From the Editor in Chief

Impacts of technology upon livelihoods and the economy have been integral to our narrative at Mystic Seaport Museum for ninety-five years. From the whaler *Charles W. Morgan* to the fishing schooner *L. A. Dunton*, and from our working waterfront, active shipyard, and a successfully operated commercial marina, to academic programs like the Frank C. Munson Institute of American Maritime Studies and the Coastal & Ocean Studies Program of Williams College & Mystic Seaport Museum, the institution has striven to engage these themes as essential components of maritime studies.

Mystic Seaport Museum recently commissioned a series of paintings from artist Alexis Rockman for an exhibition which considered the impact of maritime activities on the ocean over time. Working closely with our curatorial team and Dr. James Carlton, director emeritus of Williams-Mystic, Rockman created an incredible array of exquisite paintings which address some tough global themes, like invasive species, overfishing, plastics in the oceans, mass extinctions, and deep-sea mining. As the exhibition developed, I found myself thinking more and more about climate despair, as people are bombarded with bleak news about ocean health and sea level rise worldwide. I began to seek out what the great minds of the world are doing about these issues. What I discovered is a fascinating thread that connects our past, present, and future through maritime and now the "blue" economy. While much of our history has wreaked havoc on our seas, significant efforts are underway to find sustainable yet economically viable methodologies such as efficiencies in container ship design, renewable energy strategies, aquaculture, ocean mapping, and advanced blue technology. We added a component to the exhibition that highlighted the creative ways in which researchers and entrepreneurs are working to find sustainable solutions to common problems. Many of these are based on innovative marine architecture from the past.

Butler "Butts" Whiting, Airplane Wing Powered Boat,1923, glass negative. Mystic Seaport Museum, Rosenfeld Collection, 1984.187.10231F

One example is a favorite photograph from our collection, which has inspired my discussions around blue technology innovations in sailing and shipping. In 1923, Butler "Butts" Whiting (1882–1948) kitted out his Star Class racing keelboat hull with a World War I airplane wing, mounted on one end and affixed to a short mast. The experiment showed the immense power and efficiency of the fixed wing, as it allowed for great lift while reducing forward friction, but the hull was not designed to integrate this alteration. As a contemporary noted of Whiting's efforts, "While it cannot be said that the rig is perfect, there are great possibilities

for its modification. In the future—but then, we do not care to prophesy."[1] A century after Whiting's experiment that blurred the fine line between flying and sailing, we are seeing some incredible "possibilities for its modification." This may be most visible in the new generations of racing vessels from the America's Cup and Sail GP, which exploit aerodynamic wing technology in fixed rigs and hydrofoils.

Other designers have also experimented with "wings" for ships, including German hydraulics engineer Wilhelm Prölss, who, in anticipation of the OPEC crisis in the 1960s, came up with the concept of hybridizing a square-rigged clipper ship rig with no air gap between the yards and six rotating masts, allowing the sails to act as a single wing on an enormous scale. The material technology was not available at the time to implement the rig. It was not until 2006 that Prölss's idea was realized in a high-tech superyacht, the 88-meter *Maltese Falcon*, and, later (2016), the 106.7-meter *Black Pearl*, to improve efficiency at a large scale.

Innovations in yacht design often percolate into other industries, such as lowering carbon emissions in cargo shipping. There is intense competition in this sector, as companies work to develop low-carbon and even no-carbon cargo ships that privilege sail over engine power. The United Nations' *2023 IMO Strategy on Reduction of GHG Emissions from Ships* calls for a reduction of shipping emissions by at least 40 percent by 2030. While alternate fuels are one pathway for reducing emissions, some companies are revisiting sails as an auxiliary or primary power to achieve these goals. Sail-assist innovations include hydrofoiling, kite sailing rigs, retractable fixed-wing sails, and inflatable fixed sails with telescopic mast. In 2023 the cargo vessel *Pyxis Ocean*, retrofitted with two 37.5-meter-high foldable rigid sails called WindWings, traveled from China to Poland by way of

In 1910, brothers Adolph and Arthur Caille founded the Caille Perfection Motor Company. Although they had no experience in designing engines, they turned their ingenuity to producing high-quality inboard engines and, by 1913, had produced their first outboards. A noteworthy innovation on this engine is the use of a variable pitch propeller to change both the direction and the speed of the boat, at a time when reliable gear boxes were not available to engines of this size. Variable pitch is a common concept today, but was somewhat ahead of its time in 1930. Caille's habit of painting the gas tank red led to the moniker "Redhead" for its outboard motor line. Caille Model 15 "Redhead" 5 speed, ca. 1930. Mystic Seaport Museum, 2023.57.15

1. "You Name It," *The Rudder* 39, no. 9 (September 1923): 31.

Electric power in boats goes back more than a century, but until recent improvements in batteries and motors, it has not been practical. Just added to the Mystic Seaport Museum collection, this 2022 prototype by Flux Marine in Bristol, Rhode Island, is an example of the newest technology. It is capable of 15 horsepower at the propeller shaft and 30 horsepower for acceleration. It features a novel closed loop cooling system, belt drive, and signature dual strut lower unit. It is typically powered by a 96-volt lithium-ion battery bank. Flux electric outboard engine, 2022. Mystic Seaport Museum, 2024.59

Engine photo captions by Pieter Roos, curator of the Wells Boat Hall Exhibition, Mystic Seaport Museum.

Brazil and Tenerife, to prove the sails could reduce fuel consumption by 20 percent. A new shipping startup, Veer, privileges sail over engine power and uses green hydrogen fuel cell engines to supplement DynaRig sails by Southern Spars, which are based on Prölss's original design. The past meets the future.

Mystic Seaport Museum is proud to present this second issue of *Mainsheet*, which explores maritime technologies, livelihoods, and economies. We have received an outpouring of fantastic testimonials for our premier issue and were recently honored with an Award of Merit by the Connecticut League of Museums. *Mainsheet* is being recognized worldwide for its excellence of scholarship, content, design, and accessibility.

On a personal note, this will be my last issue as editor in chief as I head off to take a new post as president and CEO of the Maritime Museum of San Diego. It has been my honor and my great pleasure to launch this important contribution to maritime studies in partnership with the staff here at Mystic Seaport Museum and the *Mainsheet* Editorial Board. My deepest thanks to Michelle Turner, managing editor, whose dedication to excellence and accessibility ensures our readers and scholars the very highest platform on which to learn, to share knowledge and ideas, and to inspire. On behalf of all of us at the Museum, I thank our supporters for your faith in this journal and its mission.

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