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BRONSON MUSEUM

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This is the Society's museum, 5th Floor of the 8 North Main Street Building, Attleboro, Mass. — Museum hours are from 9:30 to 4:30, Mondays, Tuesdays, and Thursdays. For special arrangements to visit on other days, contact the Director, Maurice Robbins, or the Curator, William S. Fowler at the Society Office, Bronson Museum, Attleboro, Mass.

The Museum includes exhibits of artifacts and seven dioramas portraying man's prehistoric occupation of New England. The displays are arranged so as to show man's development through four culture stages, from early post glacial times.

The most recent diorama extends 15 feet across the front of the museum. It depicts an Archaic village of seven large and unique wigwams as indicated by their foundations, excavated at Assowampsett Lake by the Cohannet Chapter. Human figures to scale make the scene come alive and help create what unquestionably is an outstanding addition to our ever growing museum displays.

ABORIGINAL DUGOUT DISCOVERED AT WEYMOUTH

CHESTER B. KEVITT

Editor's Note: As confirmation that the Weymouth dugout probably is a product of aboriginal times, reference is here made to a water color painted by John White in 1586, one of his many water colors, the first authentic pictorial records in the New World (Sir Walter Raleigh's first colony of Virginia). Reproduced for the first time in The New World, by Stefan Lorant, p. 189 it depicts Indians fishing from a dugout, which has a rounded end at both bow and stern, similar in all respects to the Weymouth dugout. While Virginia is somewhat removed from New England, nevertheless, there is reason to believe that the distance was not such as to deny contacts of some sort, which could have created similarities in dugout styling along the eastern seaboard.

Weymouth, or Wessagusset to use its Indian name, lies some seventeen miles southeast of Boston on Massachusetts Bay. Founded in 1622 by Thomas Weston, a London merchant and speculator, Weymouth is the second oldest settlement in the Commonwealth of Massachusetts.

The townspeople will long remember 1965 as the year its reservoir, the "Great Pond" went dry, a victim of the severe drought that plagued the northeast during the early 1960s. For more than eighty years, Great Pond has been the chief source of water for the Town. Located in the sparsely settled southern end of Weymouth, the natural beauty of the Pond and surrounding area has remained unspoiled since the early days of the settlement.

Geologically, Great Pond was formed some 12,000 years ago by the receding "Wisconsin" ice glacier that once covered New England. The Pond is roughly rectangular in shape, measuring slightly more than a mile in length and about a half a mile wide. A gently sloping shore descends to a saucer like bottom that is carpeted with granite boulders and debris left by the receding glacier. The Pond is

fairly shallow with a maximum depth of about 20 feet. Along the shore and clinging to the stones and boulders may be seen a brownish black porous substance known as limonite or bog iron. In colonial days the Town leased the digging rights of bog iron at the rate of 60 cents a ton. The ore was sold to the early foundries and forges in eastern Massachusetts. The principal source of Great Pond's water comes from the large swamp areas bordering along the southern and western side that drain into two streams, one at the extreme southeastern and the other at the northwestern end of the Pond. The Pond drains into Mill River that wends its way to Whitman's Pond — where the herring spawn each spring — and thence to the sea. Early records of the Town indicate that Mill River was once navigable for small boats.

Late in October 1965, the Weymouth Historical Commission was advised by Howard Crocker of South Weymouth that he had possession of an old boat found in Great Pond that he felt should be turned over to the Historical Commission. It seems that a group of boys exploring near the southern tip of the Pond were attracted by what appeared to be a water-soaked thick plank embedded in the mire some distance from the old shore line. The boys tried to pry the object out, but it was too firmly embedded to be budged. With Crocker's help, the mud was dug away and soon the outline of a boat began to take shape. Finally their efforts were rewarded and the boat was carefully removed from its muddy bed. Crocker and the boys did not realize it, but they had made a rare discovery. Revealed to their sight, intact and in remarkable condition was an aboriginal dugout (Fig. 1).

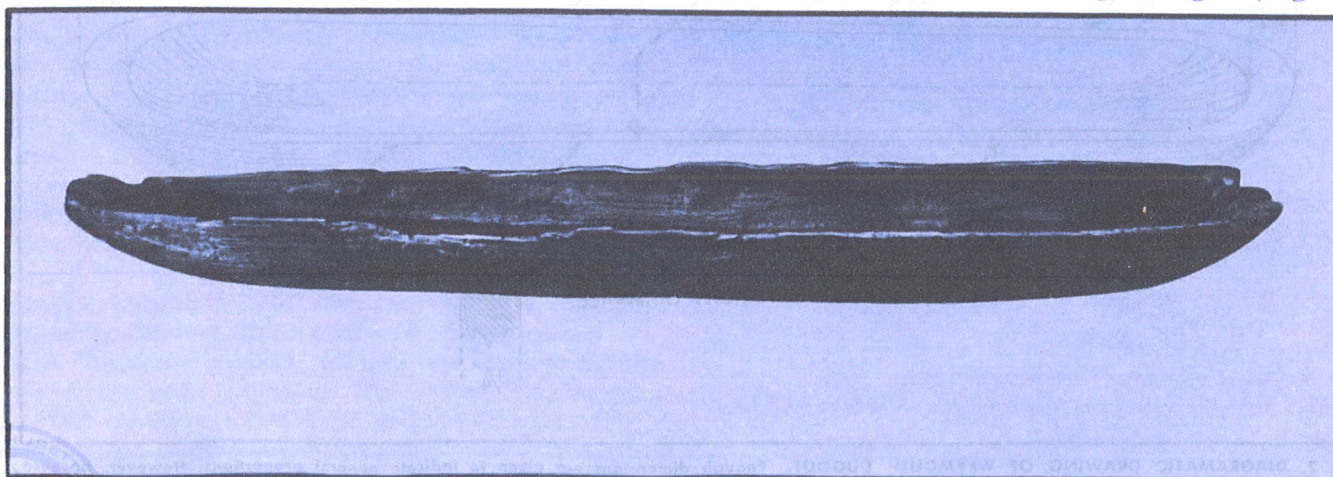


Fig. 1. WEYMOUTH DUGOUT. Note rounding of both ends, with the draught at the left-hand end appearing slightly less. Aboriginal stone artifacts found about Great Pond give credence to the dugout's source as being aboriginal.

Although we know that dugout canoes were extensively used by the Indians of eastern Massachusetts, few have ever been found. In fact, they are one of the rarest aboriginal items to be found in North America, chiefly because they were made of wood and wood cannot long survive exposure and dampness. The dugout discovered in Great Pond survived because it was buried in a protective coat of mud for centuries. In 1524, John Verazanus, the Florentine explorer, tells about these dugouts used by the Indians of Narraganset Bay. Also, Samuel Champlain in his explorations along the Massachusetts coast in 1607, observed the Indians building dugout canoes. In his journal he says: "The canoes of those who live there are made of a single piece and are very liable to turn over if one is not skillful in managing them. We had not before seen any of this kind, which are made in the following manner. After cutting down, at the cost of much labor and time, the largest and tallest tree they can find, by means of stone hatchets—for they have no others except some few which they received from the savages on the La Cadie, who obtained them in exchange for furs—they removed the bark and rounded off the tree except on one side where they apply fire gradually along its entire length; and sometimes they put hot pebbles on top. When the fire is too fierce, they extinguish it with a little water, not entirely but so that the edge of the boat may not be burnt. Being hollowed out as much as they wish, they

scrape it all over with stones which they use instead of knives. These stones resemble our musket flints."

The Historical Commission's immediate problem was to keep the vessel from drying out which would have been disastrous, causing the wood to check and possibly to collapse. The dugout was carefully removed from its original site and sunk in a small lagoon near the Pond's filter plant. Next, a call was put through to the Peabody Museum of Archeology and Ethnology at Harvard. Dr. William R. Bullard of the Museum was surprised and delighted by the news of the discovery. He immediately arranged to have it inspected by Dr. James Deetz, Associate Anthropologist at Harvard and the University of California. Dr. Deetz was on Sabbatical leave from the University of California to teach at Harvard and to direct the restoration work at Plimoth Plantations in Plymouth, Massachusetts. Within a few days, Dr. Deetz was at the Pond and his first reaction on seeing the dugout was to exclaim, "You have actually found one, no doubt about it." A thorough examination of the dugout disclosed that it had probably been made with stone rather than metal tools, strongly indicating aboriginal craftsmanship. Measurements of the dugout appear in an appropriate drawing by Joseph C. McCarten (Fig. 2). Further evidence of native workmanship was the blunt shaped bow and stern. In the early part of the 18th century, a few dugout canoes

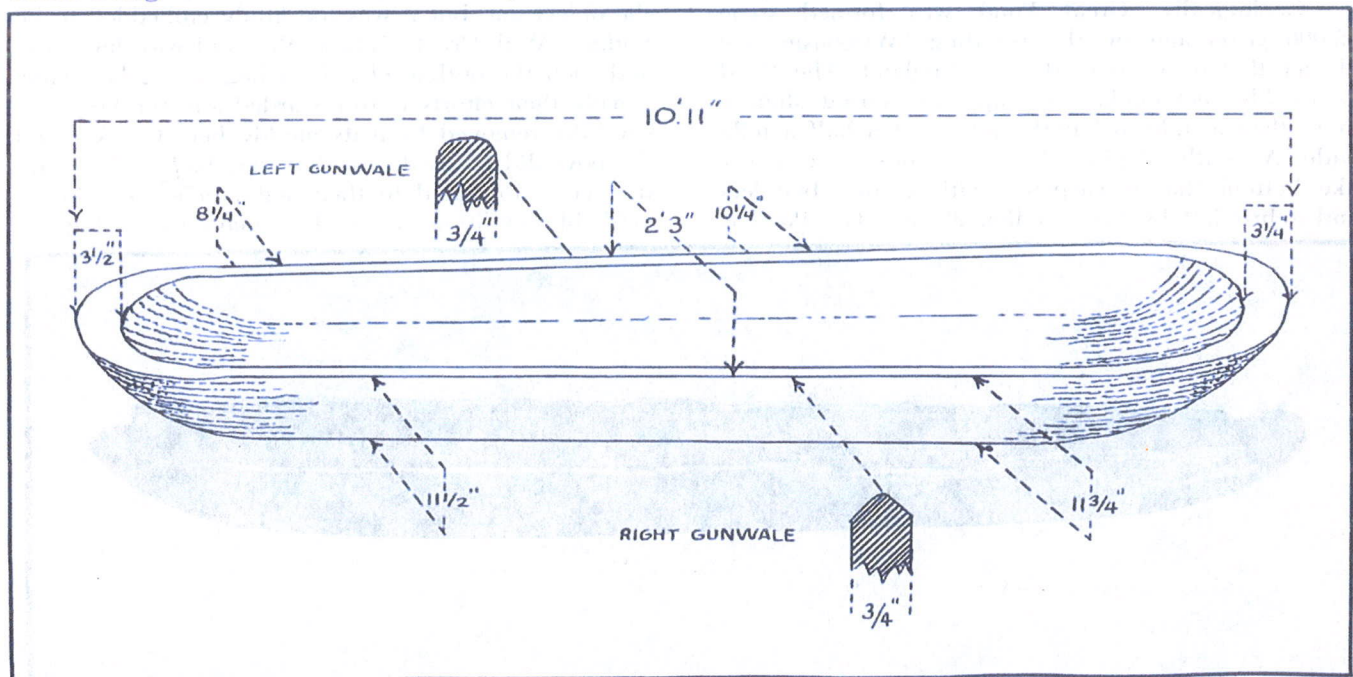


Fig. 2. DIAGRAMATIC DRAWING OF WEYMOUTH DUGOUT. Enough dimensions are given to indicate general proportions. However, because of the limitations of this kind of drawing, edges appear sharp, which actually are irregularly rounded on the dugout. Thickness of canoe walls varies throughout, suggesting hand work with crude stone tools.

were made by white settlers who copied the aboriginal design. However, they made one significant change, the bow was usually pointed or narrow, shaped after the European style. Definite confirmation of the dugout's aboriginal origin was established later when its age was determined by radiocarbon analysis.

Storage of the dugout in the lagoon provided an excellent but only temporary means of protecting the vessel from drying out. The immediate danger now was that Great Pond would go completely dry, thereby shutting down the pumps. If this happened with winter closing in, the danger of a freeze and ice damage to the vessel was very great. The first step was to design a water storage tank. Fortunately, this was no problem since one of the members of the Commission, Charles E. Adams, Jr., is an engineer and his talents were put to work. In a short time the design was completed and turned over to the Weymouth Vocational High School, who had agreed to construct it.

In the meantime the dugout was hauled from the water and a 30 gram sample of wood was taken from the hull and sent to the Geochron Laboratory in Cambridge, Massachusetts, for a radio-active carbon determination test; a sample was also sent to the U.S. Department of Agriculture's Forest Products Laboratory in Madison, Wisconsin, for identification of the wood.

While waiting for the storage tank to be finished, the Commission's attention turned to the problem of finding or devising a method that would permanently preserve the dugout and also locate suitable quarters to carry on this work. In considering possible methods of preserving old wood, Arsen Charles of Harvard's Peabody Museum pointed out that the Forest Products Laboratory, to whom a specimen of the dugout had recently been sent for identification, had done considerable research and experimental work in the field of stabilizing and preserving green and decayed wood. The Commission was also in touch with William Baker, Marine Engineer and designer of the Mayflower II now on exhibit in Plymouth Harbor. He had visited and was familiar with the method employed by the Swedish government to preserve the wooden warship WASA that capsized and sank in Stockholm Harbor shortly after it was launched in 1650. Discovered in 1956, the ship was found to be in remarkably good condition. The warship was raised in 1962, towed to a dry dock, and is presently being treated by a method devised by the Swedish government. As it turned out, both the Swedish government and the Forest Products Laboratory were using a sim-

ilar method of preserving old or archeological wood, utilizing "polyethelene glycol" as the preserving agent. Essentially, this process consists of immersing the wood in a solution of "PEG" for varying periods or until it is determined that the adsorption process is complete. The principal of the "PEG" process is the filling of the wood fibres by the wax-like "PEG". When air-dried, the former green or water-soaked wood retains its original shape, there is little danger of collapse, and shrinkage is held to a minimum. When the process is completed, the wood is found to be somewhat darker, and has a slight waxy feel to the touch.

On December 13th, the Great Pond went dry and the pumps in the filter plant were shut down. The Historical Commission was advised by the Water Department to remove the dugout immediately, as the lagoon was expected to freeze over. The following evening, four members of the Commission, braving a 15° temperature, raised the dugout from the bottom of the lagoon, carefully loaded it in a station wagon, and took it to the home of the Commission's Chairman where it was buried under a blanket of snow and wet leaves.

While waiting for the storage and treatment tank to be completed, the Commission continued its search for a suitable place to carry out the work of preservation. Fortunately, the new Tufts Library of Weymouth had recently been completed, and through the good offices of Mrs. Eleanor Cooney, Town Librarian, the Library Trustees made available a sizeable area in the spacious basement of the new building.

Early in January, results of the Carbon-14 tests were received from the Geochron Laboratories Inc. in Cambridge, Massachusetts (Sample No. GXO541.) Educated guesses placed it no earlier than the 18th century, however, the carbon test established the median age of the wood as 445 years plus or minus 100 years. In statistical language, the report says that the chances are two out of three that the tree from which the dugout was made, was cut down not earlier than the year 1405 nor later than 1605 with 1505 as the median year. "A recent study by Minze Stuiver of Yale and Hans E. Suess of the University of California," on the "relationship between radiocarbon dates and true sample ages," suggests that the Weymouth dugout may be older than the standard Carbon-14 test indicated. According to the study, the true calendar date of the dugout may be as early as A.D. 1450.

On the heels of the Carbon 14 test, the Historical Commission was informed by the Forest Products Laboratory that the dugout was made of eastern white

pine. This was somewhat surprising since its dimensions indicated that it was made from a tree of at least 10 feet in circumference, and white pine trees just did not grow that large, or so it was assumed. A little research revealed how wrong this assumption was. Donald Peattie, in his excellent book, *A Natural History of Trees of Eastern and Central North America*, points out that prior to 1650, white pine forests covered most all of New England westward to the area of Lake Michigan, including the southern tier of Canada. Stands of these trees included huge giants in size, branches often starting more than 80 feet above the forest floor, and records exist showing that many of these white pines grew to heights of 200 feet and more. To the early settlers, the vast forests must have seemed inexhaustible. Spurred by the demand for ship masts in England, as well as for building material in the colonies, these forests soon fell victim to the axe, since conservation was unheard of then. By 1650, the giant pines were all but extinct, and the white pine of today is only a stunted copy of its noble ancestor. Some idea of their former size can be seen in the "Bowdoin" pines near the campus of Bowdoin College in Maine.

Late in January, the Vocational School completed the storage tank, and it was moved to the basement of the Library. Here, the seams were caulked and the tank lined with polyethylene sheeting. The dugout was removed from its bed of leaves and snow, encased in a wooden cradle for safe handling, and taken to the Library where it was washed down and immersed in the tank. With the dugout safely under water, attention was again directed to its permanent preservation.

The method finally settled on was essentially the "polyethelene glycol" or "PEG" treatment used by the Swedish government and the Forests Product Laboratory. The latter had used it successfully on an 18th century water-logged French Bateau discovered in Lake George. Briefly, the method called for the immersion of the dugout in a 50 percent solution of "PEG." Through the generous cooperation of the Union Carbon Carbide Company, 1500 pounds of "PEG" in cake form, was obtained. Melting this down took some time due to the lack of proper equipment. However, with the makeshift aid of borrowed hot water, heating coils, and infinite patience, some 1400 pounds of "PEG" was finally melted. The adsorption

rate of the "PEG" was measured by the change in the specific gravity of the solution from daily hydrometer readings. By the 24th day, the specific gravity of the solution had stabilized, indicating that maximum adsorption had been achieved. Then the dugout was removed from the tank and allowed to air dry. In a few days, the surface moisture had evaporated, and except for being somewhat darker, its appearance was little changed. The notable difference was in the texture of the wood. The treated dugout was now firm and solid. However, prior to the "PEG" treatment, an experiment was made. A small sliver from the dugout was allowed to dry naturally. The dried specimen was almost weightless, and extremely brittle by comparison.

The number one enemy of "PEG" is high humidity. When relative humidity is near 85%, the "PEG" begins to liquify and leach out of the wood. The Historical Commission was made painfully aware of this danger during the summer of 1967. The dugout had at that time been air exposed for more than a year and was in excellent condition. The Commission was engaged in developing an exhibit room in the basement of the Library, and this project was well underway. As many will recall, July and August, were marked by prolonged periods of high humidity. The accompanying dampness in the exhibit area caused the "PEG" to start oozing out of the dugout. A plastic tent was hastily rigged over the vessel and pans of calcium chloride placed inside. This stop-gap measure checked the bleeding and soon after, a dehumidifier was obtained for permanent humidity control.

How successful was the preservation treatment? Only time can tell, but the Commission feels it was very good. In support of this contention is the fact that the dugout has now been air exposed for nearly two years, and there is no sign of checking, or other evidence of physical deterioration. The texture of the wood is the same today as it was shortly after the treatment ended. With reasonable care and attention, particularly with respect to high humidity, The Historical Commission has no reason to be pessimistic about its future physical condition.

Weymouth, Mass.
May 14, 1968

APPENDIX

1. *Weymouth Exhibit Room.* History and archaeology are not doorsteps to which people are likely to

beat a path except on rare occasions when an event or discovery captures the public imagination and in-

terest. Such was the case at the discovery of King Tut's Tomb and with the finding of the Dead Sea Scrolls.

Discovery of the dugout generated a wave of local interest, not only among youngsters, where anything Indian is exciting, but among their parents and elders as well. The Historical Commission was besieged with requests to see it, and bombarded with questions about it.

Mention has been made that space in the new Library was made available to carry out the work of preservation. Early in 1967, the Trustees of the Library went a step further and allocated this space to the Commission as a display area. Here was an ideal spot to develop a Town exhibit room where in addition to the dugout, artifacts and documents depicting the social and economic history of Weymouth and the area could be displayed.

Charles Adams, the engineering member of the Commission, designed the free-standing seven foot partitions necessary to enclose the area. These partitions were single paneled with 4 x 8' panels of homosote on the interior and plywood panels on the exterior. The interior homosote panels were ideal for mural work, or as an area for display cabinets, picture and poster displays, etc. Later, Mr. Adams designed a 16 x 7 x 7' glass paneled case to house and display the dugout. Both partitions and display case were built by the Weymouth Vocational High School. While these projects were under way, the Weymouth High School Art Department began the preparation of a series of mural paintings that would tell the story of the dugout from the selection of the tree in the forest through the various working stages to completion. The students, who participated in this project, visited the Bronson Museum in Attleboro. Here, William S. Fowler, Curator, gave them the benefit of his rich experience in the field of aboriginal culture. Habits, customs, tools, housing were explained. The students made many preliminary sketches of the

Museum's aboriginal artifacts later to be incorporated into the finished murals.

Late in June, the five panel murals were completed and moved to the Exhibit Room where they were sequentially mounted on the partitions. The professional quality of the murals must be seen to be appreciated — the most common remarks and the best compliments paid by people after seeing the students' work is: "I don't believe it."

2. *Keel Piece.* Near the excavation site was found a number of small pieces of wood that had apparently broken off from the dugout. In addition, a curved block of wood about two feet long was found nearby with nail holes and a rusted but identifiable nail head in its side. In appearance and shape, it resembled a "keel piece." Its discovery raised a number of questions with respect to its connection with the dugout, and whether it was of the same species of wood and style of workmanship found in the dugout. A sample was sent to the Forest Products Laboratory for identification, and back came the answer, "eastern hemlock." Dr. Deetz identified the nail as similar to the ones used in the early 17th century. In addition, the "piece" definitely showed the marks of metal tools and the style was more European than aboriginal. All of this evidence strongly indicated that the dugout had had a long life, and probably had passed through a number of hands subsequent to its original aboriginal source. Somewhere along the line, the keel piece may have been attached to protect the bow from damage when run up on the stony shores of Great Pond.

3. *Discoverers of the Dugout.* The following boys from South Weymouth found the dugout and with the assistance of Howard Crocker of South Weymouth, removed it from the Pond and turned it over to the Historical Commission: Donald and Jeffrey Campbell, Daniel Doyle, Paul Garvey, and Richard MacDonald.

