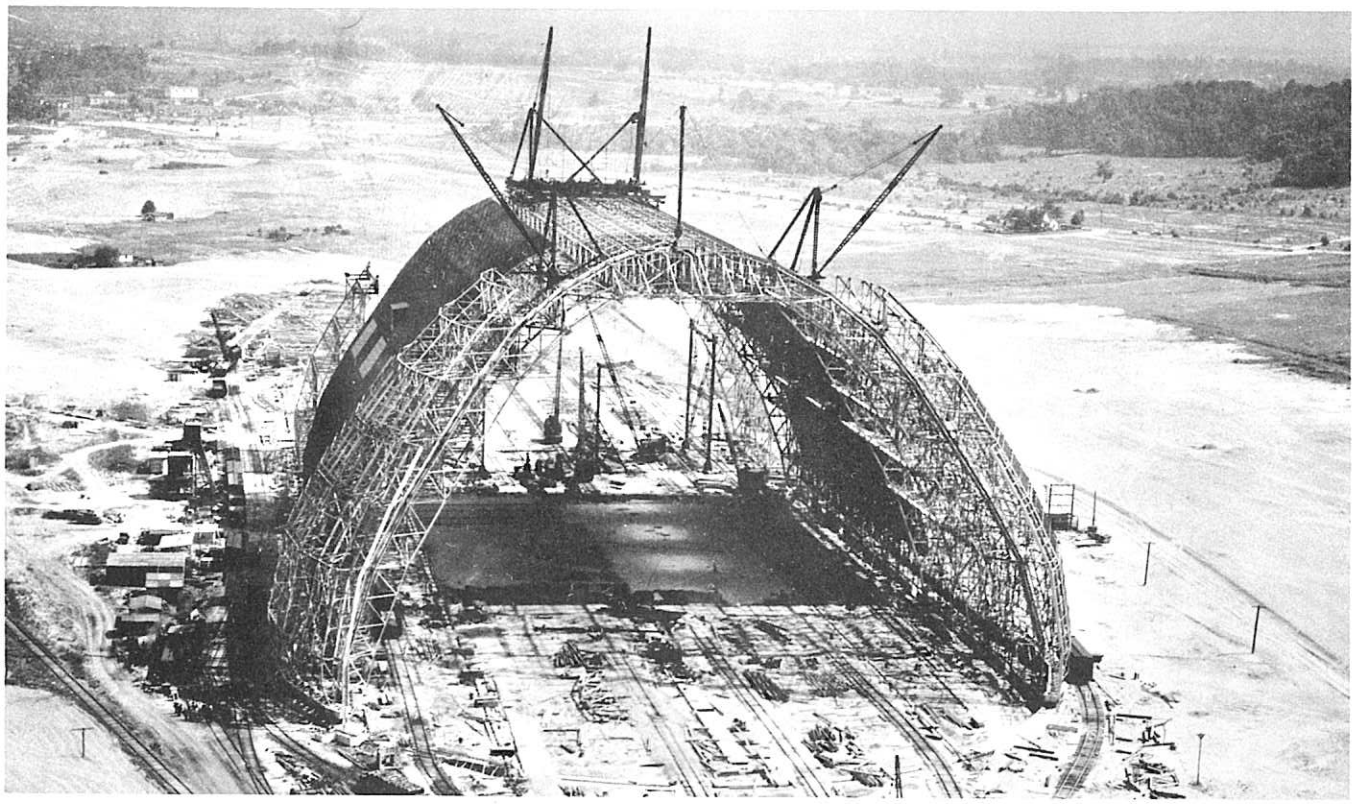
The Goodyear Tire & Rubber Co. began developing lighter-than-air craft in 1910, and in 1917 built its first airships for war duty. Goodyear President P. W. Litchfield was convinced of the rigid airship's viability for commercial travel and freight haulage, and in 1924 the Goodyear-Zeppelin Corp. was formed as a subsidiary of the tire company. It acquired Zeppelin construction rights and recruited Zeppelin engineer Dr. Karl Arnstein, a leading authority on airship construction, as director of engineering. In 1928 the Navy commissioned Goodyear-Zeppelin to build two rigid airships, each 785 feet long, and later that year the company began construction of a huge airship factory and dock at the Akron Municipal Airport.

After extensive testing with a model, Arnstein settled on the semi-paraboloid shape of the building--which has been described as "half an egg"--as the one that offered the least resistance to air currents. Wilbur Watson and Associates, architects and engineers of Cleveland, designed the airdock, which consists of 11 parabolic structural steel arches spaced 80 feet apart and connected by a system of vertical and horizontal trusses. The American Bridge Co. erected the dock's structural steel.

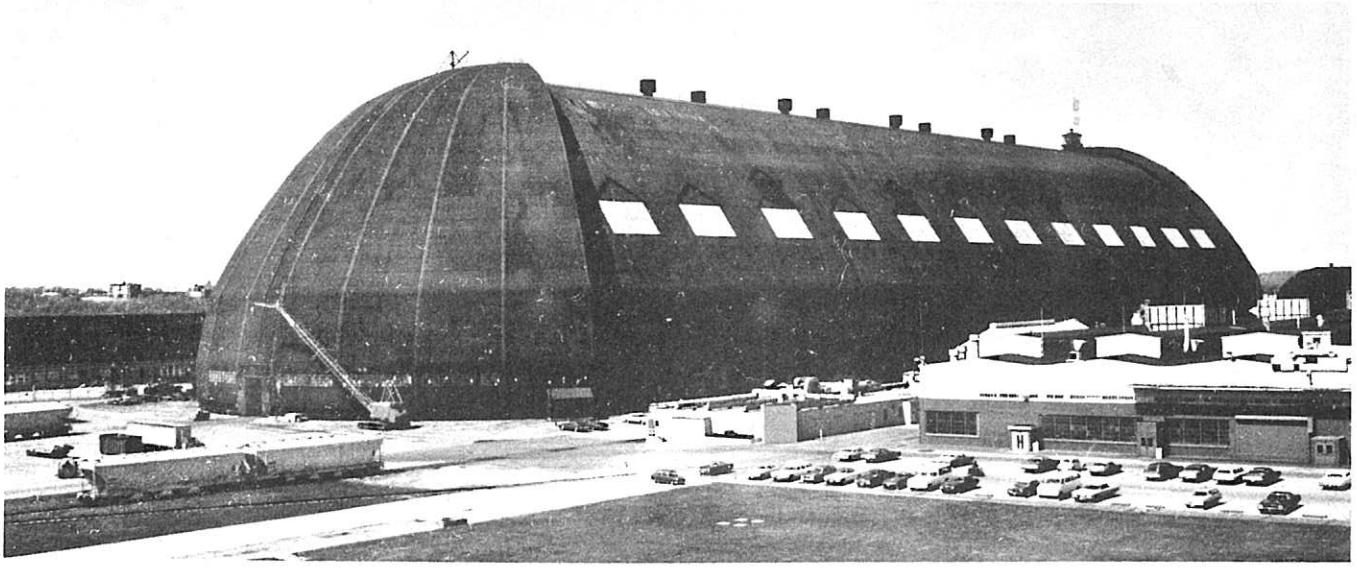
The airdock is 1,175 feet long, 325 feet wide, and 211 feet high. A floor area of 364,000 square feet makes it one of the largest buildings without interior supports in the world. Perhaps the most unusual feature of the dock is its spherical doors. Wilbur Watson described them this way: "If one can visualize a quarter of a half of an orange peel set up on a flat surface, held with a pin at its pointed top and resting on a set of rollers distributed under the bottom edge and imagine this one-eighth of an orange peel as 202 feet high, 214 feet wide at the bottom, fastened or hinged at the top point with a huge hollow forged pin and resting on 40 wheels at its base, he would have an idea of what one leaf of two that close one end of the hangar is like." The 40 forged steel, double-flanged wheels are set on curved, standard-gauge railroad tracks. The doors are opened and closed by gears connected to a 125-h.p., two-speed motor.

The first airship, the U.S.S. Akron, was christened on August 8, 1931, by Mrs. Herbert Hoover before a crowd of 150,000 spectators. The U.S.S. Macon was christened on March 11, 1933. But the era of the rigid airship was short-lived. The Akron plunged into the Atlantic Ocean during a storm on April 4, 1933, while the Macon was lost in the Pacific in February 1935.

The airdock is equipped with overhead electric cranes, and a series of catwalks runs the full length of the structure. Access to the catwalks (and to the roof) is provided by two



The Goodyear-Zeppelin Airdock under construction, August 20, 1929.



The Goodyear Airdock, 1976. Photos courtesy of Goodyear Aerospace Corp.

stairways and a specially designed inclined railway consisting of two counter-balanced cars running on a curved track.

In addition to the Akron and the Macon, the airdock has housed the construction of some 300 nonrigid airships, the last of which were delivered to the Navy in 1960. In 1935 the airdock housed construction of the three-car, streamlined "Comet," the first American train built with diesel power plants at both ends. The train was built by Goodyear for the New York, New Haven & Hartford Railroad.

Today the airdock is part of the Goodyear Aerospace Corp. complex and is used largely for storage. Goodyear Aerospace, a wholly owned subsidiary of Goodyear Tire & Rubber Co., is a major manufacturer of aerospace and defense systems.
["Huge Airship Factory and Dock at Akron, O. Is Nearing Completion," Iron Age 124 (October 3, 1929):885-86; Wilbur J. Watson, "Erecting the World's Largest Roof: Airship Factory and Dock for Goodyear Zeppelin Corporation, Akron, Ohio," Civil Engineering 1 (November 1930):71-76.]