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# Technological History as Green Space

## Joliet Iron Works

The development of the steel industry after the Civil War helped launch the most active period of economic growth in American history. Improvements in blast furnace design, which greatly increased steel productivity, made this growth possible. In order to understand this heritage, it is important to preserve the rapidly disappearing physical remains of the steel era. Nevertheless, preserving fully-intact blast furnaces will be expensive and complex. The only successful example to date is the Sloss Blast Furnace National Historic Landmark in Birmingham, Alabama, which was saved from demolition in the late 1970s.

Preserving the ruins of important blast furnaces is a much more achievable goal. These sites have often survived as overgrown, forgotten nooks along the fringes of urban areas. They could easily be bulldozed, but they could also be saved as green space with trails allowing visitors to rediscover the site. As visitors wander the trails encountering each new set of foundations that mark the former base of a blast furnace, they are reminded of a rapidly disappearing industrial heritage.

One such model, now under development, is the blast furnace ruins of the Joliet Iron and Steel Company at Joliet, Illinois. The remains are in a wooded tract along the banks of the Illinois and Michigan Canal, which was designated as a National Heritage Corridor in 1984. The NPS, in cooperation with local preservation groups, has identified and is now preserving and interpreting several sites along the canal from Chicago to Des Plaines.

The Forest Preserve District of Will County, a state agency that manages several historic and natural sites in the county, is developing the Joliet blast furnace ruins into a bike and interpretive trail integrated into the Corridor. The district faces the challenge of preserving the natural harmony of this green space while simultaneously revealing the history of technology told by the industrial ruins: the foundations of two sets of blast furnaces representing two successive design generations.

Unfortunately, foundation remains do not convey iron production as readily as an intact blast furnace. The tools of the industrial archeologist, including surveying software and instrumentation, computer-aided design, and exhaustive historical research can provide help in developing an interpretive plan to overcome this problem.

Carefully crafted interpretive ideas will convey the sense that these quiet ruins were once a loud, hot, dangerous workplace and that the site is historically significant. The first Number One and Two furnaces were part of an early Bessemer Convertor steel mill built by Alexander Holley in 1873. Joliet was the ninth of a series of prototypical mills designed by Holley that helped launch the American iron and steel revolution. The blast furnace remains reveal much about the progress of blast furnace design in the late-19th century. One outstanding feature of this crucial sequence of improvements was the dramatic increase in the furnace size. The contrast in the scale between the Number One and Two furnaces, originally built in 1873, and the Number Three and Four furnaces, built after 1900, is striking.

To understand the site, visitors must discover what a blast furnace is, and they must visualize such a structure standing where only ruins remain. For interpretive planners, knowledge of the available information is helpful. Because new technology was continually perfected, blast furnaces did not remain static. To remain competitive, iron makers had to upgrade their facilities regularly. The company chronicled these improvements in engineering drawings, ground plans, and other documents generated as part of a renovation project. Professional trade journals also featured articles and photographs heralding the installation of new machinery and equipment.

The information necessary to interpret the ruins of a blast furnace plant is abundant, but it must be organized. At the Heritage Park in Joliet, Illinois, this organization process began with the production of a base map of the site. Developed in civil engineering software using measurements taken with a surveying instrument, this map shows the string of foundation remnants that stretch for nearly a quarter mile along the Illinois and Michigan Canal.

An accurate base map based upon readings gathered during the field work phase is essential to the industrial archeologist. Precise drawings of surviving foundations can often provide information not otherwise available. No matter how exhaustive company records and maps might be, they never tell the complete story. At Joliet, for instance, a substantial structure at the north end of the site was labeled only as the “Gas Engine House.” The field measurements of the massive

foundations inside the ruined walls of the building showed that three large Allis Chalmers internal combustion engines once chugged away 24 hours a day driving generators that made electricity for the rest of the furnace plant.

The base map was incorporated into a CAD program. Several historical maps of the site, including Sanborn Insurance maps and ground plans drawn by the plant engineers, were scanned and imported into the program. Drawings of equipment used at the site discovered during the research process were also scanned into the file.

With this data, it is feasible to call up on the computer screen a variety of map overlays depicting key aspects of the site. Zooming out and showing the overall site with a historical map overlaid upon the existing ruins is also possible. This depiction helps identify features that otherwise appear as meaningless piles of rubble. It also provides a map for laying out a hiking trail through the site.

Once the location for a wayside has been selected, zooming in on that particular area and viewing the map overlays and machine views atop the existing foundation ruins are possible. The design team can then edit the various layers, paring away extraneous lines and other information to create an image highlighting the location of machines. With a judicious selection of waysides on the hiking trail, the interpretive staff can trace the evolution of the modern blast furnace.

The work of the Will County Forest Preserve District and the Canal Corridor Association in interpreting the Joliet blast furnace ruins is important. The remains of America's steel industry continue to rapidly disappear. The chances of preserving more than a few examples are slim because of the enormous long-term cost involved. Still, preserving ruins found within green space sites is a cost-efficient alternative.

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## IEEE Center for the History of Electrical Engineering Milestone Program

The IEEE Electrical Engineering Milestones Program honors significant achievements in electrical, electronic, and computer engineering. The Program is conducted by the IEEE History Committee through the IEEE History Center at Rutgers University. The Institute of Electrical and Electronics Engineers (IEEE) is an international organization with more than 300,000 members and the world's largest technical professional society. After approval by the IEEE, a bronze plaque describing and commemorating the achievement is placed at an appropriate site. Honoring these achievements fosters an awareness among electrical engineers of their professional history, increases public understanding of electrical engineering, and encourages the preservation of historically important materials and sites. The program also collects and distributes documentation of significant historical events.

As a grass-roots historical activity, the Milestones Program functions through the local IEEE Section, which nominates an achievement and provides documentation of its historical significance. After the nomination is approved by the IEEE History Committee and the IEEE Executive Committee, a plaque is cast and the Section conducts a dedication ceremony. This process increases awareness, both by the Section members and the public at large, of local heritage. Also, the documentation of the achievement helps to separate fact from local myth, and the Milestone process opens up channels of communication between the Section and other civic organizations, typically a local historical society. In the future, it is hoped that some Milestone nominations will include an industrial archeology component, thus further enhancing the Program's role in historical preservation and its contacts with other organizations concerned with researching and disseminating the history of technology.

Since its inception in 1983, the Milestones Program has honored 27 achievements. Among these are the Adams Hydroelectric Generating Plant at Niagara Falls which, when put into service in 1895, demonstrated the practicality of alternating-current power systems; Westinghouse Radio Station KDKA, which pioneered radio broadcasting in 1920; the MIT Radiation Laboratory, where radar was developed during World War II; the Atanasoff-Berry Computer, an experimental electronic computer built during World War II; and the ENIAC, a large electronic digital computer completed in 1946.

The Milestone Program, like the IEEE itself, is international; and quite a few Milestones have been dedicated outside the United States. These include the landing of the transatlantic cable at Heart's Content, Newfoundland; the Poulsen-arc radio transmitter invented by the Danish engineer Valdemar Poulsen in 1902; and the directive short-wave antenna (also known as the Yagi-Uda antenna), invented in Miyagi, Japan. On a number of occasions, the IEEE has collaborated with other engineering societies in promoting recognition and preservation of historic sites. For example, the Vulcan Street Plant, an 1882 hydroelectric station in Appleton, Wisconsin, was simultaneously named an IEEE Milestone, a National Historic Civil Engineering Landmark of the American Society of Civil Engineers, and a National Historic Engineering Landmark of the American Society of Mechanical Engineers.