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Humanizing the *Seas*

A Case for Integrating the Arts and Humanities into *Ocean Literacy and Stewardship*

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Using ships' logbooks to document the changing natural world

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Abstract

Mystic Seaport Museum has taken an active role in making historical archives, especially first-hand accounts such as logbooks, more accessible to researchers. We believe that digitizing such materials and making them easily available online helps modern-day scientists understand the changing nature of the marine environment over centuries. The use of multiple personal accounts was important to Matthew Fontaine Maury, the "Pathfinder of the Seas" and head of the US Naval Observatory in the mid-19th century, and others attempting to get an understanding of the ocean's currents and physical make-up. These materials add to the knowledge base necessary to make informed decisions going forward and promote the principles of Ocean Literacy, knowing that the ocean influences our lives, and we influence the health of the ocean.

Mystic Seaport Museum holds one of the largest collections of archival materials pertaining to American maritime history in the country. As the head of the Library and Collections Research Center within a museum,[1] my main mission is to make as much of our collection available to as many staff and visiting researchers as we can for their research needs. Much of what we collect focuses on the 18th and, predominantly, 19th centuries. We manage to share this information through in-person visits as well as making much of our collection available online. Our collection of primary resource materials, logbooks, and journals, in particular, are of special interest to researchers in the humanities and scientific pursuits as well. Because of this, we have endeavored to digitize many of the logs that seem to get extensive use and also to scan those that are in poor shape and cannot endure excessive handling, making all more available to a wider audience.[2] As an example, by using data from logbooks as one of its tools, NOAA's 20th Century Reanalysis Project takes a dataset of 200 years' worth of meteorological readings to compare historical weather patterns to current ones. The purpose of making historical archives available in the context of ocean literacy is to reinforce the fact that understanding the past can help to make better decisions going forward. If we are to understand the impact the oceans have on humanity, and the impact humanity has had on the oceans, looking to the past is essential.[3]

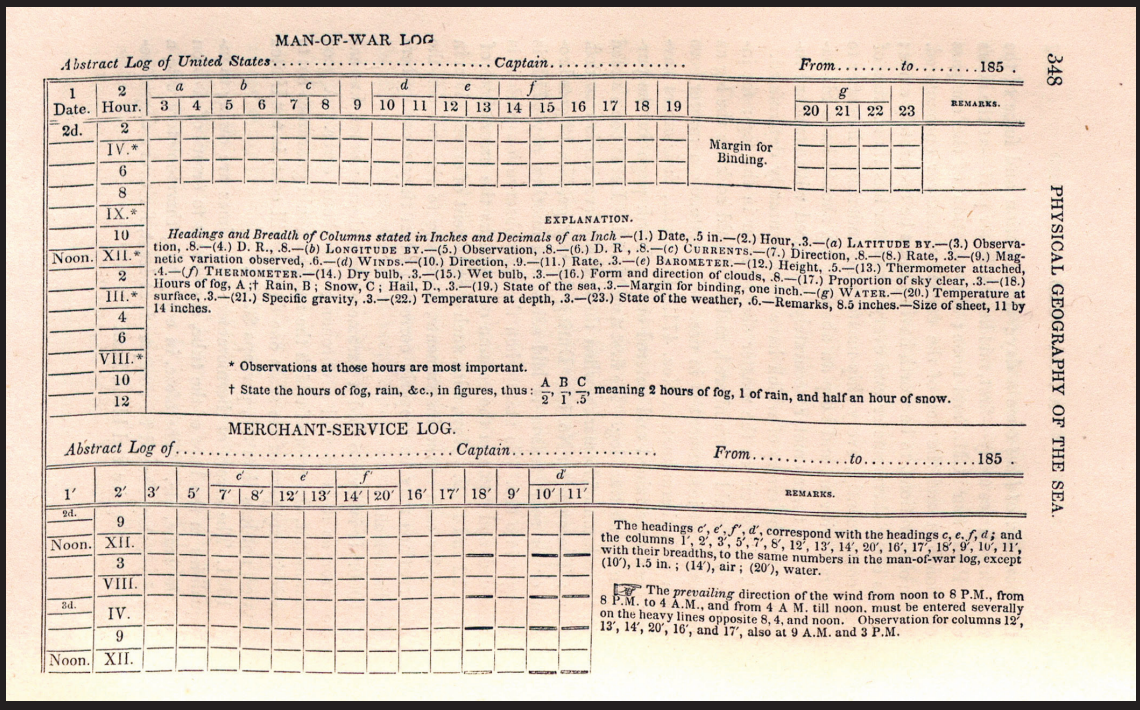
So what is a logbook and how does it mesh with those goals? In short, logbooks are notebooks kept aboard ships to record daily navigational and other critical information. According to Richard Henry Dana, author of *Two Years before the Mast* and *The Seaman's Friend*, "the logbook is the depository of the evidence of everything that may occur during the voyage; and the position of the ship, the sail she was under, the wind, &c."[4] The "&c." here includes mentions of temperature, occurrences of ice in the water, occasional barometric readings and more. Other "logbooks" from voyages are not logbooks at all, but personal journals. Some are more wordy

than others. Because quite often a logbook can be very dry, frequently giving the previous details as well as the ship's location, the time of day, the wind direction and speed and little else, they do not read as easily as a personal account. A journal, however, often gives much more detail about the goings-on of the ship and may impart important information, such as marine life sightings and catches, that might be missed in the official logbook, which is usually kept by the first mate. The human historical interface with the ocean, whether mercantile, exploitive, or military, can usually be traced through the ships' documents. Making these primary sources available directly relates to at least three of the seven goals of Ocean Literacy, being: (1) The ocean is a major influence on weather and climate; (2) The ocean supports a great diversity of life and ecosystems, and (3) The ocean and humans are inextricably interconnected.

Over the years, there has been a lot of interest from scientists in logbooks for the purpose of gathering data for any number of reasons. Logbooks are often better than other written documents for this because there is usually a consistency in how logbooks are kept, making data collection relatively uniform. While they may be dry in their presentation, if done correctly and consistently, the data collected can be useful to modern-day researchers. Much of the interest from scientists has been in environmental changes over the decades and centuries. Comparative studies speak of things such as wind direction, air and water temperature, locations of ice in Arctic regions, as well as changing populations of whales, seals, etc. Data collection aboard ships could be very formal (official logs) or informal (journals and letters). A fine example of how logbook data is used in climate research is in Michael Chenoweth's article "Ships' Logbooks and 'The Year without a Summer.'"[5] Here, Chenoweth examined over 200 logbooks to assess the global climate in 1816. That year saw the coldest temperatures on record for the Northern Hemisphere, causing food shortages and other hardships for many. Chenoweth has also engaged in other historical research of climate and storms based on his examination of hundreds of logbooks, such as his article on historic cyclonic activity in the Atlantic basin.[6]

Aside from the information kept in traditional ships' logs, one man, Matthew Fontaine Maury, a US naval officer in the mid-19th century who was in charge of the US Naval Observatory, developed methods to have ship captains record information that helped him develop useful navigational tools. This includes yet another form of logbook, called the *abstract log*. Here is one form that he had both naval and merchant ships use to consistently record wind directions, barometric pressure, air and water temperatures, storm information, fog, etc.

Abstract log from Maury's *The Physical Geography of the Sea.*



MAN-OF-WAR LOG

Abstract Log of United States.....*Captain*.....*From*.....*to*.....185 .

1 Date.	2 Hour.	a 3	4	b 5	6	c 7	8	9	d 10	11	e 12	13	f 14	15	16	17	18	19	g 20	21	22	23	REMARKS.
2d.	2																						
	IV.*																		Margin for Binding.				
	6																						
	8																						
	IX.*																						
	10																						
Noon.	XII.*																						
	2																						
	III.*																						
	4																						
	6																						
	VIII.*																						
	10																						
	12																						

EXPLANATION.

Headings and Breadth of Columns stated in Inches and Decimals of an Inch.—(1.) Date, .5 in.—(2.) Hour, .3.—(*a*) LATITUDE BY.—(3.) Observation, .8.—(4.) D. R., .8.—(*b*) LONGITUDE BY.—(5.) Observation, .8.—(6.) D. R., .8.—(*c*) CURRENTS.—(7.) Direction, .8.—(8.) Rate, .3.—(9.) Magnetic variation observed, .6.—(*d*) WINDS.—(10.) Direction, .9.—(11.) Rate, .3.—(*e*) BAROMETER.—(12.) Height, .5.—(13.) Thermometer attached, .4.—(*f*) THERMOMETER.—(14.) Dry bulb, .3.—(15.) Wet bulb, .3.—(16.) Form and direction of clouds, .8.—(17.) Proportion of sky clear, .3.—(18.) Hours of fog, A ; † Rain, B ; Snow, C ; Hail, D., .3.—(19.) State of the sea, .3.—Margin for binding, one inch.—(*g*) WATER.—(20.) Temperature at surface, .3.—(21.) Specific gravity, .3.—(22.) Temperature at depth, .3.—(23.) State of the weather, .6.—Remarks, 8.5 inches.—Size of sheet, 11 by 14 inches.

* Observations at those hours are most important.

† State the hours of fog, rain, &c., in figures, thus: $\frac{A}{2}, \frac{B}{1}, \frac{C}{.5}$ meaning 2 hours of fog, 1 of rain, and half an hour of snow.

MERCHANT-SERVICE LOG.

Abstract Log of.....*Captain*.....*From*.....*to*.....185 .

1′	2′	3′	5′	c′ 7′	8′	e′ 12′	13′	f′ 14′	20′	16′	17′	18′	9′	d 10′	11′	REMARKS.
2d.	9															
Noon.	XII.															
	3															
	VIII.															
2d.	IV.															
	9															
Noon.	XII.															

The headings c′, e′, f′, d′, correspond with the headings *c*, *e*, *f*, *d*; and the columns 1′, 2′, 3′, 5′, 7′, 8′, 12′, 13′, 14′, 20′, 16′, 17′, 18′, 9′, 10′, 11′, with their breadths, to the same numbers in the man-of-war log, except (10′), 1.5 in. ; (14′), air ; (20′), water.

☞ The *prevailing* direction of the wind from noon to 8 P.M., from 8 P.M. to 4 A.M., and from 4 A M. till noon. must be entered severally on the heavy lines opposite 8, 4, and noon. Observation for columns 12′, 13′, 14′, 20′, 16′, and 17′, also at 9 A.M. and 3 P.M.

Those who turned in such information to Maury would receive a set of his most current ocean charts that he developed from such data gathering. Such was the success of Maury's offer, immediately attracting hundreds of ship captains, that the first international meteorological conference on the subject was held in 1853, in Brussels. The result of the conference was cooperation from many sea-going nations to require their captains to gather the same information and report it to Maury for analysis, resulting in ever more detailed charts of the world's oceans. It was Maury's intent to present what Baron Alexander von Humboldt termed a "Physical Geography of the Sea" to any and all who were interested.[7] And while his methods, including what we would call "crowdsourcing" today, were questioned by both scientists and the navy,[8] his study of winds, currents, temperatures, magnetism, salinity and more was a massive undertaking that laid the groundwork for future generations of scientists.

The symbiotic relationship between sea captains and Maury is apparent in one letter from Mystic Seaport Museum's collection written by a merchant captain to Lt. Maury.[9] It reads, in part:

> Dear Sir,
> On my last voyage round the world I had your wind and current charts of the N & S Atlantic and on return send you my abstract from California to Calcutta to London and Cork. I am about to go on the voyage again and will feel obliged to you if you will supply me with charts of the Pacific Ocean as to my opinion of the wind and current charts as far as my experience will allow me to judge they are a benefit to ships that has them and follows the directions given by you. My ship is not one of the Clippers but a good sailing ship.…
>
> With respect, I remain yours,
>
> Daniel M. McLaughlin
> Master of ship *Gray Feather*, New York

The transaction of obtaining charts and directions for the pledge of keeping an abstract log is illustrated in a promissory note to Maury from Nicholas Kirby.[10] The document is signed by Kirby, master of the ship *Uncowah*, stating that he had received "one Abstract Log, one copy of Maury's Sailing Directions 7th edition," and six sheets of Maury's Wind & Current charts, for a voyage from New York to China. Kirby pledged to keep a journal of the voyage and present it to the Naval Observatory when he returned. Maury's charts became standard issue aboard American ships because of their accuracy in detailing all manner of navigational issues that helped captains achieve safer, faster, and therefore more profitable voyages. According to naval historian Jason Smith, "For the navigator, such order and design manifested most powerfully in the tracks of the vessels that came before him and the new paths that Maury now encouraged him to follow. As Maury said, the seas were full of meaning. The chart was the medium through which he could communicate it. He was a master at it."[11] Below is just one of many charts created by Maury from the information he collected from many hundreds of logs. This shows the Atlantic basin and the movement of the Gulf Stream. He also developed detailed charts of wind speeds and direction worldwide, and more.

Currently, entities such as the National Oceanic and Atmospheric Administration (NOAA) are also interested in informal data-gathering methods, especially from whaleships that spent time in the Arctic. NOAA's mission, "To understand and predict changes in climate, weather, oceans, and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources," explains the agency's interest in supporting the 20th Century Reanalysis Project, which recently released a data set that "provide[s] continuous estimates of the most likely state of the global atmosphere's weather on 75-kilometer grids eight times a day for the past 200+ years."[12] Each grid is refreshed every three hours to give historical means for temperature, humidity, pressure and more for that specific space. Much of the information was gathered from studying ships' logs transcribed by volunteers for the Old Weather project.[13] Oldweather.org uses volunteer transcribers to note instances of sea ice and observations of weather written in ships' logbooks, primarily from the 19th and early 20th centuries.

The following example of informal data is taken from a series of logs of British whaling ships off Greenland in the late 1700s. These logs from the collection of Mystic Seaport Museum make numerous mentions of ice floes, weather conditions, and, very importantly, locations. Comments on one

Gulf Stream chart from Maury's *The Physical Geography of the Sea.*

page from the ship *Henrietta* in March 1792 include, "Made the ice in sludgey streams ... in amongst it until 11 a.m. found nothing but sludgey ice intermixt with ragged pieces ... Long. 70′ 57″, Lat. 37′ W."[14] As NOAA and others have realized, comparing historic data to current conditions is useful in gauging changes over the decades and centuries. This quote by Dr. Sam Willis from the University of Exeter gives an indication as to the importance of using logbooks for studying the environment:

> The value of these sources [logbooks] for climate scientists ... lies not only in the sheer quantity of this material, but also in the fact that the observations were made at sea. More than 75% of the world's surface is covered by ocean; it is one of the defining characteristics of the earth as a planet. The quality of observations made at sea moreover, is necessarily more 'pure' than those made on land. There are no mountain ranges to create wind systems of their own, nor are there cities to increase temperature or create smog. Land-bound the majority of us may be, but it is to the sea we must turn to understand this aspect of our planet.[15]

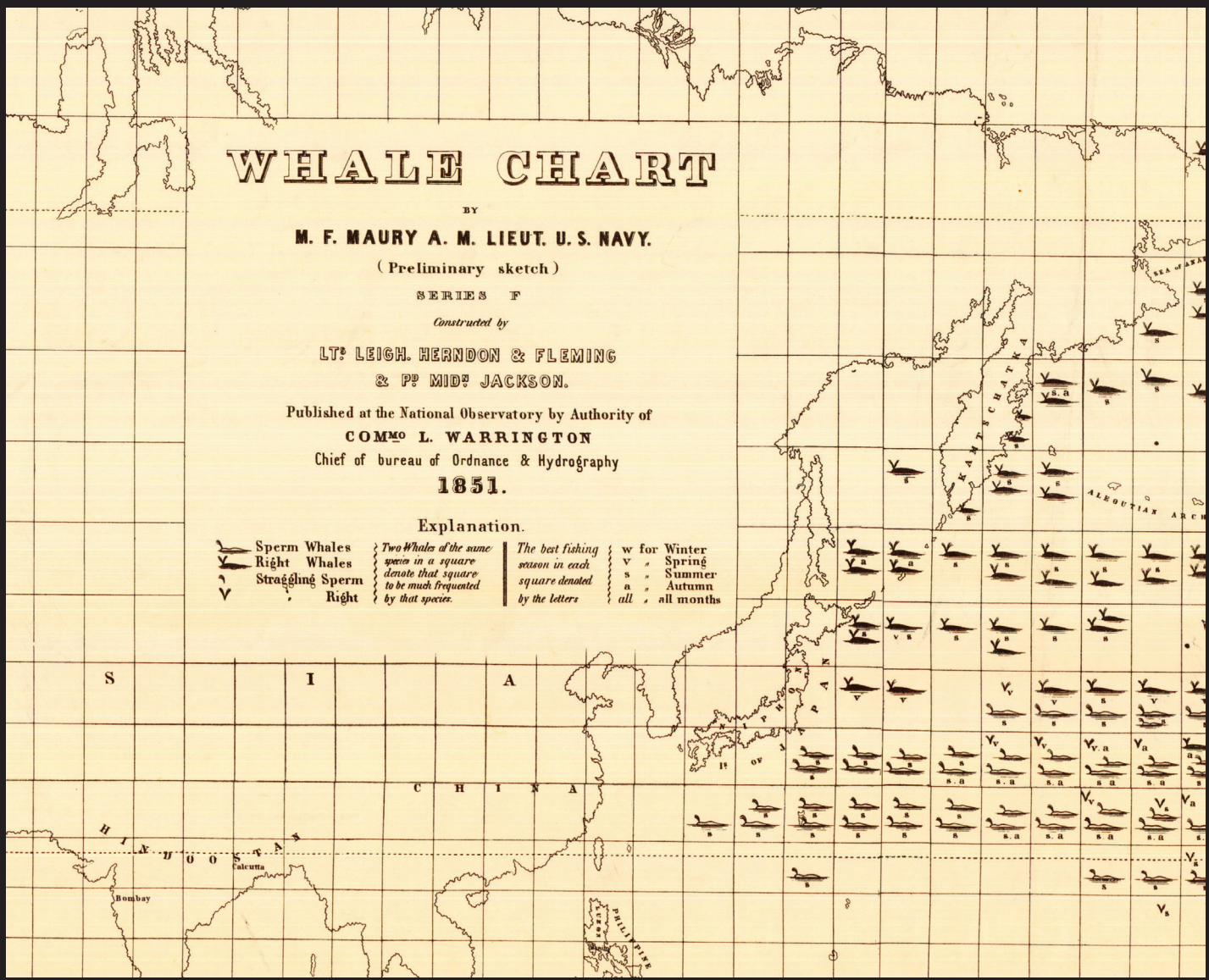
In addition to meteorological information, data compiled on a regular basis in logbooks have ecological value, as can be seen in this detail of yet another chart produced by Lt. Maury in 1851.[16] While it can now help us understand historic whale populations and positions, it was initially done to support economic measures, as the whaling industry was a major source of capital and employment in New England. Even Melville's Ahab benefits from Maury's chart as he uses calculations to de-

termine the time and place the white whale might again appear.[17] Maury once again convinced whaleship captains to log even more data by keeping track of their comings and goings and catches of different types of whales during different seasons to assist in the catch of what we now know to be a limited resource.

Other studies have also used logbooks extensively to research whale populations over time. The four authors of "Spatial and Seasonal Distribution of American Whaling and Whales in the Age of Sail" pored over hundreds of logbooks to illustrate in a series of maps the historical distribution of whale species around the world.[18] According to the authors, "patterns shown on the maps provide the basis for various inferences concerning the historical distribution of the target whales prior to and during this episode of global whaling." In order to understand the current health of whale populations, finding a theoretical baseline using logbooks to determine whale catches during earlier centuries is one method to make an assessment. To understand the extent of the world's whaling fleet in the age of sail, Mystic Seaport Museum and the New Bedford Whaling Museum have created an online resource examining over 16,000 American whaling voyages and recently added links to research on British, Scottish, French and Canadian whaling.[19]

Seals, another natural resource in the 19th century, were hunted to near-extinction in certain regions for both their fur and, especially in the case of elephant seals, their oil. While ecological studies of seal populations and studies of the economic impact of sealing are the common uses of logbooks

Detail from 1851 *Whale Chart* by M.F. Maury.



from sealing ships, others have used them to locate historic archaeological sites in the Antarctic region. Seeking to understand the first resource exploitation in the South Shetlands in the early 19th century, Andres Zarankin and Maria Ximena Senatore examined logbooks through secondary sources on sealing to understand daily life patterns in sealing camps in these islands.[20]

In the same region, on an 1835 whaling voyage from Bridgeport, Connecticut, through the South Atlantic to the Indian Ocean, a medical doctor who was aboard the ship, Theodore Lewis, took copious notes about his natural surroundings along the way. During a stop at the Falkland Islands, he noted some of the local vegetation:

> On some of the hills may be found in abundance a kind of shrub known by those who frequent the Islands under the name of Lacock tea. I know not from whence the name is derived. This tea forms a most healthy palatable and indeed to many [a] delicious beverage. I know nothing that it might be compared to that would give a correct idea of its flavour but the most sensible quality as to taste is a slight Turbinthinate flavour or somewhat resembling our pine. It requires much boiling and is often used by Whaling and sealing vessels as a substitute for the tea of our own use. Could this be cultivated in the United States (and I think it might) it would become a valuable article both as a common drink and in the hands of Medical men as a remedy for those diseases connected with a diminished flow of the urinary secretions as it is a very powerful Diuretic attended with a very slight stimulant property.[21]

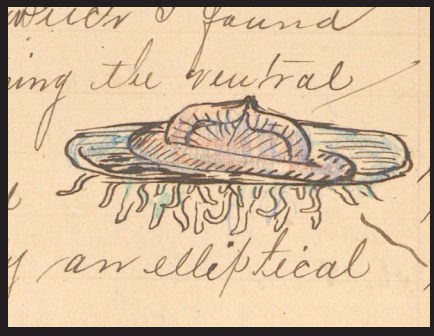
His notes on vegetation and animals along his route are quite enlightening. Ocean voyaging by early whalers resulted in all manner of new information brought back to American shores, including the discovery of uncharted islands that were invariably named after members of whaling families, such as Howland Island in the Pacific.

Another example from the museum's collection comes from a journal of a voyage of the *USS Vandalia* in 1886. The journal was kept by William Edwin Safford, who graduated from the Naval Academy six years earlier and would go on to a distinguished career with the Department of Agriculture as a botanist and eventually would have a number of plants named after him. At this young age he exhibited an extraordinary enthusiasm and breadth of knowledge as a naturalist in the US Navy. On a voyage that left from the Portsmouth Navy Yard in New Hampshire for a cruise to South America, Ensign Safford described a diverse array of plants and animals encountered on this cruise. Shown here is but one of the drawings the young naturalist would make along the way. [22] Drawn somewhere in the South Atlantic, it shows a *Velella velella,* a gelatinous zooplankton, which lives on the surface of the ocean. A common name today for this organism is "by-the-wind-sailor".

Safford, like Maury, paid attention to scientific measurements (and to Maury's charts) to hypothesize on the nature of the environment, as can be seen in this passage as the *Vandalia* moved south through the Atlantic towards the equator:

> When we started out from New York, from the accounts I had read of the dreaded doldrums, and the charts of the ocean currents I had seen, I almost expected to find a sort of barrier encircling the earth at the equator, which would separate Northern from Southern pelagic animals; but I must confess as far as our observations of the temperature of the air and the surface water of the sea are concerned as well as the density of the latter, I see no reason why any of the truly pelagic forms should be limited either to the Northern or the Southern Hemisphere. I can see no reason why the pretty little Vellela mutica and the discophore jelly fish which I first collected in Latitude 40 08 N. and again in 7 45 should not extend from the latitude of the Northern limit of the Gulf-Stream to the

Drawing of *Velella velella* from Safford journal. Log 323.



Southern limit of the warmer parts of the South Atlantic.

There are many institutions around the world with collections of logbooks and journals from the age of sail. The New Bedford Whaling Museum, the Peabody Essex Museum in Salem, Massachusetts, and the National Maritime Museum in Greenwich, England, are just a few of the organizations with collections of original ships' logbooks. The Council of American Maritime Museums can be found online and lists numerous American museums with pertinent collections. In addition to reflecting the changing nature of the world's climate, logbooks and journals can help us understand changes in regional flora and fauna. Thanks to the efforts of individuals like Matthew Fontaine Maury, responsible sea captains, and inquisitive crew members and passengers, archives are full of such documents that shed light on how the past influences the future and how humanities can play a larger role in ocean literacy.

Endnotes

1. The G.W. Blunt White Library at Mystic Seaport Museum in Mystic, Connecticut.
2. See "Digital Resources" at https://research.mysticseaport.org/.
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10. Nicholas Kirby, Document, 1858, VFM 845, G.W. Blunt White Library, Mystic Seaport Museum.
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18. Tim D. Smith, Randall R. Reeves, Elizabeth A. Josephson, and Judith N. Lund, "Spatial and Seasonal Distribution of American Whaling and Whales in the Age of Sail," *PloS One*, April 27, 2012, https://doi.org/10.1371/journal.pone.0034905.
19. https://whalinghistory.org.
20. Andres Zarankin and Maria Ximena Senatore, "Archeology in Antarctica: Nineteenth-Century Capitalism Expansion Strategies," *International Journal of Historical Archaeology* vol. 9, no. 1 (2005): 43–56.
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22. William Edward Safford, Journal, 1886, Log 323, G.W. Blunt White Library, Mystic Seaport Museum.