



STATE ARCHAEOLOGICAL PRESERVE



CONNECTICUT STATE HISTORIC PRESERVATION OFFICE

Pine Island: A coastal islet's storied past

Agriculture, industry, recreation, and more



Acknowledgments

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On the cover: Photograph of cut stone wharf that was originally part of the nineteenth century menhaden factory and that was resurfaced with concrete during World War II when the island was the site of a gun battery. Branford House is visible in the background (Photo by R. Christopher Goodwin & Associates, Inc.)



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HISTORY OF SETTLEMENT ON PINE ISLAND

Overview

Pine Island is one of the many small islands that span the coastline of Connecticut. It is located off the coast of Groton in waters historically known as “The Eastern Chops of New London Harbor.” The close proximity of these islands to diverse and valuable maritime resources made them attractive to Native American and Euro-American populations alike. Remnants of these historic occupations are still present today. Ruins of old stone walls, foundations, sheds, docks, and wharves are scattered across the island and its shoreline. Some are visible from the surface, others are buried.

Although there is evidence of Native American and early Euro-American activity on the island, James Baley’s 1788 grave is perhaps the earliest dated feature visible on the island. The property passed from Baley to other farmer-mariners until the Stoddard family established a summer resort during the early nineteenth century. In 1862 the island was sold to a commercial fish oil company that became known as the Pine Island Oil Company and the factory established there later became the Quinnipiac Company’s Fertilizer Works. The decline of the fish oil and fertilizer business bankrupted the business and the owners sold the island to Morton Plant in 1903. The wealthy son of a railroad magnate demolished the fertilizer factory and used the island as a recreation area for his estate on the mainland. The State of Connecticut purchased the island in 1939 and during World War II, the U.S. Government built a gun battery on the island. The island reverted back to the state after the war and the land is now part of the Avery Point campus of the University of Connecticut.

Early Settlement

Although Native American artifacts are scant, the Pequot Tribe, whose territory encompassed the Poquonnock River drainage area, as well as their predecessors, were likely quite familiar with the island. Early European explorers in the area observed countless Native American fishing stations, hunting lands, and villages along the coastal areas bordering the Long Island Sound (Ebbin 2010).



The gravestone of James Baley, who died and was buried on Pine Island in 1788 (photo by Ross Harper, PAST, Inc.)

Pine Island takes its name from the tree growth that dominated the island in early Colonial times. Town meeting records from 1651 indicate that “ploo maker” (plow maker), John Cole, was the first person granted “the marsh upon pyne island” (Caulkins 1895: 77). By the middle of the eighteenth century the island was owned by James Avery, who passed it to his sons upon his death in 1754. The Averys likely utilized the land to harvest salt hay for their cattle as well as timber (Harper 2013). A few years later one of the sons, Latham Avery, sold a parcel of nine acres to James Smith. When Smith sold his holding in 1784 to Revolutionary War Veteran James Baley, it was transferred with “buildings and appurtenances,” indicating some measure of development on the island. After settling on Pine Island, Baley seems to have lived a life tethered to the sea. His time on the island, however, did not last long. In 1788 he drowned after falling overboard while

pulling lobster traps. His gravestone is still in place on the island, with this epitaph: "In memory of Mr. James Baley who was drowned Sept. 2, 1788 in the 37th year of his age." Items left to his widow, Martha, included corks, a seine, a skiff, and various boat building materials (Clouette and Harper 2009).

Like many other rural families of the day in coastal New England, James and Martha Baley did not rely exclusively on the sea for their sustenance. His probate list included a cow, four swine, "forty-five hundredweight of hay," some flax, and 50 pounds of cheese, as well as a spinning wheel, a loom, and various modest household items. Although much of the property was sold to pay bills, Mrs. Baley retained the right of residence in a portion of the house for several years. In 1789, however, the house and land were sold to Jesse Starr, a fellow soldier who fought beside Mr. Baley in the War. By 1792, Starr was living on the island, as made evident by a *Connecticut Gazette* advertisement seeking the owner of a skiff he had recovered from Fishers Island Sound (Clouette and Harper 2009).

Little information is available concerning Starr's activities on Pine Island, and the same is true of Peter Avery II, who acquired the island in a series of transactions in 1797. Starr and Avery likely followed a farmer-mariner lifestyle similar to Mr. Baley. Avery owned the island for more than 25 years, and eventually sold it to Mark Stoddard II in 1823.

RESORT USE DURING THE EARLY NINETEENTH CENTURY

The Stoddard family brought Pine Island into service as a summer resort, catering to visitors from New England cities and towns who were seeking a respite from the summer heat, and the accompany-


ing odors, of their hometowns. The primary operators were Orin Stoddard and his wife, Clarissa. An advertisement placed by one of the family members in the *Norwich Courier* on June 9, 1830, promoted their "summer retreat," inviting members of the public to visit their house and noting that: "Some improvements have been made which have much contributed to the convenience of the house, among these are a new wharf ... Parties from the city or other places may rest assured that they will here find very good accommodations and every necessary attention paid to make it agreeable to the company. While he gratefully acknowledges past favors, he solicits future patronage, and assures the public that no pains will be spared to give the most ample satisfaction to all who may favor him with a call." (Clouette and Harper 2009).

After Orin Stoddard died, his widow, Clarissa, married John G. Spicer, and the newly married couple continued to operate the house as a summer retreat. By 1847 the steamer *Angelina* called at the island three times weekly en route from New London to Stonington. Eventually, the Spicers decided to part with their retreat, and with Pine Island. In 1862 they sold the island to Hubbard D. Morgan.

MENHADEN FISH PROCESSING

Morgan's acquisition brought a new era of activity, as Morgan was one of the first entrepreneurs in the region to extract oil commercially from menhaden. With his business partner, Franklin Gallup, Morgan formed the Pine Island Oil Company to focus on extraction of menhaden oil, and he created a parallel enterprise called the Pequot Seining Company, which managed a fleet of fishing boats to bring menhaden to the shore (Clouette and Harper 2009).

TO THE PUBLIC.
SUMMER RETREAT.




The subscriber respectfully informs his friends and the public, that the house on Pine Island is opened for the reception of company. Some improvements have been made which have much contributed to the convenience of the house, among these are a new wharf, which makes it very convenient for landing in boats, &c.

Parties from the city or other places, may rest assured that they will here find good accommodations and every necessary attention paid to make it agreeable to the company. While he gratefully acknowledges past favors, he solicits future patronage, and assures the public that no pains will be spared to give the most ample satisfaction to all who may favor him with a call.

ORIN STODDARD,
Pine Island, May 19th. 6w8

The Stoddard family advertised the health benefits of their "summer retreat" on Pine Island (from *Norwich Courier*, Norwich, CT June 9, 1830)

DAILY LINE---NEW-LONDON, NORWICH, &C.



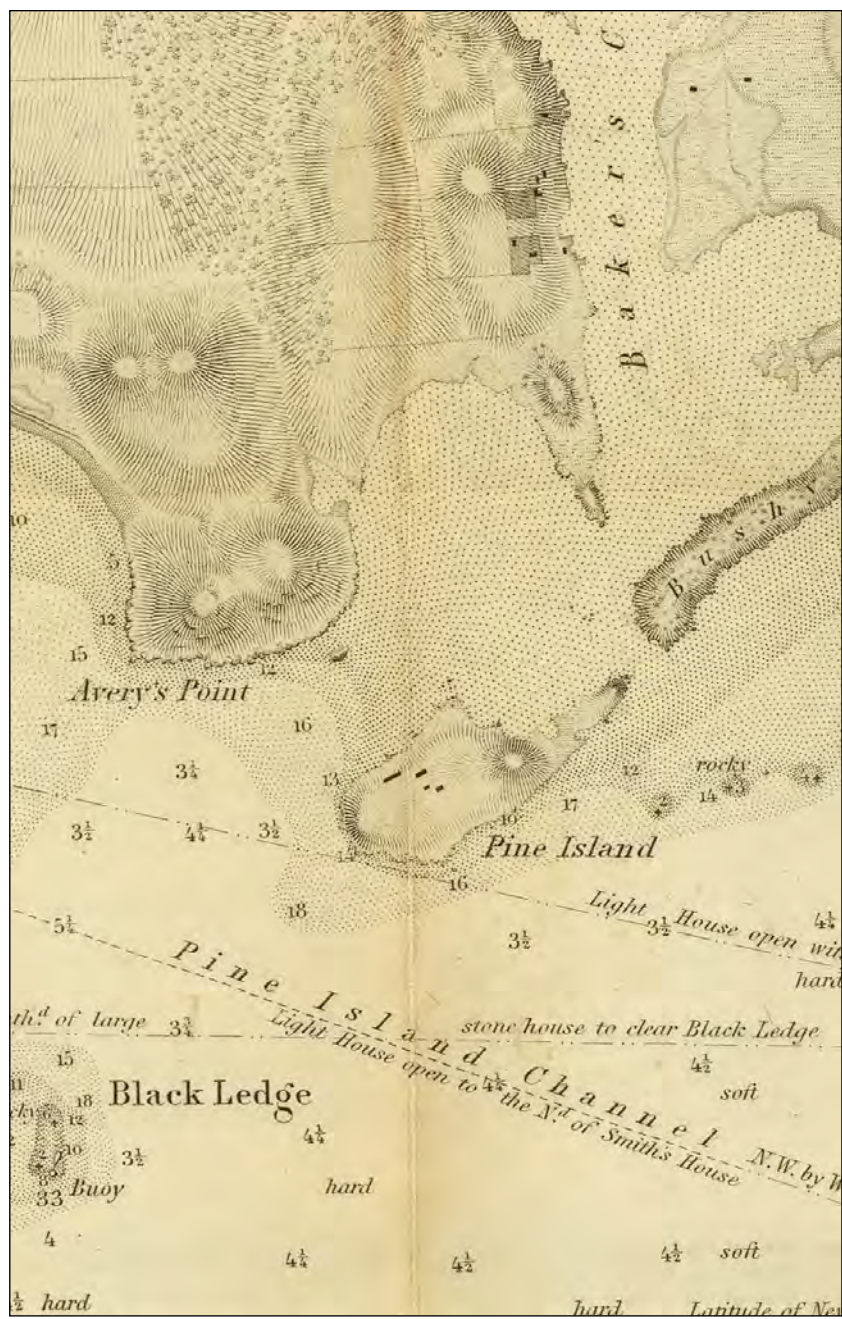
THE STEAMER ANGELINA, Capt. A. Lovell, leaves this city daily at 2 o'clock, P. M., for Norwich, stopping at Groton, Gale's Ferry, (Palmer's Landing), Allyn's Point, and other landings on the river.—Returning, leaves Norwich at 8 o'clock, A. M. for New-London, stopping as above.

On Tuesday, Thursday, and Saturday, at half past 9 o'clock, A. M., the Angelina leaves this city for Stonington, stopping at Harbor's Mouth, Eastern Point, Pine Island, and Bradford's Island, (where she lands passengers for Mystic and Portersville.)—returning in time to leave this city for Norwich at 2 o'clock. For further information inquire of the Captain, or of

THOMAS KELLEY, New-London.
E. A. BILL, Norwich.

June 12 1866

The Steamer *Angelina* put in at Pine Island three times a week in the 1840's (from *Morning News*, New London, CT June 14, 1847)



Pine Island as shown on an 1848 nautical chart for New London Harbor (NOAA Historical Map & Chart Collection)

It was no accident that the production of menhaden oil was becoming commercially viable at that time. For many years prior, whale oil had served the same purpose and was harvested by numerous whaling companies across the North Atlantic. As whale oil use broadened commercially, the fishing industry adopted numerous technological advances to boost effectiveness and profit. The development of commercial steamships, for one, boosted the speed and technical capabilities of the vessel. The utilization of gun-loaded harpoons, as well, advanced precision and deadliness. Demand for whale oil rose as people began to flock to New England towns. In 1845 the industry had reached its peak, accumulating 18 million gallons in one year, after which production began to fall as a result of diminishing whale populations (Goode 1887).

With the decline in whale oil supply, menhaden oil was utilized as a cheaper alternative and, from mid-century onward, became the substitute of choice (Naomi Dayan 2016). However, although there was little real difference in its effectiveness as a lantern fuel, customers generally preferred whale oil. Consequently, a considerable amount of the “whale oil” that was marketed in the latter part of the nineteenth century was in reality menhaden oil (Goode 1880:192). The supply-and-demand struggle between whale and menhaden oil persisted until the widespread use of petroleum and the introduction of coal-fired electric plants supplanted animal oils in the late part of the century.

Hubbard and Gallup managed the Pine Island Oil Company until 1864, when the Quinnipiac Company of Hamden purchased a controlling interest. The same company purchased the remainder of Pine Island Oil in 1868, along with the physical stock (mostly seining boats) of the Pequot Seining Company. Under the guidance of its founder, William G. Hall, the Quinnipiac Company had developed new processes for large-scale processing of menhaden for commercial products that included both oil and “fish guano,” or the dried scrap byproduct of fish oil reduction. The fish scrap itself then was sold into a growing market for agricultural fertilizers to meet the agricultural production needs of a growing American population (Frye 1978:27).

The operation was renamed the Quinnipiac Fertilizer Company in 1871. By that time (according to the 1870 federal census of industry), its holdings on Pine Island included a factory with two boilers and two hydraulic presses for extracting the oil, along with two “guano mills” for grinding up the dried scrap. The operation was supported by 51 employees at the plant and an unreported number who operated the seining boats. The company’s revenue of \$60,000 that year was evenly split between sales of oil (48,000 gallons) and sales of fertilizer (700 tons) (Clouette and Harper 2009).

Although we have no detailed descriptions of the Pine Island plant, similar contemporary operations along the Atlantic Seaboard offer a picture of what it may have looked like. For example, a contemporary plant in Milford, Connecticut, was a three-story wood-clad building accompanied by drying platforms and several drying sheds for oil

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Menhaden Fisheries in Coastal Connecticut

The extensive estuaries, protected harbors, and islands in Long Island Sound made it a prime location of the menhaden fishing industry. George Brown Goode, a researcher for the United States Fish Commission, noted that it was one area “designated as being most frequented by large schools of menhaden” (Goode 1880:165). As whaling began to decline, local farmers and watermen witnessed the growing demand for menhaden and established menhaden fishing companies, or fisheries. These local fisheries varied in size, some of which employed hundreds of workers. Menhaden processing factories were common in the eastern Long Island Sound during the late 19th century and maintained their own fleets to provide a steady supply of fish. In 1887, Goode recorded that Connecticut had eleven functioning factories and three that had recently closed down. The factories recorded were:

- Gurdon S. Allyn & Co., on Mason’s Island in Stonington**
 - Leander Wilcox & Co. (formerly J. Green & Co.),
on Mint Head in Mystic**
 - Waley & Co., at Poquonnock Bridge in Groton**
 - Quinnipiac Fertilizer Company, on Pine Island in Groton**
 - Luce Brothers, at Niantic**
 - Salt Island Oil Company, at Westbrook**
 - J. H. Bishop, at Madison**
 - Fowler & Colburn, at Guilford**
 - E. R. Kelsey, at Branford**
 - Welch’s Point Oil Company, at Milford**
 - The George W. Miles Co., at Milford**
 - *Quiambog Oil Company, on Noyes Neck in Stonington
which burnt down in 1876;**
 - *Gardner Oil Company, Mason’s Island in Stonington**
 - *Reuben Chapman’s Works, Mason’s Island in
Stonington**
- *= closed**

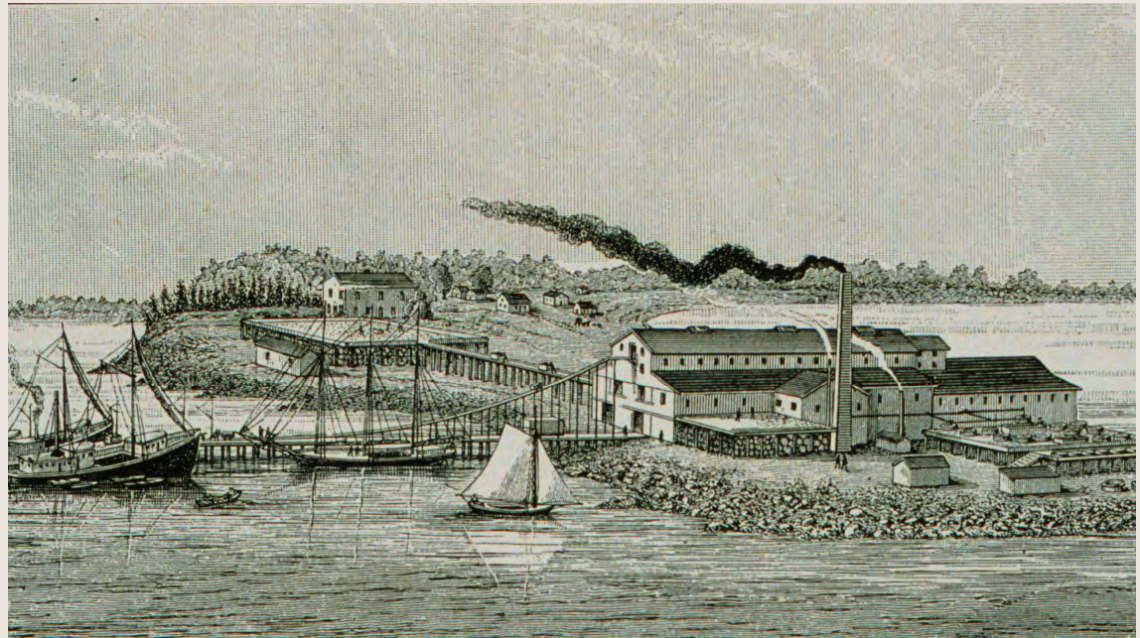


Illustration of the George W. Miles Co. menhaden factory at Milford, CT (Courtesy of NOAA Fisheries Service)

Because of the foul odor emanating from the factories, most factories were located in rural areas or on remote islands as to not offend surrounding communities (David Tedone 1982:50). As a means of mitigating this, some Connecticut companies adopted the use of “floating factories” which permitted processing to occur far from the shoreline. The Luce Brothers company, for instance, built a floating factory on the hull of the Union, a decommissioned railway ferry boat while the George W. Miles Co. erected one upon an old man-of-war.

While not the largest commercial maritime industry in Connecticut, menhaden contributed greatly to the state’s economy. In 1880, at least 631 persons were employed in the trade in Connecticut. The same year, Connecticut menhaden factories were the third most profitable fishery in New England and the Mid-Atlantic, with a reported profit of \$250,000 (Goode 1887:361).

(continued from page 03)

and guano. In 1874 the company acquired the *William C. Spicer*, a 44-ton steam-powered menhaden boat, making the company the first in the area to own a steam-powered vessel (Clouette and Harper 2009).

The Quinnipiac Fertilizer Company continued to add employees through the 1870s, with 100 on the payroll in 1880. However, as profits gradually declined, the company sold a schooner in 1876, a sloop in 1878, and the *William C. Spicer* in 1882. It recorded an operating loss of \$12,000 in 1880, and by 1886, awash in debt, the Quinnipiac Fertilizer Company went bankrupt. Researchers who examined the records of the company's 1888 insolvency proceedings from the New London Probate Court reported:

Buildings enumerated in the proceedings include not only the factory itself but an office and a laboratory "in the house" and a building referred to as a "dormitory." The proceedings also indicate a range of support activities needed to keep the menhaden factory running: a complete set of pipe-fitting tools, a portable forge, a set of fireman's tools, and a printing press to print the 200-pound bags in which the company's product was marketed. The company also engaged in raising food, perhaps for the resident factory workers: the inventory included three head of cattle, three tons of hay, and twelve chickens. It appears that by the time of the bankruptcy, the company had branched out beyond fish scrap to offer a wide range of soil-improvement products: on hand were quantities of bone meal, bat guano, and Peruvian bird droppings. Perhaps most telling is the geographic extent of the company's operations. In addition to its factory on Pine Island and offices and warehouse in New London, the company maintained storage facilities in Barre and Montpelier, Vermont; Northampton, Massachusetts; Oneida, New York; and Baltimore, Maryland (Clouette and Harper 2009).

In the wake of the bankruptcy of the Quinnipiac Fertilizer Company, the Pine Island holding was reconstituted in 1888 as the Quinnipiac Company. The company continued to struggle, however, and in 1903 the island was sold for \$100 to Morton F. Plant, who permanently ceased operations. Plant, heir to a railroad fortune and other business interests, had recently purchased nearby Avery Point on the mainland, where he was constructing a magnificent summer residence that is known today as the University of Connecticut's Branford House. The foul odors emitted by the fish processing operations are reportedly what caused Plant to purchase the island. He quickly tore down the facilities and utilized the island for recreational activities and is said to have maintained an orchard there (Ebbin 2010).



Advertisement for Quinnipiac Fertilizer Company (Image courtesy of Richard D. Sheaff)

REPORT OF COMPLETED WORKS

HARBOR DEFENSES OF LONG ISLAND SOUND

AMTB BATTERY—NO. 915

~~SECRET~~

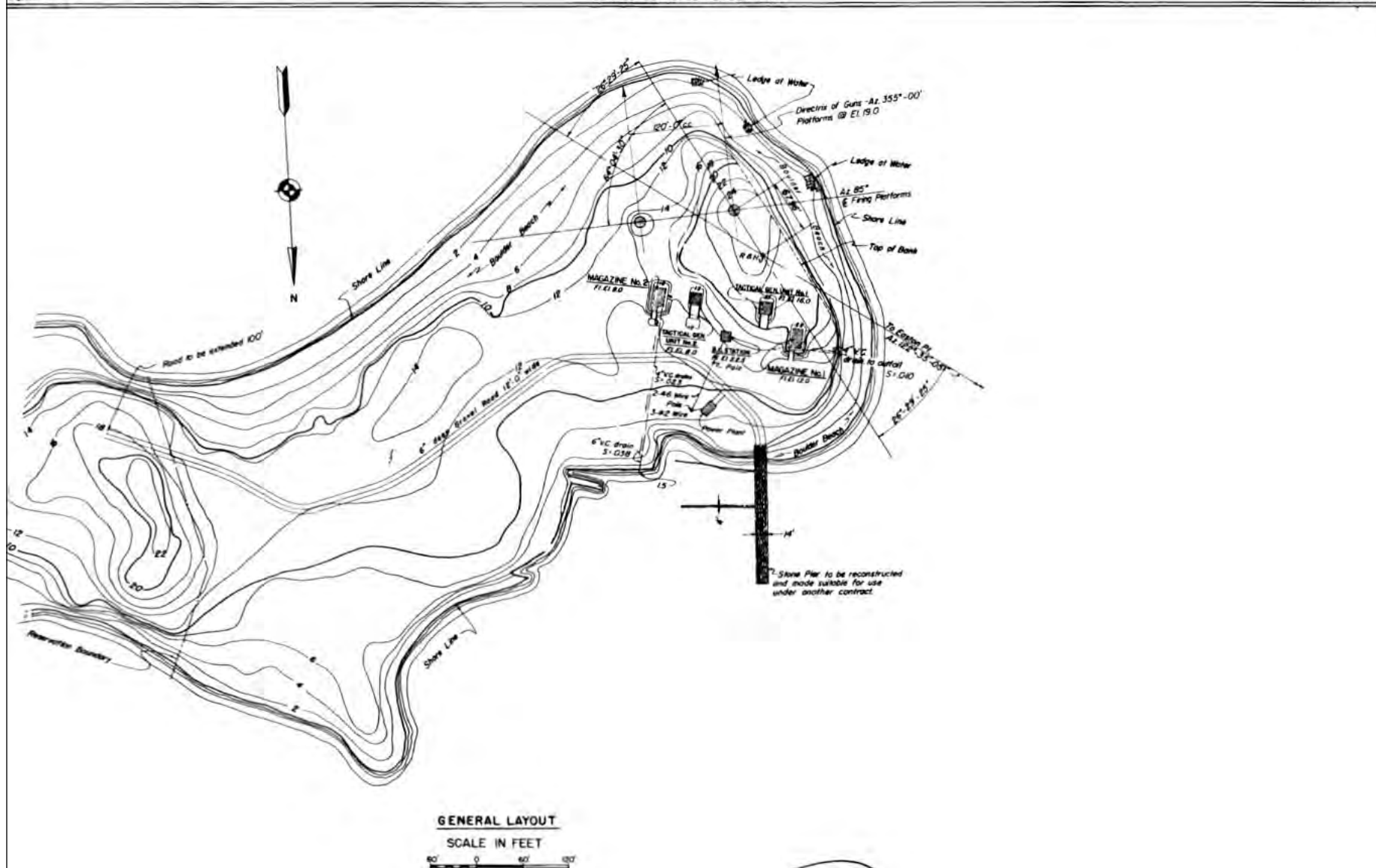
PINE ISLAND, CONN

SCALE AS SHOWN

FORM 7

CORRECTED TO SEPTEMBER 1944

Sheet 1 of 4



WORLD WAR II

Pine Island and the Plant estate at Avery Point eventually were auctioned off and sold to the State of Connecticut in 1939. In 1941 the state turned both over to the U.S. government in support of the federal defense of the coast. A Coast Guard station was created on the mainland property, and a gun battery (Battery AMTB 915) was installed on the western end of Pine Island. The battery's purpose was to defend the New London area from fast-moving torpedo boats, and from attack from the air. At the heart of the battery were four 90-mm. guns, two of them stationary and two mobile. Ammunition storage was provided by two earth-covered concrete magazines, and two generators were installed to provide electricity. The guns had an effective range of about 8,000 yards. They never were used, as the war passed without enemy attack. In 1968, after the Coast Guard operations ceased at Avery Point estate and Pine Island, the properties reverted to the State of Connecticut and were granted to the University of Connecticut as a campus branch (Ebbin 2010).

AMTB-915 and Pine Island during World War II

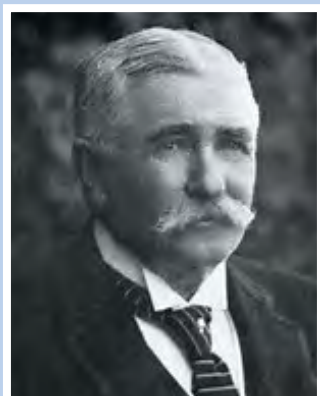
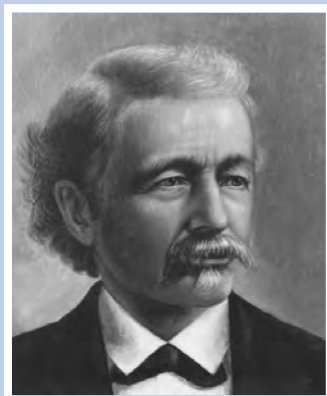
Pine Island was the site of one of five Anti-Motorized Torpedo Boat (AMTB) batteries in Long Island Sound. Capable of defending against surface and air attack, each AMTB included two 90-mm guns on fixed mounts, two on towed mounts, and two single 40-mm Bofors anti-aircraft guns. These batteries were established at Fort Terry, Fort Michie, Fort H. G. Wright, and on Pine Island and Goshen Point at the mouth of the Thames River. The 90mm M3 guns were designed with a heavy shield on three sides and remote fire control for use against high-speed craft that might be able to slip past large coast defense guns located at the eastern entrance of the Sound. These included a large heavy casemated battery at Camp Hero (Montauk, N.Y.), and smaller batteries at Fort H.G. Wright (Fishers Island, N.Y.), Fort Terry (Plum Island, N.Y.), and Oaks Inn Military Reservation (Misquamicut, R.I.). Two batteries at Camp Hero were each equipped with a pair of 16-inch guns with a range of 26 miles. These large guns were planned for batteries at Fort H.G. Wright and Fort Terry but never completed. Batteries with smaller 6-inch guns were constructed in support of the larger gun batteries and at the other forts in the Eastern Sound.

Battery AMTB-915 on Pine Island and its sister battery, AMTB-914 at Goshen Point, were constructed from April to August 1943. Each consisted of two 90mm guns mounted on M3 fixed gun mounts, two 90mm guns on mobile gun mounts, two earth-covered concrete magazines for ammunition storage, portable generators, and a Battery Commander's station. AMTB-915 also included two tactical dens and a pier for service vessels. Each battery had a dual mission of defense against fast enemy motor torpedo boats and enemy aircraft. Each gun was manned by a 15-man crew. These AMTB batteries were deactivated in 1946 and used for training by the Coast Guard. The property reverted back to the State of Connecticut in 1967 when the Coast Guard moved its training facilities to Governor's Island, N.Y. Avery Point, and the land at Pine Island, is now used as a satellite campus of the University of Connecticut.



The two fixed-mount 90mm guns installed as part of the Anti Motor Torpedo Boat Battery (AMTB-915) on Pine Island during World War II looked like this gun installed on Battery Parrott, at Fort Monroe, Va. (photo by Neal Snyder, U.S. Army Environmental Command)

Morton F. Plant



Henry B. Plant's (left) investment in railroads created the foundation of wealth that propelled his son, Morton F. Plant (right), to social prominence (Photo of Henry Plant from Florida Photographic Collection; Photo of Morton Plant from the Jim Streeeter Collection)

Commodore Morton F. Plant was born to wealth and high social station. He was the son of railroad magnate Henry B. Plant, who had amassed a fortune through investments in railroads in Florida and along the Atlantic Seaboard. By the later part of the nineteenth century, under Henry's stewardship, the "Plant system" had grown to include several interconnected railroads along with steamer and steamship lines. His decision to invest in creating railroad infrastructure in Florida, anchored in Tampa, paid off handsomely during the period of dramatic growth that Florida witnessed in the late nineteenth and early twentieth centuries.

Henry's son, Morton, was born in 1852 in Branford, Connecticut. After attending Russell Military Academy in New Haven, Morton joined Southern Express, one



Morton Plant's estate on Avery Point, now known as Branford House, is owned by the University of Connecticut (photo by user Pi.1415926535, Wikipedia)

of his father's companies, eventually rising to become chairman of the board of directors. During the ensuing years he would add to his portfolio executive positions and directorships in a variety of other companies, chiefly in the transportation industry.

Morton Plant built two mansions in Manhattan, where he lived for much of the year. The first of these, a neo-Renaissance building at the corner of 52nd Street and Fifth Avenue, was built in 1905. The second was completed in 1916 on the corner of Fifth Avenue and 86th Street. Yet Plant maintained close ties to Connecticut, and to the New London area in particular, throughout his life, and he focused significant charitable effort in the area. He was a principal benefactor and first chairman of the board of Connecticut College for Women in New London (now Connecticut College), and a trustee and benefactor of the Pomfret School in the northeastern Connecticut town of the same name.

A devotee of sailing, Plant owned several sailing and steam yachts during his lifetime. He was a member of four yacht clubs, including the New York Yacht Club, and he organized and participated in a circumnavigation of the world in his steam yacht *Iolanda* in 1909-10. Plant also was an avid fan of the relatively young game of baseball, and owned the New London Eastern League minor league team in addition to his majority holding in the Philadelphia club of the National Baseball League. His son, named Henry Bradley Plant after Morton's father, carried on Morton's devotion to sailing. In fact, Bradley, who worked throughout his adult life in the family business, lived on his 140-foot yacht *Mascot* for the last six years of his life, wintering in Miami and spending the warm months in the Northeast. Bradley died aboard the yacht in Miami in 1938, at the age of 42.



One of two mansions that Morton F. Plant built in Manhattan. This one is situated at Fifth Avenue and 52nd Street (Photo by David Shankbone, English Wikipedia)



Morton Plant was a co-founder and major benefactor of Connecticut College for Women in New London, now the co-educational Connecticut College. Above: Fanning Hall (Photo by Beyond My Ken, Wikipedia)

HISTORY OF THE NORTH AMERICAN MENHADEN FISHERY

Oh, me father was the keeper of the eddystone light
And he slept with a mermaid one fine night
From this union there came three
A porpoise and a porgy and the other was me

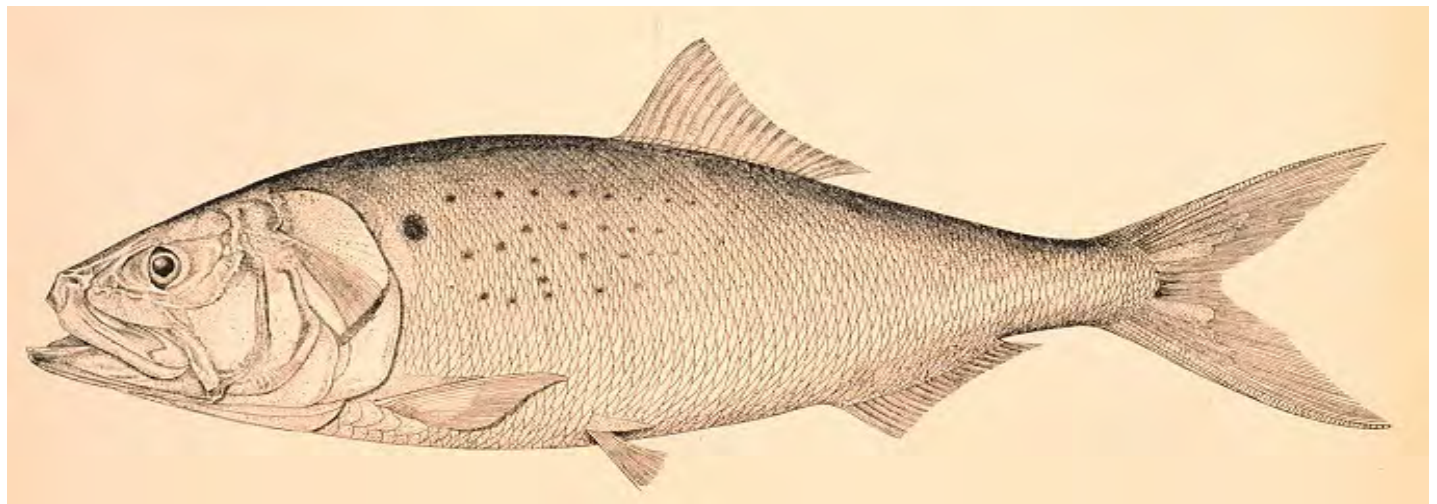
—The Eddystone Light (traditional)

“Porgy,” or “pogy,” was only one of the alternative names for the Atlantic menhaden. Others included fatback, bunker, alewife (or oldwife), greentail, whitefish, bogfish, chebog (and its Latin binomial, *Brevoortia tyrannus*). A member of the herring family, the menhaden was for many years a dominant part of the North Atlantic fishery. It was menhaden that Native American Algonkian people taught the Pilgrims to use as a fertilizer during their early days at Plymouth, and it was Native Americans who gave the fish its primary name. The Narragansett called them *munnaewhat-teaug*, which translates as “that which manures,” and it was this word that eventually was corrupted to “menhaden.” Other Native Americans had different names for the species. For the Abenaki in Maine, the fish was known as *paubagen* or *poghaden* (“fertilizer”), from which we get the modern name “pogy.”

As the Euro-American fishery became established off the Eastern Seaboard of North

America, menhaden soon emerged as a central component. By the late nineteenth century, at the zenith of the whaling industry, menhaden actually yielded more oil for America’s lanterns than whales did. In his 1880 history of the menhaden fishery, ichthyologist G. Brown Goode estimated the annual menhaden catch at 250,000 to 300,000 tons, equaling 600 million to 700 million fish (Goode, G.B., *The Fisheries and Fishery Industries of the United States* [1887]:330).

Consumption of menhaden by humans today centers around its use in dietary supplements. Historically, the vast majority of the menhaden catch went



The Atlantic menhaden, *Brevoortia tyrannus*, is the primary source of menhaden oil in North America today (Courtesy of National Oceanic and Atmospheric Administration)



The Atlantic menhaden (Photo by Brian.gratwicke wikimedia)



Menhaden run in schools that contain hundreds of thousands of fish (Photo courtesy of Crabby Taxonomist)

to lantern oil, and much of the remainder became fertilizer. However, the fish also had a dietary value for humans, especially among poorer people, who consumed them as people today eat sardines. Even today, menhaden constitute the largest total landings by volume of any fish on the Atlantic coast. Only pollock (in Pacific Alaska) outweigh menhaden in the volume taken by commercial fishing fleets.

Menhaden owe their historical abundance to their place in the lower rungs of the sea's ecological ladder. They are herbivores, consuming vast amounts of plankton, and during algal blooms in the heyday of the fishery during the nineteenth century, they could be observed swarming in schools stretching over several miles of ocean. Because of their

profusion, menhaden are a primary food source for a number of predator fish, including tuna, mackerel, drum, and sharks. In fact, menhaden are parts of the diets of so many predator species that Goode stated in 1880 that a person consuming almost any Atlantic marine fish was eating "nothing but menhaden." They also are consumed in large quantities by seabirds like ospreys, eagles, seagulls, pelicans, and egrets. As the nineteenth century wore on and the North Atlantic whale population declined, the use of menhaden as a source of oil increased; by 1870, menhaden provided 50 percent more oil than was secured from whaling.

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Menhaden Chronicles: The Legacy of George Brown Goode (1851-1896)

The canonical reference work on the history of the menhaden fishery was published over 125 years ago. G. Brown Goode's *The Natural and Economic History of the American Menhaden* (1879) is a monument to well-integrated fieldwork and documentary research, and its continuing value as a reference source is reflected in the fact that several editions of the book are still in print today. It is fair to say that all subsequent research and publications regarding almost any aspect of menhaden or the American menhaden fishery fall within the shadow of Goode's book. And the volume was by no means Goode's only accomplishment.

George Brown Goode was born in New Albany, Indiana, on February 13, 1851. Upon the death of his mother less than two years later, his father brought him east, settling in Amenia, New York. George was privately tutored through his secondary school years, but on reaching college age, he entered Wesleyan University in Middletown, Connecticut. In 1871, following his graduation, Goode became the first curator of Wesleyan's new Orange Judd Museum of Natural History (later the Wesleyan Museum). The following year, while doing volunteer work for the U.S. Fish Commission in Eastport, Maine, near the Canadian border, he met Spencer Baird. Baird was an accomplished ornithologist, ichthyologist, and herpetologist. Baird had served as the first curator of the recently founded Smithsonian Institution for 21 years beginning in 1850. Toward the end of his service as curator, Baird developed a strong interest in marine fisheries. Indeed, when Goode met him in Eastport, Baird had just been appointed first Commissioner of the U.S. Fish Service by President Ulysses Grant.



During his short life of just 45 years, G. Brown Goode accomplished more than many scholars who live twice as long (Photo courtesy of Smithsonian Institution Archives)

Goode was impressed with Baird's intellectual energy and eclectic interests, and soon became the older scholar's protégé. Baird's keen interest in fisheries research was a pivotal influence, and Goode's career track took focus from that time forward. His summer work for the Fish Commission continued for the next five years while he spent the academic year at Wesleyan, but in 1872, Goode moved to Washington to join the Smithsonian's staff. In the 1880s he would become the Assistant Secretary of the Smithsonian Institution in charge of the National Museum. He eventually would serve, in 1887 and 1888, as Commissioner of the U.S. Fish and Fisheries Commission. During his association with the Smithsonian, Goode oversaw the creation of numerous exhibits, and helped to extend the Smithsonian's reach by overseeing off-site exhibits in Philadelphia, Berlin, and London. He also wrote extensively on museum design and administration.

Given his diverse responsibilities for the Smithsonian, it is remarkable that Goode produced any research results, let alone the extensive corpus of work that he accomplished. His work is all the more notable for its geographic and topical diversity. Goode studied and wrote about mammals, birds, reptiles, and crustaceans, in addition to his main love, fishes. His *Fishes of Bermuda*, the product of a visit to that island, was published in 1876 and remained a key reference work on that subject for a number of years. The same can be said of *The Fisheries and Fish Industries of the United States*, published in seven volumes from 1884-87, and his masterful *American Fishes*, a popular yet encyclopedic account of North American game and food fishes. In collaboration with Tarleton Bean, Goode produced *Oceanic Ichthyology* (1896), as well as 40 published research papers. Among his numerous other publications were histories of American science, biographies of several American naturalists, and *Virginia Cousins*, a 526-page history of the Goode family. Additionally, he fathered and helped his wife, Sarah, to raise four children. His corpus of work produced would have been impressive even for a scholar who lived a full life. Yet that was not to be Goode's fate. A longtime heavy smoker, Goode succumbed to pneumonia on September 6, 1896. He was 45 years of age.



Ornithologist and naturalist Spencer Fullerton Baird (1823-1887) became a collaborator and longtime friend to G. Brown Goode (Photo by William Bell, Smithsonian Institution Archives)

(continued from page 11)

Today, the bait fishery annually takes about 400 million pounds of Atlantic menhaden, some of which are ground to meal for chum, and some of which are used whole as bait for crabs and predator fish (Food and Agriculture Organization of the United Nations Species Fact Sheet: *Brevoortia tyrannus* [2014]). The primary device employed to catch menhaden is the purse seine, a specialized net that can bring in tens and even hundreds of thousands of fish in a single haul. During the nineteenth century a filled purse seine could capture enough menhaden to produce as much oil as a blue whale. Instead of capturing a fraction of the menhaden schools, the seine technique permitted the capture of entire schools. Throughout the early 20th century technological innovations facilitated overfishing by the industry. By the mid-20th century there was a marked decline of menhaden populations in New England (Acheson, Poggie, and Pollnac, *Small Fishing Ports in Southern New England*, Report to the National Science Foundation Volume 1b [1980]:80).



During the nineteenth century heyday of the New England menhaden fishery, the purse seine was the device of choice for landing them. (Photograph from Walsh (1894) *Economic Uses of Non-Edible Fish*, *Popular Science Monthly*, Vol 45)

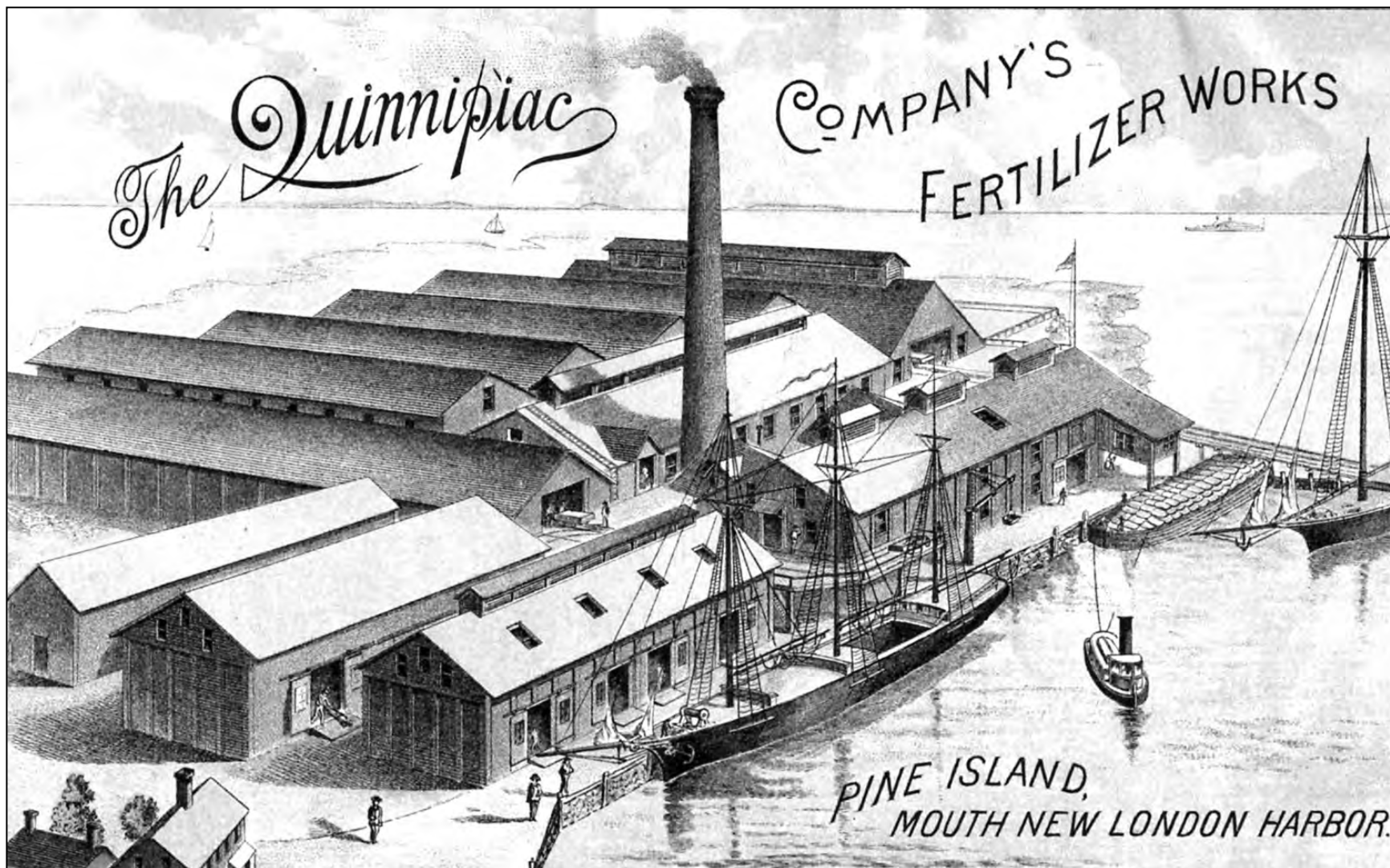


Native Americans in New England used menhaden as a food and to fertilize crops (Image from The German Kali Works [1911] *The Teaching of Agriculture in the High School*)



Aerial view of Pine Island showing the location of selected features visible on the surface (Image courtesy of Connecticut Department of Energy and Environmental Protection)

A Visit to the Quinnipiac Fertilizer Works on Pine Island in 1878



My first day was spent getting to Pine Island, a bit of land a few acres in extent, lying just east of the entrance of New-London harbor... A little after daylight the next morning a shrill whistle summoned us on board the fishing steamer Wm. Spicer. Very quietly the little wheel at the stern began to twist itself around and silently, almost stealthily it seemed, we slid out of the harbor behind the island. At about 5 o'clock the cook's bell rang, and the crew went to breakfast while the company waited for the second table. Workers, not drones, rank first on a fishing steamer.

Breakfast was scarcely over when there arose a cry of "There they play" and sure enough a few boat lengths from us, was a bunch of menhaden sporting at the surface and making the spray fly. Towed behind the steamer were two large row-boats, each containing half of a seine nearly 1,000 feet long and a hundred feet wide. Into these stepped the captain and fishing crew of six men, and after a few moments maneuvering for position, the boats were rapidly rowed around the "bunch" in opposite directions, a man paying out the seine from the stern of each.

A purse seine is used, to the lead line of which rings are attached, and through these rings a small rope is run, by which, when the boats come together around the fish, the bottom of the net is rapidly gathered together... contracted until they are a compact mass, when the steamer comes along side; the net is made fast to her, and a scoop or bag not, holding about two barrels, and worked by steam, is set going, and the fish begin to come on board. The scoop is bandied about as fast as a day laborer will handle a shovel it takes up about 500 fish at a time,

and I should judge the forty or forty-five thousand caught at that after breakfast haul were all taken in in ten minutes.

...then we were away for Pine Island. Here the bony fish are again the subjects of "rapid transit." A small steam engine stands on the dock with steam up, in obedience to a signal whistle from the steamer while some distance out. With a hoisting apparatus they are lifted out of the hold of the steamer in a tub that holds a thousand fish, and by which the count is made. Three or four fishermen pitch them into the tub with a "shovel" made by fastening netting to an iron hoop, about a foot in diameter, attached to a straight wooden handle. So expeditious are they, that fifty thousand per hour are transferred from the hold to an immense box, raised about six or seven feet above the water. Under this box extends an inclined plane, upon which a car holding five thousand fish carries them to the cooking tanks.

These are sixteen in number, and usually hold ten thousand at a boiling, although twelve and a half thousand can be cooked at once in each. As fast as the tanks are filled, steam is let on, and in about 45 minutes they are done.... From one thousand to three hundred thousand fish are usually brought in each evening, though as high as six hundred thousand have been caught by the Quinnipiac Company's fishing fleet in one day.

The ordinary catch is usually disposed of by midnight... At half past six the next morning the whistle from the "works" calls them to press the fish, which have been left in the tanks cooling through the night. There are two hydraulic presses and four



Photo of Purse seine fishing for menhaden in 1894 (published in *Popular Science Monthly* Vol 45)

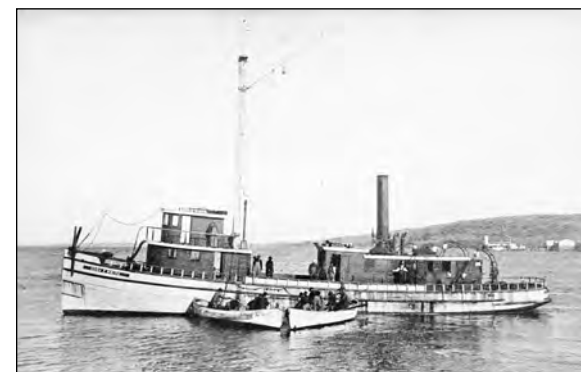
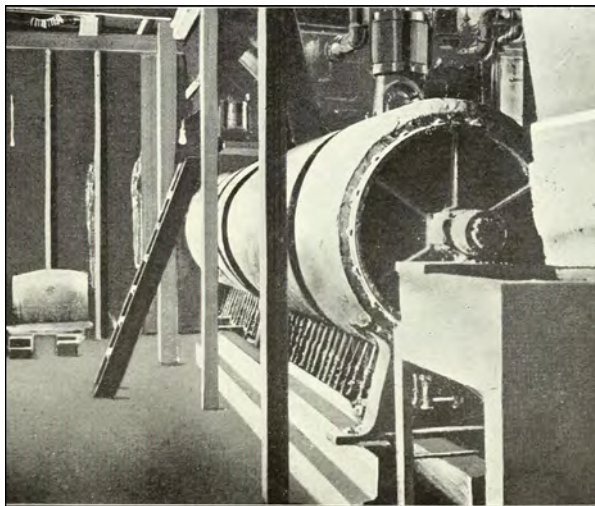


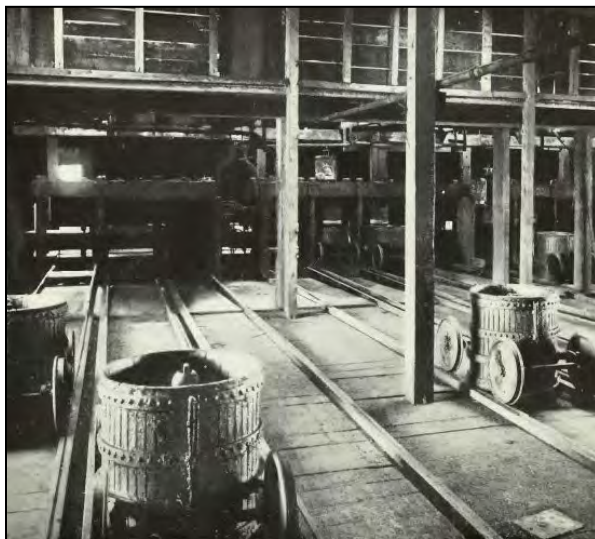
Photo of a menhaden steamer receiving a purse seine haul in 1894 (published in *Popular Science Monthly* Vol 45)



Gang of Portuguese in hold of steamer filling the hoisting tubs (Sect v, vol 1 p. 337) from a photograph by T.W. Smilie (Goode 1887 *The Fisheries and Fishery Industries of the US Fisheries* Section 5, Plate 110)



Continuous steam cooker (Photo from Report of the Commissioner for the Year Ending June 30, 1902)



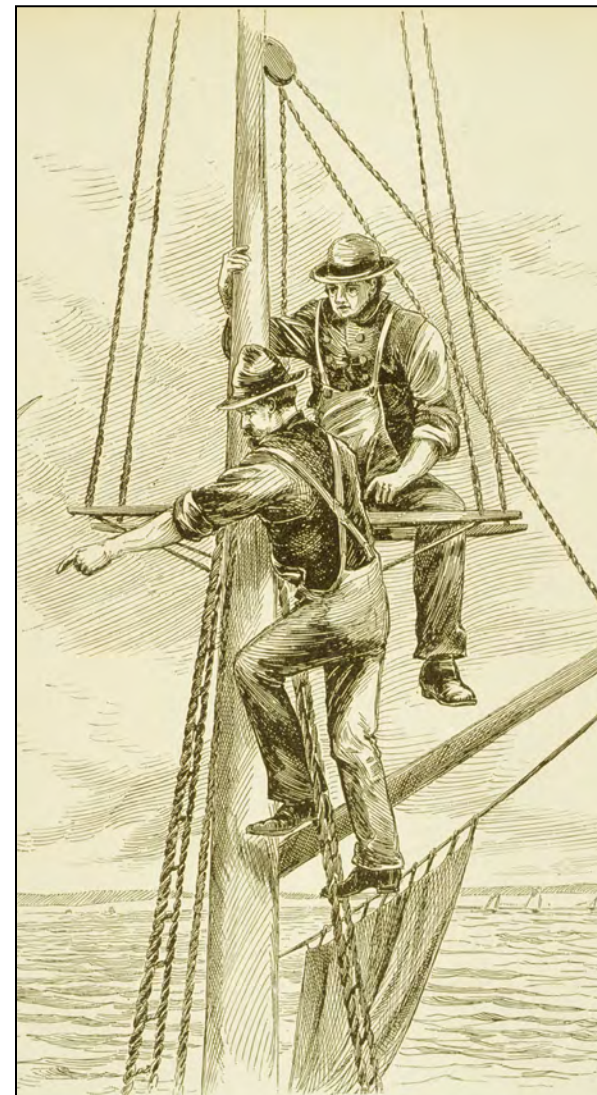
Press room of menhaden factory (Photo from Report of the Commissioner for the Year Ending June 30, 1902)

receiving tubs, each of which is worked by two men. The warm fish are forked out of the tanks into the tubs, rolled on a little railway under the presses, the oil and water rapidly expressed, and the tub rolled back to the other end of the track, where the scrap is dropped through the bottom of the tub upon the platform below. If the weather is fine, it is spread on platforms to be sun-dried, after which it is ground into fish guano. During rainy weather it is treated to a dose of sulphuric acid, which fixes the ammonia, and not only makes the fertilizer more valuable, but prevents that "ancient fishy smell" common in the vicinity of fish-works.

... Having gotten the scrap into marketable condition, let us return to the oil. A trough carries the mingled oil and water to a large vat, and after standing a few minutes, the water is drawn off from the bottom into a second tank, the gate being closed as soon as any oil is seen.

The large tank is again filled, and the operation repeated, until the oil on the top is sufficiently deep to allow of its being drawn off clear into another large tank called a bleaching tank, from which, after standing in the sun to bleach, and allow any heavy impurities to settle, it is drawn into barrels for shipping. The price ranges from 35 to 45 cents per gallon, and the product from one to fourteen gallons per thousand fish, according as they are fat or lean.

Excerpted from *A Farmers' Fishing Trip: How Fish Guano is Made* (Crusoe 1878)



Lookouts at masthead of menhaden steamer watching for schools (courtesy of NOAA National Marine Fisheries Service) (from *Fishery Industries of the United States* by G Brown Goode 1887)

PINE ISLAND TODAY

The history of Pine Island is recorded in the archaeological remains left on the uninhabited island. Currently part of University of Connecticut's Avery Point Campus, no buildings or structures remain on the densely vegetated island. A thick mantle of saplings, shrubs, beach rose, and poison ivy masks most of the remnants of human activity on Pine Island. A stone and concrete wharf marks the site of the Quinnipiac Company's fish oil and fertilizer factory, the foundations of which extend into the overgrown interior of the island. Other remnants of activity include James Baley's grave markers, retaining walls, timber pilings, concrete footings of lightly built structures, concrete gun mounts from a World War II era Anti Motor Torpedo Boat Battery (AMTB), and other features associated with the factory or AMTB.

The earliest occupation on the island was a scatter of pre-contact period chipping debris left from stone tool manufacture that was observed on a beach on the north shore of the island.

Revolutionary War Captain James Baley's grave (d. 1788) is located on a small knoll near the center of the island. Two markers identify Baley's gravesite. A worn granite or gneiss stone with a carved winged soul-effigy, that appears to be an original marker, stands near a second commemorative marker erected during the twentieth century located a few feet away. A dry-laid rubblestone retaining wall supports the southwestern margin of the knoll.

Evidence of the Quinnipiac fish processing factory complex is scattered across the northwestern portion of the island. A



Photograph of James Baley's gravestones. Older gravestone is visible in the rear of this image; the second stone in the foreground was erected during the twentieth century (Photo by R. Christopher Goodwin & Associates)



Photograph showing the stone wharf with concrete cap at Pine Island (Photo by R. Christopher Goodwin & Associates)



Photograph showing the boat slip and circular construction at Pine Island (Photo by R. Christopher Goodwin & Associates)



Photograph of the boat slip showing the retaining wall and wood pilings along the shoreline. Brick and other debris on the beach in the foreground are probably remnants of the fish processing plant and AMTB-915 activity (Photo by R. Christopher Goodwin & Associates)

large stone wharf extends approximately 180 feet from shore and is flanked on the east side by two 100-foot-long stone walls that appear to form a 45-foot-wide boat slip. A semicircular stone wall forms a pool at the northwestern corner of the slip. Historic nautical charts and an illustration dated ca. 1888 indicate that the factory's buildings extended nearly to the edge of the boat slip so that menhaden could easily be offloaded and products loaded onto vessels for shipping to customers. Constructed out of massive quarried stone blocks, the wharf and boat slip were probably built to serve the factory and later used by the coastal defense. The 16-inch-thick concrete slab that now covers the stone was probably added during World War II, when the island was the site of Battery AMTB-915.

Several stone retaining walls and wooden pilings are evident along the shoreline adjacent to and east of the boat slip. These are probably vestiges of the fish oil and guano factory depicted in the ca. 1888 illustration of the fertilizer works. These remnants include an iron mooring ring and a scatter of bricks and nineteenth century artifacts that were observed on the shoreline south and east of the stone slip.

A reporter visited the factory in 1878 and described the entire operation, from fishing for menhaden to extraction of the oil and processing the fish meal (a.k.a. fish guano). He observed that the boilers and fish oil presses were housed in buildings near the docks and that the fish scrap was dried outside on platforms when the weather allowed, but in sheds when the weather was rainy.

The 1884 *Nautical chart of New London and Vicinity* depicts the wharf and factory buildings adjacent to it, and at

least five free-standing buildings on the west side of the island. A second, less substantial dock and at least three additional structures are depicted on the eastern side of the island.

Remnants of the World War II activity on the island include the depressions, concrete tunnels/gun mounts, and concrete footers visible in the western part of the island. The features correspond to components of AMTB-915 depicted in the U.S. Army's engineering plans (map, page 15). These facilities included remains of fixed-turret mounts for two 90-mm guns and associated tactical dens and magazines, a power plant and the battery commander's station. Records indicate that the battery also included two mobile gun mounts. Each gun required a crew of 15 men.

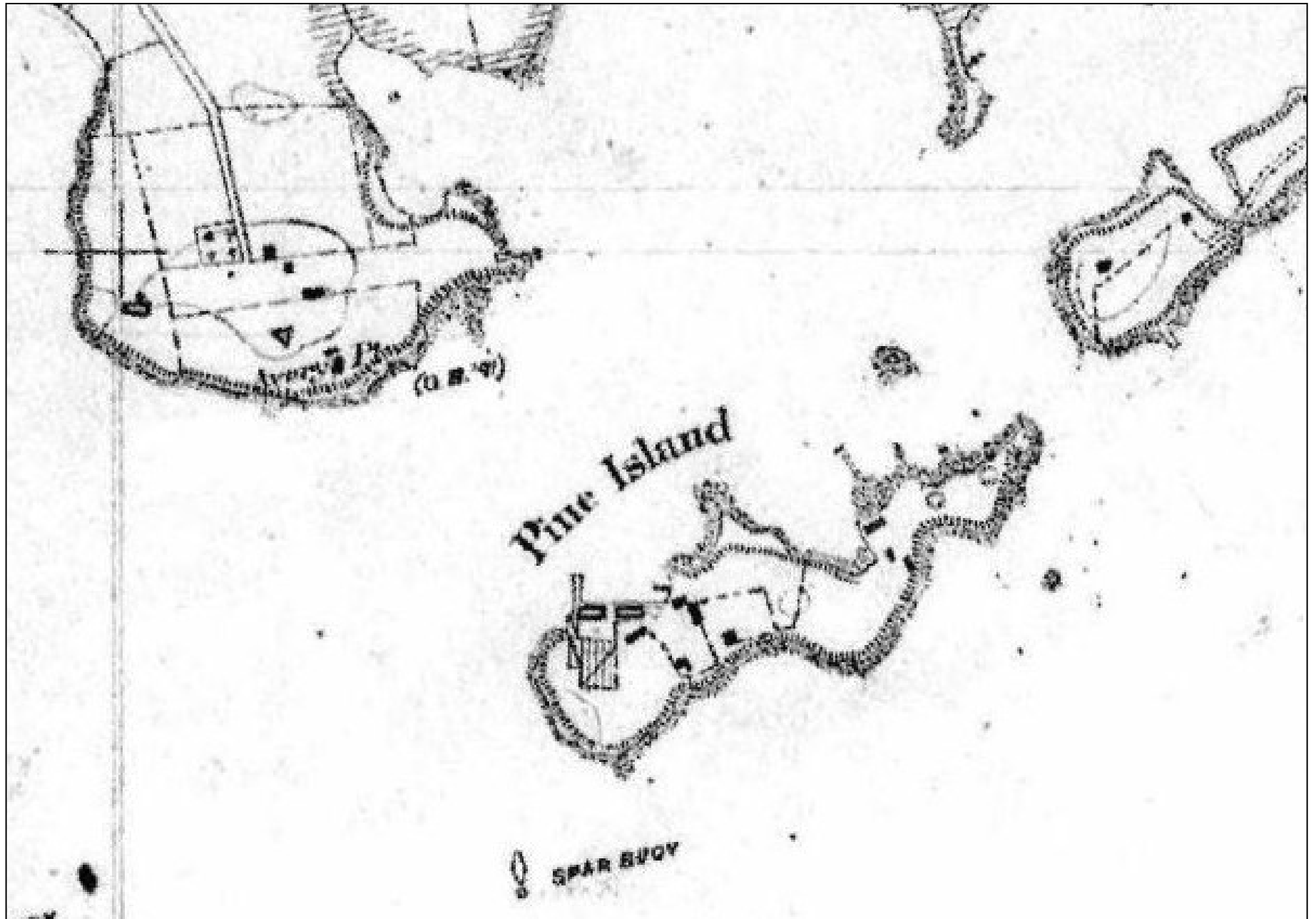
The remains of several outbuildings that are probably associated with AMTB-915 are present in the central portion of the island including a grid of circular concrete footings, a concrete foundation and slab west of James Baley's grave, and a collapsed wood frame structure with a tar paper roof. Timber pilings and a stone jetty and other cut stone blocks on the northeastern end of the island indicate that this lower portion of the island also was used, though without further investigation one can only speculate about whether some of these remains might be related to the use of the island as a summer retreat during the early nineteenth century or for recreation by Morton Plant's family a century later.



Photograph of concrete footers probably related to the AMTB-915 battery commander's watch station (Photo by R. Christopher Goodwin & Associates)



Photograph of concrete tunnel beneath the gun mount in the firing platform for one of the 90-mm guns at AMTB-915 on Pine Island (Photo by R. Christopher Goodwin & Associates)



Excerpt of the 1884 *Nautical Chart of New London and Vicinity* showing the Quinnipiac Fertilizer Works factory complex and other structures on Pine Island. The large stone wharf and factory buildings are visible on the western end of the island. A dock and three additional buildings are depicted on the eastern end of the island (NOAA Historical Map and Chart Collection)



Poured concrete foundation and floor of structure on Pine Island (Photo by R. Christopher Goodwin & Associates)



Stone jetty and dock remnants on the northeastern part of Pine Island (Photo by R. Christopher Goodwin & Associates)

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State Archaeological Preserves

The Connecticut Legislature established the State Archaeological Preserve program in 2000 as a way to protect significant archaeological sites. Sites that are listed on the National Register of Historic Places and/or the State Register of Historic Places qualify for designation as a Preserve, whether private or public property. The National Register is the official Federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture worthy of preservation. Similarly, the State Register of Historic Places is a census of historic and archaeological resources that are integral to the development of Connecticut's distinctive character.

The State Historic Preservation Office, in the Department of Economic and Community Development, is empowered to designate archaeological sites as Preserves (C.G.S. Section 10-384). SHPO, in coordination with the Office of State Archaeology and, when appropriate, the Native American Heritage Advisory Council, works with property owners to nominate significant archaeological sites as Archaeological Preserves. SHPO also maintains the master list of Archaeological Preserves.

Preserves recognize the educational and cultural value, as well as the fragile nature, of archaeological resources. Many of Connecticut's Preserves are on private land and fall under the protection of property owner rights. Connecticut law provides that, regardless of whether a Preserve is on private or public land, no person shall "excavate, damage, or otherwise alter or deface the archaeological integrity or sacred importance of a preserve. Connecticut General Statutes Section 10-390 provides significant penalties for vandalism and the unlawful collecting of archaeological remains from State Archaeological Preserves.

Connecticut's Archaeological Preserves as of January 2019

1. Putnam Memorial State Park, Redding and Bethel (1/01)
2. Axle Shop-Spring Factory Archaeological Site, Hamden (2/01)
3. Kent Iron Furnace, Kent (3/01)
4. Newgate Prison and Copper Mine, East Granby (4/01)
5. Fifth Camp of Rochambeau's Infantry, Bolton (6/01)
6. Fort Wooster Park, New Haven (7/01)
7. Fourth Camp of Rochambeau's Army, Windham (12/01)
8. Small Pox Hospital Rock, Farmington (9/02)
9. New London Engine House & Turntable, New London (4/03)
10. Quinebaug River Prehistoric Archaeological District, Canterbury (5/03)
11. Aunt Polly, East Haddam (5/03)
12. Cornfield Point Light Ship LV51, Old Saybrook (5/03)
13. Bridgeport Wood Finishing Company, New Milford (5/03)
14. John Brown Birthplace, Torrington (8/03)
15. Air Line Railroad, Colchester and East Hampton (12/03)
16. Governor Samuel Huntington Homestead, Scotland (2/04)
17. Cady-Copp House Archaeological Site, Putnam (5/05)
18. World War II "Hellcat" Sites, Preston (11/05)
19. Henry Whitfield State Museum, Guilford (4/06)
20. Dividend Brook Industrial Archaeological District, Rocky Hill (4/06)
21. Fort Griswold State Park, Groton (10/06)
22. Ebenezer Story Homestead & Tavern, Preston (10/06)
23. Fort Stamford, Stamford (10/06)
24. New England Hebrew Farmers of the Emanuel Society Synagogue and Creamery Archaeological Site, Chesterfield (Montville) (9/07)
25. Prudence Crandall House Museum, Canterbury (8/08)
26. LeBeau Fishing Camp & Weir Site, Killingly (8/08)
27. Lighthouse Site, Barkhamsted (12/08)
28. CCC Camp Filley, Haddam (12/08)
29. Pine Island Archaeological Site, Groton (02/09)
30. Ash Creek Corduroy Road, Fairfield (3/09)
31. West Parish Meeting House, Westport (2/10)
32. Middle Encampment, Redding (08/13)
33. Charcoal Mound, Barkhamsted (3/15)
34. Walt Landgraf Soapstone Quarry, Barkhamsted (4/15)
35. Gail Borden Condensed Milk Factory Site, Torrington (5/15)
36. Midway Railroad Roundhouse Archaeological Complex, Groton (6/15)
37. Nike Missile Site - HA-36, Portland (8/15)



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