

29.45:9

Clemson University



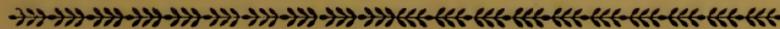
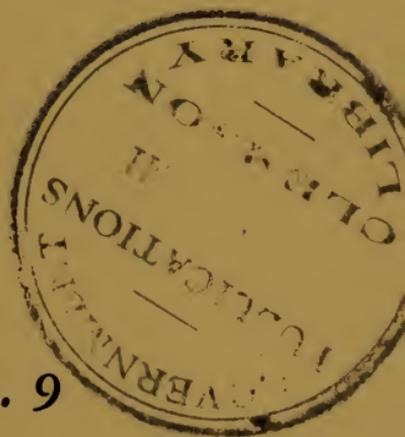
1604 019 801 184



# Wharf Building of a Century and More Ago

**NATIONAL  
PARK SERVICE  
POPULAR STUDY  
SERIES**

*HISTORY No. 9*



For sale by Superintendent of Documents, Government Printing Office, Washington  
Price 10¢

NATIONAL PARK SERVICE  
POPULAR STUDY SERIES

*History No. 9*

# Wharf Building

of a

# Century and More Ago



1941

UNITED STATES DEPARTMENT OF  
THE INTERIOR, HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE, NEWTON B. DRURY, *Director*



*Salem Customhouse (1819), from a drawing by Samuel O. Smart*

# Wharf Building Of a Century and More Ago\*

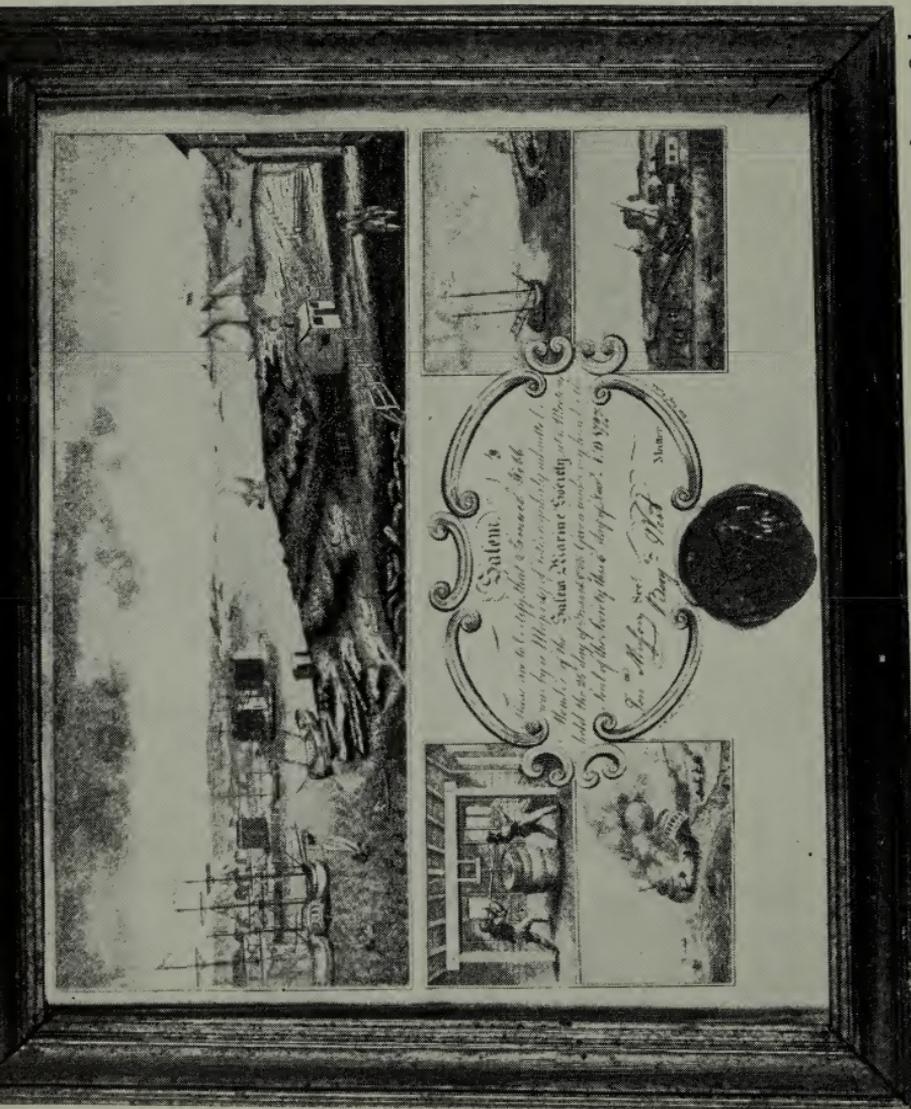
*By Edwin W. Small, Superintendent, Salem Maritime National Historic Site, Salem, Massachusetts.*

WHARVES appear to have been regarded as commonplace by our predecessors and their construction as an ordinary occurrence. It is much more difficult, therefore, to obtain information about them than to find out about the more exceptional things, for, when compared to the building of such a direct means to a livelihood as a ship, the construction of a wharf must have appeared incidental and definitely of less concern and interest. Yet wharves were essential to the use of ships, and today their ruins are sometimes the only physical indication of past maritime activity. The ships which brought wealth and prosperity to Salem disappeared long ago, but here and there along the waterfront the remains of old wharves survive as witnesses to the heyday of sailing ship commerce.

Notable survivals on Salem Harbor are Derby Wharf and Central Wharf, now part of the area of more than 6 acres comprising Salem Maritime National Historic Site, Massachusetts. The National Park Service has made extensive repairs to both these wharves. In that connection attention has been directed in general to old time wharves and every effort has been made to get as much information as possible from the scanty sources bearing upon them.

---

\* From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. III, No. 6, December 1939, pp. 8-13.



This certificate of membership in the Salem Marine Society, issued in 1797, shows Salem harbor as it had appeared the year before. Part of Derby Wharf, with warehouses, is seen at the left, and the end of Central Wharf (then Forrester's Wharf) appears at the extreme left corner

The first detailed reference to wharf building which has been found appeared in 1840 in the *Merchants' Magazine and Commercial Review*, edited by Freeman Hunt.<sup>1</sup> It is an article describing the manner of constructing wharves along the New York waterfront. Briefly, the type described is a pile bulkhead formed by rows of wooden piles driven close to each other, then backfilled with earth and covered with plank. Wood appears to have been used to the exclusion of other building materials, the explanation being offered that "Wood is so plentiful in America that to repair, or even construct, works in which timber is the only material employed is generally regarded as a very light matter. . . ." The same type of pile-lined wharf, with "more attention . . . by the builders to the durability of the work," is attributed to Boston. But Boston also had wharves constructed of timber cribs, timber bulkheads, and walls of stone. In fact, wharves using these structural devices may have been the rule rather than the exception. A paper published in the *Transactions of the American Society of Civil Engineers* in 1923,<sup>2</sup> which touches on the early wharves of Boston, includes descriptions of timber cribs, timber bulkheads, and granite walls, but makes no mention of close-set piling as a prevailing type of bulkhead or wall construction.

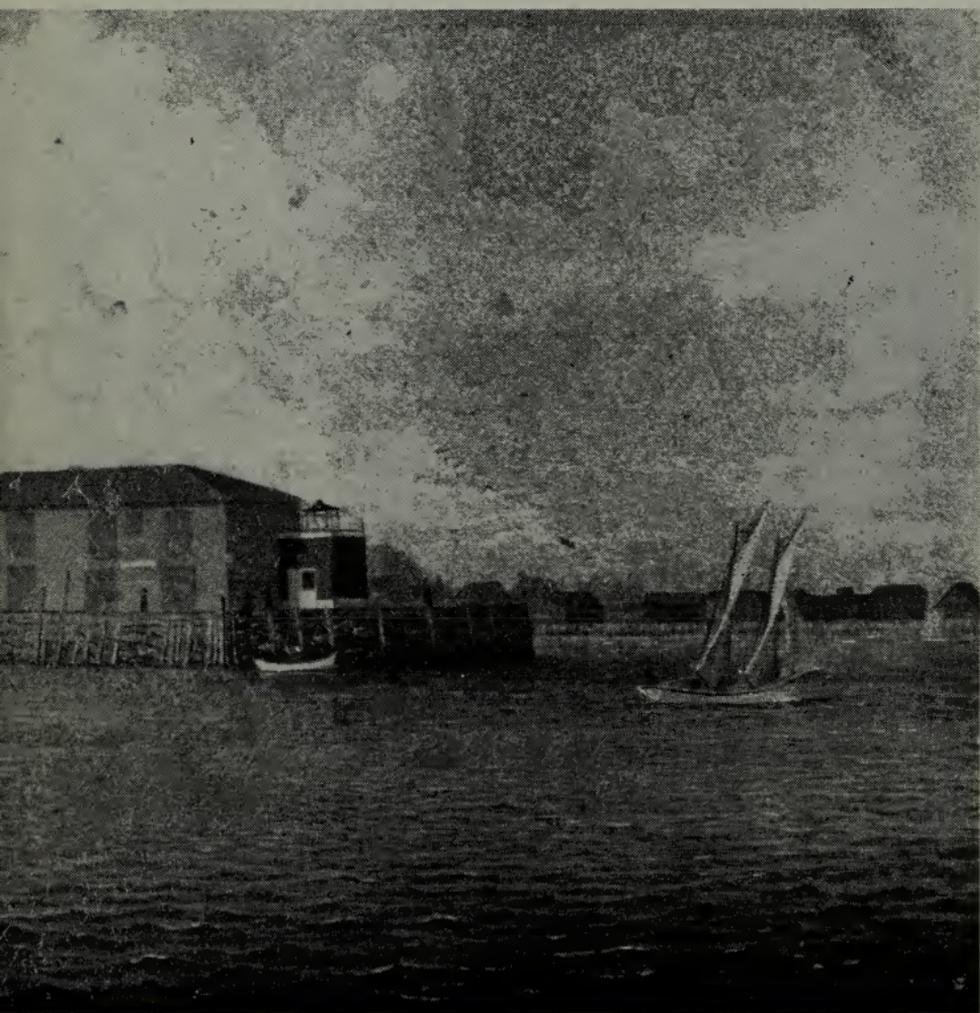
The type of wharf made of timber cribs or more specifically described in the above cited technical paper as "built of stone-filled timber cribs enclosing areas which were filled with earth," it is thought corresponds to what Dr. William Bentley, the indefatigable diarist, knew at Salem in 1819 as a "cobb" wharf. Bentley says that stone wharves which were beginning to be built about that time were a great improvement over "our other wharves of Cobb & liable to be hurt by every sea."<sup>3</sup> The "other wharves," he relates in another connection, "are built of wood, and sunken by rocks."<sup>4</sup> How the name "cobb" came to connote a wharf of timber cribs held down by rocks cannot be explained readily, unless it was derived from the use of cob or cobblestones to sink

the timber cribs. Although Dr. Bentley observed that stone wharves were being built at Salem by 1819, they most likely were constructed of beach or cobblestone and not quarry-cut stone. Wharves with walls of quarry-cut stone were not built much before 1830 at the earliest. Up to that time the stone used even in building construction appears to have been worked only from rock which lay on the surface of the ground. The deposits of Quincy granite had not been touched. All stone taken from Quincy or Braintree until then had come mainly from glacial



*Derby Wharf as painted by Porter Brown in 1879. The arrival of the*

boulders in the town commons. Quarries had not yet been opened because artisans had not devised tools that would work into the rock effectively. Charles Francis Adams, in his *History of Quincy*, says this problem was solved in 1803 when three men in the north precinct of Braintree succeeded in splitting a large stone by using iron wedges. After the effective use of the iron wedge had been demonstrated, quarries were opened in Quincy, but the new age of stone did not begin to flower until the Granite Railway was built in 1826.



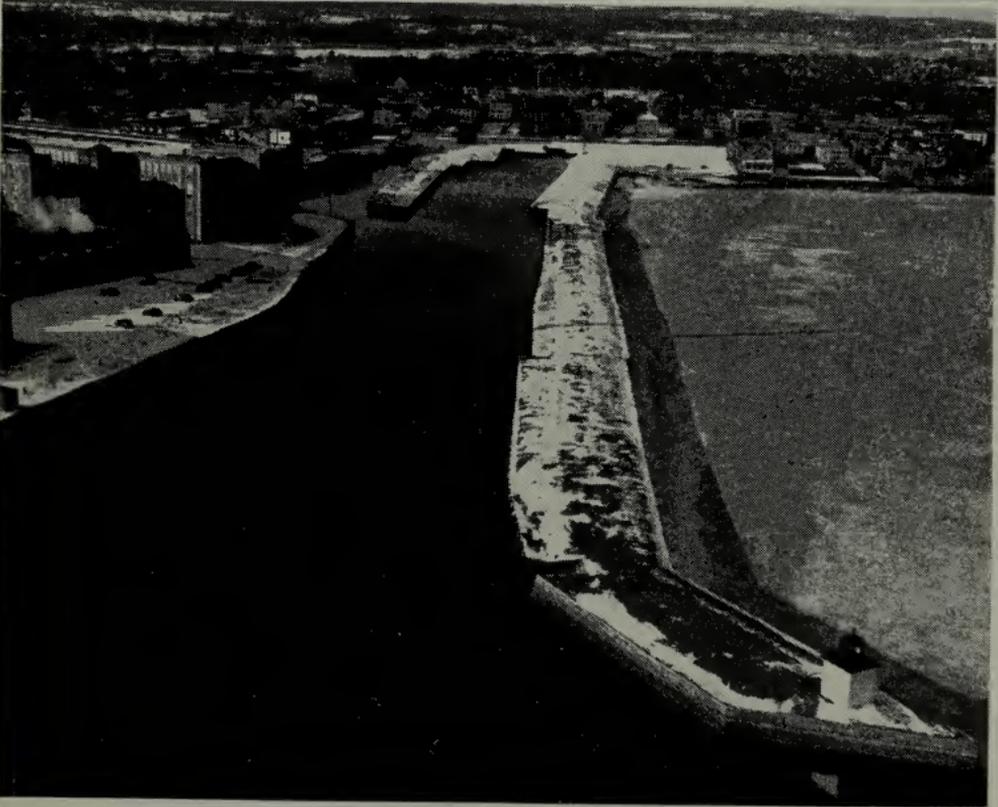
*indicates a timber platform built over a dislocated sea wall*

The Derby Wharf in existence during the business career (1762?-1799) of the great merchant, Elias Hasket Derby, was without doubt one of the "cobb" wharves which Dr. Bentley said in 1819 were the common type at Salem. A good part of Derby Wharf and the end of Central Wharf, then called Forrester's Wharf, are depicted in a scene dating from 1796. Both wharves appear to be entirely of wood, with fender piles resting against a facing of timber cribs (see upper illustration in certificate on p. 2).

Although this pictorial evidence points to a structure with facing built completely of wood, there are indications that stone also was used as facing on Derby Wharf before the days of granite quarries. In 1784, for instance, Bentley says Derby employed Joshua Phippen to finish the east wall of his wharf in stone at the bottom for a distance of 667 feet; and again, in 1800, 569 feet of the western side was repaired and faced with that material.<sup>5</sup> If these figures are correct, most of the length of the wharf that existed in 1800 had some stone on both sides, for an inventory of the estate of Elias Hasket Derby taken the previous year gives the total length of the wharf as only 760 feet and the width as 52 feet.

After the death of Elias Hasket Derby in 1799, the wharf came into the possession of his seven children. A plan of the lots on Derby Wharf drawn in 1805 shows the line of a pier running 1,124 feet from the south end of the wharf to the channel of the South River. Between 1806 and 1809 the proprietors of the wharf replaced this pier with a solid wharf at a cost of \$45,000, thus making the wharf almost three times as long as it had been before. The reason for extending it, as explained in a petition from the proprietors to the General Court, was "want of sufficient depth of water," and the expectation that the extension "would be highly beneficial to the trade of Salem and probably would lead to other important improvements."<sup>6</sup>

It is in the extension made between 1806 and 1809 that original walls, if any, survive in the wharf today. For a distance of 200 feet or more in the base of both the east and west walls, pieces of



*At the top is seen Derby Wharf before its reconstruction by the National Park Service. The view at bottom was made after completion of work*

split boulders and beach rock still are to be found. These boulders were split by fire or by wetting down wooden pegs or wedges inserted into the crevices of the natural rock. The stone obtained in this manner is distinguished readily by masons and keen observers from the irregular blocks of quarried granite that were introduced later to build up the sea walls and as materials for other repairs.

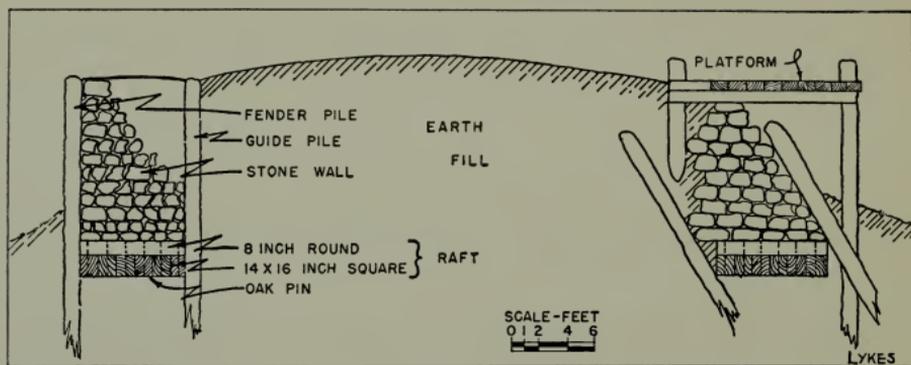
Study of evidence uncovered during the late reconstruction operations sheds some light on the methods of construction used when facing walls of stone were introduced. For the foundations of the walls large rafts were made of hewn timbers, 14 to 16 inches square and 30 to 50 feet long, fastened together with cross pieces of oak pins. The rafts were then decked over with 8-inch round timbers laid transversely and floated into position at high tide. Guide piles driven into the mud flats held the rafts in proper alignment and wall construction was started, the rafts settling into the mud as the wall increased in height and weight. The operation necessarily was slow and fortunately so, for by the time the wall had been built up to final grade, settlement of the foundation rafts most likely had ceased or reached a point where the burden of the wall could be borne safely.

It was not always possible, however, to hold in line the foundation rafts and the walls resting upon them. In some cases they floated away from their guide piles and settled out of position. Occurrences of this sort, it is believed, account for much of the irregularity now evident in the line of Derby Wharf. Sometimes, also, after a section of wall had been completed and the filling of earth placed behind it, the foundation slid outward because of the pressure of the fill against its back. A wall damaged by such movement was unsatisfactory as a berthing wall for ships, it being impossible to lay a vessel close enough to the top of the wall to load or discharge a cargo conveniently. To correct this condition, piles were driven just outside the dislocated foundation and a timber platform erected, one side resting on the wharf wall and the other carried by the piles. Two sections on

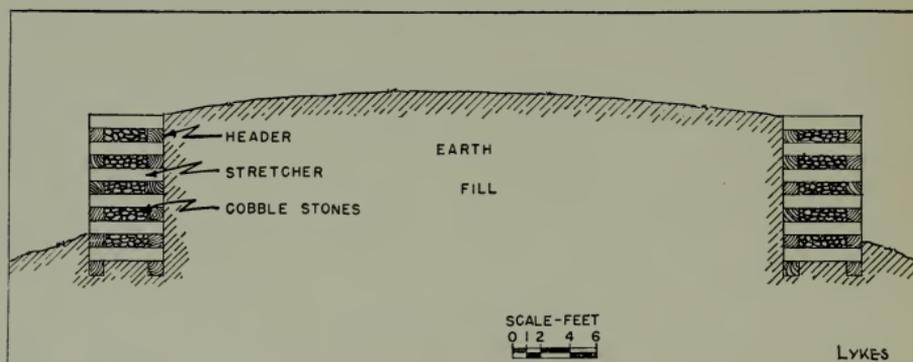
the west wall, each more than 100 feet in length, were affected by movement of their foundations in the above manner and, as indicated in a painting of the wharf done by Porter Brown in 1879 (see illustration), they were planked over in the way described. The type of structure thus evolved was not in any sense the product of planned construction; it was one of Yankee ingenuity faced with a bad situation.<sup>7</sup>

Timber cribs, formed by laying up timbers in alternate rows of headers and stretchers, have been mentioned as typical of the "cobb" wharves of Dr. Bentley's time. They were used in Derby Wharf and during reconstruction operations a year ago their remains were found frequently as buried obstructions back of the set walls. Evidence was found to indicate that the stone used to sink these cribs was sometimes secured to the bottom of headers by nails or wire, but probably it more often was simply loaded on top of the headers as fill back of the stretchers. After the face of the wharf was laid up in quarried stone, much of the older timber cribbing disappeared from view, but new cribbing was used in many locations as capping for new sea walls. This "cap cribbing" was less durable but lighter than stone and was, therefore, preferable as capping where walls rested on unsteady foundations or were not strong enough to carry a heavier capping. Unlike the earlier cribs, the later cap cribs were not always sunk with rocks but were nailed down with spikes and partly covered with the backfill of earth.

Central Wharf, built originally by the merchant Simon Forrester in 1791, offers none of the complex problems of construction and later changes of Derby Wharf. Disintegrated timber cribs lie buried behind the present wharf's timber bulkheads and beneath the hearting of earth. It was without doubt one of the "other wharves of Cobb" in Salem to which Bentley made reference in 1819. Like Derby Wharf, it did not escape changes and improvements; but instead of receiving sea walls of granite, it was given a facing of planks laid up against piling and held in position by tie rods running from side to side.



*Cross section of stone wall on sunken raft and (at right) a platform built over a dislocated wall*



*Cross section of cobb wharf*

## NOTES

<sup>1</sup> April 3, 1840, 313-314, 316.

<sup>2</sup> "Shore Protection and Harbor Development Work on the New England Coast," LXXXVI (1923).

<sup>3</sup> *Diary*, IV, 625-626.

<sup>4</sup> "Description of Salem," Collections of the Massachusetts Historical Society, 1st series, VI (1799), 228.

<sup>5</sup> *Diary*, I, 128; II, 469; *Derby Family Papers*, IX, 51.

<sup>6</sup> Massachusetts Archives, *Resolves—1805*, Ch. 118.

<sup>7</sup> For conclusions reached in the above and preceding paragraph the writer is especially indebted to *Completion Report, Derby Wharf*, F. P. No. 706, prepared December 1938, by Oscar S. Bray, Associate Engineer, National Park Service.

*National Park Service*  
*Popular Study Series*

- No. 1.—Winter Encampments of the Revolution.
- No. 2.—Weapons and Equipment of Early American Soldiers.
- No. 3.—Wallpaper News of the Sixties.
- No. 4.—Prehistoric Cultures in the Southeast.
- No. 5.—Mountain Speech in the Great Smokies.
- No. 6.—New Echota, Birthplace of the American Indian Press.
- No. 7.—Hot Shot Furnaces.
- No. 8.—Perry at Put in Bay: Echoes of the War of 1812.
- No. 9.—Wharf Building of a Century and More Ago.

