

THE ANCHOR

WISCONSIN MARITIME MUSEUM | QUARTERLY

SPRING/SUMMER | 19

ADRIATIC

**Unloading History:
The story of the
first self-unloading
schooner barge**

PERFECTION ON PARADE

A centuries old
tradition continues at the
Wisconsin Maritime Museum

The LOFTSMAN

**The lost art of
handcrafting a
seaworthy vessel**

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Ship Dog of the
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Highlights and milestones,
by-the-numbers



WISCONSIN
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MUSEUM
AT MANITOWOC



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If you haven't sensed it here at the museum, you haven't visited us lately. It is certainly evident right here in the *Anchor*. This spring we bid a fond farewell to Lisa Pike, who has been editing the magazine and serving as research assistant at the museum. She didn't go far, Lisa is dedicating her time to her position at the Manitowoc Library, just across the river. Our thanks for her years of service and best wishes on the voyage ahead.

We have taken this editorial opportunity to make some changes to the *Anchor's* layout and look with a new graphic designer, Remington Cleve. Remington has been doing great design work in the galleries and with our marketing materials over the past year (see the article on the pop-up exhibits (pg 19).

Aligning our branding with the *Anchor* was the logical next step, and we look forward to hearing feedback from you about the new format. Our online subscribers will notice a new embedded flip-book presentation of the magazine on our redesigned website: www.wisconsinmaritime.org. Back issues will be accessible to everyone, and the current year's issues to members only via password.

Please also let us know what you think of the approach we are taking with content. Great pieces highlighting aspects of Great Lakes maritime history like Joe Fisher's article on the art of lofting and drafting and Caitlin Zant's article on the shipwreck *Adriatic* are alongside topics current at the museum like Scottie Dayton's recap of the 2019 Ship Model Contest held here in May, as well as updates from the Education, Collections, and USS *Cobia* teams.

For now, we are taking a team approach to compiling the magazine as we look for new recruits to the museum staff to take on crucial curatorial and communications roles in the months ahead. This certainly does not mean we have slowed down implementing change here at the museum. In fact, the Board of Trustees enacted a significant change July 1 by elevating me to the Executive Director position. I am so grateful for this opportunity and welcome the challenges and responsibilities ahead.

Please join us this summer to celebrate fifty years of the Wisconsin Maritime Museum. Moreover, I invite you to help define our next fifty years by talking to our staff, participating in our programs and letting us know how you think we can best connect to Wisconsin's waterways ■

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Comments and suggestions regarding *The Anchor* may be directed to the editor at 920-684-0218 or e-mail: editor@wisconsinmaritime.org. The submission of articles and other material for publication is welcomed. Copyright 2019 by the Wisconsin Maritime Museum. *The Anchor* is designed by Freelance Artist, Remington Cleve and printed by Graphic Composition, INC., Greenville, Wisconsin.

The Wisconsin Maritime Museum is a private non-profit organization located in Manitowoc, WI, founded in 1968 as the Manitowoc Submarine Memorial Association, Inc., the Museum is dedicated to the preservation and interpretation of local, state and regional maritime history. The Museum has a membership program and distributes *The Anchor* quarterly to its membership. Other membership benefits include; unlimited free admission to the Museum and USS *Cobia*, discounts for purchases in the Museum Store, research services, and special events.

Accredited by the American Alliance of Museums, the Wisconsin Maritime Museum is also a member of the Association of Midwest Museums, Wisconsin Federation of Museums, Association for Great Lakes Maritime History, Council of American Maritime Museums, International Congress of Maritime Museums, Historic Naval Ships Association, and the American Association for State and Local History, and is a Smithsonian Affiliate.



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SPORT

Ship Dog of the Great Lakes

by Pamela Cameron,

Illustrator: Renée Graef

Sport: Ship Dog of the Great Lakes tells the true story of a homeless Newfoundland-Retriever puppy who finds a welcoming home on the lighthouse tender *Hyacinth*. Sport is rescued from the Milwaukee River by two of *Hyacinth's* crew members, and quickly becomes an important part of the crew himself. We follow Sport as he explores the tender "from bow to stern, from port to starboard," retrieves objects for the crew, and plays baseball alongside his mates.

Available in the Pier 75 Gift
Shop at the Wisconsin
Maritime Museum

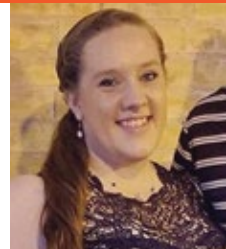
The *Hyacinth* served as a lighthouse tender from 1903 to 1945, for the US Lighthouse Service and the US Coast Guard. Lighthouse tenders, like *Hyacinth*, were used to transport supplies and service lighthouses, lightships, and buoys.

Hyacinth sailed Lake Michigan and Green Bay, serving cities as far south as Chicago and Michigan City; to Manitowoc and Ludington; and as far north as Rock Island and Manistique.

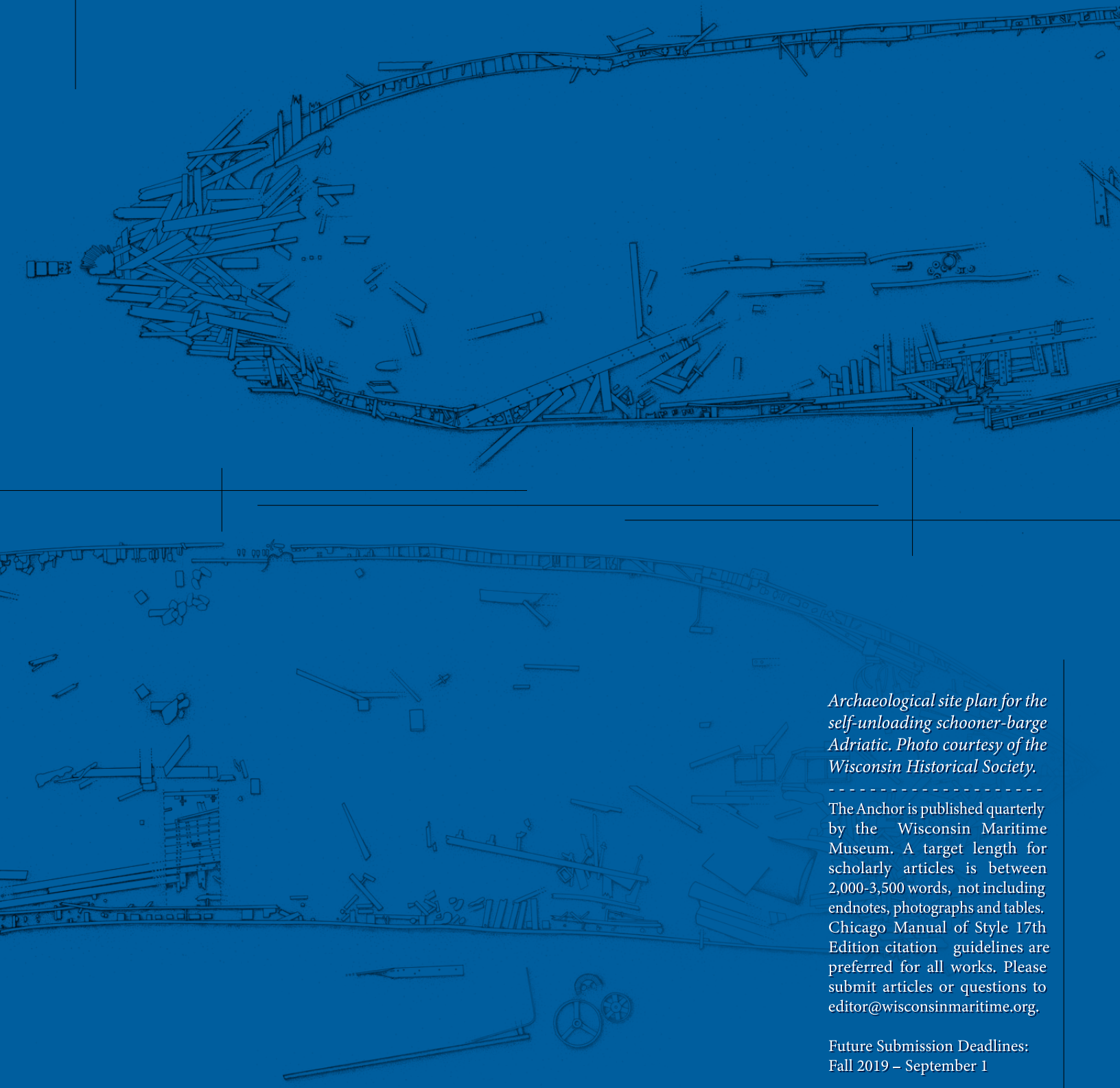
The real Sport served on *Hyacinth* from 1914 to 1926. Sport was known in every port the crew visited. Sport passed away from old age on July 19, 1926 and was given a proper sea burial off the coast of Ludington, MI. The crew attended Sport's funeral service in full uniform, saluting him as he was lowered into Lake Michigan. *Hyacinth* Captain Harry Maynard wrote about Sport in the September 1, 1926 issue of Lighthouse Service Bulletin and stated, "Sport was just a dog, but he was always a good dog and a good shipmate, a friend to everybody and everybody's friend."

Sport: Ship Dog of the Great Lakes is available in the Pier 75 Gift Shop at the Wisconsin Maritime Museum. Did you know you can find a wide array of children's books for all ages and reading levels in Pier 75? Admired titles like *Pout Pout Fish* and *Curious George* board books shine alongside leveled reading books about boats and submersibles. Young readers will enjoy stories like *The Mighty Mackinaw*, *All the Way to the Ocean*, *Walter the Wiley Walleye*, and *Do Fish Fart?* We have activity books and stories about lighthouses and Lake Michigan, and even Usborne Books stories and activity books on WWII, museums, and more.

Don't Forget! Members can save 10% on all gift shop purchases at the Wisconsin Maritime Museum ■



SCHOLARLY ARTICLES



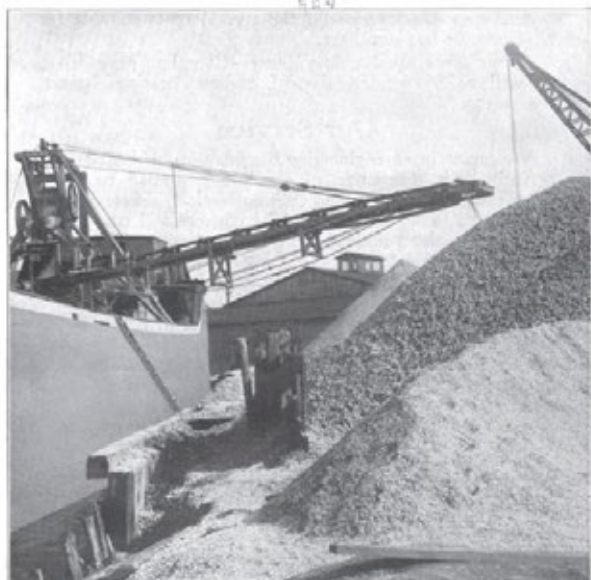
Archaeological site plan for the self-unloading schooner-barge Adriatic. Photo courtesy of the Wisconsin Historical Society.

The Anchor is published quarterly by the Wisconsin Maritime Museum. A target length for scholarly articles is between 2,000-3,500 words, not including endnotes, photographs and tables. Chicago Manual of Style 17th Edition citation guidelines are preferred for all works. Please submit articles or questions to editor@wisconsinmaritime.org.

Future Submission Deadlines:
Fall 2019 – September 1



NUMBER 66



Cover of the Stephens-Adamson Manufacturing Company's monthly publication featuring *Adriatic* unloading cargo (Stephens-Adamson Manufacturing Company).

• UNLOADING HISTORY •

ADRIATIC

The First Self-Unloading Schooner Barge

At the end of the 19th century, rapid technological developments in shipping and shipbuilding took place in response to the growth of industry and the expansion of the United States. As the 20th century progressed, increased demand for raw materials pushed the limits of shipping to new heights, and companies along the shores of the Great Lakes developed innovations in shipbuilding technology to meet these demands. The self-unloading schooner-barge, *Adriatic* exemplified this economic and industrial atmosphere in the Great Lakes region at the turn of the 20th century. *Adriatic's* innovative technological advancements adapted the vessel to the diverse demands of Great Lakes commerce and played a vital role in the expansion of trade in the region. Likewise, these innovations reflected the broader changing maritime industrial and economic atmosphere of the Great Lakes in the early 20th century.

Adriatic was launched on 12 October 1889 from the James Davidson shipyard in West Bay City, Michigan. Built as a 202-foot long, three-masted, wooden schooner, *Adriatic's* construction exemplified Davidson's unique shipbuilding techniques. Davidson and his shipbuilding company were known for building large, strong, wooden vessels intended for transporting bulk cargo. Although most shipbuilders in the Great Lakes were building their ships predominately out of iron and steel by 1889, Davidson continued to build massive wooden steamers and schooners. To maintain structurally sound vessels, Davidson made use of existing technology and developed his own innovations to increase the longitudinal strength of his ships. Like many wooden shipbuilders of the 19th century, Davidson used hogging trusses in all of his vessels and basket-weave cross bracing in many of his hulls.

Where Davidson's true ingenuity appeared, was in his use of floor keelsons. Instead of gaining longitudinal strength from the single support structure around the keelson, as was common in most other wooden vessels, Davidson lined the keelsons of his vessels with two iron plates, and placed up to six additional floor keelsons on either side of the central keelson, covered by laterally running ceiling planking. Instead of having a massive central keelson structure, the holds of Davidson's vessels remained unobstructed, allowing his ships to carry cargos comparable to larger vessels. As one of Davidson's smallest vessels, this innovation allowed *Adriatic* to have a successful career carrying ore, wheat, and coal for the company.

As was common for schooner-barges, *Adriatic* was towed by a large wooden steamer as a consort, which gave the wooden vessel a competitive edge over the larger steel bulk carriers on the Great Lakes. In the 1890s, a wooden steamer towing a consort could carry between 7,500 and 8,000 tons, substantially more cargo than steel bulk carriers of similar size, without a significant increase in operating costs. Steamers could tow multiple schooner-barges in consort, doubling and tripling the amount of cargo per trip. Though railways were the primary transportation system of moving goods westward, schooners and consort systems remained the most economical mode of transportation for bulk goods on the Great Lakes: a system in which *Adriatic* performed a valuable role.

Davidson retained ownership of *Adriatic* through the first few years of its service, but in January 1892, he sold *Adriatic* to Morris A. Bradley and Captain George Stone of Cleveland, Ohio. *Adriatic* continued its work for the Bradley Line, regularly carrying cargos of wheat, coal, and ore throughout the upper Great Lakes region, until the vessel became unprofitable as a result of higher maintenance costs and use of faster, more economical vessels.

By the turn of the 20th century, advancements in shipbuilding technology began to render *Adriatic's* use as a schooner-barge uneconomical. Although these advancements placed many



Leathem and Smith Stone Quarry circa 1905 (Gayle Soucek, *Door County Tales*).

vessels in the Great Lakes completely out of commission, *Adriatic* did not suffer this fate. After the close of the 1910 season, Bradley had the vessel transported to Manitowoc, Wisconsin, where it remained laid up until its purchase by Thomas H. Smith of the Leathem and Smith Stone Company in 1912. In 1905, Smith developed a stone crusher intended to produce smaller, more profitable stone products. By 1911, the demand for these new stone products had increased dramatically. In order to handle this increased output, Leathem and Smith needed a stone barge capable of loading and unloading crushed stone quickly. Dockside improvements helped facilitate more efficient loading and unloading techniques, but the process remained arduous and expensive.

When Leathem and Smith purchased *Adriatic* from M.A. Bradley, the vessel immediately underwent a massive overhaul, in which rail tracks, a traveling derrick with a clamshell bucket, and hoppers were added to the ship. At the start of the 1914 season, work began on the installation of new self-unloading equipment designed by the Stephens-Adamson Manufacturing Company, the leader in belt unloading technology for mines and self-unloading ships in the Great Lakes region. *Adriatic*

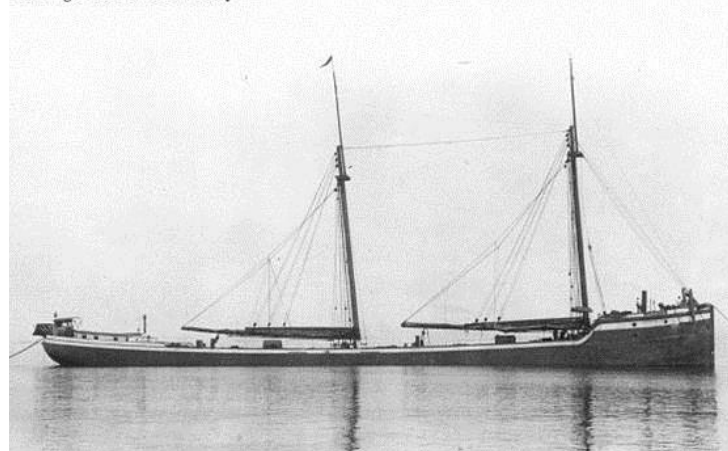
was equipped with two parallel hoppers, extending almost the entire length of the ship's hold. Beneath each line of hoppers ran a 20 in. x 150 ft. belt conveyer, which would discharge cargo on to an inclined pan-conveyer in the bow. This 45 ft. pan-conveyer carried the cargo to a belt conveyer located on a 60 ft. swinging boom, which would discharge the cargo onshore. The system was powered by a small donkey boiler located in the vessel's bow. With these improvements, *Adriatic* could carry up to 1,000 yards of stone cargo and could unload at the rate of 250 yards per hour, allowing *Adriatic* to unload its cargo in around four hours; far faster than traditional methods of unloading.

Although the vessel had been carrying cargos for the Leathem and Smith Stone Quarry since 1913, 1915 was considered *Adriatic's* first official season as a self-unloading stone barge. *Adriatic* carried cargos of crushed stone and sand for

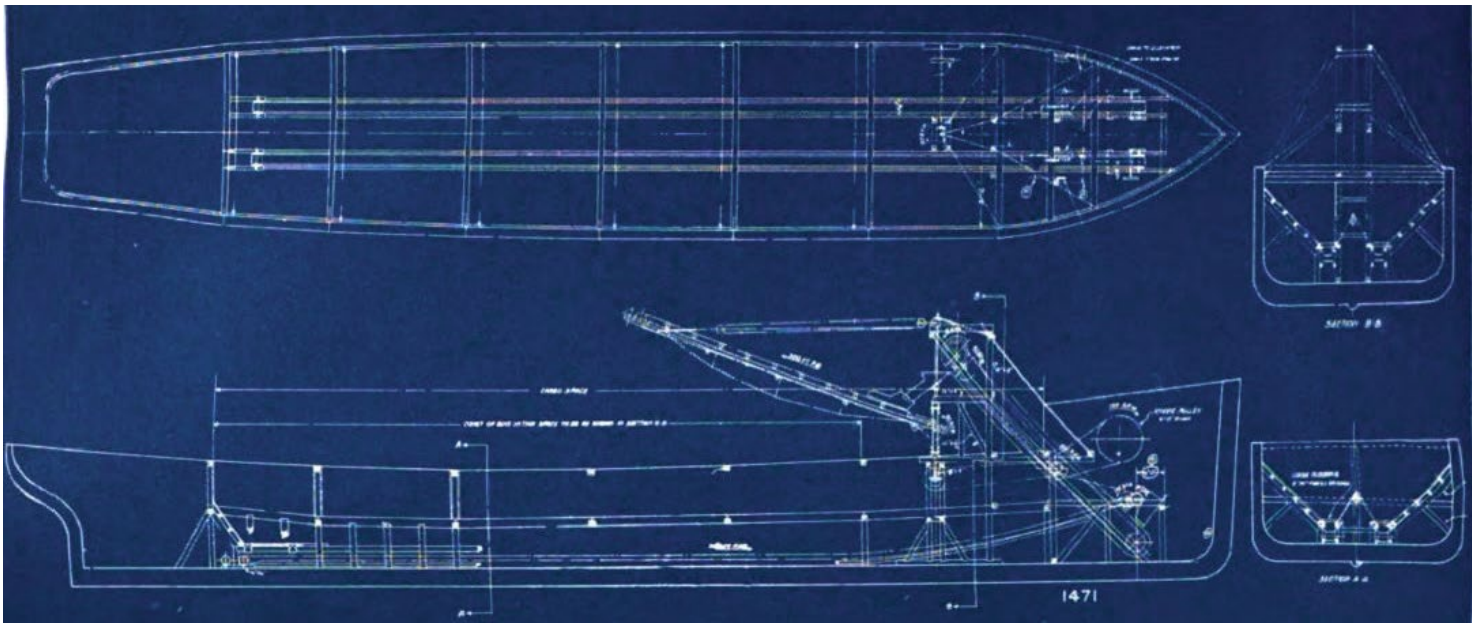
the Leathem and Smith Stone Quarry until the mid-1920s, hauling stone to ports in Michigan and delivering stone for the construction of roads along the eastern shores of Lake Michigan. By the mid-1920s, however, better technologies and shipbuilding techniques began to outpace *Adriatic* and it began to lose profitability. *Adriatic* remained in use hauling shipments of stone for the next three years as the Leathem D. Smith Stone Company continued to grow and expand, but by 1927, the aging vessel's effectiveness as a stone barge had run out. *Adriatic's* license and enrollment was renewed for the last time in November of 1927, and it was tied up at one of Smith's abandoned coal docks, signifying the end of its active service in the region. By the summer of 1930, *Adriatic* had filled partially with water and settled on the floor of Sturgeon Bay. On 24 June 1930, the ship's enrollment was surrendered in Milwaukee, listed as "Dismantled and Abandoned". In fall 1934, the abandoned vessel caught fire and burned to the waterline.

Though *Adriatic* met the end of its career in 1929, the vessel remains an important part of Great Lakes maritime history. As one of the first self-unloading vessels on the Lakes, *Adriatic* is an important link in the development of

Historical Collections of the Great Lakes
Bowling Green State University



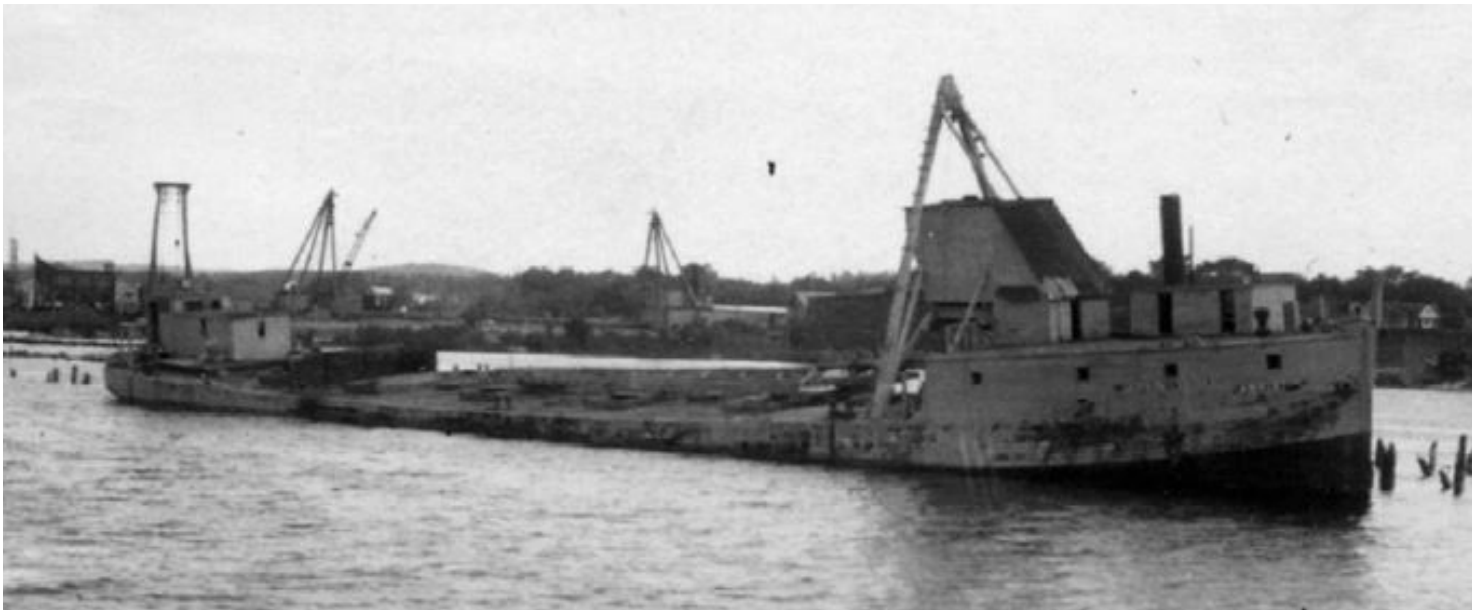
Adriatic as a schooner-barge in a consort system, loaded with cargo (Bowling Green State University).



Schematics of *Adriatic's* self-unloading machinery, designed by Stephens-Adamson Manufacturing Company (Stephens-Adamson Manufacturing Company).

shipping and shipbuilding in the region. The ship's relatively small size allowed it to access most ports along the Lake Michigan shoreline where larger vessels could not reach. Additionally, the design of its self-unloading equipment became a model for modern ship designs. These factors demonstrate *Adriatic's* importance to the development of commerce and engineering advancements in the Great Lakes region. Together,

these elements facilitated the profitability of the vessel as a schooner-barge and a self-unloader, keeping industries of the region thriving, and connecting the eastern and western Great Lakes. The development of *Adriatic's* career demonstrates historic economic trends in the Great Lakes and the broader economic atmosphere of the United States at the turn of the 20th century ■



Adriatic abandoned at Sturgeon Bay before its 1934 fire (William Lafferty Collection).

Additional reading: "Technological Innovation in Great Lakes Shipping: Leatham D. Smith and the Rise of the Self-Unloader" By: William Lafferty in "A Fully Accredited Ocean": Essays on the Great Lakes. Edited by: Victoria Brehm. Buckets and Belts: The Evolution of Great Lakes Self-Unloaders. By: William Lafferty and Valerie van Heest

PERFECTION ON PARADE



Toni Levine, M.D., of Wayne, Ill., won a gold plaque, the People's Choice award, Modelers' Choice award, and the Gordon Stiller Best Maritime Carving award for her scratch-built *HMS Atalanta* (1775). The plank-on-frame presentation of the 14-gun Swan class sloop is built to a scale of 1/4 inch equals 1 foot (1:48), making the model 30 inches long.

PERFECTION ON PARADE

The earliest representations of vessels historians have found are approximately 6,000 years old. These primitive pictures and occasional descriptions leave much room for guesswork. It wasn't until the middle of the 17th century that construction drawings, written descriptions, and detailed models provided fairly reliable information.

The art of building scale ship models was once a thriving, although small, industry. Today, only a handful of dedicated individuals continue the art, either as an avocation or as commissions. Equally rare are the once abundant ship model competitions. Yet for 43 years these elements have formed the annual Midwestern Model Ships & Boats Contest and Display at the Wisconsin Maritime Museum. This May a

total of 35 entrants arrived from Arkansas, Illinois, Indiana, Iowa, Michigan, Minnesota, Oregon, and Wisconsin.

Entries were separated into categories for scratch built, wood or plastic kits, operational, dioramas, and

nautical crafts. Master carver and full-time artist Thomas Tittl judged the latter. Fritz Drexler, Bob Filipowski, and Coleman Seskind used a point system to judge the ship models based on their individual merits. Modelers were ranked novice,



Plank-on-frame construction closely duplicates shipwright practice, creating an almost lifelike ship through a wealth of details.

A centuries-old tradition continues at the Wisconsin Maritime Museum

by Scottie Dayton
photos by Sam Parent



Every detail can be duplicated, down to the intricate figureheads from vessels.

intermediate, or advanced according to their skill level.

At the Saturday night banquet, contest co-chairs Kurt Van Dahm and Wendy Lutzke awarded seven gold, 10 silver, and 16 bronze plaques. Gold plaque recipients also qualified for nine special awards. Such was the case for three exhibitors.

Toni Levine, M.D., of Wayne, Ill., led the way with her plank-on-frame *HMS Atalanta* (1775), a 14-gun Swan class sloop built at 1/4 inch equals 1 foot (1:48)

scale. The 30- by 8- inch - wide scratch-built model received the People's Choice award, Modelers' Choice award, and the Gordon Stiller Best Maritime Carving award.

Different woods provide most of the color contrasts on the model. Levine primarily used castello

boxwood, holly for the deck and underwater hull planking, cherry for the hatch coamings, and English boxwood for some carvings and the capstan. She painted the wale using coats of diluted black artists acrylics.

"The plans for *Atalanta* didn't show the frieze details, so I borrowed the frieze from *Fly* (1776), another Swan class sloop," says Levine. She painted the decoration on paper, then glued it to the hull.

The figurehead is shown in profile on the plans, enabling Levine to fashion the bare-breasted Arcadian huntress of Greek mythology from Sculpey clay applied over a wire armature. In her left hand is one of Aphrodite's golden apples from the tree of love.

Figuring this out was crucial...If I got it wrong, everything would go down the drain.

Gus Augustin,
Best Novice Builder Award Winner

The judges selected *PT-187* (1943) for the F.K. Bemis Best of Show award and the Badger Air Brush Best Paint Finish award. Built by Bob Steinbrunn from Phelps, Wis., the heavily modified 1/4 inch equals 1 foot (1:48) scale Bluejacket Ship Crafters' kit represents the 80-foot ELCO boat as assigned to Motor Torpedo Boat Squadron 12 in the Southwest Pacific. The squadron received the Presidential Unit Citation for action in New Guinea waters from October 1943 to March 1944.

The F.K. Bemis Best of Show award and the Badger Air Brush Best Paint Finish award went to Bob Steinbrunn from Phelps, Wis., for his heavily modified *PT-187* (1943) at 1/4 inch equals 1 foot (1:48) scale. He painted the 80-foot ELCO boat in the U.S. Navy Measure 31/5p Pacific Ocean camouflage scheme.





Splash model and photo by Kurt Van Dahm.

The practicum enabled me to leave my comfort zone and...helped me move past the paralysis by analysis.

Patrick Sand, Best Novice Builder Award Winner

Besides the kit's basswood, Britannia pewter, and photoetched parts, Steinbrunn used styrene shapes, brass rod, steel wire, and three-dimensional printed parts. Extensive detailing infused lifelike qualities to the model. For example, Steinbrunn added wiring, bolts with nuts, cross braces, halyard blocks, and fasteners to the SO surface search radar mast. Torpedo tubes were detailed with bolts, rivets, weld seams, wiring, and impulse chamber handles. Even the red fire extinguisher has a cone, hose, and handles.

The paintwork, mostly Floquil brands, received the same meticulous care. Steinbrunn lightly sanded and buffed out eight coats of clear lacquer to smooth the basswood hull. Then he airbrushed the hull, engine room cover, day cabin, and chart house with a coat of Reefer Gray to highlight any imperfections.

"The Pacific Ocean camouflage scheme is the U.S. Navy's Measure 31/5p," says Steinbrunn. "I lightened the four colors with 10 percent white for scale effect, then added Reefer Gray to reproduce weathering and salt stains on the paint." The hull's antifouling bottom paint was a lightened mix of Red Oxide and white.

To create depth on small details and enhance visibility, Steinbrunn brushed them with thinned Dark Wash. Then he airbrushed the paintwork with Testors Dullcote for the desired flat finish. Lastly, he used pastel and charcoal pencils and Doc O'Brien's weathering powders to add discharge stains from bilge pump outlets and to replicate rust. Assembling the 4,027 parts took more than 19 months and 584 hours.

Sailing in from Westmont, Ill., Kurt Van Dahm's model of *Splash* (1935) at 1 inch equals 1 foot (1:12) scale won the Roger Jaekel Best Great Lakes award and the Best Racing Class Sailboat award. The 23-foot standard Sailable, built by Burger Boat Company, was used as a racer, daysailer, and short cruiser.

Owner Kurt Breuer had the original blueprints, which Van Dahm supplemented with measurements taken off *Splash* and photographs. From these, he laid up a solid hull using lifts, made a plaster mold of the plug, and duplicated it in fiberglass. "A fiberglass hull ensures the wood hull planking won't dry out and crack," he says. Van



More than 50 gold-painted boxwood carvings adorn the stern of Gus Agustin's *HMS Sussex* (1693) at 1/16 inch equals 1 foot (1:192) scale. Windows were drilled out, then cleaned up with an X-Acto knife and square needle file.



Gus Agustin of Arlington Heights, Ill., won the Dana McCalip Best Miniature award for *HMS Sussex* (1693). Most of the model is cherrywood, but the planking is boxwood. The model measures 13.5 inches length overall and has a 2.50 inch beam.

Dahm detailed the interior with frames, stringers, clamps, ceiling planks, and deck beams, then painted them and the model to match the original's 1935 livery.

The rigging is 17-strand stainless steel jeweler's wire and some jewelry fittings. Van Dahm fabricated working turnbuckles to tighten the rigging and built tripod boat stands, two forward and two aft, to mount the model.

Last year Gus Agustin of Arlington Heights, Ill., entered the lion figurehead for *HMS Sussex* (1693). This year he entered the entire model and won the Dana McCalip Best Miniature award. The 80-gun, third rate was lost in a severe storm off Gibraltar in 1694. All but two of the 500 crew drowned, including Admiral Sir Francis Wheler. The disaster seemed to confirm suspicions about the inherent instability of two-decker 80-gun ships, such as *Sussex*, and a third deck was then added for new ships of this armament.

Agustin's source for the model was Gilbert McArdle's book *Building A Navy Board Model of HMS Sussex* (1693). He reduced the plans to 1/16 inch equals 1 foot (1:192) scale, then decided how to separate the main deck to expose the gun deck's interior detailing using a functional lifting

mechanism. "Figuring this out was crucial," he says. "If I got it wrong, everything would go down the drain." In the end, lifting a bar under the case separates the hull and sliding a lever locks the mechanism in place.

Agustin carved the figurehead, two dolphin pedestals, and transom from boxwood using a Mini-Craft drill and various burrs. The stern has 50 carvings and the window mullions are wire. He mounted the model on a walnut base with a maple inlay, then built the case from 3/16-inch-thick Plexiglas trimmed with brass angle. The project took some 1,800 hours over 18 months to complete.

Patrick Sand from Libertyville, Ill., was so overwhelmed after winning a gold plaque for his revenue cutter *HMS Sultana* (1767) that his knees almost buckled when he heard his name called

for the Best Novice Builder award. Although Sand had attended the model contest before, he had never entered one until now.

Following the *Sultana* practicum by Chuck Passaro, Sand built the 3/16 inch equals 1 foot (1:64) solid hull kit from Model Shipways. "The practicum enabled me to leave my comfort zone and scratch-build everything from volutes to deck furniture," he



L-R: Special award winners Bob Steinbrunn, Kurt Van Dahm, Patrick Sand, Toni Levine, and Gus Agustin.



Patrick Sand won a gold in the novice Wood Model Kit category and the Best Novice Builder award with HMS Sultana (1767).

says. "Most important, it helped me move past the paralysis by analysis."

Having overcome his fear of failure, Sand fashioned bits, tiller arm, gratings, binnacle, windlass, bilge pumps, anchor stocks, mast coats, trestletrees, and mast caps from various woods. He used toothpicks for treenails, the ensign staff, and cap rail stanchions, then molded the cap rail volutes from Sculpey clay painted black.

Sand even simulated the correct period British flags by printing their images on Japanese washi paper. These were wetted with water and shaped. He placed a 1769 colonial half pence at the bow because it was in circulation when *Sultana* served as the king of England's tax enforcer.

"I've come to realize that great ship models are a series of skilled mistakes overcome by patience, experience, laughter, and some wood filler," he says.

The contest is supported by the Nautical Research and Model Ship Society of Chicago, Rocky Mountain Shipwrights, Midwest Model Shipwrights, Wisconsin Scale Boating Association, North Shore Deadeyes, Nautical Research Guild, River Bluffs Maritime Museum, Badger Air Brush, and the F.K. Bemis family. The longest running museum-affiliated and juried ship model competition in the nation returns on 16-17 May 2020. Check wisconsinmaritime.org or Facebook ■

BURGER® Honoring a Shipbuilding Heritage



The opening of the Burger Boat Exhibit celebrated three grand ladies: *Splash*, *Lady Isabel*, and *White Swan*. *Splash*'s owner, Kurt Breuer, shared memorabilia and family stories about her, while modelers Kurt Van Dahm, Steve Wheeler, and Richard Young recounted how they became involved with the boats.

A special event at this year's model contest opened a new exhibit featuring three scale models of vessels built by the Burger Boat Company: *Lady Isabel*, *White Swan*, and *Splash*. The models, scratch-built by Steve Wheeler, Richard Young, and Kurt Van Dahm respectively, are in the Wisconsin-Built Boat Gallery.

Wheeler was inspired to build a 1 inch equals 1 foot (1:12) scale model of *Lady Isabel* (1907) when he saw the restored 42-foot raised deck cruiser in the Wisconsin-Built Boat Gallery. "Various viewing areas obscured sight lines or distances were too great to see many details," he says. "I thought a large model placed near the original boat would give visitors an all-around view." Museum personnel accepted his proposal and the donated model, which won the Roger Jaekel Best Great Lakes award and the Modelers' Choice award in the 2018 model competition.

White Swan (1922) was built for the Oriental Mills Transit Company and named after its best brand of flour. Thomas Kirt commissioned Young to build the 1/4 inch equals 1 foot (1:48) scale model in memory of his father, Emil Kirt, the company's president in 1922. "I had been intrigued with the vessel ever since I saw a photo of her," says Young. "She had an unusual design for a Great Lakes freighter." The model is based on plans from Burger Boat and Kahlenberg Brothers and photos obtained from the Wisconsin Maritime Museum and the Williamson family.

When Kirt passed, the family donated the model to the museum.

Splash (1935), a 23-foot standard Sailable, called Manitowoc her home port for 51 years. She was first owned by Louis Scheutte, then his grandsons Ned and Richard Breuer. Now berthed in Marinette, Wis., *Splash* remains an active daysailer on Lake Michigan with great-grandson Kurt Breuer and his children at the helm.

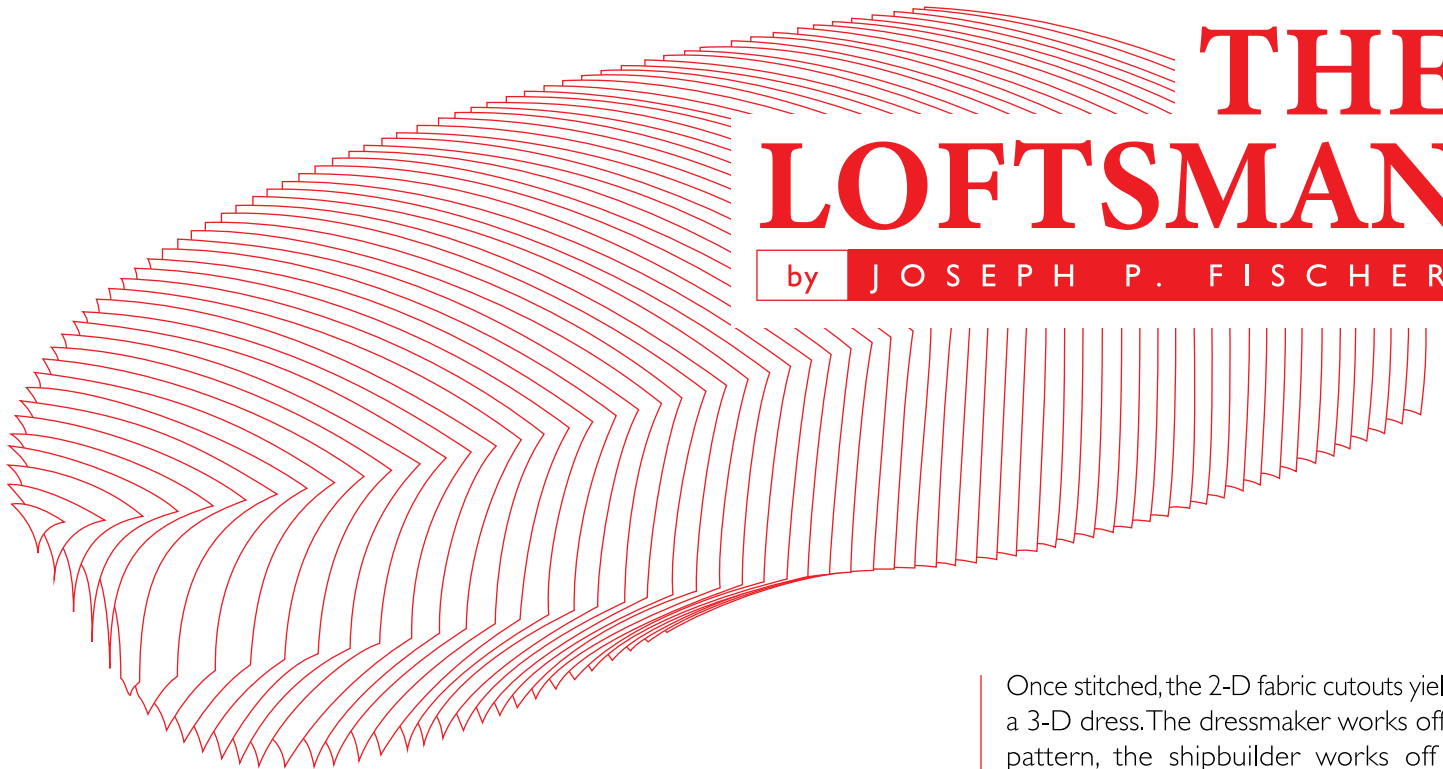
Breuer commissioned a model of *Splash* through the Wisconsin Maritime Museum, then donated it to them. Van Dahm accepted the commission for the 1 inch equals 1 foot (1:12) scale model, then visited the vessel twice. "I took tons of photos and measurements, and the museum staff provided copies of the original plans," says Van Dahm. He delivered the model to the museum in 2018.

The exhibit was a group effort between the museum staff, especially Paul Rutherford, Tiffany Charles, and Hannah Patten, and graphic designer Remington Cleve. Cleve created the panels for the reading rails and the Burger-logo wraps on the display bases.

Executive Director Cathy Green also recognized Burger Boat for being a key partner; company representative Ron Cleveringa for assisting the modelers, the Kurt Breuer family for helping to underwrite the exhibit, and Steve Wheeler and the West Foundation for their financial contributions ■

THE LOFTSMAN

by JOSEPH P. FISCHER



LOFTING

The shipbuilding loftsmen of yesterday has gone the way of the blacksmith.

In the days of “BC” (Before Computers), shipbuilders used loftsmen to take the 2-D engineering drawings and lay them out full scale on a loft floor to make templates of the ship components, that are subsequently laid on flat steel plates and marked for cutting. Flanges that will need to be bent 90 degrees have the

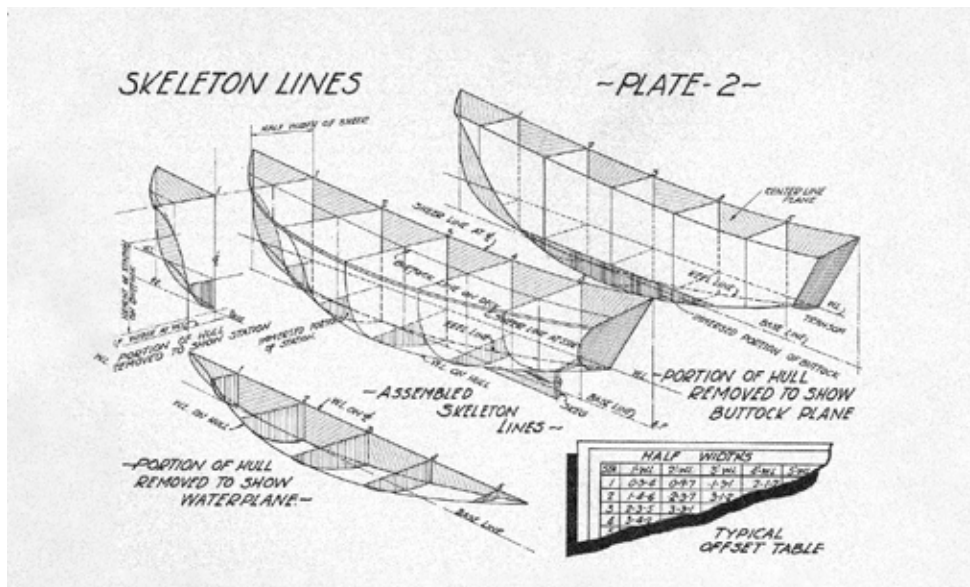
bend lines shown; other reference lines are also marked on the templates and transferred to the steel plates.

This is analogous to making a dress. A dress designer makes a 3-D sketch of what form the finished dress will take, and the dressmaker determines where the seams will go and how wide they will be. It is the responsibility of the dressmaker to create a 2-D pattern to lay out on the fabric panels, from which the material will be marked and cut.

Once stitched, the 2-D fabric cutouts yield a 3-D dress. The dressmaker works off a pattern, the shipbuilder works off a template. In shipbuilding, a pattern refers to a solid 3-D object used in a mold to make a poured casting.

The mold loft is a large space typically in the uppermost floor of a building under the rafters, where the floor space is unbroken by support posts or frames. The open space allows the loftsmen to lay out ship components full size, just as a sail loft allows the sailmaker to layout a sail full size. If the wood flooring was too rough to draw on, the floor was often covered with a thin sheet of plywood and painted a flat white.

The first step in lofting is to make a grid on the floor. If space is limited, the three views—profile, plan, and section—are superimposed on top of each other. The naval architect draws the same grid to a small scale, and often divides the length of the ship into 10 or 20 equally spaced stations for ease in fairing. A table of offsets on each station is furnished to the loftsmen, traditionally given in feet, inches, and eighths of an inch. “12-8-5” is read as 12 feet, 8 inches, and 5/8 of an inch. These offsets show, in the profile view, the height, above baseline, of each buttock plane at each station. Any



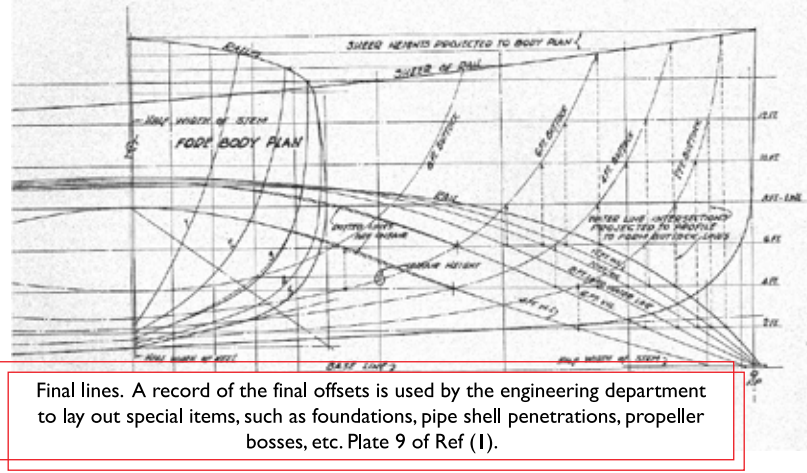
sheer of the deck is also shown, as well as the curvature of the stem and stern. In the plan view, the half-breadth (distance of the line from the centerline plane) of each waterline plane at each station is also scaled from the architect's small drawing. When these offsets are marked on the loft floor, the loftsmen sets a wooden batten on each side of the offset and anchors it in place by driving nails along its length on each side. At full scale, the curves are wiggly like a snake. The loftsmen eyes the curve and removes selected nails from the side of the batten to produce a smooth curve with minimal changes from the original offsets. This process is called fairing. The faired line is drawn directly on the loft floor. The faired offsets, on frames, are marked on a smaller batten for each waterline and transferred to the body plan. Any changes to the shape in one view changes the shape in other views; a reiterative process occurs until the offsets are the same in all views and are smooth—or fair—to the eye. The naval architect defines the hull shape via stations, while the shipbuilder constructs via the vessel smaller-spaced frames. Having the different views superimposed on top of one another results in a complex view of interwoven lines, and each line must be identified to distinguish one from another. See Plate 9 of Ref. (1). A table of faired offsets is made for the

record, and a copy is also returned to the engineering department, so that subsequent drawings can be made as accurate as possible.

This fairing process for an average vessel can take a crew of four to six loftsmen up to six weeks to complete. Hulls with more shape and complex curves can take longer. The final shape is usually reviewed by the naval architect to confirm that the resulting shape is what he intended. See Plate 2 from Ref. (1).

The loftsmen's tools comprise a carpenter pencil with a sharp chisel edge, knife, hammer, folding rule, tape, marking pen, and chalk line. He usually has pockets sewn into the knees of his trousers into which rubber pads can be inserted to relieve the load on his knees, as much of his time is spent on the floor on hands and knees. Other tools used in the mold loft are shown in Plate 4 of Ref. (1).

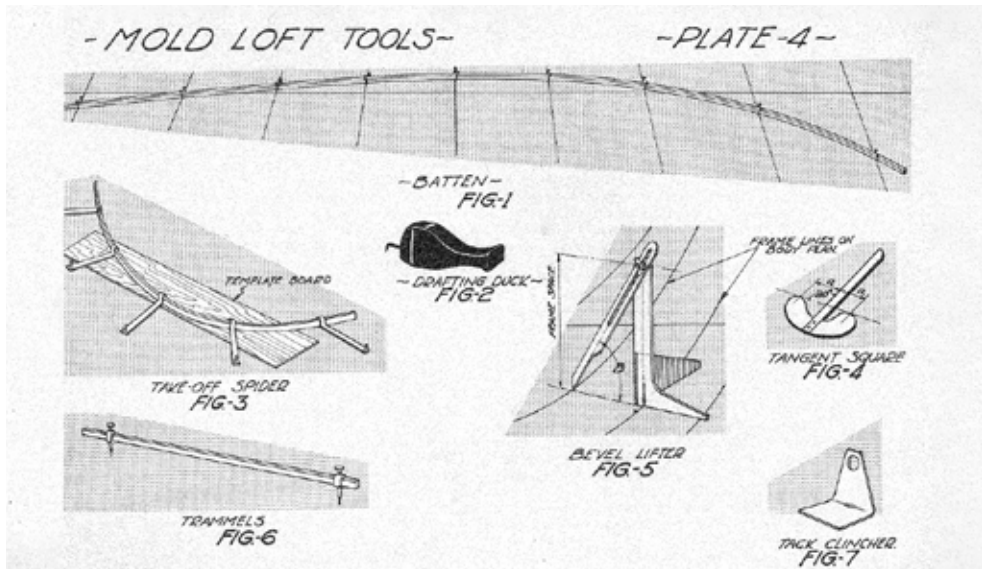
Once the final lines are marked on the loft floor, templates of the flat parts of the vessel are made according to the drawings furnished by the engineering department. Flat pieces can include frames, bulkheads, and decks. Templates

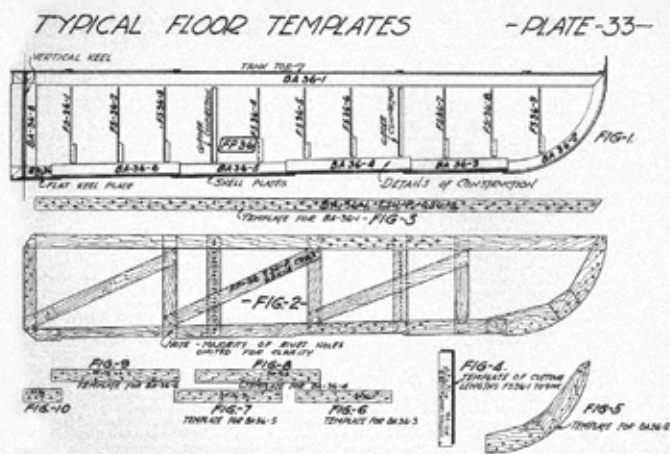


are made of wood (typically 6-inch and 8-inch basswood about 3/8 inch thick) or tough paper, often a red, resin paper about 10 feet wide that will maintain its shape even with wide ranges of temperature and humidity. Wooden templates have the shape marked and are cut by a band saw, then planed by hand to attain the proper shape and nailed together to form the final template. The wood is lapped and fastened using square clout nails that are slightly longer than the two layers of wood. A steel clinching plate is placed under the wood. A typical template for a floor plate (a transverse, vertical bottom frame is called a "floor") of a riveted hull is shown on Plate 33 of Ref. (1).

The flat components of the vessel—frames, decks, and bulkheads, for example—are the easy parts. The vessel's curved shell plate is much more challenging at every stage. The curved part of the hull is divided up, much like an orange peel, to be curved like a cone or cylinder. The engineering department uses a wooden half model, painted in a flat white to mark stations, frames, bulkheads, and decks.

The largest steel plates are laid out on the model, allowing for the actual rolled plate to be trimmed with minimum waste; seam (longitudinal) and butt (transverse) joints are marked directly on the model as well. Sheets of paper are laid along the curved surface to ensure that the plates can be rolled in one direction only. The plates are made smaller; with more seams and butts to avoid backset (double curvature). See Plate 25 of Ref. (1)





MODERN SHIP PRODUCTION

Today, software—Shipconstructor, for example—takes the offsets, on stations, as input data and fairs the lines. The faired lines are imported to other computer programs to calculate the hydrostatic characteristics (displacement, stability, flooding, tank capacities, etc.) of the hull. A 3-D model is created and all structural details are input into the model. In addition to the structural components, plans for piping, duct work and electrical wire ways are added to the computer model. This eliminates interferences during the vessel's construction and allows the builder to generate accurate bills of material for structure, piping, and wires. The hull is divided into sections and 3-D sketches are developed for each erection section, showing its weight and center of gravity. This aids planners in lifting operations and ensures adequate crane capacity. Piping runs, or spools, can be drawn in, allowing for parts of the piping system to be cut and assembled in the shop with confidence in proper fit. In the days of manual lofting, stock, usually 2 inches of added length, was added to one end of each section and trimmed on the berth to make the final assembly. The computer lofting has sufficient accuracy so that stock can be eliminated and the parts can be cut neat. Equipment and machinery is added to the model to show clearances for operation and maintenance. Some software programs allow a virtual walk-through the vessel to show how it all fits together. It's not your grandfather's mold loft anymore!

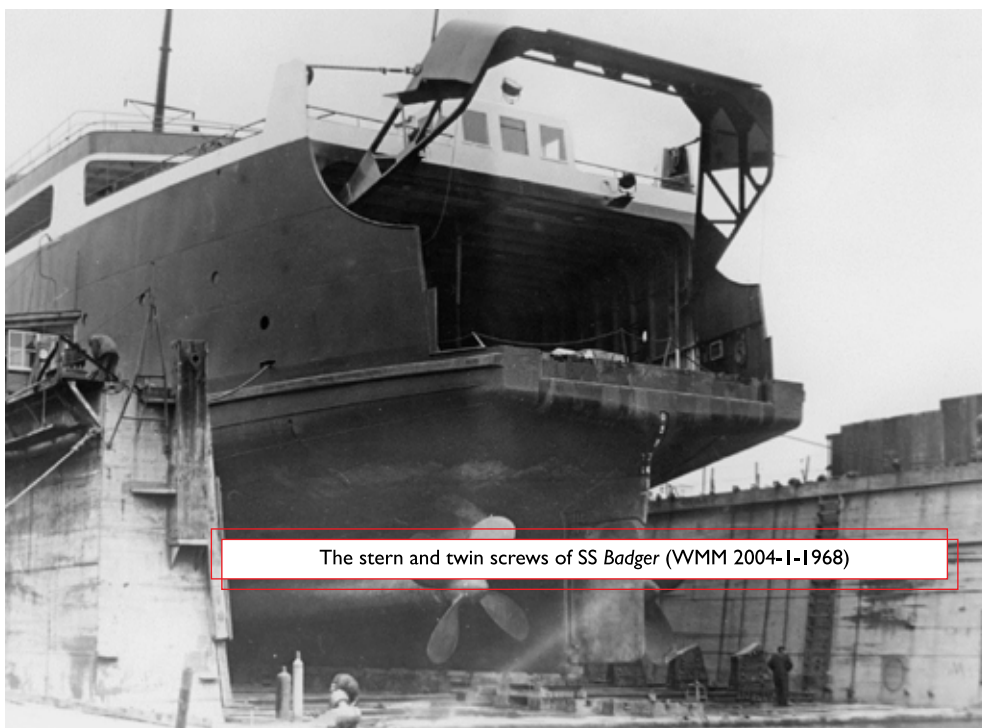
LOFTING SS BADGER

In 1949, Christy Corporation (now Fincantieri Bay Shipbuilding) of Sturgeon Bay, Wisconsin, signed a contract with the Chesapeake and Ohio Railway to build two car ferries. The construction time was tight and lofting was on the critical path to completion. The ships could not be outfitted until the steel was fabricated; the steel could not be built until the templates could be lofted; the templates could not be made until the lines were faired. With much on the line, it was decided to operate the mold loft around the clock, five days a week. At age nineteen, I was promoted to supervisor of the mold loft on the 3rd shift, from midnight until 0700.

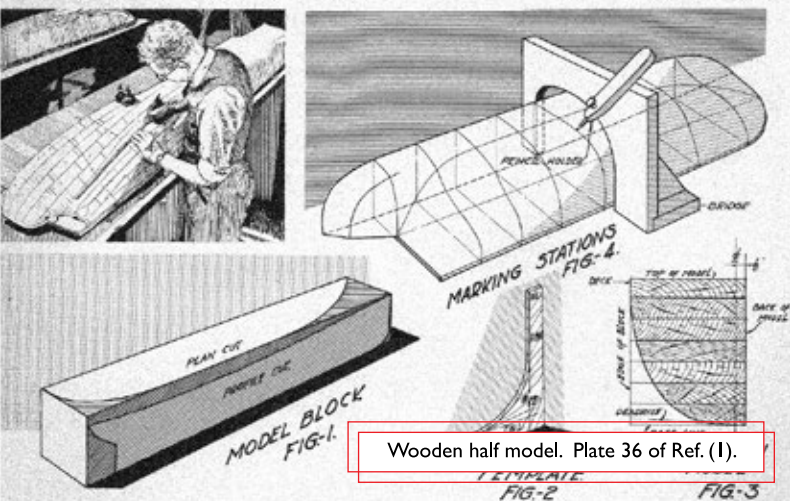
I was a recent graduate of Sturgeon Bay High School—Class of 1947. I was still a minor when applied for a job at Christy Corporation, the local shipyard.

I was told that at age 17, I was too young to work in the yard because of insurance rules, but I would be permitted to work in a restricted area—the mold loft. Even in this department, I would not be allowed to operate any power tools, such as saws, planers, etc. I had been a model airplane buff in high school, and I took to lofting right away. Some of my first projects were lofting a small passenger boat for use in Wisconsin Dells, two towboat for the US Army Corps of Engineers, and the first integrated tug and barge—the *Carport* and *Gi*.

I found lofting a welded hull fairly easy. The plates are butted together and welded. The *Badger* and *Spartan* were to be riveted—this was a whole new ballgame. The car-ferry design had clinker plating on the bottom shell, and inner and outer plating on the bilge and side shells. The bilge plate and the sheer strake (uppermost strake at the main deck) were both inner strakes. Christy Corp. used liners (a flat bar spacer on the frame) to make up the distance between the frame and the plate. If the adjoining plates were of differing thicknesses, the liners were heated and tapered in the plate shop. Bottom floors and transverse bulkheads had a bounding angle with one flange riveted to the vertical—or transverse frame—and the other flange riveted to the shell plate.



The stern and twin screws of SS *Badger* (WMM 2004-I-1968)



Wooden half model. Plate 36 of Ref. (1).

The deck was fastened to the shell by a similar bounding angle. The sheer strake at the top had to extend higher than the bounding angle, so that the angle could be “caulked” to the plate to make a watertight connection.

I was amazed to discover the ductility of steel. For example, if one punched a double set of holes in each flange of a bounding angle, a 40-foot-long angle would elongate by several inches. It would not match the holes punched in the adjoining plate even though they were lifted from the holes in the plate. Having two ships to build simultaneously saved the day. When the matching plate or angle was beyond fitting up, one of the parts was removed and saved for the second vessel and its rivet spacing could be lifted and transferred to its mating part. I spent a large part of my time identifying which parts were to be saved for the second hull.

Badger and *Spartan* are powered by twin screws, supported by a boss (a circular bulge holding the shaft bearing) with the shaft covered inside the hull. The propeller bearing is held in place by a steel casting, which holds the bearing and is part of the shell plate. I was responsible for laying out the propeller boss on the mold loft floor. Two large castings—opposite hand—were to be made for each ship. Patterns for the casting were made at a pattern company in Conshohocken, Pennsylvania; the castings were fabricated at Sun Steel Casting Company in Chester, Pennsylvania. At nineteen, I made my first business trip—I was sent to check the pattern against the lines of the hull before the casting molds were made.

I learned that a steel casting shrinks as it cools. The pattern was made oversize to compensate, a quarter inch

per foot. The pattern makers had “shrink rulers” which, while marked as an ordinary rule, were longer to allow for the shrinkage.

The layout on our mold loft floor was duplicated on a floor in the pattern shop, only to the shrink rule measurements. I checked critical dimensions on the floor from offsets that I had recorded. With the 3-D wooden pattern suspended above the floor, I checked that critical points on the pattern projected onto the proper lines on the floor by use of plumb bobs. The pattern was correct; the molds were made; castings poured. Everything fit.

My career as a loftsman was interrupted by the Korean Conflict. Shortly after my 21st birthday, I was drafted into the US Army in June, 1951. SS *Badger* and SS *Spartan* were completed in 1953, while I was in the service.

Insight into the shipyard contract for the *Badger* and *Spartan* can be found in the chapter, “Christy Corporation”, in Ref. (3) ■

¹ Rabi, SS “Ship and Aircraft Fairing and Development”, Cornell Maritime Press, 1985

² Halliburton, Alfred C. “Mold-Loft Work”, International Textbook Company, 1940

³ Christianson, Carl Raymond, “My First Seventy-Two Years”, 1975a



Launching of SS *Badger* (WMM 2007-34-5409)

1

Items from the wreck of the *Grace A. Channon* on display in the Underwater Treasures Gallery.

2

Griddle made of scrap submarine steel, part of the Wisconsin Maritime Museum's collection.

3

Aerial view of Custerdale, the housing development built for shipyard workers at the Manitowoc Shipbuilding Company during WWII. Part of the Wisconsin Maritime Museum's photographs collection.

Please do not bring any materials to the Museum without prior appointment with the Director of Collections. Guest services staff cannot accept any donations at the front desk.



BELOW DECK

NEWS FROM THE COLLECTIONS VAULT
BY TIFFANY CHARLES,
DIRECTOR OF COLLECTIONS

In Praise of Otherwise Ordinary Objects

Museum objects are physical representations of the past, they serve as a window into the lives of the people who used them. But museum objects are often things that were intentionally saved; rare and unusual objects and objects related to important historical events and people. Because these objects were deliberately kept and preserved, they represent the values of people in the past and what they thought was important.

But what about the things we may not think are worth keeping? The everyday things that were so common no one would have thought they were important enough to save, items that languish in attics and the backs of closets. We also seek to collect the seemingly mundane items that were a part of everyday life. These otherwise ordinary objects are special because they both give us a glimpse into what everyday life was like in the past, but can also illuminate the lives of individuals in a way history books cannot.

The Wisconsin Maritime Museum's collection includes many such items that have inadvertently entered the historical record. Featured in the new *Unknown Traveler* display in the

Underwater Treasures Gallery are items that were found in a suitcase on the wreck of the canal schooner *Grace A. Channon* that sank off Milwaukee, WI in 1877 while sailing towards Chicago. Several personal items were found in the suitcase including buttons, a hairbrush, hairnets, a sewing kit, a folding ruler, and a pen.

These ostensibly insignificant personal items serve as a snapshot into the life of the individual who owned them. What was her journey like? Was she traveling alone? Was she excited? Nervous? Perhaps the owner of the suitcase was a seamstress heading to Chicago for work. These types of objects allow us to imagine the answers to these questions and make a more intimate connection with the past.

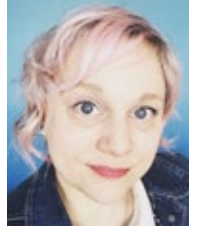


This griddle is another seemingly ordinary object. The griddle was made out of scrap submarine steel by a welder who worked for the Manitowoc Shipbuilding Company during WWII. The welder's wife used the griddle for years to cook meals for her family. The welder's

son donated the griddle to WMM many years later after it had sat unused because his own wife found it too heavy.

Without knowing the particular origins of this griddle, it would seem perfectly ordinary when in actuality it is one-of-a-kind. The griddle is also representative of larger scale societal

issues occurring at the time. Because metal was needed to build submarines and other items for the military, many everyday metal items like kitchen utensils and appliances became hard to find. This griddle is then also an example of the ingenuity of those on the homefront during WWII.



A recent donation similarly connects an individual experience with larger historical events. Doris Juenger recently donated a copy of her family's home videos. Doris's father, Floyd Beibel was a pattern maker who worked for the Manitowoc Shipbuilding Company during WWII and recorded many of the home videos included in the donation. The videos include footage of Custerdale, the housing development built for shipyard workers at the Manitowoc Shipbuilding Company during WWII, the Goodyear Blimp at the 1930's Chicago World's Fair, and Niagara Falls in 1934. These videos are literally from the perspective of someone experiencing these historical events in real time. This is a point of view that could not be captured in any other way



Tiffany Charles is the Director of Collections at the Wisconsin Maritime Museum. She can be reached at (920) 684-0218 x111 or tcharles@wisconsinmaritime.org.

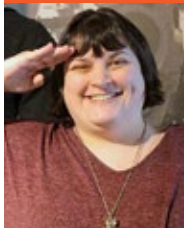


COBIA CORNER

USS COBIA NEWS
BY KAREN DUVALLE,
SUBMARINE CURATOR

1

Female employees from the US Navy Civil Service Office in Manitowoc during WWII.



Family Photos

In the spring 2017 issue of *The Anchor*, a photo was published that our Collection's team had received from the Door County Maritime Museum. The caption asked if anyone could identify the women in the photo. When the new issue arrived at the museum, I flipped through it, as I usually do, and that photo caught my eye. There was one lady that looked familiar to me. After staring at the photo for a while I couldn't shake the feeling that it was my maternal grandmother!

I never knew my grandmother, Lauretta Bourgeois Beitzel. She unfortunately passed away while shopping with her husband and two young children waiting in the car. My mom was just six years old at the time. My mom has also been gone for several years, so figuring out this mystery was not very easy.

I asked my eldest brother first. He's been collecting and digitizing all our old family photos. He had never seen this photo, but also thought she looked

like she could be our grandmother. He even thought the lady behind our possible grandmother was her sister, Ruth Bourgeois Ahearn! With that clue, I reached out to my mom's cousin, Mike, who was Ruth's son. He passed it on to his sister and she confirmed that it was their mother Ruth. We all concluded that, indeed, this was Lauretta and Ruth in the photo!

None of us ever knew that Lauretta and Ruth worked for the US Navy Civil Service Office in Manitowoc. All I ever really knew of my grandparents were that they were married after my grandfather returned from WWII. PFC George Beitzel served in the Army during WWII. He also died before I was born and no one ever knew what happened to the medals he earned during his service. Because of my interest in WWII and wanting to connect with my grandparents, replacement medals now proudly hang in my home. This photo now gave me a connection to the

grandmother I never met. But, the story doesn't end there.

Just a few months ago, my brother started working on the family photo project again after taking some time off from it. He came across a cd of photos from Cousin Mike's side of the family. Mike's wife had also worked on the family history. On that cd was The



1

Photo and also a copy of the back where all the names were written! My brother and I were so excited. Not only had we found definitive proof of Lauretta's and Ruth's identities, but we also had the names of all the other women in the photo! It took nearly two years, but the mystery was solved ■

2

A list of names on the back of the photo.

1st. Row Grace Boyle, Louetta Bourgeois, Helen Lakelly, Agnes
Abbrandt
2nd. Row Esther Rozinsky, Blanche Huske, Esther ~~Abbrandt~~ Midol,
Dorothy Mac Cabe, Eleanor Huske, Rosemary Huske,
Virginia Ziarnik
3rd. Marie Onloph, Betty , Jeanette Rochon, Ruth
Bourgeois, Barbara Cooper
Standing: Mabel Branchoud, Jane, Barbara
Fabera, Arlyll Cutworth, Helen Jeske, Arbatas

2

1

Intro panel encompassing the mission of the pop-up exhibits and our 50th year as a whole

2

In celebration of Black History Month, we opened *African Americans in Wisconsin's Maritime Landscape*

3

Ladies of the Lake: Wisconsin's Women & Their Maritime Influence asked visitors to "see maritime history from a female lens...to witness [the] indomitable strength, undeterred heroism, and tireless perseverance."

4

Indigenous Waters features an incredible dugout canoe, on loan from the Menominee Indian Tribe Cultural Museum

THE CURRENT

EXCITING EVENTS & EXPERIENCES
BY ABIGAIL DIAZ,
DIRECTOR OF EDUCATION

And 50 more...

As the Museum started thinking about its 50th Anniversary this year, we considered where we came from. In 1969, a group of civically-minded people founded the Manitowoc Submarine Memorial Association in the hopes of celebrating the area's submarine-building heritage. In the five decades since then, we've grown to be one of the largest maritime museums in the Great Lakes.



Throughout the year, three pop-up exhibits would be planned that would each highlight a different perspective that have been historically overlooked on the maritime landscape. We wrote a single panel, *Connected by Water*, that would remain up all year. The Wisconsin Maritime Museum is an

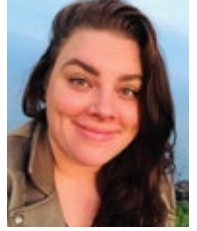
institution for all people and as such, we embrace the opportunity to share these tales of achievement, bravery and perseverance."



These pop-up exhibits showcase our commitment to do better. For example, we hope to expand *Indigenous Waters* to a full, permanent exhibit in the upcoming years. To do this, the Museum needs to form authentic partnerships with Wisconsin's American Indian nations and tribes. We recognize that the authority and agency belongs to them and we aim to amplify their voices in our galleries.



Putting together three pop-up exhibits in just a few months is no small feat. Though the Exhibits Team pushed forward these initiatives, I'm proud to say that diversity, inclusion and accessibility are supported institution-wide. Within our individual departments and as a museum, we will continue to highlight new voices and forgotten history while always remembering that water truly does connect us all. These individuals stories, like the tiny tributaries across our region, come together to create a larger epic narrative of American ingenuity, perseverance and courage. The waters are gathering at the Wisconsin Maritime Museum



New Website!

- Reserve tickets
- New Programs Calendar
- Submit research requests
- Order prints from our archives
- Renew Membership

New Faces!

The Museum is thrilled to welcome four new staff members!



EMILY SHEDAL
Education
Coordinator



ANGIE LUEVANO
Education
Coordinator



GREG LUTZ
Education &
Programming
Intern



CAITLIN SEGUIN
Special Events
Coordinator

Abbie Diaz is the Education Director and at the Wisconsin Maritime Museum. She can be reached at (920) 684-0218 x 115 or adiatz@wisconsinmaritime.org.



MEMBER'S LOCKER

AS OF JULY 2019

Welcome New Members!

Cindy Carter
Butch Drumm
Dave Greenwood
Mark Hamann
Erik Hilke
Ned & Carol Jerabek
Beth Kaylor
Mike LeClair
Douglas Lloyd
Richard Loppnow
Allen Siegel
Phillip Simila

BECOME A MEMBER FOR LESS THAN \$1 A WEEK

\$50
year

BASIC INDIVIDUAL MEMBERSHIP

- Free Admission - Unlimited Visits Per Membership Year for Member
- 10% Discount in Museum Gift Shop
- Invitations to Exclusive Member Exhibit Openings
- Invitations to Museum Travel Program
- Invitations to Annual Member Events
- Free Admission to Select Programs and Ticketed Events
- Monthly Email Newsletter
- PDF Version of "Anchor News"
- 10% Senior Discount

CORPORATE FLEET MEMBERSHIP

6
tiers

KAYAK, CUTTER, MACKINAW, SCHOONER, WHALEBACK & CLIPPER

Corporate members enjoy the dual benefits of contributing critical operating support for the nationally-recognized work of the museum while gaining exclusive benefits for their employees, clients and executives.

All Corporate Members have the privilege of requesting a private tour of the Museum and Submarine with the Museum's Executive Director.

Corporate Fleet, Spring/Summer 2019

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CliftonLarsonAllen LLP
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City Centre LLC

CUTTER (\$500)

Heresite Protective Coatings LLC
Burbey CPA, LLC
Kahlenberg Industries
Schaus Roofing & Mechanical Contractors
The Leede Research Co Inc
Ansay & Associates LLC
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McMullen & Pitz Construction Company

KAYAK (\$250)

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Michael Best & Friedrich LLP
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UPCOMING EVENTS

Smithsonian Saturday AUGUST 3

Watch a featured Smithsonian Channel documentary on a variety of topics on Smithsonian Saturdays. Free with admission.

Family Overnight AUGUST 3

Spend the night aboard our real World War II submarine! \$44/person.

ROVs At The Library AUGUST 7

Did you know archaeologists use robots to explore shipwrecks? Build and test your own ROV at the library. Free with registration through library

Educator Open House AUGUST 8

Before the school year kicks off, we invite teachers to join us for a free drink with our Education staff. Free.

Sensory Storytime AUGUST 12

Join the education staff for an interactive storytime that is suitable for sailors of all abilities. Free with admission.

Cigar Smoker AUGUST 14

Join us on the roof deck for our 5th Annual Cigar Smoker with food, drinks, entertainment and more! Tickets required.

Saturday Learning Series AUGUST 24

Our Saturday Learning Series presents lectures, workshops, movie screenings and more on a regular basis. \$5, free for members.

Subpub Nights TUESDAY – THURSDAY, Memorial Day to Labor Day

The museum's roof top bar, Sub Pub, offers great views and local brews in addition to a full bar. Free.

Visit www.wisconsinmaritime.org for updates on all of our activities.