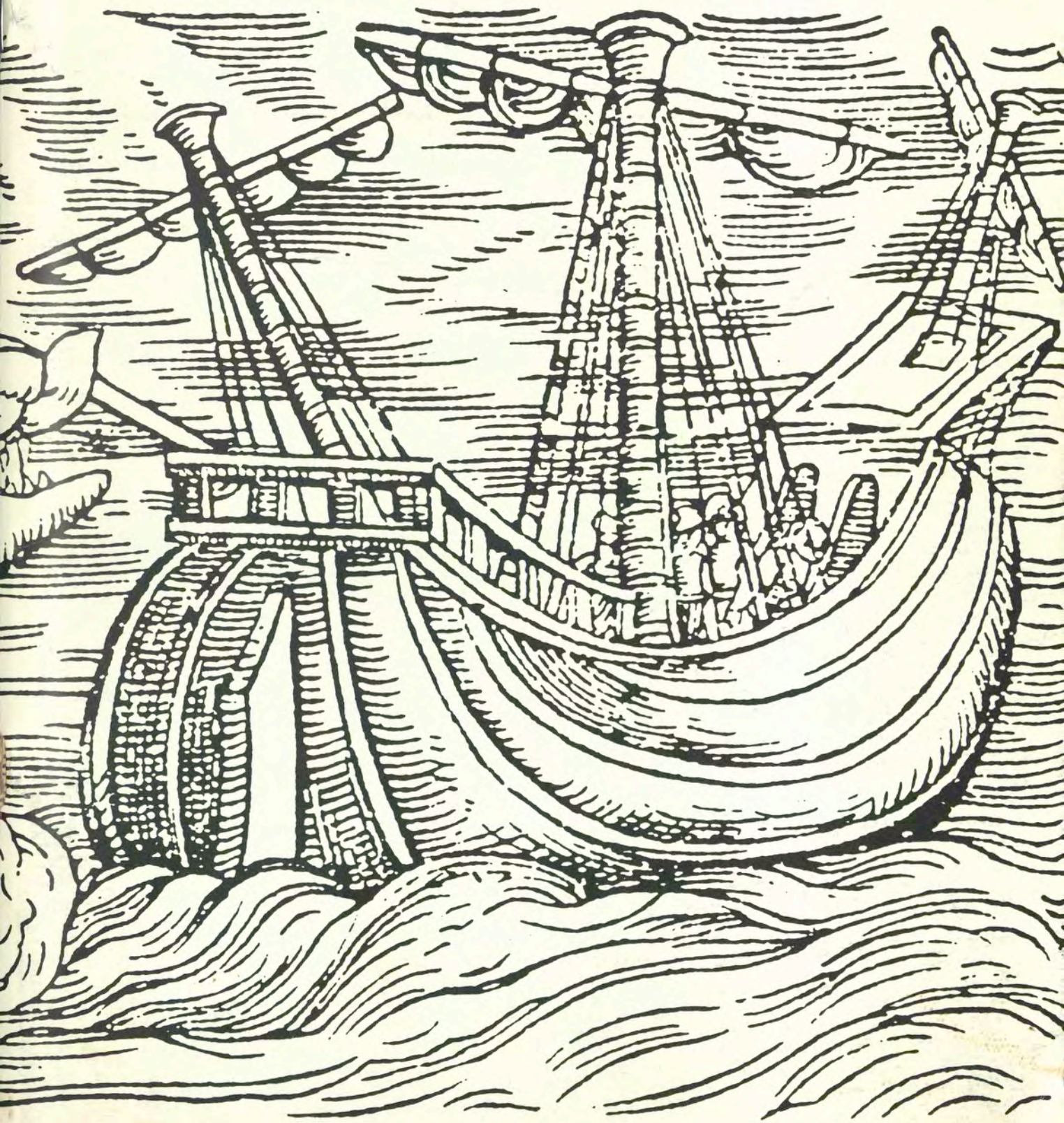
The Log *of* Mystic Seaport

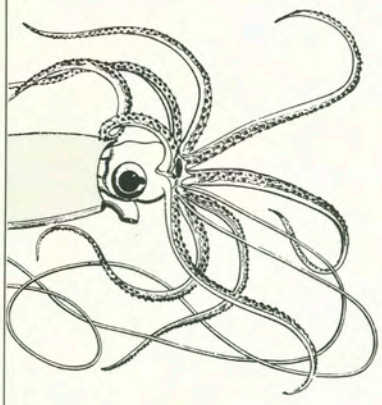
Autumn
1994
Volume 46
Number 2



Contents

33 Sightings

34 Architeuthis–*The Giant Squid: A True Explanation for Some Sea Serpents*
RICHARD ELLIS



41 The Future of Wooden Boats
JOHN GARDNER

47 Licensed to Steam: Our *Sabino* Engineers
SARA LEONE



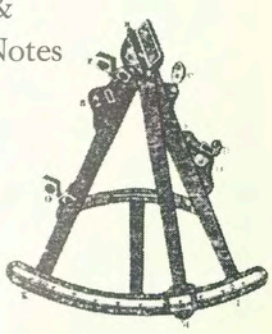
50 Morgan Barney, Naval Architect
MONA A. RIVERS

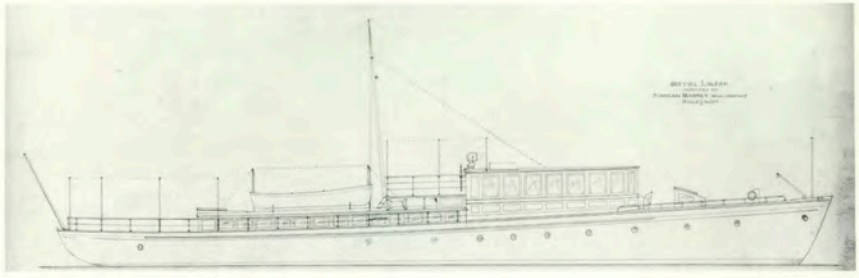
54 The *Pegasus* Steam Engine

55 William Wainwright's Recipe
SANDRA L. OLIVER

57 *Wind Rose,*® Calendar of Events & Museum Notes

62 Kids Corner





The Log of Mystic Seaport
Autumn 1994, Vol. 46, No 2
Published quarterly for members
Circulation 21,035

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Printing and Binding
Thames Printing Company, Norwich, Connecticut
On the cover: *from* Konrad Gesner's Nomenclator aquitilium animantum *(1560), in Mystic Seaport's G.W. Blunt White Library.*

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The Log of Mystic Seaport (ISSN 0024-5828) is published quarterly by Mystic Seaport Museum, Inc., 75 Greenmanville Ave., Mystic, CT 06355-0990. Subscriptions are by membership only, beginning at $35.00.

Submissions of previously unpublished articles and illustrations concerning non-naval aspects of the American maritime experience are welcome.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 *America: History and Life* and *Historical Abstracts.*

Sightings



Several years ago, many of us had the rare opportunity to view extraordinary objects from an ancient civilization as the Treasures of Tutankhamen exhibit toured this country. The artifacts we saw were awesome in the fullest sense of the word. For me, however, one moment in the exhibit was unforgettable – unforgettable because it involved more than the conventional formal display of an object with a descriptive label to read. In one of the cases was a golden horn, and as visitors stopped to look at it the sound of the horn became audible through a recording. Imagine the moment. Suddenly, we heard a sound that had been heard over three thousand years before, and we could now experience the horn in its human context, not simply as an exquisite artifact of antiquity. ❧ Visitors to art museums have rarely had such chances to use more than their sense of sight in experiencing exhibits. History museums, however–and particularly living history museums–have far greater opportunities to involve their visitors' senses in the learning process. At Mystic Seaport we have deliberately taken full advantage of this ability, and we have created a full-sensory experience utilizing all five senses of sight, hearing, touch, smell, and taste, in both subtle and not so subtle ways, in our educational endeavor. ❧ Certainly visitors to Mystic Seaport employ their eyes to appreciate many aspects of our museum. There are paintings, figureheads, models, photographs, moving images, scrimshaw, and innumerable artifacts to observe and explanatory labels to read. But there are many other rare sights. You can stand on the deck of the *Charles W. Morgan* and look aloft at the maze of rigging while our demonstration squad sets the sails. In the Museum's preservation shipyard, the boatshop, or at our historic structures under restoration you can watch skilled craftspeople at work, giving you a glimpse of the processes by which our vessels and buildings were created and are restored. The landscape of gardens and trees provides a visual treat, as does the glint of the morning sun on varnished wood, or the ethereal scene as the fog rolls in along the waterfront. ❧ These sights are enhanced by sounds; not the recorded sound of an ancient horn, but a spectrum of sounds, some of which are nearly extinct in our modern world. The distinctive sounds of the caulking mallet striking a caulking iron, the blow of an adze on a balk of timber, the shipsmith's hammer shaping iron on the anvil, or the pawls of a ship's capstan dropping into place are seldom heard outside a place like ours. The sounds of a seaport street a century ago echo in the horses hooves and carriage wheels clattering on cobblestone streets, and in the *Sabino*'s steam whistle announcing her departures. Our musicians fill the air with the sounds of fiddles, concertinas, and voices recreating the work songs of the days of sail. And, of course, there is the joyous sound of youngsters fully engaged with our dramas, *Tale of a Whaler* and *Deepwater Adventures.* ❧ In most museums "Do not touch" signs abound, but at Mystic Seaport touch conveys a great deal. We are a museum of textures: buildings sided with weathered shingles or painted clapboards, walking surfaces of cobblestone, flagstone, or oyster shells, wharves of wood and granite, and grassy lawns. Our textures may be new or unusual for some of our visitors, who may not be familiar with the rough feel of manila line or the smoothness of the spoke of a ship's wheel. Learning by touch can be painful, as when you hit your head on a low deck beam aboard the *Morgan;* or it can be surprising, as when you feel the ship heel with a gust of wind. And it can be very satisfying as you feel the tracking of a well-designed traditional pulling boat from our boat livery. ❧ The aromas of a seaport are also present for our visitors. Whose nose is not drawn to the scents of sea air, Stockholm tar in the chandlery, cedar shavings in the boatshop, lemons being squeezed, or food cooking in the Buckingham-Hall house kitchen fireplace? Other more pungent odors–cod drying on the flakes, a whiff of coal smoke from the *Sabino*, or the obvious presence of horses in our streets–balance the olfactory experience. ❧ Perhaps most unusual for a museum are the tastes experienced here. Good seafood at the Galley, the Seamen's Inne, or at our food festivals, and traditional baked goods from the Museum Stores Bake Shop are educational pleasures. And the annual Taste of History, supported by Sandra Oliver's scholarship in the history of foodways, helps you step back in time through the sense of taste. ❧ As we look forward to the future, telling the story of America and the Sea, we will continue to involve all five senses. In all of our exhibits, we will create opportunities to experience the fascinating elements of our maritime history and provide our visitors with a literal sense of the past.

J. Revell Carr

Architeuthis–The Giant Squid: A True Explanation for Some Sea Serpents

RICHARD ELLIS

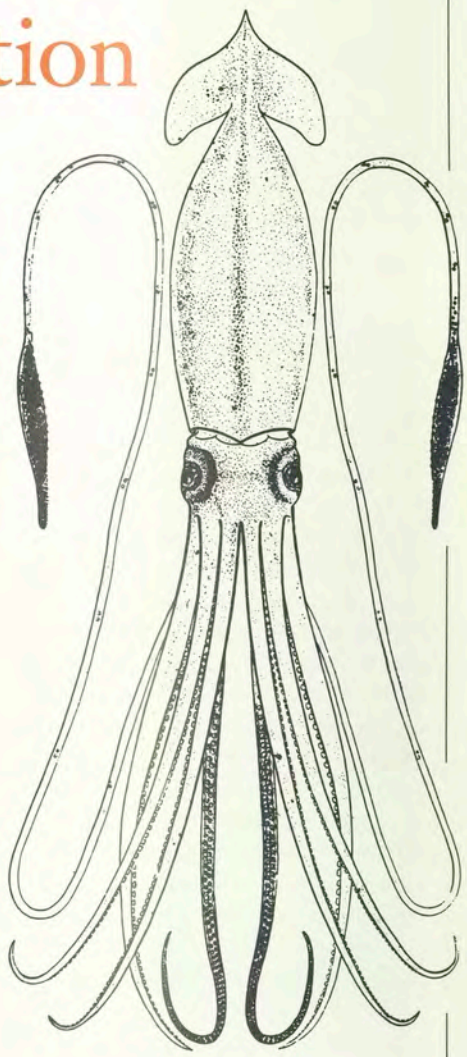
At sea off the Cape of Good Hope.... In the distance, a large dark shape is seen; it is obviously some sort of animal. The crew gathers on deck to get a better look. Sailing closer, we can make out a cylindrical body, moving effortlessly through the water. It is dark brown or black, glistening wetly. A snake-like neck appears, with a flattened head, weaving from side to side like a gigantic cobra. We can see no mouth or eyes, but that may be because the animal is facing away from us. Even though we cannot see its tail, we estimate its total length at about fifty feet. What can it be? A sea serpent? Some sort of seagoing dinosaur from prehistoric times?

Sea serpents of one sort or another have appeared throughout the world's oceans, and among the first descriptions was that of Olaus Magnus (1490-1557), the Catholic Archbishop of Sweden. He was influential as a cleric and historian, but his name will be forever associated with sea monsters. In 1658 he wrote *A Compendious History of the Goths, Swedes & Vandals, and other Northern Nations.* The descriptions and drawings that appeared on his maps firmly established the existence of many fabulous creatures, and were copied, reproduced, and modified for centuries, thus assuring his place as one of the most important figures in the history of zoology. He described the *Soe Orm* as follows: "A very large Sea-Serpent of a length upwards of 200 feet and 20 feet in diameter which lives in rocks and in holes near the shore of Bergen; it comes out of its cavern only on summer nights and in fine weather to destroy calves, lambs, or hogs, or goes into the sea to eat cuttles, lobster, and all kinds of sea crabs. It has a growth of hairs of two feet in length hanging from the neck, sharp scales of a dark brown color, and brilliant flaming eyes."

The Danish missionary Hans Egede, who eventually became the Bishop of Greenland, visited that ice island early in the eighteenth century, in hopes of converting the natives to Christianity. Two settlements were established, the first in 1721 and the second in 1723. While the Greenland Eskimos proved to be unsusceptible to the faith that was being pressed upon them, they were disastrously susceptible to the smallpox virus carried by one of the Danish missionaries, and most of them died. Egede's story is told in his *Det gamle Gronlands nye Perlustration* (published in 1741), which contains the following description:

The Monster was of so huge a Size, that coming out of the Water its Head reached as high, as the Mast-Head; its Body was as bulky as the Ship, and three or four times as long. It had a long pointed Snout, and spouted like a Whale-Fish; great broad Paws, and the body seemed covered with shell-work, its skin very rugged and uneven. The under Part of its Body was shaped like an enormous huge Serpent, and when it dived again under Water, it plunged backwards into the Sea and so raised its Tail aloft, which seemed a whole Ship's Length distant from the bulkiest part of its body.

Clergymen seemed to have a particular affinity for sea monsters (or perhaps it was vice versa), for our next witness is Bishop Erik Ludvigsen Pontoppidan of Bergen, author of *The Natural History of Norway,* published in 1755. The good bishop firmly believed in the kraken, which he called "Kraken, Kraxen, or, as some name it, Krabben," and maintained that the fishermen he spoke to told him it was a mile and a half in circumference. He took the deposition of a certain Captain von Ferry, who claimed to have seen a "sea-snake" passing his ship in August 1746. Upon being informed of the presence of the serpent, von Ferry came about in order to get nearer to it. At the Bishop's request, he described it in a letter written to the Court of Justice at Bergen:



A.E. Verrill's diagram of an Architeuthis *shows clearly the long, streamlined mantle that surrounds the body, the pair of arrow-like fins on the "tail" (which leads as the creature propells itself backwards through the water), the very large eyes, the ring of eight arms that surround the mouth, and the two long tentacles that grasp its prey. (U.S. Fish Commission,* Report...for 1879*)*

The head of this sea-serpent, which it held more than two feet above the water, resembled that of a horse. It was of a greyish color, and the mouth was quite black and very large. It had large black eyes, and a long white mane, which hung down to the surface

of the water. Besides the head and neck, we saw seven or eight folds, or coils, of this snake, which were very thick, and as far as we could tell, there was a fathom's distance between each fold.

Another worthy included in the Bishop's *Natural History* was Governor Benstrup, who saw quite a different monster than Captain von Ferry. Benstrup's version, which he illustrated, shows a long, snake-like creature, with several bends in its body showing above the surface, which he likened to "a string of buoys." The two sea-serpents included in Bishop Pontoppidan's discussion seem to have nothing in common except the folds, but in his *In the Wake of the Sea Serpents*, Bernard Heuvelmans is ready to believe in both of them: "Thus we see that in the middle of the eighteenth century at least two large sea-monsters, both partly serpentiform, but certainly different in anatomy, were found in northern waters and were rivals for the title of great sea-serpent."

Even sightings that occur in the same area seem to happen in sequence, often within a couple of years of each other. Soon after the furor of the Norwegian monsters had subsided, an Englishman named Charles (later Captain) Douglas, sailing off Lapland in HMS *Emerald*, on one of the first European oceanographic voyages, interrogated the Norwegians about the kraken and the sea-serpent, and while no one could tell him anything about the kraken, they knew a lot about what they called "Stoor Worms." Douglas recounted one sighting, described by the master of a Norwegian vessel, of three of the worms, "floating upon the surface of the sea, twelve parts of the back of the largest appearing above water; each part being in length about six feet...so that upon the whole he judged the animal could not be less than twenty-five fathoms long, and about one in thickness." From Douglas's description (which was read to the Royal Society in 1770), the "worms" might very well be the arms of a giant squid, either dead or dying.

Incredibly, the *real* kraken did not reveal itself to science until 1853, when a Danish zoologist named Johann Japetus Steenstrup examined a six-inch beak. (Giant squid have beaks like parrots, only considerably larger.) In November 1861 the French navy dispatch steamer *Alecton* had an encounter as it approached Teneriffe. "Finding myself in the presence of one of these strange beings that the ocean sometimes produces from its depths as if to offer defiance to science, I resolved to study nearer by, and try to gain possession of it," reported Lieutenant Bouyer, the *Alecton*'s commander (whom A.E. Verrill later quoted). "It is the giant squid, but the form of the tail seems to make it of undescribed variety. It seemed to measure 15-18 feet to the head, shaped like a parrot's beak, and enveloped by 8 arms, from 5 to 6 feet long. Its appearance was frightful, its color a brick-red, and this half-formed being, this colossal and slimy embryo, has a repulsive and terrible appearance."

The *Alecton*'s monster escaped, and it would be another twelve years before a scientist would actually examine the body of *Architeuthis*. For reasons that will probably go forever unexplained, giant squid began appearing off Newfoundland during the decade 1870-80, when as many as 60 of these beasts, some of them

In 1734, Hans Egede, the Bishop of Greenland, reported this web-footed monster. Despite its somewhat improbable position, it is possible to see the giant squid Architeuthis *as a likely explanation. (*Harper's New Monthly Magazine, *July 1860)*



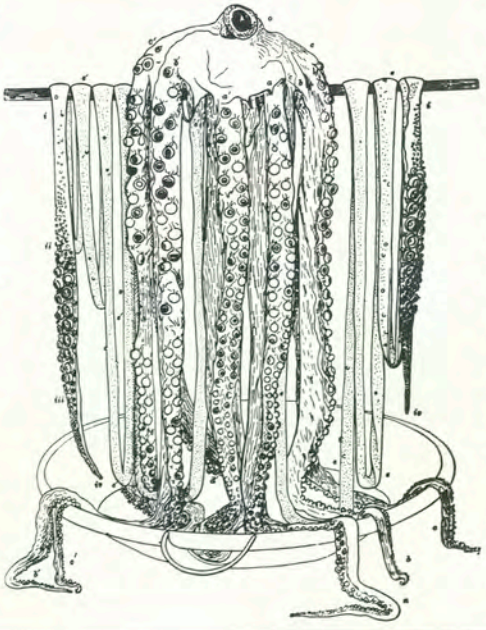
over 40 feet long, were found on the beach or floating offshore. The Gloucester fishing schooner *B.D. Haskins* picked up the first reported one on the Grand Banks in October 1871. After judging it to weigh about a ton, with a 15-foot body and 9-10-foot arms, the crew used most of it for bait. Science's first specimen was collected by the Rev. Moses Harvey of St. John's, Newfoundland–a 7-foot carcass with 6-foot arms and 24-foot tentacles, which became entangled in a herring net at Logie Bay in 1873. Two years later, as many as 30 dead and dying specimens provided a bonanza of bait for American fishing schooners on the Grand Banks. All of these sightings and recoveries led Yale University's A.E. Verrill to provide the first detailed analysis of the type–the largest of which he christened *Architeuthis princeps*–in the U.S. Fish Commission's annual report for 1879. Then, almost as quickly as they had appeared, the giant creatures disappeared from Newfoundland waters, but next they began to turn up in New Zealand. Since the turn of the century, *Architeuthis* carcasses have shown up in what appear to be random locations around the world, from Iceland and Norway to South Africa and Cape Cod.

From the most sporadic and circumstantial of evidence, we believe they live at great depths. But from an examination of the carcasses, we can extrapolate something about their lives in the icy blackness. First there are the eyes: the giant squid has the largest eyes in the animal kingdom, which can reach a diameter of 15 inches–the size of an automobile hubcap. And they are highly-developed eyes, as complex and capable as those of the higher vertebrates, but adapted for seeing in very low light levels–and of course underwater, as well. Like all squid, *Architeuthis* has eight arms and two greatly elongated tentacles, which may reach a length of 40 feet. The two tentacles are equipped with "clubs," which can grasp and hold the prey items, whatever they might be. The other eight arms have rows of suckers, each of which is individually movable and has a toothed ring around the perimeter that digs into the flesh of its prey, holding on for eternity or death, whichever comes first. At the center of the corona of arms is the powerful beak, capable of ripping chunks of flesh from prey animals that might be as big as a sperm whale. Giant squid are believed to be solitary hunters.

The giant squid has been celebrated in literature and cinema (it appears in *Moby-Dick* and *Twenty Thousand Leagues Under the Sea*), but despite these appearances–or perhaps because of them–many people still do not believe that such a creature actually exists. Several attempts have been made to replicate the squid in film, but because it is such a complex animal, the attempts have not been totally successful. (In the 1954 Walt Disney production of *Twenty Thousand Leagues Under the Sea,* it took 50 men to operate the wires, hydraulic apparatus, and remote controls required to animate the life-sized, two-ton model.)

While scientists were debating the existence of the kraken, another group of men knew that there was certainly something that fit the early descriptions, and in fact, many of them had actually seen it. Yankee sperm whalers, plying the world's oceans in pursuit of the cachalot, often saw their prey, in its death throes,

The Rev. Moses Harvey draped the complete 1873 Logie Bay Architeuthis *specimen over his shower bath to display its form. In this perspective the body is inverted and hidden by the arms, with only the mouth and beak showing at the top. The eight arms, with their many suckers, are 6 feet long; the two 24-foot tentacles, with suckers on the "clubs" at the end, are looped over the crossbar in this engraving from a photograph. (U.S. Fish Commission,* Report...for 1879*)*



regurgitate large pieces of *something*, and they sometimes hooked one of the pieces to get a closer look at it. In 1856, Charles Nordhoff wrote a book called *Whaling and Fishing*, in which he described what the whalemen called "squid," but which he believed to be "a monster species of cuttle fish:"

The animal seldom exhibits itself to man; but pieces of the feelers are often seen afloat, on good whaling ground. I have examined such from the boats, and found them to consist of a dirty yellow surface, beneath which appeared a slimy, jelly-like flesh. Of several pieces which we fell in with at various times when in the boats, most had on them portions of the "sucker," or air exchanger with which the common cuttle-fish is furnished, to enable him to hold the prey about which he has slung his snake-like arms. These floating pieces are supposed to have been bitten off or torn by the whales, while feeding on the bottom. Many of those we saw were the circumference of a flour barrel. If this be the size of the arms, of which they probably have hundreds, each furnished with air exhausters the size of a dinner plate, what must be the magnitude of a body which supports such an array?

There are those who believe that *Architeuthis* is a sluggish animal, neither powerful nor aggressive, but suppositions like that are never going to interfere with the creature's enduring reputation as a man-eating, ship-grabbing, whale-wrestling monster. It has long been a part of sperm whale lore that it has to dive to prodigious depths to seek out its favorite prey. The size and alleged ferocity of *Architeuthis* provides more than enough ammunition for the creative writer or over-imaginative naturalist, and titanic battles between the squid and its (perhaps apocryphal) arch-enemy, the sperm whale, will continue to appear in popular literature.

Sperm whales are known to feed on cephalopods, and because these whales have been hunted commercially for almost three centuries, we have had more than ample opportunity to examine the stomach contents. (In the early days of the fishery, however, when the blubber was stripped off alongside the ship, the carcass, along with the stomach contents, was discarded. It was only when the whales were hauled up on the decks of the great factory ships that the stomach contents were spilled out on deck). But even before the days of



A 30-foot juvenile Architeuthis *washed ashore on Plum Island, Massachusetts, in February 1980. In this view the 5-foot body lies on a stretcher. Note the large eye. This specimen is currently on exhibit at the Smithsonian Institution in Washington, D.C. (Photo by Carla Skinder, New England Aquarium)*

mechanized whaling, whalers observed their quarry, in its death throes, vomiting up great hunks of what could only have been giant squid.

In *Moby-Dick*, a giant squid is sighted from the *Pequod*, and described as "A vast pulpy mass, furlongs in length and breadth, of a glancing cream color...innumerable long arms radiating from its centre, and curling and twisting like a nest of anacondas." Like Melville, Frank Bullen was a whaleman-turned-author, and in his *The Cruise of the Cachalot*, he described a clash between a squid and a whale. (Bullen's narrative is replete with improbably theatrical episodes of courage–usually his–and wildly unlikely behavior on the part of various animals, and most historians are inclined to dismiss his book as more fiction than fact). Even though it might be pure invention, the book does contain a vivid description of a battle between the two gigantic predators:

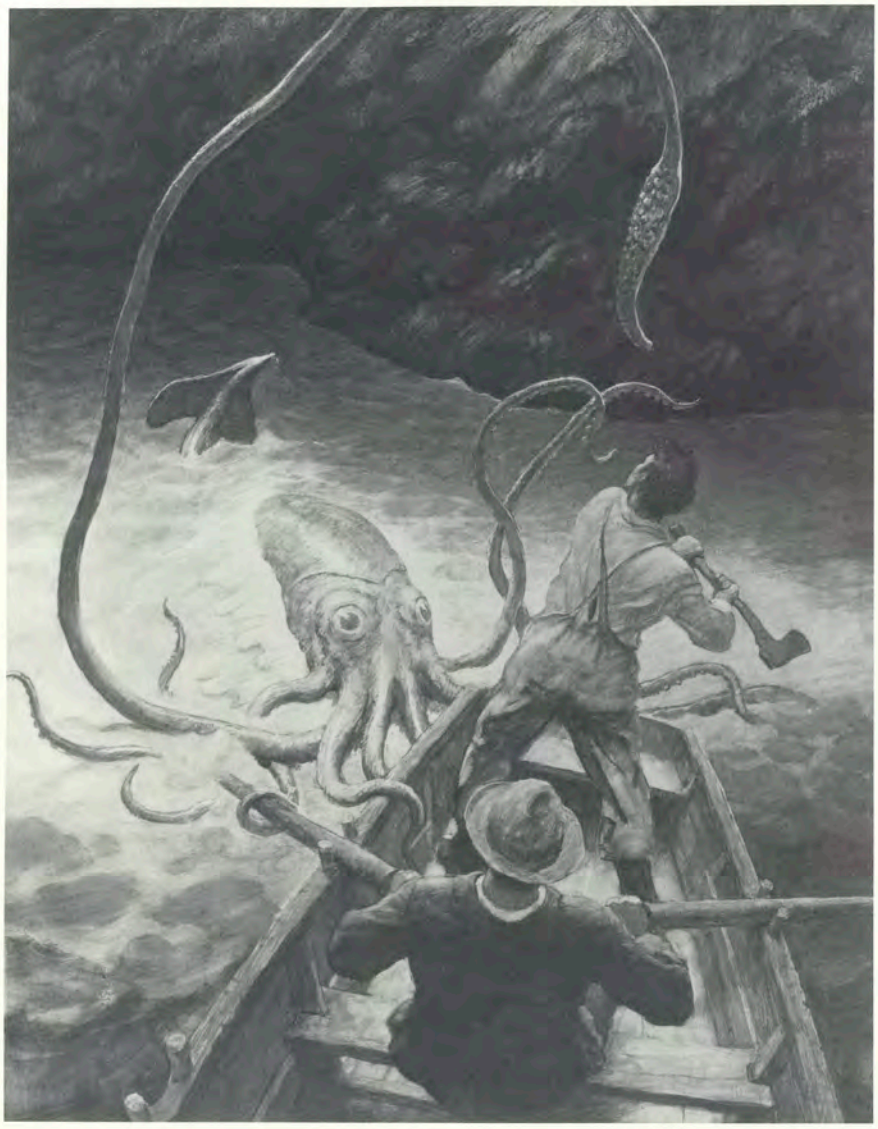
A very large sperm whale was locked in deadly conflict with a cuttle-fish, or squid, almost as large as himself, whose interminable tentacles seemed to enlace the whole of his great body. The head of the whale especially seemed a perfect net-work of writhing arms–naturally, I suppose, for it appeared as if the whale had the tail part of the mollusc in his jaws, and, in a business-like, methodical way, was sawing through it. By the side of the black columnar head of the whale appeared the head of the great squid, as awful an object as one could well imagine even in a fevered dream. Judging as carefully as possible, I estimated it to be at least as large as one of our pipes, which contained three hundred and fifty gallons; but it may have been, and probably was, a good deal larger. The eyes were very remarkable from their size and blackness, which, contrasted with the livid whiteness of the head, made their appearance all the more striking. They were, at least, a foot in diameter, and seen under such conditions, looked decidedly eerie and hobgoblin-like.

There seems to be no question that the crew and officers of the bark *Pauline* saw a battle between a sperm whale and *something* on 8 July 1875. As later reported in the *Illustrated London News*, Captain George Drevar was some 20 miles off Cape San Roque, Brazil, when the *Pauline* came upon three very large sperm whales, "and one of them was gripped round the body, with two turns, by what appeared to be a huge serpent. Its back was of a darkish brown and its belly white, with an immense head and mouth, the latter always open." The crew judged it to be 30 feet long, and almost nine in girth. "Using its extremities as levers, the serpent whirled its victim round and round for about fifteen minutes, and then suddenly dragged the whale down." Five days later the *Pauline* passed near a similar huge creature, "shooting itself along the surface," with at least 40 feet showing, and later appearing to stand at least 60 feet out of the water. With the exception of the open mouth, these creatures sound suspiciously like giant squid.

The *Plumper*'s sea-serpent was reported in the *Illustrated London News* for 14 April 1849, but the actual sighting occurred at the end of 1848. The article, which was signed "A Naval Officer," included this description:

being due west of Oporto [Portugal] I saw a long black creature with a sharp head, moving slowly, I should think about two knots, through the water in a north westerly direction, there being a fresh breeze at the time, and some sea on. I could not ascertain its exact length, but its back was about twenty feet if not more above the water; and its head, as near as I could judge, from six to eight...the creature moved across our wake towards a merchant ship barque on our lee quarter, and on the port tack.

Also in 1848, the British frigate *Daedalus* was sailing off the Cape of Good Hope when the crew spotted an enormous serpent-like creature, which appeared to



N.C. Wyeth painted a fanciful but threatening Architeuthis *in his* Adventure of the Giant Squid of Chain Tickle, *ca. 1940, an illustration for an anthology of children's literature. (Courtesy Free Library of Philadelphia)*

be about 16 inches thick and more than 60 feet long. Its "head" was held about four feet above the water, and its means of propulsion was unclear. Captain Peter M'Quhae reported to the Admiralty, "It had no fins, but something like the mane of a horse, or rather a bunch of seaweed, washed about its back." *The Illustrated London News* ran the story, accompanied by drawings done from M'Quhae's description, and the Daedalus monster entered the lists as one of the best-described sea serpents of all time (see *The Log*, 44:3, winter 1992).

With a dark "body," pointed head, no mouth, and only the faintest suggestion of an eye, the illustration that accompanied the description of the *Plumper*'s sighting looks like no living creature–except possibly a giant squid. If we look at the drawing of the *Daedalus* monster with *Architeuthis* in mind, the identification of the "monster" leaps off the page. We see not an "enormous serpent," but rather the tail of an enormous cephalopod. Captain M'Quhae obligingly drew an eye where he thought it ought to go, but in his description he never mentioned it. He did, however, write that "no portion [of its anatomy] was used in propelling it through the water, either by horizontal or vertical undulation." No vertebrate can move through the water without some visible means of propulsion, but a squid, which uses water ejected from the funnel or the mantle to move, could easily conform to M'Quhae's description. Then there is the case of the *Pauline*'s "serpent," coiled twice around a sperm whale and spinning it with its extremities. Since we already know that sperm whales regularly engage in battles with giant squid, it does not require a leap of imagination to see this creature as none other than *Architeuthis.*

While the identity of the *Daedalus*'s "prehistoric saurian" remained unresolved, more monsters began to appear, and, because M'Quhae's had been encountered off South Africa, sightings were no longer restricted to the North Atlantic. Not surprisingly then, in 1849, a "large marine mammal, with the head and general figure of an alligator, except that the neck was much longer, and instead of legs the creature had four large flappers," appeared to George Hope, an officer on HMS *Fly* in the Gulf of California. In his discussion of this event (in the British journal *Zoologist*), Edward Newman wrote, "the present existence of huge marine mammals closely related to the Enaliosauri of by-gone ages...appears to me the most interesting Natural History fact of the present century, completely overturning as it does some of the most favourite and fashionable hypotheses of geological science."

I do not propose to assign all sea-serpent sightings to *Architeuthis*, but there is a strong possibility that many of those seamen and passengers who reported a "monster" of some sort were actually seeing the giant squid. Let us examine the serpents of the Scandinavian ecclesiastics, Bishops Egede and Pontoppidan. As Henry Lee points out in *Sea Monsters Unmasked*, Egede's illustration of a sea serpent can be easily made to look like a giant squid if we eliminate the eye and the mouth, and have the "blow" come from the funnel instead of from the mouth. Pontoppidan's accounts are based largely on hearsay and the reports of Von Ferry and Benstrup, but he also mentions the carcasses that washed ashore with regularity on the coasts of Norway. Is it not possible that mid-eighteenth-century Norway saw an invasion of giant squid like the one that occurred in Newfoundland in the late nineteenth century?

When British naturalist Philip Henry Gosse wrote *The Romance of Natural History* in 1861, he concluded with a chapter entitled "The Great Unknown," in which he summarized much of what

was known about sea-monsters up to that time. On 28 July 1845, four men were out on Romsdal Fjord, fishing:

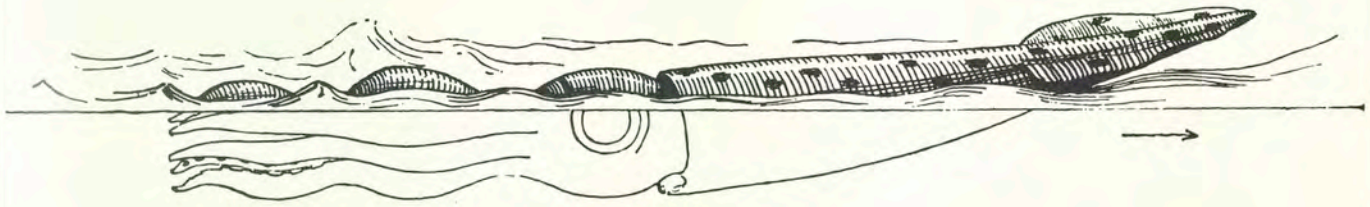
They saw a large marine animal, which slowly moved itself forward, as it appeared to them, with the help of two fins, on the fore part of its body near the head, which they judged from the boiling of the water on both sides of it. The visible part of the body appeared to be between forty and fifty feet in length, and moved in undulations like a snake. The body was round and of a dark colour, and seemed to be several ells [an ell equals two feet] in thickness. As they discerned a waving motion in the water behind the animal, they concluded that part of the body was concealed under water. That it was one connected animal they saw plainly from its movement. When the animal was about one hundred yards from the boat, they noticed tolerably correctly its fore-part, which ended in a sharp snout; its colossal head raised itself above the water in the form of a semicircle; the lower part was not visible.

kjaempeblaeksprutten. Particularly significant are the "waving motion" behind the animal (the arms), the "head" (a tentacular club), and the absence of eyes. (Ninety-nine years later, in Vike Bay in the very same Romsdal Fjord, a giant squid measuring 30 feet in total length was found by fishermen. One cannot fault those who believed that the 1845 animal was a sea serpent; how could they know that a real animal fitting that description would eventually appear?)

In 1905, two British naturalists, E.G.B. Meade-Waldo and M.J. Nicoll, on a scientific cruise aboard the Earl of Crawford's steam auxiliary yacht *Valhalla*, sighted a dark brown animal with a great frill on its back off the coast of Brazil. In the *Proceedings of the Zoological Society of London*, Meade-Waldo published his observations:

I looked and saw a large fin or frill sticking out of the water, dark seaweed-brown in colour, somewhat crinkled on the edge. It was apparently about 6 feet in length and projected from 18 inches to 2 feet from the water. I could see, under the water to the rear of the frill, the shade of a considerable body. I got my field glasses on to it (a powerful pair of Goerz Trieder), and almost as soon as I had them on the frill, a great head and neck rose out of the water in front of the frill; the neck did not touch the frill in the water, but came out of the water in front of it, at a distance of not less than 18 inches, probably more. The neck appeared about the thickness of a slight man's body, and from 7 to 8 feet was out of the water. The head had a turtle-like appearance, as had also the eye. I could see the line of the mouth, but we were sailing pretty fast, and quickly drew away from the object, which was going very slowly. It moved its head from side to side in a peculiar manner; the colour of the head and neck was dark brown above, and whitish below–almost white, I think.

It is certainly possible to read this description as a monster with a "frill," but it is almost as easy to see it as a description of a giant squid swimming at the surface; the frill could be one of the tail fins; the neck (not attached to the "frill") one of the long tentacles, and the head its flattened end. The "turtle-like" appearance of the eye is admittedly a problem, but if something looks like the "head" of an animal, we expect to see an eye *somewhere,* and Meade-Waldo and Nicoll may have only imagined it. (There have been many "sea-monster" sightings that can be explained as *Architeuthis* if we assume that the observers misidentified the eye). As for the "peculiar" movement of the head (which Nicoll described as "a curious wriggling movement"), it is more likely that they were describing an object that was *not* a head, but something else–a tentacle, perhaps. We know virtually nothing about the locomotion of giant squid at the surface (if indeed they ever locomote at the surface), but it is possible that these creatures swim with a tentacle out of the water, which would go a long way towards explaining the sightings of a large-bodied animal with a long neck. (If a giant squid ever swam with both of its tentacles out of the water, we would probably have reports of two-headed monsters).



In this diagram of a giant squid swimming at the surface, Henry Lee provided a possible explanation for the Daedalus *sea monster. The tentacles have been omitted from the drawing, but they would have more than doubled the creature's length. (Lee,* Sea Monsters Unmasked*)*

Gosse wrote, "Few seacoasts have been more sedulously searched, or by more acute naturalists...than those of Norway. Krakens and sea-serpents ought to have been living and dying thereabouts from long before Pontoppidan's time to our day, if all tales were true; yet they have never vouch-safed a single fragment of the skeleton to any Scandinavian collector." Eleven years later, when a Kraken "fragment"–consisting of an entire giant squid–appeared off Newfoundland, an explanation appeared and it became possible to interpret Gosse's story as a description of what the Norwegians now call

Most authors of sea-monster studies quote the tale of the Grace Line steamer *Santa Clara,* sailing from New York to Cartagena in 1947. Some 118 miles off North Carolina, the ship struck a marine creature. Third Officer John Axelson saw

a snakelike head rear out of the sea about 30 feet off the starboard bow of the vessel. His exclamation of amazement directed the attention of the other two mates to the Sea Monster, and the three watched it unbelievably as in a moment's time it came abeam of the bridge where they stood and was left astern. The creature's head appeared to be about 2 1/2′ across, 2′ thick, and 5′ long. The cylindrically shaped body was about 3′ thick, and the neck 1 1/2′ in diameter. The visible part of the body was about 35′ long.

Since none of the descriptions include a mouth or eyes–features that would

probably attract immediate attention–it seems plausible to assign all the elements of the *Santa Clara* sighting to the giant squid. The "snakelike head" could be the club end of one of the long tentacles with the suckers turned away from the viewer, and the "neck" would be the tentacle itself. The given dimensions coincide with those of the club of a large squid's tentacle, and even the "cylindrically shaped body" is the right size. In other words, there is nothing in this description that might not refer to *Architeuthis.*

The giant squid is not the explanation for every monster; there are many sightings by reputable persons that cannot be conveniently dumped into a basket woven of squid tentacles. Some monsters have been oarfish; others basking sharks, whales, or their deformed carcasses. There are some that simply cannot be encompassed by any rational explanation. We now realize that there are gigantic creatures alive and well in the world's oceans, but the giant squid remains the quintessential sea mystery. There have been about 150 records of specimens stranded on the beach or floating at the surface, but so far, nobody–at least nobody who knew what they were looking at–has seen a healthy giant squid. Because of the animal's deep-water habitat and its presumed rarity, an expedition to film one in its native habitat is beyond the range of our technology, and even if it were possible, the cost would be prodigious. Where would we go? Once we got there, to what depth? And what would we use to entice the creature into camera range? A film of one (or more) of these 60-footers, propelling itself through the murky deep, remains among the sea's last uncaptured images.

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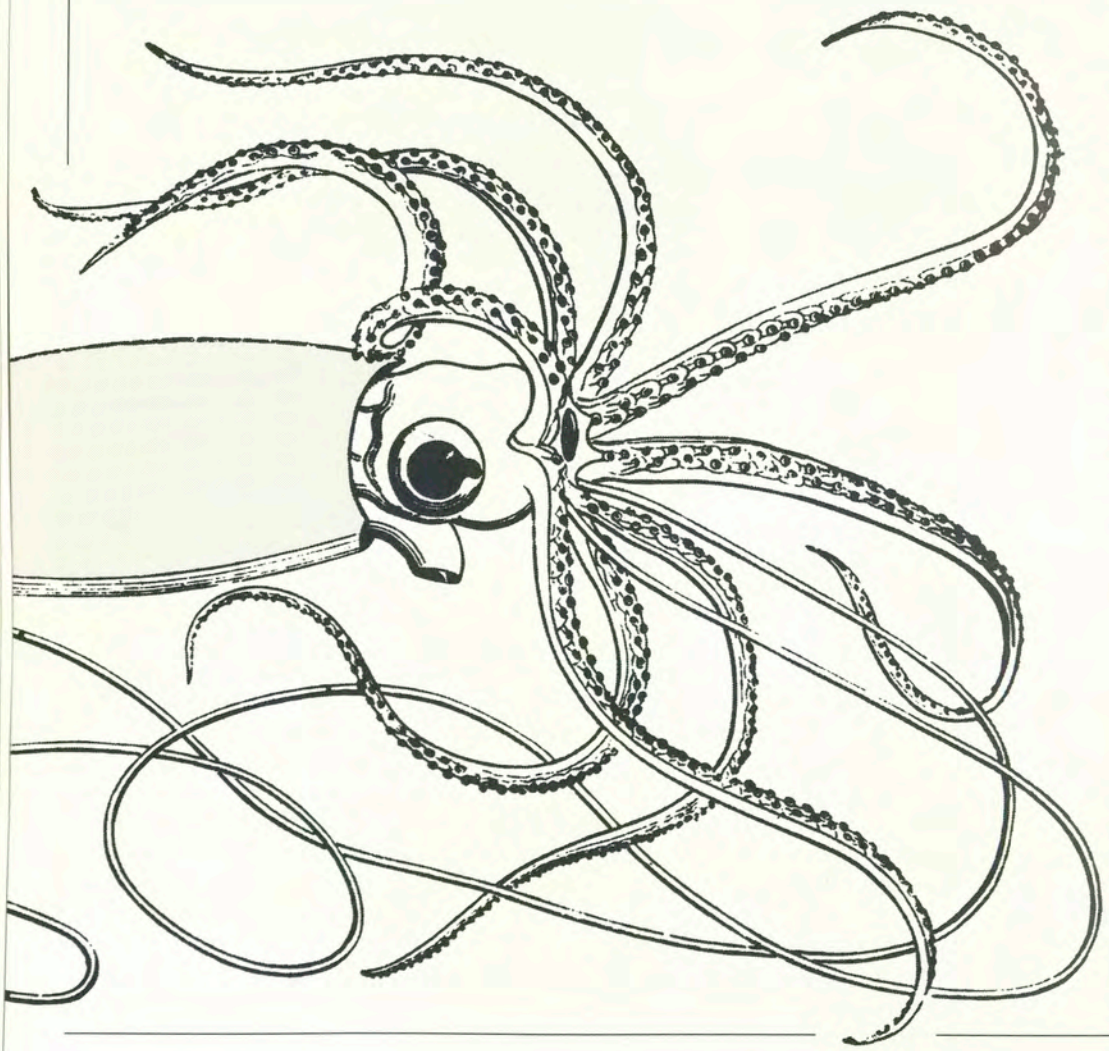
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A side view of the elusive Architeuthis, *showing the mouth between the arms, the huge eye, and below it the funnel with which it jets through the depths by expelling water. (U.S. Fish Commission,* Report...for 1879*)*

The Future of Wooden Boats

JOHN GARDNER





A team of competitors from East Harlem Maritime School pulls together at the oars of a Mystic Seaport-built whaleboat during the November 1993 Youth Rowing Race. Rowing teams came from Connecticut, Rhode Island, Massachusetts, and New York. (Sharon Brown Photograph)

The Museum Small Craft Association was conceived and brought forth at Mystic Seaport 18 years ago. An article entitled, "Maritime Museums: Obligation and Objectives," published later the same year in volume 1, number 6, of *WoodenBoat*, reported and commented on that first meeting. The reasons for holding the meeting, set forth in the opening paragraphs of this report, are as valid and as applicable today as they were then, in spite of the changes that have taken place, and the progress that has been made since.

"The future of wooden boats, if they are to have a future," the final paragraph concludes, "lies to a considerable extent with marine museums. History has placed in their hands a unique opportunity and a unique obligation. The boats in their collections constitute a treasury of small-craft knowledge and design, which could not now be found anywhere else. And because these museums attract millions of visitors, they have an unparalleled opportunity to make this historic resource available to the widest reaches of the public for their appreciation and use. Indeed, in view of the museums' acknowledged educational function, any other course would be a violation of their public trust."

This was the first time, I believe, that museum professionals had come together solely for the purpose of considering what could be done with small craft and what the role and function of small craft in an active museum program could and should be. The passage of time has brought changes, but there have been no radical departures, so far as I am aware, from the basic conclusions that came out of that first meeting, which acknowledge that small craft have a unique and vital contribution to make to the active programs of the living museum.

What is unique and vital about small craft? Basically it is this: it is only by means of small craft, defined as ranging from the small dinghy up to 40 feet and even somewhat more, that many people today–especially young people–have any chance of getting on the water in an active way, and have any chance of experiencing by themselves and on their own something of the pleasures and thrills, as well as hardships, dangers, and responsibilities, of going to sea. The youngster in his small boat, caught out in a sudden squall, learns to respond with a resourcefulness and self-control that will stand him in good stead later in life, whether at sea or ashore. Without that direct personal experience that comes from using boats on the water–yes, in caring for them, repairing, and even building them–youngsters will have missed something important in growing up; nor can they be expected in later life, if they have been so deprived, to have any deep interest in the sea and things maritime. Were that to happen on a broad scale, as is now threatening to happen, maritime history, despite our best efforts otherwise, would be in danger of losing social relevance, fated to become the retreat of a few socially detached antiquarians.

Maritime museums are not numerous, and for the greater part are quite recent in inception. The oldest in this country by far is the Peabody (now Peabody & Essex) Museum in Salem, Massachusetts, founded in 1799 as the East India Marine Society. The individual most responsible was the Reverend William Bentley, minister of Salem's East Church, an immensely able and learned man of wide-ranging scientific interests and progressive views. He encouraged his parishioners, many of whom were engaged as seamen in the newly opened trade with Asia, to be observant, and to bring back curios, oddities, and specimens of the strange and different things they saw. This they proceeded to do in increasing quantities, and it was to house and exhibit such items for the information and instruction of the public, as well as for their entertainment, that these various collections were brought together in the East India Marine Hall on Essex Street. By 1821 the Society's collections had grown to number an imposing 2,269 items.

In the days before the invention of photography and such later developments as moving pictures, television, and theme parks, such exhibits had an impact they do not have today. They opened up fascinating new worlds to the viewers; they transported their viewers to faraway places that otherwise they would have had no conception of. The educational effect was profound, and while no formal statement of educational intent may have been made, it was, nonetheless, implicit and operative to a high degree.

The effects to be obtained now from exhibits intended merely for walk-by viewing, no matter how cleverly and

lavishly laid out, are bound to be much weaker, and even feeble in comparison with the response achieved by the outside competition museums must contend with. And this is most especially true for small craft exhibits, where viewers have had little or no prior experience with small craft or the opportunity to use them.

For maritime museums to attempt to compete with commercialized mass entertainment would be a fatal mistake, a trap to be avoided. This is well stated in a recent issue of the *New York Review*, in a commentary on *Jurassic Park* by Stephen Jay Gould, Harvard professor, MacArthur fellow, and author of numerous prizewinning books.

"I happen to love theme parks," he writes, "so I do not speak from a rarefied academic post in a dusty museum office. But theme parks are in many ways the antithesis of museums. If each institution respects the other's essence and place, this opposition poses no problems. But theme parks belong to the realm of commerce, and museums to the world of education–and the first is so much bigger than the second. Commerce will swallow museums, if educators try to copy the norms of business for immediate financial reward." Nothing could be more true or to the point; yet, unfortunately, there are indications that what Gould warns against is beginning to happen.

Leaving aside the assemblage of models that comprise the Watercraft Collection at the National Museum of American History in the Smithsonian Institution as hardly within the scope of our considerations here, 130 years were to elapse before a second maritime museum was to appear in this country, followed by a third in little more than a year; namely the Marine Historical Association at Mystic, Connecticut, in 1929 and the Mariners' Museum at Newport News, Virginia, in 1930.

These are and were history museums from the beginning, as the Peabody Museum at Salem was not in the beginning, 200 years ago when the glories of America's maritime achievements lay ahead in the future, and had not yet faded into the past.

As Carl Cutler, maritime historian, explained in the "Statement of Plan and Purposes of the Marine Historical Association," which he issued as secretary of the organization at the time of its formation, the Museum originated as a "by-product," as he put it, of efforts by himself and others to salvage historical material related to New England's seafaring past that were fast disappearing, being discarded, thrown out, and sold as junk–customhouse records by the ton, manuscripts, logbooks, photographs, and wagon loads of builders' half models, sawed up and burned as firewood.

"From the acquisition of a collection to the problem of proper housing for it, is a short, imperative step," Cutler wrote. "And from problems of housing to the advisability of developing other ways and means of putting this and similar future acquired property to work in an effective way, is a question which has already suggested itself. *It is one thing to have a fine collection and exhibit it to the public in an interesting manner. It is wholly another matter to make that collection the nucleus of a vital, growing force which shall be the rallying point of an organization capable of playing a worthy part in a living America with a future to face* [emphasis mine]."

What we have here is a powerful declaration of purpose. Clearly the intent of the Museum's founding fathers was an active and influential involvement on the part of the Museum in the ongoing social process.

Despite rain, 200 people attended the first Rowing Workshop and Conference at Mystic Seaport, held 24 years ago, 6-7 June 1970. Forty-five boats were in the water, including (center) *a 10-foot clinker pram built by W. Southworth of Egypt, Massachusetts, from Herreshoff lines and redesigned construction details published by John Gardner in the* National Fisherman *in 1968. (Les Olin Photograph)*



The Mariners' Museum at Newport News had quite a different origin. Archer M. Huntington, who founded it, envisioned the museum as a nonprofit education institution intended to help make America sea-minded. The inscription on the museum's great bronze doors reads: "This museum is devoted to the culture of the sea and its tributaries, its conquest by man, and its influence on civilization."

As the son of Collis P. Huntington, this country's greatest railroad builder, Archer M. Huntington had unlimited financial means at his disposal. This enabled him when he set up his small-craft collection, the first of any size in this country, to assemble representative small craft from all over the world, one of the most unusual and striking being a 51-foot example of a Portuguese fishing type, a survival from ancient times propelled solely by oars. This collection was first displayed for a short time in the open, but was soon moved under cover to protect it from the weather.

The depression years of the 1930s and the war years of the 1940s were almost entirely blank for maritime museums, except for the opening of a small marine museum at Searsport, Maine, in 1936.

This was also a thin time for small craft, although interest was building up beneath the surface, so to speak, as evidenced by the resounding popular response to L. Francis Herreshoff's contributions to *Rudder* in the late 1940s that resurrected and revitalized for a short time that all-but-defunct boating magazine.

Then, in 1952 the Adirondack Museum was instituted and funded by Harold Hochschild. Hochschild had spent much of his childhood and youth in the Adirondacks, which he had come to know well and to love. To serve as director for the new museum Hochschild picked Dr. Robert Bruce Inverarity, who had studied West Coast Indian canoes extensively. From this background he was able to appreciate the singular qualities of the Adirondack guide boat and the contribution that remarkable craft had made to the culture and development of the Adirondack region. In view of this, Inverarity chose the guide boat as the focal center around which to organize the new museum.



The first recreational boatbuilding classes for amateurs were offered by Mystic Seaport's Small Craft Laboratory in January 1971. The two-hour classes met once a week for 15 weeks, and this 13 1/2-foot Chamberlain dory skiff, was the focus of the class. Here John Gardner demonstrates how to fasten the steam-bent white oak frames with assistant Syl Costelloe. (Les Olin Photograph)

The previous year had seen the publication by W.W. Norton of Howard Chapelle's *American Small Sailing Craft*, a revised and extended version of material he had first treated in articles in *Yachting* in 1932. The book was an instant success, and its influence on the boating public was immediate and far-reaching. Also, I might add, in that same year, 1951, my first article on dories appeared in the old *Maine Coast Fisherman.*

Small craft at the Mariners' Museum during the fifties was quiescent. There is no evidence of activity at Searsport. The Peabody in Salem, to the best of my knowledge (and I was spending a lot of time there as a volunteer in the 1950s and 1960s), had only one full-size small boat, a Chaisson-built sailing dory donated by the Phillips family, stored away out of sight in a corner of the basement. But at Mystic Seaport during that decade an active small-craft program under the direction of James Kleinschmidt, Marine Maintenance Superintendent, had made remarkable progress.

The rescue of endangered examples of historic New England working craft had begun in earnest. Efforts were made to search out such boats and secure them for collections. An example is the Kingston lobster boat, one of an all but vanished type, found by Kleinschmidt in 1956, rotting in a field in Scituate, Massachusetts. This find, with a photograph, was reported in the *Maine Coast Fisherman.* Kleinschmidt brought the boat back to Mystic Seaport, where it was restored and added to the permanent collection, and is now on exhibit.

An account of how things stood at the end of the decade is to be found in *Small Craft at Mystic Seaport*, issued in December 1959, the first catalog of museum small craft to be compiled and published. This small, 82-page illustrated paperback book included 54 of the 61 boats classified as small craft then at the Museum.

The 1960s was a decade of explosive growth for marine museums. It saw the inception of no less than nine new maritime museums, and they lost little time in starting their own small-craft collections. According to my count, more maritime museums were established in that ten-year period than came into being in the three and one-half decades that followed. I confess I cannot satisfactorily account for this sudden burst of museum proliferation, although I suspect that the surge of tourism that peaked in the early 1970s, before the gas crunch hit, had something to do with it. Prior to that setback, endless crowds of ordinary Americans with the yen and the means took to their cars and the open road each summer to see America for the first time, and they loved it. Maritime museums drew them in by the thousands.

Eagerly rising to the challenge in preparation for Mystic Seaport's third annual Youth Rowing Race, two youngsters practice their rowing skills against a stiff head wind in one of the L. A. Dunton *dories built by Will Ansel. (Sharon Brown Photograph)*



In the summer of 1969, my first year at Mystic Seaport, I was invited to be one of the judges at the Antique Boat Show at Clayton, New York, along with Howard Chapelle and representatives from *Rudder, Yachting,* one of the motorboating publications, and others.

One summer a few years previous, a married couple had restored an old, broken-down power launch and were so pleased with the results that they celebrated by inviting friends, who came in a variety of powered craft. The gathering was repeated the following year, and by 1969 had become an annual one-day event involving the whole town of Clayton, New York.

It was from the Clayton show that we got the idea of holding a boat show of our own here at Mystic Seaport; only it was to be limited to traditional non-powered small craft. In order to arouse interest in recreational rowing, then at a very low ebb, we sent out announcements for a rowing workshop. The response far exceeded our expectations. Many came, and they had the time of their lives on the water trying out each other's boats in spite of the pouring rain. Although the call had gone out for rowing boats, so many of the boats that came were also rigged for sail that sailboats as well as rowing craft were invited the following year, and the name was changed to Small Craft Workshop. Powerboats were excluded, however, and have been to this day, with a few special exceptions.

This was the first small-craft boat show, the granddaddy, if you will, of all the various and sundry small-craft shows and meets that now take place each summer across the length and breadth of this country. To attempt to list them all would be more than we could possibly undertake here.

Toward the end of 1966, Edmund E. Lynch, who brought with him a masters degree in museum administration from Cooperstown and practical experience as curator at the Adirondack Museum, took over the curator's job at Mystic Seaport. Bursting with ideas, energy, and drive, Ed Lynch hit Mystic with the force of a seismic shock. The reforms he instituted and the programs he put in place are with us yet. One of his first accomplishments was a complete restoration of the sandbagger *Annie,* the Museum's premier small-craft attraction, which sun, wind, water, and neglect had reduced for a second time to a rotting hulk.

Discussing *Annie*'s restoration in *The Log* of December 1969, Lynch made some observations foreshadowing developments soon to take place that would greatly enlarge museum involvement with small craft. "Although we attempt to exhibit small craft now (only about one-third of the total we own)," Lynch wrote, "there is a further dimension that I have felt is more important than their display. If the technology of boat building is lost, we will begin to possess a collection of curios and oddities....As a viable museum we want to encourage small boat building in the twentieth century. We would like to give the home craftsman a practical knowledge of the past and have our collection of small boats used more actively by researchers, scholars, students and builders. Everyone fears that a museum has a tendency to become a mausoleum. We have the capacity of instilling life into our small craft collection. We ask only the opportunity to begin."

And begin Mystic Seaport did very shortly thereafter, in the winter of 1970-71, by initiating an evening class in traditional boat construction for the home, or nonprofessional, builder. It was the first organized instruction in recreational boatbuilding to be offered in this country, the very first. I would like to think of it as the seed from which has sprung all the various and sundry nonprofessional boatbuilding classes and schools, whether directly sponsored by museums or not, now scattered from Maine to the state of Washington, from upstate New York to the Carolinas, Louisiana, and Texas. More likely it was only by chance, so to speak, that Mystic Seaport happened to be first. A widely pervasive need for such instruction had been building up for some time and otherwise would undoubtedly have broken through somewhere else very shortly.

For a variety of reasons not wholly clear nor easy to explain, more and more of those nurtured on the writings of Howard Chapelle, L. Francis Herreshoff, and others were turning to the classic small craft of yesteryear, and their construction, partly as a means of self-expression, partly in order to get on the water, and partly as a reaction against ill-designed, overpowered, overpriced fiberglass boats. The unlikely but instant and spectacular success of a new publication, started on a shoestring and devoted to classic small craft–namely *WoodenBoat*– is an indication of the way the wind was blowing in the early 1970s.

I have attempted so far to show what a recent phenomenon the maritime history museum actually is, and to sketch against that background the even more recent emergence of small-craft studies and activity as a serious part of the museum program. We have now arrived in our considerations at the 1970s, the decade in which the action really begins to take off. To lay it all out here in full detail would take us into next week. We must be content with calling attention to a few salient points. We might begin by

mentioning that at the first International Congress of Maritime Museums in London in 1972, small craft got equal billing with yachts and larger vessels for the first time ever.

With the arrival of the 1970s, substantial small-craft literature began to build up with solidly researched studies of lasting value, including Peter J. Guthorn's *Sea Bright Skiff*, Pete Culler's *Skiffs And Schooners*, Atwood Manley's *Rushton and His Times In American Canoeing*, and Kenneth Durant's *The Adirondack Guide Boat*. Roger Taylor's International Marine Publishing Company came into the picture early on. We have already mentioned *WoodenBoat*. *The National Fisherman* kept up a steady output of small craft articles and designs. The Traditional Small Craft Association was started, and although the Catboat Association goes back to 1963, its activities and membership were greatly expanded in the 1970s. Besides the ongoing activities at Mystic Seaport, Lance Lee's Apprentice Shop, a ground-breaking experiment in hands-on small-craft education, was initiated and carried on at Maine Maritime Museum during this period. In 1976 at Olympia,



During Photo Weekend, costumed Museum staff demonstrate their boat-handling skills in a variety of small craft available to the visitor at The Boathouse. Tim Wells rows the Rangeley Lake boat reproduction Nelson B., *built in the Boat Shop in 1978 by Barry Thomas and Val Danforth, and Ted Kaye is at the helm of the newly restored 1917 26-foot Herreshoff launch,* Resolute*'s tender, which began providing river excursions to the public in the summer of 1993. (Sharon Brown Photograph)*

Washington, a small-craft conference at Evergreen State College, where the announced subject was "Wooden Boats and the New Craftsman," opened up and set in motion organized small-craft activity in the Pacific Northwest. The following year saw the formation of the Center For Wooden Boats in Seattle. This is hardly a complete summary of all that took place during the 1970s, but it is enough to give the picture.

The course was set. In the years that have followed, small-craft activity has deviated very little from patterns laid down in the 1970s. At the same time the number of maritime museums seems to have stabilized. The only other maritime museum to be founded in the 1970s besides the Center For Wooden Boats was the North Carolina Maritime Museum at Beaufort, unless the Hudson River Maritime Museum at Kingston, organized in 1980, is also included. And since then only two new museums with a maritime orientation have appeared, both highly specialized, neither of which has done very much with small craft or seems likely to. Perhaps a point of saturation has been reached in the maritime field, at least for the immediate future. Museums are very much dependent on outside forces, and considering the present uncertain state of the economy, retrenchment rather than expansion seems to be the order of the day.

Nevertheless, small craft in maritime museums have come a long way in a short time. Once considered merely as objects to be exhibited passively for walk-by viewing–and it is not my intention to denigrate exhibits, which have a worthy and time-honored function to perform–small craft are now coming to be treated in the museum as boats to be exhibited and used as boats, on the water, in their natural element.

Looking back, I believe we can take satisfaction in what has been accomplished. Looking ahead, I see many opportunities and much to do. We have





The Woods Hole Spritsail Boat Sandy Ford *was built in the Small Craft Laboratory in 1972 by John Gardner and Sylvester Costelloe from lines taken from the donated Crosby-built* Explorer *(ex-*T. C.*). Guy Hermann is at the helm; his son Jammer, and Walter Ansel and his son Douglas, round out the crew during the summer racing series sponsored by The Boathouse. (Sharon Brown Photograph)*

gone about the task of building up our boat collections with enthusiasm and diligence and have assembled imposing numbers of specimen craft, as documented in the union list compiled by the Museum Small Craft Association. It may just be that the time has arrived to slack off a bit in collecting. It could be that in some instances we have more boats than we need or can use to advantage.

We have already touched upon the weakened state of the economy. Who can deny that the standard of living for Middle Americans has declined appreciably in the last few decades? Even with two wage earners working, many families are hard-pressed to make both ends meet. One consequence is that, more and more, Middle America is being excluded from recreational boating. The only way that many of us can get on the water these days is in small, simple, inexpensive boats–such boats as maritime museums have in their collections of traditional small craft.

In view of the acknowledged educational function of maritime museums, this would seem to present an educational opportunity these museums can hardly avoid. Maritime museums are in an ideal situation to put visitors into suitable small boats, to let them try out these boats on the water, to use them, to get to know and compare them, preliminary to choosing boats for themselves. Boathandling and elementary seamanship are taught in the process. For those who decide they want to build a reproduction of one of these heritage craft for themselves, there are plans and instruction in the museum's boat shop close by.

Two museums already have successful programs in place, and there may be others I am not aware of. The Center For Wooden Boats, in its ideal situation on Lake Union in the center of Seattle, was built around such a program based on experience derived from an earlier boat rental facility operated on Lake Union by Dick and Colleen Wagner. The program the Center has developed is state of the art, and a model to aim for.

Here at Mystic Seaport we have offered instruction in wooden boatbuilding for the past 22 years, but it wasn't until the summer of 1988 that we opened the boat livery to put visitors on the river in reproductions of classic wooden boats that they could row and sail themselves–dories, whitehalls, peapods, sharpie skiffs, Beetle cats, and others–17 different boats in all. The livery was enthusiastically received from the start, and has become one of the Museum's most popular attractions. In the six summers the livery has been in operation, 11,363 visitors have been put on the water in small boats, and the Mystic Seaport-built 20-foot Crosby catboat reproduction *Breck Marshall* has carried 26,693 paying passengers on half-hour trips on the river.

Visitors have come from as far away as Canada and Europe to try out livery boats. Children especially have been thrilled by the boats, frequently experiencing for the first time what it is like to be on the water in a small boat and to have a try at the oars. It is an educational experience that will be with them all their lives.

Children naturally and instinctively take to boats; they are fascinated and enthralled by them. They delight in building them and working on them with their own hands. They should be given that opportunity. Only if our children are introduced to boats at an early age and grow up using them on the water will what we are doing today have any relevance for the future. Otherwise, our efforts to collect and preserve heritage boats will have been for nothing.

As museum professionals, preservation is our business, our forte, our thing, so to speak, so we had better understand that the way to preserve small craft is not to embalm them for static exhibits or to tuck them away in mothballs, but rather to get their reproductions out on the water, use them, wear them out, and replace them anew.

Treated in that way, small craft are immortal, or as near immortal as anything can be; while, unfortunately, ships stand threatened by the harsh economic realities of large-scale vessel preservation.

Just because small craft are small does not make them any less a joy. Pete Culler, who from early manhood sailed, built, and designed large vessels, turned for his yachting pleasure in later years to a Swampscott dory that he rigged to sail. And his friend, Waldo Howland, who had owned and sailed his share of large yachts in his day, got his fun on the water as he grew older in *Dixie Belle*, a trim 17-foot, flat bottom, sprit-rigged Chesapeake skiff that Pete Culler designed and built for him.

Historic small craft are for the young, the old, and the in-between. They are to use and enjoy, and to pass on for future generations to use and enjoy, *ad infinitum*. Preservation through use: in the long run, that is the only way.

Licensed to Steam: Our *Sabino* Engineers

SARA LEONE

"The principal essentials to success in engineering are a sound constitution... combined with common sense, capacity and willingness to work, and work hard, both mentally and manually, a disregard for dirt and temporary discomfort, ability to bear annoyances good naturedly, and a determination to succeed," states the author of *Marine Engineers: Their Qualifications and Duties*, published in 1897.

Sabino's Chief Engineer Rob Russell has been meeting these requirements every day since he began working at Mystic Seaport in 1987. After apprenticing with an engineer for 2 1/2 years, he was tested and received a "United States Merchant Mariner, Limited 3rd Assistant Engineer's License," issued by the Coast Guard. This learn-by-doing method of acquiring a license, called "coming up through the deckplates," has been the traditional method since the first American steamboats of the early nineteenth century.

Another engineer who passed through those proverbial plates is George King III, who worked as a Coast Guard band director for 22 years before coming to the Museum in 1983. Like Russell, he received his license by serving a 2 1/2-year apprenticeship. On Saturdays, King enlists the help of volunteers who enjoy working in the engine room. One dedicated steam engine aficionado comes all the way from Staten Island.

Why do our hard-working engineers fit the previously mentioned depiction? Just spend a day with them and you will see why! The first two hours of their 12- to 14-hour day are spent taking care of minor maintenance issues and reading over the engineer's log, which contains information about the previous day's operation. During this time, deckhands prepare the boiler's firebox with a layer of paper and wood, and load up to four tons of two different kinds of coal into bins on either side of the engine room. Shortly thereafter, the engineer takes propane torch in hand and lights the firebox; steam forms and coal is shoveled into the flames. As the pressure reaches 30 to 40 pounds, boiler valves are opened allowing steam to warm the pumps and the engine. While this is taking place, coal and ash dust are washed off the work area, the brass is polished, and the bilges are pumped. When the oiled and greased engine becomes "too hot to touch," it is rotated by hand with a "jacking bar" to assure that condensed steam is worked through the open drains in the cylinders. After two or more revolutions, steam is admitted and the drains are closed; the engine is run forward and in reverse until it turns over, and then it is left in reverse to keep warm until all the deck chores are completed. At this point, the boat is ready to move away from her overnight berth at the lift dock in the Shipyard to the *Sabino* dock, near the Village Green, for the first load of passengers.

The *Sabino*, the last coal-fired, wooden, passenger steamer in operation, was launched as *Tourist* from East Boothbay, Maine in 1908. Last year, this national historic landmark carried over 60,000 passengers. Throughout the decades, people have been fascinated by the engine and curious about the engineers who make the boat move.

"They can see all the parts at once; it's very concrete to explain," says Russell, as he opens the firebox doors and shovels



"Mystic Seaport is a very friendly place to work," says Chief Engineer Rob Russell. He points out some of the daily benefits of the job, from the interesting passengers with whom he speaks, to the ever-changing scenery on a downriver cruise. (Claire White-Peterson Photograph)

in another heap of coal. He contrasts the boat's steam engine to modern machinery, which is operated by "black boxes" with the mechanism concealed, and refers to hand-firing coal and maintaining appropriate boiler pressure as a "lost art."

The engineers keep the pressure at a level which moves the boat at the proper speed by adding more coal to keep the fire up, or closing the ashpit doors to subdue the flames. The fire heats water circulating through pipes in the boiler. When water reaches the boiling point, it forms steam in the steam drum atop the boiler. The immense pressure from this expansion moves the pistons up and down, and provides power to move the propeller. Eventually the steam changes back to water and the process begins again. The 660-gallon boiler make-up tank is filled with city water at the beginning of the season; the boat typically uses between 100 and 200 gallons of this water per day.

The *Sabino* is a remarkably powerful boat; every cycle of the engine rotates the propeller shaft one time, which turns a 300-pound bronze propeller that measures 48 inches in diameter, with 54 inches of pitch, and propels the boat ahead about three-and-a-half feet per revolution. The twisting action of the engine is called "torque," and the force is measured in "foot pounds." A semitrailer truck engine of 500 horsepower exerts a force of 1,175 foot pounds of torque; *Sabino* , with a Paine compound engine rated at just 75 horsepower, exerts approximately 3,500 foot pounds.

As the boat cruises quietly towards Lighthouse Point on a beautiful summer day, one finds Russell watching the "sight glass," which indicates the level of steam and water in the boiler. While turning his attention to the pressure gauge, and making sure it registers around 100 pounds for the daily half-hour cruise, he states that the same technology runs a nuclear boiler, but, "we have a lot less trouble getting rid of the ashes."

Mystic Seaport has instituted a number of procedures to make sure the environment remains virtually untouched by the operation. As stated previously, two different types of coal are used. In the morning, "Big Vein" is burned. This semi-bituminous coal from Maryland generates a minimum of smoke, which keeps the air and boiler cleaner. The ashes from this kind of coal are thick, and the engineer must rake them often to keep air flowing through the iron grating. Coal burns at up to 2,400 degrees Fahrenheit, and iron melts at that same temperature, so any accumulation of ashes will result in a dissolved grating. For the remainder of the day, a bituminous, even-burning, low-sulphur and low-smoke coal from the Pocahontas mine in West Virginia is burned.

When the last passenger of the day has disembarked, the engineer cleans the soot off of the boiler tubes with a jet of steam, called a "steam lance"; this practice takes place at the *Sabino* dock. Next, the fire is built up slightly, just enough to get the boat to the Shipyard. Once there, the engineer rakes the flames and ashes many times until most of the live coals fall through the grates, and waits until the pressure is neglible; then he shuts down the pumps and opens the drains. Finally, the begrimed engineer takes a shower and changes clothes before going home.

Both Russell and King emphasize that the main thoughts of every day revolve around safety. Once a year, Coast Guard inspectors check the *Sabino*'s two spring-loaded safety valves and tag them with a seal of endorsement. The valves release steam when pressure in the boiler exceeds the limit set by boiler engineers.

Before spring-loading was used for this purpose, the system consisted of a vertical rod with a balanced horizontal scale, but this became unreliable with every rock of the boat. In addition, engineers would tamper with the settings to allow for more pressure, which made the boat go faster, but also caused many nineteenth-century steamboat explosions.



Engineer George King III was given a steam engine for his eighth birthday and has been hooked ever since! Now he owns thirteen, "not counting models and toys." (Claire White-Peterson Photograph)

Working in an engine room that contains heated moving parts requires quick thinking. Instinct dictates that one reach out to break a fall. But the engineers immediately draw their arms close to the body; shoulders will not lodge in the small nooks of the operating engine. As Russell states, "This is a confined space in the bottom of a boat. Sweating, burns, and sometimes bumping into things are part of the job."

In fact, one engineer was particularly proud of his scar. While he was still in the Coast Guard, King was approached by a fellow "steam man" who rolled up his sleeve and said:

"George, take a look at the size of this blister."

"That's terrible!"

"No, it's not! A steam man ain't worth anything unless he's got a burn!"

"Well congratulations! By the way, how'd you get it?"

"Don't tell anybody, but I got it on a corn popper!"

One day each week, Russell and King work together aboard the *Sabino* and talk over a variety of matters relating to the boat's maintenance and operation. A much more complex exchange occurs between these men and the captain, who has neither throttle nor shift lever in his upper deck pilothouse. He must rely on a system of jingles and gongs to convey instructions. Depending on whether the boat is underway or stopped, one ring of the gong bell means "stop," or "slow ahead." The jingle bell can mean "stand by," "more power," or "all done," depending on the situation. Two rings of the gong mean "slow astern," and it tells the engineer to drop the lever to change the timing on the engine, making it run in reverse.

For detailed conversation, a long bronze pipe, the "speaking tube," extends from engine room to pilothouse, allowing either party to summon the other. To illustrate, the captain moves a small control to open the pipe and blows into the end, producing a high-pitched whistle. The engineer answers the "call" by putting his ear to the tube, and the calling party speaks at the other end. This system became an open invitation to one prankster of long ago, who poured water down the tube directly into the ear of an unsuspecting victim!

The principal essentials to success in engineering are a sound constitution... combined with common sense, capacity and willingness to work, and work hard, both mentally and manually, a disregard for dirt and temporary discomfort, ability to bear annoyances good naturedly, and a determination to succeed.

Another form of communication takes place between engineer and passenger. Both men answer questions from curious onlookers while tending the engine. The most common inquiry is clearly answered by the sign posted above the engine room stating "Yes it's hot down here!" To combat that ubiquitous heat, the engineers drink between three and four gallons of water daily. Nevertheless, Russell has a winter weight and a summer weight: a difference of ten pounds.

But hard work doesn't stop when summer is over. Even in the off-season, the engineers are putting in long days to prepare the *Sabino* for next year. From the first springtime cruise to the last autumn half-hour trip, notes about long-range plans are jotted down. Winter, the time for major maintenance, is just around the corner.

During the cold months of last year, the engineers spent a good portion of their time in the *Sabino* Shop, making a new feed pump and a new fire pump. Russell and King stress the support that the Museum and its members have steadfastly given to the *Sabino*. When the engineers put a request in *The Log* for used pumps, enthusiastic response enabled them to build the new ones entirely from member contributions!

Located in the Shipyard, the *Sabino* Shop is filled with an assortment of intricate-looking tools and metal pieces. Its walls are lined with shelves labeled with technical terms containing fractions of every size imaginable, which are completely indecipherable by the mechanically disadvantaged. Both engineers' sense of humor shines through when one notices such labels as "silly things," "small bits o' gasket," "big stuff," and " boiler thingys" amid the more clinical names.

This year-round dedication to the *Sabino*, maintained as a historic vessel while still meeting 1994 Coast Guard requirements, insures her future. "The boat could go for another 100 years," says Russell. In addition to the engineers and captains, a team of hardworking deckhands make sure the boat is cleaned and polished, and the passengers are happy and informed; ticketsellers, while juggling phone reservations and a multitude of questions, still see that everyone gets a chance to ride.

Rob Russell talks about the symbolic importance of the first whistle of the season. The *Sabino* comes out of her winter slumber, tested and approved. The firebox is lit, and the engineer yanks on the whistle for an extended time. Now the locals know that warm weather has arrived, and summer is around the corner. But, more importantly, that prolonged whistle is a celebration: the steamboat that wins the heart of every person aboard is back for another year.

Morgan Barney, Naval Architect

MONA A. RIVERS



In 1988, the Ships Plans Collection of Mystic Seaport Museum received a collection of plans donated by the family of Morgan Barney, one of New York City's naval architects of the early 1900s. These plans were an important addition to the Museum's collections because they represent a transitional period, when an expanding class of professional naval architects experimented with the new internal combustion engines for yachts, fishing boats, and other small commercial vessels.

In 1991, the Museum received a grant from the National Historical Publications and Records Commission (NHPRC) to create an introductory level position for someone to learn archival methodology through arranging, describing, cataloging, and entering the ships plans data into the Museum's on-line collections management system. When I began this job in January 1992, no one could tell me much about Morgan Barney. As I sorted through his work, I became interested not only in the vessels represented by the hundreds of designs, but in the man behind those plans.

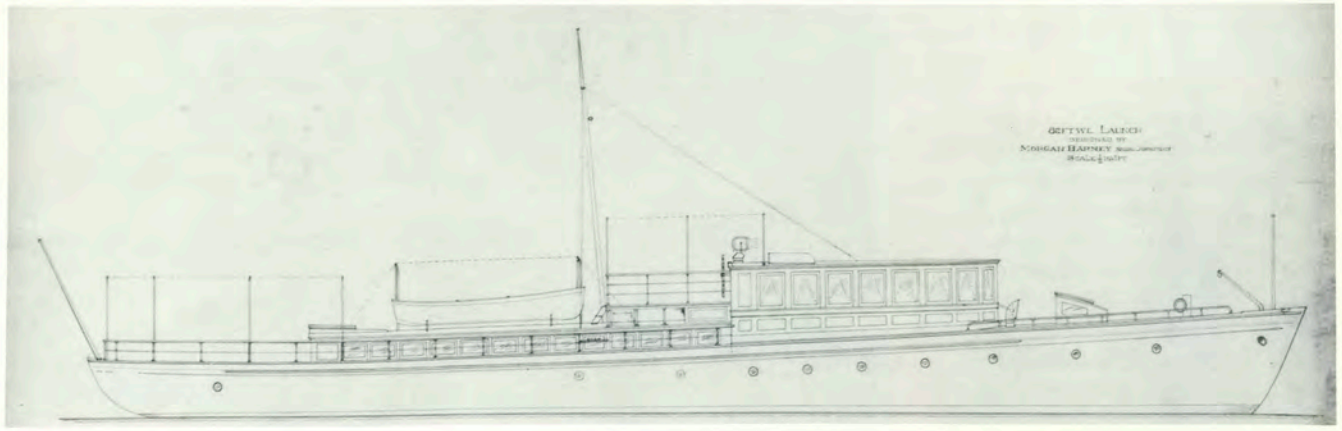
Morgan Barney was born in New Bedford, Massachusetts, on 25 September 1878 to George and Juliet A. M. Barney.[1] He was named for the prominent New Bedford merchant Charles W. Morgan, with whom George Barney had started his career. George Barney went on to become the confidential clerk of Edward W. Merrill & Company in New Bedford and, according to one source, was the "real brains of the outfit." He was also the director of several banks, insurance companies, and other major companies within New Bedford, and therefore played an active role in the whaling industry.[2]

Morgan and his sister Anne spent their summer holidays in their parents' summer home on Nashawena Island, and later in South Dartmouth, Massachusetts. During these summer months, young Barney began to design and build small sailboats, which he raced and won against boats designed by his older and more experienced opponents.[3]

Encouraged by his success, Barney entered the Massachusetts Institute of Technology's Naval Architecture program in 1896. An active student, he divided his time between studies and extracurricular activities. He was a member of the tennis club, the M.I.T. yacht club, and several senior year committees, and he served as editor-in-chief of two college publications.[4] His college years coincided with rapid strides in the perfection of the steam engine and the development of the internal combustion engine for marine use. Despite his youthful interest in sailboats, he developed a strong interest in the design, speed, and fuel economy of steam and motor-powered vessels. Therefore, when he got a chance to write his senior thesis on the "Progressive Speed Trials of Steam Yacht *Freelance*," he jumped at the opportunity. This was "great luck for me as it is the latest fad in [naval architecture and] very valuable scientific work," he wrote in his senior year diary.[5]

After receiving his naval architecture degree in 1900, Barney entered into a practical apprenticeship, working as a draftsman for naval architect H. C. Wintringham in New York City, where he had previously been employed as a part-time draftsman. Wintringham allowed him to design all orders for boats under 38 feet, including the small tenders for the grand steam yachts designed by the more experienced architect. By April 1901 Barney had earned the title of head draftsman at the company.[6] The next year, to gain further experience, Barney took a job as draftsman at the George Lawley and Sons yacht yard in South Boston.[7]

Above: *Morgan Barney (1878-1943). (Courtesy Rhoda Barney Jenkins)*



Although he did not have an entirely free hand at designing in these drafting jobs, Barney was developing his skills and talents. In 1902 he entered two designing competitions sponsored by *Forest and Stream* magazine. He won first prize for his design of a practical 25-foot cruising sloop, and second prize for a 15-foot racing sloop designed under the Seawanhaka Corinthian Yacht Club's rule.[8] Finally, in the spring of 1903, Barney opened his own office at 29 Broadway in New York City to design custom yachts.[9] He also did some yacht brokerage through Frank Bowne Jones, with whom he shared an office.

With the turn of the century came a wealth of new ideas, improvements, and innovations within the boating industry. Before 1900 the motorboat or any boat using an internal combustion engine was a "comparative curiosity."[10] Although inventors such as Nikolaus Otto in Europe and Frank W. Ofeldt in this country had begun experimenting with this type of engine as early as the 1860s, it was not until nearly 1900 that it was perfected and its principles were well known within the industry.[11] In comparison with the prevailing steam engine, the gasoline engine was lighter, smaller, cheaper, and easier to operate, and it did not require a licensed engineer to run it.[12] In the few short years between 1900 and 1910, the waterfront was transformed as the gasoline engine was adopted to facilitate the work of fishermen and small cargo carriers who had been dependent upon oar and sail. The gasoline engine made the sea accessible to new users and recreationalists as well. Indeed, the newly improved gasoline engine had become "truly a necessity" in the eyes of contemporaries.[13]

Within a few years of its introduction, naval architects had discovered that the internal combustion engine necessitated a new hull form. The displacement hull shapes that had been used for sailing vessels or rowing craft were overpowered by the light, powerful gasoline engine. Designers had to consider both scientific and aesthetic elements of hull design.[14] Morgan Barney was among the many designers experimenting with hull design, shape, and features during these early years.[15] One of his designs was a 30-foot launch with three means of steering: a tiller attached directly to the rudder, a steering wheel at the bow, and a second wheel about amidships on the starboard side of the launch.[16] Another plan in the collection shows a motor speedboat with two rudders, each with a tiller attached to the boat's square transom. Its hull has almost no draft because the propeller shaft emerges from the hull at its midpoint.[17]

He experimented not only on paper but on the water as well. His daughter, Rhoda Jenkins, talked about the time Barney bought two early Star Class boat hulls and attempted to make a catamaran by joining the two with a huge plank and placing a sail in the middle. Unfortunately, there was no efficient means of steering the catamaran, and it was beached on its first trial run. The Gold Cup speedboat races, which Barney viewed from his Greenwich, Connecticut, home on Indian Harbor, inspired him to build an extremely light, wood-frame boat covered with either a very lightweight wood or canvas. The design was an early "step" hydroplane, with a flat step partway back on the bottom to reduce the wetted surface dramatically by lifting the bow of the boat, leaving almost no hull surface to push through the water.[18] Although these particular experiments failed, trials like these were the seeds of Barney's successes.

Barney's designs were generally considered to be "particularly seaworthy, distinctive in appearance, and economical in operation."[19] One of his designs, a 45-foot launch named *Ildico III*, was used as a research tool for Barney after she was built. He tested her gasoline engine by comparing the fuel consumption and the engine speeds at different levels of operation to calculate fuel economy. This type of test proved to be extremely valuable to designers of boats and engines alike, for they led to drastic improvements in both hull and engine design. At this still early stage of experimentation with this new type of engine, the "intelligent combination of these two elements" was essential for the development of an economical, fast, and staunch vessel.[20]

Although power vessels were the trend during this era, Barney particularly enjoyed designing sailboats.[21] In 1906, he teamed up with Charles D. Mower to

The 91-foot Elaray *was one of Barney's largest commissions. Built in 1907 at the J.M. Bayles & Sons shipyard at Port Jefferson, Long Island, for William H. Briggs, she was a distinctive-looking vessel, with a large deckhouse that served as a dining saloon and also a pilothouse in inclement weather. (plan, M.S.M. Ships Plans Collection 86.85.27; photograph, M.S.M. 88.23.156)*

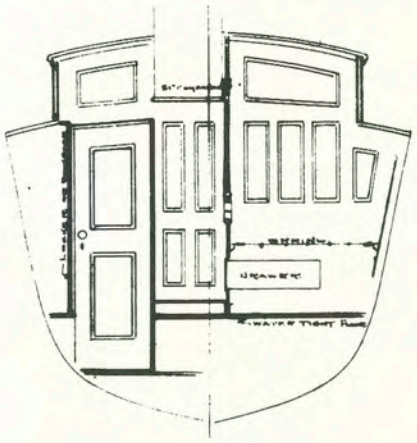


design *Cherry Circle*, which went on to win the Sir Thomas Lipton Competitive Cup in both 1906 and 1907. The 1907 race was the closest and "most sensational race ever sailed for the Lipton Cup," with *Cherry Circle* winning the race by one second.[22] Barney also designed several one-design sailboats for the Indian Harbor Yacht Club in Greenwich, Connecticut, as well as some large schooner yachts and other sailboats.

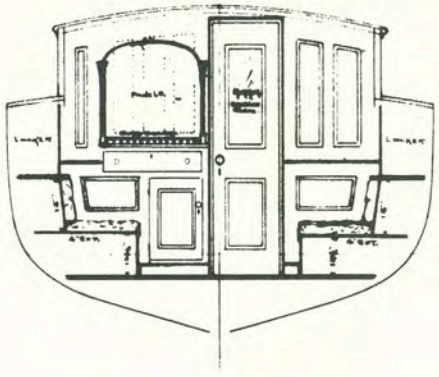
Although the majority of his designs were pleasure craft, Barney also designed commercial vessels, including towboats, ferries, barges, and cargo carriers. He assisted with the changeover to high-speed engines in the Staten Island and New Jersey ferries in the early part of the century. During the First World War, he set up a shipyard at the State Pier in New Bedford, where he used concrete to convert several barges to oil tankers. At a time where supplies were rationed and limited, this was considered "an ingenious conservation of essential materials and space."[23]

Before the Great War began, the United States depended on foreign vessels to carry nearly 90 percent of her foreign trade. With the commencement of the war in Europe, many foreign vessels withdrew from their usual trade routes to serve their own countries, leaving the United States unable to meet its shipping needs. Therefore, the U.S. Congress passed the Shipping Act of 1916 and created the U.S. Shipping Board to oversee the building of an adaquate U.S. commercial fleet. Upon the United States' entry into the war in 1917, the U.S. Shipping Board Emergency Fleet Corporation was formed under a provision of the Shipping Act of 1916. The Corporation was organized specifically to launch and execute a coordinated merchant shipbuilding program to build the many new vessels required to transport supplies to the war front and replace those destroyed by enemy fire.[24]

The destruction of the Allied vessels, primarily by submarines, was one of the greatest problems America and the Shipping Board faced. With losses in shipping amounting to an estimated $6,000 a minute, the Board began to consider suggestions for making ships "unsinkable."[25] One suggestion came from the board of the inventor Hudson Maxim. He proposed lining concrete-skinned steel hulls with buffer-cylinders containing pulverized coal or water, surrounding these cylinders with water or fuel oil, and placing a screen of steel rods between the cylinders and the inner bulkhead. If a torpedo struck the ship, the shock, heat, and expanding gasses would be absorbed by the coal within the cylinders, the oil or water between the cylinders, or both, thereby preserving the cargo within the bulkheads and preventing the entire ship from sinking.[26]

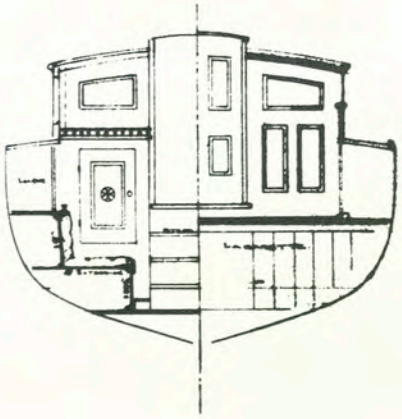


Maxim commissioned Barney to continue the design work, draw the plans, and prepare the building specifications for Maxim's Torpedo-Proof Ship, as it came to be called. Although the ship was never built and the theory was never tested, the completed plans, preliminary sketches, and other material relating to the invention still exist within the Morgan Barney Collection.[27]



In 1919, Barney married Nora Stanton Blatch, daughter of the suffragist leader Harriot Stanton Blatch and granddaughter of the well known feminist, Elizabeth Cady Stanton. As an engineer and architect herself, Mrs. Barney shared her husband's interest in architectural design.[28] The couple had two children: Rhoda and John Peter.

Barney was most productive during the prosperous era before the First World War. In his 1938 diary, he reminisced about the Armistice, which had ended World War I 20 years earlier: "In 1918–A beautiful day. I remember walking...across [the] bridge to New Bedford & hearing the whistles and seeing the flags....I had collected 5,000 [dollars] from U.S. for assisting Hudson Maxim & had about 21,000 [dollars] coming to me on Island Oil barges & tug. Also plenty of bonds etc. & cash! Our fortunes change!"[29]



Barney designed his last known large yacht, *Edithia*, for J. H. Hanan in 1920.[30] He continued to design small boats for friends and family, and had an active business in buying, restoring, and selling boats of all types.[31] He discussed naval architecture with his brother-in-law, Benjamin Karl Sharp, who was also a naval architect, and corresponded with Frederick. K. Lord and W. P. Stephens, exchanging plans with, and making models for, Stephens.[32] Barney also maintained an active membership with the New Bedford Yacht Club, was the



Barney's favorite design was the 75-foot Ildico IV, *which he planned for Charles Henry Davis in 1909. More than ten years later Barney purchased her, renamed her* Shark, *and used her as his own yacht for many years thereafter. She is shown here anchored at Nashawena Island, where Barney spent his childhood summers. (M.S.M. 93.111.1)*

measurer and a member of the Indian Harbor Yacht Club, and was a member and one of the founders of the New York Technology Club.[33]

Barney had a great love for boating and sailing, and he loved to tell stories of his adventures. One of his favorite stories involved a trip that he had taken in a 75-foot motor yacht named *Shark*. Barney had designed the *Shark*, whose original name was *Ildico IV*, in 1909 for Charles Henry Davis, a wealthy and prominent resident of New York City. After she served as a patrol boat during World War I, Barney bought the *Shark* from the U.S. Navy and decided to take a trip to Florida. While exploring the inland waterways around Norfolk, Virginia, he took a wrong turn up a narrow creek. Because it was too narrow to turn around, Barney had to keep going forward until he found a "Y" in the waterway. He steered up one fork and set his stern anchor up the other one, then settled down to wait for the flow of water to push the boat back until it pivoted on the anchor line and turned itself. "There was a tide in there, too," recalled his daughter, Rhoda. "At one point [he] went to sleep, and heard this creaking in the middle of the night, and he thought, 'My god, what's that?' And he came out on deck and the *Shark* was there with the bow on one tussock of beach grass, and the stern on another one, and the bayou swimming out underneath the keel! He said it was well built!"[34]

In mid-February of 1943, Barney suffered a debilitating stroke that affected his speech and partially paralyzed his left side. He went to live with his sister, Anne, in New Rochelle, and she continued Barney's diary, recording his daily progress. Although he was weak and unable to move, his mind and his memory were still clear. He sometimes became frustrated and depressed with his inabilities, but generally kept busy reading his old diaries, labeling photographs, and answering correspondence. Eventually his progress slowed, and on 22 June 1943, at 65 years of age, Morgan Barney passed away in Stamford Hospital in Stamford, Connecticut.[35]

The hundreds of plans generously donated by his family and cataloged and processed through the National Historical Publications and Records Commission grant now stand as his legacy. In them lies a story of the time when naval architecture was a young science and dramatic changes in propulsion and materials led young designers like Morgan Barney on an adventure into unknown waters. Their successes and failures, documented in collections like this one, can interest and inform us still.



Designed by Barney for J. H. Tyson of Riverside, Connecticut, the 62-foot Vorant III *was built by Williams-Whittlesey at Steinway, New York, in 1906. Shown opposite in details from Barney's plan and at right nearly ready for launch, she resembles a steam yacht, complete with stack, but she was powered by a 4-cylinder, 50-horsepower Standard gasoline engine, and the stack vented the exhaust of the engine as well as the galley range. Like many of Barney's powerboats, she has a double-ended hull. (plan, M.S.M. Ships Plans Collection 86.77.3; photograph, 88.23.170)*

The *Pegasus* Steam Engine

MARIFRANCES TRIVELLI

Not every object on exhibit at Mystic Seaport Museum fits neatly into a glass case! One of the latest additions to the Museum's collection is a tugboat engine that stands 14 feet high and weighs 30,000 pounds. This 850-horsepower steam engine was originally used to power the Standard Oil Company tugboat *Socony* #5, later named *Pegasus.*

The *Socony* #5's engine had a long and colorful career before finally arriving at the Museum's Preservation Shipyard. Both the tugboat and her engine were built in 1927 by the Staten Island Shipbuilding Company for the Standard Oil Company of New York, later known as the Mobil Oil Company. The *Socony* #5 was the second tug of that name, its predecessor having been an 80-foot wooden tugboat. The new *Socony* #5 was built of steel and measured 101 feet. Although large diesel marine engines had been perfected by the 1920s and many tugs were converted from steam to diesel power, steam propulsion still remained a popular choice because of its reliability and simplicity of operation. The *Socony* #5 would retain the same steam engine throughout her 40-year working career.

The tug Pegasus, *ex-*Socony #5, (left) *photographed at Portsmouth, New Hampshire, by John Lochhead. (Courtesy The Mariners' Museum, Newport News, Virginia)*



The *Socony* #5's engine is a compound design, which became a common marine engine type in the 1870s. With two cylinders, a compound engine makes more efficient use of the expansive power of steam. Moderately high-pressure steam is first introduced into the small high-pressure cylinder, then exhausted into the larger low-pressure cylinder, where it continues to expand. The cylinder sizes are balanced to equalize the pressure on the pistons. Eleven times more powerful than the *Sabino*'s compound engine, this engine is also a contrast in that it has a piston valve to control steam admission and exhaust for the high-pressure cylinder and a slide valve to control steam for the low-pressure cylinder. The location of the low-pressure valve between the cylinders meant reduced condensation, resulting in greater engine efficiency. Since the valve was not located on the end of the engine, the entire power plant could stand close to the bulkhead, thus conserving space below deck.

The *Socony* #5's engine was well-equipped to handle the repetitious but necessary duties of a typical oil company tug. While owned by Standard Oil of New York, the *Socony* #5 usually moved barges of refined oil from the terminals in New Jersey to customers along New York Harbor, or up the Hudson River. Occasionally, the *Socony* #5 may have been required to dock a company-owned tanker.

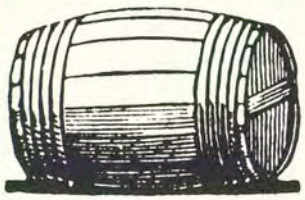
In August of 1951, the *Socony* #5 was sold to the Portsmouth Navigation Company, to be used on New Hampshire's busy Piscataqua River. The new owners renamed her *Pegasus,* in honor of the Mobil Oil flying horse insignia she sported upon her arrival. By 1968 she had been sold again, and the marine architect Alfred F. Sanford III used her as a houseboat in Nantucket for the next ten years.

By the late 1970s the *Pegasus* had again changed hands and was bound for Florida, where her new owner hoped to convert her into a floating restaurant. Plans were made for the engine to be cut into chunks, removed, and recycled. Luckily for Mystic Seaport Museum and for engine buffs everywhere, the engine was rescued by Dr. Albert Hickey in 1984. Hickey, a member of the Steamship Historical Society of America, arranged for a crane to remove the engine intact, and last year he provided for its donation to Mystic Seaport Museum. Since last summer, visitors approaching the Shipyard have been greeted by the engine's imposing structure, which is visible from as far away as the Galley.

The Museum's restoration of the *Pegasus* engine has already begun. Each month, a group of dedicated volunteers under the direction of Rich Voss clean and document engine parts for eventual reassembly. This energetic group hopes to operate the *Pegasus* engine under steam at the 1996 Antique Marine Engine Exposition. [M.S.M. 93.153]

William Wainwright's Recipe

SANDRA L. OLIVER



Who would have expected a coal heaver aboard a U.S. Navy sloop of war to note a recipe in his diary, but there on the inside of the back cover of William Wainwright's 1861-64 sea journal is an untitled recipe for something with boiled cider, currants, and spices in it. Even beyond this recipe, Wainwright wrote of food more often than many seafarers, which attracted me to his journals, now Logs 429 and 430 in Mystic Seaport's G.W. Blunt White Library.

Considering his menial position as one of 15 coal heavers in the stokehold of the USS *Kearsarge* during the Civil War, Wainwright was well spoken, and his candor is refreshing. The *Kearsarge* is best known for sinking the CSS *Alabama* in June of 1864, more than two years after Wainwright joined the ship at Portsmouth, New Hampshire, in December 1861 for her maiden cruise in the Atlantic and Mediterranean.

Wainwright spent his first Fourth of July in the Navy aboard the *Kearsarge* at Gibraltar in 1862. "Today is the anniversary of our independence and a glorious day it is," he wrote exuberantly. "The sun seems to shine with greater briliancy [*sic*] than ever it has before. it came peeping over the top of The Rock of Gibraltar in all its glorious Splender–it got so warm the we were compelled to spread awnings at 8 oclock."[1]

The *Kearsarge*'s crew–163 strong–dressed ship completely fore and aft before breakfast. "After the ship was dressed breakfast was piped I had a jolly old breakfast consisting of fried fish and potatoes There was nothing of account occurred during the day." At least not until the afternoon: "4 oclock PM. What is that I hear do I hear aright? yes my ears do not deceive me. It is the boatswain piping all hands to 'splice the main brace' There was no need of passing the word more than once this is my first 4th of July on board a man of war God only knows where I shall be when another comes around."

But long before the Fourth of July 1863, the temperance movement had managed to affect Navy policy in a way that put a considerable damper on Wainwright's enjoyment of the day. Ten days after Wainwright had his Fourth of July drink, the U.S. Congress passed a law effective the first of September that year, which terminated liquor rations to U.S. Navy crews and forbade the use of spirits in the Navy except for medicinal purposes.[2]

Wainwright was dubious about the benefits of the new Navy abstinence, and he suspected hypocrisy among temperance workers. "Perhaps I am better off but if I am I cant see it. I guess there is not many that belongs to the Temperance society but what has their drink on the sly. and I dont blame them if they did I would have had mine if I had been anywhere where I could have got it."

When the Fourth came along he grumbled: "This is the second fourth of July I have passed in this ship. I don't want to pass the third. This would suit some of you at home who dont like the smell of powder or hear firecrackers for we being at sea we never took any notice of it all. as whiskey is abalised in the Navy we cant even splice the mainbrace which I would have done if I could."

Even Wainwright's Thanksgiving that year was not as good as it could have been: "I have no reason to find fault with my Thanksgiving dinner I had roast goose for dinner and some nice mince pies for supper. if I could have had a drink after dinner I should have been all right. but those good old times in the Navy are gone by never to return."

Still, the Fourth of July 1864 brought Wainwright and his shipmates an unexpected treat when Captain Winslow had them splice the mainbrace with French brandy in celebration of the national holiday and their recent victory over the *Alabama*. But then it was back to the cider and small beer with which they washed down their rations.[3]

Wainwright was probably not alone in mourning the end of liquor rations in the Navy. The tot of rum so famous in sea songs and sailor lore had been issued in the British Royal Navy since the seventeenth century, and became known as grog after Admiral Vernon ordered its dilution with water in 1740. After its creation, the U.S. Navy followed suit. When alcohol was still considered a stimulant there was some justification in issuing it to sailors twice–later once–a day, although drunkenness–"grogginess"–was a frequent result.

But the close association between sailors and grog distracts us from the fact of widespread drinking in society at large during the eighteenth and early nineteenth centuries. Large quantities of liquors of various sorts were imbibed in addition to the beer and cider considered suitable for family consumption. In the early nineteenth century, Navy rations allowed a gill of spirits per day–that is half a cup, or three jiggers full–a tacit admission of normal practice among workingmen ashore.

At home, sailors and landsmen alike drank beer and cider with their meals. Most settlers in this country from England and Europe were accustomed to drinking almost anything but water at their meals; water was unfit to drink in many parts of the Old World. Brewing was considered an important part of a housewife's skills, just as breadmaking, preserving, and dairying were. In early New England, where apples grew abundantly, cider did not always mean the sweet, freshly pressed product most of us know, but rather a fermented beverage–fermenting cider preserved it for use at any time. By mid-century, when this recipe was written down, cider could be either sweet or hard.

People who could afford to do so consumed imported wines and spirits–Caribbean and New England rum, European gin, and Middle Atlantic and Southern whiskeys–as well as the beers



Confined to his duties in the stokehold amidships, William Wainwright rarely got to the Kearsarge*'s quarterdeck, where her sober-faced officers posed for this view shortly after the ship sank the CSS* Alabama. *Captain John A. Winslow stands third from left; at far left is the muzzle of one of the ship's two 11-inch Dahlgren guns, which Wainwright called the biggest guns he had even seen. Albumen photograph, 28 July 1864. (M.S.M. 90.65.1)*

and ciders of ordinary use. Liquor consumption rose noticeably around the American Revolution, but one source reports that liquor drinking peaked in the 1820s with an annual per capita consumption of four gallons–that's a third of a gill per day.[4] When we consider that women and young people generally did not drink liquor in large quantities, it is not unreasonable to imagine regular drinkers averaging a gill per day or 12 gallons per year.

Various theories have been proffered for America's increased use of alcohol during the Federal period. One theory, which has a parallel in our own time, suggests that tremendous stress on individuals caught in rapidly changing social and economic conditions led them to relieve anxiety in their lives with alcohol. Whatever the cause, liquor was sufficiently abused to generate a backlash. From a practical standpoint, the move from handcrafts to industrialization required a sober, reliable workforce. At the same time, in another manifestation of the pressures of industrialization and immigration, the religious revival of the Second Great Awakening in New England placed renewed emphasis on biblical morality and social responsibility. Out of these efforts grew the temperance movement in the 1820s. As we now know, temperance supporters had gained sufficient strength to abolish the Navy's use of alcohol in 1862, and the entire nation's use for a decade in the 1920s, and temperance has remained an issue in American history for 175 years.

Which brings us to our recipe, the first ingredient of which is cider. There is no way of knowing for sure, of course, that William Wainwright wrote this recipe down while he was at sea. Nor do we know why he recorded it. Since it lacks a name and instructions for cooking, we don't even know what the recipe was expected to produce. In her 1833 *American Frugal Housewife,* Mrs. Child included a recipe for cider cake, but unlike this one it contains no eggs, currants, or molasses. Nor was I sure how to interpret "boiled cider." The recipe clearly called for experimentation.

I used the ingredients as I would in any standard cake or cookie recipe. While apple cider was sometimes boiled down to make a kind of thick syrup–a kind of cider or apple molasses–I did not think that would necessarily be right for Wainwright's recipe. I chose to take a cup and a half of sweet cider, reduce it to one cup, and to use it as a liquid. Chances are it would work just fine if you used one cup of unboiled cider. For "spice to taste" I used cinnamon and freshly grated nutmeg, popular nineteenth-century spices.

When it was all mixed, I ended up with a moderately stiff dough. I dropped some of it in large spoonfuls onto cookie sheets; some of it I spooned into a small loaf pan; some of it I put into a pudding mold to steam up as a pudding. The recipe was most successful as a steamed pudding, being moist and with a brownie-like stickiness. Personally, I thought the cookies were the most successful for modern tastes and cooking habits, although cookies are not as historically probable as a pudding.

If you wish to try this as a pudding, I recommend you halve the recipe and use a large pudding mold with a center tube. If you make the recipe as cookies, keep in mind that this is a high-yield recipe. Use any spice you like; the recipe would work beautifully with ginger; cloves or allspice would be good, too.

Wainwright's Recipe

1 cup Boiled cider
1 Molasses
2 Sugar
1 Butter
1 Currants
2 Eggs
6 Flour
2 Soda
spice to taste

Modern interpretation:
2 cups sugar
1 cup butter
2 eggs, beaten
1 cup molasses
6 cups flour
2 teaspoons baking soda
2 teaspoons cinnamon
2 teaspoons nutmeg
1 1/2 cups apple cider, boiled and reduced to 1 cup, and cooled
1 cup currants

Preheat oven to 350°

1. Cream together well the sugar and butter; add eggs and beat, then add molasses and beat till well blended.

2. Sift together the dry ingredients and beat into the wet ingredients. Add the cider and continue beating.

3. Fold in the currants, making sure they are evenly incorporated.

4. For cookies, drop tablespoonfuls on a greased cookie sheet and bake 15 minutes.

For a pudding, have ready a large pot of boiling water, grease the pudding mold, and boil pudding 2 1/2 to 3 hours.

The full recipe yields 5-8 dozen cookies; half a recipe yields a 1 1/2-quart pudding.

Wind Rose,® Calendar of Events & Museum Notes

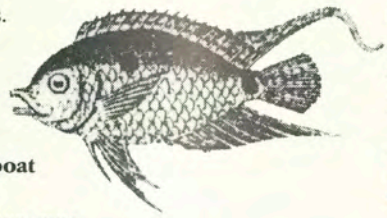
For further information about Museum events call the Mystic Seaport Information Line at (203) 572-5315 unless otherwise noted.

For further information about Mystic Seaport Stores events call (203) 572-8551.

August

Summer hours continue. Mystic Seaport is open from 9 A.M. to 8 P.M. daily, through 28 August.

Outdoor Demonstrations of maritime activities, include whaleboat demonstrations, sail handling, fish splitting, and more. Full schedule available at gates.



Steamboat *Sabino* continues 1994 summer season through 28 August, with daily half-hour trips on the hour, from 11 A.M. to 6 P.M.; 90-minute downriver cruise at 7 P.M. 1994 rates for the half-hour trip are $3 for adults, and $2 for youth (6-15); the downriver cruise costs $7.50 for adults, and $6 for youth (6-15). Five and under are free for both rides, but must have a ticket. *Sabino* Booth: 572-5351

The Boathouse continues 7-day-a-week operation, 10 A.M. to 7 P.M., through 28 August. Sailboat rides aboard *Breck Marshall* and launch rides aboard *Resolute*'s tender are $3.50 per person, six passengers per trip. Members receive a discount on rowboat and sailboat rentals. Rates for rowboats are $5.25 ($7 for nonmembers) for 30 minutes, and $8 ($10.50 nonmembers)for one hour. Sailboat rental rates are $10.50 ($14 for nonmembers) for one hour. The Boathouse: 572-0711, ext. 4233.

"Images of a Sailor" exhibit continues in the R. J. Schaefer Building through 14 October. See how various images of sailors–in the press, in caricatures, in portraits, and other media–have shaped our perception of seafarers throughout history.

28-9/2 ***Brilliant*** **Sail For Teenagers.** Mystic to Mystic. *Sold Out.*

29 Museum Hours Change. Mystic Seaport is open 9 A.M.- 5 P.M., with the full summer schedule of demonstrations, participatory drama, and horse and carriage rides continuing through 5 September.

29 Steamboat *Sabino* begins fall schedule, with daily half-hour trips on the hour, from 11 A.M. - 4 P.M., through 10 October; 90-minute downriver cruise at 5 P.M. , through 25 September. Refer to early-August entry for rates. *Sabino* Booth: 572-5351.

September

1 The Jewish Lunar Calendar Program in the Planetarium describes the origins and development of this intriguing calendar, through 30 September. Available to groups only, by reservation. Planetarium: 572-5355.

6 Fall Schedule begins, with outdoor demonstrations according to schedule available at the gates.

6 The Boathouse. Hours of operation reduced to weekends only, 10 A.M.- 5 P.M., through 10 October. Refer to early-August entry for rates. The Boathouse: through 10 October, 572-0711, ext. 4233; after 10 October, 572-5341.

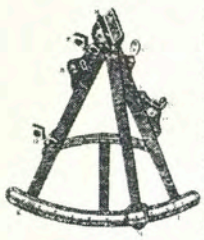
9-12 ***Brilliant*** **Sail For Adults.** Mystic Schooner Race. *Sold Out.*

10 Mystic Schooner Race. Traditional and modern schooners from throughout the Northeast compete in the 27th annual invitational schooner race. Participants rendezvous at the Museum on Friday evening, for an early Saturday morning start. Awards ceremony on Saturday evening. Sail Education Office: 572-5323.

10 Interpreter for Visitors with Hearing Impairments. Check schedule posted in Visitor Reception Center.



10-11 Photo Weekend. Staff and volunteers, dressed in period costume, pose for your camera on the Museum grounds and aboard ships. Mystic Seaport is open from dawn to dusk. Members are invited to take part in the photo contest for cash prizes, and the exhibition. Entry forms are available during the weekend at the gates. Sponsored by Eastman Kodak.



13 Basic Celestial Navigation course is held Tuesday evenings, 7:30-9:30 P.M., in the Planetarium, through 22 November. Cost is $135 ($150 for non-members). Planetarium: 572-5355.

17 On-The-Water Seamanship Course aboard 38-foot powerboat *Seascribe.* Day-long class includes instruction and practice in docking, anchoring, vessel maneuvering, and safety procedures. Departs from the Shipyard at 9 A.M. and returns at 4:30 P.M. Program cost is $125 ($140 nonmembers). Dockmaster: 572-5390.

17 Fall Sailing Classes. Adults and Juniors can choose from a full range of courses, from Beginner to Advanced, as well as Learn To Race, and Racing Series. Sail Education: 572-5323.

18 On-The-Water Navigation Course aboard 38-foot powerboat *Seascribe*. Day-long class includes practical work in Piloting and Dead Reckoning, Loran, Radar, GPS and Celestial Navigation. Designed for students who have completed classroom work in Piloting and Dead Reckoning and/or Celestial Navigation. Departs from the Shipyard at 1 P.M. and returns at 8:30 P.M. Program cost is $125 ($140 nonmembers). Dockmaster: 572-5390.

19 Members-Only Lantern Light Tour ticket sales, through 2 October. Refer to 2 December entry for a complete description and schedule.

24 Members' Day. Refer to back cover for information.

24 Mystic Maritime Gallery. Fifteenth annual Mystic International Exhibition opens. Gallery: 572-8524.

24 On-The-Water Seamanship Course. Refer to 17 September.

25 On-The-Water Navigation Course. Refer to 18 September.

October

1 On-The-Water Navigation Course. Refer to 18 September.

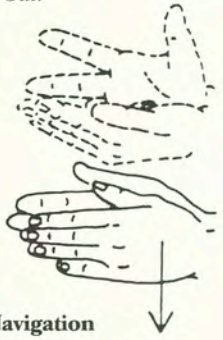
2 On-The-Water Seamanship Course. Refer to 17 September.



2-7 Elderhostel. Enjoy an in-depth tour of the Museum on the first day, then sail New England waters aboard the *Mystic Clipper*, mooring each night at various harbors, which might include Block Island, Newport, or Sag Harbor. Participants will study three disciplines while aboard: regional maritime history, the voice of the seafarer through literature and chanteys, and navigation. Education: 572-5322.

3 Lantern Light Tour tickets on sale to the general public. Refer to 2 December entry for a complete description and schedule.

7-10 *Brilliant* Sail For Adults. Baltimore to Baltimore. *Sold Out.*



8 Interpreter for Visitors with Hearing Impairments. Check schedule posted in Visitor Reception Center.

8 On-The-Water Navigation Course. Refer to 18 September. *Seascribe* departs at 12:30 P.M. and returns at 8 P.M.

8-10 Chowderfest Weekend. Local civic groups serve a variety of chowders and other tasty fare–from clam cakes to hot dogs–at the Boat Shed. Listen to chantey music as you enjoy these delicious menu items, from 11 A.M.- 3 P.M. throughout Columbus Day weekend.

9 On-The-Water Seamanship Course. Refer to 17 September.

12-16 *Brilliant* Sail For Adults. Great Chesapeake Bay Schooner Race. Baltimore to Norfolk. *Sold Out.*

14 Introduction to Coastal Navigation. Classes are held in the Planetarium on Thursday evenings, 7:30-9:30 P.M., through 18 November. Cost is $72 ($80 for nonmembers). Planetarium: 572-5355.

15 Fireplace Cooking Class. Share a hearty New England repast that you've helped prepare on an open hearth. Takes place in the newly refurbished Buckingham\Hall House from 6-10 P.M. Interpretation: 572-5356.

15-16 Pilot Weekend. A working weekend for membership volunteer group. If you are interested in more information regarding this group, please write to the Membership Office at the Museum address.

16-21 Elderhostel. Refer to 2-7 October entry.



18 Morning Fun For Kids. Special members' educational program for parents and preschoolers ages 2 1/2 to 3 1/2, Tuesday mornings from 9-10 A.M., in the Children's Museum. Series continues through 22 November. Cost is $35; a second child can attend for an additional $14. Education: 572-5322.

20-24 *Brilliant* Sail For Adults. Four-day weekend sail from Norfolk to Baltimore. Visit maritime museums and explore Chesapeake Bay while learning about the local environment. Become an active member of the crew, and learn general seamanship and traditional nautical skills from professional sailors. No experience necessary, but participants should be physically fit, agile, and inquisitive. Cost is $495. Sail Education: 572-5323.

22 Dyer Dhow Derby. A fleet of Museum sailing dinghies race on the Mystic River with members of several East Coast yacht clubs at the helm. This annual event expresses our appreciation to those who donate Dyer Dhows to our Sail Education program. Sail Education: 572-5323.

22 Fireplace Cooking Class. Refer to 15 October entry.

28-11/1 Boatbuilding Classes include instruction and work in a variety of operations basic to traditional wooden boatbuilding, including planking, steam bending, and more. Participants work with museum-supplied tools and materials. Classes run 9 A.M. - 5 P.M. Cost is $320 ($350 for nonmembers), and enrollment is limited. Small Craft Office: 572-0711, ext. 5028.

28-29 Ghost Tales. Refer to back wrap for information. *Sold Out.*



29 Children's Halloween Parade. Refer to back wrap for information.

31 Museum Hours Change. Mystic Seaport open from 9 A.M. - 4 P.M., grounds close at 5 P.M. through 1 January 1995.

November

4 Library Book Dutch Auction. Prices reduced hourly. Hundreds of titles in this annual event sponsored by the Fellows of the G. W. Blunt White Library, 10 A.M. - 5 P.M. Library: 572-5367

4-5 Southern New England Maritime History Symposium. Fourteenth annual program explores diverse aspects of regional maritime history through lectures and discussion. Refer to back wrap for information. Curatorial: 572-5313.

4-6 Mystic River Historical Society Days. Special discounts and events at the Mystic Seaport Stores to celebrate the history of the region. This is a community effort with members of the Mystic River Historical Society, which will receive a portion of the sale proceeds. 10 A.M.- 5 P.M.

4-9 Boatbuilding Classes. Please see 28 October entry.

9 "Maiden Voyage" Presentation. Refer to back wrap for information.

12 Feature Artists Exhibition opens at the Mystic Maritime Gallery. Reception at the Gallery from 2 - 5 P.M. The exhibition will run through 31 December. Gallery: 572-8524.

12 Interpreter for Visitors with Hearing Impairments. Check schedule posted in Visitor Reception Center.

19 Rhythm of the Oars: Stories of Rowing in America Exhibit opens in the R. J. Schaefer Building. Refer to page 61 for information.



24 Thanksgiving Day. Mystic Seaport open on a limited basis. Twenty-three exhibits, with three staffed, 9 A.M. - 4 P.M.

25 Ornament Contest Delivery to the Museum Stores. Entries will be accepted through 8 December.

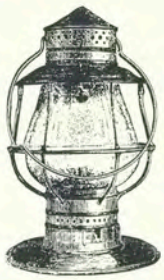
25-27 New England Field Days. Thanksgiving weekend offers special activities for families, including wagon rides, and outdoor games.

28 Christmas Activities Schedule begins, through 1 January; schedule available at the gates.

28 The Star of Bethlehem, a half-hour program on this noted celestial phenomenon will be presented in the Planetarium daily at 2:45 P.M. through 2 January. Presentations for groups must be reserved. Planetarium: 572-5355.

30 Yuletide Tours These daytime tours of selected exhibits and ships are conducted by guides in nineteenth-century costume, and include chantey music and conversations with roleplayers. Tours are one hour in length,and leave the Visitor Reception Center every 15 minutes, 9:30-11:45 A.M. and 1-2:30 P.M., Wednesdays through Sundays, until 17 December. An interpreter for the hearing impaired will be available for tours on Saturday, 10 December at 10 A.M., 11:30 A.M. & 1:30 P.M. Reservations are required, and can be made by calling 1-800-522-1841, Monday through Friday from 9 A.M. to 4 P.M.

December



2 Lantern Light Tours. These evening tours recreate a Victorian Christmas in a village drama that takes place around you. Each year has a new storyline. Tours leave the Visitor Reception Center every 15 minutes, 5-9 P.M., through 22 December. Tours will not run on 5-8, 13, and 20 December. Ticket prices are $18 for adults, and $10 for youths, 4-15 years old. Children under 3 are free but must be able to sit on an adult's lap. An interpreter for the hearing impaired will accompany the tour on Monday, 12 December at 5:30 P.M., 7 P.M., and 8:30 P.M. Reservations are by phone only, at 1-800-522-1841, Monday through Friday, from 9 A.M. to 4 P.M.

3 Members' Shopping Day at the Mystic Seaport Stores. Extra discounts for members all day, 10 A.M. - 8 P.M.



9 Ornament Contest winners at Mystic Seaport Stores announced.

10 Interpreter for Visitors with Hearing Impairments. Check schedule posted in Visitor Reception Center.

18 Community Carol Sing takes place in Anchor Circle at 3:30 P.M. Here's your chance to sing with a brass quartet and Mystic Seaport carolers. No admission charged today.

24 Christmas Eve. Mystic Seaport open on a limited basis. Twenty-three exhibits open, with three staffed, 9 A.M. - 4 P.M.

25 Christmas Day. Mystic Seaport is closed.



26 Kids After Christmas. Games, crafts, and all kinds of special activities for children, through 1 January. Also, "Plum Pudding Voyages" for families - special activity tours in exhibit buildings, at a cost of $2 per person at 11 A.M. and 1 P.M. daily.

Can You Help Us?

Mystic Seaport is in need of a used low-mileage sedan or station wagon, preferably under 5 years old and 40,000 miles. The Education Department and staff from other areas of the Museum will use the vehicle to attend professional meetings and present in-school programs. Please contact Ric Curcio at (203) 572-5380.

....And a Belated Thank You!

The staff of Mystic Seaport expresses a sincere "thank you" to all of you who have responded to this column through the years. From pumps for *Sabino* to books that are "generously appreciated by the ladies and sailors of the American Seamen's Friend Society," your support has enabled us to make things, do things, and go places. We acknowledge and appreciate our members' role in helping the Museum maintain its reputation for presenting and preserving America's maritime heritage.

Visitors are Hearing Voices!

This summer, Mystic Seaport is taking advantage of electronic technology to carry people out of the present and into the nineteenth century. Figuratively speaking, that is! New audio installations bring the past to life in four village exhibit buildings.

Rob Richter, Supervisor of Special Interpretive Programs, was responsible for producing the creative content of the audio. "If technology is done well, it enhances and stimulates the visitor experience," said Richter, adding that the sounds of the past improve the interaction between individuals and artifacts.

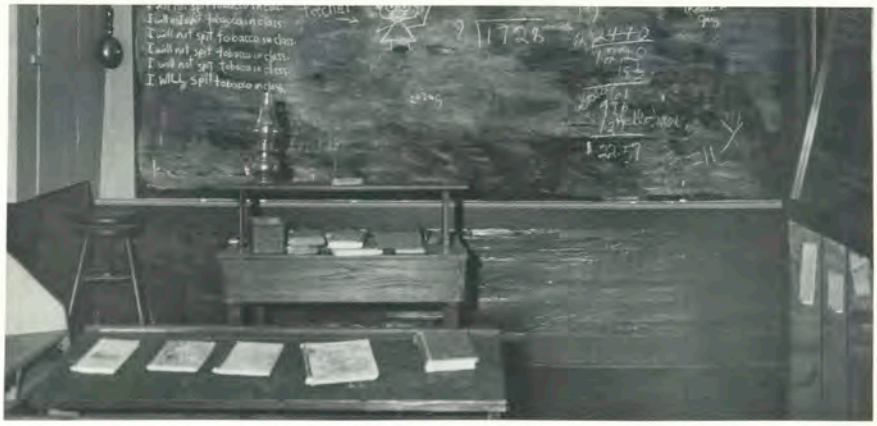
The Boardman School echoes with the ageless clamor of impatient children waiting for the end of class. The sounds create an ethereal presence in the physically empty room. Then, lessons begin and we encounter a number of striking dissimilarities to today's education practices. School is in session, and it is Saturday! Furthermore, when one student reads his essay, "The School," we learn that he attends class year-round; children in rural communities customarily studied throughout the year, although seasonal demands for chores came first. The wide range of grades in a one-room schoolhouse is another difference, and particular attention was given to casting voices that reveal an age spread of six or seven years.

All of the audios were recorded at the Museum, and involved a number of trips to the Audiovisual Media Division's extensive sound effects library on compact disc. Certain noises, unavailable in the collection, were staged especially for this project.

Mike Scott, our Media Specialist Assistant, explains that the voices and sounds were recorded on a master reel-to-reel tape, and eventually ended up on a computer chip. Digital message repeaters, containing the chip, were installed in the exhibit buildings. The repeaters have no moving parts, and this is particularly important because the four buildings are not temperature controlled. Changes in climate have virtually no effect, as compared to mechanisms with moving parts, such as tape players which are weather sensitive.

Scott emphasizes the importance of using digital technology. Tapes are a magnetic storage medium. Each time they are copied there is a slight deterioration in the sound quality; the second generation tape is not quite as sharp as the first. But with digital recording, like CDs, the quality remains the same after an unlimited number of reproductions. Regular tapes record and play the actual sound, or "analog." However, digital tapes record binary codes; when played, the system reads these codes and translates them into the original sounds. In this respect, new technology has mitigated the process of deterioration.

The Fishtown Chapel's audio contains a passionate sermon on the "evil beast": alcohol; the minister's strong words beseech listeners to "empty your cellars and wine closets of the beverage." The text is taken from an actual sermon that Mystic churchgoers of 1890 heard at their local place of worship. The service concludes with a temperance hymn, "The Cup of Cold Water," which was recorded by the Connecticut College Choir.



The Boardman School was built circa 1768 in Preston, Connecticut, and functioned as a one-room schoolhouse throughout the nineteenth century. (Mary Anne Stets Photograph)

In the Victorian era, temperance was an important social issue. Mystic Seaport emphasizes this noble but arduous mission of many churches and benevolent organizations through the American Seamen's Friend Society Reading Room exhibit, where roleplayers explain their hopes of making a sailor's time on shore a thoroughly dry experience.

Despite such pleas for abstinence, the music emanating from the Schaefer Tavern is telling quite a different story. A narration of true tales and coarse characters is interspersed with songs that sailors heard as they made merry. Of particular interest are the escapades of an audacious female crimp named Gallus Mag, who weighed two hundred pounds and stood over six feet tall.

Life at sea was full of hardships, and the shoreside watering hole was a place of revelry after safely returning to land. Port towns had a reputation for rough-and-tumble taverns; however, it is important to keep in mind that, just as today, drinking establishments varied not only in size and shape, but also in quality and reputation.

On a sobering note, the most dramatic recording occurs in the New Shoreham Life-Saving Station, which originally stood on Block Island. Here, visitors are taken on an auditory journey beyond the confines of the building and transported to a beach on a stormy night. The scenes unfold around the rescue of passengers aboard a vessel that has just run aground. Impressive sound effects realistically depict the procedures of the station, including a breeches buoy rescue.

In the late nineteenth century, the U. S. Life-Saving Service constructed life-saving stations along the Atlantic, Gulf, Pacific, and Great Lakes coastlines. During the wreck-prone months from September to June, they were manned by crews of about seven skilled surfmen. In most cases, rescues were accomplished by surfboats launched from the beach; in extreme circumstances, the breeches buoy was used to haul survivors ashore.



The New Shoreham Life-Saving Station was constructed on Block Island in 1874, and assisted vessels in distress until 1890. (Gene Myers Photograph)

Of all the exhibit buildings with audio, the Life-Saving Station is the most unfamiliar to people; our society still maintains schools, chapels, and taverns, although in different forms. Scriptwriters were sensitive to this fact, and made the technical aspects of the scene easy to understand by using simple, yet accurate terms.

In adding this new audio dimension to village exhibits, the Museum is acknowledging that people acquire information in different ways: some prefer reading and viewing, others learn by talking with individuals, while some are most comfortable with audio or video presentations. These new teaching tools broaden the reach of our exhibits. Stuart Parnes, Director of Exhibits and Interpretive Programs, asserts, "the great thing about Mystic Seaport is that there are so many ways to tell our story, and adding electronics makes it that much better."

Parnes considers this new technology to be another form of interpretation, and assures us that it will not replace people. He states further, "technology is not an alternative to the real objects. We are always very conscious to do this as supplementary to the real thing."

The Stillman Building is illustrative of the number of ways that electronics enrich a visitor's experience. Two laser disc videos, "The Whale Hunt" and "The *Morgan* as an Icon," began as videocassettes and were transferred to disc when the Museum had the financial resources. Besides producing less wear and tear on the system, the improvement for viewers is significant: the *Morgan* videocassette had four minutes of black screen while rewinding, compared to five seconds for the laser disc playback. One of the audio programs takes place in a recreation of a fo'c'sle, and it includes voices of all ages and both sexes describing life aboard whaleships. The background sounds of seagulls, waves, and wind are so naturally yet subtly portrayed that for a moment the fo'c'sle appears to be rolling.

Another type of technology allows visitors to control their level of participation: an interactive computer system. From quizzing themselves on whaling-related topics to "signing on" as a crew member, this program never fails to fascinate the young at heart. Museum Teacher Jane Foster describes the excitement of children making the connection between computer images and the *Charles W. Morgan*: "We've just seen that, we've just seen that," they exclaim to their companions. On a recent visit, an ingenious young German boy carefully pronounced each question aloud and struggled for the appropriate answer as a way to improve his knowledge of the English language.

The visitor-interactive computer age came to Mystic Seaport in 1989, when the Museum received an Apple Grant for equipment to start programs. Similarly, the electronics for "The *Morgan* as an Icon" exhibit came from a special grant. Parnes reiterates the importance of donations, "We've always relied on outside support to bring our technology up a level."

Mystic Seaport looks at the future in terms of innovative ways to explore and preserve the past. As advances in technology continue to make learning more accessible, we hope that visitors leave with a new perspective on history, and on their own lives. In the meantime, the voices of the past will continue in the village.

Rhythm of the Oars: Stories of Rowing in America Exhibit

Mystic Seaport kicks off 1995 as the "Year of Rowing and Small Craft" with a rowing exhibit in the R. J. Schaefer Building. Opening on 19 November, the exhibit tells the story of the American rowing tradition, and includes rowboats, models, photos, paintings, films, and a hands-on display. Whether for work or recreation, these craft have been an important and influential mode of transportation throughout the ages. With that in mind, the collection also addresses European rowing, which greatly influenced our own traditions. From seasoned rower to interested spectator, all will be amazed at the multitude of ways that rowboats have been used from the nineteenth century to the present.



Even though the sun is bright, a serious rower can never be too prepared for a sudden squall! (M.S.M. 64.355)

Kids Corner

Wind in Your Sails

ABOUT WIND AT SEA AND HOW SAILORS USE IT

Elinor De Wire

THE GREEK WINDS

The Ancient Greeks gave names and personalities to the different winds. All the winds were thought to live on Mount Haemus in Thrace. Aeolus was the supreme god of all the winds and lived inside a cave on Thrace where he kept all the winds of the world in bags and freed them only when he wished. Greek sailors believed Aeolus invented the sail to help ships move in the wind.

Aeolus was assisted by five major wind gods: Boreas, the North Wind, blew his cold breath to cool the earth. Euros, the East Wind, brought the storms by flapping his cloak. Notos, the South Wind, poured his jar of water over the land to make rain. Zephyros, the West Wind, carried warm and gentle breezes in his robes. Tempestas was moody and flung terrible storms over land and sea when she grew angry.

I saw the different things you did,
But always you yourself you hid.
I felt you push, I heard you call,
I could not see yourself at all --
O wind, a-blowing all day long,
O wind, that sings so loud a song!

Robert Louis Stevenson
"The Wind"

WINDS SAILORS DREAD

Storm winds have different names around the world. We call big storms hurricanes or gales. Find these mighty storm winds in the search below.

BAGUIO (Philippines)
WILLY WILLY (Australia)
TY FUNG (China)
KOHALA (Hawaii)
FRISK VIND (Sweden)
BOFU (Japan)
DROMI (Syria)
ASIFAT (Arabia)
HURRICANE (United States)
MONSOON (India)

K	O	H	D	R	O	M	I	C
O	L	L	I	W	Z	S	D	R
H	U	R	R	I	C	A	N	E
A	F	T	Y	L	R	Q	I	D
L	O	A	R	L	U	M	V	N
A	B	F	F	Y	H	O	K	O
M	A	I	O	W	C	N	S	O
O	G	S	B	I	Z	S	I	S
R	U	A	S	L	U	O	R	N
D	I	R	J	L	X	G	F	O
G	N	U	F	Y	T	U	A	M
M	O	N	S	O	N	F	O	B

WINDS SAILORS USE

Match three important sailing winds, and two calm regions, with their numbered descriptions below. Find out where they are on the earth.

___ Doldrums
___ Trade Winds
___ Prevailing Westerlies
___ Horse Latitudes
___ Polar Easterlies

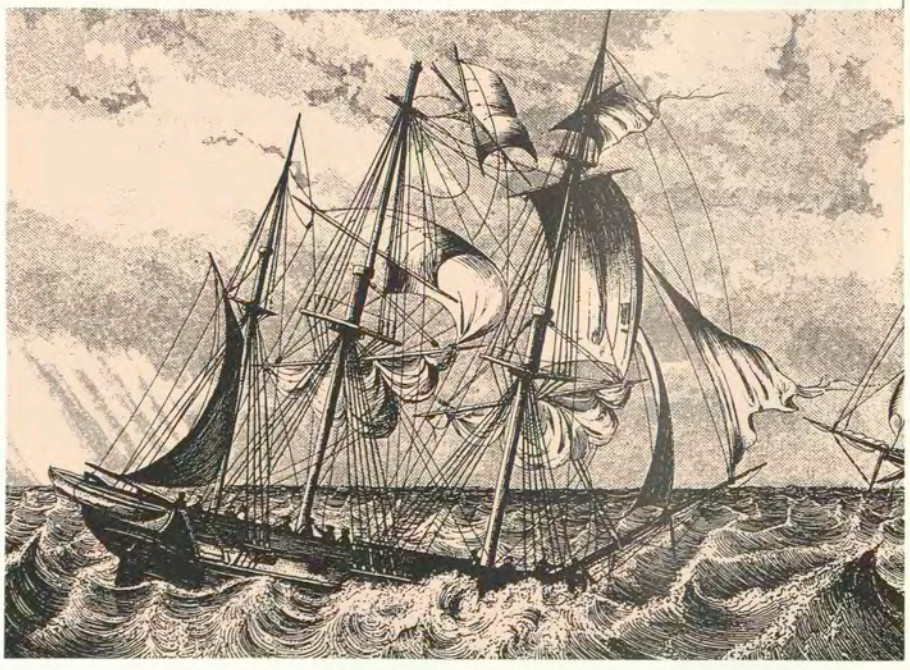
1. Sailors like these steady tropical winds that blow between the equator and the Horse Latitudes. They are important to ships traveling the major trade routes.

2. A ship could languish in this hot and windless place at the equator! Sailors go nowhere in this "dull space!"

3. These winds blow mostly from west to east and prevail in the mid-latitudes. Sailors know they sometimes bring bad storms.

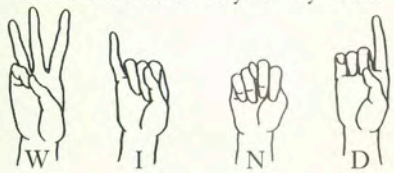
4. A ship can float aimlessly for weeks in this calm region not far from the tropics. Becalmed sailors might get hungry enough to eat a horse!

5. These chilly winds in the far north and far south bring cold air blowing from east to west and cause sailors to pull on warmer jackets.



Say Wind!

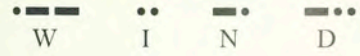
The word "wind" is what poets call onamatopeaia––a word that sounds just like what it is. Say "wind" so that it sounds like wind as it leaves your mouth. Here are some other ways to say "wind"



(Sign Language for the Deaf)

(German)	Der Wind
(French)	Le Vent
(Spanish)	El Viento

(Morse Code)



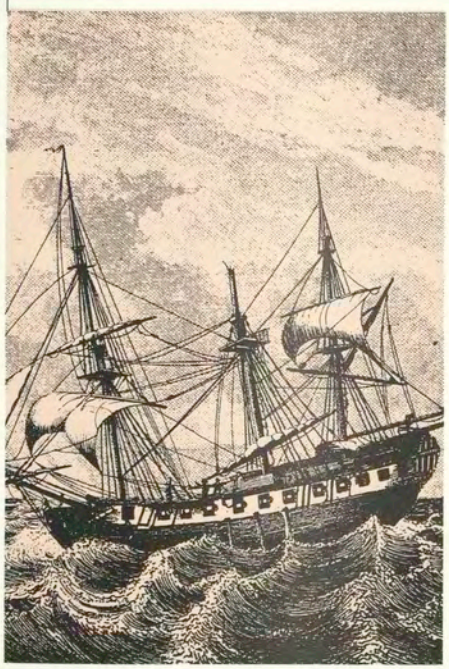
(Weather Warning Flags)

Small craft warning.
Winds up to 38 miles forecast.

Gale warning.
Winds from 39-54 miles perhour forecast

Full gale warning.
Winds from 55-73 miles per hour forecast.

Hurricane warning.
Winds 75 miles or over forecast



"Sunday, July 2, 1911 –– Fred heaved his old shoes overboard to bring wind. A sacrifice to Neptune? It's a tradition going back, I know, and I must spend some time in re–studying ancient history to see what I can find out about Greek and Roman seamen making their sacrifices to get a fair wind. Isn't it enchanting?"

Dorothea Moulton Balano
From her journal kept aboard the *R.W. Hopkins*

Wind Words

Leeward or Windward? Which is the side away from the wind? Which is the side in the path of the wind?

Tack? It's not a pin when you're out for a sail. It's the zigzag way a sailor uses the wind. Find out how.

Wind on the Weather Map

Circles have lines attached to them to show wind direction and speed. Here's how it works:

Wind from the North:



Wind from the South:



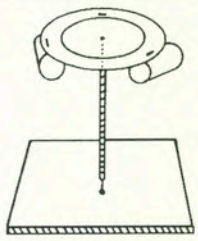
Wind from the East:



Wind from the West:



Paper Plate Anemometer



Materials: Paper plate, 3 paper cups, soda straw, 2 long nails (headless and with a big head), board or heavy cardboard, stapler, hammer.

Make It!: Hammer headless nail into center of board. Drop soda straw over nail. Staple paper cups to paper plate. Push nail with big head down through center of plate. Slip into top of soda straw. Place outdoors in wind and watch it spin!

Windy Math

In 1805 Admiral Francis Beaufort of the British Navy made up a scale of wind speeds and their effect on a ship's sails. Part of his chart is found below. Use it to figure out these windy math puzzles:

Which type of wind is twice as strong as the strongest gentle breeze?

Which type of gale is three times as powerful as a the weakest moderate breeze?

Which force of wind at its highest is half of a whole gale?

Beaufort Number	Seaman's Term	Knots
1	LIGHT AIRS	1-3
2	LIGHT BREEZE	4-6
3	GENTLE BREEZE	7-10
4	MODERATE BREEZE	11-16
5	FRESH BREEZE	17-21
6	STRONG BREEZE	22-27
7	MODERATE BREEZE	28-33
8	FRESH GALE	34-40
9	STRONG GALE	41-47
10	WHOLE GALE	48-55
11	STORM	56-65
12	HURRICANE	above 65



T R I V I A

How long have we been using the wind to move watercraft? Maritime historians believe the sailboat was invented about 5000 years ago, but it was a much simpler vessel than today's sailboat. About 2500 years ago movable sails and rudders for steering were added.

"Cat's Paws" is the sailor's nickname for tiny surface ripples on the sea caused by a slight breeze. They're so soft and gentle, only a cat could make them!

About the Authors

RICHARD ELLIS is currently recognized as the foremost painter of marine natural history subjects in America. His paintings have been exhibited widely and reproduced in many publications, and he has written more than 80 articles and worked on several television specials. His books include *The Book of Whales* (1980), *Dolphins and Porpoises* (1982), *Book of Sharks* (1989), *Great White Shark* (1991), *Men and Whales* (1991), *Physty* (1993), and the soon to be published *Monsters of the Sea*, which provides more information on *Architeuthis* and the other real and imagined "monsters" of the deep.

JOHN GARDNER, Mystic Seaport's Associate Curator for Small Craft Studies for 25 years, continues to study and write on the history, technology, modern adaptations, and enduring values of traditional small craft and their use. He delivered this address to the Museum Small Craft Association at Mystic Seaport in 1993.

MONA A. RIVERS is an Assistant in Mystic Seaport's Ships Plans Division, having come to the Museum in 1992 under a grant from the National Historical Publications and Records Commission. She graduated from Eastern Connecticut State University in 1991 with a B.A. in history and social science.

SARA LEONE, *The Log*'s Associate Editor, is a veteran of many departments at Mystic Seaport.

MARIFRANCES TRIVELLI is Cataloguer in the Registrar's Office of the Museum's Curatorial Department.

SANDRA L. OLIVER, a foodways historian in Maine and former Mystic Seaport staff member, has written a history of New England maritime foodways that will be published by the Museum in the fall.

ELINOR DE WIRE is Supervisor of Curriculum and Instruction for the Museum's Education Programs Division.



This summer a new Beetle Cat is gracing the Mystic Seaport waterfront! The *Wilbur Langdon* was donated to the Museum for use at the Boathouse by Mrs. Mary L. Langdon in memory of her late husband. The boat was built by the Beetle Catboat Division of the Concordia Company in South Dartmouth, Massachusetts. Her maiden sail as part of the livery fleet occurred on opening day of the 1994 Boathouse season.

Mrs. Mary L. Langdon and Shipyard Director Dana Hewson shake hands astern of the Beetle Cat Wilbur Langdon. *(Judy Beisler photo)*

Notes to "Morgan Barney"

1. "The Month in Yachting," *Yachting* 74:2 (August 1943): 51.

2. William C. Weintraub, "Industrial, Commercial & Maritime Introduction of New Bedford, Massachusetts, 1760-1900," (research report, Mystic Seaport Museum, 1975), 39; John Peter Barney, "A Biography of George Barney," photocopy in Manuscript Collection, G.W. Blunt White Library, Mystic Seaport Museum, original in the possession of Rhoda Barney Jenkins.

3. "The Month in Yachting," 51.

4. Massachusetts Institute of Technology, *Senior Portfolio, Class of 1900,* M.I.T. Museum Collection.

5. Morgan Barney, diary, 7 November 1899, Morgan Barney Papers, Collection 207, box 1, vol. 1, G.W. Blunt White Library, hereafter cited as MBP.

6. Rhoda B. Jenkins, telephone conversation with author, 29 September 1993; Mystic Seaport Museum, Ships Plans Collection, Catalog 86.6 , 86.8, 86.9.

7. Massachusetts Institute of Technology, Class of 1900, *First Decennial Record of the Class of 1900: 1900-1910* (Rochester, New Hampshire: Rochester Printing Company, [1910]): 13.

8. "Designing Competition," *Forest and Stream,* 15 March 1902, 213-16; "Seawanhaka-Corinthian Y.C. Designing Competition," *Forest and Stream* , 14 June 1902, 471-73; Mystic Seaport Museum, Ships Plans Collection, Catalog 86.12, 86.13.

9. *First Decennial Record,* 13.

10. W.F. Durand, *Motor Boats: A Thoroughly Scientific Discussion of their Design, Construction, and Operation* (New York: International Marine Engineering, 1907), 1.

11. Benjamin A.G. Fuller, "The Coming of the Explosive Engine, 1885-1910," *The Log of Mystic Seaport* 45:2 (Autumn 1993): 35-38.

12. Howard Greene, "The Boat and Its Engine," *Yachting* 1:4 (April 1907): 228.

13. Fuller, "The Coming of the Explosive Engine," 34; A.E. Potter, "The Evolution of the Gas Engine," *Yachting* 1:2 (February 1907): 82.

14. C.O. Liljegren, "The Limits of the Speed Launch," *The Rudder* 14:3 (March 1903): 198; Fuller, "The Coming of the Explosive Engine," 38.

15. Owen Roberts, "The Lake Worth Motor Boat Races," *Yachting* 1:3 (March 1907): 141-43. This article has photographs of almost a dozen mid-size motorboats, yet they are all distinctly different in hull form and appearance.

16. Ships Plans Collection, Catalog 86.199.

17. Ships Plans Collection, Catalog 86.336.

18. Rhoda B. Jenkins, interview with author, Greenwich, Connecticut, 13 September 1993.

19. "The Month in Yachting," 51.

20. "Plans of *Ildico III* – A 45-Foot Launch," *Yachting* 2:5 (November 1907): 291.

21. "The Month in Yachting," 51.

22. Handley, J. M. "The Lipton Cup Races on Lake Michigan," *Yachting* 2:4 (October 1907): 222-25, 248.

23. "The Month in Yachting," 51; Rhoda B. Jenkins, interview, 13 September 1993.

24. John George Glover, ed., *The Shipbuilding and Shipping Industries* (New York: Prentice-Hall, 1941), 633-34; Edward N. Hurley, *The Bridge to France* (Philadelphia: J.B. Lippincott, 1927), 21-26.

25. "Hudson Maxim Asks Anti-Torpedo Test," *New York Times,* 17 January 1918; "May Put Double Hulls in All Steel Ships," *New York Times,* 19 March 1918.

26. Hurley, *Bridge to France,* 222-23; "Hudson Maxim Asks Anti-Torpedo Test," p. 11, col. 2; Hudson Maxim, "Great U-Boat Peril," *Scientific American* (12 May 1917): 472; Hudson Maxim, "How to make Ships Torpedo-Proof," *Scientific American* (9 June 1917): 578-84.

27. Ships Plans Collection, Catalog 86.234.

28. "Marries Morgan Barney," *New York Times,* 14 February 1919; Eleanor Flexner, *Notable American Women 1607-1950,* vol. 1, ed. Edward T. James and others (Cambridge: The Belknap Press of Harvard University Press, 1971), 172-74; Morgan Barney, diaries, Coll. 207, box 1, MBP. References to Nora Barney's work can be found in the following entries: vol. 5, 27 February 1938, 16 April 1938, 4 November 1938; vol. 6, 26 August 1940.

29. Morgan Barney, diary, 11 November 1938, Coll. 207, box 1, vol. 5, MBP.

30. Ships Plans Collection, Catalog 86.241.

31. Rhoda B. Jenkins, interview, 13 September 1993.

32. Morgan Barney, diaries, box 1, MBP. B.K. Sharp had worked as a draftsman for Barney in 1909, and apparently married his sister sometime afterward. It is possible that Barney and F.K. Lord worked together at one time.

33. "The Month in Yachting," 51.

34. Rhoda B. Jenkins, interview, 13 September 1993. See also Mystic Seaport Museum Oral History Collection in the G.W. Blunt White Library.

35. Morgan Barney, diary, 1943, box 1, vol. 9, MBP; "The Month in Yachting," 51.

Notes to "William Wainwright's Recipe"

1. William Wainwright, journal, December 1861-June 1864, Log 429, G.W. Blunt White Library, Mystic Seaport Museum. For the USS *Kearsarge* see Donald L. Canney, *The Old Steam Navy,* vol., 1, (Annapolis: Naval Institute Press, 1990), and David D. Porter, *The Naval History of the Civil War* (New York: Sherman Publishing Co., 1886).

2. *Official Records of the Union and Confederate Navies in the War of the Rebellion,* ser. 1, vol. 7, (Washington, D.C.: Government Printing Office, 1896), 584.

3. William Wainwright, journal, June-November 1864, Log 430, G.W. Blunt White Library.

4. Jack Larkin, *The Reshaping of Everyday Life, 1790-1840* (New York: Harper and Row, 1988), 286.

SEAPORT SALUTE

Anna Glen Butler Vietor



Anna Glen Butler Vietor may have lived on Park Avenue most of her life, but she has ships and the sea in her blood. Descended from a large old New York family, she is the great-granddaughter of a founder of New York's famous Black Ball Line of packet ships. Traveling in the 1930s with her parents to Europe and South America, reportedly on *every* major ocean liner, inspired her lifelong interest in shipping and the Port of New York. Her marriage to Alexander Orr Vietor, a sailor who was working for the yacht brokers Sparkman & Stephens when they met, brought her summers on Martha's Vineyard. There, her "Grandma's House" remains the center of a swirl of summer activities for her large family of six children and twenty-three grandchildren. ❧ The many organizations that have captured her imagination and dedication include the Central Park Conservancy, the Garden Club of America, the New York Botanical Garden, Colonial Williamsburg, the U.S. State Department Foundation, the Holland Dames, The Henry Francis DuPont Winterthur Museum, the Peabody and Essex Museum, the Ocean Liner Museum, the New-York Historical Society, and the Seaman's Church Institute. ❧ Mystic Seaport Museum has been extremely fortunate to have enjoyed the participation of the Vietor family. Alec Vietor served the Museum as a trustee for 25 years, and he was a major supporter of the G.W. Blunt White Library. After his death, Mrs. Vietor graciously donated many of Alec Vietor's logbooks, journals, scrimshaw pieces, whaling artifacts, and manuscripts to Mystic Seaport. The Museum's Alexander Orr Vietor Memorial Fund provides for the acquisition of distinctive and significant manuscript material relating to American maritime and whaling industries, and it supports the Alexander Orr Vietor Memorial Lecture Series. The Vietors' son, Richard, is continuing in the family tradition, serving Mystic Seaport as a trustee and as treasurer of the Museum. ❧ Anna Glen Vietor is held in high esteem and has the deep respect and affection of her family, her friends, and her lifelong associates. Her interest in and appreciation of sea-related activities and history personifies the vision of Mystic Seaport Museum. We are proud to salute her.

MYSTIC SEAPORT MUSEUM®

CELEBRATE MEMBERS' DAY! 24 SEPTEMBER 1994



From butter making to whaleboat rowing, we're planning all kinds of hands-on fun! This special day has been created just for you and your family. Highlights include behind-the-scenes tours, children's activities, music, boat rides, and great food! Come early and participate in a full day of special events, including the Annual Meeting for Mystic Seaport members. Watch the mail in late August for your personal invitation containing a full listing of events.