The Carrie Furnaces Industrial Tour
Rankin, PA

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The Carrie Blast Furnaces in 2006.

PITTSBURGH GEOLOGICAL SOCIETY
FIELD TRIP

June 24, 2023

Guidebook
PGS Summer Field Trip
June 24, 2023

The Carrie Furnaces Industrial Tour
Rankin, PA

Trip Organizer

Mary Ann Gross

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THE CARRIE FURNACES INDUSTRIAL TOUR

INTRODUCTION

The 2023 PGS summer field trip gives you the opportunity to learn about the steel industry that had an enormous impact on Pittsburgh beginning in the mid-1800's. Although the steel mills that operated along the Monongahela Valley are mostly shuttered, we will learn how the Rivers of Steel National Heritage Area is preserving their legacy and the legacy of the steel industry throughout the surrounding area. This trip will show a taste of history through the Rivers of Steel tour of the Carrie Furnace, which has been designated a National Historic Landmark.

In addition to the efforts of the Rivers of Steel, there are countless books and internet sites that provide information on all aspects of the industry: the men involved in establishing the steel complex like Andrew Carnegie and Henry Clay Frick, as well as the skilled and unskilled workers who toiled in the mills, many of whom gave their lives; the conflicts waged to provide better wages and working conditions; and the final causes of the collapse of the industry.

RIVERS OF STEEL

(From: https://riversofsteel.com/experiences/tours/industrial-tour/)

Connect with Pittsburgh's steel industry heritage on this guided tour of the Carrie Blast Furnaces National Historic Landmark. Tours highlight the site's iron-making technology, its workers, and their culture.

Declared a National Historic Landmark in 2006, Carrie, as it's affectionately known, entices visitors to marvel at the scale and legacy of its industrial might. A remnant of the legendary U.S. Steel Homestead Steel Works, the Carrie Blast Furnaces are a vestige of Pittsburgh's 20th-century domination of the steel industry.

During this two-hour guided tour, you'll hear stories about the site's technology (including why it is nationally significant) as well as get to know the culture of its workers. You'll also learn a bit about the iron-making process, from the movement of the raw materials to the tapping of the furnaces that produced fiery molten iron.

Our Story

(From: https://riversofsteel.com/about/our-story/)

A Vision for the Future, Built on the Past

Rivers of Steel's journey began in the aftermath of the collapsed steel industry. In 1988, a group of citizens got together, united by their concerns that with destruction of the shuttered mills an important part of our region's culture was in danger of being erased, too.

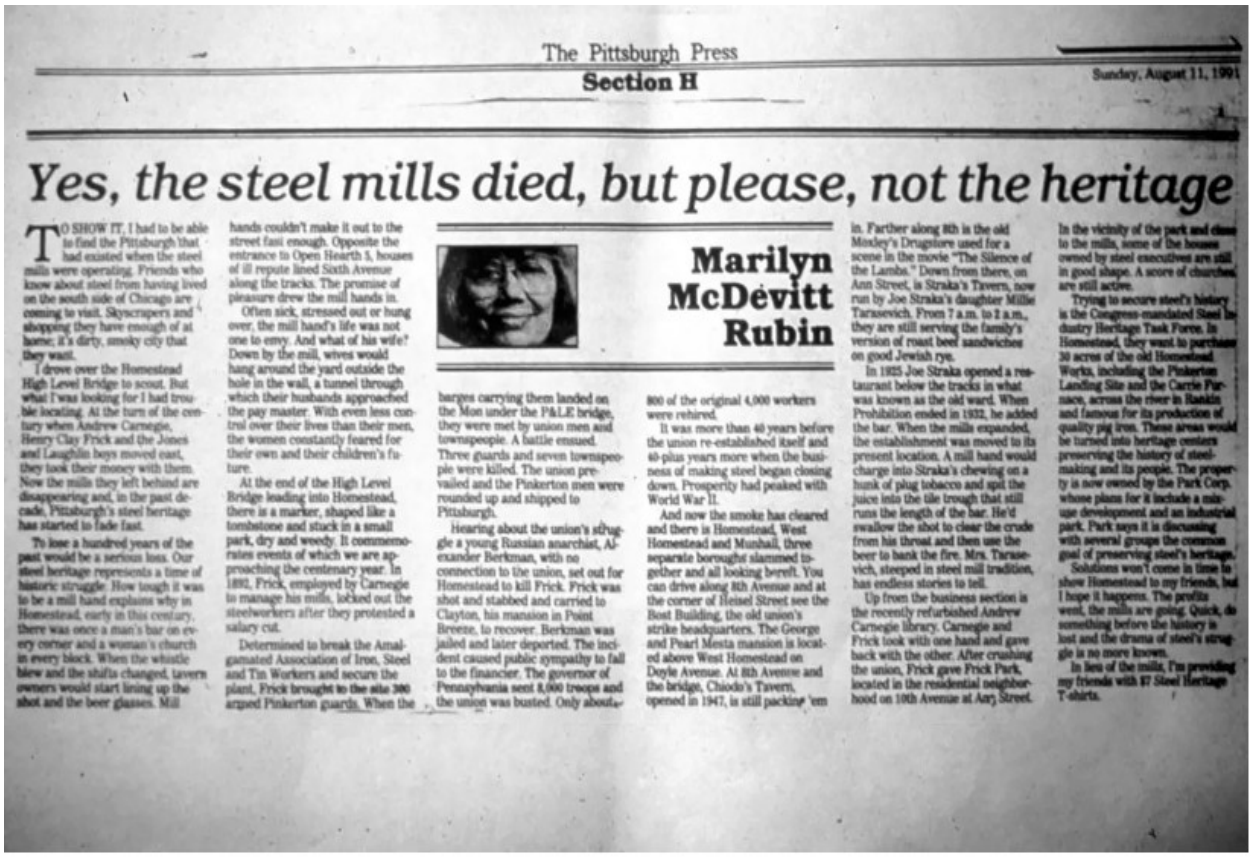
The prevailing sentiment at the time was not one of reverence for the industry; rather, it was a stew of mixed emotions – anger for the way things went down, loss of identity in the face of joblessness, and fear of an uncertain future. The emotional landscape was too raw for most folks to want to celebrate what the steel industry once was, especially when it was painfully obvious that this 'industrial downturn' reflected permanent change.

Long story short: those citizens organized as a task force. Four years later, the nonprofit organization that was to become Rivers of Steel was established to carry the torch of "Big Steel" and its related industries – not simply telling the companies' stories and the products they made, but the stories of the men and women who worked there.

It is a legacy was too important not to save. Relics and remnants were captured, so were oral histories. The scope of which grew beyond the workers themselves, encompassing the neighborhoods they represented – their languages, their churches, their traditions and recipes – and sowed the seeds of what was to become Rivers of Steel's archival, cultural conservation and exhibition programs.

A National Heritage Area is Formed

These services provided helped local communities to transition into a new era. But to revitalize the communities more work still needed to be done. A vision for the future was necessary, as were economic resources.



The Pittsburgh Press
Section H
Sunday, August 11, 1991

Yes, the steel mills died, but please, not the heritage

Marilyn McDevitt Rubin

TO SHOW IT, I had to be able to find the Pittsburgh that had existed when the steel mills were operating. Friends who know about steel from having lived on the south side of Chicago are coming to visit. Skyscrapers and shopping they have enough of at home; it's dirty, smoky city that they want.

I drove over the Homestead High Level Bridge to scout. But what I was looking for I had trouble locating. At the turn of the century when Andrew Carnegie, Henry Clay Frick and the Jones and Laughlin boys moved east, they took their money with them. Now the mills they left behind are disappearing and, in the past decade, Pittsburgh's steel heritage has started to fade fast.

To lose a hundred years of the past would be a serious loss. Our steel heritage represents a time of historic struggle. How tough it was to be a mill hand explains why in Homestead, early in this century, there was once a man's bar on every corner and a woman's church in every block. When the whistle blew and the shifts changed, tavern owners would start lining up the shot and the beer glasses. Mill hands couldn't make it out to the street fast enough. Opposite the entrance to Open Hearth 5, houses of ill repute lined Sixth Avenue along the tracks. The promise of pleasure drew the mill hands in.

Often sick, stressed out or hung over, the mill hand's life was not one to envy. And what of his wife? Down by the mill, wives would hang around the yard outside the hole in the wall, a tunnel through which their husbands approached the pay master. With even less control over their lives than their men, the women constantly feared for their own and their children's future.

At the end of the High Level Bridge leading into Homestead, there is a marker, shaped like a tombstone and stuck in a small park, dry and weedy. It commemorates events of which we are approaching the centenary year. In 1892, Frick, employed by Carnegie to manage his mills, locked out the steelworkers after they protested a salary cut.

Determined to break the Amalgamated Association of Iron, Steel and Tin Workers and secure the plant, Frick brought to the site 300 armed Pinkerton guards. When the barges carrying them landed on the Mon under the P&LE bridge, they were met by union men and townspeople. A battle ensued. Three guards and seven townspeople were killed. The union prevailed and the Pinkerton men were rounded up and shipped to Pittsburgh.

Hearing about the union's struggle a young Russian anarchist, Alexander Berkman, with no connection to the union, set out for Homestead to kill Frick. Frick was shot and stabbed and carried to Clayton, his mansion in Point Breeze, to recover. Berkman was jailed and later deported. The incident caused public sympathy to fall to the financier. The governor of Pennsylvania sent 8,000 troops and the union was busted. Only about 800 of the original 4,000 workers were rehired.

It was more than 40 years before the union re-established itself and 40-plus years more when the business of making steel began closing down. Prosperity had peaked with World War II.

And now the smoke has cleared and there is Homestead, West Homestead and Munhall, three separate boroughs slammed together and all looking bereft. You can drive along 8th Avenue and at the corner of Heisel Street see the Bost Building, the old union's strike headquarters. The George and Pearl Mesta mansion is located above West Homestead on Doyle Avenue. At 8th Avenue and the bridge, Chiodo's Tavern, opened in 1947, is still packing 'em in. Farther along 8th is the old Mickey's Drugstore used for a scene in the movie "The Silence of the Lambs." Down from there, on Ann Street, is Straka's Tavern, now run by Joe Straka's daughter Millie Tarasevich. From 7 a.m. to 2 a.m., they are still serving the family's version of roast beef sandwiches on good Jewish rye.

In 1925 Joe Straka opened a restaurant below the tracks in what was known as the old ward. When Prohibition ended in 1933, he added the bar. When the mills expanded, the establishment was moved to its present location. A mill hand would charge into Straka's chewing on a hunk of plug tobacco and spit the juice into the tile trough that still runs the length of the bar. He'd swallow the shot to clear the crude from his throat and then use the beer to bank the fire. Mrs. Tarasevich, steeped in steel mill tradition, has endless stories to tell.

Up from the business section is the recently refurbished Andrew Carnegie library. Carnegie and Frick took with one hand and gave back with the other. After crushing the union, Frick gave Frick Park, located in the residential neighborhood on 10th Avenue at Auy Street.

In the vicinity of the park and close to the mills, some of the houses owned by steel executives are still in good shape. A score of churches are still active.

Trying to secure steel's history is the Congress-mandated Steel Industry Heritage Task Force. In Homestead, they want to purchase 30 acres of the old Homestead Works, including the Pinkerton Landing Site and the Carrie Furnace, across the river in Rankin and famous for its production of quality pig iron. These areas would be turned into heritage centers preserving the history of steelmaking and its people. The property is now owned by the Park Corp. whose plans for it include a mixed-use development and an industrial park. Park says it is discussing with several groups the common goal of preserving steel's heritage.

Solutions won't come in time to show Homestead to my friends, but I hope it happens. The profits went, the mills are going. Quick, do something before the history is lost and the drama of steel's struggle is no more known.

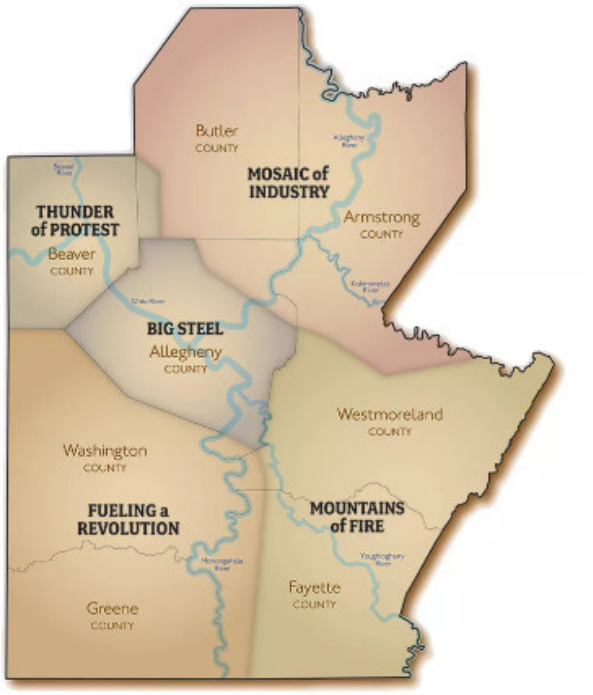
In lieu of the mills, I'm providing my friends with 37 Steel Heritage T-shirts.

Article from The Pittsburgh Press, August 11, 1991

So the Steel Industry Heritage Corporation—the original name of Rivers of Steel—petitioned state and federal officers to create a Heritage Area, a region recognized for the national importance of its historic landscape. The case was supported by a vision to "weave together the cultural and historical resources in a way that makes our heritage visible, exciting and accessible. Its timely implementation will have a major impact on the regional economy by promoting tourism and economic development." In 1996, the Rivers of Steel National Heritage Area was created by an act of Congress and the Commonwealth of Pennsylvania. With that action, a new era began.

Growth Through Heritage Tourism

In the intervening years, that vision came to pass . . . a number of industrial sites were saved, and became the heritage attractions that Rivers of Steel manages today. Three would later be designated National Historic Landmarks, including The Bost Building in Homestead, the W.A. Young & Sons Foundry and Machine Shop in Rices Landing, and Carrie Blast Furnaces #6 & #7 in Swissvale and Rankin.



Rivers of Steel also stewards the historic Pump House and Water Tower – site of the 1892 Battle of Homestead, located in Munhall.

Community Revitalization Projects

Through its grant program, Rivers of Steel has funded many projects in partnership with local communities. Brownfields have been redeveloped, main streets revitalized, river landings made accessible, recreational trails created, and much more. This work continues today. Each year Rivers of Steel grants funds to regional nonprofits for projects that sustain a sense of place through the preservation and interpretation of the heritage, cultural and recreational assets of the region.

As an organization, Rivers of Steel is resilient, reflecting the hard-working character of the people of southwestern Pennsylvania. Each project, each attempt to stop demolition of a historic place, or petition for National Historic Landmark status, is another achievement for the benefit of the region at large.

Thirty years on, the prospects for Pittsburgh and southwestern Pennsylvania have improved, some areas more so than others. So while we have had many great successes, the work is not yet done.

Heritage Through the Lens of Art . . . And Science!

As Rivers of Steel evolves, so does its methods. Interpretation through the arts has become an essential way to engage visitors, at our attractions & in communities throughout the region. Narratives have expanded. The industrial story is included, but so is a post-industrial one. Through initiatives like the Mon Valley Creative Corridor, Rivers of Steel is fostering the creative economy by partnering with creative professionals, enterprises, communities to establish the region as a thriving destination.

In an era when science & technology are, once again, driving forces in the region, Rivers of Steel has expanded its educational programs, helping students to discover how southwestern Pennsylvania's natural resources have shaped our industrial past and cultural heritage—and how our environment today impacts our region's future. In 2016, Rivers of Steel acquired RiverQuest, a nonprofit that focused on environmental science education, along with the Explorer riverboat, the vessel which hosted the organization's programming. Today, Rivers of Steel continues to offer the award-winning student programs which RiverQuest had been known for, and has pursued more opportunities on the boat, offering heritage-based sightseeing tours and arts-based programs and workshops.

Experiences and Impact

Rivers of Steel was founded on the principles of heritage development, community partnership, and a reverence for the region's natural and shared resources. It continues to strengthen the economic and cultural fabric of western Pennsylvania by fostering dynamic initiatives and transformative experiences, whether it is through its attractions and programs or its work behind-the-scenes as a pivotal partner in economic redevelopment.

Today there are many ways to experience Rivers of Steel. What's common among them is the passion with which each program and project is realized – and the assurance that each engagement will broaden your perspective.

The Historic Preservation of the Carrie Blast Furnaces

(From: https://riversofsteel.com/the-historic-preservation-of-the-carrie-blast-furnaces/)

January 13, 2023

The Carrie Blast Furnaces in 2006.

This past fall, when the tour season ended at Carrie, construction season began. Working along with Century Steel Erectors, Rivers of Steel has initiated the first of several significant projects that will facilitate the stabilization of the Carrie Blast Furnaces and allow for expanded access to previously restricted parts of the site for visitors.

These latest projects are part of the historic preservation work on this National Historic Landmark that began when Rivers of Steel first started to manage the site in 2010. In these first dozen years, the reach and impact of Rivers of Steel's work at the site has been exponential. Tens of thousands of visitors experience the Carrie Blast Furnaces each year. Now, as the Regional Industrial Development Corporation (RIDC)-led development of the adjacent Carrie Furnace site has begun, including the building of two tech-flex structures, we anticipate this trajectory to continue. With more exposure and visitation projected, the historic preservation and stabilization of the Carrie Blast Furnaces National Historic Landmark is crucial now more than ever.

Dispelling the Myths

A view of the Ore Yard in 2011; one year after Rivers of Steel began its stewardship of the site, a path has been cleared for tour groups.

Beyond being an industrial and cultural icon in our own region, the Carrie Blast Furnaces are a standout in international industrial heritage preservation. Following benchmarking trips as part of a comprehensive master planning project Rivers of Steel undertook over the last year, we discovered that the Carrie Furnaces have one of the best-preserved cast houses in the world. Additionally, Rivers of Steel's arts programs—including metal arts and graffiti arts—are lauded by our global counterparts as an innovative way to introduce audiences to our site and the importance of industrial heritage preservation. Most people who stumble on Carrie—through channels outside of our word-of-mouth or marketing presences—are introduced to it as an "abandoned" place; it became internet famous (with the help of cable television shows) for its rust and overgrowth, as well as for the Carrie Deer guerilla art sculpture.

To be fair, the site sat empty and unsupervised for quite some time. Furnaces #6 and #7 (which remain today) went offline in 1978. The rest of the plant closed in 1984. It sat, as is, until 1988, when the Park Corporation took ownership and focused on scrapping most of the buildings—including two of the remaining four furnaces—while Rivers of Steel fought to save what it could from demolition. Then, the Redevelopment Authority of Allegheny County took over ownership in 2005. The following year, Rivers of Steel secured National Historic Landmark status for the Carrie Blast Furnaces #6 and #7 and became stewards of the site in 2010. Thus, there were over twenty-five years when Carrie was not in daily use. However, locals know that it was never truly "abandoned." It was frequented by artists, graffiti-writers, and everyday folks—people who were looking to connect with part of our region's heritage by entering a place that was off limits to the public during its heyday.

From the last years of the plant's operation until Rivers of Steel took stewardship of the historic site in 2010, the structures of the National Historic Landmark did not undergo any care or maintenance. This essentially means that Rivers of Steel has been playing historic preservation and stabilization "catch-up" for those decades of neglect.

A view of the Central Courtyard as it appeared in 2006. Image by Randy Harris.

What It Means To Be a National Historic Landmark

National Historic Landmarks represent an outstanding aspect of American history and culture; they are places that illustrate the nationally significant history of the United States.

The Carrie Blast Furnaces contribute to the understanding of how the Pittsburgh region was responsible for creating the steel that transformed the world's infrastructure during the 20th century, a time when it also earned the title of "arsenal of democracy" for its military supply contributions for our national defense. On a more human scale, this vestige of the past helps Rivers of Steel to share the stories of our region's workers and their families, their accomplishments and sacrifices—actions that help define the character of our communities even today. Yet when you consider Carrie's landmark status from a maintenance point of view, it represents both challenges and opportunities that are as unique as the stories it represents.

Sun streams through the roof of the AC Power House in 2008, reflecting the state of neglect prior to Rivers of Steel's stewardship. Photo by Ron Baraff.

Historic Preservation Work on an Industrial Scale

Upon being granted stewardship of the Carrie Furnaces, Rivers of Steel immediately began addressing the preservation of the site, guided by the Secretary of the Interior's Standards for the Treatment of Historic Properties. Rivers of Steel's staff and a handful of volunteers worked tirelessly to pull back overgrowth, especially from the structures where it could continue to degrade the architectural integrity. In 2011, staff raised the funds for the first major stabilization project, installing a new roof on the AC Power House, along with other smaller initiatives. This triage work, occurring roughly from 2010 to 2015, helped to slow the rate of degradation and open up spaces to make them safe for visitors . . . but there was more work to be done.

"2010 marked the beginning of our hands-on work at the site to reclaim it as a historic landmark," said Ron Baraff, Rivers of Steel's director of historic resources and facilities. "Not only did we have to learn how to creatively manage the

landscape and formulate best practices in preservation on the fly, but we also had to change the culture of the site that had developed over the previous twenty-plus years. No longer was it an “abandoned” or dormant site, it was a National Historic Landmark that needed to be protected and nurtured.”

“While we fully understood the attraction that the site had become,” Baraff continued, “it was incumbent upon us to ensure its long-term safety. To do so, we had to tackle not just the encroachment by nature, but also by scrappers, urban explorers, and the curious. To this end, we worked diligently to secure the site and initiate stabilization efforts.”

Safety has always been the first priority. Rivers of Steel performs regular structural surveys to determine a priority listing of issues to be addressed. In 2017, on the second major stabilization project, with funding from the Pennsylvania Historical and Museum Commission (PHMC) Keystone Preservation grant fund, Rivers of Steel worked with Songer Services to remove 75 feet of distressed steel and brick from the Hot Stove’s Draft Stack and place a cap on it. This project ensured that Rivers of Steel could continue to safely bring visitors onsite.

The Glory Daze motorcycle show is just one of the events that was hosted in the AC Power House last year. Photo by Adam Piscitelli / Primetime Shots, Inc.

Over the last five years, much needed work has been done by a few full-time staff members of Rivers of Steel. Life safety, security, electricity, and lighting systems were installed, including in the AC Power House, where most events and programs take place.

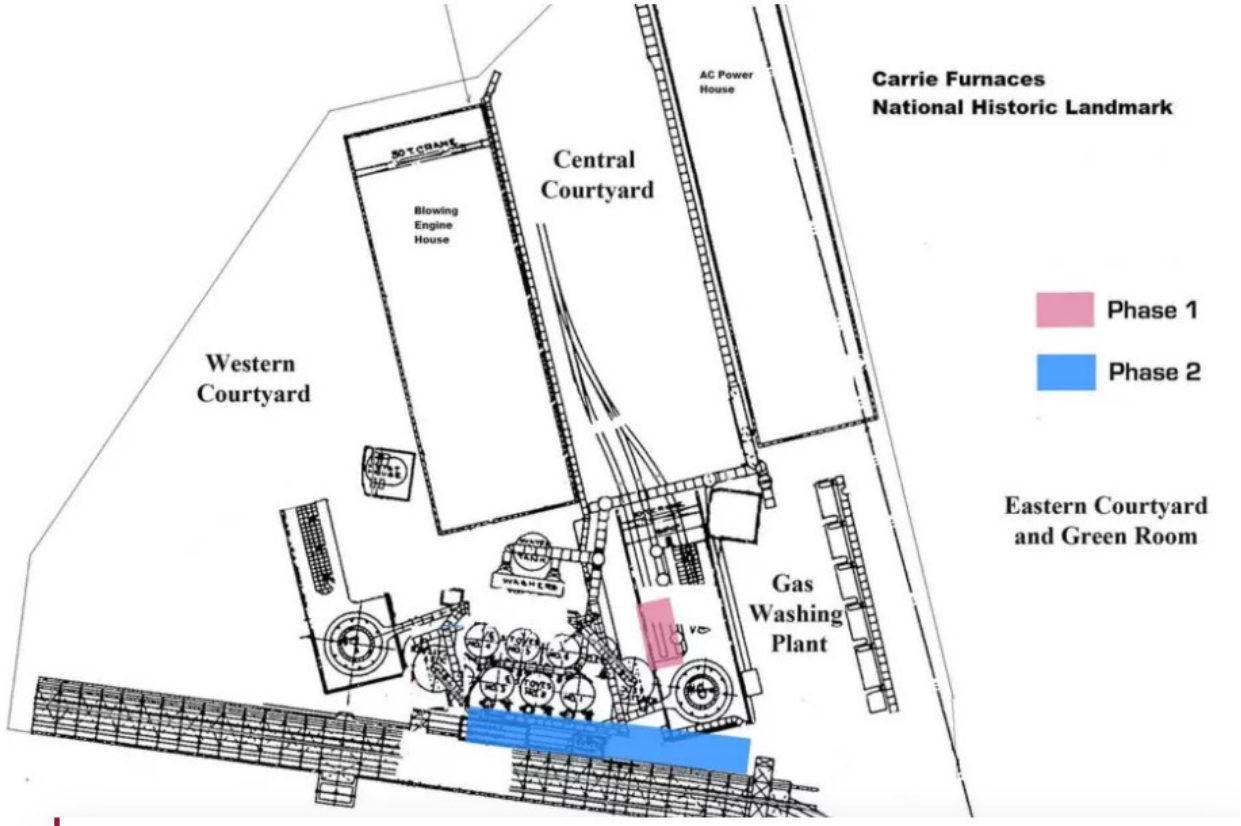
Big Challenges and Big Money

The historic preservation efforts at Carrie exist beyond the scope of many historical landmarks. Most of the time, professionals that are versed in historic restorations specialize in more traditional types of structures, like historic homes or brick or stone buildings. Preservation and restoration experience on industrial structures is quite limited, especially within the United States. Last year, Rivers of Steel's efforts to determine the best path forward led to researching work that's been done in Europe, particularly in Germany's Ruhr and Emscher Valleys, the Saarland, and in parts of Belgium and Luxembourg. Rivers of Steel also joined TICCIH, the International Congress on the Conservation of Industrial Heritage, to connect with colleagues globally to discuss the unique challenges we face.

Over the past two years, with the support of Senator Jay Costa and other state and federal elected officials, Rivers of Steel has raised significant funding for continued preservation and stabilization, including funding from the Commonwealth of Pennsylvania's Redevelopment Assistance Capital Program; the National Park Service's Save America's Treasures grants program; the National Endowment for the Humanities Challenge Grant; and the PHMC's Keystone Historic Preservation grant program, along with support from local foundations and corporations.

Our current project—the first major undertaking since the stack stabilization—includes stabilizing the #6 Cast House, rebuilding the sluiceway behind the Cast House, opening up the sluiceway alley to visitors for the first time, and additional stabilization work that will continue to allow visitors on the Stove Deck. Funded by the Save America's Treasures and Keystone Historic Preservation grants mentioned above, this work is crucial to Rivers of Steel's interpretation of the site, which features industrial tours that follow the iron-making process.

Additional projects are also pending. With the support of U.S. Senator Bob Casey in 2021, Rivers of Steel received a Save America's Treasures grant for stabilization work on the shell of the AC Power House, including concrete and masonry repair, along with the paving of the internal ramp. Beyond structural integrity, this will improve the usability of this historic building.



This site maps shows the areas of work for the project currently underway in the offseason at the Carrie Blast Furnaces.

Recently Senator Bob Casey and former Congressman Mike Doyle both announced separate federal grants for stabilization work on the Blowing Engine House. These funds will support the work necessary to preserve and stabilize the building following historic guidelines, and lay the groundwork for securing occupancy of the building. This is the first very important step toward the Blowing Engine House becoming the Visitors' Center for not only the Carrie Blast Furnaces site, but for the entirety of the Rivers of Steel National Heritage Area.

How the Furnaces looked during the Festival of Combustion in 2022. Photo by Ron Baraff.

Augie Carlino, president and chief executive officer of Rivers of Steel, lauded the support from the elected officials and said, “Senator Casey, Congressman Doyle, and State Senator Jay Costa are strong advocates for Rivers of Steel and our work at Carrie and throughout the National Heritage Area. In addition, Allegheny County Chief Executive Rich Fitzgerald is delivering on his promise to work with Rivers of Steel, RIDC, and the communities surrounding Carrie to make the site’s development a priority for Allegheny County, positioning the development for 21st-century jobs.”

A Vision for the Future

As mentioned briefly above, Rivers of Steel has completed a comprehensive master plan for the Carrie Blast Furnaces National Historic Landmark site. Approved just this past December by the Board of Directors, the master plan not only recommends steps to stabilize and preserve the historic structures, but also includes plans to renovate and reuse existing interior spaces—and build new structures—for interpretation, exhibition, education, recreation, and special

events. The Carrie Blast Furnaces are the centerpiece of Rivers of Steel's operations—the hub reaching out to the spokes of our other historic and touristic sites as well as our many heritage partner sites throughout our eight-county National Heritage Area.

The implementation of this master plan is on the horizon. Rivers of Steel's vision dovetails with what has been planned by RIDC and the Pittsburgh Film Office for the adjacent commercial development, as well as with what Allegheny County plans for the Rankin Hot Metal Bridge, also a National Historic Landmark.

Each step of the way, we have been working with our community partners in Rankin, Swissvale, Braddock, and North Braddock, along with the Redevelopment Authority of Allegheny County, and now, RIDC, on the preservation and redevelopment of the entire development site.

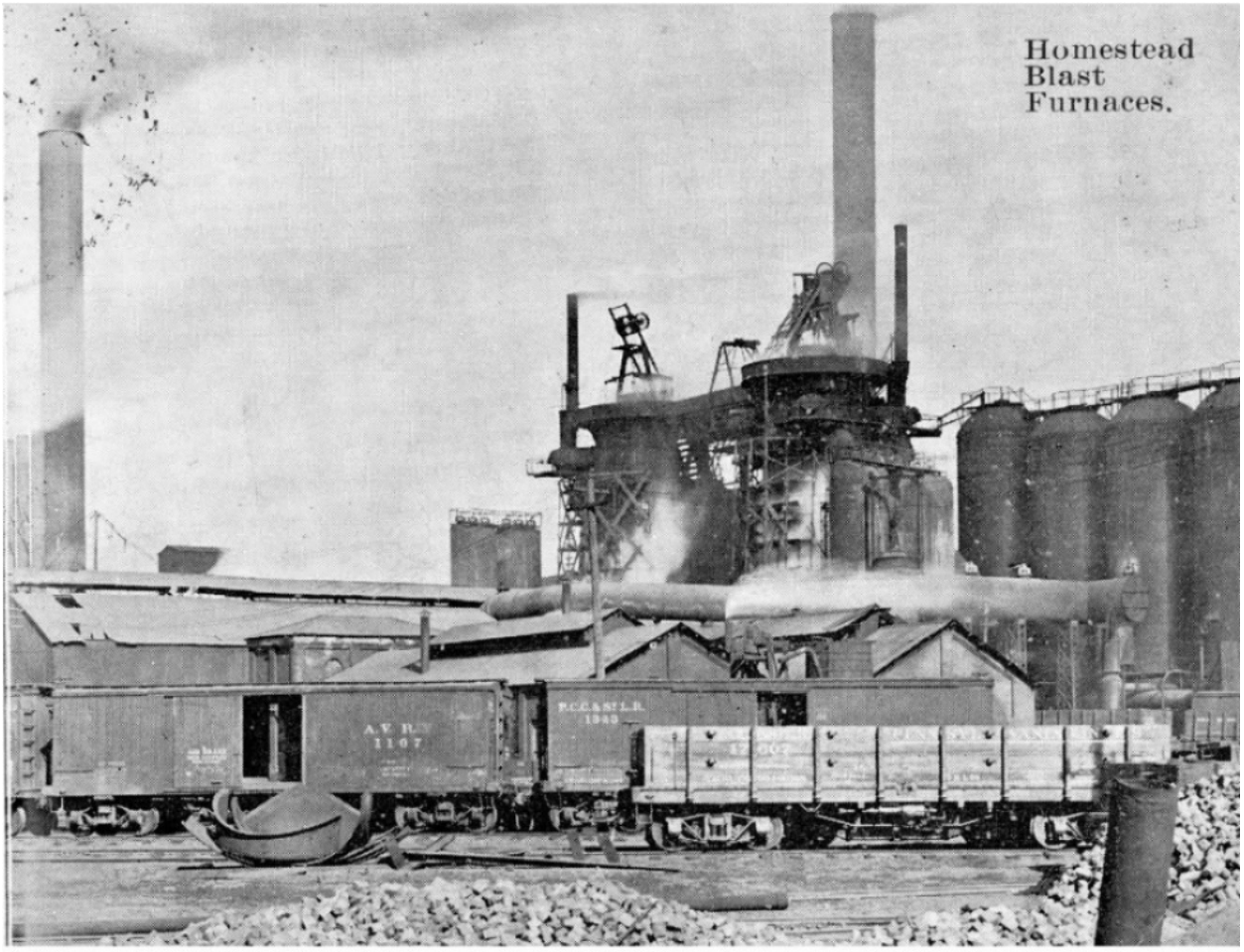
As Rivers of Steel has done with other redevelopment projects in Duquesne and McKeesport, we are working to ensure that former industrial sites are interpreted for the public and their stories are told. Unlike those other redevelopments, including the much-lauded Hazelwood Green, the Carrie Furnaces development is a National Historic Landmark. While this adds more stringent guidelines for redevelopment, the result will be an internationally known destination—an asset for our immediate neighbors in the Monongahela River Valley and to the many visitors the site will draw to the region.

It has been a long time coming for Carrie, for the team here at Rivers of Steel, for our partners, and for the residents of the region who have been working to build its future. We are on the precipice of a new era and we are grateful to be the stewards of this landmark—a space that reflects the resilience of our region's people, both historically and today.

Carrie Clark: She Who Lit the Fires

Blog by Dr. Kirsten L. Paine, March 9, 2023

After years of research, we finally know who is the namesake of the Carrie Blast Furnaces.



An early image of the Carrie Furnaces #1 and #2. Collection of the Rivers of Steel Archives. The Carrie Furnaces were named in honor of Carrie Clark.

Who is Carrie?

“Who is Carrie?” Any tour guide at the Carrie Blast Furnaces will say that this is their most frequently asked question.

Legend had it that Carrie was Carrie Fownes, the daughter, sister, mother, or aunt of one of the Fownes brothers, who were two of the founding owners of the Rankin mill. The problem, however, is that there were very few substantive references to a Carrie—or the more formal Caroline—Fownes linking her to the mill itself. Family histories did not show a woman with that specific name.

A standard answer from tour guides alluded to the speculative Fownes family connection before providing the context behind the historical practice of naming blast furnaces after the wives, daughters, and sisters of the mill owners. Among

nineteenth-century blast furnaces like Carrie, there were Dorothy, Eliza, Jane, Isabella, and Bernice, among others.

Furnaces bore women's names as a means of acknowledging a female member of a prominent family. Simply put, nineteenth-century women were unlikely business owners. They rarely owned property, controlled bank accounts, or held positions of power and influence in public commercial circles. Women in wealthy families, like the Fownes family in Pittsburgh, exerted sociopolitical influence in domestic and home-adjacent spaces. Naming a furnace after a woman gave her both a presence and a stake in the family enterprise. It also created monuments to women's memory by an industry not remembered for welcoming women's presence, participation, or investment.

"Who is Carrie?" This is a tantalizing question for any historian. Ron Baraff, director of historic resources and facilities at Rivers of Steel, says, "I have been looking for 'Carrie, the Person,' since 1998. While there were many reference clues, they were always incomplete, a historical afterthought."
Witnessing the magnitude of the two preserved furnaces on the Monongahela mill site makes it hard to think about Carrie as a "historical afterthought." There she rests in her anthropomorphized glory—tended, cared for, visited, celebrated, and as full of life as she ever was. Her name runs to the heart of Pittsburgh's living memory for those who worked at the mill when it was operational, lived in the neighboring communities of Swissvale and Rankin, and saw the glow, fire, and soot and heard the metallic rumble and roar. Baraff says, "I feel like I have been

The Carrie Furnaces in the Carnegie Steel era, a rapid expansion from the first furnace fifteen years before. Collection of the Rivers of Steel Archives.

looking for Carrie my entire life!”

Carrie Is Revealed

The Carrie Furnace Company began in 1884. Brothers H. C. and W. C. Fownes were founding partners and hands-on managers of the company, which had other investors and interested parties. William Clark, the Fownes brothers’ maternal uncle, was a prominent figure in the Pittsburgh iron industry and known primarily for Solar Iron Works. He became the president and manager of his nephews’ new venture.

When Furnace No. 1 smelted its first tons of iron on February 28, 1884, the whole Monongahela River valley knew about it. All of Pittsburgh knew about it. In the latter decades of the nineteenth century, any time a new mill opened in the Monongahela River valley, area newspaper reporters converged on the site to write stories about opening ceremonies. These ceremonies were not unlike christening new ocean liners. The social, political, and economic elite congregated to celebrate the new venture, which contributed to expanding the global prominence of Pittsburgh’s industrial might.

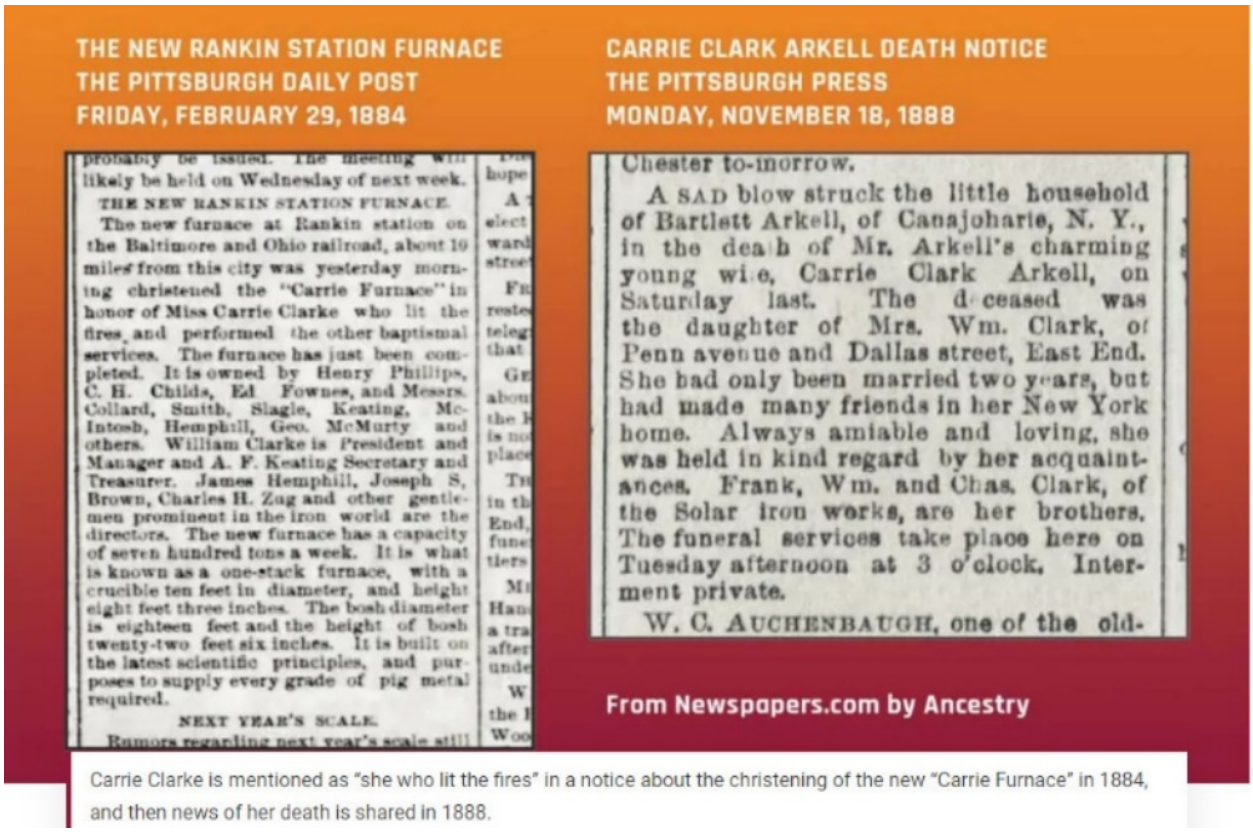
The Pittsburgh Daily Post covered the excitement. On page four of the February 29, 1884, edition, the staff reporter filed an article called, “The New Rankin Station Furnace.” It reads, “the new furnace at Rankin Station on the Baltimore and Ohio railroad, about [ten] miles from the city was yesterday morning christened the ‘Carrie Furnace.’”

Ron Baraff found this article while scouring Pittsburgh newspapers for information on the early days of the Carrie Furnace Company. He continued reading the article and noticed the furnace was named “in honor of Miss Carrie Clarke [sic] who lit the fires and performed other baptismal services.” William Clark’s daughter (and the Fownes’ brothers’ first cousin) had been tucked away in a few lines of local journalism!

Those lines, however, provided “the proof that eluded us for so long,” said Baraff. Those lines “give us not just a name to affix to the narrative, but they opened the door to a life and time in our region’s rich industrial history.”

Ron's discovery kicked open a door for the rest of Rivers of Steel's Museum and Archives department, who quickly set to finding as much information as possible about Carrie Clark. They "went on a quest to find out more about our Carrie," Baraff says. Over the next few days, emails zipped back and forth as Ron, Ryan Henderson, Barney Terrell, and I followed her across the historical record and recovered the identity, life, and legacy of the woman whose name echoes throughout the Monongahela River Valley.

Ron remarked the "longtime assumptions were close to being accurate," but because of the focus on the Fownes family, the Clark family and their connections to each other went unexplored. Finally, being able to reclaim a person's entire life story with the simplest premise: "Who was Carrie Clark and what happened to her," well, "it is a researcher's dream."



THE NEW RANKIN STATION FURNACE
THE PITTSBURGH DAILY POST
FRIDAY, FEBRUARY 29, 1884

probably be issued. The meeting will likely be held on Wednesday of next week.

THE NEW RANKIN STATION FURNACE.

The new furnace at Rankin station on the Baltimore and Ohio railroad, about 10 miles from this city was yesterday morning christened the "Carrie Furnace" in honor of Miss Carrie Clarke who lit the fires and performed the other baptismal services. The furnace has just been completed. It is owned by Henry Phillips, C. H. Childs, Ed Fownes, and Messrs. Collard, Smith, Slagle, Keating, McIntosh, Hemphill, Geo. McMurty and others. William Clarke is President and Manager and A. F. Keating Secretary and Treasurer. James Hemphill, Joseph S. Brown, Charles H. Zug and other gentlemen prominent in the iron world are the directors. The new furnace has a capacity of seven hundred tons a week. It is what is known as a one-stack furnace, with a crucible ten feet in diameter, and height eight feet three inches. The bosh diameter is eighteen feet and the height of bosh twenty-two feet six inches. It is built on the latest scientific principles, and purposes to supply every grade of pig metal required.

NEXT YEAR'S SCALE.

Rumors regarding next year's scale still

CARRIE CLARK ARKELL DEATH NOTICE
THE PITTSBURGH PRESS
MONDAY, NOVEMBER 18, 1888

Chester to-morrow.

A SAD blow struck the little household of Bartlett Arkell, of Canajoharie, N. Y., in the death of Mr. Arkell's charming young wife, Carrie Clark Arkell, on Saturday last. The deceased was the daughter of Mrs. Wm. Clark, of Penn avenue and Dallas street, East End. She had only been married two years, but had made many friends in her New York home. Always amiable and loving, she was held in kind regard by her acquaintances. Frank, Wm. and Chas. Clark, of the Solar iron works, are her brothers. The funeral services take place here on Tuesday afternoon at 3 o'clock. Interment private.

W. C. AUCHENBAUGH, one of the old-

From Newspapers.com by Ancestry

Carrie Clarke is mentioned as "she who lit the fires" in a notice about the christening of the new "Carrie Furnace" in 1884, and then news of her death is shared in 1888.

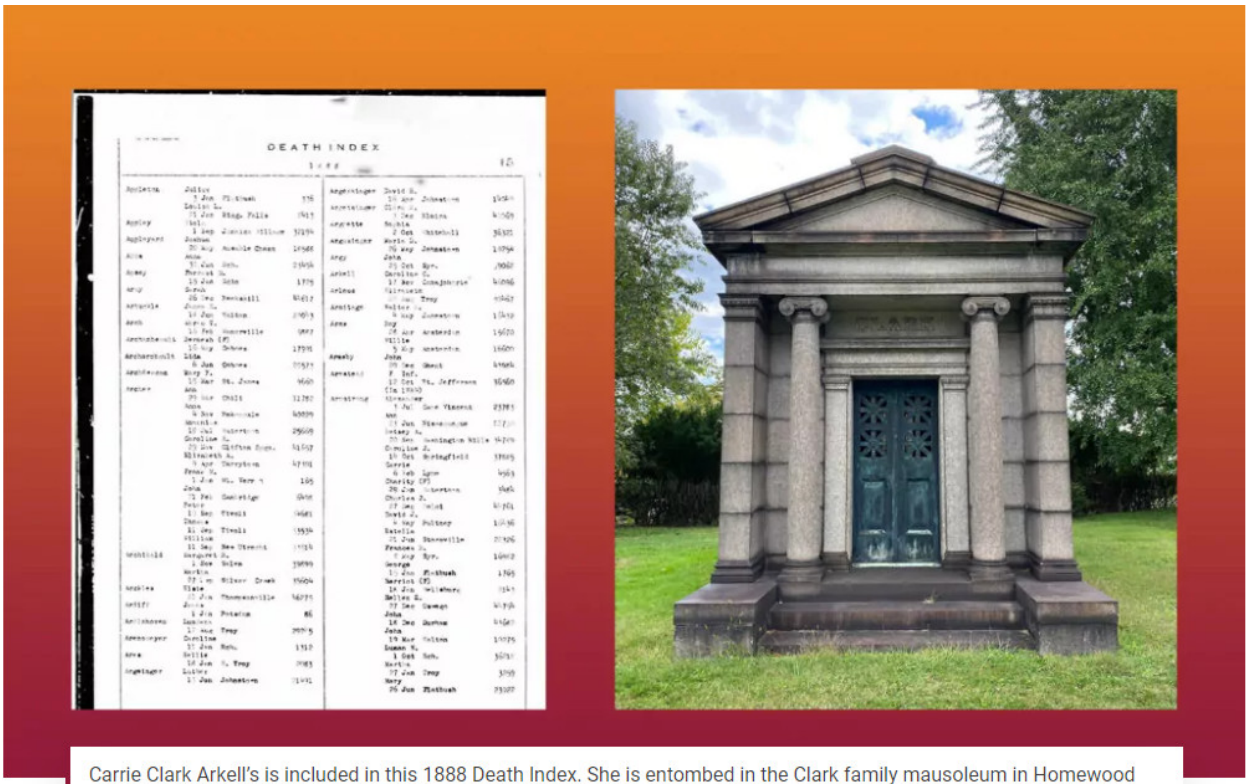
Ron, Ryan, Barney, and I found census records, marriage license notices, academic files, obituaries, and cemetery records. Her present biography remains short, and at first glance, it may appear sparse. However, remember this biography represents a major breakthrough in a twenty-five-year-long quest.

Carrie Clark, a Life

Caroline “Carrie” Bell Clark was born on March 19, 1863, in Youngstown, Ohio. Her family moved to Pittsburgh before 1869, when her father, William Clark, started the Solar Iron Works, located in Lawrenceville. In 1877, Mr. and Mrs. Clark sent Carrie away to Vassar Preparatory School in Poughkeepsie, New York. While there, she completed courses in Latin, German, French, Greek, mathematics, rhetoric, geography, and history. In 1880, Carrie Clark began studying at Vassar College, an institution that endeavored to provide wealthy young women educations equal to what their brothers received at other elite universities. Clark left Vassar and returned to Pittsburgh in 1881.

She assumed an extraordinarily public role in February of 1884 when she assisted her father by lighting that first fire in the brand-new mill bearing her name. A flurry of activity befitting a wealthy young woman in the late-nineteenth-century United States ensued. William Clark died in August 1884, a mere six months after the mill’s opening. Less than two years later, Carrie Clark married Bartlett Arkell, the rather dashing son of a New York State senator, in Pittsburgh, likely close to the Clark family home in Point Breeze on the corner of Penn and Dallas Avenues, on November 30, 1886. Clark and her new husband relocated to his hometown of Canajoharie, New York, shortly thereafter. Their son, William Clark Arkell, was born on September 28, 1887.

Carrie Clark died on November 17, 1888. She was twenty-five years old. Her obituary describes her as “charming” and “always amiable and loving” toward her friends. Her body was brought back to Pittsburgh. She rests in the Clark family mausoleum in Homewood Cemetery, Section 14, Lot 111.



Carrie Clark Arkell's is included in this 1888 Death Index. She is entombed in the Clark family mausoleum in Homewood Cemetery.

Carrie for the Ages

Restoring Carrie Clark's identity to the record of Carrie Furnace reinforces the fact that the history of industry in Pittsburgh includes, and sometimes even centers, women. Women's lives and contributions to the mills, regardless of whether or not their sacrifices lay at the base of a blast furnace, open hearth, rolling mill, or in a rail yard or a coal mine, matter.

Clark is a piece of Pittsburgh's industrial story. When asked if he thought Clark's identity would change the way people look at the furnaces and what he hopes the public will take away from knowing her name and at least a little bit about her life, Ron Baraff expounded, "We can provide a more complete narrative of the early days of the company and its founding families and of the industry and region.

"Carrie Clark is an important player in the life of the site—her name and her legacy (and that of her family) echoes from the nineteenth century into the twenty-first," Ron continued. "No longer is she just a name. Now she is a person, a life, a connection to our collective past. History is at its best when it is viewed

humanistically and with dimension, taken off the pages of books and brought to life. It becomes relatable and real. It is our job as historians and interpreters to serve as guides for others to understand the past and make it come alive again."

This is a turning point for Rivers of Steel's story as well. Not only does the organization steward the National Landmark bearing her name, but Rivers of Steel now stewards the memory of Carrie Clark, the young woman who lit the first flame.

Dr. Kirsten L. Paine is an educator and researcher with more than a decade of experience working in higher education. She started working for Rivers of Steel in 2017 as a tour guide at the Carrie Blast Furnaces National Historic Landmark and was inspired by the mission to preserve such a national treasure held in public trust. Kirsten is committed to the work of public humanities education in her role as Site Management Coordinator and Interpretive Specialist. By creating and facilitating public programs that make the National Heritage Area's history come alive for the community, she believes in archival study and teaching from primary sources as vital community resources.

For two other articles about Carrie Clark by Dr. K.L. Paine, see:

https://riversofsteel.com/who-was-carrie-clark

and

https://riversofsteel.com/the-marriage-of-carrie-clark-and%20bartlett-arkell/

HISTORY OF THE EARLY STEEL INDUSTRY

Although the story of iron and steel production and the players involved is an extraordinarily complex one, the following section presents a few facts from the beginning of steel development, especially in the Monongahela Valley.

Two of the main contributors to this story were Andrew Carnegie and Henry Clay Frick. Born fourteen years apart, their relationship would build an empire of steel making in a matter of a few tens of years.

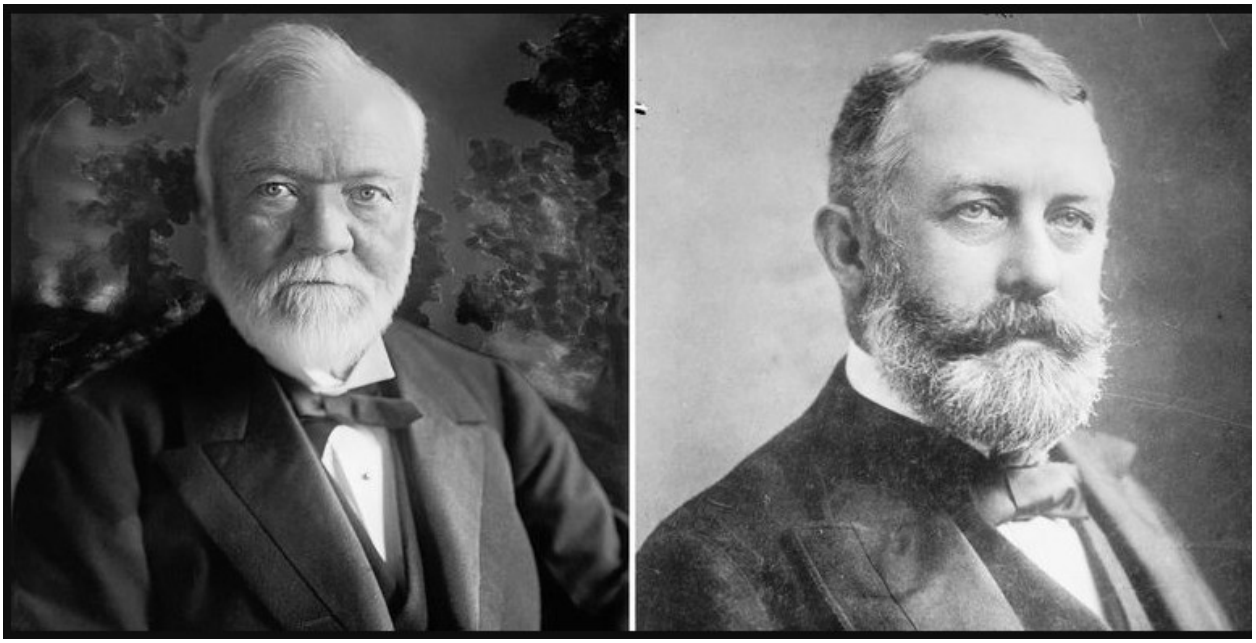


Figure 1. Photographs of Andrew Carnegie (left) and Henry Clay Frick (right). Images from https://hips.hearstapps.com/toc.h-cdn.co/assets/17/10/andrew-carnegie-henry-clay-frick.jpg

Iron had been produced throughout Pennsylvania since the 1800's, but as Hoerr explains "[t]he beginning of the 1870's was precisely the right time in the industrial development of the United states for the appearance of the steel industry." Steel was stronger and less malleable than iron, and a better material for constructing "railroads, bridges, factories, and office buildings." "The Bessemer steelmaking process, invented and improved upon in the 1860's, was ready for large-scale application." The region had all the resources required – coal, coke, limestone, iron ore, the three rivers and railroads. Additional iron ore was barged in from Missouri and shipped in from northern Michigan and Minnesota. (Hoerr, 1988)

This is when Andrew Carnegie (1835-1919) stepped into making steel. He had made a small fortune in railroads, iron furnaces, rolling mills and other ventures, but saw his railroad customers were gravitating to steel rails. The Carnegie, McCandless & Company was formed and, in 1894, built in Braddock the Edgar Thompson Steel Works, named after the Chairman of the Pennsylvania Railroad, Carnegie's mentor. The molten iron originally came from the Lucy Furnaces. After two blast furnaces were built, the plant produced iron, as well as steel.

The Homestead Works, built in 1881 by a competitor, were bought two years later by Carnegie. In 1884, four blast furnaces, known as the **Carrie Furnaces**, were built across the Monongahela River in Rankin to supply molten iron. The two plants were connected by a railroad bridge across the river. Carnegie and partners acquired other nearby steel mills, including the Duquesne Works in 1890. (Hoerr, 1988)

Around 1870, Henry Clay Frick (1849-1919), learned from his cousin, Abraham Tinstman, how to process coke from coal, and helped him grow the business by procuring loans from bankers such as Thomas Mellon. He formed Frick and Company, and reorganized as the H. C. Frick and Company in 1878. By 1882 the company owned over 3,000 acres of Connellsville coal lands and operated over 1,000 coke ovens (Staniford, 2005). Carnegie bought shares in the company and enormous amounts of coke for his steel operations. Frick saw a future for himself in the steel industry.

Frick's desire to buy into Carnegie's steel company was discouraged until the untimely death of Carnegie's brother, Tom, on October 19, 1886. Carnegie then offered Frick 2 percent of Carnegie Brothers for a price. In 1889, after Henry Phipps retired and the newly installed David Stewart died suddenly, Frick was named chairman of Carnegie Brothers and Company (Staniford, 2005). In 1892, Carnegie agreed to combine the assets of Carnegie Brothers and Frick's H.C. Frick and Company to form Carnegie Steel Company. Carnegie and Frick thought in similar ways about cost containment, especially as to how the employees were paid and treated (not well). They pulled together many disparate parts into a business monolith, known now as "vertical integration," which helped to make it immune to outside pressures. The parts included coal mines, coke ovens, limestone quarries, local iron ore and Mesabi Range iron ore from Minnesota, Great Lake freighters to haul the ore, railroads, blast furnaces, steel mills and other assets. This coal-to-steel chain produced phenomenal profits, allowing Carnegie, Frick and the various partners to become fabulously rich (Hoerr, 1988). Carnegie's sense of social responsibility led him to philanthropy. The profits led Frick to collecting fine art.

In 1899, Frick and Phipps were ready to sell their shares in Carnegie Steel, but were secretive about the supposed buyers. Carnegie, with reservations, went along with the proposal, but included a required payment of $1,170,000 for a 90-day option. To his great anger, he found the "buyers" were speculators with no

assets. The option ran out, the sellers' other plans failed, and Carnegie refused to return the money. That, and the culmination of many other negative events, caused the relationship between Frick and Carnegie to fall apart. On December 5, 1899, H.C. Frick resigned as chairman, again, and member of the Board for the last time. Even at Carnegie's dying request, Frick refused to make amends. Both men died in 1919.

Carnegie sold his Carnegie Steel stake in 1901 for $480 million to a group headed by J.P. Morgan. Carnegie Steel was combined with nine other steel companies to form the United States Steel Corporation, which later became USX.

The Homestead Strike Of 1892

It was mainly because of Frick's strong dislike of the unions, which was echoed by Carnegie, that the Homestead Strike of 1892 happened. In the end, though, Carnegie never got over the deaths that occurred, and blamed Frick for them.

The Amalgamated Association of Iron and Steel Workers union at the Homestead plant was made up of skilled workers and craftsmen, and was supported by over 3,000 nonunion laborers, mostly immigrants from eastern and southern Europe. While the skilled men were paid at tonnage rate, and earned between ten and fifteen dollars per day, the laborer's rate was between $2.00 to $2.25 a day, though that would change for the worse.

In the summer of 1892, Carnegie, while vacationing in Scotland, gave Frick full authority to break the union and eliminate their hold on negotiating contract terms at the Homestead Works. Their contract, which ran from 1889 to 1892, was set to expire on July 1, 1892. Frick's proposal included cutting wages which the union rejected, and negotiations stopped.

In late June, Frick locked out the workers and had a fence topped with barbed wire built around the plant – "Fort Frick." On July 2, Frick fired all 3,800 union and non-union workers. He attempted to bring in over 300 Pinkerton agents by barge at nightfall, but they were violently stopped by the workers and townspeople who had broken through the fence. Shots were fired during the ruckus, resulting in the deaths of at least 2 Pinkerton agents and 6 up to possibly 12 workers. After more violence and the takeover of the plant, the strike ended after the company requested Pennsylvania Governor Robert Pattison send in the National Guard.

Over 8,500 soldiers arrived, and the workers surrendered the plant on July 12 (Hoerr, 1988 and Staniford, 2005).

Frick reopened Homestead and only hired workers applying as individuals. By November 21, the union had given up. Workers reapplied for jobs under the company's terms of 12-hour shifts, reduced wages and other concessions. The Homestead Strike was a major defeat for the union and a forty-year setback for efforts to unionize workers in general. In 1896, laborers were being paid an average rate of $1.40 a day. (Staniford, 2005). The rate for skilled labor had dropped as well.

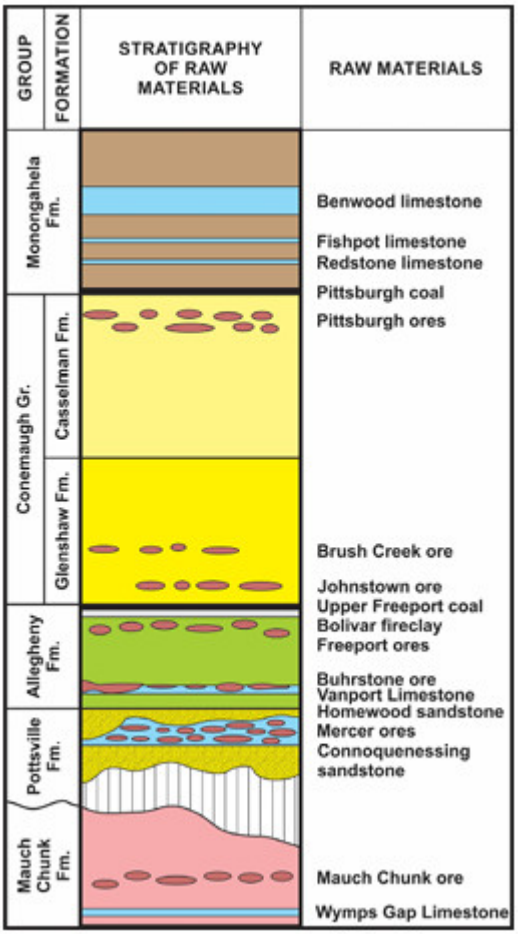


Figure 2. Generalized stratigraphic column for western Pennsylvania, showing iron ores, limestones, sandstones, coals, and fireclays (from Samways et al., 2014)

Raw Materials Used

Pennsylvania initially provided the raw materials required to make iron – the iron ores, limestones, coal, fireclays, sandstones, water for transportation and energy, and vast forests for charcoal (Harper and Kollar, 2018). Many of these same materials are required for the production of steel. Rather than duplicating their efforts, the 2018 Fieldtrip Guide should be referred to for detailed information about these products, and short summaries from the Guide are given here.

Iron ore was readily available in western Pennsylvania in the form of siderites. Of lessor importance were limonite (brown ore), hematite (kidney ore) and goethite or bog iron ore. They are found in the Pottsville, Allegheny, Glenshaw and Casselman Formations The 2018 Guide has detailed descriptions of the origins of these ore deposits.

Limestones occur extensively throughout western Pennsylvania. Included are the Redstone, Fishpot and Benwood limestones of the Monongahela Formation, and Wymps Gap Limestone of the Mauch Chunk Formation. These were quarried extensively for use in the blast furnaces.

The limestone is crushed and heated to drive out the carbon dioxide leaving pure lime. The limestone and lime are used as flux in the blast furnaces to soak up impurities in the molten iron. The impurities float to the top and are skimmed off as slag (Stwertka and Stwertka, 1978).

The Pittsburgh coal bed is the basal unit of the Monongahela formation. The Connellsville area of Fayette County contained a metallurgical grade coal which made a superb coke for the blast furnaces. Frick owned at least 3,000 acres of coal properties for mining, and processed this coal into coke in his ovens.

How a Blast Furnace Works

This section has been taken from "Blasting Ore into Iron," from the Stwertka and Stwertka's 1978 book describing how a steel mill works. It might not describe exactly how a blast furnace worked either in the 1900s, or how it works in the 21st century, but it provides an idea of what happens to convert iron ore into pure iron.

Blast furnaces, standing in rows, can be as tall as twenty-five-story buildings. They are used to smelt the raw iron ore into iron, with the assistance of coke, limestone and lime. This mix of materials is called the "charge," which is hoisted to the top and loaded into the furnace. Nearby, gas stoves heat air to temperatures as high as 2000 degrees Fahrenheit, which is blown into the bottom of the furnace at speeds up to 400 miles per hour. The stove is said to be "on blast." The operator of the jet fans is called a tuyerman (pronounced twee-YER-man). Roughly four tons of hot air are needed to produce a ton of iron.

The inside of each blast furnace is lined with heat-resistant bricks that withstand temperatures as high as 3000 degrees Fahrenheit. At those temperatures, the iron ore will become liquid. As the iron ore, limestone and coke, the charge, are loaded into the top of the furnace, the hot gases rush up from below. The charge is suspended in the upper part of the furnace, slowly working its way down. During this slow drop the iron is freed from the ore.

As the charge moves down through the top half of the furnace, oxygen, other gases and dust is removed from the ore and piped off through tubes at the top of the furnace. Halfway down, the limestone reacts with the impurities in the ore and coke, forming a material called slag. The now molten iron and slag drip through the burning coke and fill the hearth at the bottom and hottest part of the furnace. The pool of molten iron stands about four to five feet deep, with a layer of slag floating on top. A furnace keeper and helper test the molten iron for temperature and chemical analyses.

Once the iron is ready, it is tapped or cast out of the furnace, approximately every six hours. Exceptionally large furnaces can produce as much as 1,000 tons of iron per cast. Men protected in aluminized protective suits start the cast by drilling a taphole in the hearth above the molten iron, releasing the impurity-laden slag into a slag ladle mounted on a railroad car. Once the slag is removed, the lower taphole is opened to let the molten iron pour out into a channel into insulated "hot-metal" railroad cars. The cars work like gigantic thermos bottles, keeping the iron from cooling. Each car can hold about 160 tons of iron. The iron, still containing impurities, is shipped to special furnaces to be refined into steel. (Stwertka and Stwertka, 1978)

A BRIEF LOOK AT THE DEMISE OF THE STEEL INDUSTRY

Named one of the Best Business Books of 1988 by USA Today, "And the Wolf Finally Came, The Decline and Fall of the American Steel Industry" by John Hoerr, discusses in great detail the failures of labor-management relations in the collapse of not just the steel industry, but American industry in general. This, again, is an overly complex story and only touched upon here.

In 1901, United States Steel Corporation brought 60 to 70 percent of the steel industry under one corporate roof. Its anti-union stance finally broke the Amalgamated Association of Iron and Steel Workers union in 1909, when U.S. Steel declared it would no longer recognize the union at any of its plants. Though the AAISW still existed, its short sightedness denied membership to unskilled, immigrant, and black workers, thereby limiting its membership numbers severely and its influence in any other company. Steelworkers made little progress in improving their wages, working conditions and hours of work.

“Even a former vice-president of U.S. Steel wrote of his “disgust at the squalid living conditions” in the mill towns of the Monongahela, Allegheny, and Ohio valleys. Whose fault was this, he asked rhetorically, and answered: “Who maintained working conditions which tended to brutalize the body and soul? Answer – Carnegie Steel Company and the U.S. Steel Corporations.” (Hoerr, 1988)

As time went on, management failed to recognize the rising dominance of Japanese steelmakers during the 1960s. They failed to develop resources abroad and modernize plants at home (Hoerr, 1988). In addition, management refused to listen their workers’ suggestions for improvements. Its internal training programs for its supervisors were stagnating, further reducing abilities to improve productivity and costs.

After years of stability following World War II, a number of upheavals occurred from the mid-1970s to the mid-1980s to cause permanent change throughout the world. The upheavals included the rise and fall of the OPEC oil cartel, the emergence of Developing World countries as manufacturing powers, the fading of American technological supremacy, and the growth of a new technology based on the silicon chip, microelectronics and the computer (Hoerr, 1988).

Some changes closer to home occurred to produce major economic challenges for Americans, including the deregulation of the trucking and airline industries, and the election of Ronald Regan, who worked to disengaged the federal government from the relationship between corporations and people (Hoerr, 1988).

When the recession of 1981-82 began to recede, the Pittsburgh region found over 95,000 manufacturing jobs lost and the unions had lost over 3.4 million members, or 11 percent of its 1979 membership. Manufacturing employment was not returning, and the living standards of the workers were reduced by wage cuts and unemployment. Many jobs went to the nonunion service industries, that generally paid lower wages. In Europe, the unions avoided a similar fate by winning large government subsidies that helped their members survive. But here, the unions were forced to agree to wage concessions and other cuts, which allowed some companies in trouble to survive. But no help came to the workers (Hoerr, 1988).

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APPENDIX 1:
INSTRUCTIONS FROM RIVERS OF STEEL ABOUT THE TOUR

CARRIE FURNACE INSTRUCTIONS: WHAT TO KNOW BEFORE YOU GO

As a former industrial site, there are a few things to keep in mind to ensure an enjoyable visit.

- **Social distancing:** Social distancing is no longer mandatory, but we do ask that you be mindful of the people around you, allowing for a comfortable amount of space when possible.
- **What to wear:** The majority of each tour is outside; please dress for the weather. Additionally, the ground is uneven—sensible shoes are a must. Sneakers or boots are recommended. ***Open-toed shoes and high heels are prohibited***.
- **Hard hats are required to be worn for the duration of your tour.** If you have a hard hat, please feel free to bring it. For those who need one, a hard hat will be provided and collected after the tour. Hats are disinfected between uses.
- **Restrooms & concessions:** The rawness of the site is certainly part of its charm. However, that rawness also limits the creature comforts many of us are accustomed to, like running water. Portable bathrooms and wash stations are available. Food amenities are generally not available (with some exceptions, such as food trucks at festivals).
- **Photography:** Photography is permitted. For safety reasons, videography and drones are prohibited.
- **Accessibility:** Handicapped parking is available, but the grounds covered during tours are not wheelchair accessible. There is one spot where the steps are steep, but a handrail is present.
- **Liability:** By purchasing admission tickets, all visitors are required to sign a liability waiver to tour the Carrie Furnace and consent to be photographed. The PGS also will have a liability waiver to sign.
- **Bug Spray:** We will be outside, so bug spray with tick repellant might be useful.

APPENDIX 2:
DIRECTIONS TO CARRIE FURNACE

(Also refer to the Google Map on the website:
https://riversofsteel.com/attractions/carrie-furnaces/)

The Carrie Blast Furnaces are located in Swissvale and Rankin, PA in the Monongahela River Valley. The entrance to the Carrie Blast Furnaces is located at Carrie Furnace Boulevard, Rankin, PA 15104. There is a general lack of street signs in places, but the following directions should lead you to the Carrie Furnace site:

From Pittsburgh - Take the Parkway East (I-376) from Pittsburgh through the Squirrel Hill Tunnel and exit right to Swissvale. Bear right at the fork toward Swissvale and get in the left lane. Turn left at the stop sign and then right at the traffic light onto South Braddock Avenue. Get in the right lane and take South Braddock Avenue past Edgewood Towne Centre and straight on through Swissvale for 1.5 miles to the overhead signs for Duquesne/Homestead and Braddock/Exit Only. Get into the right lane for the Braddock exit and at the next set of overhead signs bear right just before the Rankin Bridge. Stay in the right lane and at the traffic light go straight through the intersection onto Carrie Furnace Boulevard. Drive 0.7 miles, park, and walk to the gift shop.

For those coming from the east - Take the Parkway East (I-376) from Monroeville and exit right to Swissvale and Edgewood. Turn left onto Braddock Avenue at the traffic light at the bottom of the ramp. Pass under the Parkway East to the traffic lights, get in the right lane, and stay on South Braddock Avenue past Edgewood Towne Centre and straight on through Swissvale for 1.5 miles to the overhead signs for Duquesne/Homestead and Braddock/Exit Only. Get into the right lane for the Braddock exit and at the next set of overhead signs bear right just before the Rankin Bridge. Stay in the right lane and at the traffic light go straight through the intersection onto Carrie Furnace Boulevard. Drive 0.7 miles, park, and walk to the gift shop.