

A History of Beavertail Lighthouse

America's Third Oldest Light Station



Beavertail Station, photo courtesy of Sarah Gleason

By Sarah Gleason

Strategically located near the entrance to Newport harbor, between the east and west passages of Narragansett Bay, sits Beavertail Point at the southern end of Conanicut Island. As colonial Newport became a major port through its part in the Triangle trade, Beavertail was recognized as the most advantageous site for a navigational beacon. The town of Jamestown maintained a watch house at the site (probably for security due to the shifting alliances among the British, French, Spanish and Indians) and before

long a beacon was added as well. Exactly what form the beacon took is unclear, but the town records suggest it may have been a form of elevated bonfire. The Proprietor's Records for March 2, 1705, order "that there shall be a chimney built upon the Watch-house at Beaver Tail by the Indians belonging to the town. . . "June 9, 1712 records "that John Hull grant a warrant to Gersham Remington to warn the Indians to build a beacon as soon as possible." Beacons, then, were often buckets of burning tar or pitch, which burned more slowly than wood, hung from a pole.

When the Newport proprietors purchased the island from the Narragansett Indians in 1657, Beavertail Point was

allocated to Benedict Arnold, ancestor of the famous traitor. Apparently the responsibilities that this important site entailed were not wholly to Benedict's liking. June 9, 1712, a warrant was issued to him "to look after the watch and see that it is faithfully 'kept'". . .

August 23, 1738, the Colony of Rhode Island established a "bank" to raise money for a lighthouse at Newport "which will be of singular service for vessels coming into the harbor in the night season, and prevent great damage which is occasioned for the want thereof." Typically such money would have been raised by taxing vessels using the harbor, but war between England and Spain interrupted the undertaking. Had it been car-

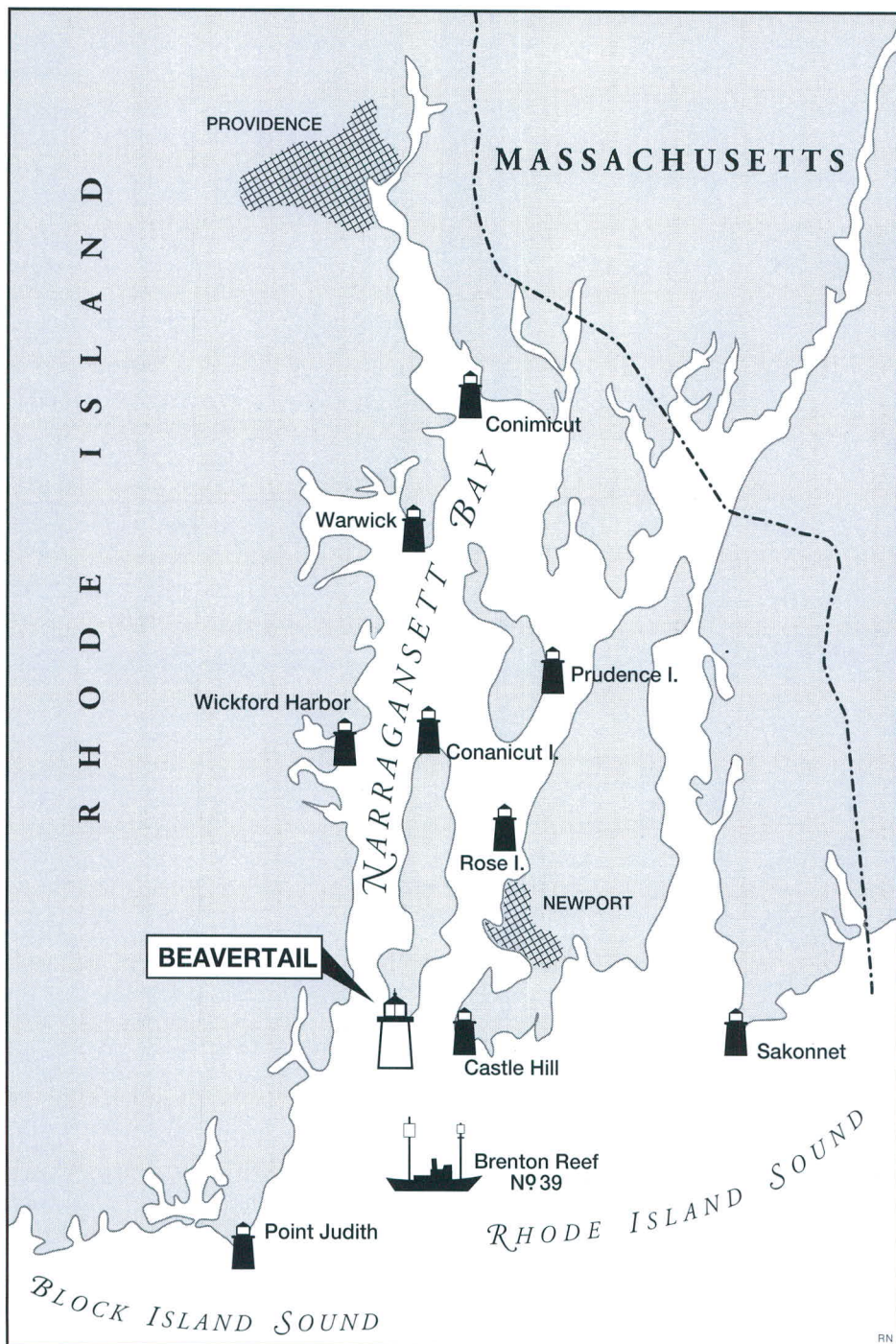
ried out, Rhode Island would have had the second lighthouse in the country (the colony of Massachusetts erected the first lighthouse in 1716 on Little Brewster Island in Boston harbor). Two years later the town of Jamestown ordered another beacon to be built by Able Franklin. This particular signal may have been one of a chain extending from Watch Hill to Providence. This chain is believed to have been built for use in warning the colonists of approaching enemies.

By 1749 funds for a lighthouse had been secured, and in February the General Assembly authorized a committee "to build a light house at Beaver Tail on the island of Jamestown (alias Conanicut), as there appears a great necessity for a light house as several misfortunes have happened lately for want of a light." Members of the committee included Abel Franklin, Josiah Arnold (Benedict's son), and Captain Joseph Harrison. The work must have been completed by August, for that is when the Assembly ruled "that

there be a proper Person appointed by the Committee . . . to be Keeper of said Light house . . . and that he be under the particular inspection of said Committee, who are hereby fully impowered upon such a person's failing in his duty, to remove him, and put another in his Room from time to time. And said Keeper shall carefully and diligently attend his duty at all times, in kindling the Lights from Sun setting to Sun rising and placing them so as they may be most seen by vessels coming into or going out from this Colony." Abel Franklin was appointed first keeper. When the lighthouse was finally built, it was the third in the colonies.

This lighthouse had the impressive distinction of having been designed by the leading colonial architect, Peter Harrison. Harrison had just completed the Redwood Library in Newport and was working on plans for King's Chapel in Boston when he agreed to help with the lighthouse. His brother, Joseph, was on the lighthouse committee and was a ships' captain, as Peter had once been. He no doubt enjoyed this chance to contribute to the safety of navigators and to Newport's importance. The lighthouse was built of wood, twenty-four feet in diameter at the base and thirteen feet at the top. It was fifty-eight feet high at the cornice surmounted by an eleven foot high, eight foot diameter lantern. July 23, 1753, it burned to the ground – only three days after the General Assembly paid Joseph and Peter's bill of £29 – 7s – 4p for paint. In August the General Assembly authorized a new lighthouse of "stone or brick, at the Place where the lately burnt stood." Harrison also designed the new tower. The building committee was ordered to make use of all the bricks at Fort George (on nearby Goat Island) or such part of them as they shall think proper." Meanwhile Abel Franklin continued his duties with an ordinary lantern.

This brick lighthouse appears in a depiction of the French fleet entering Newport harbor under fire from the British in 1779. When the British departed Newport soon after that they partially destroyed the tower; it remained unlit until the close of the War. In May 1783, the General Assem-



bly voted "that the duty on all ships and vessels (except Coasters, fishing vessels, wood sloops and vessels employed in bringing stone and sand) be raised 8d, per ton: that the said duty be continued until there shall be a sufficient sum raised to defray the expense of repairing the said lighthouse."

On August 7, 1789, the new Congress established its jurisdiction over the nation's twelve lighthouses. Besides fortifications, these were the first structures to embody the federal authority, an indication of the importance of sea commerce at that time. The state governments, however, did not all relinquish their authority easily. Not until May 1793, did the Rhode Island General Assembly agree to the transfer of Beavertail, "provided, nevertheless . . . that if the United States shall at any time hereafter neglect to keep it lighted and in repair . . . the grant of said lighthouse shall be void and of no effect."

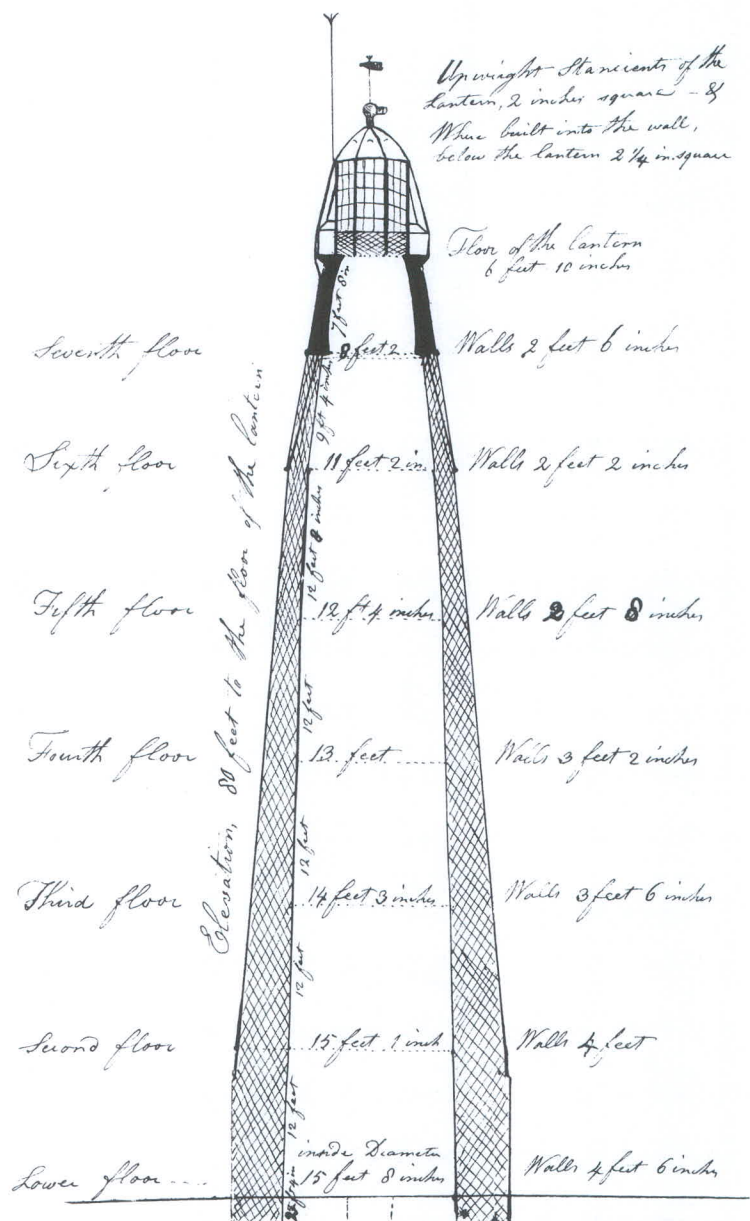
Ships continued to be wrecked despite the presence of lighthouses. More than 30 wrecks off Beavertail have been recorded since 1830; how many occurred before then can only be guessed. Many mariners charged that the unreliability of the lighthouses contributed to the uncertainties of nighttime navigation. The 1796 Certification of the Providence Marine Society, an organization formed to help mariners and their families in times of need, vividly depicts the rescue of sailors from a ship dashed against the rocks at Beavertail. The lighthouse mutely watches on.

In October of 1817, an experiment of considerable significance in the history of illumination took place at Beavertail. Newport inventor David Melville was awarded a contract from the Department of the Treasury to demonstrate that gas was a viable alternative to whale oil as a lighthouse illuminate. Whale oil had many drawbacks as a fuel, including smoking up the lantern glass and difficulty igniting in cold weather. During a twelve-month demonstration, Melville showed that gas burned much more cleanly and brightly, and could be seen from greater distances, than could whale oil fueled lamps. Gas greatly simplified the keeper's tasks as well. It was supplied through a copper pipe to the lantern room; this eliminated the ardu-

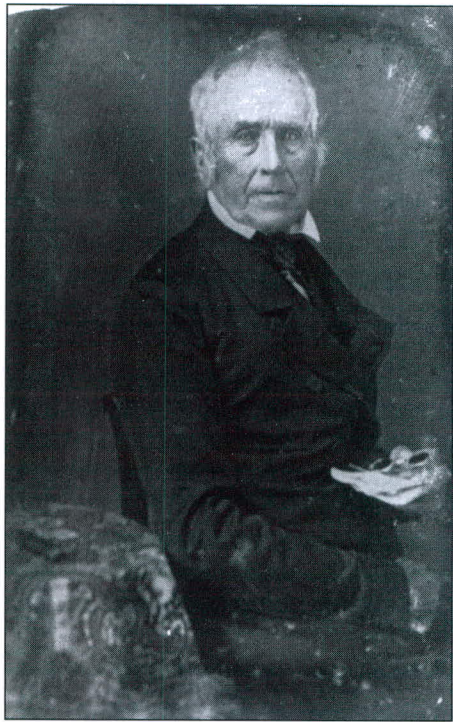
ous tasks of carrying containers of whale oil up the tower and trimming the charred wick end of the whale oil lamps several times each night. Melville built a gas house northeast of the tower, and produced hydrogen gas by burning tar and rosin in a tightly closed retort. The gas was purified by passing through a tank of water and then stored in a gasometer tank until needed. The government acknowledged the success of Melville's experiment, which had been widely praised by mariners and others, but refused to renew his contract. Melville charged the whale oil industry of lobbying against him.

Problems with the condition of the lighthouse plagued it for much of its century-long life. One source of the difficulty was damage inflicted by the British, described here in 1804 by William Ellery, Superintendent of Lighthouses for Newport:

"The British in the Revolutionary War set fire to it and the flames so shocked the walls; especially about the Windows, that notwithstanding they are four feet and a half thick at the bottom and three and a half feet thick at the top, our Masons have not since been able to make them tight and secure against the impression of storms of rain."



An early engineering sketch for the construction of the first Beavertail tower. The comments at upper right state: "Upright [stanchions] of the lantern, 2 inches square - & where built into the wall, 2 1/4 inch square." Drawing courtesy of the author.



David Melville from a daguerreotype belonging to Raymond Goddard. Photo courtesy of Sarah Gleason.

Also contributing, were the primitive colonial building techniques employed in the construction of lighthouse towers. Rubble stone and other local materials were simply piled up to create walls with enough mass to support the weight of the tower. At some point, too, the height of the tower at Beavertail was increased. In 1827, Melville was awarded a contract to reduce the height of the lighthouse, “. . . by taking off the whole of the upper part thereof down to the old cornice of the building, where the diameter is about fifteen feet from outside to outside and eleven feet from inside to inside of the wall; i.e., the new parts of the lighthouse to be removed and the old part, up to the said cornice, to remain: whereon (he) shall erect an iron lantern . . .” At the same time, Melville installed circular wooden stairs with an iron handrail, “no step to exceed eight inches in height” and to be “provided with double steps for resting places at the equal distances of ten stairs.” The lantern was fitted with “a double [copper] table, and fifteen patent lamps, with heaters, fifteen nine inch silver plated reflectors, and two spare lamps fitted with heaters.” For the work on the lantern he was paid \$285.00, and for the work on the tower, \$1150.00. He also received the old lantern with its table and lamps, the lum-

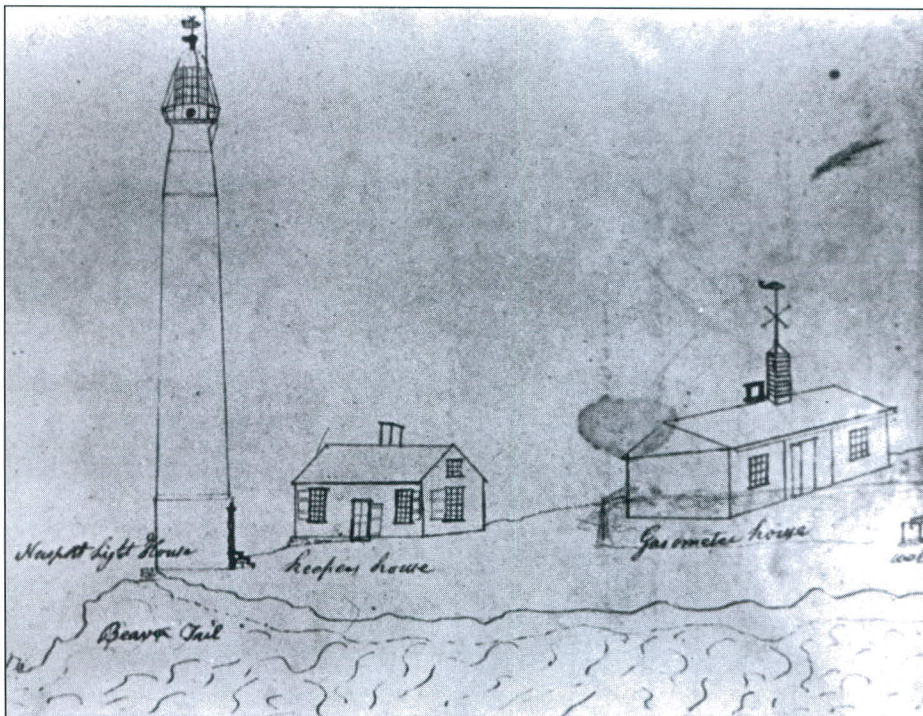
ber from the floors and stairs of the building, and any stones from the top of the building that remained after using them to fill in the basement.

The 1838 Report to the U.S. Light House Establishment, Beavertail lighthouse is described as ninety-eight feet above the level of the sea and its limit of visibility as 15 $\frac{3}{4}$ miles.

“The rubble stone tower was 68 feet high ascended by an interior spiral stairway of wood with landings at convenient places. The oil was stored under the lower landing. There were 15 lamps, with reflectors, arranged around two circular copper tables, each 3 feet in diameter, the lower table supporting eight lamps, the vacant space being towards the land.”

In 1851 the lighthouse is reported to be in bad shape: “worst built tower yet seen, built of soft shale; not been repaired in seven years;” and, “the inside walls are as green with moss as the fields around with grass.”

In 1852 the U.S. Light House Board was established, and the reforms that followed included replacement of decrepit lighthouse structures. In Rhode Island, Beavertail, Watch Hill, and Dutch Island lighthouses were all replaced (Beavertail and Watch Hill with nearly identical designs), and Point Judith was rebuilt. Congress appropriated \$14,500.00 for the new lighthouse at Beavertail, plus a third-order Fresnel lens, and a Daboll horn fog signal. The ten-foot square granite tower, was completed in 1856, one-hundred feet inland from the old structure. The fog horn building was constructed over the old foundation and an oil house and keeper's house were built adjoining the tower. In 1898 an assistant keeper's house was added. Today all but the fog signal building stand as four-square as when they were built. When the 1938 hurricane devastated the coast, it destroyed the fog signal building and uncovered the foundation of the long forgotten 1754 lighthouse (A plaque at the site identifies it incorrectly as the 1749 foundation.). The circular rubble foundation may be seen today, a rare example of this early building technique.



Sketch of Beavertail from David Melville's 1818 "Meteorological Table and Diary" relating the 1817-1818 experiment in gas lighting of the Beavertail Lighthouse. Newport Historical Society, courtesy of the author.

The story of fog signals is perhaps one of the most interesting features of Beavertail's history. On many occasions the lighthouse was a testing ground for important inventions and engineering developments in this field. Various tests enabled the development of highly efficient fog signals in the century following 1850.

Beavertail's location on the southern tip of Conanicut Island is in a region with a high incidence of fog. Because of its location, it was critical to warn vessels of the land mass. The first fog signal established at the Beavertail Light Station was a bell, tolled by hand whenever there was evidence of a ship in the vicinity. The bell signal was established in March of 1829, and although it was a small bell, it must have been of some service as ships passed very close to the Beavertail station. Bells, in those days, were considered the most efficient form of fog signal; the only other sound producing signal was the ordinary cannon. Trials of a cannon at Boston (1719 - 1721) had shown it to be of dubious value.

1850 was the beginning of a period of intense activity in the Lighthouse Service. The adoption of many new forms of signaling equipment would result from this period. Mr. Celadon Daboll, of New London, Connecticut, claimed to have developed a fog trumpet. The Service made an agreement with him and sometime in 1851, he installed one of his new fog signals at Beavertail for a trial. Daboll's fog signal consisted of a fog horn or trumpet, an air compressor, and a cylindrical tank for storage of air. The sound producing instrument was a vibrating reed of metal (similar to a clarinet reed, only forty-eight inches long) set in the throat of a long metal trumpet. The compressor consisted of a hand cranked pump placed on the storage tank. Daboll, however, was a good businessman and sought to adapt his fog signal to the views of his prospective customers. If his horn was not liked by the customers, he was prepared to fit a whistle to the apparatus. If the keepers objected to turning the crank of the pump by hand, he offered to harness a horse to the equipment, either on a treadmill apparatus, or

walking around a windlass.

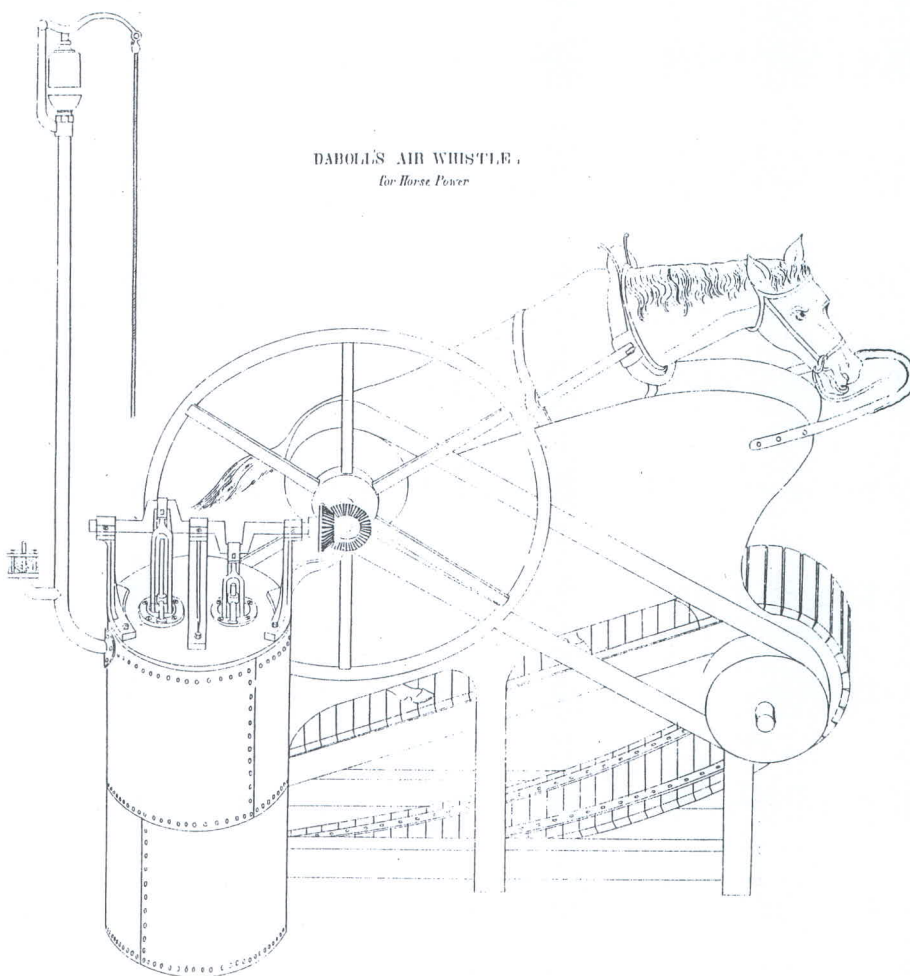
Daboll, in his reed horn or even the whistle, had introduced an entirely new type of fog signal for lighthouse purposes. Not only were the devices to produce sound quite new, but the air compressor and air storage tank were the beginning of a new era. The difficulties in a means to power these new type signals were soon to be overcome by developments in other fields.

The final Daboll signal installed at the Beavertail station consisted of a reed horn, with an air compressor operated by horse power; the horse was duly provided, and no doubt alternated in his duties between blowing the fog signal and taking the keeper's family to town. In a comparatively short time the Daboll signal at Beavertail was discontinued, but more was to be heard of it later.

The Beavertail station next became a testing ground for another entirely new

kind of signal. It was a steam whistle that had previously been used for other purposes, but not as a fog signal at lighthouses. The trial of this signal was made in 1857. The signal selected for Beavertail was a five-inch whistle. It remained in service for eleven years and proved beyond a doubt that steam had great potential for sounding fog signals. The only drawback to this form of signal was an inadequate supply of water.

When this steam plant reached the end of its useful life, requiring repair, the Lighthouse Service took the opportunity of trying out a newer form of Daboll's fog signal. The service was using steam fog signals at other stations and Daboll, by this time, had solved one of his greatest difficulties, that of motive power, by adapting the hot air engine to his signal. This machine was gaining wide popularity as a means of producing power in moderate quantities.



DABOLL'S AIR WHISTLE,
for Horse Power

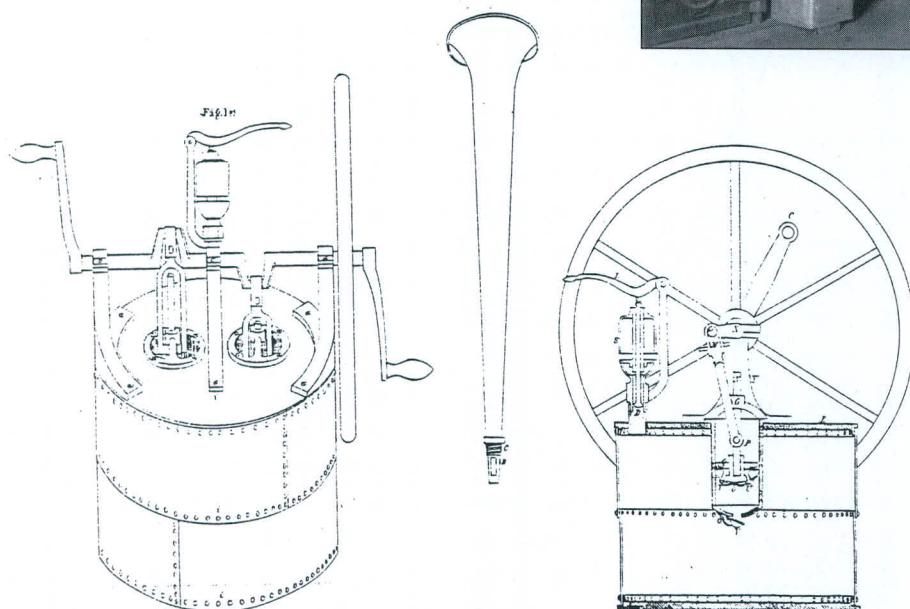
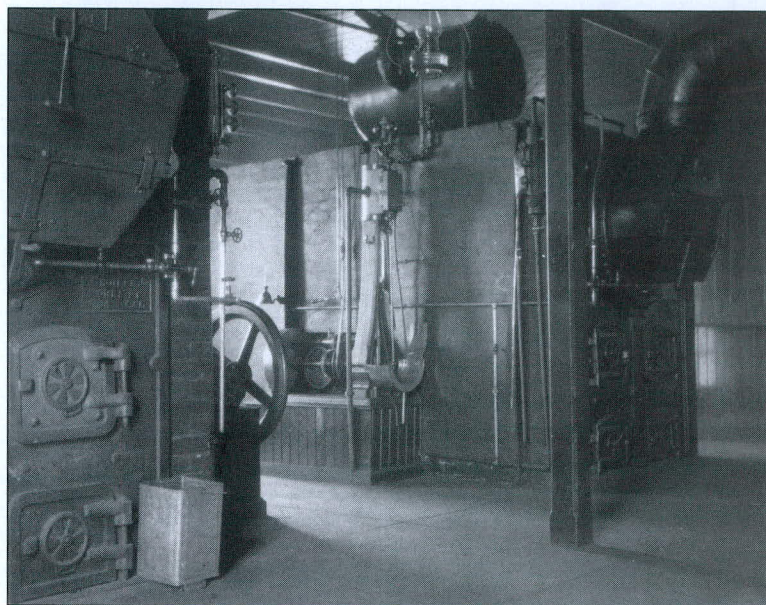
Horse Power

The hot air engine was hauled to Beavertail in 1868. This was not really a new invention, but a machine of the type John Ericson (designer of the *Monitor*) had recently devised. This engine had proven far more successful than the products of any of the earlier designers. The new signal was immediately successful. The mariner received a distinctive and reliable sound, and the Lighthouse Service found a signal that was not difficult to operate and had a minimum of operating complications.

The second signal at Beavertail lasted for thirteen years. The only criticism was that the machine was difficult to start in a short period of time, especially in cold weather. Eventually the machinery wore out and required replacement. During its period of operation great progress was made in the design and construction of boilers. A second trial of steam began at Beavertail in 1881. The Service installed an up-to-date steam plant, with duplicate boilers and two ten-inch whistles. Mariners hailed the new signal as a great improvement, as indeed it was. The new boilers had ample capacity and could quickly put the signal in operation when fog appeared. The whistles were much larger than their predecessors.

In 1888 another improvement to fog signal technology evolved, and improvement of great interest to the mariner. The Service adopted the Crosby automatic fog signal controller, and one of the first was installed at Beavertail. The Crosby controller used a small amount of steam from the boiler to accurately time the sounding of the fog signal. The new controller made it possible to provide an accurate characteristic of the signal. This was a boon to mariners, especially when navigating in an area where there were several signals, all perhaps sounding simultaneously. By having an accurately timed characteristic (length and frequency) the mariner could determine where a signal was coming from and which light station was producing the signal.

At the turn of the century, there was a renewed competition between steam and compressed air to power fog signals. In 1900 Beavertail was fitted with the new compressed air siren. For Beavertail this was an innovation both in the method of producing the sound and the power to produce it. The siren consisted of a moving plate or cylinder, both of which were slotted. As the moving part rotated at high speed, it alternately opened and closed the slots many thousands of times per minute, setting up air vibrations known as sound. This new installation was also the first time an internal combustion engine had been used at Beavertail. Oil engines had just become sufficiently reliable to be accepted by the Lighthouse Service.

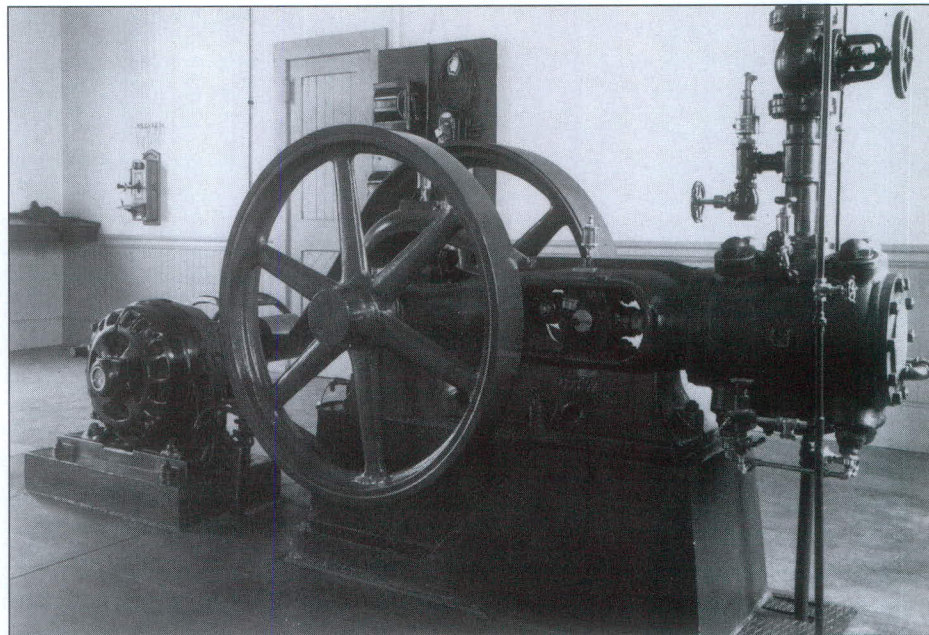


Keeper Power

Typical coal or wood fired steam boilers in a fog signal building. These massive boilers were usually installed in duplicate to ensure a source of power was always available for the fog signal. During usual period when fog may suddenly come on the scene, the boilers were kept "banked" (a smoldering fire which could rapidly be brought to full blaze). USLHS photo circa 1910.

Eventually, electric motors were installed to drive the air compressors. Sirens were employed until the Beaver-tail fog signal was discontinued.

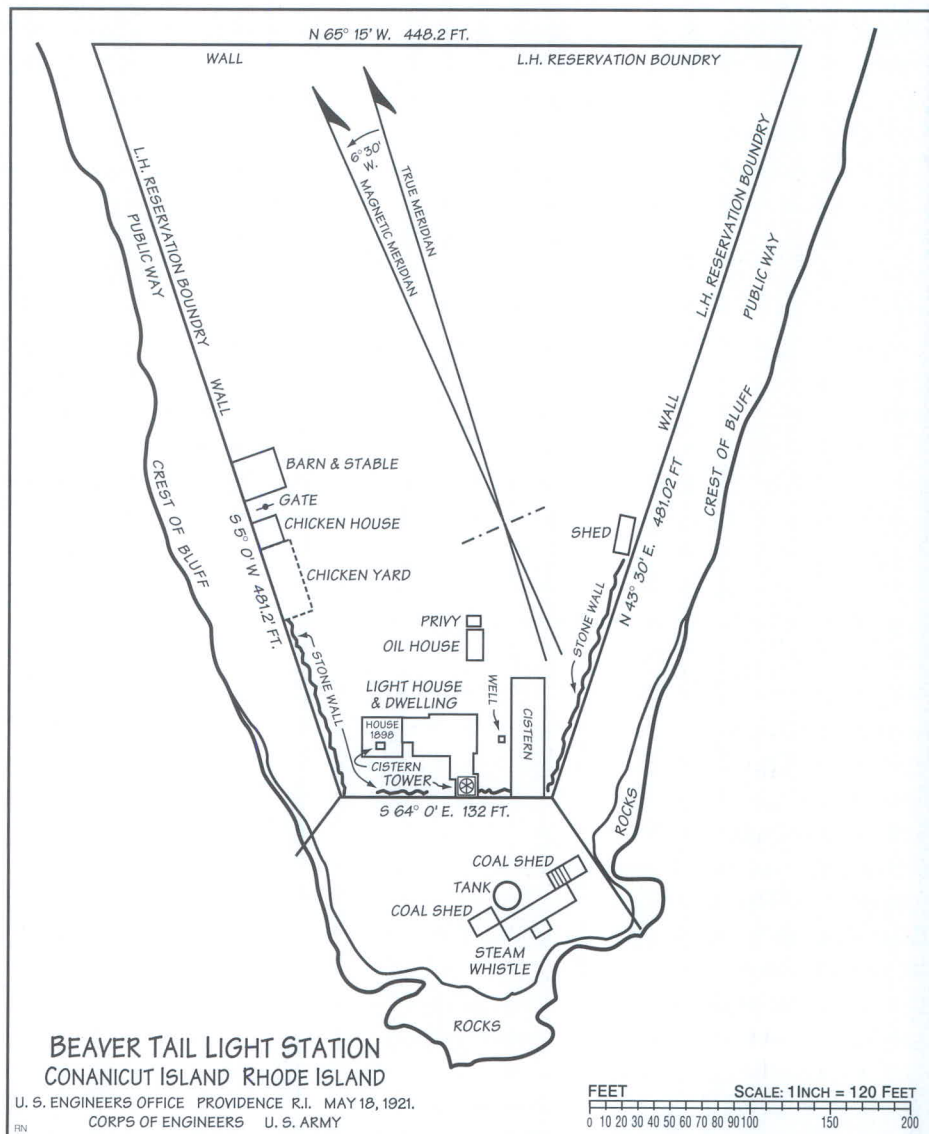
In 1981, Beavertail State Park was opened following acquisition of acreage used for military purposes during World War II. The Coast Guard continues to operate the light as one of ten that are active on Rhode Island waters. The keeper's house is occupied by a caretaker. The assistant keeper's house, empty since 1972, received exterior renovation soon after the park opened, but the interior remains unfit for public use. The Rhode Island Parks Association is planning to renovate the assistant keeper's house as a maritime museum, with exhibits on the nautical and natural history of Beavertail Point. A traveling exhibit on Rhode Island's lighthouse will be installed here once the building renovation is completed.



The electric motor, at left, powers this large air compressor. Air is pumped into huge air reservoirs and a timing device releases air at intervals to sound the fog signal. USLHS photo circa 1930.

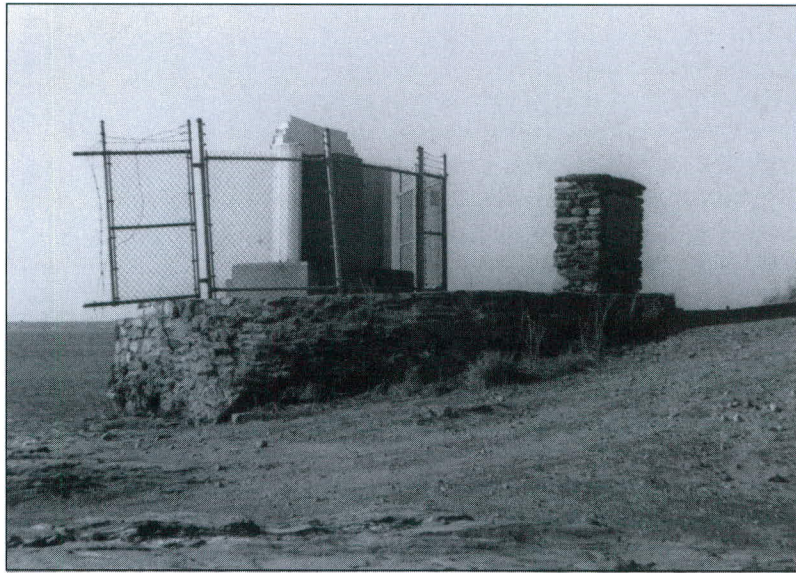
In 1981, Beavertail State Park was opened following state acquisition of this and other military sites in and around Narragansett Bay. (Today, the nearby Dutch Island lighthouse today is also part of the resulting Bay Islands Park System.) Through the efforts of the nonprofit Rhode Island Parks Association, the Beavertail Lighthouse Museum was opened in 1989 in what had been the deteriorating Assistant Keeper's House. (This building was added to the station in 1898 to house the additional personnel needed for the upgraded fog signal.)

The lighthouse and museum crown a spectacularly beautiful site, facing the open Atlantic to the south, Newport to the east and Narragansett to the west. Thousands come to enjoy the site year-round, to explore the fascinating granite outcroppings and tidal pools, to fish, picnic, or simply to contemplate nature. The nonprofit Beavertail Lighthouse Museum Association now maintains the Museum in cooperation with the R.I. Division of Parks and Recreation and the U.S. Coast Guard. Last summer nearly fifty volunteers kept the Museum open to visitors seven days a week, from Memorial Day to Labor Day, and weekends until Columbus Day. More than 12,000 visi-

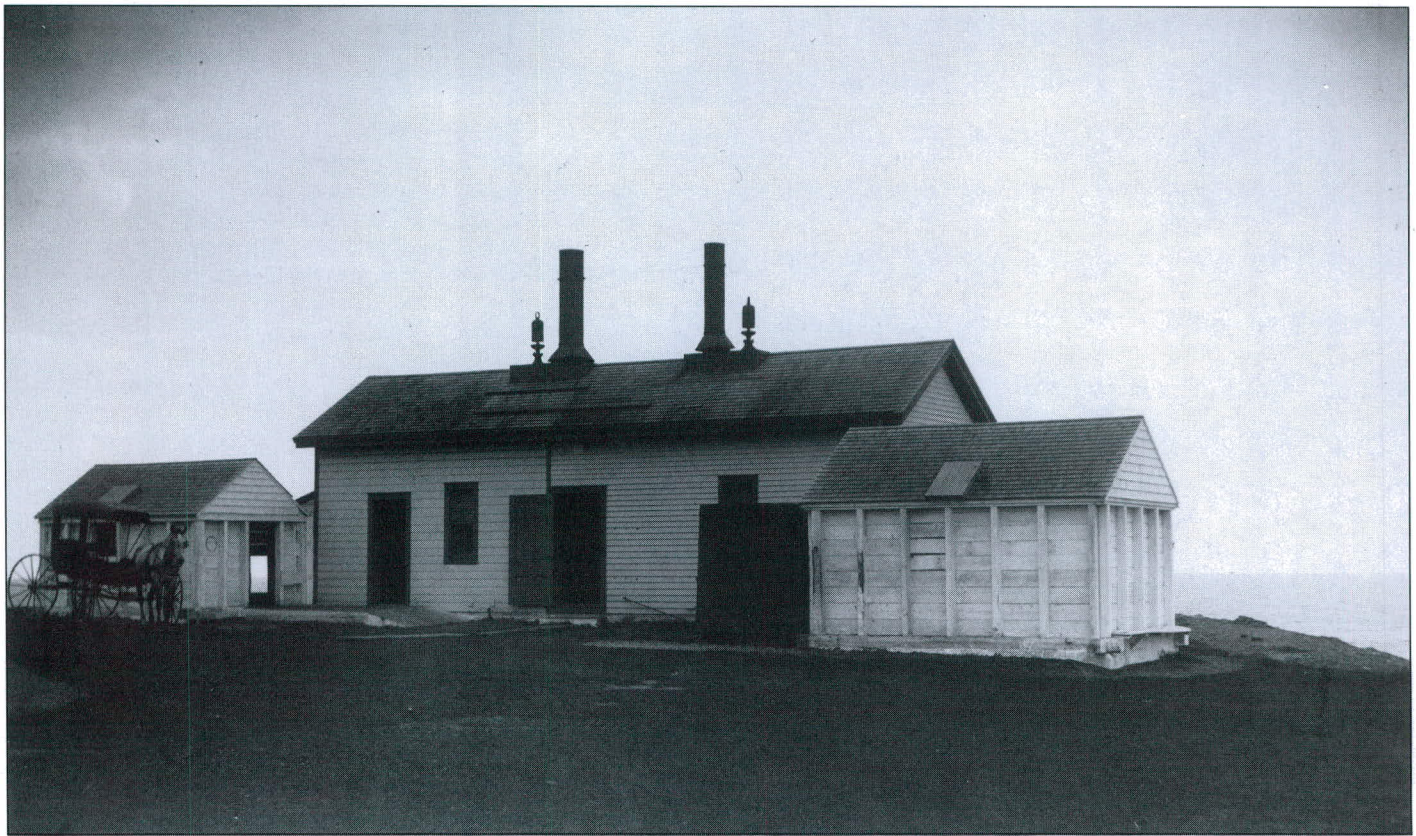


tors stopped by to enjoy the exhibits on the navigational history, natural history, and oral history of Beavertail and other Rhode Island lights.

Building improvements continue. A recent grant from the Champlin Foundations will make possible the restoration of the original red roof, the fond wish of Henry Armbrust, the first President of the B.L.M.A., in whose memory it will be dedicated. A back room will also be renovated to house a complete set of wooden Rhode Island lighthouses made and donated by former Coast Guardsman Robert Dennis, as well as an expanded gift shop. Donations to continue this work will be gratefully accepted, and can be mailed to B.L.M.A. P.O. Box 83, Jamestown, RI 02835. (Beavertail T-shirts may also be ordered, \$8 for children's sizes, \$10 for adult sizes, plus \$3.00 for postage and handling.) For up-to-date information on summer Museum hours, phone (401) 423-3270.



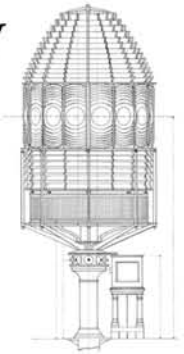
Above — The rubble foundation of the original Beavertail tower now supports a modern electronic sound (fog) signal. The squat object at right is a plaque informing the visitor of the fact. Photo courtesy of Sarah Gleason.



The Beavertail fog signal building supporting dual steam whistles. The building at right is probably the coal house. Note the buckboard at left. Photo probably taken by Clarence Stanhope prior to 1900. Newport Historical Society photo courtesy of Sarah Gleason.



Join the U.S. Lighthouse Society Today or Give the Gift of Membership!



Restoration & Preservation



Thomas Point Shoal Lighthouse, MD

The U.S. Lighthouse Society has donated to many lighthouse preservation projects throughout the U.S. Most recently we were honored by being presented with the Preserve America Stewardship Award from The White House for our restoration work at Thomas Point Shoal Lighthouse.

*To learn more visit
www.uslhs.org
or
call Headquarters at
415-362-7255*

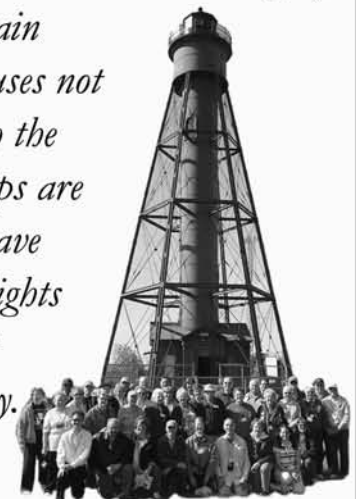
Help Support Our Important Mission!

Education



The Keeper's Log magazine is the only one of its kind and has been published quarterly since 1984. Receive this award-winning publication as a benefit of membership.

The Society organizes domestic and international lighthouse tours. Many of our excursions gain access to lighthouses not normally open to the public. These trips are a great way to have fun, see lots of lights and learn about lighthouse history.



Tincum Lighthouse, NJ