

THE NATIONAL
IRON & STEEL
HERITAGE MUSEUM

BOILERPLATE

Spring 2018



**The GUPPY
Comes Home**

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Front Cover:

The GUPPY, built by Sun Shipbuilding in 1970 utilizing two spun heads made at Lukens Steel, has become part of the museum's collection, and is on display in the 120" Motor House building.

Photo by: Darryl Hutcherson

PRESIDENT'S MESSAGE

The day the GUPPY arrived in Coatesville was such an exciting time for NISHM. The museum collects anything related to the American steel industry – photographs, documents, and artifacts, including full-size steel products. The GUPPY is one of various steel products now on display at the museum, which also include a sonarsphere and a World Trade Center steel trident.

When NISHM acquired the 120" Mill Complex property in the Fall of 2016, our plans to expand the museum began. The 120" Mill and Motor House buildings will allow us to showcase large-scale exhibits

and objects of iron and steel processes and products, just like the GUPPY. The submersible is a special addition to our collection and strengthens our ability to tell the whole iron and steel story.

I would like to personally thank all of the people and organizations involved with bringing the GUPPY home: Independence Seaport Museum, ArcelorMittal Coatesville, Diversified Mechanical, City Construction Company, and of course, the individual donors. I hope you will visit us soon to see the submersible!



Scott G. Huston



Jim Ziegler

EXECUTIVE DIRECTOR'S REPORT

With vision, objective study and appreciation, the history profession ought to be thriving, according to the History Relevance

Campaign, a grassroots movement made up of public historians. Yet we need to find approaches to make history more popular and pertinent, and discover new ways of reaching a broader audience. In training for the future, we first need to look back to our past, to

develop our ability to understand the present and plan for the future.

Museums need to provide vivid, engaging experiences for visitors and build a culture of continuous improvement through innovation, improvisation and maybe some trial and error. We present exhibits, public programs and activities that illuminate history and draw visitors into dialogues of what the history tells them about current issues.

How do we know what matters to our guests? We ask them!

Our Mission

The National Iron & Steel Heritage Museum is a not-for-profit educational institution whose mission is to promote an understanding of the iron and steel history of Coatesville, Chester County, Southeastern Pennsylvania and the region to audiences of all ages and interests by collecting, preserving, exhibiting and interpreting iron and steel's history and its relationship to the region and nation beyond.

The National Iron & Steel Heritage Museum is a project of the Graystone Society, a 501(c)3 public charity registered with the Pennsylvania Bureau of Charitable Organizations. Contributions are tax deductible to the extent permitted by law.

JANET KLEIN - 2018 REBECCA LUKENS AWARD

The twelfth annual Rebecca Lukens Award will be presented to noted historic preservationist and museum management consultant, Janet S. Klein. Mrs. Klein proved vital in the seminal stages of the restoration of Terracina, the first historic home in the Lukens National Historic District. Established by the National Iron & Steel Heritage Museum to honor individuals who exhibit the qualities of Rebecca Lukens, the annual award will be presented to Mrs. Klein at a May 31st reception, in the Lukens National Historic District.

Mrs. Klein is a graduate of the University of Pennsylvania, mother of two, and wife of noted television management professional, Lew Klein. As a native of Philadelphia, Mrs. Klein is known in many historic arenas, but initially for her work inspiring and promoting Fairmount Park house tours for the Philadelphia Museum of Art. She is also credited with the creation of such projects as The Liberty Trail, for which she designed and promoted a 165-mile automobile route of historical attractions, installed road signs, and produced and distributed a corresponding color map and brochure. Her work with historic house tours grew as she became affiliated with the National Trust for Historic Preservation which provided technical assistance to 18 historic house museum agencies "to solve their problems of administration, interpretation, restoration, volunteers, marketing, fund raising, grants, financial management, and collections," according to Mrs. Klein.

She was an early supporter of Terracina (the home of Isabella Lukens, daughter of America's first female industrialist, Rebecca Lukens) through the William Penn Foundation Grant. "Terracina showed



tremendous potential as an historic house museum with great heritage and a solid nucleus of supporters. I have great respect for the accomplishments of the Graystone Society and the National Iron and Steel Heritage Museum".

Her list of accomplishments reads like a Who's Who in the preservation world. She has served in various capacities with the following organizations or businesses: Woodlands Mansion and Cemetery, Philadelphia Historical Commission Historic Designation Committee, American Philosophical Society Friends Committee, Abraham Lincoln Foundation of the Union League of Philadelphia, Rosenbach Museum and Library, Pennsylvania Department of Conservation and Natural Resources, Temple University Ambler College, Historic Delaware Canal Improvement Corporation, Preservation Alliance for Greater Philadelphia, Preservation Pennsylvania, Pennsylvania Historical and Museum Commission, Fairmount Park Historic Preservation Trust, Inc., and many more.



Photo by: Sam Radziviluk

GUPPY SUBMERSIBLE COMES HOME TO COATESVILLE

First the sonarsphere... then the World Trade Center steel tridents... and now the GUPPY! The sonarsphere came back to Coatesville in 2007. In 2010, NISHM brought home a collection of steel tridents from the Twin Towers. And this year, with the support from people like you, the GUPPY submersible was acquired and brought home, as well. All three of these products were made with Coatesville steel and are now on display at the museum.

Built by Sun Shipbuilding & Dry Dock Company (a subsidiary of Sun Oil Company) in 1970, the GUPPY was designed to be a practical, affordable submersible for ocean engineering, including inspection of oil rigs and drilling equipment and geological surveys. With a selling price of about \$95,000 and weighing 5,000 pounds, the GUPPY was one of the lightest, most affordable

submersibles available.

Lukens Steel Company manufactured the steel heads (bowl-shaped plates) that made up the GUPPY's pressure hull. Fabricated from HY-100 HSLA (high strength, low alloy) steel, the pressure hull had a yield strength of 100,000psi and an inside diameter of 66 inches. The GUPPY is small: just 11 feet long and 7.5 feet tall.

NISHM would like to thank all of the donors that helped bring the GUPPY home... we could not have done it without you! The GUPPY can be seen on museum guided tours, which are offered Monday through Saturday, at 10:00am, 12:00pm, and 2:00pm. Please come on by and see it!

On Friday, February 23, a cool, rainy day, the GUPPY submersible was transported from Independence Seaport Museum to NISHM. Shown is the GUPPY coming down 1st Avenue.

Right:

Employees of Diversified Mechanical, City Construction Company, and ArcelorMittal Coatesville unload the GUPPY in the 120" Motor House, the submersible's present home.

Photo by: Sam Radziviluk

Bottom (clockwise from left):

1. The pressure hull, prior to machining. It was fabricated from two Lukens Steel Co. heads.

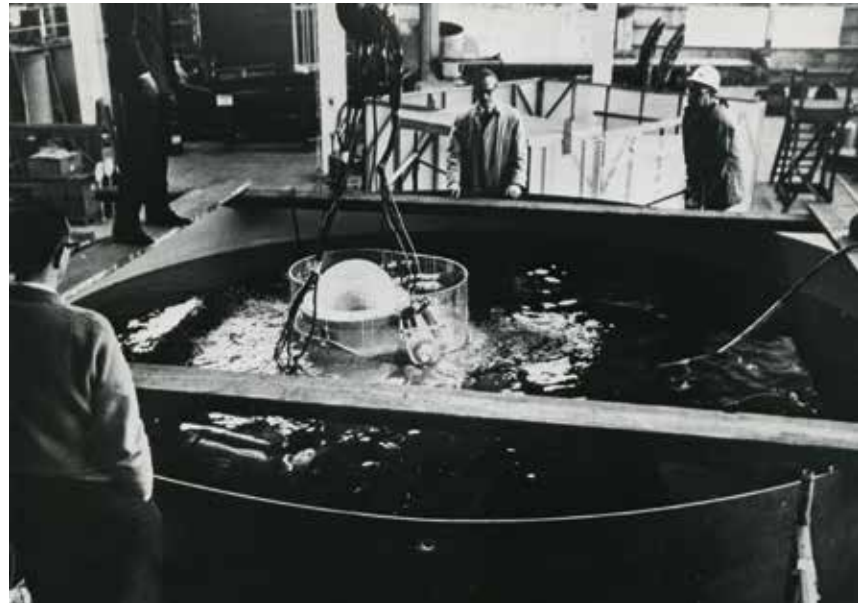
Photo: Lukens Advertising Dept. Archives

2. The GUPPY being tested in a water tank during the final stages of construction at Sun Shipbuilding.

Photo: Lukens Advertising Dept. Archives

3. The electric & communication cable and associated GUPPY storage containers arrive at the Motor House.

Photo by: Sam Radziviluk



ROLLING IN COATESVILLE: THE WORLD'S LARGEST PLATE MILL

Early Rolling - By the 1800s, Coatesville, Pennsylvania became the perfect location for an iron site. It had natural resources, access to power through the Brandywine River, and was located next to the first hard road in America. On July 2, 1810, Isaac Pennock completed the purchase of property, which he converted and established the Brandywine Iron Works & Nail Factory.

Dr. Charles Lukens, married to Isaac's daughter Rebecca, leased the iron works in 1817. At the time, steam power was providing a new market for iron products. Dr. Lukens saw this as an

opportunity to expand the business into the boiler plate market, so he modified the mill, which rolled America's first boiler plate in 1818. Brandywine Iron Works' reputation for quality boiler plate continued under Rebecca Lukens, who took over operations of the mill in 1825. She rebuilt the mill, upgraded the equipment, and established her site as a successful rolling business.



Illustration of the Brandywine Iron Works & Nail Factory in the early 1800's. Notice the rolling mill in the center, the site's first, and three to four feet wide.

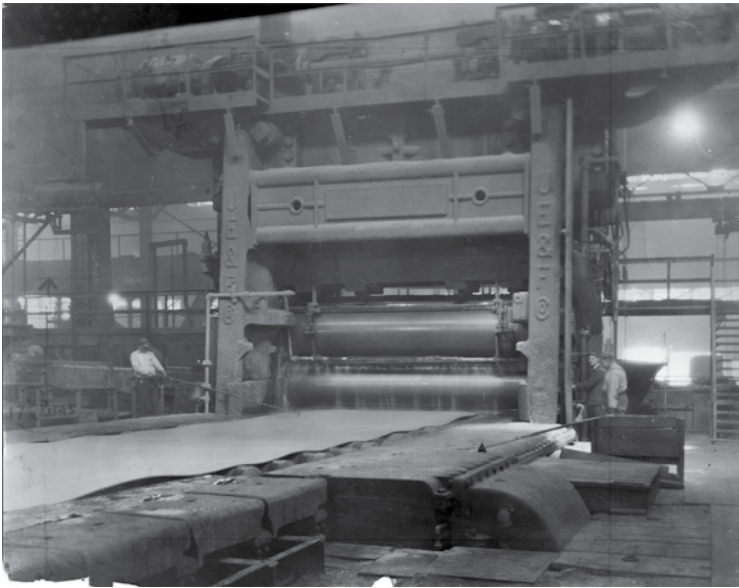
Rebecca Lukens' immediate successors made very few changes to the technology, process, product, and operations of the mill. That changed in 1870, when the partners installed a new steam-driven 84" two high reversing plate mill. In 1890, the business incorporated as Lukens Iron & Steel Company.

Changes and Competition - In the late nineteenth century, three developments changed the rolling industry. First, a growing demand for steel that reduced the market for iron. Second, an emerging preference for wider plates by boiler makers and shipbuilders, who could reduce the number of riveted seams required in their products

with wider plates. The third development was the emergence of local competition in Coatesville. In 1881, John and William Worth formed Worth Brothers. Over the next few decades, Lukens and Worth competed for the largest mills. In 1890, Lukens' 120" rolling mill, driven by a Corliss steam engine, rolled its first plates. The 120" mill was the largest in the U.S. until 1896, when Worth installed a 132" rolling mill. In 1901, Lukens began construction on a three high 140" wide mill, which began operations in 1903 as the country's largest plate mill. Just two months later, however, Worth commissioned a 152" wide plate mill. Once again the country's widest title passed from one neighbor to the other.



A 1910s post card of Worth Brothers, which competed against Lukens Iron & Steel Company for the largest rolling mill in the United States.



An early photograph of Lukens' 206" Rolling Mill, the widest in the world".

The World's Largest Plate Mill - In

1915, Lukens' engineers and the United Engineering & Foundry Company began to design a one-of-a-kind 204" rolling mill, a four-high mill and the widest in the world. It had 34" diameter, 30-ton work rolls and 50" diameter, 60-ton backup rolls, all driven by a 20,000 horse power twin tandem compound steam engine. Several other factors were designed specifically for this mill, including a hydraulic ingot tilter.

The mill rolled its first plates in May 1918 and was widened to 206" in 1919, still the widest in the world. For more than forty years, Lukens in Coatesville, Pennsylvania, produced the widest plates in the world; steel that went into vast numbers of

American bridges, skyscrapers, battleships, submarines, armor vehicles, and more.

After a 120", partially automated mill was added in 1943, Lukens had three of America's five four high rolling mills. Lukens began to electrify its mills after World War II – first the 120", then the 206" in April 1950 with the installation of two 4,000 horse power DC motors. A new 140" rolling mill was installed in 1959 to relieve the load of the 206" rolling mill, which lost its status as the world's widest mill in the 1960s, but remained the widest in the western hemisphere.

Lukens Steel Company was acquired in 1998 and the site changed ownership until 2006, when it became part of ArcelorMittal, the world's largest steel company. Both the 140" and 206" mills operate in Coatesville today. Although the 140" is the workhorse of the Coatesville facility, the 206" operates weekly. The 206" mill rolls plates for bridges, skyscrapers, and military defense, especially armor plate for the U.S. Navy. Located at the longest, continuously operating steel site in America, the 206" rolling mill celebrates its 100th anniversary in 2018 as one of the widest and oldest operating mills in the world today.

Please keep an eye and ear out this fall... NISHM will be showing an exhibit about the history of rolling, the rolling process, and Coatesville's 206" rolling mill.



The 206" Rolling Mill in 2016. The mill celebrates 100 years of operation in 2018, and remains one of the widest in the world. Photo by: Sam Radziviluk

Article originally published in "Steel Times International."



Photo by: Robert Williams

MARY ANN ROSSI

NISHM is happy to welcome Ms. Mary Ann Rossi to our Board of Directors. A partner at MacElree Harvey, a law firm in West Chester, Mary Ann is a woman of true distinction. She has been an active member in the community for many years, serving the Chester County Fund for Women and Girls, Legal Aid of Chester County, and Brandywine Health Foundation.

Ms. Rossi's relationship with NISHM began in 2015. Because of her involvement at MacElree Harvey and in community organizations, she was the recipient of the 9th annual Rebecca Lukens Award. Since then, Mary Ann has been a consistent supporter of the museum. She joined the Board of Directors this year.



THE NATIONAL IRON & STEEL HERITAGE MUSEUM

Rebecca Lukens

Here Died: 1791 - 1804
Location: Chester County, PA
Site/Company: Brandywine Iron Works & Nail Factory

Historical Significance:
 Rebecca Lukens was an ironmaster and America's first female industrialist. She took over the Brandywine Iron Works & Nail Factory in 1823 and operated the

THE NATIONAL IRON & STEEL HERITAGE MUSEUM

Lakshmi Mittal

Here Died: 1930 -
Location: India
Site/Company: LNM Holdings, Mittal Steel, ArcelorMittal

Historical Significance:
 Lakshmi Mittal formed the world's largest steel company. He joined his father's company, Inpat, after college, built his first mini mill at the age of 25, and formed his private company, LNM Holdings, in 1995. Mittal had a vision of consolidation and globalization, unlike anyone else, and made 47 acquisitions over 15 years. In 2005, Mittal purchased International Steel Group and formed Mittal Steel. The following year, Mittal merged with Arcelor, creating ArcelorMittal, the world's largest steel company, with Lakshmi Mittal as Chairman and CEO.

IRON AND STEEL HALL OF FAME

NISHM's next exhibit is the "Iron and Steel Hall of Fame." The history of iron and steel is long – thousands of years. It is rich – full of amazing discoveries, life-changing inventions, important decisions, and keen individuals. What are those discoveries, inventions, and decisions? And who are the individuals that made them?

This exhibit reveals a sampling of the inventors, engineers, investors, and owners that made important discoveries and decisions. These men and women had the greatest influence on the iron and steel industry over the last few centuries. Some of the individuals included are Thomas & John Potts, Rebecca Lukens, Henry Bessemer, Andrew Carnegie, and Lakshmi Mittal.

The "Iron and Steel Hall of Fame" will be on display from late May through September.

THANK YOU TO ALL OF OUR NEW AND RECENTLY RENEWED MEMBERS

(OCTOBER 1, 2017 TO FEBRUARY 28, 2018)

NEW MEMBERS

Ellen Endsloew James Fulton Carol Haag Ausmus Marburger
Theodore & Marilyn Pawlik

RENEWING MEMBERS

(* DENOTES 5+ CONSECUTIVE YEARS, BOLD DENOTES 120" MILL CLUB MEMBER AND ABOVE)

Paul Backenstose	Thomas Barnett*	Louis Beccaria*
Norman Bernard	John Bertram*	Patty Biffen
Viola Bird	John & Felicitas Bowie*	Susannah Brody *
Alex Cann, Jr. *	Vivian Childs	Francis Cooper
Ted & Dolly Corbo*	Robert Coulter	Ross Davis
Dorothy DiOrio	Eleanor Donato	Judi Ebelhar*
Ron Echhoff	John Forese*	John Graves*
Allyn & Robert Greeney*	James Groome	Colin Hanna
Maurice & Judith Hare*	Herbert Hoffman	Robert Holliday
Carol Holloway*	Mary Ellen Hopson*	Scott Huston*
Skip & Barbara Huston*	William T. Keen*	John & Marion Kirwin
Dale Krapf*	Harry Kreider*	Edward Lawrence*
Joan Levenite*	Harry Lohr	William McGroarty
David Nunn	Steven Nunn	Albert Nunn
Robert Olseski*	Peter Patukas	Richard Pennock
Marion Piccolomini	Nancy Pitcherella	Cynthia Quinn*
Barry Rabin	Dick & Nancy Saha*	Mary Ann Shumway
Matthew Skros	Fred & Mary Ellen Smith*	Sharon Tandarich*
Christopher Trunk*	Donald VanHorn*	Thomas Walsh
Kenneth Wyerman	Patti & Jim Ziegler	

WE COULDN'T DO IT WITHOUT YOU!



WINTER LECTURES

Winter programs at NISHM were a great success! First, at our “Meet Rebecca Lukens” living history event in January, guests were able to ask Rebecca Lukens (as portrayed by Susannah Brody) a variety of questions. To honor Black History Month, Thaddeus Stevens (as portrayed by Steve Anderson),

spoke about his involvement in politics and abolitionism. And lastly, in March for Women’s History Month, local historian Dan Graham spoke about the women who made our region’s early iron industry a success. Each of these programs can be viewed at steelmuseum.org.

UPCOMING EVENTS

SPRING

Rebecca Lukens Award Presentation

May 31 | \$50
5:30pm - 8:30pm

Town Tours & Village Walks

June 21 | Free Admission
5:30pm - 8pm

FALL

Coatesville Remembers September 11th

September 11 | Free Admission
8am - 4pm

Fall Lecture 2

November 1 | \$5, Members Free
6pm - 8pm

Fall Lecture 1

October 1 | \$5, Members Free
6pm - 8pm

Holiday Open House: Santa, Trains & Music

December 7 | Free Admission
6pm - 8pm

PHOTOGRAPHIC PRINTS

Now you can own beautiful photos of NISHM grounds! The winning photographs of last year's photo contest are now for sale in the museum store. Two prints are available: Graystone Mansion Entrance (color), taken by Paul Kempest, and Narrow-Gauge Locomotive (black and white), taken by Jewels McLean.



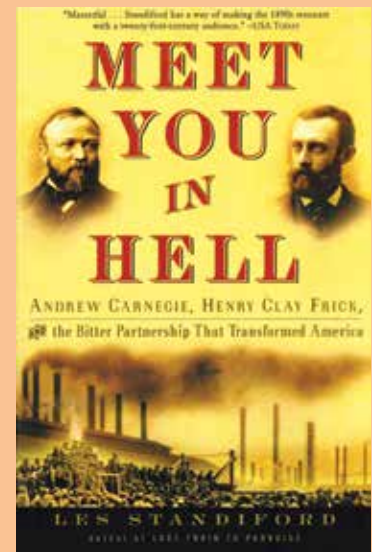
\$5.00 each



MEET YOU IN HELL, LES STANDIFORD

This is the riveting story of Andrew Carnegie and Henry Clay Frick, two of America's biggest steel magnates, and the bloody steelworkers' strike that turned their partnership into a strong rivalry. This historical book captures the good and bad of steel manufacturing, the ways of big business, and the troubled relationship between Carnegie and Frick.

\$15.00

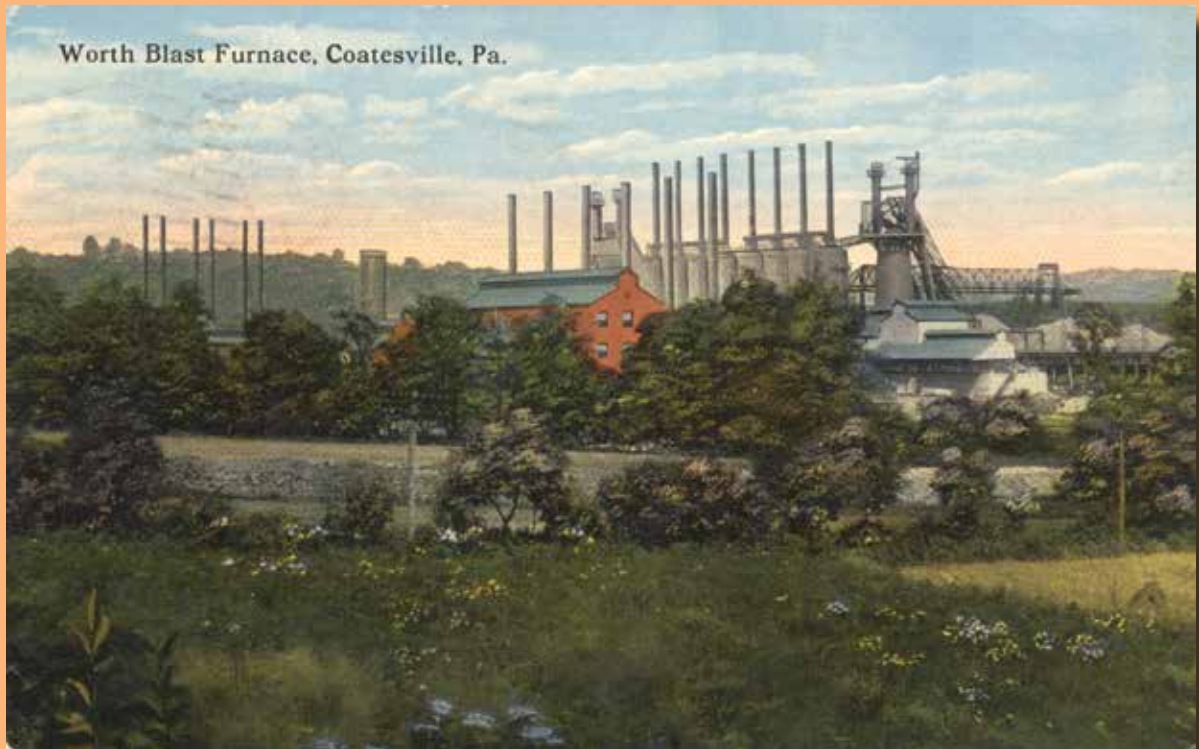


YOUR HOME AWAY FROM HOME!

At Graystone Mansion, history, architecture, and modern conveniences combine to create a timeless elegance. Built in 1889, designed by Cope and Stewardson, Graystone Mansion is a classic example of the American Collegiate Gothic style of architecture. The exterior gray stone and interior dark wood paneling, carved fireplaces, and grand staircase provide a magnificent setting for your special event. The extensive grounds include a large variety of flowers, trees, and other plants, which create a gorgeous backdrop for photographs. Host your next event here, and we promise that your event will be spectacular! Contact Sharon Tandarich at admin@houstonproperties.org if interested.



THE NATIONAL
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c1915 colored post card of Worth Brothers' Blast Furnace, Coatesville, PA. Worth Brothers was one of Coatesville's various steel companies. It rivaled Lukens Steel Company for the largest rolling mill in the U.S. in the late 1800s and early 1900s.