
Lynn Harris

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Description
The purpose of this multi-year project is to conduct historical and archaeological research in the waterfront area of the three Georgetown area plantation sites – Richmond Hill, Laurel Hill and Wachesaw. This season of work was devoted to recording a large barge located in proximity to Laurel Hill. The primary goal was to document architectural features which would reflect the carpentry techniques used by the builders and the possible function of the vessel. Limited surface artifact sampling was conducted to provide some insights into activities and date ranges associated with the local riverine area. This project was also intended as an opportunity for the Sport Diver Archaeology Management Program to teach volunteer sport divers about concepts in underwater archaeology, barge construction and documentation methodology. Divers from around the state assisted in all aspects of the project which ranged from simple surveying tasks, keeping field log books, search techniques, excavation, hull documentation, artistic renderings of the site and hull components, artifact cataloging and assistance with production of the final report. An equally important goal was to establish a good working relationship with the sport diver community which could be of great future value to the state.

Keywords
Excavations, Sport Diver Archaeology Management Program, Barges, Underwater archaeology, Waccamaw River, Plantations, Georgetown County, South Carolina, Archeology

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The Waccamaw-Richmond Hill Waterfront Project 1991:
Laurel Hill Barge No. 2.

by

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University of South Carolina

Research Manuscript Series 214
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Cover photograph courtesy of Mr. Mackie Hill, Middleburg Plantation.
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ABSTRACT

The purpose of this multi-year project is to conduct historical and archaeological research in the waterfront area of the three Georgetown area plantation sites - Richmond Hill, Laurel Hill and Wachesaw. This season of work was devoted to recording a large barge located in proximity to Laurel Hill. The primary goal was to document architectural features which would reflect the carpentry techniques used by the builders and the possible function of the vessel. Limited surface artifact sampling was conducted to provide some insights into activities and date ranges associated with the local riverine area.

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ACKNOWLEDGEMENTS

The Underwater Archaeology Division of the South Carolina Institute of Archaeology and Anthropology is very grateful for time and assistance devoted to this project by volunteer divers and non divers from around the state. Hampton Shuping deserves special recognition for initiating the project, his organizational skills in co-ordinating the fieldwork, high standard of archaeological recording and dedicated approach towards encouraging amateur archaeology in the state. The volunteer sport divers - Don Stewart, Steve Kelsay, Daryl Boyd, Butch Lishka, Patrick Harris, Debbie Lesser, Jan Mallindine, Donnie Edwards, Steven Lindsay, Wayne Martin, Miller Ingram, Wally Ketron, John Peace and Richard Burdine - can be recommended for efficiently and enthusiastically taking on any task that they were assigned even in adverse diving conditions. Many thanks to Amy Lewis and Dale Boyd who assisted in topside duties.

The drafting expertise of Daryl Boyd and generous donation of drafting equipment to the Sport Diver Archaeology Management Program was greatly appreciated. Assistance with the fieldnote transcriptions and inking for this report by Butch, Daryl and Hampton was a great help.

I would also like to thank colleague David Beard for his frequent assistance in the field and ideas about the site, Carl Naylor for his thorough and unforgiving editing of this report, Mark Newell for providing background information on barges, Jonathan Leader for conserving a rice hook recovered from the site, and my supervisor - Christopher Amer - for his encouragement and approval of this weekend project.
INTRODUCTION

In 1990, local sport divers Hampton Shuping and Don Stewart reported four wooden barges* in the Waccamaw River to the South Carolina Institute of Archaeology and Anthropology (SCIAA) at the University of South Carolina in Columbia. Dock structures and concentrations of artifacts were also found by the divers in proximity to the wrecks. In December 1990, staff from the Underwater Archaeology Division conducted a preliminary assessment of the barges and concluded that historically this had been a high-use riverine landing area by the local plantations and deserved further investigation.

Hampton Shuping, who had previous experience in working on avocational archaeology projects with MADA (Marine Archaeological Divers Association) in Florida, suggested documenting the barges would be a good opportunity to initiate a co-operative sport diver/archaeologist field project. As the main focus of the recently established Sport Diver Archaeology Management Program, a program within the Underwater Division, is education and collaboration with the local sport diving community, Hampton’s request was favorably received and this site was selected for a pilot project to train volunteers in underwater archaeology recording methods.

The project is intended to be a multi-year effort to conduct historical and archaeological research on the waterfront area of the three plantations with which the barges are likely to be associated - Richmond Hill, Laurel Hill and Wachesaw (Figure 1). The first summer season of work conducted from May to October 1991 concentrated on recording the largest and most complexly constructed barge dubbed Laurel Hill No. 2. The primary goal was to document the architectural features that could provide information about carpentry techniques used by the builders and some insights into the possible function of the vessel.

As barges are a type of watercraft that played an important part in South Carolina’s plantation economy and riverine transportation system, these wrecks are viewed by the author as integral components in the archaeological and historical record linking land and water. Therefore, activities that took place on plantations, such as agriculture, boat building, and the use of barges for specific tasks, are addressed in this report on the first season of work on the Waccamaw River.

*Barges are also referred to as lighters, flats and scows in the historical literature.
Figure 1. Rice Plantations on the Waccamaw River
THE ENVIRONMENTAL SETTING

The Waccamaw River flows parallel to the Atlantic coastline from North Carolina to South Carolina where it enters Winyah Bay near Georgetown. Flowing across the Coastal Plains of the Carolinas the river acquires discharge from the Lumber, Pee Dee, Black and Sampit rivers. This creates an extensive estuarine environment. The narrow peninsula of land between the river and the ocean in South Carolina is known as Waccamaw neck. Richmond Hill, Laurel Hill and Wachesaw plantations are located in an area of sandy bluffs and widened bottomlands on the eastern edge of this peninsula (Figure 2).

While the Waccamaw River is affected by the bay configuration at Georgetown, there is little salinity in the vicinity of the plantations. The primary effect of Winyah Bay is a 3- to 6-foot tidal fluctuation. This tidal fluctuation and the presence of extensive bottomland environments provide a fertile setting for the production of crops like rice.

As the Waccamaw River area environmental setting has been described in other SCIAA Research Manuscript Series Reports (RMS) this topic will not be covered in depth in this report (J. Michie 1984: 1-18 & J. Michie 1987: 13-26).
Figure 2. The Waccamaw River
HISTORICAL BACKGROUND

Agriculture in the Waccamaw Area

These Waccamaw plantations were the most productive in the Georgetown District. Along the river banks enormous growths of cypress and live oak were cleared by the plantation workers for establishing ricelands. Live oak and yellow pine also proliferated some way back from the river and represented another economic source for the plantations. Yellow pine was a prized source of building timber and also provided a large amount of naval stores such as turpentine, tar, pitch and resin. Live oak was the best and most durable ship building timber in the South. A variety of small subsistance crops such as oats, peas and potatoes were grown in addition to rice, the largest commercial crop. Potato crops yielded abundantly, often as much as 400 bushels per acre. Fruits did well in the Lowcountry's tropical climate, particularly the Scuppernong grape. Sorgum and sugarcane grew readily and a few families made their own syrup (Georgetown Enquirer, February 16, 1881:3). Salt production from nearby salt marshes, for example in the vicinity of Murrells Inlet, was also an additional source of income (MSS 1863, H.H. Wilson).

The Waccamaw River was a historically important shipping route from Georgetown to the inland settlements and plantations in the northeastern part of the state. The delta-like environment in the lower reaches of the river was affected by the movement of tides which tended to flood and form swamps. This was excellent for the cultivation of rice, a primary agricultural activity along river during the 1700's and 1800's. Rice plantations extended all the way from Winyah Bay to Horry County. Wachesaw and Richmond Hill plantations, located approximately 25 miles upstream from the coast, have a rich and varied history that began in 1731. Richmond Hill became a rice plantation in about 1810, but Wachesaw did not start rice production until 1849 or 1850 (J. Michie 1990: 17).

Rice agriculture was very labor intensive and the Waccamaw plantations had large slave communities. In post Civil War years towards the end of the nineteenth century, the prosperity of the rice plantations began to decline. This was attributed primarily to labor problems. Workers demanded what plantation owners considered to be high wages - as much as $8 per month and rations (Georgetown Enquirer, February 3, 1881). Hurricanes in 1813, 1820, 1822, 1834 and 1854 also caused a tremendous amount of damage to plantations and the property of the planters like wharves and boats (R. Bridwell 1982: 46 & 47).
The Waccamaw River and Plantations:

The plantations on the Waccamaw River were strategically located in terms of the cultivation of rice, the production of salt, the overland transportation of goods from ships at Murrells Inlet and the riverine trade and visitation to and from the port of Georgetown. If these plantations had been situated any farther upstream they would not have had the benefit of tidal effects of the river which created the fertile swamps for growing rice, the salt marshes and assisted the propulsion of watercraft which relied on poling, sails or oars (Figure 3). In a deep river, like the Waccamaw, rowing and sailing, rather than poling, were the more practical means of propulsion. In shallower rivers, like the Pee Dee, boaters poled watercraft over the sandy shoals. Primary hazards for the Waccamaw watercraft were snags caused by floating or submerged debris and running aground, often for a number of days, when the river was low (E. Pringle 1922:317 & 359).

Boating to the plantations from Georgetown took approximately seven hours, a day or a night trip, which was hastened or slowed by prevailing wind or tidal conditions. In a letter to his wife, a Conferedate soldier named H.Wilson describes a boat trip on the Waccamaw River to Laurel Hill plantation:

Al McDow and myself left (Georgetown) on Monday morning at 10 for a place called Laurel Hill (near to which is the salt works of Colonel Jordan)....We had a delightful trip...., every half mile along the river were the magnificent rice farms and splendid residences... Up to this time, the passage was very tedious, as we were working against the tide without wind, but soon after a fine breeze sprung up and we had delightful sailing. We arrived at Laurel Hill at about 4 o’clock where we met Col. Jordan the proprietor of the place and salt works. He took us to his house and treated us with all the hospitality of a South Carolinian. I found the family quite intelligent, and also plain and unassuming in their manners...After leaving Laurel Hill at 7 1/2 o’clock we made good time for a few hours, having the advantage of an ebb tide, but soon a stiff breeze arose, which being a head wind against the tide, made the water very rough, and slow travelling, as a sail was of no advantage. We had to depend on the oars entirely, and with only two of us to row 25 miles, made but slow time. At times the water was so rough that the boat had to go sideways... Sometimes the bough where I was sitting would be three feet out of the water. But we arrived safely at 2 o’clock in the morning, and since getting a sound nap, I feel quite well, and well paid for my adventure (MSS 1863, HH Wilson).

It is evident from this letter that Laurel Hill was owned by Colonel Jordan in the 1860’s. During the 1700’s, documents indicate that it belonged to Anthony Mathews
The Allston family owned Richmond Hill until 1825 when it was sold to Dr. John D. McGill. Wachesaw Plantation was owned from the 1700's onwards by Capt. John Murrell and his descendants. Little is known about John Murrell. The current coastal town of Murrells Inlet, which lies on the original tract, bears his name (J. Michie 1990:26, 27).

Although the rice plantations on the Waccamaw River were associated with great wealth and visited by many travellers and celebrities, the very climate and environment that was so favorable for rice cultivation was a great hardship for the families who lived there. Most plantation owners, like John McGill, spent only the winter months on the plantation and escaped to the seashore at Debordieu, Pawley, Magnolia, the interior of the state, or the mountains to get away from the heat and mosquitoes during the summer (Georgetown Enquirer, February 16, 1881: 3). Visitors to the plantations also complained of the snakes and alligators on the river. It was believed that an alligator would attack a man who ventured near the water. As Seldon Huntington, a missionary who undertook a trip up the Waccamaw stated, "My very entrails shudder at the thoughts of such monstrous creatures (alligators)...I felt very anxious to get away from all the snakes and alligators. We tied the vessel to a tree when the tide met us and the next day, Friday, we got down among the the rice plantations where the country is very pleasant and handsome plantations with houses and Negro villages." (MSS 1831, Seldon Huntington).

Evidently it was a relief and pleasure for travellers who undertook the Waccamaw River trip to reach the plantation homes. Despite the wealth and comfort associated with these settlements, the utilization of this harsh environment was a response to an important agricultural market in the 18th and 19th century. This economy was intimately linked with the water and therefore the utilization of watercraft.

Boats and Boat Building

Each plantation family owned a fleet of flats, rowboats and dugout canoes (E. Pringle 1922:14). These watercraft were used for transporting agricultural produce, people and livestock. The plantation possessions listed in will of William Waties Jr., registered owner of the "Lorrill Hill" property from 1725 to 1736, included "123 slaves, 16 horses, 55 head of sheep, one pettiauger, 1 ferry boat, five canoes, 1 set of surveying instruments, half ownership in a sloop..." (L. Drucker 1980:1). Flats or barges are specifically mentioned in documents relating to the Waccamaw plantations for tasks such as taking the framework for the house at Richmond Hill across the Waccamaw, carrying furniture and supplies to Laurel Hill and to seaside summer residences, and for transporting people and cargoes of rice to the mill (C. Joyner 1984: 73 & 82; E. Pringle...
Barges were also used for important social occasions such as attending church services and wedding parties (E. Pringle 1863: 39). On one occasion guests were "rowed home from a plantation wedding by slaves as far as twenty miles up the Waccamaw, keeping time to their rowing as they improvised songs in honor to the bride and groom." In 1819, James Monroe cruised down the Waccamaw to Georgetown "on one of the plantation barges" which was decorated for the occasion and rowed by eight negro oarsmen dressed in livery (C. Joyner 1984: 128 & 5). During the Civil War, when southern ports were blockaded, barges on the Waccamaw were used to transport salt and rice upriver to the railroads (E. Pringle 1922: 27).

The size of a barge also appears to have been a significant factor in relation to use. The larger barges were used for tasks such as harvesting rice and moving people and goods, whereas smaller ones were used for ferrying laborers across the river, for carrying rice seed, mud for breaks and other light work (Doar 1935: 34). Barges carrying rice and other important cargoes were often decked over as protection against the weather. There is also mention of securing protective fabric covers or awnings on barges. In the smaller, open decked barges the cargo was liable to be damaged (E. Pringle 1922: 27 & 29).

Plantation watercraft were often built by slave craftsmen using hand tools such as the saw, plane, axe, adze, hatchet, auger, chisel and drawing knife. Carpenters felled great cypress trees in in the swamps which "measured 3 and 4 feet at the butts." These trees were then hewed into 30 to 40 feet planks and taken back to the plantation by water. The construction of a flat is also described in Doar (1936: 34):

These flats were made bottom upward, so that the planks could be put on, and when finished they were pushed into the water and turned over. To do this they had an ingenious method, which was to take the flat out to the river, carry it to a deep place, fasten one end to the bank, at right angles to it, anchor or tie the other end in the stream to another flat, then throw mud on the one side the whole length until that side sank and the other rose. The force of the tide would then catch and whirl it over. It was then baled and the flooring put in and head and foot timbers.

Good slave carpenters were in demand and were even able to hire out their services off the plantation, provided they paid their masters a portion of their income. In 1854, a good hired carpenter was paid $120 to help build a house. To gain some idea of the buying power of this sum of money at that time - a horse, a valuable commodity, cost approximately $60 and a boat cost $30. Carpenters were trained by master craftsmen in
large carpenter shops on plantations. The chief carpenter usually took on four or five apprentices at a time. A slave, Thomas Bonneau, was the chief carpenter for Robert Allston on Richmond Plantation. Bonneau was very proud of his apprentices and claimed that he did not turn out 'jack-legs', a term used to describe mediocre craftsmen. Other talented slave carpenters of note who were from plantations on the Waccamaw River were Renty Tucker from Hagley Plantation, Richmond from Woodbourne Plantation, Hardtimes Sparkman from Mt. Arena, and Welcome Beese of Oakland (Figure 4). Plantation barges and other items associated with rice agriculture, like flood gates, were made in the carpenters shop (E. Pringle 1922: 14). Slaves also became skilled shipyard workers and carpenters in the shipwrights trade and presented a competitive cheap labor force to the many free white shipwrights who thought that the lower wages of the slaves were unfair (R. Fleetwood 1982:41&42).

As slaves in South Carolina were from West Africa, also a riverine environment where boats and boatbuilding were necessary, it has been suggested that carpentry skills associated with the West African tradition are also likely to have been imported by the slaves to the state (M. Newell 1992: pers. comm.). Not only did slaves build the plantation boats, but were also responsible for their use and care. Boats were a valuable and essential commodity to the plantation and were kept sheltered from the sun during the day and locked up at night (C Joyner 1984: 72 & 73).

European boat building influences, particularly Scottish, Irish and English, are also likely to be evident in the watercraft built in South Carolina. Well known colonial Carolina shipbuilders such as John Rose, Robert Wells, John Imrie, James and William Begbie and Daniel Manson came from these areas (R. Lambert 1987: 27). If slaves were working in shipyards supervised by builders such as these, it is also likely that they acquired European boatbuilding skills.

Further archaeological investigation into the manufacture and use of the Waccamaw wrecks could potentially provide some further insights into the carpentry skills of the builders and activities that were conducted on certain types of boats.
FIELDWORK

Sport Diver Participation

One of the important fieldwork objectives of this project was to train volunteer sport divers in underwater archaeological techniques, specifically small craft documentation. This training was undertaken by staff from the Underwater Archaeology Division, most frequently the Charleston Field Office staff, the author and David Beard. Hampton Shuping also played a leading role in co-ordinating and directing project activities. During the course of the project a total of twenty five divers from across South Carolina (and a few from out of state) participated in the work. All of the diving was done over weekends. Work boats were provided by sport divers and SCIAA. All the sport divers paid their own expenses incurred by travel, food, equipment and air. SCIAA staff provided professional advice, training and specialized equipment like water dredges. All artifacts recovered by sport divers were kept by SCIAA for documentation and conservation.

Diving tasks during the project were delegated according to the number of diving volunteers present that day, their diving experience or particular skills, and work duties that were planned in advance. Weekly conferences between the author and Shuping determined work objectives and assignments for divers who indicated that they would be diving on the project the following weekend. Usually about eight sport divers were present. The core group was Don Stewart, Steve Kelsay, Daryl Boyd, Butch Lishka, Debbie Lesser, Celinda Marshall and Richard Burdine. On occasion there were also non-divers such as Dale Anderson and Amy Lewis who helped with topside duties. All divers and non-divers enthusiastically and efficiently took on any task that they were assigned (Figures 5-8).

Methodology

When we initially selected barge no. 2 as our project site for the season, we were totally oblivious to the complexity in its design. The fact that numerous timbers were disarticulated, the port and starboard sides were not symetrically built, sediment from the river bank had pushed in the port side, and visibility was generally near zero made diving and understanding the site a challenge even for experienced river divers. All new project participants were given a site orientation dive before starting work operations. A down line ran from the small bay where we beached the dive boats directly to the site (Figure 9). We tried to make tasks as simple as possible and to orient divers with familiar features on the wreck such as the knees. The strength of the current was unpredictable and this frequently made taking long measurements or setting floats difficult. However, by the end of the
season we had established methods to conduct these tasks with as much accuracy as possible.

Since recording conditions were not ideal, no attempt at full documentation was made. Only enough data was gathered to provide a general understanding of the site and construction of the barge (Figure 11). To assist new divers, underwater recording forms designed by Shuping showed measurements to be taken on particular features (Figure 12). Initially, gross measurements were taken of the length and breadth of the vessel and header logs. External measurements included the chine log, upper strakes and plan view of the stern header log. The slope angle of the extant ramp was also documented (Figure 13). Internal recording was undertaken on the lodging and standard knees, keelsons, midship thwart cross-section and framing members. Locations of scarph joints on the keelsons were documented. Disarticulated members, the bow header log and a standard knee, were recovered and recorded in detail aboard the SCIAA pontoon boat before being re-deposited on the site (Figures 14 and 15). The drawing of the header log was complemented by a photo-mosaic (Figure 16). Average dimensions for various structural members such as frames, keelsons, and ceiling and hull planking were taken (Figure 17). Wood samples were also taken from these components. The identification of these samples still has to be undertaken.

Water dredges were used to remove accumulated bank sediment from the internal port side of the barge to clear the chine area for further documentation. Dredging operations were halted when a large mass of burlap in the aft port section of the barge was exposed. Dredge spoil was sorted by topside volunteers aboard the dive boat. All artifacts were recorded and transported back to the Charleston Field Office.
Figure 5. Steve Kelsay and Mark Newell Prepare to Record the Angle of the Chine log using a Measuring Device Designed by Steve
Figure 6. Butch Lishka Holds the Bow Header Log
Figure 7. Archaeologists, David Beard and Lynn Harris, prepare to dive with Debbie Lesser, an upstate sport diver.
Figure 8. Darryl Boyd Drawing A Recovered Timber
Figure 9. Location of Laurel Hill Barge No. 2
Figure 11. Barge Construction
LAUREL HILL BARGE NO.2
PLAN VIEW OF STERN HEADER LOG

NOTE: DRAW ANY NOTABLE WOOD GRAIN OR TOOL MARKS

A:
B:
C:
D: ___ DEPTH:
E: ___ DEPTH:
F: ___ IS "F" THE SAME ALL THE WAY: YES: ___ NO:_

MEASUREMENTS IN METRIC

NAME OF RECORDER: ____________________________
DATE: ______________

Figure 12. Underwater Recording Form Designed by Hamp Shuping
Figure 13. Angle of Extant Stern Ramp
Figure 14. Field Drawing of Disarticulated Bow Header Log by Daryl Boyd
Vessel Construction:

The barge was relatively large in comparison to others recorded in South Carolina to date. The overall length was 17 meters (55 feet 9 inches) with a beam of 4.75 meters (15 feet 7 inches). Chine-log hull construction was a similarity shared with other smaller barges recorded in South Carolina (M. Newell 1991: 6&7). Newell hypothesizes that although chine-log construction (also referred to as "chine-girder" construction in the literature) was an ancient European method, it may have been re-invented in Colonial America. Vessels were built using two halves of a single split cypress log to form the two principal structural elements of the hull sides. The log, usually of extreme diameter, was split and carved out to form the chine of the vessel. As large cypress logs were already in use by the indigenous population for dug-out canoe construction by the burn and scrape method, it can be speculated that the expanded dug-out and chine log barge of the historic period were both African and European adaptations of these aboriginal watercraft.

The hull sides of this particular barge each consist of a chine log, upper strakes and a gunwale strake. Each chine log had a distinctive gradual shelf in the stern corners for the placement of two lodging knees (Figure 18). In contrast to the usual architectural symmetry associated with boat construction, the upper hull strakes are uneven sizes. On the starboard stern area two side strakes are scarphed together (Figure 19). The port side has three upper strakes above the chine log. The starboard side only has two upper strakes. This suggests that the builders may simply have used available plank sizes. Plank replacement during the later life of the vessel is also a consideration.

Like other barges, this one has multiple keelsons - in this case four each made up of three scarphed sections (Figures 20 - 23). The ends of the keelsons are tenoned into mortises cut into the header logs at the bow and stern. The recovered bow header log still retains one outer natural surface with the bark left intact (Figure 14). Some researchers consider it to be somewhat unusual for European boat building carpentry where all surfaces on timbers were conventionally shaped and sided. This suggests that this barge was more likely to have been built by a carpenter of African tradition where non-functional surfaces did not have to be worked down for stylistic reasons (M. Newell 1992, pers. comm.). All the keelsons run through a midship thwart (Figure 24). A sister keelson runs parallel to one of the central keelsons from the midship thwart to the bow (Figure 20). Another small thwart piece connects these two keelsons. The reason for this structural reinforcement is unknown. Perhaps a heavier cargo was loaded in the front of the barge. There is also the possibility of a structural weakness in one of the keelsons which was not apparent to us during documentation.
Figure 16. Photomosaic of the Bow Header Log
<table>
<thead>
<tr>
<th>Components</th>
<th>Depth (profile)</th>
<th>Width (Plan View)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frames</td>
<td>9 cm</td>
<td>15 cm</td>
<td>65-70 cm</td>
</tr>
<tr>
<td>Keelsons</td>
<td>10 cm</td>
<td>21-23 cm</td>
<td>17 m</td>
</tr>
<tr>
<td>Outer Hull Planks</td>
<td>3.3 cm</td>
<td>23-25 cm</td>
<td>varied</td>
</tr>
<tr>
<td>Ceiling Planks</td>
<td>1-2 cm</td>
<td>26-32 cm</td>
<td>varied</td>
</tr>
</tbody>
</table>

Figure 17. Table Showing Average Dimensions of Structural Components.
Figure 18. Placement of Lodging Knees
Figure 19. Port Side Showing Scarph Joining the Strakes
Figure 20. Plan View of the Barge Showing the Four Keelsons.
Figure 21. First Section of Keelson No.1
Figure 22. Four Sections of Keelson No. 4
Figure 23. First and Fourth Sections of Keelson No. 3
Ship-like features such as small framing members, knees (lodging and standard), and ceiling planking are present. Ten small framing members, spaced 1.55 meters (5 feet, 1 inch) apart, run the length of the vessel. The standard knee (which is a substitute for the fifth frame and sixth frame from the stem end) are situated closer to the adjoining frame with an interval of 55 cm (1 foot, 9 inches). This indicates that structural reinforcement was required midships. Further strength is provided by the midship thwart running between the port and starboard standard knees (Figures 25 & 26). Midship reinforcement in a sailboat is usually associated with the location of a mast step. In this instance it could be the location where oarlocks were mounted to facilitate structural strength necessary for rowing action.

The ceiling planking in the area aft of the midship thwart was more intact than the planking forward of the thwart (Figure 10). Observations of the sections of intact ceiling revealed that unfastened planks were laid on top of the keelsons and held in place by a single longitudinal chine strake. Each plank was rabitted at either end to fit under this loose chine ceiling strake. The chine ceiling strake was notched to receive the framing members. Loose fitted ceiling strakes, similar to the system used on many wooden vessels in the present day, would enable the barge crew to easily lift them and recover items in the bilge, bail out excess bilge water or check the seams of the outer hull planks for seepage. The reason that so much ceiling planking is missing or scattered on the site can be attributed to this method of loosely laying fitted strakes.

Two thole holes in the stem header log for retaining a sweep suggest that upstream end of the barge was the stem (Figure 27). The lodging knees which are also only present at this end are structurally, and possibly functionally, significant (Figure 28). The stresses created on the stem header log by the use of a sweep, acting essentially as a rudder, necessitated structural reinforcement in this area. Large holes in the center of each lodging knee might also be used to secure lines holding the sweep in position in much the same way as a tiller is secured by lines to cleats on the deck of a sailboat so that the vessel does not require constant manual attendance. This system would be convenient for a barge travelling with the tide for long straight sections on a river.

Treenails were used to fastened through mortise and tenon joints such as those at the ends of the keelsons (Figure 30) and to attach the chine logs and upper side strakes to the header logs (Figure 31). Treenails fasten keelsons, frames, lodging knees and standard knees to the outer hull planking and the chine logs. Cut nails fasten the toes of standard knees, the gunwale strake to the upper side strake and a small rubrail to an outer hull plank. Several square-headed (not wedged) loose treenails in the bottom outer planking were enigmas because they did not appear to attach any other structural members. A
plausible explanation at this time is that these are plugs that were used to drain excess water from the barge when the vessel was dragged or driven up onto a bank or log ramp.
Figure 24. Cross Section of the Midship Section
Figure 25. Artist's Conception of the Midship Section
Figure 26. Plan and Profile of Standard Knee at the Midship Section
Figure 27. Plan View of Thole Holes in the Header Log
Figure 28. Plan View of Lodging Knee
Figure 29. Attachment of Keelson to Header Log
Figure 30. Attachment of Header Log to Side Strakes
Artifacts

Several artifacts were recovered from the vessel and surrounding site during the dredging operations. Three excavation units along the interior chine of the port side were cleared of accumulated sediment from the river bank during this operation (Figure 31).

Unit A:
Brick fragments
Loose treenail
Oarlock (Figure 32)

Unit B:
Brick fragments
Large granite river cobble
Sewn leather shoe sole
Cut nail

Unit C:
Brick fragments
Chain
Coal
Historic ceramic sherd - Saltglazed stoneware with interior glaze (Albany ware mid 1800's)
Pre-historic pottery - Cordmarked (100BC - 1200AD)

Unit D:
A large mass of burlap or woven flax/hemp was uncovered during excavation of unit D. The fragility of the material and potential damage the dredging could cause resulted in a decision to halt the excavation in this unit. At a later date, a sample of this material was recovered from this unit for research purposes.

A number of non-aligned searches were also conducted in the vicinity of the barge. Attempts at aligned searches, circular and lanes, were abandoned due to the hindrance and dangers of accumulated vegetation and logs. A concentration of artifacts encountered by the divers in proximity to the wreck was buoyed and triangulated with compass bearings to landscape features (figure 34). Samples of surface artifacts from this concentration area were recovered to provide some insight into activities in the vicinity of the site and to compare with artifacts found in situ on the barge.
Figure 31. Excavation Units
Figure 32. Oarlock
Figure 33. The Rice Hook
Figure 34. Surface Sampling
Hardware:
3 rice cutters (1 complete with a wooden handle, 2 blade sections)
1 cut nail
2 bolts
1 door hinge
1 door knob

Historic Ceramics:
2 pearlware sherds (1 rim sherd with an annular design - 1780 to 1803, 1 rim sherd with blue and white transfer design - 1795 to 1840)
1 stoneware churn lid (one process hanging lid 1800's)

Glassware:
3 bottle necks (early 1900's)
2 bases (1 South Carolina Dispensary bottle - 1893 to 1907, 1 dark green bottle with a pontil base - mid 1800's)
2 complete bottles ( 1 half pint St. Pierce Smirnoff, 1 fruit juice bottle. Both 1900's)

Colonio-ware (1700 - 1800):
1 standing base
1 lipped rim sherd
1 plain sherd

Pre-historic pottery:
1 curvilinear complicated stamped sherd (1000 AD to 1720 AD)
1 linear punctate sherd (1800 BC to 500 BC)
6 rectilinear complicated stamped (100 AD to 1720 AD)

Organic material:
1 section of a cut coconut
Cutting hooks (Figure 35) such as those found in proximity to the barge are typically associated with agricultural activities. The presence of the burlap/woven flax raises a number of questions about its use and context. If it is in situ could it have been: a seating or floor mat, a sling for loading and unloading cargo, protection for stowed cargo or a part of the cargo? Again, there is always the possibility that it eroded out of the river bank and was deposited on the barge some time after the wrecking. The presence of a cut coconut shell is interesting. Coconut shells have recently been found on a number of other sites in South Carolina dating to the 1800's. As coconuts were not grown in South Carolina, it is likely it was among the favored fruits brought in from the Caribbean during the 1700's and 1800's.

CONCLUSIONS

Hypotheses about the functional or stylistic reasons for architectural details of this vessel will hopefully be substantiated with future barge studies on better preserved sites or perhaps even from revelations through historical accounts. While European, African or indigenous American carpentry influences are difficult to detect with any great certainty, documentary evidence does stress the role of the African plantation slave as a skilled carpenter and boat builder. European influences are likely as slaves were evidently learning construction methods in colonial shipyards during the 17th and 18th century. The hull construction of this large barge is unique in comparison to others found in South Carolina to date.

The craftsmanship and extremes taken to enforce structural strength in this vessel such as use of chine logs, knees and framing members (features not usually associated with barge architecture as well as the presence of ceiling planking), led to a number of possible conclusions about the function of the vessel. One explanation is that it was the plantation barge used for longer upstream and downstream river trips, for example to Georgetown, carrying heavier than usual loads of agricultural produce like rice. Ceiling planking covering the bilge would help keep the cargo dry. Alternatively, it may have been the high status barge on the plantation used by the planters and their families to visit other plantations or for social or shopping excursions to Georgetown. Comfort aboard the barge would be increased by the presence of ceiling planking and ship-like construction might be partly ornamental. A third possibility is that the builder of the barge had past experience as a shipwright and simply made the barge using ship-building techniques. Of course, ceiling planking may also be more prevalent on other barges than previously thought.
Loose fitted strakes are likely to be the first structural elements to disappear or be scattered around a site.

It is apparent that the artifacts found inside the barge such as the Native American pottery sherds probably eroded out of the river bank, rather than representing in situ cargo or personal items. This casts some doubt on the possibility of an in situ context for any of the other historic period artifacts recovered during dredging operations. Dates for the pre-historic pottery range from 100AD to 500 BC. Most historic period artifacts in the vicinity of the barge and recovered from the wreck date to the late 1700's to the mid-1800's. Glassware dates to the late 1800's and early 1900s.

This first field season of the Waccamaw project was a success in two respects. First, a great deal of information was generated about the architecture of this barge. Second, a group of sport divers gained a tremendous amount of training and experience in underwater archaeological recording techniques. These divers will be a valuable asset to the state's underwater archaeology program in the future where funds for long term projects in this discipline are minimal. The assistance and the support of the sport diver community is greatly needed if South Carolina's historic underwater past is to be properly preserved.
APPENDIX
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