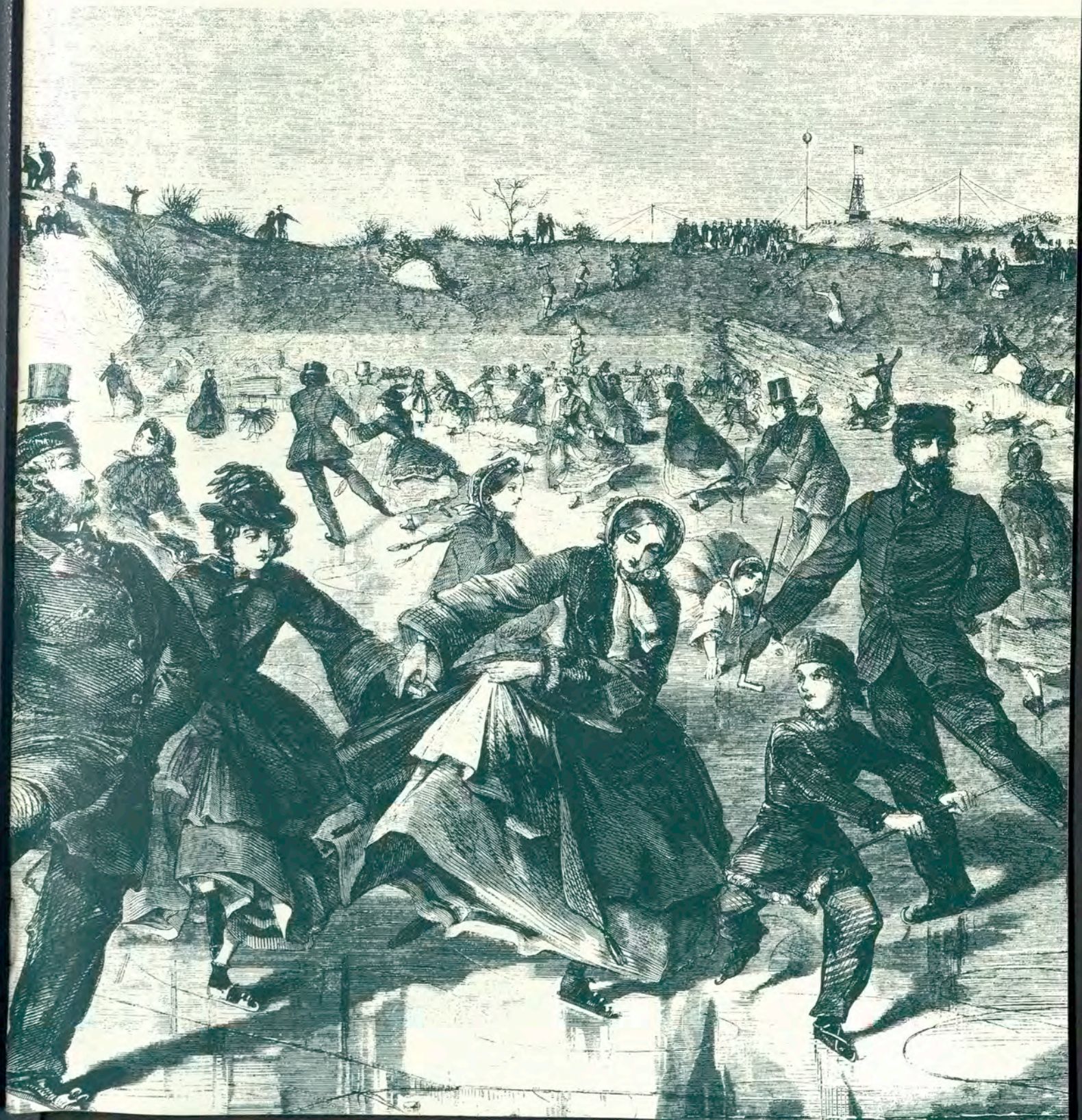
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Winter
1996

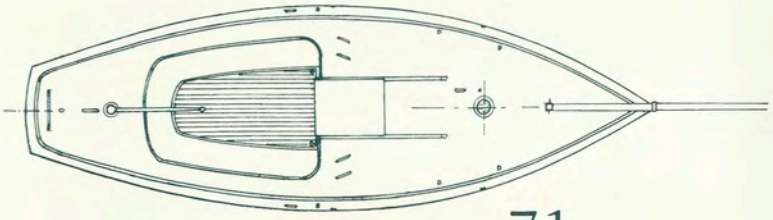
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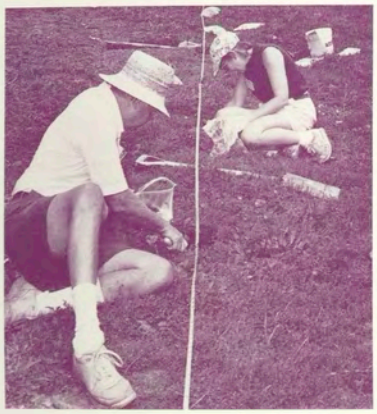


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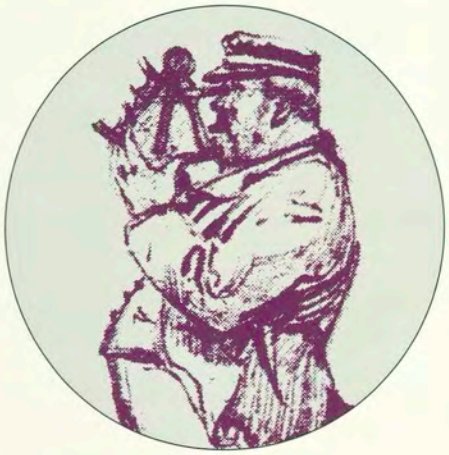
Submissions of previously unpublished articles and illustrations concerning non-naval aspects of the American maritime experience are welcome. Editorial guidelines are available from the Publications Department. *The Log of Mystic Seaport* is abstracted in *American History and Life* and *Historical Abstracts*.

Sightings

Museums are by nature "collecting institutions." History museums have a unique role to collect, preserve, and exhibit or provide research access to objects (and documentary texts or images) creating a link with people of another era. Through such collections, visitors and scholars can gain an understanding of past decades, centuries, or millennia. For some, this physical or intellectual interaction with the collections provides a perspective from which to address the challenges of our own time.

A museum normally continues to build and refine its collections to better serve its visitors and users. At Mystic Seaport we pursue this effort in virtually every area of our collections. Since recognizing almost twenty years ago that a select group of members desired to establish special ties with specific areas of the Museum's collections, staff and Trustees have worked to provide opportunities for those with a particular commitment to demonstrate their affinity by belonging to special groups.

In 1981 our then Librarian–the late Jerry Morris–organized the Fellows of the G.W. Blunt White Library to strengthen the Library's collections and endowment. The 55 current Library Fellows come from a wide variety of backgrounds, but they are united in their concern for the Library and their interest in advancing its goals. The Fellows support the work of the Library through dues, contributions, and participation in events that provide special experiences for them while helping the Library. Their dues are applied to current purchases, conservation projects, and activities. The Fellows have also been instrumental in building the Library's endowment. Library users already benefit from



the Fellows' sponsorship of the computerization of the card catalog, and Museum members are exposed to the good works of the Fellows in encouraging research through their support of the annual prize article contest in *The Log*.

Recently, there has been an important change in this special interest group. Acknowledging that many individuals with a more general interest in the Library could not participate to the same degree as the Fellows, we have created a group called Friends of the G.W. Blunt White Library. As a "Friend," someone who uses the Library regularly or wants to show support for this important aspect of the Museum's work can pay modest annual dues and know that they are joining with others to endorse and encourage the efforts of this fine Library.

With the successful Fellows of the Library program demonstrating the possibilities, a number of people asked if we could establish an organization to permit them to express their enthusiasm for Mystic Seaport's collections of art and objects. Staff, Trustees, and other members of the Curatorial Committee responded to this concern by creating the Friends of the Collections of Mystic Seaport. While the Museum has fine collections, certain voids or weaknesses inhibit our efforts, especially as we work to tell more fully the story of America and the Sea. Our curators are now identifying key works or objects needed to give our collections the comprehensive American maritime character they must have. Friends of the Collections will assist with the acquisition of works of art, prints, photographs, or other objects that will enhance the Museum's collections. As a secondary mission, they will help support the restoration of art and objects. Those involved will have the satisfaction of participating in a critical aspect of our work. Like the Fellows of the Library, the Friends of the Collections will also experience the enjoyment of unique opportunities behind the scenes with our collections, at other museums, and in distinguished private collections.

Mystic Seaport has evolved over the years through the commitment of many friends and members, who have applied their minds and their funds to help make it a great museum. To continue these efforts, the Fellows and Friends of the G.W. Blunt White Library and the Friends of the Collections of Mystic Seaport now provide new opportunities for involvement. Mystic Seaport will become a stronger Museum through their special emphasis on the collections that form its core.

J. Revell Carr

DIRECTOR

Historical Archaeology *at* Mystic Seaport, 1996

Part I

HAROLD D. JULI, PH.D.,
PROFESSOR OF ANTHROPOLOGY, CONNECTICUT COLLEGE

In 1837, three brothers, George, Thomas, and Clark Greenman purchased twelve acres of land in Mystic to establish their shipyard. Part of the land included a house that the brothers used, briefly, as their residence. In late 1838, they sold the house, and moved next door—into a new home that was recently built for them and subsequently became the permanent residence of George Greenman. After a series of owners, the brothers ended up buying back their original home, only to sell it to David Langworthy in 1852. For the next thirty years, the Langworthys operated a boardinghouse at this location; most of their boarders were men working in the Greenman's shipyard. Today, both of these properties are on the Mystic Seaport grounds.

At present, the Museum is planning to restore and interpret the George Greenman House and the Langworthy House as a new opportunity for visitors to learn about Mystic Seaport's history. An archaeological study prior to the restoration and exhibit preparation has the potential to develop new information about several aspects of these properties, with particular emphasis on below-the-ground or "subsurface" remains of family life associated with the homes, and information about nineteenth-century use of



During the summer, Mystic Seaport offered three tours per day of the archaeological site. Staff from the Museum's Interpretation Division alternately participated in the excavations and led the tours in order to provide visitors with up-to-date and detailed information. (Jennifer M. Stich photo)





space, plantings, gardens, and landscape history.

In the 1930s, archaeologists in the U.S. began to turn their attention to the material and architectural remains of seventeenth-century, colonial, and nineteenth-century Euro-American life[1]. As a consequence, this period gave rise to historical archaeology as a means of learning about the past; the discipline's development paralleled that of American archaeology's primary focus—the sites and remains of native prehistory.

In one of its earliest manifestations, historical archaeology was used in the 1930s at Colonial Williamsburg as a technique to discover architectural remains—principally the surviving below-ground foundations of structures in Virginia's eighteenth-century capital[2]. While the discipline subsequently developed in a number of directions, the use of archaeology in the reconstruction and interpretation of domestic architecture, domestic lifeways, and the study of small-scale domestic landscapes, has been a continuing tradition within the field. This approach has been used in several regions to study sites ranging from rural farms[3] to the homes of wealthy elites.[4]

In New England, in particular, the historical archaeology of domestic life has been addressed in a variety of studies from the sites of African Americans in Massachusetts[5], to the archaeology of a nineteenth-century boardinghouse in Lowell, Massachusetts.[6]

Thus, the archaeological project on Mystic Seaport's properties, associated with the Greenman family's domestic life and the adjacent Langworthy boardinghouse, has the potential to develop a previously unknown body of information on the various nineteenth-century activities that occurred at these sites.

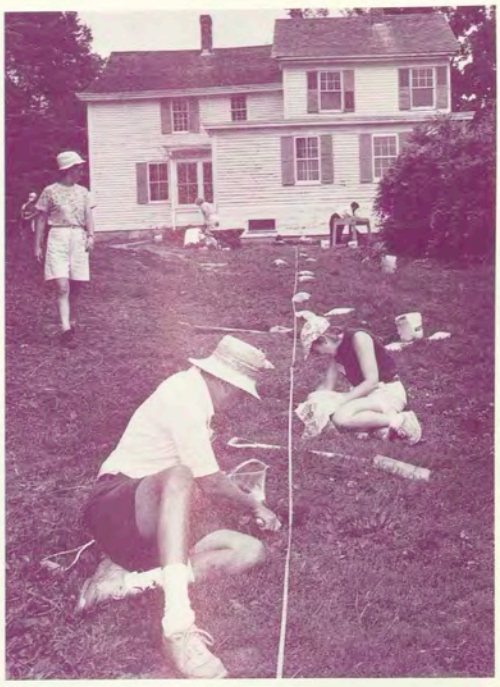
Built in 1839 in the Greek Revival style, the George Greenman House was occupied as a domestic dwelling that underwent alterations and additions toward the end of the century, including the addition of a large front porch, a second-story ell, and a two-story ell added to the back of the house.

The landscape at the rear of the house

Left: Outfitted with the basic archaeological equipment of trowel, bucket, whisk broom, and dust pan, staff and volunteers scrape down the surface of the soil in even, flat layers within their units. Other tools of the trade include pruning shears and axes for cutting roots, and dental tools for extremely fine excavation work. Soil is removed into buckets, and sifted (a sifter located in the left background) for small finds. All recovered objects are placed in a plastic bag that has been labeled with the exact location. Each person keeps accurate field notes for every unit, denoting finds, and stratigraphy—layers of soil distinguished from each other by color and texture variations. (Jennifer M. Stich photo)

Right: The yield from a particularly abundant unit in the front yard of the George Greenman House. From top to bottom: an assortment of nails, glass, pipe stems, ceramics, and a bottle top. At the bottom is an ornate clay pipe bowl. Pipe stems are dated by the measurement of the diameter of the interior hole; older pipes have larger holes, and as time progressed, the hole became increasingly smaller. A simple drill bit is the best measuring tool for these stems. (Jennifer M. Stich photo)





Left: Professor Harold Juli discusses the location of the bone deposit with staff and volunteers. Every morning, excavation participants received a briefing on recent progress and goals for the day. (Jennifer M. Stich photo)

Right: Volunteers dig small test units in carefully measured intervals to retrieve soil for analysis in the back yard of the Langworthy House. The soil is placed in a labeled plastic bag for analysis. (Jennifer M. Stich photo)

contained several outbuildings. One, of unknown function, exists today as an overgrown foundation, and another building, ca.1850, still stands. It is believed to have been used as an office and garden shed. The rear of the property contained a barn and shed, built in 1868, that burned in 1886; a second barn constructed on the site of the first, came down in the 1938 hurricane, leaving only part of the barn's foundation.

The property also includes landscape features relating to historic activities such as a garden, lawn, planting beds, trees, fences, and walkways. Several of these features may date to the nineteenth century, although others, such as fencing, may be of recent vintage.[7]

The second property, the David Langworthy House, is directly south of the George Greenman House along Route 27 (Greenmanville Avenue). This house is thought to have been built in 1820 as a single-family home in the one-and-a-half-story Cape style.

During the 1850s, the house was raised and a new first story was built underneath the original. A two-story addition was added to the south side, as well. The structure was used as a boardinghouse for shipyard workers from the 1850s to the 1880s and subsequently as a single family home.

At present, the property at the rear of the house consists of a highly eroded downward sloping "backyard" that has visible evidence of coal ash washing out of subsurface deposits—very likely the remains of nineteenth-century dumping activities.

The foundation of a nineteenth-century barn, heavily overgrown prior to the project, is also situated in the rear of the property, along with plantings that are either part of the site's historic landscape, or recent additions.[8]

Using a variety of archaeological techniques, we investigated several areas in the front and rear yards of the homes, with the most intensive work focusing on outbuildings and landscape features in the rear of each property, especially the George Greenman House backyard.

The archaeological remains must be combined with the documentary-based historical information on these houses and properties. Together, this synthesis of evidence will provide the strongest basis for the accurate reconstruction of the activities associated with these properties during the nineteenth century.

Central to any archaeological project is excavation, which can reveal new information concerning outbuilding foundations, artifact distributions, landscape use, garden form, fencing, paths, etc.

Upwards of forty Mystic Seaport volunteers from the community, ages 12-75, received training in field archaeology and excavated the site. In addition, interested Museum staff spent a considerable time assisting with the



Each bag of soil is placed in the soil flotation device—a simple mechanism that contain layers of increasingly fine filters. Water is pumped through the device and visible plant and seed remains are deposited on the filters for later analysis in the lab. (Jennifer M. Stich photo)

excavation and conducting tours of the site, supplemented by explanations of the archaeological work as it was unfolding, as a way to educate Museum visitors about the archaeological project.

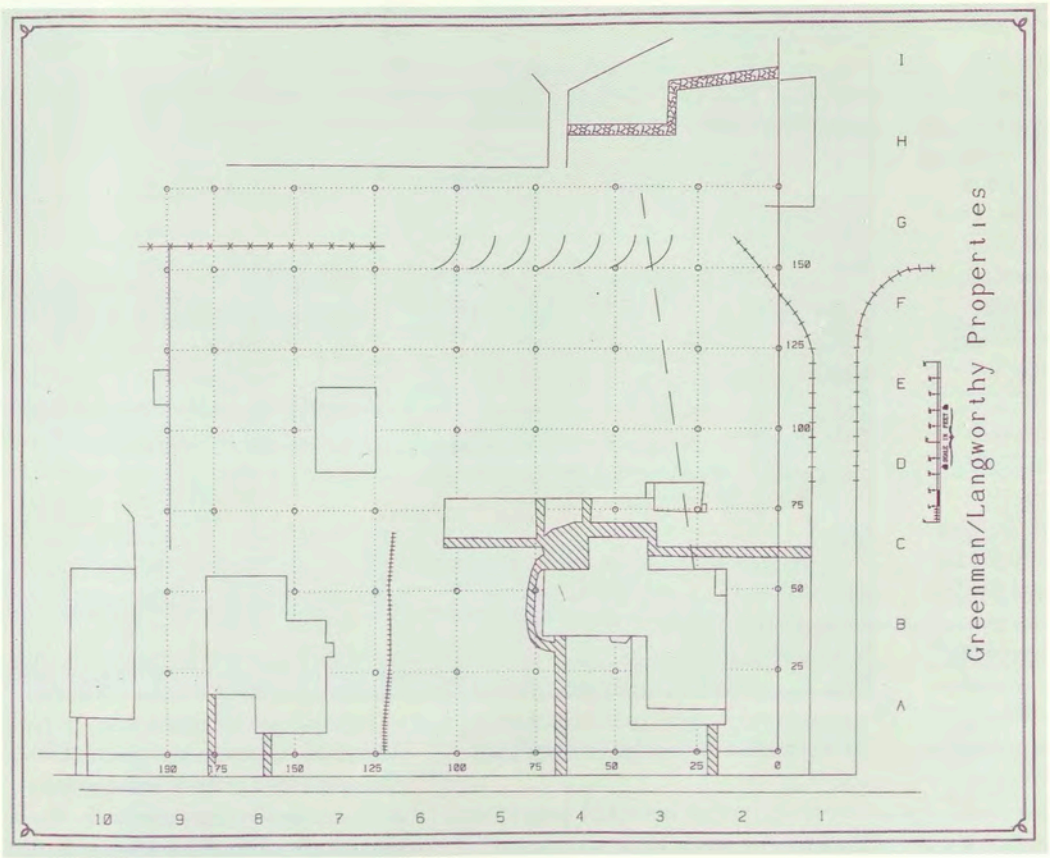
Volunteers and staff, alike, were a dedicated and hardworking group who made the project a success, while learning many aspects of the discipline of historical archaeology.

In the actual fieldwork we excavated about one hundred 2 1/2 x 2 1/2-foot holes as the standard test unit; this is a convenient size that can be excavated quickly and expanded as necessary to form trenches or larger units. We determined the position of test units by using random sampling, as well as judgmental sampling procedures; based upon location and/or research, some areas were thought to have a greater potential for producing data, hence the term judgmental sampling. In modern archaeology, a premium is put on testing the smallest percentage of a site that will yield data sufficient to answer the questions being asked. In addition, other units, such as shovel test pits of several sizes, were used throughout the site when specialized information, such as soil for flora analysis, was recovered.

We are now processing all of the recovered artifacts in the laboratory at Connecticut College where they are being washed, identified, dated, and studied following standard procedures.

On nineteenth- and twentieth-century sites such as these, the most abundant remains consist of ceramics, glass (window and bottle), bones, clay pipestems, metal, building materials, and nails. Other materials include wood, leather, and specialized assemblages associated with various activities in barns, workshops, gardens, etc. The artifacts will be studied in several ways, including formal identification and usage, their spatial distributions, and their relation to the architecture and changing landscapes at each site.

Historical archaeology relies on textual and material sources in order to interpret a site, so primary and secondary historical research is essential to the success of the archaeological project. Mystic Seaport staff have accomplished much of this research over the years through sources available as primary documents in the possession of the Museum. In addi-



At Mystic Seaport, the actual excavations were organized within several testing zones—shown in this computer-generated plot plan. Dividing the two properties into zones enabled us to compartmentalize the excavations in a systematic and manageable form.

tion, unstudied primary documents may be located in local repositories such as the Stonington Town Records. Documents such as probate inventories, for example, are extremely useful in archaeological interpretation because they list the contents of homes and outbuildings upon the death of an individual.

Because this project seeks to study historic landscape forms and outbuilding form and function, among other topics, the analysis of photographs in the Museum's archives is extremely important. The archives contain at least two-dozen photographs that record aspects of the buildings and/or the landscapes at each property. An important method in this study will be to create a set of photographically-based "chronological landscapes" for each property, making it possible, by using a master map of the properties as they exist today, to place features of the landscape such as structures, fencing, trees, and gardens, visible in the photographs, in their correct positions, for different periods in the history of each house. Archaeological test units can be positioned in areas to verify the existence of these features, as well as in areas where features are not seen in photographs.

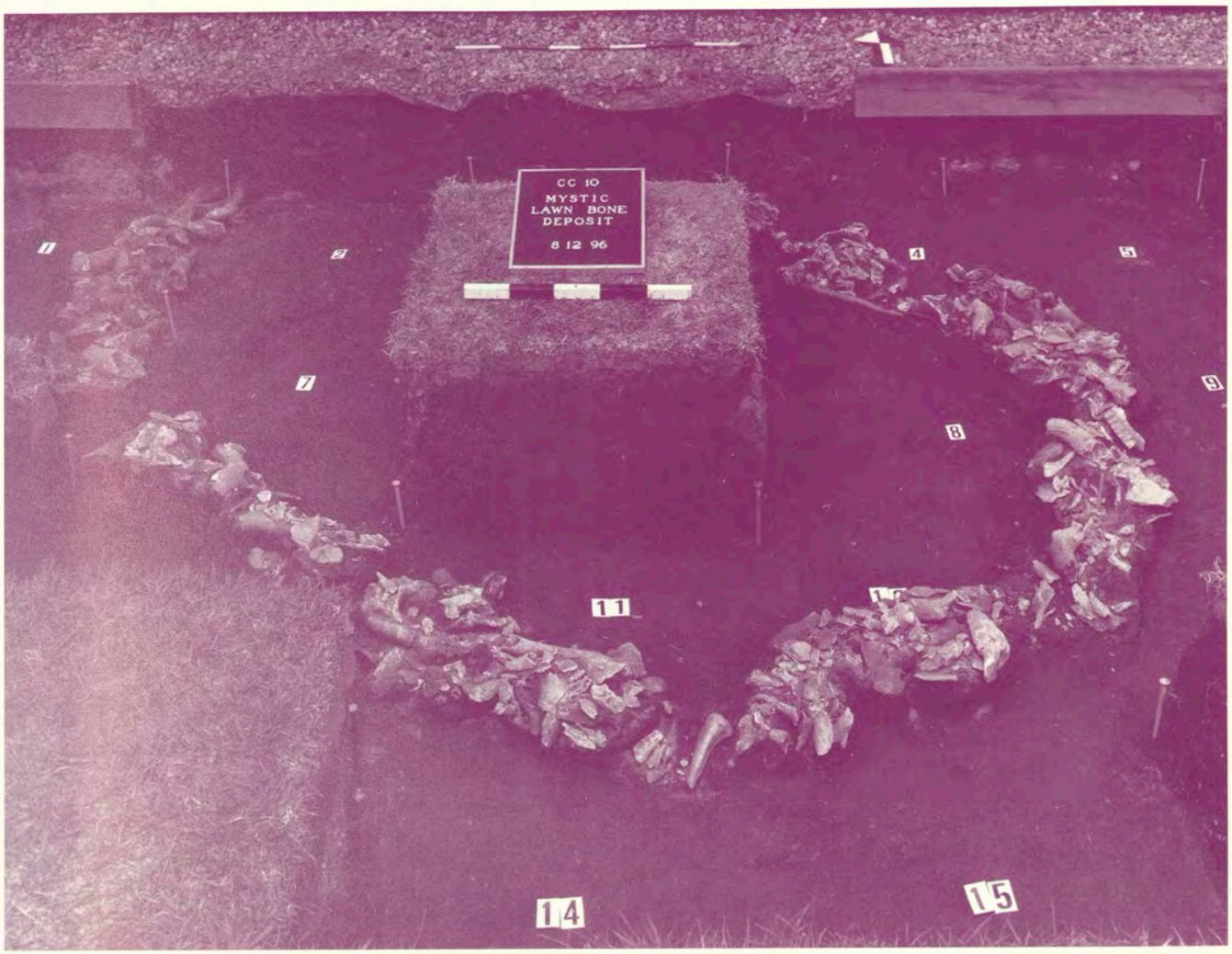
The analysis of these historic landscapes cannot be complete without three types of botanical analysis. First, we commissioned a historical plant survey of each property to describe the extant flora and to differentiate between the modern and the historic plantings; the results will help to determine whether particular plantings or planting beds contain historic species or recent additions.

The second type of landscape analysis is palynology: the study of the microscopic plant pollen that is usually distributed in soil deposits under the ground and archaeological stratigraphy. Pollen is virtually indestructible and is often found on archaeological sites. Although used primarily in prehistory to reconstruct ancient environments, palynology has been used successfully in historical archaeology to reconstruct recent landscapes.[9]

The third type of botanical analysis is flotation—a water separation procedure used to recover macro (visible) plant and seed remains, embedded in archaeologically-recovered soils. In the process of excavation, we collected

Mystic Seaport hopes to uncover answers to the following questions during the excavation:

- What do the artifacts recovered at the site tell us about the activities, social status, and lives of the George Greenman family and Langworthy boardinghouse occupants over time?
- What features defined the landscape at the time of construction in 1839 (Greenman) and ca.1820 (Langworthy)?
- What structures were added to the property as it evolved throughout the nineteenth and twentieth centuries?
- How did the structures function through time? Did structures exist that are not visible on the surface today?
- What forms of fencing or other site boundary markers defined the property, or activities on the property, during the nineteenth and twentieth centuries?
- How were the lawns in the front and back of the house used throughout its occupation?
- What activities were undertaken in the areas surrounding the house before, during, and after its occupation?
- How did the landscape surrounding the house change before and after 1839 (Greenman), and ca.1820 (Langworthy), with respect to the planting of trees, flower beds, and other outdoor activities and decorative embellishments?
- Were there trash and/or refuse pits on the property, and where are they located?
- Where was the privy at each property located during the nineteenth century? What was its size and configuration?
- What were the various functions of the barns on each property?
- Were historic features at the back of each property altered by the building activities of Mystic Seaport?
- Can the historic landscape be reconstructed to approximate a period, or periods, in the occupation of these structures?
- Can the archaeological study suggest appropriate placements of walkways and access points for house visitation?
- How can the archaeological project accommodate and educate visitors to the Museum during the study?



Bone deposit found in the front yard of the George Greenman House. The bones represent a variety of animals such as cow and sheep, and some of them exhibit butchering marks in the form of clean cuts and hack marks. These units provided one of the most compelling areas of the site for visitors and staff alike due to the unique nature of the circular formation. Museum staff and volunteers entertained tourgoers by ascribing a variety of nicknames to the bones, including "Ground Beef," "Mystic Mammoth," and "Bonehenge." (Jennifer M. Stich photo)

soil samples for flotation and performed the separation procedure on-site. After the recovered plant materials, such as seeds, are dried, they are identified, and the result is often very helpful in understanding the nature of the historic plant species present and their distributions.

In addition, the analysis of animal bones recovered in excavation contexts has been extremely useful in historical archaeology. Typically, on historic sites, the bones are related to diet—that is, meat consumption patterns—but also may be indicators of other processing activities of social class or status, since the cuts of meat consumed usually relate to family income and standing in the community.

In conclusion, the methodology for the archaeological research is a multidisciplinary approach combining traditional excavation and artifact studies, with the recovery and analysis of closely-related information such as environmental and faunal remains.

This brief summary has been an overview of the project. Part II of this report, to be published in the summer 1997 issue of *The Log of Mystic Seaport*, will discuss our findings and their relationship to the questions we hope to answer.

Notes

1. I. Noel Hume, *Historical Archaeology* (New York: Alfred Knopf, 1969).
2. Ibid.
3. R. Keeler, *The Homelot on the Seventeenth Century Chesapeake Tidewater Frontier* (Ann Arbor: University Microfilms, 1977).
4. W. Kelso, *Kingsmill Plantation, 1619-1800: Archaeology of Country Life in Colonial Virginia* (New York: Academic Press, 1984).
5. Baker, "Lucy's Garden" in R. Schuyler, ed., *Archaeological Perspectives on Ethnicity in America* (Farmingdale, N.Y.: Baywood, 1980) 29-37
6. M. Beaudry and S. Mrozowski, eds., "Interdisciplinary Investigations of the Boott Mills, Lowell, Massachusetts," *Cultural Resource Management Study No. 18* (Boston: Division of Cultural Resources, North Atlantic Region, National Park Service, 1987).
7. W. York, "Greenman and Langworthy Houses Project Description," Curatorial Department, Mystic Seaport Museum, 1996.
8. Ibid.
9. G. Kelso, "Palynology in Historical Rural-Landscape Studies: Great Meadows, Pennsylvania," in *American Antiquity* 59:2 (1994):359-72.



Waterboats of the Northeast

ANDREW W. GERMAN

In the spirit of Mystic Seaport's current "WaterWorks" exhibit in the Schaefer Building, we recognize fresh water as a precious commodity, but have you ever thought of it as cargo? It is true that the New England ice trade flourished sending fresh water in its frozen state to ports as far away as India, but an entirely different fleet developed especially to deliver fresh water to vessels in port.

Like Samuel Taylor Coleridge's Ancient Mariner, sailors at sea were surrounded by water they could not drink so, for example, American vessels departing on a transatlantic voyage were required to have at least 60 gallons of fresh water per person. While vessels remained small and ports were undeveloped, with freshwater streams close by, a ship's crew could easily float the vessel's water casks to the mouth of a stream and fill them with sufficient water for a typical passage. But as busy commercial waterfronts expanded, fresh water became less accessible. Vessel size increased too, and larger crews and more passengers, as well as the advent of the steam engine, meant the need for more fresh water and a reliable way to deliver it on shipboard.

While British Royal Navy sailing water hoys date back several hundred years, American waterboats were apparently developed in the first quarter of the nineteenth century. An aged Boston waterman, writing in the *Nautical Gazette*, reported that Boston's first waterboats were developed about 1820 by adding wooden tanks and decks to ships' longboats. They were reportedly rigged as feluccas, with Mediterranean lateen sails. Although this was an unusual rig for North American waters, the triangular lateen sail would have made them quite maneuverable around the waterfront. The boats filled their tanks from various creeks and wells on the margins of Boston Harbor until Boston's municipal water system was completed.

The Collector Pratt *scoots along off Goat Island in Newport Harbor. The 27.5-foot* Collector Pratt *was built at Newport in 1879 for Joshua Sayer and was named for Newport Collector of Customs Frederick A. Pratt. Coasting and fishing schooners, as well as the large sailing and steam yachts that called at Newport, kept the* Collector Pratt *busy for ten years. After a two-year lay-up, she returned to service for Gardiner B. Reynolds in 1891 and was finally abandoned and broken up in 1899, worn out after twenty years of lugging water. Edward W. Smith photographed her on a summer day in the mid-1890s. (M.S.M. 69.822.128)*



Viewed across piles of dried codfish on the flakes (drying racks) of an East Gloucester wharf, the 37-foot Gloucester waterboat Wenham Lake *sails leisurely down the harbor on an October Sunday in 1912. Built at Gloucester in 1896, the Wenham Lake supplied the Gloucester fishing fleet under sail until 1921. Thereafter, with a gasoline engine she served as a waterboat or lighter until 1957. (M.S.M. 76.208.352)*

In New London, Connecticut, the expansion of the whaling industry increased the maritime demand for fresh water. At first, in the accustomed manner, ships' crews towed strings of water casks up Winthrop's Cove and filled them through a hose run from the millrace of the town mill. Whaling agent Joseph Lawrence had access to a stream and built a brick reservoir near the waterfront to supply his vessels. Nathan and William W. Billings, however, built a large, shallow, rectangular barge-like scow with a pumphouse and a 500-barrel capacity. A couple of men would kedge the scow up Winthrop's Cove, using a yawlboat to carry the scow's anchor forward and the scow's windlass to haul it up to the anchor. Again, the millrace of the town mill supplied the water. Kedged back to the Billings or Williams & Haven wharf, the scow's cargo was siphoned or pumped by hand into the water casks aboard ship.

The fishing fleet of Gloucester, Massachusetts, was large enough to support a waterboat by 1850, when two boats were purchased in Boston. That year, one Gloucester waterboatman sold 77,000 barrels of water at ten cents a barrel, making $7,700. Three boats were operating in the 1860s, supplied by tank wagons that hauled fresh water to the waterfront. After reservoirs were built at East Gloucester in the 1870s, water was piped to several wharves and the tank wagons were retired, although a water supply on the wharves reduced the need for waterboats as well.

New England waterboats built after the Civil War commonly took the form of a catboat. With its one large sail, the cat rig gave the boats sufficient maneuverability, and made them easily handled by one or two men. Often 30 to 35 feet in length, with a 12-foot beam and 4 1/2-foot depth of hold, these boats carried a wooden tank amidships holding 150 barrels (about 4,700 gallons) or more of water. Some were also fitted with insulated storage to carry several tons of ice. The waterboatman delivered his water by hand, using a manual force pump on deck.

New London's first sailing waterboat was the cat-rigged *Annie Sherwood*, built at New London about 1867 and fitted with a 2,000-gallon tank. Her hand pump delivered a measured amount on each stroke. The *Sherwood* was replaced by the former Gloucester waterboat *Undine* in 1885. In Gloucester, the similar waterboats *Aqua Pura* of 1871, *Wanderer* of 1881, and then the Wenham *Lake* of 1896 continued to



Advertising hardware, groceries, clothing, drugs, and confections (candy), the Undine*–a water nymph in Greek mythology–passes yachts anchored off Fort Trumbull in New London Harbor. Built by Arthur D. Story at Essex, Massachusetts, in 1881, the 32-foot* Undine *was a Gloucester waterboat until coming to New London in 1885. She began to carry advertising on her sail in 1895, while commanded by the enterprising Ambrose Lester. The* Undine *had a 5,200-gallon capacity and was said to serve yachts and commercial vessels in New London Harbor "with almost the regularity of the tides." Reequipped with a gasoline engine in 1907, she remained at New London until 1917 and ended her days as a New York fishing boat in 1932. Edward H. Newbury photographed the* Undine *around 1900. (M.S.M. 80.41.441)*



At Boston's T Wharf, the early steam-powered trawler Ripple *lies alongside one of the T Wharf waterboats. In design this waterboat resembles a cat-rigged sailing vessel, but she is powered by a gasoline engine, which has also replaced her manual force pump. The firm of Gannon and Plunkett operated the waterboats that supplied most of the fishing vessels in Boston. They would fill the 1,000-gallon water tank of a large schooner for $5.00 in 1909. Henry D. Fisher photographed this view in the winter of 1911-12. (M.S.M. 76.208.102)*

supply the fishing fleet under sail until the 1920s.

During the decade after the Civil War, steam-powered waterboats appeared. Boston's first steam-powered waterboat, the 17-ton *Flora*, entered service in 1872, about the time that waterboats in New York and other major ports began to shift to steam. These powered waterboats, with larger capacity and steam delivery pumps, were better suited to supply large oceangoing vessels in the major ports. In design they were barely distinguishable from tugboats, although some had tall standpipes to deliver water to ships with high freeboard. In the 1890s, Boston's steam-powered Union Wharf waterboats dispensed fresh water at twenty-five cents per hundred gallons. With their high-pressure steam pumps they were also prepared to pump salt water aboard a vessel for ballast or to wash the hold or test seams for leakage. Their boilers could also produce steam to steam clean the marine growth on vessel centerboards or to test for leaks in a ship's boiler. By 1901, seven steam-powered waterboats served the large coasting schooners, coal barges, and steam vessels that passed in and out of Boston Harbor. But in Boston, as in other ports, these boats worked on such a narrow margin that they might be laid up when the cost of coal rose too high.

A final step in waterboat efficiency was the introduction of the gasoline engine. Shortly after 1900, gas engines began to power waterboats like the 40-foot *Lizzie Pettigrove* of New London, built at East Boothbay, Maine, in 1902 and fitted with a 7,000-gallon cypress tank and storage for four tons of ice. She was joined by the motor-powered waterboats *Volunteer* and *Konomoc*, and in 1907 the *Undine* herself was converted to power. The same conversion took place in Boston, eliminating the port's sailing waterboats by 1910.

As these photographs from Mystic Seaport's collection suggest, waterboats only rarely show up as the focal point of maritime photography. More often, they appear at the margins, or in the background, carrying on their essential but prosaic work of supplying drinking water for sailors at sea.

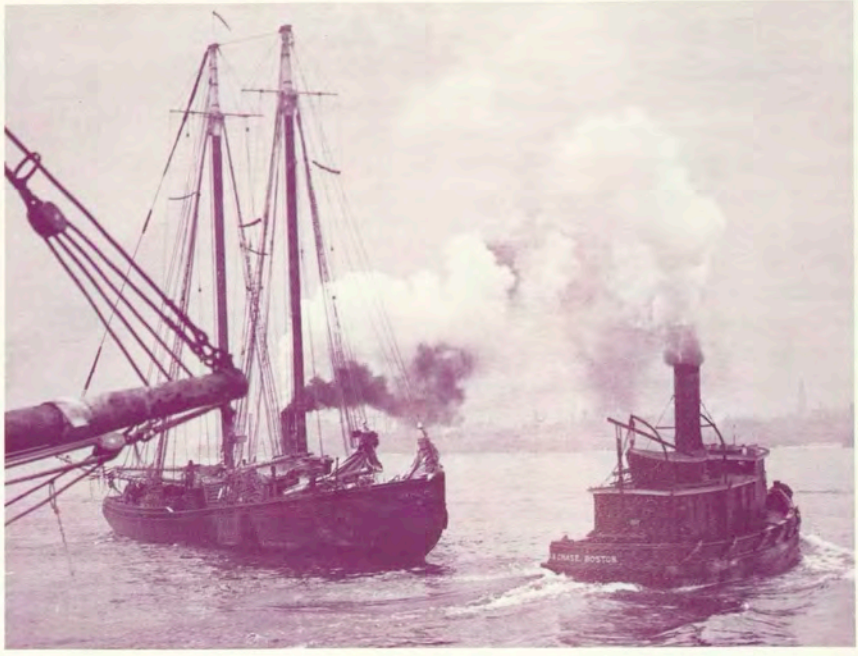
Sources

Howard I. Chapelle. *The National Watercraft Collection*, 2nd. ed. (Washington, D.C. and Camden, Maine: Smithsonian Institution Press and International Marine Publishing, 1976), 339-41.

Andrew W. German. *Down on T Wharf: The Boston Fisheries as Seen Through the Photographs of Henry D. Fisher* (Mystic: Mystic Seaport Museum, 1982).

Nautical Gazette, 5 September 1901.

R.B. Wall. "Original Fresh Water Boats in the Harbor of New London," *New London Day*, 25 March 1907.



Pulling away from Boston's T Wharf, the Ida M. Chase *exchanges whistles with a tug maneuvering the fishing schooner* Aspinet. *Built by Richard Keough at the Atlantic Works, East Boston, in 1901 for Captain George Chase, the 51-foot* Ida M. Chase *was designed as a combination waterboat and tugboat. Henry D. Fisher took this view early in 1912. (M.S.M. 76.208.127)*

WINTERTIME MEMBERS' PROGRAMS

For information about the following members' programs, please call the Membership Office at (860) 572-5339. Reservations for members' programs are guaranteed with payment. Please use the attached Members' Programs coupon where applicable. For other programs, call as noted.

1996-1997 ADVENTURE SERIES- SOLD OUT!



PRESERVING YOUR PAST SERIES

NEW A series of morning presentations by Mystic Seaport curators on how to preserve various aspects of your collections. Classes meet in the G. W. Blunt White Library from 9:30 A.M.-11:30 A.M. Series cost is $35 ($45 for nonmembers); individual classes cost $10 ($12 for nonmembers).

Finding Your Past

January 25

Learn the sources and techniques for exploring your family history. The discussion guides participants in where to look for information and how to organize it.



Preserving Your Photographic History

February 1

Learn how to preserve your cherished family photos. Identify and date photographs by using historic detective work.

Preserving Your Family Treasures

March 1

Discover easy "how-to's" of taking care of your family heirlooms. Do's and don't's of the proper way to care for and preserve textiles, papers, paintings, furniture, and metal goods.

Preserving Stories of Bygone Generations

March 15

Learn how to capture and preserve the stories of older generations. From often-told family stories to community history, you'll be able to preserve the oral history of past decades for the future.

Stew and Stories

February 28, March 7, March 14, March 21

Enjoy a hearty New England stew in the cozy Spouter Tavern. The menu includes your choice of beef or fish stew, salad, a traditional New England bread, dessert, and coffee or hot apple cider. Beer and wine are available for sale. After dinner relax by the stove and listen to a role-player weave tales of New England legend and lore. Each seating is limited to 20 people. You will be assigned a dinner time; there are two seatings per evening, 6 P.M. and 8 P.M. This traditional New England evening costs $20 ($25 for non-members).

SKILLS CLASSES

Class spaces are reserved on a "first come – first served" basis, **only** upon receipt of payment. Make check payable to: Mystic Seaport Museum, and send to: Edward Baker, Interpretation Division, Mystic Seaport, 75 Greenmanville Avenue, PO Box 6000, Mystic, CT 06355. Confirmation of your participation in the class will be sent to you with more information regarding when and where to report. Your check will be returned to you if the class is already filled or if the minimum numbers are not reached. You may call the Interpretation Division office at 572-5356 for more information.

Carving Class

January 14 - February 6
Tuesday and
Thursdays, 6:30-9:30 P.M.

Eight sessions instructed by Jonathan Shay, professional carver and Supervisor of Exhibits for Mystic

WINTERTIME MEMBERS' PROGRAMS

Seaport. Designed for students with no prior training, but open to experienced carvers as well, individual attention will allow all to progress at their own pace. The class will be project oriented; past projects have included name boards, stern boards, decorative panels, eagles, and carved box lids. Enrollment is limited to 6 students (minimum of 4). All materials and tools are provided. $225 ($245 for nonmembers).

Smithing Class, Level I

January 27- February 19
Monday and
Wednesdays, 6:30-9:30 P.M.

Eight sessions cover both modern and traditional blacksmithing techniques. Designed for students with no prior training, individual attention will allow all to progress at their own pace. Instructed by William Scheer and Russ Ostlund, two very experienced smiths and teachers. Enrollment is limited to 6 students (minimum of 4). All materials and tools are provided. $225 ($245 for nonmembers).

Smithing Class, Level II

March 5-March 26
Monday and
Wednesdays, 6:30-9:30 P.M.

Eight sessions, this class follows the Level 1 class so that students who wish may take both. It is designed for participants with some blacksmithing skills. This class focuses on advanced forge work, decorative techniques, and useful items. Bill and Russ will again be the instructors. Enrollment is limited to 6 students (minimum of 4). All materials and tools are provided. $225 ($245 for nonmembers).

FOR CHILDREN

Sea Squirts

Session I: Wednesdays, January 15-February 19, 9-10 A.M.
Session II: Wednesdays, March 12-April 16, 9-10 A.M.

Sea Squirts is a program with a nautical theme for 2 and 3 year olds and their grownups in the Sailor's Reading Room (temporary winter location of the Children's Museum), and includes stories, songs, toys, science, a craft and, weather permitting, a "field trip" to a Museum exhibit. Cost is $42 for the first child ($48 for nonmembers) and $15 for each additional child. To register, call the Museum Education Department at (860) 572-5322.





HOLIDAY PROGRAMS & ACTIVITIES

Lantern Light Tours

December 6-22

Mystic Seaport's popular evening tours take you back in time to Christmas Eve in the 1870s as the village locals prepare for the coming festivities. A horse and carriage ride and Christmas carols add the perfect touch to this recreation of a Victorian Christmas! Each year has a brand-new storyline. Lantern Light Tours depart every 15 minutes from 5-9 P.M. at the Visitor Reception Center; tours will not run on December 10 and 17. Ticket prices are $18 for adults and $10 for youth 4-15 years old. Children under 3 are free, but must be able to sit on an adult's lap. Reservations are by phone only, at 1-800-522-1841, Monday through Friday, from 8 A.M. to 4 P.M.

Community Carol Sing

December 22

A brass quartet and the Mystic Seaport Carolers kick off the annual carol sing in Anchor Circle at 3:30 P.M. A canned good donation is requested.



Charles W. Morgan *in a snowstorm*
by Harry Neyland (M.S.M. 78.238)

MYSTIC SEAPORT®
1996–97 Annual Fund

Thank you for supporting Mystic Seaport's 1996–97 Annual Fund. Your gift will help fortify the Museum's daily operations, enabling us to continue our commitment to telling the stories of America and the Sea through preservation, education, and scholarship.

Please remember that matching gifts, offered by many employers, can double or triple the value of your gift. Please check with your employer and enclose appropriate forms, if eligible. Thank you!

J. Revell Carr
Director

WINTERTIME MEMBERS' PROGRAMS

Kids After Christmas

December 26 - January 1, 1997

Special activities for all ages, including magic shows, a magic workshop for children, and an origami workshop for the whole family—make paper boats, whales, and stars!



SENIORS

Elderhostel

January 5-11, January 12-18

Explore "Maritime New England" at Mystic Seaport. Three commuter spaces are available. Cost for the program, excluding meals and lodging, is $125. Call (860) 572-5323.

PLANETARIUM

Please call the Planetarium at (860) 572-5355 for information and reservations.

Basic Celestial Navigation

January 28-April 8 *Tuesday evenings, 7:30-9:30 P.M.*

Topics include plotting, the *Nautical Almanac,* sight reduction by tables and programmable calculator, and star identification. Practical sight taking with the sextant is done at Stonington Point or Watch Hill on a weekend day. Cost is $135 ($150 for nonmembers).

Introduction to Coastal Navigation/ Piloting and Dead Reckoning

January 13-April 7, Monday evenings, 7:00-9:00 P.M.

Topics include tides, currents, plotting, aids to navigation, and chartwork. Cost is $144 ($160 for nonmembers). *No class on February 17.*

HOURS

Christmas Activities Schedule
through January 1, 9 A.M. - 4 P.M.

Winter Schedule
Village Exhibits Closed
January 2 - February 14
10 A.M. - 4 P.M.

February 15 - March 30
Village Exhibits Reopen for the Year
10 A.M. - 4 P.M.

UPCOMING EVENTS

Kids' Liberty Days
February 15 - 23

Victorian Yankee Symposium
"Victorian Yankee Goes West"
March 22

Yachting History Symposium
April 5

WoodenBoat Show
June 27, 28, 29

CLIP & MAIL

Reservations must include payment; tickets will be mailed as ordered up to 5 days before any event. A list of ticket holders will be compiled.
Sorry, no refunds.

Name_____

Address_____

City_____

State_____ Zip_____

Tel. ( )_____

VISA, MC, AMEX#_____

Signature_____ Exp._____

Check payable to Mystic Seaport; send to: Membership Reservations, 75 Greenmanville Ave., Box 6000, Mystic, CT 06355-0990

Please indicate ticket quantity:

PRESERVING YOUR PAST WORKSHOPS

____ @ $35 ($45 for nonmembers) for the series
____ @ $10 ($12 for nonmembers) per workshop for:
____ Jan. 25 ____Feb. 1 ____ March 1 ____ March 15

subtotal_____

STEW AND STORIES

$20 per member ($25 for nonmembers)
____ Feb. 28 ____March 7____March 14 ____March 21

at ____ 6 P.M. ____ 8 P.M.

subtotal_____

TOTAL_____

WINTERTIME MEMBERS' PROGRAMS

Give Your Friends and Relatives the Gift of Mystic Seaport!

From warming up by the Spouter Tavern's cozy fire with a mug of hot cider on a snowy winter afternoon, to sitting back for a relaxing boat ride on a hot summer day, your gift of a Mystic Seaport Membership will be appreciated throughout the year! **Plus, we're offering a HOLIDAY DISCOUNT of $5 off the purchase of a new membership!** Just fill out the attached form, and we'll send you a gift membership package that includes a copy of *The Log of Mystic Seaport* , a car decal, and information about the Museum and its programs. Or, if you prefer, we can mail the package to the new member with a personalized gift card.

Basic Membership Benefits

Admission for a full year; discounts on guest admission, dockage, classes, programs, and Mystic Seaport Museum Stores purchases*; subscription to *The Log of Mystic Seaport*; a car decal; reduced rate on dues if renewed before expiration date; express entry at the Visitor Reception Center (seasonal).
**restrictions apply*

Membership Categories

Individual ~~$35~~ $30-Basic membership benefits for one named adult.
Dual ~~$45~~ $40-Basic membership benefits for two named adults at the same address.

Family ~~$55~~ $50-Basic membership benefits for two named adults at the same address and their children (or grandchildren) ages 6-18.

Charge by phone at (860) 572-5339 or fill out the coupon below and send to: Membership Office, Mystic Seaport, 75 Greenmanville Ave., P.O. Box 6000, Mystic, CT 06355-0990. Make check payable to Mystic Seaport, or charge with Visa, Amex or MasterCard.

Unique Gifts at the Mystic Seaport Museum Stores!



Silk ties—made exclusively for Mystic Seaport including three designs from our Rosenfeld Collection and more!

Our deck prism is an exact reproduction of the one remaining prism mounted in the deck of the *Charles W. Morgan*. The prism makes an excellent paperweight that also serves as an interesting conversation piece!



Purchase these items and other wonderful gifts at the Mystic Seaport Museum Stores. For more information call

(860)572-5385

CLIP & MAIL

GIFT MEMBERSHIP APPLICATION

☐ Individual $30 ☐ Dual $40 ☐ Family $50

Both first and last names must be listed for each adult using the membership.

New Member's Name(s):
Mr./Mrs./Miss/Ms _____

Mr./Mrs./Miss/Ms _____

Address _____

City _____

State _____ Zip _____

Telephone _____

Credit Card # _____ exp. date _____

Your signature _____

Your Name:
Mr./Mrs./Miss/Ms _____

Address _____

City _____

State _____ Zip _____

Telephone _____

Send next year's renewal notice to: ____me ____ new member

Send gift package to: ____me ____new member

Sign my name on gift card as follows:

_____

Rediscovering the *Nixie*

CHARLES STORROW



Photographed during a Beverly Yacht Club race on 28 June 1890, the Nixie *shows off her cutter rig. The author derived much of the detail for his model from this photo. (Courtesy Hart Nautical Collections, MIT Museum)*

John Gardner, Mystic Seaport's late curator for small craft, published an article on the keel sloop *Nixie* in the Spring 1981 issue of *The Log.* This struck a familiar note with me. I remember the *Nixie* in Marblehead, Massachusetts, in the 1930s and 1940s, when I was young. Inspired by John Gardner's description of her history, and excited to learn that she was preserved in the small craft collection at Mystic Seaport, I decided that someday I would build a model of her. When I started, some years later, it was necessary to create plans, and to learn as much as I could about her in order to do so. This became a far more complicated but satisfying project than I ever imagined.

The *Nixie* is an important example of the small racing yachts built during the development of "Corinthian" (amateur) sailboat racing in the 1870s and 1880s. It was a time of competing theories in racing sailboat design. One approach favored wide, shallow-draft, centerboard craft, particularly catboats and the extreme sloop-rigged sandbaggers. The other approach favored narrow, deep-keel hulls with either cat or sloop rigs. The *Nixie* represents the latter approach, which predominated around Boston.

The *Nixie* is significant too because she was designed by the era's leading American yacht designer, Edward Burgess. An expert sailor with a passion for entomology, Burgess did not go into business as a designer until he was 37, in 1884. His designs, which incorporated elements of the deep-draft British cutters he had sailed while in England, quickly established Burgess's reputation, especially when the *Puritan*–designed for members of the Eastern Yacht Club–outsailed the New York Yacht Club's entry and successfully defended the America's Cup against the British *Genesta* in 1885. Although his fame rests on his America's Cup boats *Puritan*, *Mayflower*, and *Volunteer*, Burgess continued to design small yachts of the type he loved to sail. During seven years of active designing before his untimely death in 1891, Burgess is known to have created 137 designs for yachts, pilot schooners, and fishing schooners.

Burgess designed the *Nixie* in 1885, the same year he designed the *Puritan*. Like many of the small Boston-area racing craft of the 1870s and early 1880s, the *Nixie* was designed as a keel catboat with relatively deep draft, outside ballast in the form of a lead keel (an innovation in yacht design around 1870), and a single large mainsail. Her dimensions were approximately 23 feet 8 inches on deck, 20 feet on the waterline, 7 feet 8 inches beam, and 4 feet 6 inches draft. She was built by William B. Smith of South Boston for Alexander Cochrane (1840–1919) a Boston businessman with a summer house in Beverly, Massachusetts, a very short distance by water from Salem and Marblehead. Cochrane ran the Cochrane Chemical Company in Malden, which made nitric, muriatic, and sulfuric acid, as well as other products.



The Nixie *was partially dismantled before Dr. Frederick Tudor purchased her for preservation and donated her to Mystic Seaport in 1973. She remains unrestored, as seen in this 1975 photo. (M.S.M. 73.714; Maynard Bray photo)*

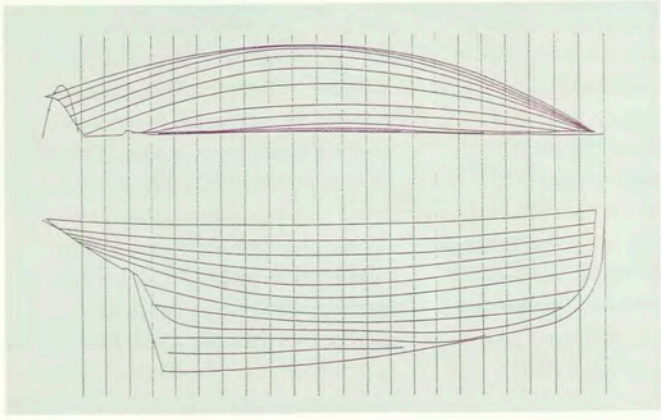
Cochrane apparently had the *Nixie* built for his two sons, Alexander L. Cochrane (1870–1928) and Francis D. Cochrane (1877–1941), for she was listed in their names in *Manning's American Yacht List* from 1887 through 1903, and in the Beverly Yacht Club yearbooks from 1892 through 1896. In 1885, when the *Nixie* was built, Alexander would have been fifteen years old and his brother Francis eight, which was just about right to begin sailing and racing. The Beverly Yacht Club to which they belonged was actually a sailing organization that sponsored races for boats under thirty feet. Edward Burgess himself had been instrumental in founding the club in 1872.

After about five years of sailing as a cat-rigged boat the *Nixie* was rerigged as a more modern cutter with the addition of a long bowsprit and two stays for a staysail and a jib. Even in those days the *Nixie* attracted attention for her good looks, as in 1894, Thomas Mott's *Yachts and Yachtsmen of America* published a small woodcut of her and an appropriate description. It is safe to say that, as with other long–lived boats and ships, those good looks helped keep the *Nixie* in existence for over one hundred years.

About 1903 Cochrane sold the *Nixie* to Stephen J. Connolly, also of Beverly, who kept her in Manchester. After being seriously damaged in a boatyard accident in 1908 or 1909 she was abandoned in Manchester. Some time later Captain Charlton Smith, a boatbuilder in Marblehead, bought her "for her value as firewood," towed her to Marblehead, and placed her in storage under his boatshop, to be rebuilt some day. In the 1930s he undertook that project and used her for several years, but in the 1940s she was sold again. She had been largely dismantled for rebuilding when Dr. Frederick Tudor purchased her and donated to Mystic Seaport as a memorial to his grandfather, Edward Burgess. So far as is known, she is the last example surviving of Burgess's work.

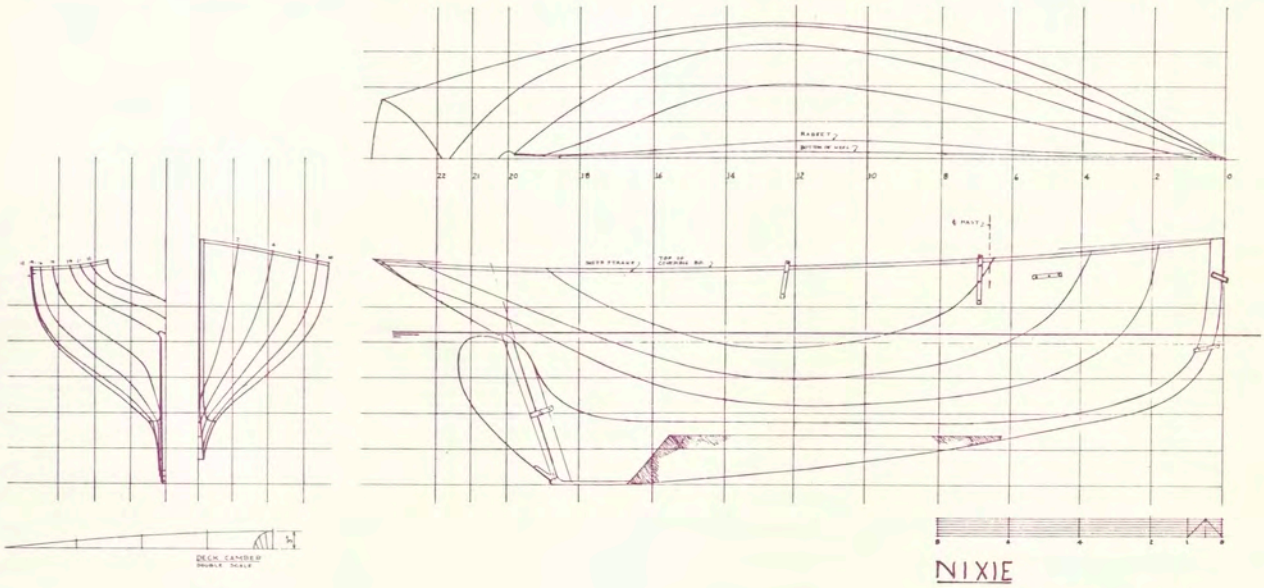
As she exists now in storage at the Museum, the *Nixie* is but a shell of a boat, with only keel, frames, and planking. Her deck and interior are gone. There is a deck frame, installed by Captain Smith during his rebuilding, but it bears no relation to the original deck and cockpit. No spars have survived to help determine the original sail plan.

When I asked Peter Vermilya, associate curator for small craft at Mystic Seaport, if the Museum had a lines drawing, which I would need as a starting point to do the plans, he explained that no plan existed. However, the Museum had instituted a new project to take lines off the boats in the collection using an Electronic Distance Measuring Machine, or EDM. This surveying instrument uses a laser to measure angle and distance to a small target that, in this case, is held at a point on the hull of the boat. When the necessary data on points over the surface of the hull have been taken, a computer and plotter are used to generate a lines plan, which Museum staff believe is an extremely accurate rendering of the original boat. Since data points were taken along the plank edges, it was also possible to generate a drawing showing the run of the planking. Using the data, the computer can also produce isometric views.

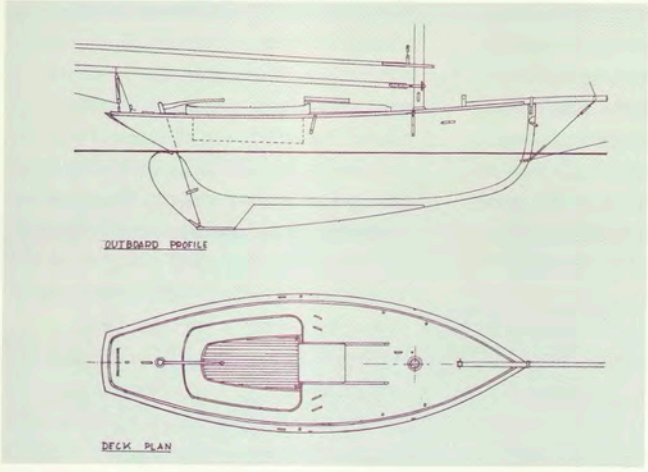


The Electronic Distance Measuring Machine produced an extremely accurate set of coordinates representing the hull shape. This rendering of the run of the planking emphasizes the twisting and distortion of the Nixie*'s hull after 110 years.*

The resulting lines drawing of the *Nixie* shows all the twist and unfairness in the hull as it now exists, 110 years after construction. Since I wished to depict the *Nixie* as she was about 100 years ago, I studied the hull to derive a theory concerning the changes that had taken place due to the aging process. I also had to study the hull to see how she was constructed, and to look at photographs to determine as much as possible about her rig and deck arrangement.



Lines of the Nixie, *as reconstructed by the author, show stations (vertical transverse sections), waterlines (horizontal longitudinal sections), and buttocks (vertical longitudinal sections). Some of the external metal fittings on the hull, including the rudder hardware and chainplates for the shrouds, running backstays, and bowsprit shrouds, are included. The details of the outboard profile and deck plan were derived from the 1890 photo and other Burgess plans. The shape of the rudder was not taken from the rectangular one that came to Mystic Seaport with the boat but, rather, from the more rounded rudder shown in a photograph taken when she had been newly rebuilt by Captain Smith. In that view the shape of the rudder agrees with the shapes of those shown in Burgess drawings of other boats.*



My first task was to decide how the present shape of the hull differs from that of 110 years ago as a result of age, warping, twisting, and sagging. After several false starts I decided on a hypothesis. The EDM-generated drawing shows the starboard side of the boat. On that side, the sheerline, marked "S" on the drawing, has a pronounced unfairness or hump in it amidships. There is also a pronounced hump in the rabbet line, where the planking joins the wood keel. However, the top of the lead ballast keel below the wood keel is straight, and there is a definite gap between the top of the lead and the bottom of the wood. On the port side of the boat the hump in the rabbet line and sheer are less pronounced. In a telephone conversation, John Gardner indicated that the frames, or ribs, in the boat had probably not changed shape much, if at all. Thus, in my drawing I kept the shapes of the transverse sections–which indicate the frames–as they were in the EDM takeoff, but moved them down to a straightened rabbet line. I then adjusted the sheerline, waterlines, and buttocks accordingly. In order that the drawing would be comparable to those of other boats designed by Burgess, I asked Mark Starr, in charge of computer-assisted design applications at the Museum, to rotate the grid of waterlines and section lines slightly, to bring the waterlines parallel to the rabbet line. This changed the shape of the section lines a little, since they were cutting through the form of the hull at a slightly different angle. However, it was easy to change the grid by means of the computer.

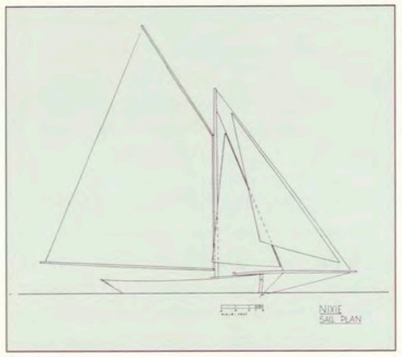
Since there is no evidence of the *Nixie*'s original cat rig, I had decided to model her as she was after her conversion to a cutter in 1890, based on the photographic evidence. After the publication of his *Nixie* article, John Gardner received a letter from Fenwick Williams, the well-known yacht designer of Marblehead, who had compared photos of the *Nixie* before and after the Charlton Smith rebuild, and wondered whether Captain Smith might have moved the mast aft. I decided to attempt to verify whether this was so by doing a layout of perspective vanishing points on a tracing of the 1890 photo of the boat under sail. This process is the opposite of that used by an architect

to derive a perspective drawing from the plan and elevations of a building. The perspective drawing would also give me the information required to draw the sail plan and derive the spar dimensions. To accomplish this it was necessary to estimate the location of the camera on the water with respect to the boat, and the camera's height above the water. It took several tries before I was satisfied with the results, While this estimating process cannot produce exact results, I feel my dimensions are very close to correct.

The mast location measured on the hull at Mystic Seaport agrees exactly with that shown on the perspective, indicating that the mast had not been moved. When I first completed this drawing I was amazed at the the length of the bowsprit and boom and the height of the mast. Such a large sail area does not seem necessary in a keel boat like the *Nixie* and would not be advantageous under the handicap rule then in use, which was the simple Seawanhaka Club formula based on sail area and waterline length. I worried that perhaps I had made an error in some way. But then Kurt Hasselbalch, curator of the Hart Nautical Collections at the Massachusetts Institute of Technology, turned up a photo of the similar but slightly smaller *Wraith*, designed by Burgess in the same year as the *Nixie*, showing sail and spar proportions very similar to those I had derived for the *Nixie*. The *Wraith* was built as a catboat and was changed to a sloop in 1889, about a year before the *Nixie*'s similar conversion.

I derived the deck arrangement for the *Nixie* from a close study of the 1890 photograph. The cockpit coaming, companionway, covering boards, and toe rails all came from this source, as did the leads of the rigging. However, it took a long time to decide on the deck construction. The covering boards and toe rails suggest a deck made up of narrow planks sprung to the profile of the covering board and finished "bright" or varnished, but I could not see deck seams in any of the photos, nor could deck planks be seen in the photos of the *Wraith* or of the similar boat *Wanda*. This left two choices: either a painted wood deck, probably with straight seams parallel to the boat's centerline, or a wood deck covered with canvas. I knew that canvassed decks, which became very common in later years, were understood at the time of the *Nixie* because I found a reference to them in Kunhardt's 1885 book, *Small Yachts*, but they do not seem to have been very common then. Yet, since the curved covering boards following the line of the topsides in plan view did not seem compatible with straight deck planking, I decided on a canvassed deck for my model.

I based the cockpit design on that of the "24–Foot Waterline Cruising Yawl" designed by Burgess and published in Kunhardt's book. I originally indicated on my drawing a rectangular self–bailing cockpit, but I modified it to make its perimeter follow the line of the boat's rail, as shown on the plans of the yawl. When the photograph of the *Nixie* is interpreted with this cockpit form in mind it

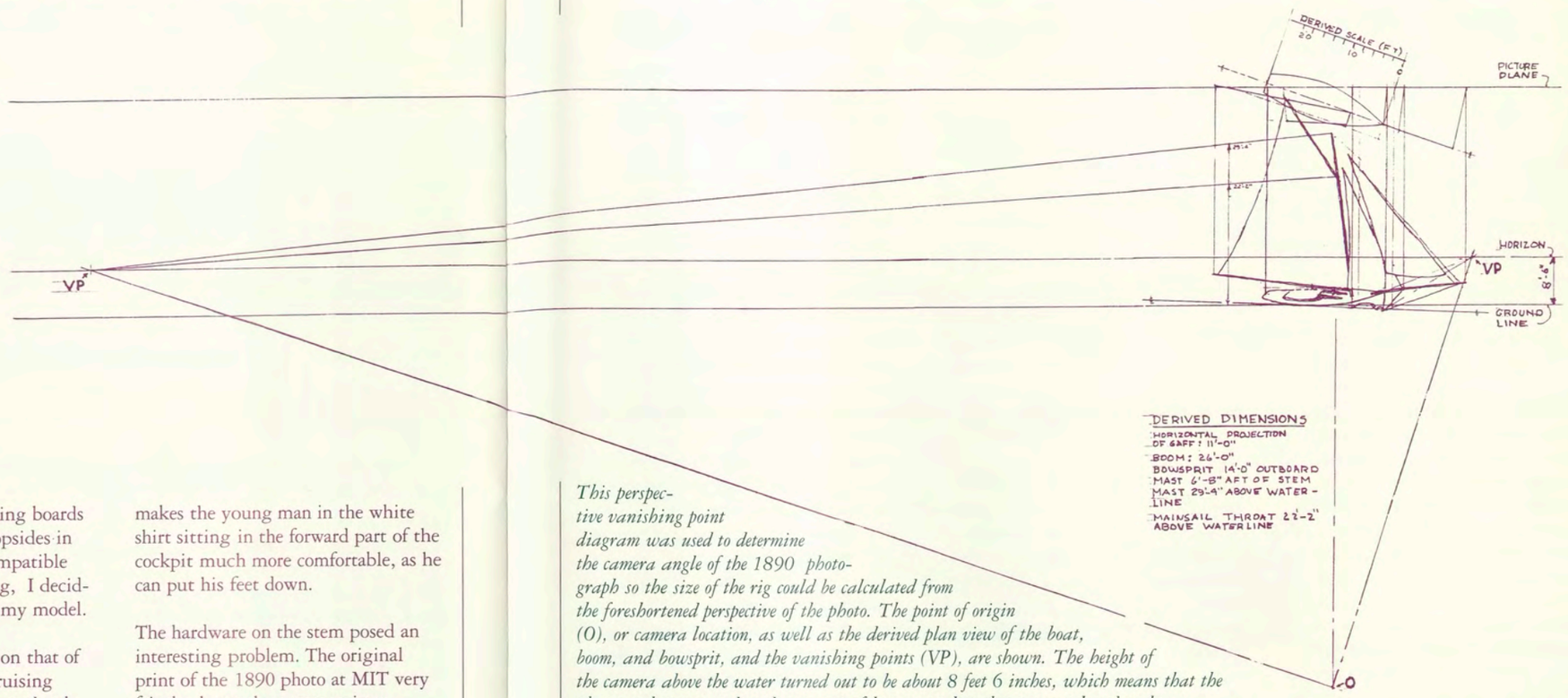


The author derived this sail plan from the perspective drawing. With a mast standing 29 feet above the waterline, a 14-foot bowsprit, 26-foot boom, and 11-foot gaff, this interpretation of the Nixie*'s rig at first appeared too large.*

makes the young man in the white shirt sitting in the forward part of the cockpit much more comfortable, as he can put his feet down.

The hardware on the stem posed an interesting problem. The original print of the 1890 photo at MIT very faintly shows the gammon iron, which holds the bowsprit. I decided after much study that the bowsprit must have been square in section where it passed over the stem, and that in the topsides the stem was not beveled to a sharp edge at its forward extremity, as is the stem currently on the boat. The design of the gammon iron and also of the fitting to terminate the bobstays was not clear. Happily, everything fell into place with the receipt of a photo from Lyman Smith II, grandson of Captain Charlton Smith, showing the *Nixie* in Captain Smith's yard during the rebuild in the 1930s. The stem is, indeed, rectangular in section at the top, and the bolt holes for the gammon iron, as well as the bobstay fitting below the waterline, show very clearly. Also shown is a stem-mounted mooring fitting, which must date from the *Nixie*'s early days as a catboat. None of these fittings exist on the boat today, and the upper part of the stem has been replaced.

Having done the research and completed the drawings described thus



This perspective vanishing point diagram was used to determine the camera angle of the 1890 photograph so the size of the rig could be calculated from the foreshortened perspective of the photo. The point of origin (0), or camera location, as well as the derived plan view of the boat, boom, and bowsprit, and the vanishing points (VP), are shown. The height of the camera above the water turned out to be about 8 feet 6 inches, which means that the photographer was on board some sort of larger vessel, perhaps an anchored yacht.

far, I felt I had accomplished all I could to define how my model should appear. But there remained an interesting question that had come up all through the process. How did the *Nixie* compare with other boats designed by Edward Burgess?



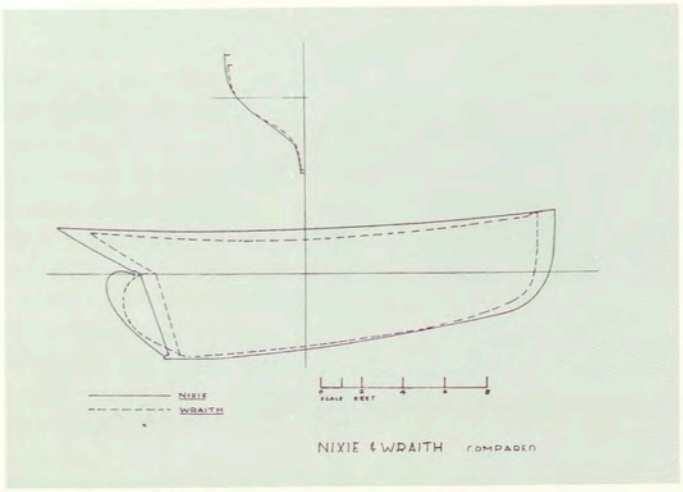
This photograph of the Wraith, *also designed by Burgess as a cat and rerigged as a sloop, confirmed the great length of the bowsprit and boom of these small racing yachts. She was photographed on 19 August 1889. (Courtesy Hart Nautical Collections, MIT Museum)*

In his 1981 article, John Gardner indicated that the *Nixie* was supposed to be an enlargement of the *Wraith*, an 18-foot keel cat built in 1885 for General Charles J. Paine, the managing owner of the America's Cup defender *Puritan* (in 1887 the general's brother John B. Paine of Boston was listed as her owner). The *Nixie* was two feet longer on the waterline, and her freeboard was substantially increased. She also had less sheer, but the profiles of the bows and sterns were very similar. It almost seems as if the designer's intention was to keep the bow and stern profiles the same while lengthening the *Nixie*'s midbody by two feet. However, the draft of water was slightly increased. The midsections seem noticeably different, but perhaps



This faded photograph of the Nixie *at Captain Charlton Smith's Marblehead boatshop in the 1930s provided crucial evidence for the rigging hardware on the stem. (Courtesy Estate of Charlton Smith)*

the differences are more apparent than real. The beam at the waterline is about the same in both boats, but the *Nixie*'s topsides flare out above the waterline. The question that we can-



Top: Are the Wraith *and* Nixie *based on the same Burgess design? Here their profiles and midsections are compared, derived from the EDM takeoff of the* Nixie*'s lines at Mystic Seaport and the original plans of the* Wraith *at MIT. The larger* Nixie *is shown as a solid line.*

Below: Based on the extensive research described here, the author completed his model of the Nixie *in 1996. (Claire White-Peterson photo)*

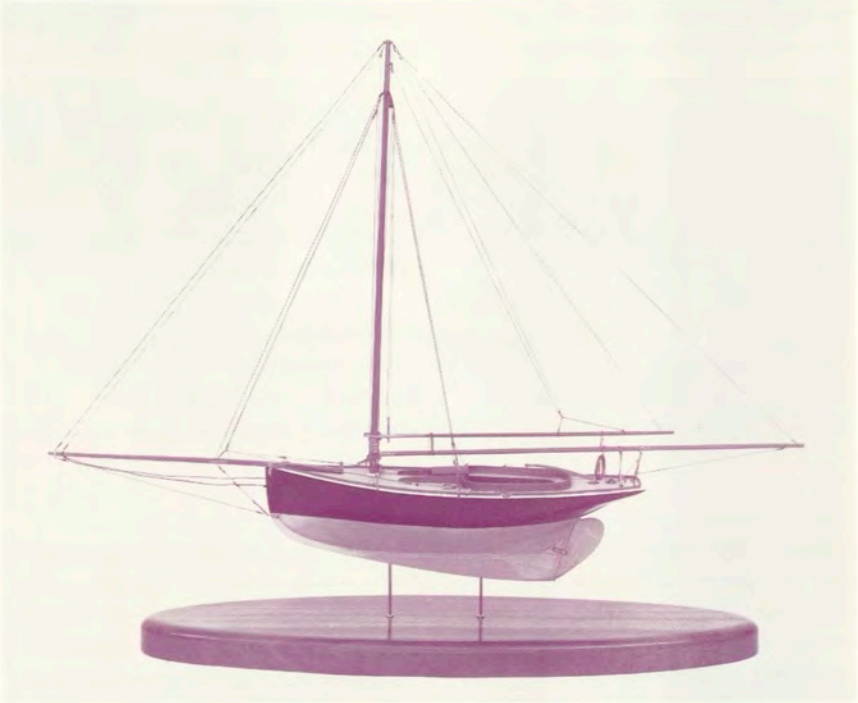
not answer is whether the *Nixie* was really a different design or the modification in midsection was made by the builder. Perhaps he was given the plan of the *Wraith* and told to make a new boat two feet longer. The latter seems likely, considering that detailed adherence to designs was not considered very important by many builders of that period, who were accustomed to building from their own plans and to interpreting plans based on their own yard practices.

However, the opposite answer might be inferred from the plan in Kunhardt's *Small Yachts* of a 24–foot waterline cruising yawl designed by Burgess in 1884 or 1885. The book included a sail plan and deck and arrangement plans. The proposed dimensions were 29 feet overall, 24 feet waterline, 6 feet 2 inches beam, and 5 foot draft. The beam on the waterline is given as 6 feet exactly. There are some strong similarities to the *Nixie* in the profile and lines, although the *Nixie* is shorter and wider on deck. However, the beam on the waterline is very much the same, and the sections below the waterline are quite similar. A doubtful feature of the yawl is the extreme width of the wood keel, and the resulting triangular cross-section of the iron keel. Otherwise, the shapes of the sections of the yawl seem quite similar to those of the *Nixie*. Those of the *Wraith* appear quite different. There is, therefore, precedent in Burgess's work for the *Nixie*'s design, but we do not know whether or not her sections are what Burgess intended.

For those of us interested in the history of American yacht designs, Edward Burgess's small boat designs remain a tantalizing enigma. He is best known for his larger vessels, such as the America's Cup defenders *Puritan* (1885), *Mayflower* (1886) and *Volunteer* (1887), and the fishing schooners *Carrie Phillips* (1887), and *Fredonia* (1889), but his small racing yacht designs represent a type especially close to his own heart. Thanks to W.P. Stephens and his *Traditions and Memories of American Yachting*, we have lines for a number of the larger Burgess racing sloops. Among the published small-boat plans, we have had the *Wraith*; the *Columbine,* a keel sloop 19 feet two inches on the waterline that appeared in Kunhardt's *Small Yachts;* and an 18-foot catboat–possibly a redrawing of the *Wraith* plan–published in *St. Nicholas Magazine* in 1890. To this group, thanks to Mystic Seaport's "EDM" lines-takeoff program, we now can add an approximation of the *Nixie*, the last survivor of the inspired work of Edward Burgess.

Acknowledgements

I wish to thank the following individuals for providing information: Mary Lane Cairns of Marblehead, Stephen J. Connolly III of Marblehead, Martha Jones of the Eastern Yacht Club, Lyman Smith II of Middletown, Rhode Island, and John W. Sears of Boston.



Measuring Mystic Seaport's Half-Model Collection the Electronic Way

MARK STARR

Mystic Seaport has many different types of collections, from its full-sized vessels and their related artifacts down to its scale-model collection of ships from our nation's past. One fascinating group of objects is the collection of over 800 half-hull models. Many of these attractive, three-dimensional wooden half models hang in various exhibit spaces at the Museum. Ranging from six inches to as much as twelve feet in length, these models often appear to be simple nautical wall decorations. However, the models represent much more than that. Locked within their shapes is the history of American ship design during the past two hundred years.



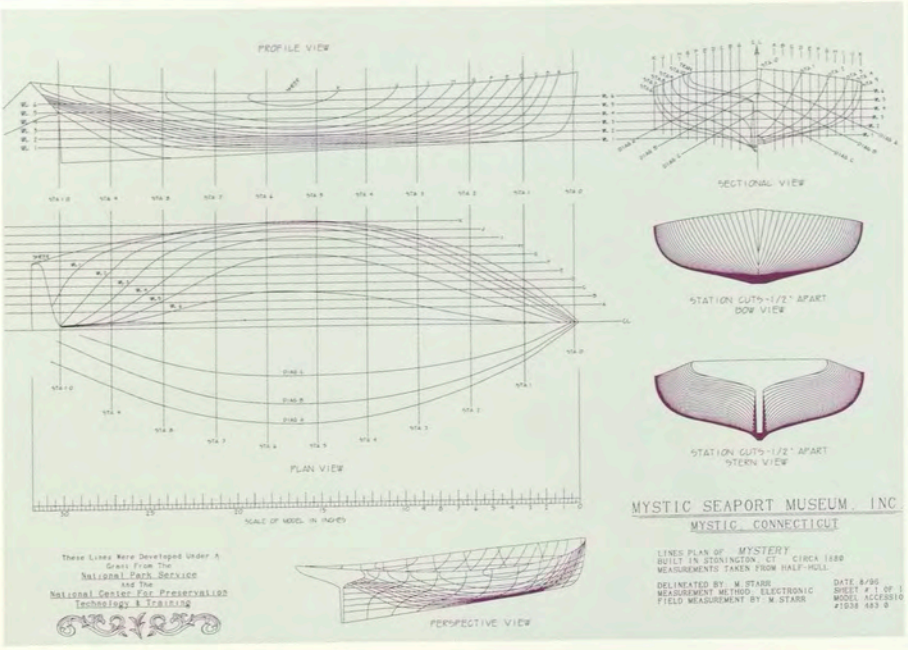
Volunteer Roger Hughes uses the Coordinate Measuring Machine to record the shape of the half model of an unidentified small boat. The computer "reads" the relationship of the three arms whenever a data point is taken and records the coordinates of each point. Computer-assisted design programs, such as MultiSurf, convert the coordinates into visual form as "ships' lines." (Judy Beisler photo)

Most of the ships themselves, and any written documentation of their shapes, have been lost to time, so these models provide a significant link to the builders and designers of the past. Converting the information stored within each model into a paper or electronic format–a process that is now underway at Mystic Seaport–therefore releases information that once again can be used by researchers, naval architects, and boat or model builders. Add to the Seaport's collection the many other large collections of half models throughout the country, and it is easy to see that a significant volume of information waits to be retrieved.

There are two reasons we are interested in measuring the models in our collection. The first is that these are unique artifacts that have survived over the years, and as such are important pieces of our material past. They are cared for, stored, and displayed much as harpoons or paintings are, and are written about, photographed, and drawn to satisfy curatorial objectives. Should some catastrophe strike the collection, an irreplaceable amount of information would be lost. Having a standardized set of measurements for each of the models would at least partially compensate for such a loss. Not only would the measurements taken add greatly to the curatorial description of each half-hull, they would also preserve the design elements they originally represented.

The second reason is that, unlike other objects in our collections, these models were not built as an end product in themselves, but rather as design tools. Because of this, they should be examined and documented in far greater detail than is normal for a simple card-catalog description. They are three-dimensional blueprints of much larger objects, oftentimes the first draft or mathematical ideal of an actual vessel to be constructed. By measuring these models, we can gain a clearer understanding of the thought processes that went into the designs of generations of commercial and naval ships, as well as pleasure craft. We can also compare the lines of one model to those of other models, and even theoretically test their performance, once the lines have been taken off the half models.

Over the years, Mystic Seaport staff and volunteers have measured and drawn lines of selected half models in the Museum's collection by hand, but due to a lack of both time and trained personnel, the process has been slow. Models that have stirred particular interest in one way or another have been measured, but without that impetus few others have been drawn. As a result, the Museum's preservation shipyard recently began searching for an alternate, computerized method of tackling the documentation process and making more information available to the public. We also decided it was important to expand the scope of the project to include models in other collections throughout the United States, such as those of the Smithsonian Institution and the Hart Nautical Collection at

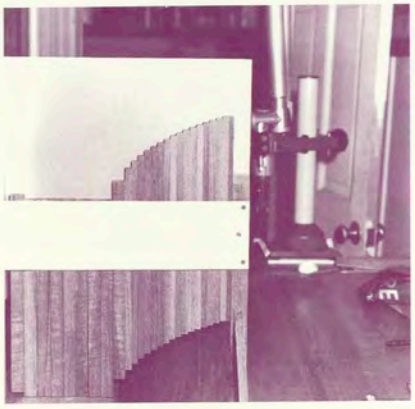


Electronic measurement permits extremely accurate and visually interesting renderings of the lines of a half model. As well as the traditional plan, profile, and sectional view of the Stonington sandbagger sloop Mystery, *built ca. 1880, this printout includes a perspective view and full bow and stern views. (M.S.M. 38.483)*

the Massachusetts Institute of Technology. We therefore invited these organizations to join us in our venture.

After deciding on a computerized method to both measure and draw the models, we applied to the National Center for Historic Preservation Technology and Training, a division of the National Park Service based at Northwestern State University of Louisiana, for a grant to purchase the necessary equipment and to train staff and volunteers in its use. After receiving the grant, we ordered both the equipment and the software and began the project.

We decided to measure the model collection with a machine known as a Coordinate Measuring Machine, or CMM. This type of machine is used by machinists in a variety of fields to check that manufactured items meet



In the past, half models at Mystic Seaport were measured with the use of this jig, by which points along a vertical station on the model could be marked on paper and then converted by hand to lines and section plans. (Peter Fix photo)

exacting tolerances or to reverse-engineer existing components by duplicating their precise shape. We chose an arm-type CMM for the project, as it gave us the most flexibility and accuracy for the type of measuring we would be doing. This type of CMM works rather like a human arm in that each individual joint allows for a certain degree of rotation, while all of the joints combined allow even greater flexibility. The end of the arm has a point probe constructed of either Teflon or rubber. The computer keeps track of the rotation of each joint in the arm and does the trigonometry necessary to locate the tip of the probe as it is moved through three-dimensional space. The operator of the machine merely places the probe on the point of interest on the hull, then presses a button to record the X, Y, and Z coordinate locations of that point. The machine is capable of taking over 30,000 points an hour, accurate to about five or six thousandths of an inch over the length of the model!

Each measurement taken is captured on a laptop computer, which contains the software to run the machine. In addition, the CMM can take planer cross sections using a software lock. In this mode, the operator defines the planer cuts to be made, then passes the point probe back and forth across the imaginary plane. The software picks up only those points that lie on the defined plane. In this way, planer cuts such as vertical stations (cross-sections), horizontal waterlines, and vertical, longitudinal buttocks can be accurately described. This allows the operator to define the shape of the model in whatever way is desired, traditional or nonconventional. Each of the model's data sets contain approximately 600 to 800 coordinate points, although more complicated models may contain over 1,600.

Once the three-dimensional coordinates have been gathered, they need to be converted into a more convenient format. This format is typically known as a set of "ship's lines." To do this, the operator first turns the coordinate points into a computer "surface." The surface is an electronic form of the wooden model and, like the model, can be sliced and measured at any section desired. AeroHydro, a naval-architecture design company, was generous enough to donate a copy of its MultiSurf software to Mystic Seaport for use with this project. MultiSurf is a ship design surfacing package that

Continued on page 72

Museum Notes

Voyage to the Lands of Gods and Heroes: A Special Family Learning Adventure aboard the Stella Oceanis June 29-July 12, 1997

The Mystic Seaport Membership Office is pleased to offer a unique family travel opportunity that promises to provide the memories of a lifetime.

Our itinerary includes the world's most legendary destinations: Athens, the historic Greek Islands of Rhodes and Santorini, Ephesus and Istanbul in Turkey, plus Malta, Sicily, and the archaeological treasures of Pompeii, Herculaneum, and Rome.

Do you treasure special moments shared with your child or grandchild that were possible only because you had escaped from your hectic day-to-day routine? Imagine sharing just such magical moments at an archaeological dig, at a magnificent mosque in Istanbul, or on a tranquil beach at Rhodes. We have taken care of all the details so that your entire family can enjoy the wonders of the world.

Experienced counselors and youth education experts lead groups of similarly-aged children in the Young Explorers Program, a series of educational and recreational activities developed to enhance their appreciation of the sites we visit. At night, they'll go on deck to stargaze and hear ancient tales of how the constellations were formed, they'll learn to tie nautical knots, discover how sailors navigated by the stars, and keep their own ship's log.

We are proud to present this trip in collaboration with the Association of Yale Alumni, the Society of Alumni of Williams College, and the Alumnae Association of Smith College. Adults will enjoy a series of lively and intellectually stimulating lectures by faculty from these prestigious institutions of learning, including Williams College Professor and Director of Mystic Seaport's Munson Institute, Ben Labaree.

We hope you will join us next summer! Please call the Membership Office at (860) 572-5339 for more information.

Alert!!!

The Children's Museum will move to the Sailors' Reading Room for the winter while the Edmondson House interior—home of the Children's Museum—is painted.

Oysters "R" in Season at Seaport Videos®!

This new educational release about oysters is made for our younger viewers. Hosted by middle-school student Kevin Walsh, this story introduces you to the biology and ecology of oysters and offers a view into the history of Connecticut's shellfish industry. Historic footage and pictures, plus interesting locations shot at Mystic Seaport, make this video an excellent scientific primer. Color and B&W, 25 minutes.

A Living Harvest: Oystering on Long Island Sound costs $14.95. You may purchase it at the Mystic Seaport Museum Stores, or call the Film and Video Archives Division at 1-800-445-9236 for more information or a video catalog.

Mystic Seaport Raises $2.5 million America and the Sea Endowment

Member Support Pushes Campaign Over the Top



A gala dinner was held on 23 October 1996 at the New York Yacht Club, to honor the Museum's Chairman Emeritus, Robert G. Stone, Jr. The photo (left) shows current Chairman William E. Cook presenting a hand-carved compass rose to Chairman Stone. The carving symbolizes the Museum's new Teaching and Research Fellowship in American Maritime History, honoring Mr. Stone's leadership during six years of the Museum's growth and expansion. The Stone Fellow will be one of a team of scholars whose research will inspire new program initiatives and revitalize the way Mystic Seaport tells the stories of America and the Sea. The Fellowship is funded by the successful completion of the $2.5 million America and the Sea Endowment, made possible by the generosity of Museum members, private foundations, corporations, and many of Mr. Stone's family and friends, together with a prestigious challenge grant from the National Endowment for the Humanities.



Charles W. Morgan *in a snowstorm by Harry Neyland (M.S.M. 78.238)*

Mystic Seaport Annual Fund

$580,000 Goal

Support Mystic Seaport's Efforts in:

• Research • Education • Preservation • Restoration

Please Respond Today
Our Fiscal Year Ends on April 25, 1997