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CONFERENCE PROGRAM & TOUR GUIDEBOOK

SOCIETY FOR INDUSTRIAL ARCHEOLOGY
MICHIGAN TECHNOLOGICAL UNIVERSITY
1400 TOWNSEND DRIVE
HOUGHTON, MI 49931-1295

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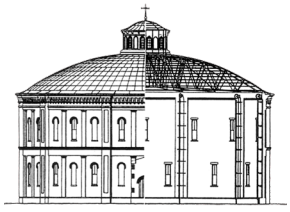

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Faribault Mill (Faribault Woolen Mill)

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St. Anthony Falls Laboratory (University of Minnesota)

University of Minnesota & Violia at the U of M Main & SE Plants

Upper River Services

U.S. Army Corps of Engineers

Waterous Company

Xcel Energy (Hennepin Island Hydroelectric Plant and Main Street Power Station)

SIA
MINNEAPOLIS 2024
TOUR SITES

THURSDAY, MAY 16 TOURS

BUS T-1: ST. ANTHONY FALLS

Upper Lock

The Upper Lock began as part of the St. Anthony Falls Upper Harbor Project, which was authorized by Congress in the River and Harbor Act of 1937, 1945 and 1958. The Corps of Engineers was authorized to study the feasibility of extending the Mississippi River's 9-foot navigation channel around the Falls of St. Anthony and into the Upper Harbor area of Minneapolis. This would extend river navigation 4.6 miles upstream.

The Upper Harbor Project provided for the construction of a Lower Lock with a lift of 24.9 ft, together with a new Lower Dam, both completed in 1956 and an Upper Lock with a lift of 49.2 feet, finished in 1963. Additional work included minor alterations to the crest of the existing upper dam, dredging a channel 9 feet deep and a minimum of 150 feet wide for barges, and bridge and utility alterations. The construction of the Upper Lock permanently closed off the water supply for the waterpower canal that had supplied the flour mills on the west side of the falls. The canal gatehouse, which controlled the flow into the canal from the Mississippi, was razed during lock construction.

The Upper Lock and dam are located in the center of the historic milling district of Minneapolis, within the boundaries of the Saint Anthony Falls National Register District. The complex consists of a concrete horseshoe dam, a concrete lock, a three-story building that includes the operations center and an enclosed observation deck, and a public restroom building. Additional structures include a jetty that extends into the intermediate pool and a line of dolphins upstream from the lock. In addition, the 1883 Stone Arch Bridge crosses the navigation channel and jetty below the Upper Lock, and the Third Avenue Bridge crosses the Upper Dam.

The Upper Lock is a single-lift type, with a normal lift of 49.2 feet, highest of any lock on the Mississippi, and accounts for more than 10 percent of the total height change between Minneapolis and St. Louis. It is also the northernmost of the 29 Mississippi locks in the nine-foot channel system between Minneapolis and St. Louis. (The Lower Lock lift is 24.9 feet.) The lock is 400 feet long and 56 feet wide. It has upper and lower miter gates and an upper Tainter gate. The final design for the Upper Lock was based on model studies by the Corps of Engineers at the nearby St. Anthony Falls Laboratory, then named the Hydraulic Laboratory. For each lockage, the lock chamber is filled in 8 minutes, using 11 million gallons of water, and is emptied in 7 to 10½ minutes.

In 2015, the Upper Lock closed to river navigation. The Lower Lock remains open as the head of navigation on the Upper Mississippi River's 9-foot channel.

Mill City Museum

The Mill City Museum, part of the Minnesota Historical Society, is constructed within the ruins of the Washburn A Mill, a National Historic Landmark flour mill that burned in February 1991. The eight-story museum structure was designed by Thomas Meyer of Minneapolis architectural firm Meyer, Scherer & Rockcastle, Ltd. (MSR) to tell the history of flour milling in Minneapolis, which was the milling center of the world from the 1890s to the 1930s.

The original Washburn A Mill was constructed on the site in 1874 and destroyed in the great Minneapolis mill explosion of 1878, ignited by airborne flour dust and killed 18 individuals. A new Washburn A Mill was constructed in 1879-80 and, at the time was the largest flour mill in the world. The mill, originally operating on waterpower, functioned until 1965, surviving long after flour milling had declined in the city. The mill was listed in the National Register in 1971 and declared a National Historic Landmark in 1983. Following the 1991 fire, the Minnesota Historical Society argued against demolition of the ruins and moved to establish the Mill City Museum on the site. The new museum, focused on telling the Minneapolis flour-milling story, opened in 2003. The structure has retained its Landmark status. A major museum feature is the eight-story Flour Tower, a giant elevator that carries visitors up through the museum floors, opening on each floor to sight and sound exhibits of milling history.

St. Anthony Falls Laboratory (formerly St. Anthony Falls Hydraulic Laboratory)

The St. Anthony Falls Hydraulic Laboratory building was completed in 1938 on the west side of Hennepin Island, not far from Main Street. An abandoned 1850s building that historically had multiple uses, including a paper mill and a city waterworks, was razed to make way for the new laboratory. The construction was funded by the Works Progress Administration (WPA) and designed by its first director and noted hydraulics engineer, Lorenz G. Straub.

It is a flat-roof building of irregular plan, primarily of reinforced-concrete construction, with one- and two-story sections, expanded in the 1960s-70s. Operated from the beginning by the University of Minnesota, the laboratory has focused on cutting-edge fluid mechanics research. From the beginning, the building was designed to draw water from the Mississippi's east side millpond, employ the water in a variety of interior research facilities, and return the flow through a tailrace on Hennepin Island. Following the addition of the atmospheric boundary layer wind tunnel in the 1980s, the facility's name was shortened to St. Anthony Falls Laboratory (SAFL), as it remains today. A major renovation of the research facilities came in 2010-14, with funding from the National Science Foundation. At present, research at SAFL is categorized into three primary areas: fundamental fluid mechanics research, environment, and energy. These research thrusts are paired with state-of-the-art facilities that support a diverse range of fluid dynamics research. In addition to serving the University's educational community of students and faculty, the laboratory's research extends to the engineering and scientific community worldwide.

Hennepin Island Hydroelectric Plant

The Hennepin Island Hydroelectric Plant is Located near the center of Hennepin Island, now considered more on the east side of the river and St. Anthony Falls. It is a contributing property in the National Register St. Anthony Falls Historic District. The flat-roofed, two-level building has a reinforced-concrete foundation, brick walls, and a skeletal steel frame. Pilaster strips divide the exterior walls into equal panels pierced by large rectangular windows with concrete lintels and sills. A limestone headrace conveys water to the plant from the eastside mill pond. The flow exits through arched openings on the downstream side.

Constructed in 1908, the plant was designed by William de la Barre, the Austrian-trained chief engineer of the St. Anthony Falls Water Power Company, which owned and operated the facility. At the time of its completion, the Hennepin Island Plant was the nation's first "surplus power" hydroelectric installation. Since other waterpower users at the falls had prior legal right to the streamflow, the Hennepin Island Plant operated only when there was a "surplus" of water. Usually, its operation was restricted to weekends and holidays, when the mills at the falls shut down. The plant originally sold its total output to the city's streetcar system. In 1923, the installation became the property of Northern States Power Company (NSP). In 1955, NSP rebuilt the original four horizontal generating units and added a fifth vertical generating unit. At the same time, the plant's generating system was converted from 35 cycles to 60 cycles to supply power to the municipal grid. Today's owner of the plant is NSP/Xcel Energy.

As a condition of renewing its federal license in 2004, NSP/Xcel Energy agreed to create the adjacent recreation area known as Water Power Park, with trails offering close viewing of the Falls, along with text panels interpreting the history of the Falls area.

Main Street Power Station

Completed in 1911, Main Street Power Station is the second building of the same name on the site, a short distance from the Hennepin Island Hydroelectric Plant. The original plant was constructed in 1894 by the Minneapolis General Electric Company, which was acquired by Stone and Webster of Boston in 1899. When the station burned to the ground in 1911, Stone and Webster, which was also a major engineering firm, designed and built a new hydroelectric station, incorporating from the earlier plant three horizontal turbines with corresponding wheel pit and tailrace systems. In the new plant, the turbines were connected to new Westinghouse generators by rope drives.

The generating units produced three-phase 13,200 volt alternating current, stepped down by transformers in the building to 2,300 volts for distribution in the municipal grid. In 1912, Main Street Station was acquired by Consumers Power Company, which was later reorganized as Northern States Power Company (NSP). The building remained

an active generating facility until 1968. Surviving equipment at the site includes the 1894 turbines and 1911 generators with rope drives to the turbines below. A modern substation yard on the building's east elevation continues in operation.

Extending two levels above grade and three levels below, this hydroelectric station is a flat-roofed, steel-framed, brick-walled building with a stone and concrete substructure. Measuring 192 feet by 72 feet, the facades are symmetrically arranged in panels articulated by pilasters with an inset stone capital. The slightly projecting cornice is supported on corbelled brick consoles. The plant is connected to Main Street by two steel-girder bridges. The plant originally drew water directly from the east-side mill pond, discharging the flow through tailrace tunnels that exited about two-hundred yards downstream on Hennepin Island.

Pillsbury A Mill

Once the world's largest flour mill, the Pillsbury A Mill is now a National Historic Landmark that has been adapted for a new use residential housing units for artists and studio space for artists to use. The adaptive use project was undertaken by Dominion Management Services, the same company that redeveloped the Schmidt Brewery in Saint Paul as artists lofts (to be visited by one of the Friday tours).

Soon after moving to St. Anthony, Minnesota (now part of Minneapolis), where his uncle was already an established businessman, Charles A. Pillsbury launched his flour-milling business in 1869. Pillsbury adopted a new process for milling flour that was also being used by other Minneapolis millers, who were exploiting the waterpower potential of St. Anthony Falls. Together, the Minneapolis millers' superior product revolutionized the market, fostering rapid growth in the city's industrial economy and inducing farmers in the area to switch to growing hard spring wheat. Encouraging his uncle and his father to invest in his business, Pillsbury continued to expand the enterprise, soon building the "A" mill in 1881. Designed by Minneapolis architect Leroy Buffington and mill engineer W.F. Gunn, it is the only architect-designed mill at the Falls. At first producing 5,000 barrels of flour per day (196 pounds per barrel), daily output exceeded 16,000 barrels by 1905. Pillsbury accomplished this by moving more and more auxiliary components of the process to new, adjacent buildings, effectively becoming the Pillsbury A Mill complex that we see today.

The Pillsbury A Mill operated until 2003. Shortly after it ceased operating, a developer acquired the mill and produced a development plan. By then, the mill had been listed in the National Register of Historic Places, been declared a National Historic Landmark, and was a significant contributing feature in the St. Anthony Falls Historic District. With failure of the project, however, the National Trust for Historic Preservation designated the Pillsbury A Mill one of the nation's 11 Most Endangered Historic Places in 2011. Dominion entered the picture in 2013 and put together a financing plan that included federal and state tax credits for rehabilitating historic structures and for developing affordable housing for artists. After spending more than $100 million on the project across two years, the Pillsbury A Mill opened in 2015 as the A Mill Artist Lofts with 251 living units for artists and studios for clay, painting, photography, dance, and musicians. The adaptive use of the A Mill, designed by the Minneapolis architectural firm the BKV Group, left many of the original industrial features of the building intact and dramatically visible from public spaces. The project also includes a hydroelectric generating plant fed by the same headrace that fed the old water-powered flour mill.

BUS T-2: NORTHEAST MINNEAPOLIS

Electric Machinery

Electric Machinery Company was founded in 1891 as a service shop. Founded by Janes T. Boustead and Charles H. Chalmers, the company started manufacturing electric machinery in 1897. Boustead claimed to have installed the first dynamo in Minneapolis, in 1881, located in a Brush Electric Co. plant at St. Anthony Falls. He also claimed to have installed the first electric motor in Minneapolis, in 1885 at a printing company. Worthington Machinery Corporation, which made construction equipment and other machinery, acquired Electric Machinery Manufacturing Company in 1944, and Worthington merged with Studebaker in 1967. From then through 2006, ownership of Electric Machinery passed through several hands, including Turbodyne, McGraw-Edison, Dresser Industries, Dresser-Rand (following Dresser's merger with Ingersol-Rand), Ideal Electric Holding Company, and Converteam (a French company). WEG acquired Electric Machinery from Converteam in 2011.

WEG is a global corporation, based in Brazil, that makes electric motors, generators, transformers, and turbines. Established in 1961, its name is the acronym of the first names of its three founders, who were an electrician, an administrator, and a mechanic, respectively. WEG now has subsidiaries in 37 countries, including Argentina, India, Mexico, Portugal, South Africa, Germany, China, and the U.S.

Electric Machinery's original shop was near the corner of Washington and Nicollet avenues in Downtown Minneapolis. The small company had struggled until Truman Hibbard, who joined the firm in 1897, designed a synchronous motor (constant speed) in the late 1910s that helped it become a leader in the field. It moved to a second location at 1331 NE Tyler Street (where a Blu Dot furniture outlet is now located) in the early twentieth century. The company acquired its present property in 1939. Electric Machinery expanded its footprint on the property through the 1940s and 1950s. The current complex covers 360,000 square feet. The company designs, manufactures, and services large electric motors and generators for various industries, including oil & gas, power generation, mining, and pulp and paper. Among the products it makes are synchronous motors (constant speed), induction motors (variable speed), synchronous generators, turbo (2 pole) generators, and brushless exciters. Electric Machinery's products are in more than 250,000 installations worldwide and represent more than 1.5 million horsepower. In the late 1950s, Electric Machinery employed about 1,100 people in Minneapolis. The company currently has 215 employees.

Sources: *Electrical Record* (February 1915): 69.
Minneapolis Sunday Tribune (24 August 1958).

Graco

Russell & Leil Gray (brothers) formed Gray Company in 1926 to manufacture an air-powered lubricator (grease gun) that Russel had invented. Their first location was at 120 S. 10th Street in downtown Minneapolis, about three blocks (as the crow flies) south of the conference hotel. During the Great Depression, the Gray brothers were able to increase sales by taking a trailer on the road to demonstrate the capabilities of their equipment to a mechanizing economy that was creating ever more demand for lubrication. During World War II, the company developed a system that the U.S. Army used to lubricate convoys of military vehicles moving across Europe and the Pacific.

In the post-war period, Gray Company created a new Industrial Equipment Division in order to enter markets beyond the lubricating niche. The company acquired its current property in NE Minneapolis in 1954 and developed an airless paint sprayer in 1958. Gray Company moved into markets in Europe, Asia, and South America in the 1960s, greatly expanding sales, and then changing its name to Graco toward the end of the decade. In the 1970s, Graco acquired H.G. Fischer & Co., a Chicago company that made an electrostatic paint-spray gun, which allowed Graco to enter the automotive market. Today's organizational structure, with an Industrial Equipment Division, a Contractor Equipment Division, and a Lubrication Division, was established in the 1980s. The company continues its product innovation, developing a new sprayer for painting stripes on pavement in the 1990s.

Entering the 2000s, Graco had manufacturing facilities in South Dakota, Ohio, and China, in addition to Minneapolis and Rogers, MN. In the 2010s, Graco bought a powder-coating company in Switzerland and a manufacturer of fluid-handling equipment in Utah. Our tour of the Graco plant in NE Minneapolis will focus on its manufacture of spray-painting equipment.

Production Engineering

Production Engineering Corporation (PEC) was founded in 1957 as H & B, Inc., by Herman Albers and Bob Gustafson. They started their business in a rented space in the Strutwear building in downtown Minneapolis using a Bridgeport mill and a Sheldon lathe purchased on credit from a local machine-tool distributor. (Strutwear once made hosiery. Its 1920s Art Deco building is listed in the National Register of Historic Places. The BKV Group, architects who designed the adaptive-use projects at the Pillsbury A Mill and the Schmidt Brewery, seen on other tours as part of this SIA conference, designed the adaptive use of the Strutwear building for affordable housing.) Gustafson left H & B to establish Formac Machine Company. Herman Albers then changed the company name to Production Engineering Corp. in 1962.

PEC moved to its current location in 1977. The company has grown steadily over the years, along with its customers in the computer, aerospace, and defense markets. Ownership is now in its third generation, and 100% of PEC's business is defense work. The company is a fabricator that cuts, shapes, welds, and finishes steel and aluminum for custom orders. Many of PEC's products are precision cabinets and enclosures for control panels, computers, and other high-tech devices used by the U.S. Navy and related customers.

Northrup King Building

The Northrup King Building was erected in 1916 to house the seed-processing and shipping operations of Northrup, King & Company. In 1884, Jesse Northrup and Charles Braslan had opened a retail seed store in Minneapolis. They were interested in selling seeds suitable for a northern climate, and the following year they issued their first catalog of flower, vegetable, and field seeds intended to be hardy enough to thrive in Minnesota's climate. As the company was acquiring farmlands to produce its seeds, expanding its market area, and developing a wholesale operation in Chicago, William and Preston King (father & son) invested in the business, but it went bankrupt in 1896 following the Financial Panic of 1893 and the destruction of its Minneapolis headquarters by fire in 1894. A new company, Northrup, King & Company was incorporated later in 1896 and bought the remaining assets of the earlier company. Shipping seeds by U.S. Mail and developing a chicken-feed business, the enterprise headquartered on Hennepin Avenue thrived entering the twentieth century. In the 1910s, the company acquired eleven acres in Northeast Minneapolis that gave it service from two railroads, the Northern Pacific and the Great Northern, allowing a new facility to receive seed by rail and then ship cold-climate seeds throughout Minnesota and to the northern Great Plains.

A local contractor, Barnett & Record Company, built the new facility in 1916. The firm specialized in industrial construction and had a patent for a reinforced-concrete grain silo. The new facility had a large warehouse for storing onion sets (keeping them at an even temperature so they wouldn't sprout), a building for drying and cleaning seed corn, other facilities for receiving and purifying grain seeds (e.g., wheat and oats), equipment for bagging seed, and facilities for grinding and bagging poultry feed. The complex also housed offices, a testing laboratory, a department for handling bulk garden seeds, a printing department for catalogs, and a shop for making wood crates and boxes. Expanding its seed offerings to forage crops (clover, alfalfa, timothy, and millet), Northrup, King & Company expanded its buildings in the late 1920s and again in the 1940s. By 1954, the company was the largest general seed supplier in the world. It employed 1,300 people, more than half of whom worked at the NE Minneapolis headquarters. In 1968, Northrup, King (heretofore a closely-held corporation) offered sale of its shares to the public for the first time. Shareholders agreed in 1976 to sell the company to Sandoz Ltd., a Swiss company. The office functions of the NE Minneapolis building closed, but the seed plant continued in service until 1986, when Sandoz sold the land and buildings to Shamrock Properties. Ten years later, parts of the complex began to be converted to artists' studios, and in 2019 Sandoz sold the property to Artspace Projects, Inc., a Minneapolis-based developer of affordable live/work spaces for artists. Its first three projects were located in Saint Paul, including the Northern Warehouse Lofts in a former Northern Pacific building in Saint Paul's Lowertown district.

Artspace now operates affordable living and studio facilities throughout the U.S. from California and Washington to New York and Connecticut, including in Arkansas, Colorado, and North and South Dakota. Artspace has seventeen facilities in Minnesota, including the Twin Cities as well as Duluth, Brainard, Fergus Falls, and Hastings. Artspace has two projects in the Northrup King Building, the studios, which we'll see during the tour, and a residential development that will create 84 live/work units plus some commercial space.

Source: Amy Lucas, "Northrup, King & Company Complex," National Register nomination, prepared by Landscape Research LLC, August 2020.

FRIDAY, MAY 17 TOURS

BUS F-1: MINNEAPOLIS INDUSTRIES

Metro Transit Operations & Maintenance Facility

Metro Transit is one of the infrastructure organizations under the overall oversight of the Twin Cities Metropolitan Council, which was created by the Minnesota Legislature in 1967 to address major issues facing communities in the metro area of Minneapolis & Saint Paul, including inadequate facilities for treating wastewater, a failing privately-owned bus system, the need to protect certain natural areas, and economic disparities in the metro areas that made it difficult for some communities to pay for essential services. Metro Transit now runs bus lines, a light rail system, and commuter trains.

Metro Transit's 12-mile Blue Line went into service in June 2004. Running from the Minneapolis Warehouse District to Fort Snelling, it was the first light rail system in Minnesota. It has since been extended to the Minneapolis-Saint Paul International Airport (MSP) and the Mall of America. Since the line went into operation, Target Field (home of the Minnesota Twins) has been built adjacent to the end of the line in the Warehouse District. Much of the Blue Line is parallel to Hiawatha Avenue in Minneapolis, so named because it was the route of the Chicago, Milwaukee, St. Paul and Pacific Railroad (Milwaukee Road) into downtown Minneapolis from the southeast. The Milwaukee Road's passenger service to the Puget Sound was called the Hiawatha Route. Members who take the Blue Line from MSP to the conference hotel will see historical grain elevators and other industrial developments along Hiawatha Avenue. The tracks serving those industrial customers are now operated by the Minnesota Commercial Railway, which makes connections to BNSF, UP, Canadian National, Canadian Pacific, and the Twin Cities & Western. The Metro Transit Operations & Maintenance Facility for the Blue Line is located along Hiawatha Ave.

Metro Transit added a second light rail line, the 11-mile Green Line between Target Field in Downtown Minneapolis and Downtown Saint Paul, in 2014. Much of that line runs along University Avenue, a major thoroughfare between the two cities. The Green Line serves the University of Minnesota's main campus in Minneapolis and the State Capitol in Saint Paul. The Metro Transit Operations & Maintenance Facility for the Green Line is located at the east end of the line, near Union Station and adjacent to CHS Field, where the Saint Paul Saints play.

University of Minnesota's Main Heating Plant and Southeast Steam Plant

Buildings on the University of Minnesota's Minneapolis campus have been heated by a district system since the Main Heating Plant began operating in 1912. The plant was expanded and updated in subsequent decades, serving as the main source of steam energy for the growing campus until that role was given to the Southeast Steam Plant in the early twenty-first century.

Both plants are on the edge of campus along the east bank of the Mississippi River, just downstream from downtown Minneapolis and St. Anthony Falls. The Southeast plant was historically known as the Twin City Rapid Transit Company (TCRT) Steam Power Plant, after the company that built it. TCRT was formed in 1892 by entrepreneur Thomas Lowry, who electrified Minneapolis's streetcars and merged that system with Saint Paul's to create a metro-wide network. The streetcars were initially powered by hydroelectricity but that proved to be a fickle source, leading TCRT to develop three small steam plants in the 1890s. These also were inadequate. In 1902-1903, the company built the substantial, coal-fired, Southeast Steam Plant along the Mississippi River. It was designed by the engineering firm Sargent and Lundy, which had extensive experience in power plant design, and structural engineers Edward and Ralph Shankland, all from Chicago. Intended to be a backup plant, it became TCRT's primary facility by 1909.

As automobiles and buses grew widely available and TCRT's equipment aged, the company began having financial and administrative difficulties. When buses completely replaced streetcars by the mid-1950s, the company sold the Southeast plant to Northern States Power Company (NSP), the local electric utility, in 1954. NSS converted two of

the coal-fired boilers to oil. In 1976, after oil prices surged, NSP sold the plant to the university, which converted the boilers back to coal and installed a new steam turbine in an ill-fated electrical co-generating project supported by the U.S. Department of Energy. The plant was listed in the National Register of Historic Places in 1994.

When the university prepared a utilities master plan in 2009, the capacity of the Southeast plant was found inadequate to meet anticipated expansion of the campus. After considering many options, the university decided to undertake a major overhaul of the Main plant, which had deteriorated since being decommissioned. A massive abatement project included removing one convertible gas/oil and six coal-fired boilers. The plant, now called the Main Energy Plant (MEP), has been updated inside and out. The first full year of operation of its new, highly efficient, combustion turbine generator and heat recovery steam generator was 2017. The plant has the capacity to produce 250,000 lb/hour steam and 22.8 MW electricity. The Southeast plant, rated to generate 650,000 lb/hour steam and 16 MW electricity, remains available to supplement the MEP. Pipes snake through tunnels from the plants, supplying steam to heat and cool about 150 campus buildings.

Sources:
Chris Farr, "Power the Future from Remains of the Past," *District Energy* 104, no. 1 (First Quarter 2018): 12-17.
Deanne Zibell Weber and Jeffrey Hess, "Twin City Rapid Transit Company Steam Power Plant," National Register nomination, prepared by Hess, Roise and Company, February 1994.

Bell Manufacturing

Bell Manufacturing is a small fabricator that cuts, shapes, welds, and finishes steel and aluminum for custom orders. Bell Manufacturing's largest regular customer is Room & Board, a nationwide furniture brand that has an outlet in Edina, a Minneapolis suburb.

Minneapolis Water Works–Fridley Plant

This 72-acre facility operated by the City of Minneapolis edges the east bank of the Mississippi River, the city's sole source of water. Beginning in the 1872, the city built a series of pumping plants to provide water to the growing community. Pumping Station No. 4 was erected in 1888 at the city's northern border, upstream from industry and residential development at Saint Anthony Falls that dumped raw sewage and other waste directly into the Mississippi. As typhoid epidemics became increasingly common in the early twentieth century, the city began adding chlorine to the water and completed its first water purification plant in Columbia Heights, somewhat inland from the river, in 1913.

Eleven years later, it began constructing a filtration plant directly north of Station No. 4 in the community of Fridley. The filtration plant and Pump Station No. 5 were designed by Minneapolis architects Fallows, Huey, and Macumber. Since opening in 1927, the plant has been the only supplier of water for the city, as well as some suburbs. Upgrades and expansion since that time include a softening plant (1938-1940), dewatering plant (1971-1973), lagoon overflow treatment plant (1995), chlorination and disinfecting building (ca. 2009), clarifying tanks (ca. 2009), settling basins, shops, and sheds, and a garage. Its operations are augmented by the earlier Columbia Heights plant and related Pump Station Nos. 7 (1950) and 8 (1976) and by the Hilltop Reservoir (2001) in New Brighton.

Source: Kate Scott, "Fridley Water Filtration Plant," Minnesota Architecture-History Inventory Form, prepared by The 106 Group Ltd., August 2, 2012, in State Historic Preservation Office files, Saint Paul.

BUS F-2: FARIBAULT INDUSTRIES

Seneca Wastewater Treatment Plant

The Seneca plant was built in 1972 to serve eight communities (total population about 250,000) in the south metro area of the Twin Cities. It is operated by the Metro Council Environmental Services (MCES). It has a capacity to treat 34 million gallons of wastewater daily. The facility provides primary and secondary treatment to wastewater, allowing the resulting clean water to be discharged into the nearby Minnesota River. Solids produced during treatment are incinerated, and the resulting ash is disposed in a landfill in nearby Rosemount.

The Minnesota legislature created the Metropolitan Council in 1967 to address major issues facing communities in the metro area of Minneapolis & Saint Paul, including inadequate facilities for treating wastewater, a failing privately-owned bus system, the need to protect certain natural areas, and economic disparities in the metro areas that made it difficult for some communities to pay for essential services. Subsequent legislation created a Metropolitan Transportation Commission, a regional parks system, a housing and redevelopment authority, a system for sharing tax revenues among communities in the metro area, and a regional system of sewage treatment plants, of which the Seneca plant is the third largest (and fourth largest statewide).

Daikin

Daikin Industrials Ltd. is a Japanese company founded in 1924 (one hundred years ago). Headquartered in Osaka, it was originally named Osaka Kinzoku Kohyosho LP. It made parts for aircraft. It also pressed and drew radiator tubes (hence Kinzoku – metal – in its name). With the development of safer fluorocarbons (now banned) in 1930, the company started experimenting with refrigerants. In 1951, it was the first Japanese company to make packaged air-condition systems, and it changed its name to Daikin. The company also started experimenting with compressors and heat pumps. In more recent years, the company has shifted to refrigerants that are sustainable and contribute three times less to global warming. It is now the largest manufacturing of air conditioning in the world.

McQuay was established in Minneapolis in 1933 to make pipe-threading machines. After the Second World War, it diversified into making cooling units and air condition systems for commercial applications. It expanded its operations into Europe and Asia. Daikin bought McQuay in 2006, and it is still a brand name in Daikin's global enterprise. McQuay's headquarters was in Plymouth, a western suburb of Minneapolis. That facility now conducts product testing for Diakin and is also Daikin's headquarters in the U.S. McQuay opened a manufacturing plant in Faribault in the 1960s. That plant, which has been modernized over the years, is the one we'll visit. Daikin opened another manufacturing plant in Owatanna (17 miles south of Faribault) in 2000; since then, Daikin has tripled the size of the Owatanna plant. And in 2018, at which time Daikin employed more than 900 people at its southern Minnesota factories, the company built a second plant in Faribault, on the city's north side. Daikin works with high schools and colleges in southern Minnesota and with the Minnesota Department of Economic Development to provide the training prospective employees need to work at its factories. Daikin uses a method called DOJO training, which involves training in basic skills at an off-site location before new or reskilled employees are placed in a production setting. Daikin also has manufacturing facilities in Alabama, Massachusetts, and Texas; Belgium, Czechia, France, and Italy; as well as Korea, Indonesia, Malaysia, Singapore, and Thailand.

Faribault Woolen Mill

Faribault is the county seat of Rice County, an agricultural county in southeastern Minnesota. The Faribault WoOlen Mill has its origins as a horse-powered carding mill established by Carl Klemer in 1865. The business expanded to include spinning of wool yarns and weaving of woolen blankets in 1872. A new mill (part of the current complex) was built along the Cannon River in 1892. For most of the 20th century, the main outlet for Faribault blankets was department stores, but the company's production was diverted to war production during both world wars. Financial

difficulties forced the Faribault mill to close in 2009, and new ownership reopened the mill in 2011. It now operates with much of its older milling equipment side-by-side with newer technology. In 2022, Faribault Woolen Mill bought Brahms Mount, a cotton mill in Maine, and the company now sells products made of both wool and cotton. The company's new brand is Faribault Mill, to reflect the diversity of its product lines.

Schmidt Artist Lofts

This complex of live/work units for artists is located in the former Schmidt Brewery, long a fixture along West Seventh Street in Saint Paul. Brewing beer on the site started in the 1850s under Christopher Stahlmann's Cave Brewery, named for the caves along West Seventh and the bluffs of the Mississippi River in Saint Paul that were used for cooling the beverage in kegs. The business became the St. Paul Brewing Company in 1898 and then was sold to Jacob Schmidt in 1900. Schmidt's North Star Brewery had started brewing beer earlier in the century near the Hamm's Brewery in the Dayton's Bluff area of Saint Paul. When the North Star Brewery burned in 1900, Schmidt and his associates bought the property of Stahlmann's former brewery on West Seventh. Forming the Jacob Schmidt Brewing Company, they started construction of a new set of buildings along West Seventh in 1901. Architect and engineer for the new plant was German-born Barnard Barthel, who had started his career in Chicago working for Frederick W. Wolff, said to have been the pioneer of brewery engineering in the U.S. Like the designs created by Wolff's office (including the Grain Belt Brewery in Minneapolis), Barthel's designs featured up-to-date brewing technologies and European eclecticism in architectural style. When completed, the Schmidt brewery rivaled the Hamm's brewery in output. Whereas Hamm's mainly targeted Minnesota markets, Schmidt marketed its product regionally and competed with giant breweries in Milwaukee and St. Louis.

The Schmidt brewery was able to stay in business during Prohibition by making non-alcoholic beverages. Schmidt's "near beer," called Schmidt Select, was so popular that, when Prohibition ended in 1933, the Schmidt brewery was able to return to full production of beer to satisfy its loyal customers. It soon became the seventh-largest brewery in the U.S. After the brewery closed in 1990, the Minnesota Brewing Company bought the building and put it back into production of beer with a new "Landmark" label, but it failed as a business in 2002. Another company made an unsuccessful effort to use the facility to produce ethanol. After sitting idle for about eight years, Dominion Management Services (the same company that redeveloped the Pillsbury A Mill as artist lofts) redeveloped the Schmidt Brewery in 2012 for live/work units for artists (247 lofts and 12 townhouses, plus workspaces for clay, painting, performance, video, and sound). Architects for the project were the BKV Group (again, the same architects who designed the redevelopment of the Pillsbury A Mill). AIA Minnesota and the McKnight Foundation honored the Schmidt Artist Lofts with the Affordable Housing Design Award.

Source: St. Paul Heritage Preservation Commission, "Jacobo Schmidt Brewing Company Historic District," 25 May 2011.

BUS F-3: ST. PAUL INDUSTRIES

Minnesota Transportation Museum

The Minnesota Transportation Museum (MTM) states that its mission is to educate, inspire, and engage visitors by sharing the story of rail transportation history in the Upper Midwest and how the evolution of rail transportation shapes lives, culture, the economy, and society in the present. The museum collects, preserves, restores, and provides resources for visitors with the goal of inspiring passion for railroading by presenting information in engaging and enjoyable ways, including hands-on learning opportunities. The museum also operates real transportation equipment during demonstrations, other experience-based learning activities, and immersion rides, including seasonal passenger train rides through the St. Croix River Valley on the Osceola & St. Croix Valley Railway.

MTM is located north and east of the Minnesota State Capitol, at the National Register-listed Jackson Street Roundhouse, built in 1907 as a steam engine maintenance facility for the Great Northern Railroad. It was one of the last roundhouses built by "Empire Builder" James J. Hill. Following acquisition by MTM in 1986, Jackson Street Roundhouse was restored as an operating roundhouse, and the turntable was re-installed in 2001. In addition to serving as MTM's back shop, it houses archives, an audio-visual theater, a meeting room, and offices. The shop houses numerous historical machine tools that its volunteer machinists use to restore locomotives and rolling stock. Volunteer machinists will be present using some of the machine tools during our tour. MTM, in collaboration with the Great Northern Historical Society and Northern Pacific Historical Society, is currently creating an archive with climate-controlled space and a combined cataloging system.

Tolerance Tool

Tom Hoffer and Rich White founded Tolerance Tool, Inc., in North Saint Paul in 1992 to machine injection molds and diecast molds for the automotive consumer-products industries. In the mid-2000s, the company began to focus on serving customers in the medical-device industry, and that work now comprises more than 60% of the Tolerance Tool's business. This small machine shop makes precision molds for clients who make plastic parts using injection molding. In addition to making steel molds using conventional CNC machine tools, Tolerance Tool uses electrical discharge machining (EDM) to make molds with sharp internal corners.

Rich White retired from the company in 2021, and it was purchased by Beanstalk Collaborative Community Wealth (BCCW), a holding company located in Denver, CO. BCCW's mission is to provide financing and other support to help small manufacturing businesses remain in their local communities. Since the BCCW acquisition, the North Saint Paul business is named Tolerance Tool LLC.

Upper River Services

Founded in 1984, Upper River Services operates in the Port of Saint Paul. It has six towing vessels for moving barges around and through the upper end of the Mississippi River inland waterway. Its towboats move barges into and out of docking facilities in the Port of Saint Paul and at Savage, which is several miles up the Minnesota River from Saint Paul. Upper River Services also cleans barges using methods that meet local, state, and federal environmental standards. It has two shipyards with facilities that include dry dock, cranes, machine shop, and fueling services. Upper River Services also assembles fleets of barges for movement down the Mississippi. From its control center, located at Barge Terminal Two, Upper River monitors the movement of barge traffic throughout the Mississippi River system.

The Port of Saint Paul was established as a governmental agency by the Minnesota Legislature in 1929. Three years later, the City of Saint Paul transferred its Barge Terminal One, on the north side of the river, to the Port of Saint Paul. In 1960, the Port added Barge Terminal Two on the south side of the river, where Upper River Services is now located. Two more terminals were added in 1964. Several private enterprises also have their own docking facil-

ities within the jurisdictional area of the Port of Saint Paul. The port ships and receives grain, corn, soybeans, salt, cement, aggregate, livestock feed, fertilizer, petroleum products, coils of sheet steel, and metals for recycling. Minnesota also has ports downstream at Red Wing and Winona.

Waterous

In 1844, C.H. Waterous founded the Waterous Engine Works Co. in Brantford, Ontario, Canada, and began building various machinery, including sawmill equipment and steam fire engines. In 1881, his twin sons Frederic and Frank established a company branch in Winnipeg, but within a few years the Winnipeg operation had outgrown local distribution facilities, and in 1886 the Winnipeg facility was moved to a new location in South St. Paul, MN. The new operation flourished, and in 1917 Waterous moved to a larger and more modern plant in Saint Paul, along railroad shipping lines and within a block of the Mississippi River. A second major upgrade in 1974 allowed modernization of the manufacturing process via construction of a new 140,000 square-foot manufacturing and office facility near the site of the original 1886 factory.

Waterous has been at the forefront of firefighting equipment manufacturing for over 130 years. Major innovations introduced by Waterous include the Frost-Jacket Hydrant (1886); the first gasoline-engine-driven fire pump (1898), the Floto-Pump portable fire pump (1968); the Ball Transfer Valve with a floating seal design that provides smooth transfer to pressure or volume with either manual or electric switch operation (1977); and the first self-adjusting Mechanical Seal, with superior sealing capabilities and no maintenance (1987). In addition to technological innovations, Waterous created a Mobile Training Unit in 1958 to train firefighters and mechanics across the country, and to the present day they continue to provide fire pump training materials as well as mechanics seminars and CAFS (compressed air foam systems) training programs.

The Armour Gates

The Armour Gates in South St. Paul are the only remaining physical evidence of a sprawling complex on the west bank of the Mississippi River that once comprised the largest stockyards in the world. The Swift and Armour meatpacking companies operated on the site from 1897-1969 and 1915-1979, respectively, and in their peak years they shipped more than 3.75 million hogs, 1.78 million sheep, 1.4 million cattle, and 840,000 calves. Meat processing provided the main impetus for community growth and economic development in South St. Paul throughout the 20th century. The industry offered good-paying jobs that attracted thousands of immigrants, mostly Eastern European, and tax revenue contributed to the welfare and economy of the city by helping build schools and provide city services. Armour alone paid more than $260,000 yearly in various taxes.

As a result of a financial downturn caused by aging buildings and infrastructure, increasingly outdated equipment, and industry-wide transitions to smaller specialized plants, Swift closed its doors in 1969 and the Armour plant closed in 1979. The city of South St. Paul bought the plant from a local real estate firm in 1989 and demolished the buildings the next year for $2.8 million. Much of the land previously occupied by the stockyards is now part of the Bridge Point commercial – industrial development. Due to what developers consider an inconvenient and obstructive location, redevelopment proposals often call for demolition or removal of the Armour Gates, but many residents oppose that action in favor of preserving a tangible symbol of community history. The groundswell of support for preserving the gates includes a petition initiated by a South St. Paul 7th grade class in April 2023. For more information see: https://www.change.org/p/save-the-south-saint-paul-armour-gates-1ed21a85-c077-40fd-8969-81fee32d0fca?redirect=false

FRIDAY BANQUET IN THE MARKET AT MALCOM YARDS

Friday's Banquet is being held at The Market at Malcolm Yards, a multi-cultural food court and events venue in the old Harris Machinery Building, built in 1889 by the Peteler Portable Railway Manufacturing Co., which made a patented side-dump railcar and portable track system. Gray Tractor Company occupied the building in 1917, and Harris Machinery Company took over in 1928. Harris Machinery sold a wide range of new and used supplies for boilers, machine shops, sawing machinery, threshers, and power-transmission machinery, including sprockets, pulleys and shafting, belting, and belt lacing. The Market opened in July 2021 after the building had been sitting vacant for a number of years, during which time it sustained a fire that destroyed its second floor.

Malcolm Yards, which is near the athletic complexes of the University of Minnesota East Bank Campus, is an old industrial area, much of which has been redeveloped for affordable housing. It was once served by multiple railroads and was occupied by grain elevators, flour mills, linseed-oil plants, sash and door mills, and other manufacturing operations.

SUNDAY, MAY 19 TOURS

S1: MISSISSIPPI RIVER/PORT OF SAINT PAUL BOAT TOUR

This boat tour will traverse the industrial portions of the Mississippi River extending downstream from Saint Paul. Most river tours go upstream into the gorge through which the river cuts as it flows from Minneapolis to Saint Paul. That area, which features the mouth of the Minnesota River, is considered more scenic because it's less developed. We'll see the working part of the Upper Mississippi River, where barges carry fertilizer, salt, cement, and aggregate upstream to the Twin Cities and carry agricultural commodities downstream. The area is administered by the Port of Saint Paul and provided with towboat service by Upper River Services (see entry for F3 above).

The Jonathan Padelford was built in 1969 by the Dubuque Boat and Boiler Company. It is an authentic stern-wheeler, but it is not powered by steam. In 1971, the boat was sent to a shipyard at Lamont, IL, where it was cut in half and a 20-foot section was added, giving the Jonathan Padelford its present 125-foot length. The boat is operated by the Padelford Riverboat Company from Harriet Island in Saint Paul. The company added a second boat, a 300-passenger sidewheeler called the Anson Northrup, in 1988. And in 1990, the company added a 300-passenger barge to its fleet.

S2: MINNEAPOLIS WAREHOUSE DISTRICT WALKING TOUR

During Minnesota's territorial period (pre-1858), the Mississippi River was the main transportation access to the area that would become the Twin Cities of Minneapolis and Saint Paul. Saint Paul was the head of shipping on the river, so it developed as a trading center. Minneapolis had St. Anthony Falls, so it developed as a water-powered industrial city, especially for the milling of grain. The first railroad to serve Minneapolis was the Minnesota Central, in 1864. The Chicago, Milwaukee and St. Paul bought it 1867. Other railroads followed, most notably the Northern Pacific and the Great Northern. Tracks of those railroads linked Minneapolis to shipping on the Great Lakes at Duluth and to rapidly opening agricultural areas of southern and western Minnesota, the Dakotas, and territories to the west. Those developments made Minneapolis well situated to grow as a warehousing and wholesale center, receiving large shipments of manufactured goods (dry goods, groceries, farm implements) from the east and distributing those goods to the west. The center of this warehousing activity grew along the Mississippi River on the north side of the rapidly growing downtown commercial district of Minneapolis. In time, Minneapolis became a center not only for wholesaling farm implements made in the east but in manufacturing farm equipment as well.

The Warehouse District comprises thirty square blocks listed in the National Register of Historic Places in 1987. Prominent among the district's buildings are those associated with wholesaling farm implements. Companies based in Minneapolis dominated the market for farm implements to a territory extending from Minnesota west to Idaho. As the Warehouse District continued to grow in the 1880s, brick buildings began to replace earlier wood-frame structures. Because Saint Paul was the head of river navigation, that city had had a head start on Minneapolis as a wholesale and distribution center, but by 1890, Minneapolis had surpassed Saint Paul in wholesale trade. By 1908, Minneapolis was the largest distribution center of farm implements in the world, and in 1915, the dollar value of farm implements made in and distributed from Minneapolis exceeded the value of flour milled there. Minneapolis reached a billion dollars in wholesale trade in 1919. Minneapolis had about 300 warehouses in 1920, most of them in the Warehouse District. All that construction provided work for many architects, some of them quite prominent

on the national level. Perhaps the most well-known was Cass Gilbert, designer of the Minnesota State Capitol and, after he moved to New York City, the Woolworth Building there. He designed the remodeling of the Realty Company Warehouse in the early twentieth century. The firm of Frederick Kees and Franklin Long (and its successors) has the longest list of warehouses designed in the district: 18. The Warehouse District began a gradual decline as wholesalers learned that their costs could be lower if they built one-story buildings in the suburbs.

Revitalization of the Warehouse District began in 1973 with the adaptive reuse of the Butler Building, suggesting that warehouses could be repurposed as shops, restaurants, and offices. Recent construction of Target Center (home of the Minnesota Timberwolves) and Target Field (home of the Minnesota Twins) has breathed additional economic vitality into the district.

Source: Rolf Anderson, “Minneapolis Warehouse Historic District,” National Register nomination, January 1987.

SIA
MINNEAPOLIS 2024
PAPERS & POSTERS

KILNS & CLAY

9:00 – 10:15 AM

Christopher Fennell

Dragon Kilns in America (Updated): 19th Century Innovations in Edgefield, South Carolina

The first innovation and development of alkaline-glazed stoneware pottery in America occurred in Edgefield, South Carolina, in the early 1800s CE. These potteries employed enslaved and free African Americans, and stoneware forms also show evidence of likely African cultural influence on stylistic designs. The first Edgefield kiln, built circa 1815 CE, also appears to have been based on the up-hill, dragon kiln design utilized successfully for centuries in southeast China. Edgefield thus represents "a crossroads of clay" where the influences of Asia, Africa, and Europe were combined. This presentation reviews kiln designs over time in Asia and Edgefield, and methods for examining the cultural landscape of pottery production sites and residential districts of free and enslaved laborers in these South Carolina pottery communities. Approaches including LiDAR and remote sensing offer promising strategies for effective reconnaissance and analysis.

Christopher C. Fennell is Professor of Anthropology and Law at the University of Illinois, Urbana-Champaign, and a yearly Visiting Professor of Law at the University of Chicago. His research and writing focus on historical and industrial archaeology, diaspora studies, legal anthropology, social group identities, ethnic group dynamics and processes of racialization.

Erik Nordberg

Sculpting a Solution: The Development of the Gleason Clay Shredder

Economic deposits of kaolin clays were first confirmed in the Jackson Purchase Region of Kentucky and Tennessee in the early 1890s, but the region's relative isolation from existing pottery manufacturing centers in Ohio and New Jersey delayed its development into the early Twentieth Century. One key to the industry's expansion and profitability was the creation of mineral processing equipment specifically designed to reduce, mix, and ship the region's clay products. This presentation will provide background on the mineralogy and mining of clay deposits within the region, document the work of state government to promote the region to investors and industrial consumers, and local innovations in process machinery which established this rural, agricultural region as a significant American producer of ball clays. Of particular interest is the development of the Gleason Clay Shredder, a unique piece of mineral processing equipment which continues to be produced locally for mineral companies worldwide.

Erik Nordberg is Dean of the Paul Meek Library at the University of Tennessee at Martin. An archivist by training, he helped expand the collections and public programming of the Michigan Tech Archives during his 18 winters in Houghton. He has also worked as executive director of the Michigan Humanities Council (following 8 years of service on its board), director of the Reuther labor archives at Wayne State University, and he is past president and former board members of the Mining History Association. A member of SIA since 1994, Nordberg participated in annual conferences in Houghton (1997), Pittsburgh (2009), and Richmond (2018). Nordberg received his graduate library and archival education at Wayne State and completed his PhD at Michigan Technological University, exploring the founding and early collecting of archives specializing in the records of business, industry, and technology. His current research examines the industrial history of West Tennessee.

Marco Meniketti

Burned Out Quick. A Newly Discovered Holmes Company Monitor Lime Kiln

The discovery in 2021 of a previously undocumented lime kiln and related industrial footprint in Colfax, California, has afforded a rare opportunity to examine kiln technology and the lives of kiln workers. A record year for wildfires scorched a swath of forest along the banks of the Bear River near Colfax, revealing the abandoned kiln site to archaeologists. Identified as a branch of the Holmes Lime Kiln Company that also operated facilities in Sacramento

and Santa Cruz, the Colfax kiln produced quality lime product between 1903 and 1913. The twin-stack continuous Monitor kiln was state-of-the-art in its day, yet was put into operation at a time when practical use of lime mortar for construction was waning and losing market share to Portland cement. Artifacts from the site associated with laborers provide insights into diet, leisure, health issues, ethnicity, and middle-class aspirations. Analysis of the industrial landscape underscores the interconnected nature of industries that shared the mining landscape that included quarrying, railroading, and logging. The Colfax complex will be examined in historic context, tracing its construction and operation through newspaper accounts in addition to archaeology. Lime manufacturing technology, poor economic decisions by the Holmes Company, and worker's health will be discussed using landscape assessment and key artifacts to illustrate the brief life of the operation.

Dr. Meniketti is professor and senior archaeologist at San Jose State University in California. He holds a Ph.D. in Historical Archaeology from Michigan State University and an MS in Industrial Archaeology from Michigan Tech. He is a former Chair of the Advisory Council on Underwater Archaeology and Board member of the Society for Historical Archaeology. Dr. Meniketti has published critically acclaimed books about the Caribbean colonial sugar industry, California timber industry, and most recently about California's historic maritime cultural landscapes. He is a past recipient of the SIA Vogel Prize. Dr. Meniketti has received the Excellence in Teaching Award and the Warburton Award for Research, both from the College of Social Science at San Jose State.

DIGITIZING HISTORY

9:00 – 10:15 AM

Karl Daubmann

Visual Exploration of Past and Future Kelleys Island

The Robot Historian project explores technology in visual storytelling and worldbuilding. The project mixes industrial history and geography of Kelleys Island Ohio with a futuristic design fiction narrative. In July 2022 daily logs began documenting a future world informed by the real industrial history of the island through the lenses of archaeological, ethnographic, and technological methodologies. While the project uses generative AI to produce an altered reality, the images are blended with historical images and informed by stories and places of the island. The tools expand the potential for digital humanities to both archive and share stories through contemporary dynamic media.

Daily logs accumulate to create a vivid repository of Island No. 6. Each log is a mix of text and image and gets geolocated on a dense digital map. The island's history and fictions can be explored either chronologically or geographically. The mechanical relics, once essential to the island's functionality, now stand as silent witnesses to the passage of time. Through the daily logs the Robot Historian meticulously catalogs the relics' designs, functionalities, and the stories embedded in their antiquated thick parts.

The quarry is the origin of the Kelley Island Lime & Transport Company, which was once the largest producer of limestone and lime products in the world, a nexus of the Great Lakes. The company operated between 1896 and the early 1960s. Once a hub of global industry and material extraction, the island's industrial history is fading with each passing year as a result of both neglect and abandonment. In contrast, the island's ecology bears visible scars, yet a resurgence of flora and fauna are intermingled in reclamation. This ecological resurgence stands in stark contrast to the mechanical relics scattered across the landscape, unveiling an optimistic narrative of growth amidst the remnants of a forgotten era.

Karl Daubmann is an architect at the forefront of digital design. He is Dean of the College of Architecture and Design at Lawrence Technological University in Detroit where he teaches courses in design, AI, leadership, and technology. His design practice DAUB (design, architecture, urbanism, building) focuses on expanding the potential for technology in practice. Daubmann is a Fellow of the American Academy in Rome. His research while in residence in Rome was focused on construction geometry related to the Baroque. Between 2010 and 2014 Daubmann was the Vice President of Design and Creative Director for Blu Homes where he led a multidisciplinary team that developed green prefab housing throughout the US.

Dan Trepal

Mapping Hamtramck: Reconstructing Industrial Urban Landscapes for Public Archaeology and Heritage

Industrial cities are defined by large-scale networks, both built and social, that collectively form each unique urban landscape. Visualizing past networks in legacy industrial cities can be difficult given that only fragments remain in the wake of deindustrialization. Industrial archaeologists are constantly challenged to find new and more effective ways to contextualize sites within these past networks against the backdrop of the modern, postindustrial landscape. We present the results of a recent project that digitally reconstructs this landscape for the city of Hamtramck, an industrialized city completely surrounded by Detroit. The Hamtramck Historic Spatial Archaeology project developed and launched a digital, web-based, publicly accessible interface linking information from written records and historic maps with archaeologically recovered objects or building remains associated with the same location. This paper describes our project goal, methodology, and plans for future work. The paper also introduces our recently launched web interface (www.mappinghamtramck.com) and discusses how our approach serves as a model for supporting industrial archaeology preservation and pubic engagement efforts in postindustrial cities.

Dr. Dan Trepal is Senior Geospatial Research Scientist and Adjunct Assistant Professor at Michigan Technological University. An MTU Industrial Archaeology program alumnus, Dr. Trepal has previously served as an archaeologist for the National Park Service in Alaska as well as working in the cultural resource management industry across the US. More recently specializing in the applications of geospatial information systems and remote sensing to archaeological research, his research interests include historical cast iron technology, the archaeology of mining, the industrial archaeology of the American Rust Belt, public archaeology, and the application of geospatial and remote sensing technologies to archaeology.

Kyle Parker McGlynn

Views, expectations, and reservations: digital industrial heritage in industrial museums and heritage sites.

This paper creates a foundation for how digital industrial heritage should continue in the future.by linking common themes and ideals from nine different industrial heritage and museum worker interviews. This is done by thematically analyzing industrial museums and heritage sites' workers views, expectations, and reservations about digital heritage to search for common themes that continue to appear. By understanding how public digital interaction from the curators, museum directors, and other employees' points of view, the future of digital industrial heritage is obtained. This look into digital industrial heritage was created by finding interviewers that fit two criteria: museum size and current use of technological capabilities. Nine people from each criteria participated in a semi-structured interview where they discussed their current views, expectations, future goals, disappointments, and reservations. These interviews were coded and thematically analyzed to show some of the common themes and unique ideas that run throughout the current industrial heritage community on digital industrial heritage.

Kyle Parker McGlynn is a graduate student at Michigan Technological University in the Industrial Heritage Archaeology program.

INDUSTRIAL HERITAGE AROUND THE WORLD

9:00 – 10:15 AM

Daria Jagiełło

What can Archival Documents Tell Us? The History of Water Supply and Sewerage Networks of Major Polish Cities on the Example of Toruń - A Contribution to Research

The primary purpose of the paper is to present cartographic, drawing and written materials found during an archival search on the subject of Toruń's waterworks. The search is conducted in the National Archive in Toruń, the collections of the Municipal Conservator of Monuments in Toruń, the National Heritage Institute, the Kuyavian-Pomeranian Provincial Conservator of Monuments and the company archives of the Waterworks Company Ltd.

In medieval Toruń, the aforementioned system consisted mainly of wells for drawing water, water supply intakes with aqueducts and municipal wells, and cloacal pits. The expansion and modernization of the network in the 19th century was based on ground intakes (the main intake station, the so-called "Old Bielany", supported by intakes: "Barbarka", "Fort Chodkiewicza", the station in the area of Pod Dębową Gora Street, "Podgórz", "Nowe Bielany" and [after 1950] "Mała Nieszawka", "Drwęca", "Jedwabno" and "Czerniewice", connected by a water supply network) and an expanded sewage system with a sewage treatment plant (the so-called "Rybaki" Treatment Plant).

The materials already acquired at this stage allow an attempt to characterize the transformations of Toruń's urban water supply and sewage system over the last 400 years, as the oldest of the plans (the Plan of the City Waterworks) dates back to the 17th century. The available materials not only allow research conducted from an urban planning perspective, but also a detailed analysis of the architecture (preserved designs and documentation of erected buildings), equipment and information on the operation of the facility (the organization of work, but also social relationships at work).

The title indicates "a contribution to research," as the results presented are related to a year-long research project still underway, while the author hopes to supplement the materials presented with further interesting data and documents.

Dr. Daria Jagiełło graduated in Polish Philology and Protection of Cultural Heritage at the Nicolaus Copernicus University in Torun (Poland). Doctor of art sciences in the field of conservation (title of dissertation: "Water mills in the cultural landscape of the Bzura Basin and their conservation issues"). In 2015-2016 employee of the Provincial Office for Historic Preservation in Torun, from 2019 assistant at the Faculty of Fine Arts of the Nicolaus Copernicus University. Areas of scientific interest: historical milling, technical heritage, cultural landscape. Researcher of the National Science Centre Poland grant "Water mills in the lower Vistula river basin from the beginning of the 18th to the beginning of the 21st century" (2015-2018). Author of Polish- and English-language publications in scientific journals and collective works, as well as numerous conservation documentation from her area of interest. Currently involved in research related to the water and sewage system in Toruń.

Mark Alan Rhodes II

Community and Participatory Methods within Industrial World Heritage Geographies

Welsh cultural and historical identity is often rooted in the mines, mills, and factories which drove the nation's development and gives it it's often-utilized title of the "first industrial nation." In 2021, in an effort to not only tell those stories, but expand historical narratives, preserve meaningful landscapes, and reverse economically depressed communities, Gwynedd County Council successfully welcomed a new UNESCO World Heritage Site: The Slate Landscape of Northwest Wales (SLNW). Driven by community-generated questions of over-tourism, sustainable heritage, and heritage management across cultural, economic, and political leaders, this paper employed the labor of 13 transdisciplinary industrial heritage scholars to utilize community-based and mixed-methods and generate a community-based foundation of research on the SLNW. Our chosen methods are bounded by questions. They originated out

of our research question, how can community-based methods be deployed to better understand the inscription and management of spatially disparate industrial World Heritage Sites, and they end with the idealized results of further deployable research questions rooted within the data generated by, from, and for the community. Following initial meetings, we developed a mixed-method approach to understanding the spaces and scales of industrial heritage of slate in northwest Wales. Combining in-depth interviews, drawn from the emphasis with the SLNW management plan of grass-roots organizing, and landscape analysis, mapping onto the SLNW that emphases an integrated and plural palimpsest of industrial landscapes, we considered how the embodied landscapes of slate navigate their new World Heritage status and connect with other Areas and Elements of the WHS. Utilizing fieldnotes and photography from our landscape analysis, we cross-analyze those narratives and discourses with a narrative analysis of 18 semi-structured interviews identified via snowball sampling of WHS management and adjacent stakeholders. Three questions emerge from this research that will guide future community-based efforts: will the WHS be a net-revenue generator for the region with the appropriate infrastructure for sustainability; how is the designation influencing inclusive place-making throughout the region around industrial heritage; and how is the WHS articulating its relevance or potentialities, particularly to local communities? Community-based heritage work roots itself in community-generated research questions. From initial landscape and ethnographic analyses, these questions can point not only toward ongoing work in the SLNW, but global comparisons and lessons for industrial heritage work. The Keweenaw National Historical Park, in particular serves as not only a model for the SLNW, but faces many of the same ongoing questions. We conclude by tracking the unique geographies of industrial heritage sites across international cases whereby similar questions can and have emerged amongst community-engaged scholarship.

Mark Alan Rhodes II is a cultural and historical geographer at Michigan Tech focused on memory, heritage, and landscape. They use cultural and spatial contexts to better understand historical plurality for sustainable and equitable futures with a particular focus upon heritage institutions and Wales. They also advise and teach across the department's interconnected MS and PhD programs in Industrial Heritage, Sustainable Communities, and Environmental Policy.

IRON & STEEL HERITAGE I: IRON ORE MINING

10:30 – 11:45 AM

Linda Hickey and Teresita McCarthy

Stories of Toilers Under the Sea - Bell Island Submarine Miners

In the early 1900s, a unique and perilous occupation emerged on Bell Island, nestled in the picturesque Conception Bay of Newfoundland, Canada. It was here that a group of intrepid individuals became known as the Bell Island submarine miners, laboring in the deep, dark recesses of the underground and under the ocean, extracting precious iron ore from beneath the seabed. Their story is one of extraordinary courage and determination in the face of unfathomable challenges.

The Bell Island submarine miners faced numerous dangers, including collapsing tunnels, oxygen depletion, and the ever-present specter of drowning. Their work required a unique set of skills, including underwater welding and drilling, and demanded unwavering courage. These miners developed a deep camaraderie, relying on each other for safety and support in the treacherous underwater world. Despite the perils they faced, the Bell Island submarine miners played a vital role in supplying iron ore during both World Wars, contributing to the war effort and the industrialization of North America. Their legacy lives on in the stories of their bravery and resilience, as well as in the scars etched into the Bell Island landscape.

By the mid-20th century, the global demand for iron ore began to wane, leading to the eventual closure of the Bell Island mines. This marked the end of an era, leaving behind a network of underground tunnels and a wealth of historical artifacts. The closure had economic repercussions, but it also presented an opportunity for the island to reinvent itself and capitalize on its unique mining heritage.

The transformation of the closed Bell Island mines into a world-class tourism destination was not a swift process but a visionary one. The island community recognized the potential in preserving and showcasing its mining legacy, not only as a means of honoring the past but also as a source of economic revitalization. Today, the Bell Island submarine miners are remembered as pioneers of deep-sea mining, their legacy a testament to the indomitable human spirit and the willingness to brave the deep, dark recesses of the earth to extract its treasures. Their sacrifices and achievements continue to inspire generations, reminding us of the extraordinary feats that can be accomplished in the face of adversity. The success of Bell Island serves as an inspiration for other communities facing similar challenges, illustrating that the legacy of the past can be a beacon for the future.

Linda Hickey is an advocate for cultural preservation and heritage promotion in Newfoundland and Labrador, Canada. As President of the Bell Island Heritage Society, Linda has played a pivotal role in preserving and celebrating the rich history of Bell Island and as President of the Museum Association NL she works tirelessly to strengthen the museum community in the province of Newfoundland and Labrador.

Linda is a composer, and her song “The Whistle Don’t Blow” stands as a poignant tribute to the miners who played a crucial role in shaping the region’s history.

She was awarded the Queen’s Diamond Jubilee Medal, a testament to her dedication to preserving and promoting Canadian heritage. In 2022, she was honored as the recipient of the Atlantic Business Magazine’s 60+ Achievement Award, recognizing her exceptional achievements and contributions to the cultural and tourism sectors.

Teresita McCarthy is Executive Director of the Bell Island Community Museum & #2 Mine Tour. She is a retired educator. She is a founding member of the Bell Island Heritage Society Inc. where from 1994-2012 she served in various executive positions including President. She volunteers with the Museum Association of NL from 2008-current, including President (2010-2014 & 2018-2022). Awarded the Queen’s Diamond Jubilee Medal for her contribution to culture and heritage in her community and province (2012). Received the Distinguished Service Award from the Canadian Museums Association for her culture and heritage advocacy in Canada (2021).

Gary Vidlund, James Kippola, and Chris Gleason

The Cliffs Shaft Mine Museum: Preserving Mining Heritage and Planning Future Enhancements

The Cliffs Shaft Mine Museum, located on the Marquette iron range within the Lake Superior Region, stands as a significant monument to the history of iron mining in the United States. This museum, established through the donation of the Cliffs Shaft underground Iron Mine by the Cleveland-Cliffs Iron Company, showcases the mine's operation from 1868 to 1967, during which it produced over 28 million tons of direct shipped hard Hematite ore. The site was placed on the National registry of historic places in 1992. The early cement head frames were designed in an Egyptian Revival-style by George W. Maher. The later single steel and cement head frame houses North America's first Koepe friction hoist. The site encapsulates a century of mining innovation.

Since its inception on September 17, 1998, the museum has been dedicated to the preservation of mining history. With the help of volunteers and a few staff members, it now offers a rich collection of mining artifacts, photographs, and mineral specimens.

Facing the challenges of funding and volunteer shortages, the museum nonetheless attracts around 3000 visitors each season, indicating strong public interest. Future plans aim to deepen this engagement by introducing a classroom for educational programs, allowing public access to the C Shaft's Koepe hoisting system, and restoring the district laboratory. These initiatives are designed to expand the museum's educational offerings, enrich the visitor experience, and ensure the legacy of mining in the region continues to be celebrated and understood.

By focusing on both preserving the past and preparing for future educational enhancements, the Cliffs Shaft Mine Museum is committed to maintaining its role as a vibrant center of mining heritage and an invaluable resource for learning and exploration.

Gary Vidlund, originally from Negaunee, MI, graduated from Negaunee High School in 1972. He then attended the Northern Michigan University Skill Center, where he pursued training as an automotive mechanic. After working in auto sales, Gary was hired by Cleveland-Cliffs Iron Company at the Mather B Mine in 1973, starting as an underground miner. He later transitioned to the Open Pit Empire Mine and retired after 31 years of service.

After retirement, Gary discovered a passion for mountain biking and became involved with R.A.M.B.A. (Range Area Mountain Bike Association), helping to develop their trail network. Currently, Gary volunteers at the Cliffs Shaft Mine Museum as a board member, continuing his commitment to preserving local history. In his free time, he enjoys walking the R.A.M.B.A. trails with his girlfriend, Ethel.

James Kippola, a Cliffs Shaft Mine Museum Board Member, was born in Detroit, Michigan, to second-generation Finnish immigrants. He graduated from Ishpeming High School in 1971 and earned his B.S. Degree Cum Laude from Northern Michigan University in 1975, focusing on Community Planning and Cultural Geography. After retiring as Manager of Planning for Marquette County in 2016, he dedicates his time to local government, historical organizations, and writing local histories. His volunteer work at the museum includes conducting tours and pursuing development projects. In his spare time, he researches local WWII veterans' histories, with a focus on submarine warfare, enjoys spending time with his grandsons, operating an antique sawmill, and speaking rudimentary Finnish.

Chris Gleason, born in Detroit and deeply rooted in Michigan's iron mining heritage through his Ishpeming-native parents, holds a Mining Engineering degree from Michigan Technological University (1984). Transitioning from a career as an automotive engineer to retirement in 2017, Chris now immerses himself in the local history of his ancestors' town, Ishpeming. An active member of the community, he contributes by giving guided tours at the Cliffs Shaft Mine and serving on its board. His passion extends beyond the mines to the local railroads, showcasing a broad interest in the region's historical infrastructure.

Gary Kaunonen and Allyse Freeman

Preserving Minnesota's Iron Mining History: A Human-centered Approach to Industrial Heritage

Minnesota's Iron Range is a veritable playground of industrial heritage. "Da Range" is, perhaps, one of the most human altered landscapes on Earth. The raw tonnage of materials moved is nothing less than remarkable, and the mechanical power and precision in which this was accomplished is often the subject of intense scholarship, public

fascination, and industrial heritage tourism. Thus, it is easy for visitors to the Minnesota Discovery Center, dubbed the "The Museum of the Iron Range," to become enamored with or entranced by the region's engineering, geology, technology, and massive machinery.

In addition to highlighting the mechanical aspects of the region's industrial heritage, the Discovery Center seeks to elucidate the human component of this industrial heritage as part of its visitor experience. This presentation, then, will explicate the ways in which Discovery Center staff seek to connect museum goers with the corporeal elements of industrial heritage through the collection, preservation, and interpretation of the region's outstanding mining heritage.

The four interpretation pillars of the Discovery Center are: "The Land. The Mines. The People. The Work," and these guideposts determine the collection, conservation, and preservation strategies of the museum and archival collections. The interpretational aspects of this strategy fall on the museum's design, research, and writing team, and this presentation will introduce session-goers to an overview of the intersections between the Range's landscapes, machinery, and perhaps most importantly—humanity. By highlighting past award-winning exhibits, current industrial heritage resources, and future projects the Discovery Center presenters will inform SIA attendees on what the facility has to offer in a visitor experience and opportunities for new collaborations with SIA and its members.

Allyse Freeman and Gary Kaunonen are representing the Minnesota Discovery Center located in Chisholm, Minnesota.

Allyse is Curator and Exhibit Coordinator of the "Iron Range's Museum" and has over a decade of experience in museum-work with focus on industrial history, social and labor history, and paleontology. She has an intimate knowledge of the Discovery Center's industrial holdings and interpretive history.

Gary is a graduate of Tech's IA program and has worked at Keweenaw National Historical Park, as an Instructor in higher education, and with the Discovery Center as an exhibit researcher and writer for over seven years. He has published several labor history-centered books with an analysis of industrial communities in the Lake Superior basin.

REVISIONING THE PAST & PLANNING FOR THE FUTURE

10:30 – 11:45 AM

Nasim Shiasi

Beyond Preservation: Transforming Abandoned Industrial Heritage into Vibrant Public Spaces

This paper investigates abandoned industrial heritage and delves into the delicate adaptive reuse process, specifically focusing on transforming these sites into dynamic public areas. There is a multitude of derelict industrial structures in cities around the world with unrealized transformation potential. Among these, Rome stands out as a storehouse of abandoned industrial heritage, containing a vast reservoir of underutilized historical and architectural riches.

The study highlights the Vittoria tram depot as an example of untapped heritage in Rome. This research aims to revitalize a neglected space through comprehensive study and design redevelopment while also providing insights into the broader consequences for similar places.

To achieve a suitable function for this building and to determine the best approach during the study of industrial heritage for their new function, we reviewed cases that have successfully changed their use to public spaces. Notable examples include the Cable Factory of Helsinki, Matadero of Madrid, and the Ex-beer factory of Peroni in Rome.

Extracting positive approaches from these projects, we apply lessons learned to the adaptive reuse of the case study in this research.

As the former tram depot evolves into a public cultural and educational center, the paper addresses fundamental questions surrounding the adaptive reuse of industrial heritage, as shown below.

- How can the adaptive reuse of sites like the Vittoria tram depot contribute to creating vibrant and culturally rich public spaces, and how does it impact social interactions and community engagement?

- What strategies harmonize the preservation of historical significance with the contemporary needs of the community?

- What should be the process of studying and examining suitable functions for this type of heritage?

The lessons learned from this project offer insights for future initiatives in the adaptive reuse of industrial heritage structures, promising a balanced integration of the past into the fabric of the future.

In conclusion, this study underscores the transformative potential of adaptive reuse for abandoned industrial heritage, offering a roadmap for future projects. By examining the case of the Vittoria tram depot in Rome, we navigate the intricate balance between preservation and adaptation, demonstrating the broader impact such initiatives can have on urban landscapes. As cities grapple with the challenges of heritage preservation and community development, the insights from this research contribute to a deeper understanding of the key factors essential for the successful adaptive reuse of abandoned industrial heritage for public spaces.

Nasim Shiasi holds a Ph.D. in History, Representation, and Restoration of Architecture from Sapienza University of Rome, complemented by a Master's degree in Architecture and a Bachelor's in Historic Preservation. My research primarily centers on the history, theory, and criticism of architectural heritage conservation. Throughout my career, I have been dedicated to conserving historic buildings through adaptive reuse and making urban heritage more accessible and understandable to the public. I have presented my research at national and international conferences and have received research grants. In addition to my research endeavors, I actively contribute as a volunteer teaching assistant at Sapienza University in Technological Design for the Architectural Requalification course, where we focus on the adaptive reuse of abandoned industrial heritage in Rome. Furthermore, I am a SAH Historic Interiors Group's Research Committee member.

Jonathan Coopersmith

Preserving the present so the future has a past

Based on what the SIA has learned about preserving industrial heritage, what could we do now to collect and preserve contemporary industrial infrastructure for the future? Or, as one of my colleagues asks space company executives, "If you think you are making history, what are you doing to record and preserve it?"

This paper examines possible options using the examples of the computer/IT and the space exploration/exploitation worlds. It concludes with a proposal for industrial heritage and archive communities to communicate and coordinate more to ensure the future has a rich past.

For space, the key government player is the National Park Service National Center for Preservation Technology and Training (NCPTT), which sponsored the Preserving the Race for Space: Small Steps and Giant Leaps 2023 conference in Cape Canaveral and the upcoming June 2024 conference in Houston. Other major actors are museums like the National Air & Space Museum and the Seattle Museum of Flight. For information technology, the Computer History Museum, Association for Computing Machinery History Committee, and the Engineering and Technology History Wiki (ETHW) are major actors.

In 2018, the National Science Foundation funded the "To Boldly Preserve: Archiving the Next Half-Century of Spaceflight" conference, which attracted nearly 100 archivists, historians, engineers, and records managers from 66 universities, archives, museums, private firms, and federal offices to discuss how to encourage contemporary

space actors to collect and preserve their histories, whether individual, projects, or institutions. Is it time for a similar proposal to the NSF to bring the larger hardware and physical collection and preservation communities together with more archival and data-based collectors and preservers to discuss and plan for the opportunities – and challenges – ahead?

Jonathan Coopersmith (j-coopersmith@tamu.edu) is Professor Emeritus of History at Texas A&M University, where he taught the history of technology and wrote about Russian electrification, pornography, space commercialization and the 180-year history of the fax machine. His current research includes failure in technology, and the importance of froth, fraud and fear in emerging technologies. He co-organized the 2018 NSF-funded "To Boldly Preserve: Archiving the Next Half-Century of Spaceflight" conference (www.toboldlypreserve.space) to promote the collection and preservation of space history and the 2023 "Technology Policy – Think Deeply and Build Things" workshop of historians of technology, policymakers, and policy implementers with the Arizona State University Consortium for Science, Policy and Outcomes (CSPO).

Ted Grevstad-Nordbrock

From the Akerselva to the Mississippi: Industrial Heritage Solutions in Oslo and the Twin Cities

Once seen as eyesores and sobering reminders of faded economic glory, former industrial sites have slowly come to be valued as unique commodities: as tangible emblems that contribute to the local municipal brand and allow a city to differentiate itself from others. Whether prized for their intrinsic value as heritage artifacts, or as potent elements in local urban revitalization strategies, or as real estate with green credentials in an era of climate change, the repurposed remains of the industrial age have been woven into the planning and re-envisioning of cities. They feature prominently on the websites of municipal governments, chambers of commerce, and tourism offices across the US and abroad.

Relatively little comparative international work exists to tease out differences in the heritage policies and practices that allow industrial sites to be repurposed. This paper explores the national strategies that two countries, Norway and the US, have used to encourage the preservation and reuse of industrial sites. Within these national contexts, the metropolitan areas of Oslo and the Twin Cities offer sites that illustrate ideological similarities, but also differences, in the role that industrial heritage plays in their respective societies. In Oslo, projects along the fjord and Akerselva river are explored, among them the celebrated Vulkan mixed-used redevelopment. Several sites in both Minneapolis and St. Paul, including the Schmidt Brewery cum artists' lofts, offer a foil to the context of Oslo.

From this comparative study several conclusions are drawn, chief among them that flexibility in adhering to heritage standards can make or break an adaptive reuse project. Recommendations include how US preservation policy, standards, and incentives that were developed in the 1960s might be reformulated to serve the needs of today.

A 2022 Fulbright Scholarship with the Norwegian Institute for Cultural Heritage Research Oslo, Norway, facilitated data-gathering and research for this paper.

Ted Grevstad-Nordbrock is Associate Professor of Preservation and Cultural Heritage in the Department of Community and Regional Planning, College of Design, Iowa State University, where he helped establish degree programs in Preservation and Cultural Heritage. His primary teaching and research areas are historic preservation policy and urban revitalization. He holds master's degrees in architectural history (Wisconsin) and historic preservation planning (Cornell) and a doctorate in urban geography (Michigan State). Ted has over twenty years of professional work experience, including twelve years with the Michigan State Historic Preservation Office. In fall of 2022 he was a Fulbright Scholar with the Norwegian Institute for Cultural Heritage Research (NIKU), Heritage & Society research unit, in Oslo. Ted and his family live in Ames, Iowa.

LOGGING AND MINING HERITAGE

10:30 – 11:45 AM

Steven Walton

Ford's Far-Flung Feudal Fantasy: The sawmill to save society in Alberta, Michigan

In 1935 Henry Ford had a thriving series of sawmills in the western upper peninsula of Michigan. For some reason, he got it in his mind to create a new community on Plumbago Creek, centered around the sawmill. But what he built—soon renamed Alberta—was hardly a production site, though it was a company town of sorts. It was a quasi-utopian image of quasi-self-sufficiency in the northern woods, developed to solve the problems of the Great Depression. It was not, however, like his Fordlandia settlement in Brazil, which was designed to solve a production bottleneck. Rather, this community was designed to solve a social bottleneck, and rather than unleashing his Sociological Dept. on an existing urban socioeconomic infrastructure, instead he thought he could engineer settlement to solve society's problems, trying to produce a curious form of "utopian capitalism." Students and I have been documenting and exploring the records of the Alberta sawmill itself (and colleagues have done the village writ large) as well as Ford's U.P. sawmilling operations and his better-known "Village Industries," and this presentation will offer an overview of the site, the mill, and interpretive plan proposals as groups work to "save the Alberta sawmill."

Steven Walton began his career as a mechanical engineer and then turned to the history of engineering through the history of science and technology. He is principally interested in the intersection of technology, its users, and the technical knowledge that they claim about it. Other than this project, he is writing a history of the Parsons Co. of Traverse City, MI, a project that sadly has no IA component as it's all gone. He teaches in the Industrial Heritage and Archaeology program at Michigan Tech and is departing as the *IA* Journal editor but continuing as Executive Secretary.

Dan Quine

Rediscovering Copperopolis

Copperopolis in Calaveras County, California, was once a major supplier of copper. The mines there produced more than 72 million pounds of metal between 1860 and 1946. Using ground and aerial surveys, historical research and tapping into local knowledge, the author has reconstructed the surface workings of the main mine and its associated transport systems, revealing the full extent of this complex operation for the first time.

The original mines operated on a relatively small scale, supplying copper during the Civil War and for the rapidly expanding transcontinental telegraph system. The mines went through several periods of boom and bust as copper prices fluctuated, but saw a sustained resurgence during and between the First and Second World Wars.

The mine was an early and significant user of electricity, powering the mineshafts, the ore crushing and smelting plants, and two narrow gauge tramway systems. Power was supplied from hydroelectric stations along the western edge of the Sierra Nevada.

This in-depth study covers the working methods of the mine, the smelting operation and the unusual high-level tramway that connected several local mines to the smelter. Drone imaging and computer modeling technology are used to maximum benefit to understand and describe the site.

Dr. Quine is an industrial historian and author. He presented the history of the Yellow Aster gold mine at SIA 2022. He is the author of the definitive book on the history of the Hendre Ddu Tramway in Wales, and has published more than 20 articles on industrial and railway history in journals in the UK and the US. Professionally, he is the SVP of Engineering, Product and Design at software company Hologram, holds a PhD in Machine Learning from the University of Leeds and has 15 patents from companies including Apple and Google.

Fred Sutherland

Archaeological Evaluation of the Munroe Turntable (21CA804) Site, a Logging Camp and Railroad Complex, Cass County, Minnesota

Nienow Cultural Consultants (NCC) contracted with Cass County, Minnesota to evaluate the remains of a logging railroad service and habitation site as part of the Minnesota Legacy Grant No. 2205-27182, "Munroe Turntable-Roundhouse Phase 2". Fieldwork was conducted from 20-29 August 2023. Four 1x2m formal excavation units targeted doorway locations of key historic habitation foundations and railroad maintenance features to determine their eligibility to the National Register of Historic Places. A total of 324 artifacts from 66 separate contexts were collected during the Phase II fieldwork. These included locomotive parts, historic ammunition, personal items, and an axe head. NCC compiled other field data in the forms of photography, video, LiDAR 3D models, field paperwork, GPS points, and local mapping with a total station. The results of this project clearly demonstrate the Munroe Turntable Site is eligible to the National Register of Historic Places for Criterion A, C, and D. The evidence collected reveals aspects of worker's daily lives, alcohol use, construction, operation, site abandonment and a fire from 1893.

Fred Sutherland Ph.D, RPA is a graduate of Michigan Technological University's Industrial Heritage & Archaeology program. Since completing his dissertation in 2017 he has been a project manager or principal investigator on several evaluation and data recovery excavations with an emphasis on midwestern industrial sites.

IRON & STEEL HERITAGE II: STEEL ARCHIVES AND MUSEUMS

2:15 – 3:30 PM

Victoria Miller

16 Tons: The Colorado Fuel and Iron Company and the Steelworks Center of the West Archives

With roots dating to 1872, the Colorado Fuel and Iron (CF&I) Company at Pueblo served as the principal heavy industry leader in the Rocky Mountain region, producing steel rails, spikes, and track accessories for the burgeoning railroad industry. Over the next 121 years, the company grew to manufacture dozens of other products used in the agriculture, mining, commercial, and residential industries, driving Pueblo to become the "Pittsburgh of the West." Victoria Miller will provide a brief introduction to the history of the company from its birth to its bankruptcy and in addition, provide information about the archival collections created by the company and how the collection is currently used in a museum and archival research setting.

A native of Pueblo, Colorado, Victoria Miller earned a Bachelor of Arts degree in history from Colorado State University-Pueblo and a Master of Arts degree in museum science from Texas Tech University. With more than 30 years of museum related experience, she has held positions emphasizing in collections management, museum education, exhibit design and interpretation, and museum management. In addition to her Steelworks Museum duties, she is also a certified archivist accredited by the Academy of Certified Archivists and is responsible for the acquisition, arrangement and description, preservation and access to the holdings within the Steelworks Archives.

Nick Zmijewski and Robert Bilheimer

A Brief Overview of the Industrial Archives & Library

As part of the proposed Iron and Steel Heritage Forum, Nick and Bob will present the history and current activities of the Industrial Archives & Library. Particular focus will be placed on our holdings related to iron and steel in both archival and library based collections. Highlights will include corporate collections, with large amounts of material from Bethlehem Steel, Youngstown Sheet & Tube, and Inland Steel. Private collections include those of noted steel mill modeler Mike Rabbitt, photographer Jim Kerner, and historian Craig Bartholomew. Discussion will also include steel adjacent holdings in areas like mining and quarrying, with large anthracite collections and more obscure tie ins, such as a lighting collection that includes a guide for the installation of electric lights in steel mills. Our efforts to maintain both high professional standards and make the collections accessible to the public, both in person and electronically, will be discussed. We will also cover staff expertise and organizational stability.

Nick has worked for IAL since 2017, having worked at the Railroad Museum of Pennsylvania in its archives since 2007. He holds a Bachelor's Degree in History from Wilkes University and is pursuing a Masters in Archives and Records Management from San Jose State University. Nick has been published in Railfan and Railroad as well as The Milepost and considers industrial history both his vocation and avocation, having spent much of his childhood with his father's paper and photo collection, when not visiting railroad facilities and abandoned mines. He is a member of the Society of American Archivists and the Mid-Atlantic Regional Archives Conference (MARAC), where he serves as the vendor coordinator, and is the former chair of the ArchivesSpace Governance Board. Nick grew up in Cranford, N.J., and now resides in Lancaster, Pa., with his wife, Allison, and their two children, Zoe and Logan.

Bob Bilheimer joined the staff of the Industrial Archives & Library in October 2016 after serving as one of the founding Trustees of the organization. Bob's responsibilities include being the chief operations person for the IAL, other than the management of the archives and library. He manages the day-to-day functions including communications, human resources, facilities, records management and programs, such as, oral history, educational outreach, lectures and special events.

Bob comes to the Industrial Archives & Library with over 40 years of experience in government, public and community relations, non-profit management, development and membership sales with Bethlehem Steel Corporation, Air Products, Lehigh Valley Economic Development Corporation and the Pennsylvania Chamber of Business and Industry. He is a 1978 graduate of Gettysburg College with a BA in business administration, magna cum laude and a member of Phi Beta Kappa. Bob also earned an MBA from Lehigh University in 1982. Bob has three children and resides in the Bethlehem area where he enjoys raising Seeing Eye puppies.

Michael Piersa

How Do You Turn an Abandoned Steel Mill into a World-Class History Museum?

This presentation will explain a series of once unthinkable transformations that saw the home plant of America's second largest steel producer shut down and become, in part, the Smithsonian Affiliated National Museum of Industrial History. Attendees will see how two new state laws, a pioneering partnership with the Smithsonian, and many other events such as the opening of a casino (not to mention a lot of hard work) were all pivotal factors in the establishment and success of the Museum. The talk will provide an overview of current Museum holdings that encompass a variety of iron and steel industry pieces ranging from pamphlets to a 900,000 pound hydraulic press. Strategies to address current and future challenges and opportunities will round out the presentation. These will include storage issues, space constraints, growth in a gentrifying neighborhood, working with operating machines and molten metal, outreach, and partnerships. Creative approaches will be stressed, such as collaborating with arts organizations and developing unique internal programs such as the Bethlehem Steel locomotive engineer experience, where guests learn to drive the train, instead of being a passenger.

Mike Piersa graduated with a bachelor's in history from Moravian College and a master's in history from Lehigh University. He first became involved with NMIH in 2002 and has been instrumental in the research and interpretation behind the museum's collections as well as the operational restoration of historical industrial equipment both at the museum and at outside facilities. Mike's expertise and hands-on philosophy have enabled him and his volunteer crews to preserve over 250 tons of machinery from mining, transportation, and manufacturing facilities across the northeast. He serves as a Historian and Museum Specialist at the National Museum of Industrial History in Bethlehem, PA.

CRANES, TRUCKS, & BEER

2:15 – 3:30 PM

Charlene Roise

Heavy Lifting: The Rise and Fall of American Hoist and Derrick

From a humble start in Saint Paul in 1882, the American Hoist and Derrick Company (later known as Amhoist) quickly became an international leader in the manufacture of heavy-duty cranes, hoists, and other industrial equipment. The company's machines played a critical role in construction projects throughout the world ranging from Mount Rushmore to the Panama Canal, from building fleets of ships in record time during World Wars I and II to expanding the oil and gas industry in the last half of the twentieth century.

American Hoist routinely surpassed the cutting-edge capacity of its own products. The National Society of Professional Engineers named Amhoist's 3,000-ton Revolver Crane one of ten outstanding engineering achievements of 1977. The company also diversified in the mid-twentieth century, becoming a major hardware wholesaler and manufacturing equipment for recycling, firefighting, and water distribution.

Despite Amhoist's good start to its second century, the 1980s were the company's undoing after the crane market crashed. In 1987, the company's name was changed to Amdura, its headquarters moved to Denver, and its leadership was ousted in a corporate takeover. In the following year, Amdura went bankrupt.

For its first century, Amhoist's headquarters were at its sprawling manufacturing plant along the Mississippi River's west bank near downtown Saint Paul. Corporate offices moved to a new twenty-five-story tower downtown in 1983, gaining naming rights to the building. After the company's fall, its manufacturing facilities were demolished, leaving Amhoist Tower as the best representation of American Hoist's legacy today. It was listed in the National Register of Historic Places in 2022 for that association. After Amhoist's departure, the tower's office space housed a variety of tenants but was mostly vacant by 2020. It is now being converted into apartments.

This paper will examine Amhoist's evolution and its groundbreaking technological innovations.

Historian and architectural historian Charlene Roise was a founding principal of Hess, Roise and Company in 1990. She was president of the historical consulting firm from 1997 until selling the business in 2020 and continues to work in the field. Charlene has experience with a broad spectrum of cultural resources ranging from designed landscapes and high-style buildings to bridges and aircraft hangars. Among her many projects are HAER documentation studies of the Grand Coulee and Hungry Horse dams and power plants in the states of Washington and Montana and National Register nominations for Amhoist Tower in Saint Paul, Saint George Serbian Orthodox Church in Duluth, and the Hiawatha Golf Course and Peavey Plaza in Minneapolis. After serving for many years on the board of The Cultural Landscape Foundation, she is now a member of the foundation's Stewardship Council.

William Dunsmore

"A Winter Temperature in the Summer Time": Nineteenth Century Lagerkellers and German American Identity in New York City

The rise in German immigration to the United States in the mid-nineteenth century brought about a remarkable change to the beer brewing industry in New York City and throughout the country. With the introduction of lager yeast in the early 1840s, the dominance of English-style ales was dwindling. Unlike the ales, however, lager beer required a cold temperature to allow the bottom-fermenting yeast to properly activate. In the era before mechanical refrigeration, the lager brewers relied on the German tradition of building large subterranean structures, called lagerkellers, to provide the necessary climate for lager to ferment. Despite the abundance of lager breweries that opened in New York City in the nineteenth century, only a handful of lagerkellers have been discovered, and even fewer have been properly studied – creating a gap in our knowledge of the industry and its significance to the lives of German Americans in the Empire City. Through an examination of census records to determine the birthplace of every brewer in the city between the years of 1840-1880, the importance of the brewing industry to the economic lives of German Americans can be observed. Meanwhile, the difference in the construction methods of lagerkellers throughout the five boroughs is explained through bedrock elevation and overburden thickness maps. This paper represents the first comprehensive examination of lagerkellers throughout the five boroughs, in order to demonstrate lager's role in the creation of a German American identity that combatted nativist and temperance sentiments present in the nineteenth century, while simultaneously providing an economic outlet in which German immigrants could achieve economic success.

William Dunsmore is an archaeologist currently in his final semester of a master's program at Bard Graduate Center in New York City. He has worked on archaeological projects in the Pacific Northwest, the American Southwest, the New York Metropolitan area, and the in the Cycladic Islands of Greece. For his master's research, he is studying the rise of lager beer and its role in the creation of a German American identity throughout the United States in the nineteenth century, as well as preservation methods for lagerkellers. William's research interests are varied and include historical, industrial, documentary, experimental, and landscape archaeology, Ancestral Puebloan ceramics, Southwest earthen architecture, and ancient and historic beer production.

John Reap

Shadows on the Western Highways, 1950-1975: Bulldogs, Cornbinders, and Needle-Nose Pete

This presentation will attempt to illustrate that medium and heavy trucks are purpose-built to order from seemingly common components, (deceptively so), to perform specific tasks, and will illustrate some aspects of their evolution. More specifically, the vehicles under consideration were intended to meet the demands of long-haul trucking west of the Great Plains.

Due to the longer distances between departure and destination points in the west, the overall strategy was to maximize load weight and "cubage," reducing the number of trips. These factors, plus the difficult topographic and climatic conditions encountered on the routes meant larger trailers and tractor-duty trucks, powered by large-displacement diesel, gasoline, and butane-fueled engines. Axle weight limits constituted a further critical factor, dictating "double" (tandem) axles on both tractors and trailers. In the post-World War II era, tractors evolved to a conspicuous long-wheelbase configuration that complied with a 1946 policy of the American Association of State Highway Officials, moving the steering axle forward, toward the front bumper to maximize axle separation. Fortunately, permitted length, width, and height limits were more generous than in eastern practice.

Although ten manufacturers offered such trucks during this period, examples from three were chosen for this presentation.

- Mack "western models," beginning with the LTL/LTH in 1947. Medium-price work trucks, Macks are still known in the trades as "Bulldogs," for their toughness and reliability.

- International Harvester Company's "Westcoaster" models, built at Emeryville California. IHC catered to fleet operators, but to those who drove and maintained them, they were glamourless "Cornbinders," although eminently serviceable bid-purchased trucks.

- Peterbilt's 281/351, known as the "Needle Nose Pete." A 351 pulling a tank trailer was featured in Steven Spielberg's first directorial effort, the proto-road rage movie, "Duel."

Besides attrition of the earlier fleet, several developments in the early 1970s disadvantaged later long-wheelbase "bridge formula" tractors. The introduction of 45-foot trailers in 1970 resulted in adopting shorter-wheelbase tractors that were compatible with operation farther east after length restrictions were dropped on the Interstate Highway Network, including local interchange zones. More telling were the trends toward trip-leasing of independent owner-operators and the bankruptcies of major Truckload (TL) contract and Less-than-Truckload (LTL) express carriers in the wake of the 1973-74 Oil Boycott, the "tight money" economy that followed, and deregulation of the industry with the Motor Carrier Act of 1980.

John J. Reap holds an AAS degree in Automotive Engineering Technology from what is now the SUNY College of Technology at Canton, and a BS in Technical Education from SUNY Oswego. He fulfilled the required internship at the New York State Thruway Authority's Syracuse Division equipment maintenance shop, returned after completing his degree, and retired with thirty-eight years of service. He now resides in a community on the edge of metro Phoenix.

John was a "hubcap duster" as a toddler, and the die was cast shortly thereafter, when he received a copy of illustrator George J. Zaffo's "The BIG BOOK of REAL TRUCKS" (1950).

INFRASTRUCTURE

2:15 – 3:30 PM

Perry Green

Historic Preservation of Bridges – What Role does a Civil Engineer Play?

Bridges that are 50 years old or older are considered eligible for the National Register of Historic Places, and therefore, are "protected" by the Federal Historic Preservation Act of 1966 as well as an individual State's own Preservation Act(s). Just because a Federal or State Law exists does not mean that all old bridges will be safe from removal and replacement by highway agencies. It is this diametrically opposite view of an engineer's role as a creator of new infrastructure to one who has the assignment to preserve a piece of engineering technology and history that will be discussed.

Much has been done to raise the awareness of those involved in the historic preservation of bridges over the last almost 60 years. Starting with the 1966 FHPA, statewide inventories of historic and representative bridges were developed. These surveys contained examples of every engineering design type of bridge found in a given state and throughout the U.S. They included stone arch spans from the 1840's that carried the Historic National Road, timber covered bridges that existed before the first automobiles appeared on the nation's roads, cast and wrought iron truss bridges from the latter half of the 19th Century, and early riveted steel truss bridges and concrete arch bridges from the first part of the 20th Century.

A Civil Engineer has as much a role in the preservation of a historic bridge as any number of other persons involved in a bridge project including: Planners, Historians, Archeologists, and Architects. Today, States have established goals to preserve the historically significant bridges that they have documented in their inventories. A historic bridge is supposed to be preserved unless changing and overriding safety or transportation factors require that it be altered or replaced. If this is the case, it may be necessary to move the bridge to another site or dismantle and store it pending availability of a new location. If anything should affect the historic aspect of a bridge listed in a state inventory, the bridge must be documented with a written history and detailed drawings that are then sent to the archives of the Historic American Engineering Record.

Dr. Green has a Bachelor of Science degree in Civil Engineering from Columbia University School of Engineering and Applied Science, New York, NY (1977), Master of Science in Civil Engineering (1979) and Doctorate in Civil Engineering (2001) from Lehigh University, Bethlehem, PA.

Between his Master's and Doctoral degrees, 1979 to 1991, he was a Structural Engineer and Engineering Manager for the A/E firm Burns & Roe, Inc., Oradell, NJ where he was involved with the design and construction of new nuclear power plants and the evaluation and modification of existing nuclear power plants including Clinch River Liquid Metal Fast Breeder Reactor (LMFBR), Oak Ridge, TN; Hanford 2 (now the Columbia Generating Station), Richland, WA; Clinton Power Station, Clinton, IL; Cooper Nuclear Station, Brownville, NE; Davis-Besse Nuclear Power Station, Port Clinton, OH; and Savannah River Site, Aiken, SC.

Prior to joining Bechtel in September 2011 he was an Engineering Consultant for the steel industry, the Technical Director of the Steel Joist Institute from 2004 to 2010, and an Assistant Professor at the University of Florida, Gainesville, FL from 1998 to 2004.

Dr. Green has recently retired from full-time employment with Bechtel Corporation, as part of their NS&E GBU and BNI. His field assignments included the Uranium Processing Facility for the DOE at the Y-12 National Security Complex in Oak Ridge, TN and Vogtle Units 3&4 Nuclear Power Plants in Waynesboro, GA. Prior to these assignments he was the Technical Lead in charge of all aspects of the reactor containment vessel and internal structures design for the Generation mPower small modular reactor development project, Frederick, MD.

Kelly A. Woestman

Left Behind: Mining Waste and the EPA

After revising lead screening levels, the Environmental Protection Agency has again turned its attention to the Tri-State Mining District of Oklahoma, Kansas, and Missouri. Most recently, it expanded the Oronogo-Duenweg Mining Belt Superfund Site (Missouri) to include all of Jasper County, Missouri. Many individual property owners have already been helped along with several larger area projects as the EPA has worked to oversee the cleanup of the mining waste throughout the area in an attempt "to address the long-term human health and environmental risks" still present decades later. The EPA is also working with the Jasper County Health Department to identify where children with high blood-level content live within the boundaries of the Superfund site. This effort will be compared to other nearby Superfund sites previously identified in the Tri-State Mining District including Tar Creek in Oklahoma, Cherokee County in Kansas, and the Newton County Mine Tailings site in Missouri. Each of these sites adjoin the Oronogo-Duenweg Mining Belt site. Images included in the presentation will explore the chat piles that still exist throughout the area along with the results of remediation projects.

Kelly Woestman is a Professor of History at Pittsburg State University in southeast Kansas and grew up in southwest Missouri surrounded by chat piles. She began her teaching career in 1985 and her research career in 1990. Woestman not only studies local history but continues to expand her knowledge of family history and the people who made the areas described in this presentation what it is today. She earned her PhD at the University of North Texas and began her career at Pittsburg State in 1993. Woestman teaches courses in 20th Century United States History to both undergraduate and graduate students.

William Vermes

Suspension Bridge Construction of the American Southern Plains, 1885 -1917

From 1842 through 1920, the United States issued 161 patents related to suspension bridge construction. Surprisingly, nearly a quarter of these patents (38 total) were issued to inventors in three states: Texas, Oklahoma, and Kansas, and within a relatively brief period – 1885 through 1917. Also, unlike the patents related to larger river crossings, these Southern Plains patents focused primarily on workhouse bridges with spans from 100 to 300 feet.

Not all Southern Plains patents were innovative and/or structurally sound, but three inventors stood out with multiple patents and constructions: Edwin Runyon of Weatherford Texas (4 patents from 1888 to 1893), Daniel M. Eddy of Kansas and later Missouri (2 patents, 1888 & 1893), and Nelson Sturgis of Guthrie, Oklahoma Territory (4 patents, 1899-1915). Review of these patents and these inventors works provide insight to the simplicity and complexity of their suspension bridges.

Edwin Runyon was the foremost visionary of this suspension bridge movement. His 1890 Bluff Dale Bridge in the Texas Hill Country is the earliest known cable stay bridge in the United States. Runyon and his eventual successor, William Flinn, built several more such bridges in Texas and at least one in the Oklahoma Territory. Meanwhile, Daniel Eddy's patents focused more on innovations of anchorage and fanciful stiffening truss construction that were likely more promotion material than practical. Still, Eddy received multiple suspension bridge contracts in Texas, the Oklahoma Territory, and Missouri.

In 1899, one successful suspension bridge proposal by Eddy caught the attention of an Oklahoma entrepreneur and county commissioner, Nelson Sturgis. Sturgis soon left public service to become a suspension bridge contractor in Central Oklahoma. His patents focus on suspender connections, which are illustrated in a patent model housed in the Oklahoma Territorial Museum.

William (Bill) Vermes is the bridge engineer for Portage County, Ohio. His professional work has focused on bridge inspection and historic bridge rehabilitation. His current research on Oklahoma bridge construction and involvement with the Bluff Dale Bridge (Erath County, Texas) preservation efforts have crossed to make the foundation of this presentation. Bill is the first Vice President of the Ohio Historic Bridge Association and the sole proprietor of This Old Bridge, LLC.

IRON & STEEL HERITAGE III: STEEL MILLS

3:45 – 5:00 PM

Ty Malugani

Sloss Furnaces: Finding Identity and Staying Relevant in the 21st Century

Sloss Furnaces played a vital role in Birmingham's industrial triumphs, which in turn built the foundation for the successes of the city for decades. As the second blast furnace built in the city's history, and the longest continuously running furnace site, Sloss Furnaces is largely responsible for the birth of Birmingham, and it's rise to becoming the foremost industrial city in the South. When Sloss Furnaces ceased making iron in 1970, it took ten years of debate to finally preserve and interpret the site as a museum of industry. This decision was spearheaded in the main by the citizens of Birmingham. In the 41 years since Sloss Furnaces reopened as a museum, public perception of the site changed many times--sometimes driven by decisions made by museum leadership. Today, Sloss Furnaces is grappling with its own identity, both past and present, and how to stay relevant in the modern world. This presentation will cover the changes Sloss Furnaces has experienced as a museum, the difficulties of preserving the structures as well as the history, and where Sloss Furnaces fits within modern Birmingham.

Ty Malugani is the Education Coordinator and Historian at Sloss Furnaces National Historic Landmark. He began as an intern in 2011 at Sloss Furnaces while getting his undergraduate and master's degrees in History from the University of Alabama at Birmingham. He has been full-time at Sloss Furnaces since 2017. He primarily focuses on Birmingham industrial history with a focus on iron-making.

Kirsten Paine

Rivers of Steel National Heritage Area: Past, Present, and Future

Created by Congress in 1996, the Rivers of Steel National Heritage Area is committed to preserving, interpreting, and managing the historic, cultural, and natural resources related to Big Steel and its associated industries. The Rivers of Steel National Heritage Area includes encompasses Allegheny, Armstrong, Beaver, Westmoreland, Greene, Fayette, and Washington counties. Rivers of Steel National Heritage Corporation is the 501(c)(3) that oversees the stewardship, preservation, rehabilitation, and access to sites including the Bost Building, the Pump House, and the Carrie Furnaces. The organization is dedicated to building on this area's transition from heavy industry to high technology and diversified services as well as bolstering the new regional economy by promoting tourism and economic development based on this region's historic industrial saga. A multifaceted program, the Rivers of Steel National Heritage Area's mission includes historic preservation, cultural conservation, education, recreation and resource development. This presentation will discuss the organization's history, current projects and objectives, and lay out some of Rivers of Steels' future plans.

Dr. Kirsten Paine is a Site Management Coordinator and Interpretive Specialist at Rivers of Steel. In addition to public history work related to 19th-century industrial labor, women's labor, and preservation in southwestern Pennsylvania, she specializes in 19th-century American women writers. She earned her PhD in English from the University of Pittsburgh in 2019 where she wrote her dissertation, "Not According to the Regulation of War": Intimate Civil War Writing by Female Nurses, Soldiers, and Spies, which she is currently revising into a book.

J. Richard Rowlands

Restoration of a Pair of Rolling Mill Steam Engines

Youngstown Steel Heritage is currently engaged in the restoration of the last two existing steel industry rolling mill engines in North America. The first is a 34" x 68" x 60" William Tod Co. cross compound non reversing engine owned by YSH, the other is a 50" x 60" two cylinder reversing engine built by Mackintosh Hemphill and owned by Rivers of Steel Heritage Corporation. We will compare and contrast the design differences between the two engines, unique challenges encountered in the restoration of such large pieces of machinery and considerations on balancing the needs of conservation and mechanical rehabilitation.

Rick Rowlands is the founder and CEO of Youngstown Steel Heritage, a nonprofit based in Youngstown, OH dedicated to the preservation of steel industry history through the acquisition, restoration, and operation of historic steelmaking equipment. Self-taught historian of industrial and rail history specializing in the Cleveland to Pittsburgh corridor. He also serves on the board of the Mahoning Valley Railroad Heritage Association and member of the collections committee at the National Museum of Industrial History.

COMMUNITY-BASED INDUSTRIAL HERITAGE

3:45 – 5:00 PM

Larissa Juip

Indigenizing Industrial Heritage: Stories from the Iron Range

Approaches to heritage interpretation often produce site narratives that are incomplete, leaving visitors without access to the whole story of a place. At industrial heritage sites in Minnesota's 'Iron Range,' this approach has often excluded Indigenous and Descendant community narratives detailing their relationships with iron mining. What relationships do Indigenous and Descendant community members have with historic and contemporary iron mining in Minnesota's 'Iron Range'? Through an Indigenous ethnographic method referred to as 'Indigenous Storywork' (IS), Indigenous and Descendant community members in and around the Iron Range have helped to elevate these stories and uncover a more holistic narrative of this landscape. Counter to the dominant narratives that often come out of industrial heritage scholarship-that Indigenous Peoples are primarily anti-industry or that industrialization was always viewed as a negative force of colonization by Indigenous Peoples-the stories shared throughout this research project present a much more nuanced understanding of what these relationships have been and continue to be.

Larissa Juip is an Onondaga scholar working towards a PhD in Industrial Heritage and Archaeology at Michigan Technological University. Her research focuses on the intersection between industrial and Indigenous heritage and she seeks to use Indigenous research approaches and methodologies to uncover hidden narratives within the landscape. Larissa has over a decade of experience in heritage interpretation, formal and informal education. She is currently a consultant for the Voyageurs Conservancy on their 'First People's Cultural Connections Curriculum Review and Development' project.

James Juip

Creating Meaningful Engagement in Digital Heritage Projects

The process of creating a sustainable social, political and economic future for many communities is profoundly shaped by their industrial pasts. Public participatory approaches mixed with digital mapping methods have been seen as valuable tools, giving communities a voice in the co-production of knowledge with institutional authorities. However, developing robust and sustainable engagement from community stakeholders has been a continual challenge. Scholars have promoted many different public outreach activities and programs that work to engage the public in mapping projects. However, little work has been done to develop a model that guides researchers on how to create and sustain public engagement in these projects. Using the Keweenaw Time Traveler deep map as a case

study, this work aims to fills this gap in the creation of a new model that measures both the volume and depth of participation grown through public outreach activities while also using this model to investigate and evaluate the current engagement program in use by the Keweenaw Time Traveler team.

James Juip is a senior research associate for the Geospatial Research Facility, community and education outreach specialist for the Historical Environments Spatial Analytics Lab, and PhD Candidate in the Industrial Archaeology and Heritage program at MTU. James is also an educator for Gidakiimanaaniwigamig S.T.E.M. camp for Indigenous youth sponsored by Fond du Lac Tribal College. He has 13 years of public engagement experience in the fields of heritage interpretation and education outreach. He earned the Commissioner Recognition Award for his exceptional work in heritage interpretation and community outreach for the Minnesota Department of Natural Resources in 2018. His current research focuses on the integration of community based participatory research, historic geospatial data, and modern interpretation methods to create a more holistic and inclusive narrative of past and present mining communities.

Reed Petersen

A Visitor's Center for All: A Collaborative Project Between Lake Vermilion-Soudan Underground Mine State Park and the Bois Forte Community

In an effort to present a more inclusive and holistic narrative of the history of the Soudan Underground Mine, staff at Lake Vermilion-Soudan Underground Mine State Park (Department of Natural Resources, Parks and Trails Division) began collaboration with the local Bois Forte Band of Chippewa in early 2022. Partnering with the Bois Forte Cultural Heritage Center and its director (Jaylen Strong), round table discussions with community members provided direction for the creation of new interpretive panels in the Visitor Center at the Soudan Underground Mine that will facilitate the sharing of the story of the Bois Forte community for the first time in the park's history (opened in 1965). The realities of working with an Indigenous community presented some hurdles that collaborators had to navigate over the course of the project, which is currently in fabrication and slated for completion in late spring 2024, when it will be unveiled for the interpretive season. This collaboration is the first step of many in the park's plan to create a more diverse and inclusive Visitor Center experience.

Reed Petersen is an Interpreter at the Soudan Underground Mine State Park (2016 to present) and teaches History and Government at Minnesota North College (2017 to present). He has a Master of Arts Degree (History) from Minnesota State University-Mankato with an emphasis on Minnesota History and Environmental History and a Bachelor of Arts Degree (Secondary Education) from Adolphus College.

INFRASTRUCTURE AND THE GEOLOGY OF THE TWIN CITIES

3:45 – 5:00 PM

Greg Brick

The Rise and Fall of the St. Peter Industries of the Twin Cities

The St. Peter Sandstone is an important bedrock layer under the Minneapolis-St. Paul metropolitan area, and the Midwest generally. In the Minnesota part of its range, it lacks natural cementation and is easily excavated. From the mid-nineteenth century onward, many artificial caves were dug, especially in St. Paul, and used for commercial purposes. These are here dubbed the "St. Peter industries." The big three examples to be discussed are lagering caves, mushroom caves, and cheese caves. Researching these St. Peter industries, I found a recurring theme: there was an obvious and compelling reason for the initial use of caves, but the reason why people stopped using them can be obscure.

Lagering caves, introduced by Bavarian immigrants in the 1840s, offered free subterranean "air conditioning" for brewers but had largely faded away by 1900 with the development of pure yeast culture and the invention of the Linde refrigeration machine powered by cheap electricity, leading to aboveground stockhouses. Mushroom caves, introduced by French immigrants about 1900, provided a controlled environment for mushroom farming but faded away with the coming of automobiles and corresponding decline in abundance of urban horse manure, used for bedding. By 1965, mushroom farmers began moving to outlying rural areas where horses were still abundant, employing aboveground cement block structures. The ripening of blue cheese in former mushroom caves began as a result of the cutoff of imports of French Roquefort during World War 2, but faded away after the cheese caves were damaged by the 1965 Mississippi River flood.

Greg Brick

A New Interpretation of Minneapolis History Based on Tunnel Deposits

Today, St. Anthony is an historical neighborhood within Minneapolis, but it was not always so. The town of St. Anthony was founded on the east bank of the Mississippi River in 1849, whereas the city Minneapolis was not established until 1855, because the west bank was still part of the Ft. Snelling Military Reservation.

In their early decades of co-existence, the two towns on opposing banks of the river were often rivals, with St. Anthony playing the senior role. The latter's fortunes became tied to the St. Anthony Falls Water Power Company, founded in 1856. A series of management blunders ensued, including the Chute's Cave affair in 1866. The company proposed to drive a new tailrace tunnel (called Chute's Tunnel) through the sandstone under the east bank, serving as a common exit for the water of all the mills on that side of the river. This followed the Minneapolis Mill Company's successful First Street Canal, begun in 1857.

According to Lucile Kane's classic 1966 account, The Falls of St. Anthony, "After workmen had dug several hundred feet into the shore, they encountered a great cave [called Chute's Cave]. Probably deterred by the costs of additional exploration and new engineering plans, the company then postponed construction." As is known today, from actual exploration, the cave is filled to the ceiling with a collapse deposit of limestone slabs, presenting an insurmountable obstacle for the tunnelers. "By dissipating its resources," Kane concluded, "the St. Anthony firm dragged the east-side city down with it." Chute's Tunnel led to the assimilation of St. Anthony into its by now larger rival across the river, in 1872. Minneapolis went on to become the "Flour Capital of the World," a distinction it held for half a century, from 1880 to 1930.

Greg Brick

The Opposite Sewer Systems of the Twin Cities

The St. Peter Sandstone is an important bedrock layer under the Minneapolis-St. Paul metropolitan area, and the Midwest generally. In the Minnesota part of its range, it lacks natural cementation and is easily excavated. Indeed, the St. Peter is so friable that it led to more tunneling than was really necessary. How different this is from the schist under Manhattan, or the limestone under St. Louis, where blasting through hard rocks is required to make tunnels.

Historically, one of the oddest things is how the St. Paul sewer system differs from that of neighboring Minneapolis, despite the same starting conditions—the same underlying geology. The two systems are complete opposites. When Joseph Sewall originally envisioned St. Paul's sewerage, every street had a corresponding full-sized walking passage in the St Peter Sandstone, below the Platteville limestone. Andrew Rinker, by contrast, designed Minneapolis sewerage such that only the big trunk passage was in sandstone, while individual building connections were kept above the limestone, just below street level. This is the trellis versus trunkline conundrum. Each system has its own advantages.

Greg Brick, Ph.D. was employed as a hydrogeologist at several environmental consulting firms and has taught geology at local colleges and universities. He mapped thousands of springs around the state for the Minnesota Spring Inventory at the Department of Natural Resources. His books include Iowa Underground, Minnesota Underground, Minnesota Caves, Subterranean Twin Cities, and Caves and Karst of the Upper Midwest USA, co-edited with Calvin Alexander.

POSTER SESSION

5:00 – 6:00 PM

Corey Lentz

Hatching a Plan: A Better Approach to Documenting and Evaluating Historic Fish Hatcheries in Washington

Historic fish hatcheries are physical representations of a governmental approach to addressing the depletion of Washington State fisheries from 150 years of overfishing, anthropogenic manipulation of rivers for industrial and agricultural purposes, pollution, and changing climate conditions. Examples of this property type, many of which are becoming 50 years old and potentially eligible for listing in the National Register of Historic Places, are increasingly challenged by projects sponsored by governmental and Tribal managers that seek their alteration, decommissioning, or demolition as fish conservation practices shift away from hatchery operation.

Within this context, current historic property documentation practices for hatcheries are inconsistent; fail to address these properties as multi-component sites; and are often limited to addressing significance in terms of association with federal or state agency hatchery development within a particular period. In response, this project seeks to create a statewide historic context and evaluative framework to improve documentation and evaluation of historic hatcheries.

This poster presentation will: share the findings of our inventory of hatcheries in Washington State, which was created through a synthesis of existing data; discuss how this data was used to understand the history of hatchery development in Washington, categorize typical hatchery design elements and components, and establish a baseline for current documentation practices; demonstrate use of the cultural landscape approach to ensure consideration of a more comprehensive range of built and natural characteristics that comprise this large, complex, multi-component property type; and share how our historic context addresses wider variety of themes and significances such associations with hatchery development trends, ethnographic or historic fish culture practices and processes at these sites, species conservation, or the potential relationship between tribal hatchery development and the tribal sovereignty movement of the 20th century.

Corey Lentz is a Cultural Resource Specialist at Parametrix in Seattle, Washington with nearly six years of experience in historic preservation compliance. At Parametrix, Corey strives to meet best practice standards for compliance within federal, state, and local historic preservation regulatory frameworks. Corey develops historic property documentation, environmental review and programmatic agreement documents, and preservation planning tools for the purpose of enhancing efficient and effective stewardship and regulatory compliance for his clients. Corey is especially interested in projects involving complex, multi-component historic built environment resources that have had lasting effects on patterns of settlement, community development, and the environment in the Pacific Northwest, such as hydroelectric facilities, irrigation systems, mill towns, and maritime sites.

Andrew S. Higgs

Industrial Artifact Analysis: An Ore Car constructed from a Whitaker-Glessner Co. (1918) Steel Drum

Industrial archeology involves the study of historic industrial activity and artifacts through analyses of both material and documentary evidence. This poster entails an analysis of a makeshift 12 cubic-feet capacity ore car created from a 1918 steel drum that is associated with a 1920s lode mine in remote Alaska. This crossover study combines my interest in the history of the US steel drum industry, and how miners repurpose drums for their practical needs. Evidence from the artifact revealed clues to both the industrial components and fabrication of a Whitaker Glessner Co. (Portsmouth, Ohio) 110-gallon drum, as well as a reconstruction of the skillful steps an innovative miner used to repurpose the drum into an ore car with limited resources.

Andrew Higgs of Anchorage, Alaska, has over 30 years of cultural resource specialist and management experience, including conducting research and consulting through his own company for the last 6 years. Higgs has performed archaeological and historical research in Virgina and Illinois with most of his professional career conducted in Alaska. Many of his projects have involved documenting Alaska's historic gold mining sites, machinery, structures, artifacts, and industrial landscapes. He has a special interest in understanding the historical processes and variables linked with the creation and abandonment of remote northern resource extraction-related sites and communities; in particular, their use and dependence on local, regional, national, and global commodities.

Linda Hickey and Teresita McCarthy

Stories of Toilers Under the Sea - Submarine Miners of Bell Island

The Bell Island iron ore mine, once one of the world's largest submarine iron ore mines, began operations in 1895 and became the largest producer of iron ore in the British Commonwealth, until it ceased operations1966. A total of seventy-nine million tons of iron ore was shipped during it's seventy-one years of operations. Today, the iron ore mine operates as a sustainable Tourism Anchor Attraction focusing on preserving, protecting, promoting, and presenting to visitors from around the world, access to the underground mine, the life of a Bell Island miner and documenting the history of the town. The visitor experience team of tour guides take tourists six hundred feet down a slope. An underground mining museum as a tourism destination product was a foreign concept when the idea was first conceived. The work to establish approvals, ensure safe operations to the cross cuts and carts that once held the iron ore, provided many challenges. Today, the Provincial Cultural Tourism Award winning #2 Mine Tour and Museum continues to experience exponential visitorship and provides economic growth to the tiny island community during seasonal operations. The museum is alive with tangible and intangible cultural initiatives, commemorative events, live music performances, and exhibits linking our rich mining history. Plans are in the works for a site expansion that includes a theatre and additional exhibit space. We have provincial and federal representatives who champion our cause. Our goal is to preserve the history of the mining era and ensure the work of our forefathers is recognized and shared in the best possible way to future generations. We are the gatekeepers of this incredible story, and we delight in sharing it with the world!

Linda Hickey is an advocate for cultural preservation and heritage promotion in Newfoundland and Labrador, Canada. As President of the Bell Island Heritage Society, Linda has played a pivotal role in preserving and celebrating the rich history of Bell Island and as President of the Museum Association NL she works tirelessly to strengthen the museum community in the province of Newfoundland and Labrador.

Linda is a composer, and her song "The Whistle Don't Blow" stands as a poignant tribute to the miners who played a crucial role in shaping the region's history.

She was awarded the Queen's Diamond Jubilee Medal, a testament to her dedication to preserving and promoting Canadian heritage. In 2022, she was honored as the recipient of the Atlantic Business Magazine's 60+ Achievement Award, recognizing her exceptional achievements and contributions to the cultural and tourism sectors.

Teresita McCarthy is a retired educator. She is a founding member of the Bell Island Heritage Society Inc. where from 1994-2012 she served in various executive positions including President. She volunteers with the Museum Association of NL from 2008-current, including President (2010-2014 & 2018-2022). Awarded the Queen's Diamond Jubilee Medal for her contribution to culture and heritage in her community and province (2012). Received the Distinguished Service Award from the Canadian Museums Association for her culture and heritage advocacy in Canada (2021). She is Executive Director of the Bell Island Community Museum & #2 Mine Tour.

Timothy Arron Kotlensky

Get in Kids, We're Going Furnace Hunting, Again: A New Look at The Western Pennsylvania Historic Blast Furnace Survey of Myron Sharp and William Thomas

In the early 1960s, a Pittsburgh-area duo made up of chemist Myron B. Sharp and engineer William H. Thomas embarked on an ambitious plan to relocate and document the existing conditions of historic blast furnace sites through-

out Western Pennsylvania. In 1965, they published their results over four articles that appeared serially under “A Guide to the Old Stone Blast Furnaces in Western Pennsylvania” in The Western Pennsylvania Historical Magazine. Appearing as a single volume the following year, Sharp and Thomas’s remarkable work reads as a kind of driving tour for local history enthusiasts and researchers alike yet includes pithy research summaries of 184 blast furnace sites altogether. Nearing sixty years since first appearing in print, this rich catalog of industrial heritage remains important in ways that merit closer attention. This presentation will illustrate uses of Sharp and Thomas’s survey in identifying furnace sites in cultural resources management investigations, tying the histories of furnace sites together in the context of local and regional industrial heritage, and as a jumping off point for new avenues of research and public interpretation of iron and steel industries in Western Pennsylvania. Sharp and Thomas’s work as avocational industrial archaeologists will also be considered within the context and take-off of IA as both a professional and avocational pursuit in the 1960s and 1970s, a tradition that continues to this day in the SIA.

After completing an MS in Industrial Archaeology at Michigan Tech in 2006, Arron Kotlensky worked in cultural resources consulting before joining PennDOT in 2021. Since that time, he has served as the Cultural Resource Professional archaeologist for PennDOT Districts 11-0 and 1-0 in Western Pennsylvania. Apart from his professional service, Arron has been an active member of the SIA since 2004, receiving the Robert M. Vogel Prize in 2014, organizing the annual conference in Houston, Texas in 2017, and the Fall Tour in 2022 in Northwestern Pennsylvania. He lives in the Brighton Heights neighborhood of Pittsburgh and his term as President of the SIA ends in May 2024.

Marty Johnston, Nathan Gaus, and William Tuma

Testing the Patent Claims of Charles Hunt’s 1890 Industrial Railway Equipment

In the 1890’s moving bulk material within a factory setting often involved small industrial tramways. Typically, the tramway equipment was patterned after traditional railway designs but on a much smaller scale. The C. W. Hunt Company offered unique industrial railroad cars with outside flanged wheels and swiveling axles, curious-looking battery locomotives, self-balancing cranes, and strange looking trackwork. Working from patents, historical documents, photographs, and catalog descriptions we have reconstructed models of C W Hunt’s novel industrial railway equipment in 1:8 scale. The models were used to verify Hunt’s claims of reduced rolling friction due to use of radial trucks and outside flanged wheels. Models of Hunt’s self-balancing crane verified its ability to lift heavy loads on 21-inch gauge track without the use of outriggers. Models were designed in SolidWorks and fabricated from machined and 3d printed components. Our poster describes Hunt’s creative designs and shows how we replicated his equipment. Models will be displayed.

Marty Johnston is a Professor of Physics at the University of St. Thomas in Saint Paul MN. His current work focuses on experimental investigations of deterministic chaos, but Marty also enjoys studying the history of technology through the eyes of a physicist. Alongside experimental physics, Marty and his students build working models of past technology to understand and illustrate how it functioned. His history of the Iron Mountain Mine in Pardee Montana was published in JSIA, Vol 38, No 2.

Nathan Gaus is a sophomore studying Mechanical Engineering at the University of St. Thomas as he refines his SolidWorks and machining skills fabricating models.

William Tuma is graduating in May with a BS in Mechanical Engineering from the University of St. Thomas. After graduation, Will is pursuing a Ph.D. in bioengineering at the University of Colorado in Boulder.