2-1989

The Santee Canal Sanctuary - Part I

Joe J. Simmons III

Mark M. Newell

Follow this and additional works at: https://scholarcommons.sc.edu/mrd_pubs

Part of the Anthropology Commons

Publication Info
1989.
http://www.cas.sc.edu/sciaa/
© 1989 by The South Carolina Institute of Archaeology and Anthropology

This Paper is brought to you by the Maritime Research Division at Scholar Commons. It has been accepted for inclusion in Publications by an authorized administrator of Scholar Commons. For more information, please contact dillarda@mailbox.sc.edu.
The Santee Canal Sanctuary

Part I

Preliminary Archaeological Surveys of a Portion of the Old Santee Canal, the Biggin Creek Vessel and the Mouth of Biggin Creek, Berkeley County, South Carolina.

Authored By:
Joe J. Simmons, III
Field Archaeologist and Principal Investigator,
and
Mark M. Newell,
Project Director.

With Contributions By:
Christopher Amer,
Deputy State Archaeologist for Underwater
James Michie,
Archaeologist, SCIAA Research Division
William R. Judd, Research Associate.

Submitted By:
The Underwater Antiquities Management Program of the South Carolina Institute of Archaeology & Anthropology,
University of South Carolina
February, 1989.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>(iii)</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>(iv)</td>
</tr>
<tr>
<td>List of Figures</td>
<td>(v)</td>
</tr>
<tr>
<td>Management Summary</td>
<td>1</td>
</tr>
<tr>
<td>Project Areas</td>
<td>1</td>
</tr>
<tr>
<td>Environmental Summary</td>
<td>6</td>
</tr>
<tr>
<td>Background Research</td>
<td>9</td>
</tr>
<tr>
<td>Research Objectives &amp; Design Parameters</td>
<td>32</td>
</tr>
<tr>
<td>Methodology</td>
<td>34</td>
</tr>
<tr>
<td>Results</td>
<td>41</td>
</tr>
<tr>
<td>Recommendations</td>
<td>62</td>
</tr>
<tr>
<td>Appendix A: The Biggin Creek Vessel</td>
<td>65</td>
</tr>
<tr>
<td>Appendix B: The Biggin Creek Flatboat</td>
<td>81</td>
</tr>
<tr>
<td>Appendix C: The Stoney Landing House Site</td>
<td>85</td>
</tr>
<tr>
<td>Appendix D: Old Santee Canal; Memorandum of Agreement</td>
<td>105</td>
</tr>
<tr>
<td>Appendix E: Magnetometer Survey Technical Data</td>
<td>109</td>
</tr>
<tr>
<td>Appendix F: 38BK876; Management Summary</td>
<td>117</td>
</tr>
<tr>
<td>Bibliography</td>
<td>118</td>
</tr>
</tbody>
</table>
INTRODUCTION

The survey of the proposed Old Santee Canal Sanctuary - and subsequent excavations to be reported on in Part 2 - was a Project Director's nightmare. Let me hasten to add that the purpose of this introduction is to commend - not to complain. The development of a wildlife sanctuary from the remnants of an almost 200 year old canal has never before been attempted in South Carolina.

It took vision and imagination on the part of the State's Department of Parks, Recreation and Tourism to conceive of such a project in conjunction with the Santee-Cooper Public Service Authority. It took not a little courage for the designers and engineers to plan the venture - and for the contractor to take on the task of realizing the developer's plans.

To illuminate the problem in terms of our own, narrower perspective, I should explain that methodologies for archaeological survey work are well established for land sites and equally well for underwater sites, even though the latter is still a fledgling discipline. The problem was that the project in the Old Santee Canal was suited to neither land archaeological methods, nor those of underwater. The largest area of the undertaking, the remaining mile and a quarter (2 km) of the old canal bed, was filled with mud. Neither wet nor dry, the mud either defied most conventional data gathering methods, or made them far more cumbersome and complicated.

To make matters worse, the canal bed often filled with two to three feet of water. The presence or absence of water was not predictable as most tides are - the rise and fall was commanded mostly by the demand for power from Santee-Cooper's Pinopolis Dam. The Charleston Harbor tidetables could be used to predict tides in Monck's Corner by adding an approximate four hour delay, this would then be considered in light of weather forecasts to predict the likelihood of high heat or extreme cold - both factors which would boost the demand for power Statewide - and cause the floodgates at Pinopolis Dam to open. Add to this the fact that, being part of the national grid system, the Dam could provide power to some other distant hot or cold spot in the nation - and predicting the water levels in the canal became as arcane an art as astrology!

During our work the contractor was also busy fulfilling his commitments. It rapidly became apparent that he, too, was inventing his methodology as the project progressed. Conditions in the canal were always unpredictable but for most of the time the intended goal was the draining of the canal. An official assured us at one point that "dust would be blowing down the canal in two weeks." The constant battle against the water was finally lost and the final phases of the project were conducted beneath a meter of water.

The very nature of archaeology is to reveal the unknown - but the archaeologists engaged in this activity become unsettled when the methodology is as much a mystery as the answers they are seeking! As a result the field crew had to constantly change course and equipment - with consequent rapid change of plans by management and financial staff who had to generate the paperwork to make it all happen.

Yet in the end - the work was accomplished. In performing its small part in the process of development of the Old Santee Canal Sanctuary, The South Carolina Institute of Archaeology & Anthropology at the University of South Carolina takes much pride. The project preserves a small patch of our State's dwindling primeval swamplands, it provides a refuge for a rich and varied wildlife, it puts into our historical record the efforts of newly independent South Carolinians to lay the foundations of future world economic power - and all readily accessible to the general public. Best of all, in taking on this unusual project, those that conceived and accomplished it demonstrated that the vision and spirit of innovation that created the canal in 1793 is alive and well in 1988.

Mark M. Newell,
ACKNOWLEDGEMENTS

The authors owe thanks to a great many people for the various forms of assistance great and small that made the survey phase of the Old Santee Canal Sanctuary Project possible. While mentioning here only those that rendered especially notable assistance, it should not be assumed that the smaller but nevertheless significant services of others have been forgotten or are unappreciated.

Special thanks are due to our ‘client group,’ The Santee Cooper Public Service Authority staff led by Bob Petracca, Harvey Shumate and Pat Morris, The South Carolina Department of Parks, Recreation and Tourism staff led by Mr. Mike Foley and John Rogers, and their landscape architect, Ken Simmons, Jr. of Kenneth B. Simmons Associates. For them, the archaeology of the project was but a minor facet of a much larger challenge. They nevertheless afforded us much time, patience and understanding when the special needs of salvage archaeology were brought to their attention. Had this group not been sensitive to the need to preserve our increasingly fragile and tenuous tangible links to the past, a major segment of South Carolina’s heritage would have been lost to present and future generations.

Similarly, thanks are due to the many people in University and Institute departments who have to deal with the unusual problems that so often arise in underwater archaeology - and are far from the normal concerns of land archaeology and academia. USC travel and purchasing departments, in particular Mr. Marion Dantzler, are owed thanks for patient responses and assistance to constantly changing travel documents for field staff and the handling of emergency purchases in the field. Thanks are also due to Mr. Steven D. Smith, Deputy State Archaeologist and the SCIAA executive to whom UAMP reports. A land archaeologist, Mr. Smith was courageously supportive of actions and strategies sometimes foreign to the more precise and formal methodologies of his own meter. Thanks are also due to Mr. Christopher Amer, Head of the Division of Underwater Archaeology at SCIAA for his assistance with the Biggin Creek Vessel - a challenge he cheerfully accepted within weeks of his arrival at SCIAA from Parks Canada.

Several citizens of Moncks Corner, SC are also due recognition for their contributions to our work. The staff of Fort’s Hardware were especially helpful in procuring supplies and equipment they often did not normally stock. The staff of the Berkeley Motel were always patient and helpful - despite our almost constant sin of cancelling or changing reservations every time conditions in the canal worked against us. Special thanks are due Mr. Jackie Mims. The route to the southern end of the project tracked right through the backyard of his trailer lot on the edge of the tailrace. We were freely permitted to drive everything from cars to backhoes through his yard - and to lunch on his lawn - the only patch of clean grass amidst the mud and swamp.

It is an accepted fact that anyone quixotic enough to pursue a livelihood in the field of archaeology will be required to do too much labor for too little reward under less than ideal conditions. Even so, the authors would like to acknowledge the hard work and good humor of UAMP and SCIAA staffers who contributed to this phase of the project. The conditions of the work were such that the efforts of staff were most often above and beyond what would be normally expected. Archaeological Technician/Divers Peggy Brooks and Carl Naylor were usually the first to brave the foulest smelling mud encountered anywhere in the State so far. Archaeologist Tommy Charles rendered help wherever it was needed, especially in the operation of heavy equipment. Contract ‘Diver’ Ralph Ford proved especially valuable - his irrepressible energy, his great talent for invention, his warehouse of additional equipment and bottomless repertoire of anecdotes about life as a Navy diver saved many an otherwise unproductive or humorless day. Jamie Browne, administrative assistant at UAMP’s Columbia headquarters, was allowed but one visit to the project site. Condemned most of the time to work within the four walls of an office, she nevertheless cheerfully initiated and tracked the paperwork that kept the project running and did the final proofreading of this report.

Mark M. Newell,
Joe J. Simmons III,
March, 1989.
LIST OF FIGURES

Fig. 1:  Cordsville Quadrangle, USGS detail showing project location.................2
Fig. 2:  Map of survey Areas A, B, C, D.................................................................3
Fig. 3:  Flooded portion of the Santee Canal - typical environs.........................7
Fig. 4:  1775 map of Henry Mouzon's proposed routes for the Santee Canal..........12
Fig. 5:  Senf's "General Plan" of the Santee Canal..............................................13
Fig. 6:  Planned cross section of the canal from Senf's description......................16
Fig. 7:  Existing condition of the canal cross section..........................................17
Fig. 8:  Bateau descending the New River in Western Virginia............................23
Fig. 9:  "Santee Canal Boat" Alan Reese's lost illustration.................................24
Fig. 10: A cotton box at the Black Oak Lock....................................................24
Fig. 11: Large scale sketch map of Area A..........................................................35
Fig. 12: Large scale sketch map of Area B...........................................................36
Fig. 13: Magnetometer operations within the canal.............................................37
Fig. 14: Land magnetometer operations in Area B..............................................38
Fig. 15: Artist's impression of overall layout of Biggin Creek Vessel.....................39
Fig. 16: Plan of excavation units in Biggin Creek mouth...................................40
Fig. 17: Enlarged map of magnetometer survey Area A, Part 1..........................42
Fig. 18: Enlarged map of magnetometer survey Area A, Part 2..........................43
Fig. 19: Preliminary sketch of Target IV.2............................................................45
Fig. 20: Sketch map of location of Target IV.3....................................................46
Fig. 21: Preliminary sketches of unidentified wood construct, Target IV.3.............47
Fig. 22: Sketch of the Brunswick-Altamaha canal lock gate...............................49
Fig. 23: Sketch map of the tide-lock area.........................................................50
Fig. 24: Sketch of in situ quoins at south end of tide-lock.................................51
Fig. 25: Sketch map of location of the Boxmine Boat.......................................53
Fig. 26: Sternpost of the Boxmine Boat..............................................................53
Fig. 27: Map of tide-lock area and terrestrial features.......................................56
Fig. 28: Disassociated ship's timber (first futtock).............................................57
Fig. 29: Breasthook or structural timber..............................................................57
Fig. 30: Ashley Chapman prepares temporary stabilization of carved timber.........58
Fig. 31: Sketch of carved timber found during contractor dredging operations.....58
Fig. 32: Sketch of temporal range of hand & mechanised saw marks......................59
Fig. 33: Circular saw marks & creosote impregnation identify modern timber......60
Fig. 34: Trenching operations around perimeter of Boxmine Boat.......................60
Fig. 35: Backhoe trenching operations at Boxmine Boat site..............................61
Fig. 36: Sketch map of Biggin Creek Vessel environs........................................66
Fig. 37: Revised wreck plan.................................................................................68
Fig. 38: Elevation of Biggin Creek wrecksite.......................................................69
Fig. 39: Documentation on the site of the Biggin Creek Vessel.............................70
Fig. 40: Composite photograph of possible sheerstrake.....................................73
Fig. 41: Reconstruction of hull cross section.......................................................77
Fig. 42: Artifacts associated with the Biggin Creek Vessel.....................................79
Fig. 43: General sketch map of the flatboat site..................................................82
Fig. 44: Plan & elevation of the Biggin Creek Flatboat .......................................83
Fig. 45: Cross sectional views of the flatboat......................................................84
Fig. 46: Main House test pit locations, Stoney Landing Site...............................88
Fig. 47: Test pit profile data.................................................................................89
Fig. 48: Test pit locations at the Overseer's House.............................................96
Fig. 49: Test pit profile data...............................................................................98
Fig. 50 - 56: Magnetometric target charts......................................................110-116
MANAGEMENT SUMMARY

A proposed recreational and environmental/historical interpretive park has been planned by the South Carolina Department of Parks, Recreation, and Tourism (PRT) jointly with the Santee Cooper Public Service Authority for the land along the west side of the Tailrace Canal extending between US Route 52 and Stoney Landing in Berkeley County, South Carolina (Fig. 1). The Santee Canal Sanctuary, as it has been named, encompasses the southernmost ca. 2.0km (1.25mi) of the abandoned Santee Canal and Biggin Creek which essentially bisect the property longitudinally (Fig. 2).

Development of the park and related construction activities dictated that archaeological investigations be executed. A terrestrial archaeological survey was conducted in August 1986 and the results published the following year in a thorough report produced by Tommy Charles and James O. Mills (cited hereafter as Charles and Mills 1987) of the South Carolina Institute of Archaeology and Anthropology (SCIAA). Dredging operations planned for that portion of the Santee Canal on sanctuary property necessitated a comprehensive archaeological survey within this structure. The entire 32.6km (20.4mi) length of the Santee Canal was placed on the National Register of Historic Places (NRHP) in May 1982 and is listed in the State of South Carolina Site Files as 38BK102. In addition, two areas of Biggin Creek were singled out for investigation: the remains of an apparently ship-built vessel (38BK877) eligible for inclusion on the NRHP; and an area of scattered artifacts associated with a domestic site (38BK876) at Stoney Landing (Charles and Mills 1987).

PRT and Santee Cooper contracted with SCIAA’s Underwater Antiquities Management Program (UAMP) to perform this survey. The archaeological survey conducted as a result of this contract was performed over a 20-day period during November and December 1987. All field notes and other data generated as a result of this survey (including photographic, graphic, and dive records) and the few artifacts collected and conserved will be curated by SCIAA. They are accessible through the main offices in Columbia and/or the UAMP Field Office in Charleston, SC.

Project Areas

Flooded Canal Bed

The largest area of the proposed sanctuary in which our investigations were conducted was the “wet” portion of the Santee Canal (Area A in Fig. 2). This is a stretch of canal which still holds water of varying depths and is tidally influenced due to its communication with the Tailrace Canal. The “wet” canal extends some 1,030m from the crossing of county road S-8-343 (UTM Zone 17: E 595,275; N 3,675,050) south to the approximate midpoint of the sanctuary property (Z 17: E 595,710; N 3,674,125). Throughout this length the canal averages about 17m in width, thus producing an area of nearly 17,500 sq m (1.75 hectares or 4.3 acres).

“Dry” Canal Bed

The second largest of our survey areas was the section of “dry” canal (Area B in Fig. 2) which extends from the southern end of Area A to the northern terminus of Biggin Creek (Z 17: E 595,820; N 3,673,730). The canal in this area has been partially filled with dredge spoil that has migrated down from the west embankment of the Tailrace Canal. Two marshy zones (with a combined length of ca. 230m
Figure 1: Cordesville Quadrangle, USGS detail showing project location.
and width of ca. 15m) on either end of Area B encompass a central area of standing water that is about 190m long and 18m wide. Area B covers slightly less than 7,000 sq m (0.7 ha; 1.7 A) in total.

Biggin Creek Vessel

Two distinct survey zones are located about 800m south of Area B, near the entrance from the Tailrace Canal to Biggin Creek. Within an area 11m by 7m (77 sq m) lie the remains of a ship-built vessel partially incorporated into the bank on the north side of the mouth of Biggin Creek (Z 17: E 596,065; N 3,672,960). Investigated in August 1986 by Mark Newell of SCIAA’s Underwater Division (Charles and Mills 1987:96-99), the site (38BK877, Area C in Fig. 2) contains a 9.5m (31.2ft) length of exposed intact vessel structure including portions of keel and keelson, floors, futtocks, mast step, stem post and hull planking. A scatter of disarticulated hull planking, knees, and other materials surrounds the intact section of the Biggin Creek Vessel. An unknown length of the forward end of the boat is buried within the bank.

The Artifact Scatter

Within the actual mouth of Biggin Creek lies a zone of scattered artifactual materials (Z 17: E 596,075; N 3,672,945) which is thought to be associated with a trash disposal area (38BK876) noted on the steep southern bank during the terrestrial archaeological survey of the sanctuary property (Charles and Mills 1987:93-96). The underwater component of the disposal area (also designated 38BK876, Area D in Fig. 2) was briefly investigated in August 1986 by Mark Newell of SCIAA’s Underwater Division. Extending some 46m east to west and averaging 11m out from the southern bank (ca. 500 sq m, 0.05 ha or 0.13 A), a cursory examination of the artifact scatter revealed ceramics and glass fragments dating from the 18th to 20th centuries (Charles and Mills 1987:95). A mean ceramic date of 1836 was calculated for the land component of the trash disposal area (Charles and Mills 1987:77).

Biggin Creek Barge

Within this area there also lies the remains of a wooden barge (12.2m x 4.9m x 1.1m) which probably dates from the late 1930s and is thought to have been used in the construction of the Pinopolis Dam on Lake Moultrie (Charles and Mills 1987:93-95).

Therefore, the combined project areas totaled just over 25,000 sq m (2.50 ha, 6.18 A) - 24,500 sq m of which was surveyed with a magnetometer.

Project Objectives

The primary goals of this project were: 1) to determine the nature and extent of cultural remains within the wet and dry portions (Areas A and B) of the Santee Canal; 2) to complete preliminary documentation of the remains of the Biggin Creek Vessel (38BK877); 3) to systematically re-examine the underwater artifact scatter (38BK876) in the mouth of Biggin Creek; and 4) to document the remains of the modern barge prior to its possible destruction and removal during construction of the water control structure.
The purpose for gathering this information is to provide a data base which PRT and Santee-Cooper can utilize for the impact-mitigation and comprehensive management of cultural resources within the Santee Canal Sanctuary.

Results

One very significant site was discovered in Area A: the terminal tide-lock chamber (38BK1046) and an associated land feature - probably a “turning floodgate” or overfall - of the Santee Canal were located ca. 200m south of county road S-8-343 at the northern end of the sanctuary property. Four other features, at least two of which are probably displaced components of the tide-lock, were located some distance “down-canal” from the tide-lock: two wooden lock gates thought to be made of cypress timbers were detected ca. 100m and 500m south of the chamber; a presently unidentified fragmentary construct of cypress planks was discovered ca. 330m south of the chamber; and the partial remains of a vessel thought to date to the last half of the 19th century were observed in the eastern bank of the canal at the southern end of Area A. The canal area is already on the National Register of Historic Places. The records of the nomination should be updated to reflect the new features, which, after investigation, may have the potential for considerably amplifying the importance of this National Register site.

No magnetic anomalies were detected in Area B.

The Biggin Creek Vessel (38BK877, Area C) was documented. The study appears to indicate that the vessel is of South Carolina manufacture and is a river trading vessel of the early 19th century. The scattered components appear to represent most of the vessel structure. Since no formal study of such vessels has been made in the State to date, the Biggin Creek Vessel represents important new information and is considered eligible for the National Register of Historic Places.

A series of controlled test excavations failed to discern any stratigraphic integrity within the submerged artifact scatter (38BK876, Area D) at the entrance to Biggin Creek. Artifactual materials there appear to have been thoroughly mixed in the thin sedimentary strata which overlies the marl and limestone substrata. The only patterning detectable was horizontal association between three loose concentrations detected in the creekbed and those noted by Charles and Mills (1986:76) on the sloping southern bank. It is probable that the submerged concentrations are present largely as a result of the collapse of deposits on the slope into the creekbed. This might also help to explain the more recent mean ceramic date of 1851 obtained from artifacts in Biggin Creek, Charles and Mills (1986:77) derived a mean date of 1836 for the ceramic assemblage on the slope. Perhaps the likelihood of more recently deposited materials sliding into the creek was greater than the likelihood of their becoming incorporated into the hillside. A management summary concerning 38BK876 (see Appendix F) was submitted separately at the request of PRT and South Carolina’s SHPO. It recommended that the site was not eligible for the National Register of Historic Places.

The 20th-century wooden barge located within Area D has been sufficiently documented. No further action is warranted prior to its removal and/or destruction during placement of the water control structure slated for erection in that location.
ENVIRONMENTAL SUMMARY

The Santee Canal Sanctuary property is located in Berkeley County, South Carolina, just east of the city of Moncks Corner. As such, it lies within the Atlantic coastal plain physiographic province (Kovacik and Winberry 1986:15). Constituting some 91 ha (224 A), the sanctuary runs generally north and south along the west side of the Tailrace Canal which connects the Pinopolis Dam of Lake Moultrie with the headwaters of the Cooper River.

The Tailrace Canal forms a straight eastern boundary of the property (Fig. 2). The western boundary is irregular, following the rim of a series of limestone and marl bluffs. Northern and southern boundaries are formed by the roadbed of US Highway 52 and Stoney Landing, respectively. Elevations within the property range from less than 1m to slightly more than 15m AMSL. The elevated embankments formed by dredging spoil of the Tailrace Canal to the east, the roadbeds of county road S-8-343 and Highway 52 to the north, and the bluffs to the west and southwest envelop a swampy basin wherein lies the majority of the sanctuary property.

A discussion of the geology, geomorphology, hydrology, and flora and fauna of the entire expanse of the proposed sanctuary, as they relate to the terrestrial archaeological investigations performed in 1986, has been reported (Charles and Mills 1987:5-14). The present study deals specifically with that portion of the Santee Canal which lies within the park boundaries and, secondarily, Biggin Creek.

Presently, the hydrology of the Santee Canal is similar to that of any small tidal creek. Water from the Tailrace Canal and the Cooper River joins Biggin Creek and a portion of the Santee Canal through the creek’s entrance at the southern end of the property and two culverts cut through the spoil banks to the north. Thus, the depth and direction of flow of both Biggin Creek and the Santee Canal are presently tidally influenced, as well as being affected by water sporadically released from the Pinopolis Dam during hydroelectric generation.

Depths throughout Area A at high water range from ca. 0.30m at the north end to 1.3m near the southern extreme. At low water only a small stream ca. 0.30m deep extends from the culvert to a point approximately two thirds up the length of the canal. In Area B, once part of the Santee Canal but now partially filled in by the talus of the dredge-spoil embankments of the Tailrace Canal, two marshy zones at either end encompass a central area of standing water (depth ca. 0.1-1.5m).

Currents in the old canal bed of Area A are sluggish (less than 1/2 knot) throughout most of its length, although the velocity increases in the vicinity of the culvert. Prior to disturbance of the bottom by divers or during periods of no rain, visibility in the canal is usually 0.2-0.5m. However, the slightest disturbance of the fine sediments or moderate amounts of precipitation immediately reduce visibility to zero.

Silts and decaying organic matter composed primarily of leaf litter and tree branches constitute the bottom sediments. The depths of these sediments range from a maximum of ca. 1.5m at the northern, closed end of the canal to less than 0.5m at its southern extreme. Differences in current velocities are largely responsible for the varying sediment depths.

Generally, the conditions within Biggin Creek at sites 38BK877 and 876 (Areas C and D) are the same as those for the Santee Canal: water depths are slightly greater and currents are consistently stronger. At high tide the depth of water over both sites in Biggin Creek is approximately 1.5m and, during spring and neap tides, currents reach 2-3 knots.

The Santee Canal and Biggin Creek are surrounded by dense vegetation (Fig. 3). Lowlying areas
are predominated by cypress, willow, water oak, tupelo, and fens. Loblolly pine, red cedar, various species of oak, and a scrubby understory proliferate on swales and embankments, such as the abandoned towpaths of the canal, where conditions are slightly drier. A thick mat of organic detritus composed principally of leaf litter carpets these areas.

Freshwater mussels were noted to be far more numerous in areas of greater current and, hence, increased food supply and greater dissolved oxygen content. Interestingly, a large number of turtle shells were noted throughout the length of the canal. Although the area is notorious as a haven for snakes, we observed only two suspected water moccasins during our nearly month-long field experience in the sanctuary. Fortunately, the reptilian inhabitants were dormant during our winter investigation.
BACKGROUND RESEARCH

Prehistoric

What is known about the prehistoric background of the general project area has been amply addressed in the report on the terrestrial archaeological survey (Charles and Mills 1987:15-25). Since the Santee Canal was an historic construct, yet another synthesis of the area's prehistory is not relevant to this discussion.

Historic

The Santee Canal is the oldest summit-level (cross country) canal in the United States - one or two bypass canals of the navigation system along the Potomac River (Garrett 1987:746) and a few relatively small-scale locked-out stretches on other rivers are slightly older (American Canal Society 1975). Built between 1793 and 1800 by a private entrepreneurial concern1, the Santee Canal served as a direct link from the upper reaches of the Cooper River at Biggin Creek to the Santee River some 34km (21mi) distant. It was proposed and constructed to funnel river traffic from the Up Country to Charleston, circumvent about 160km (100mi) of navigation on the sinuous Santee River, and eliminate the need for the transportation of goods by boat past the unpredictable bars at the mouth of the Santee and along the dangerous coastal run of about 74km (46mi) from there to Charleston Harbor.

Inducements to Build: Environmental and Economic

A number of environmental and economic factors provided powerful inducements to build a canal connecting the Santee and Cooper Rivers.

The Santee River system is one of South Carolina's principal aquatic thoroughfares. It spans the central, north central, and northwestern portions of the state, reaching into North Carolina and Tennessee. The Santee River is formed by the confluence of the Congaree and Wateree Rivers which, in turn, arise from the junction of the Saluda and Broad Rivers and the Catawba River and Fishing Creek, respectively. As such, the Santee River watershed accesses roughly two thirds of the highly productive Up Country and a sizeable portion of agricultural area in the Lowcountry of South Carolina. Of course, the great majority of agricultural produce from this vast area (ca. 10,000 sq mi or 26,000 sq km) was carried to market, principally to Charleston, via the Santee River and its tributaries. “It is impossible to over estimate the importance of the Santee River as a channel of commerce...” (Porcher 1970:2). However, navigation of the Santee River was tedious and time-consuming because of its torturous, meandering course through the Lowcountry. The unpredictable bars at the mouth of the Santee were another source of delay and inefficiency. When combined with the often dangerous coastal passage from the mouth of the Santee River to Charleston Harbor some 74km (46mi) to the south, these factors led,

before the outbreak of hostilities between the American colonies and Britain, to speculations on ways of greatly reducing commercial traffic on the lower stretches of the Santee River and from its mouth to Charleston.

The Revolutionary War adversely affected the productive ability of many plantations in South Carolina, especially those in and around the area now known as Berkeley County and in which the Santee Canal was eventually built.

“There was scarcely a plantation or farm in Berkeley County which had not suffered at the hands of the enemy. From many places slaves and stock had been taken away, harvested crops seized or wantonly destroyed, and farm implements broken beyond repair. For the owners there was no help from the young government” (Orvin 1973:147).

Perhaps more importantly, key British markets for agricultural produce were lost. “Before the war planters had enjoyed the benefit of a Royal bounty on rice, indigo and naval stores, but now this was lost to them, and without this bounty there was little or no profit in rice by the [non water-culture] methods then in use” (Orvin 1973:147). Indigo production, “the culture and manufacture” of which had “poured wealth into the laps of planters” (Porcher 1970:7), suffered equally after its royal subsidy was lost. South Carolina, forced to “compete on even terms with the rest of the world, found the culture of the indigo of questionable profit, and it was in a languishing state and no culture as yet attracted the industry which was devoted to this ancient staple” (Porcher 1970:7).

Adding to the agricultural depression of the area, a spate of floods along the Santee River during the last two decades of the 18th century repeatedly devastated crops, especially rice, in areas adjacent to the eventual location of the canal. The flood of 1796 was so high that it served as a standard of comparison for years afterward. Porcher (1970:7) felt that the increasingly severe inundations were caused by the clearing of forest lands for agricultural purposes in the Santee River watershed.

As a result of the economically and environmentally derived agricultural depression, large numbers of the labor force (slaves) were essentially idle. In 1792, the “plantation industry...was at its lowest point of profitableness...” (Phillips 1908:38). Therefore, when serious plans for the imminent construction of the Santee Canal were announced, local planters saw a way out of the slump: “The canal was a beneficent being which was destined to be the salvation of the planters....I have often heard the people say that they had been saved from ruin by the demand of the canal for laborers” (Porcher 1970:8).

Charleston, as the major commercial nexus of the southeast, suffered in accord with the planters and its inhabitants viewed the projected construction of the Santee Canal as a cure for their economic woes. “Many Charlestonians felt that if the Santee [River] could be connected directly with their city [via the Cooper River and the Santee Canal], that a great economic advantage would be enjoyed” (Crowson 1971:7). Not the least of these advantages was that a direct connection to the wounded, but slowly recovering, interior would supply Charleston with cheaper supplies of food. Thus, while increasing the general welfare of the area, Charleston’s merchants desired to add the “trade of the distant interior to that of the coast which [they] already so largely controlled” (Phillips 1908:36). Charleston merchants and bankers and Berkeley County planters and owners of land adjacent to the proposed canal site combined to create a formidable lobby in favor of the Santee Canal’s construction. Indeed, they constituted the directorship of the company formed to construct and manage the canal.

Essentially, the Santee Canal “was designed to enable the people of the northern and northeastern
districts of the State to send their products to the city and port of Charleston in a convenient, expeditious, and economical manner” (U.S. Army 1881:1148) and, simultaneously, help to relieve local planters’ hardships and augment the Charleston area’s trade and affluence. Grandiose, visionary plans were not lacking: some of those caught up in the excitement “dreamed of a waterway extending up the Santee system into western North Carolina and connecting overland with the Tennessee River, affording a gateway to the West” (Leland 1970:10). Alas, such far-reaching plans were never fully realized.

**Mouzon’s Routes**

As mentioned, before the Revolutionary War far-sighted individuals had contemplated a canal connecting the Santee and Cooper Rivers. Henry Mouzon was commissioned to survey areas between the two for the most feasible routes of such a connection. From 1772 to 1775, Mouzon conducted this survey and produced a map (Fig. 4) delineating five suitable routes of various lengths between several locations on the Santee and Cooper Rivers. Mouzon’s routes were laid out so that they took advantage of existing natural inter-riverine waterways: Biggin and Fair Forest Swamps of the western branch of the Cooper River and Great Hell Hole Swamp of the eastern branch of the Cooper could have been connected by fairly short overland excavations to one of the Santee River’s affluents - Greenland Swamp, Mattassee Lake, and Savannah and Santee Creeks.

“The distance from the Santee to the east branch is only fifteen miles; to the west branch, through Fair Forest Swamp, sixteen miles, whilst through Biggin Swamp it is twenty-one miles. This [latter] line, however, has the advantage of shortening by from forty to sixty miles [of further travel on the Santee] the distance from Greenland Swamp to Cooper River below the junction of the two branches....It is probable that on each of these lines it would have been unnecessary to construct an artificial reservoir by which rain water might be held for the use of the canal” (Porcher 1970:3).

Mouzon favored the Greenland Swamp-Bull Town Bay-Biggin Swamp route despite certain benefits of the others in terms of their linear distances, the volumes of earth which would have to be excavated, and correspondingly, construction costs. Apparently, he felt that the elimination of 40-60 miles (64-96km) of “unnecessary” travel on the Santee was worth the extra labor and cost of the longest route.

**Colonel Senf, Superintendent of the Santee Canal**

Col. John Christian Senf was chosen in 1787 as the engineer of the Santee Canal by The Company for the Inland Navigation from Santee to Cooper River, or “Santee Canal Company.” A Swede who served with Burgoyne’s Hessian troops and fell into American hands with the surrender at Saratoga, Senf functioned as an engineer for the South Carolina militia during the latter years of the Revolutionary War (Shank 1985:15). Afterward, he was recruited by Henry Laurens to become the State Engineer. There is no evidence to suggest that Senf had been formally trained as a canal engineer (Crowson 1971:7-8).

Interestingly, at least one other imminently qualified person was considered as superintendent of the Santee Canal: George Washington, when asked by Governor William Moultrie about the qualifications of James Brindley, nephew and protege of preeminent British canal engineer James
Figure 4: 1775 map of Henry Mouzon's proposed routes for the Santee Canal.
Figure 5: Sea's "General Plan" of the Santee Canal.
GENERAL PLAN of the CANAL and its ENVIRONS between Santee and Cooper Rivers in the STATE of SOUTH CAROLINA.

Composed in the Year 1795 and finished in the Year 1800 by Christian Benj. Clenden, Engineer and Surveyor to Chief of the Canal.
Brindley, highly recommended him (Crowson 1971:8). However, the younger Brindley was already engaged in the construction of the Susquehanna Canal which, incidentally, was completed after the Santee Canal began operation.

Even though Senf was not the first choice, he proved to be equal to the task. He tackled the prodigious engineering problems inherent in an undertaking of this scale in a daring, ingenious, and professional, though zealous, manner.

Much has been written about Senf’s personal liabilities (Porcher 1970; Cross 1985; Crowson 1971; Leland 1970; Salley 1920; Shank 1985): that he was temperamentally unsuited to directing such a venture, exceedingly vain, and possibly influenced in his choice of route by the greed of one of the Company’s directors. “With all his abilities Col. Senf had infirmities of temper which made him an unsafe director in this pioneer of industrial enterprise in the State....But he seemed to be governed by inordinate vanity, which could not brook even the appearance of a rival” (Porcher 1970:4).

Porcher (1970:3) fairly stated Senf’s epitaph: “That he was a great artist is proved by his work; that he was a judicious one may be doubted.”

Senf’s Route

The route finally decided on by Senf (Fig. 5) has been the cause of much subsequent argument. Some authorities, with the obvious benefits of hindsight, have impugned his engineering skills and judgement because he selected a course for the canal which did not take advantage of natural waterways, as suggested by Mouzon (Porcher 1970; Cross 1985; Crowson 1971; Kohn 1938; Salley 1920; Shank 1985; U.S. Army 1881). He was forced to rely on artificial reservoirs as catchments for rainwater to be used in the operation of the Santee Canal. Thus, periods of extended drought periodically rendered the canal unnavigable and adversely effected its commercial viability and eventual success. A local historian and, perhaps, Senf’s most vociferous critic offered the following analysis of his decision:

“It seems to me that if he had selected Greenland Swamp as his point of departure [from the Santee River] he would have had a navigable stream almost ready to his hands, and thereby making as direct a line as possible to Biggin Swamp, he would for the greater part of his line have had water flowing from perennial springs, and would have had, if not a shorter summit level to overcome, at least it would have been that level alone which would have been absolutely dependent upon such reservoirs. He did commence the canal on a bluff about two miles below Greenland Swamp, and almost from that point to the lower Black Oak Lock, where the canal enters Biggin Swamp, for a distance of about thirteen or fourteen miles the water was almost exclusively supplied by artificial reservoirs” (Porcher 1970:3-4).

Senf’s route joined the Santee River at White Oak Bluff or Landing, a point some two miles down river from Greenland Swamp. It has been stated that Senf vainly did not choose to utilize the Greenland Swamp waterway simply because Mouzon had suggested it. However, more serious charges have been brought by historians. Porcher (1970:4) wrote:

“It has been asserted, however, that it was not jealousy of Mouzon which governed Col. Senf in the choice of a location, but that he was acting in obedience to the will of one of the directors [Ralph Izard], who, possessing a large body of land on the [Santee] river bank, hoped to improve
its value by running the canal through it. He had actually planned the site of a town which was to bear his name [Izardton] and increase his wealth. If this is true, and no doubt of its truth existed in that country, then the engineer is chargeable with having sacrificed his judgement to the reckless greed of one of his employers."

If, indeed, Senf was so influenced, it is just to say that then, as now, "Many fine prospects for the general welfare of a community are spoiled by the selfishness and greed of an individual or individuals" (Salley 1920).

**General Physical Description of the Canal, Its Construction, and Cost**

Such modern concerns notwithstanding, the canal was constructed according to Senf's plan. The resulting distance was 32.6km (20.4mi) from White Oak Bluff on the Santee overland, crossing the greatest elevation or summit level between the two rivers, and proceeding south-southeastward to a point near Stoney Landing on the west branch of the Cooper (Fig. 5). This choice was, for its time, ingenious and daring: it cut overland rather than through waterways of swamps. As such, it was the first true cross-country canal constructed in the United States and a precursor of subsequently favored overland routes. Canals utilizing existing natural waterways connected to and between river systems were subject to flood waters affecting the systems. Their use was outmoded by canals cut through relatively high ground which were essentially independent of and largely unaffected by inundations of major river systems.

The unique, daring character of the Santee Canal carried with it certain positive and negative attributes. It must be remembered that though "this was one of the first, if not the first, canal of consequence in the United States,...there were no models to follow, no experiences to profit by, and no experienced men to employ. The planters, bankers, merchants and politicians who built the canal were pioneers" (Salley 1920), not to mention the engineer charged with the actual planning, construction, and ultimate responsibility.

Porcher (1970:10) succinctly described the major physical features of the Santee Canal as it was built:

"The canal is twenty-two miles in length, it is thirty-five feet wide at the surface of the water and twenty feet at the bottom, its depth is five and one-half feet, with four feet of water, capable of carrying boats of twenty-two tons burden; on each side is a draw-path ten feet wide; it has two double and eight single locks, and in its course over the country it lies over eight aqueducts or culverts through which as many swamp streams find a passage under its beds. From the Santee it rises by three locks thirty-four feet to the summit level, whence it descends by seven locks to [the] Cooper River, sixty-nine feet, making the difference of level between the two rivers thirty-five feet."

A hypothetical, ideal cross section of the canal (known as the canal "prism"), as per Porcher's description, is presented in Figure 6. The actual prism was altered depending on the depth of necessary excavations in particular areas of higher surrounding elevations and when greater width was required to allow maneuvering, cargo loading, unloading, and trimming, and other activities to take place on board vessels in the canal. Such activities were conducted at Lock No.1, two large and two small basins which had adjacent warehouses, the tide-lock at the southern end of the canal, and elsewhere as necessary.
Table 1: List of distances between locks, the type of lock, and its rise or fall, based on Senf’s survey figures (after Webber 1954).

<table>
<thead>
<tr>
<th>LOCK No.</th>
<th>DISTANCE FR PREVIOUS STRUCTURE</th>
<th>RISE OR FALL</th>
<th>TYPE OF LOCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>fr Santee R = 0.03mi 48m</td>
<td>+5ft (1.5m)</td>
<td>single</td>
</tr>
<tr>
<td>2</td>
<td>fr Lock 1 = 0.45mi 724m</td>
<td>+10ft (3.0m)</td>
<td>single</td>
</tr>
<tr>
<td>3</td>
<td>fr Lock 2 = 1.6mi 2576m</td>
<td>+19ft (5.8m) [2x9.5ft]</td>
<td>double</td>
</tr>
<tr>
<td>4</td>
<td>fr Lock 3 = 5.26mi 8467m</td>
<td>-10ft (3.0m)</td>
<td>single</td>
</tr>
<tr>
<td>5</td>
<td>fr Lock 4 = 1.53mi 2463m</td>
<td>-10ft (3.0m)</td>
<td>single</td>
</tr>
<tr>
<td>6</td>
<td>fr Lock 5 = 0.45mi 724m</td>
<td>-5ft (1.5m)</td>
<td>single</td>
</tr>
<tr>
<td>7</td>
<td>fr Lock 6 = 2.3mi 3702m</td>
<td>-10ft (3.0m)</td>
<td>single</td>
</tr>
<tr>
<td>8</td>
<td>fr Lock 7 = 0.16mi 258m</td>
<td>-10ft (3.0m)</td>
<td>single</td>
</tr>
<tr>
<td>9</td>
<td>fr Lock 8 = 1.39mi 2238m</td>
<td>-9ft (2.7m)</td>
<td>single</td>
</tr>
<tr>
<td>10</td>
<td>fr Lock 9 = 3.2mi 5151m</td>
<td>-15ft (4.6m) [2x7.5ft]</td>
<td>double</td>
</tr>
<tr>
<td>Tide-Lock</td>
<td>fr Lock 10 = 2.52mi 4057m</td>
<td>tidewater</td>
<td>single</td>
</tr>
<tr>
<td>Tide-Lock to Stoney Landing = 1.38mi 2222m</td>
<td>tidewater</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Total length of all Locks = 0.15mi 242m</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL LENGTH OF Santee Canal = 20.42mi (32,872m)

SUMMIT LEVEL 69ft (21.0m) Above Cooper River Level (tidewater),
Santee River 35ft (10.7m) Above Cooper River Level

Figure 7 is a photograph of the sloping bank and tow path of a section of the canal as it presently exists and which is similar to the ideal prism shape.

From the Santee River, vessels which travelled the canal ascended 34ft (10.4m) to the summit level in slightly more than two miles through two single and one double lock. The summit, running southeast for some five miles, was designed to be supplied with water by a number of reservoirs, the
principal one of which was constructed in Kirk's Swamp. During their descent to the Cooper River via Biggin Creek and Stoney Landing, canal boats dropped 69ft (21.0m) in just over 13 miles utilizing seven single locks - including the terminal tide-lock - and one double lock. A representation of elevations and distances of the Santee Canal is presented in tabular form, above (Table 1).

According to Senf's "Account of the Santee Canal" (Webber 1954), every lock was spanned by a 16ft (4.9m) bridge and there were seven other public and private "Communication Bridges" located where necessary. None of them were draw or turning bridges, implying that their vertical clearances were sufficient to allow the passage of fully laden vessels underneath. Twenty five floodgates and "overfalls" - structures designed to supply the canal with water and to remove water from it during periods of excessive rain - were located at strategic points along its length. "The Locks, Abutment and Walls of the Bridges and Floodgates [were] all built of Brick and Stone" (Webber 1954:10), excepting the terminal tide-lock which was described as a wooden structure (Porcher 1970:16). The bricks were locally produced and sun-dried and mortar was made from native limestone and oyster shell; the stone used in the canal's construction was quarried in St. Stephen's Parish (now largely incorporated in present-day Berkeley County) near Pineville (Orvin 1973:151). "Tools and other necessary equipment, especially spikes and hinges for the lock gates were forged by blacksmiths attached to the company. The lumber for the gates and foundations came from the cypress in the Santee Swamp" (Crowson 1971:9).

The nearly 21-mile long Santee Canal was constructed solely by hand. As mentioned, the agricultural depression of the local area caused incomplete utilization of the labor of a great many slaves. Berkeley County planters and slave owners viewed the construction of the canal as a form of immediate economic relief: they could hire out the services of their slaves at a handsome profit because, while attached to the Santee Canal Company, the costs of feeding and housing the slaves were assumed by the Company. From a miniscule workforce of ten laborers in May 1793 when construction actually began, the number soon rose to 150 by mid-July. By the end of 1793, some 1,000 laborers were actively engaged (Crowson 1971:8) - this is the largest number of slaves used at any one time. During 1794, 800 laborers were utilized and in 1795, 700 (Webber 1954:124). Each slave was required to remove 2.5-3.0 cu yd (1.9-2.3 cu m) of dirt per day (Webber 1954:123-124). Wages paid to slave owners or masters increased significantly over the life of the project: Senf stated that

"In the beginning of the work Negro Labourers were hired at £15 to £16 [$75-80] per year, and two third men and one third women. At present [1800 - year in which the canal was completed] the Company pays £24 [$120] for a Man Labourer, and for a Woman, £20 [$100], and are obliged to receive even numbers in Male and Female" (Webber 1954:120).

The overseers' wages had been raised from £30 to £60 [$150-300] per year (Webber 1954:123-124). The rates paid to slave owners rose considerably after ca. 1797 due to the competition for labor caused by the newly developed cotton industry which had begun to show immense profits (Orvin 1973:147). Slaves could no longer be spared from their plantation duties unless their owners were increasingly well compensated.

The Santee Canal was constructed during a seven year-period from 1793 to 1800. Senf (Webber 1954:12) stated that the first work of the canal was begun in May 1793 at the north end of summit level and progressed toward the south (i.e. the 5mi distance from Lock 3 to 4). It was in this stretch that some of the deepest and, necessarily, widest excavations were made. Subsequently, efforts were shifted to the northern and southern ends of the canal and by "the end of 1795, about five miles [8km] of the excavation
at each end had been completed and several locks were under construction" (Phillips 1908:39, quoting from Charleston City Gazette of 7 March 1796). In a report submitted in January 1796, Senf related that some 970,072 cu yd (742,243 cu m) of dirt had been moved in the year and a half since work had commenced (Webber 1954:121-122).

Many difficulties were encountered and overcome by Senf during the construction of the canal. Significantly increased labor costs have already been mentioned. Another problem which undoubtedly led to greater expenditures was the endemic malarial fevers of the swamplands through which the canal passed. Senf reported that "...from the Year 1793 to the beginning of 1800 - twenty-four white persons died at the Canal by Fevers - of which number were two Physicians, two Assistants, three Commissaries, two Master Carpenters, three Master Bricklayers, and two Head Overseers - the rest were Journeymen, Traders and overseers" (Webber 1954:120). Thus, "skilled [white] labor did not chose to remain on the canal in the 'sickly season.' This season, the summer, was the time when much of the labor could be most advantageously performed. The mortality rate, plus the slow progress, ran up the costs, further complicating the work of Senf" (Crowson 1971:9). The total number of blacks who succumbed to sickness was not noted, although 28 per year were deducted as "sick" from averaged labor-pool tabulations (Webber 1954:123): during the seven-year life of the project, that would have resulted in a total of nearly 200 individuals.

A source of unexpected trouble for the Santee Canal Company was the opposition of some of the land owners through whose properties the canal passed. Despite the promise of increasing land values, improved transportation to and from their properties, and profitable speculation on development around the locks, demands for incurred damages occurred along the length of the canal. Porcher (1970:9) stated, "Col. Senf [said] that there were only two gentlemen whose lands were trespassed upon which did not feel themselves aggrieved. One was Major Porcher, the other the director [Ralph Izard] whose influence was supposed to have made the White Oak Bluff the starting point of the canal." Some of the planters felt that access to or supplies of water for their fields were adversely effected. Others "had no fancy for the passing through their estates of slowly moving boats with all the appliances for demoralizing their negroes" (Porcher 1970:9). Recent historical research (Bennett and Richardson 1988) has revealed that Porcher’s conception of the fierceness of the opposition and the reasons for it are largely unsupported by existing legal documentation from the period.

Unseasonably heavy rains during at least three consecutive wet seasons in the early years of construction caused schedules to be discarded. Another problem, and one for which he has received considerable criticism, was Senf’s insistence on personally supervising every facet of construction carried out by the large, unskilled workforce. As Porcher (1970:6) noted,

“In constructing a work of this kind obviously the best and cheapest way of proceeding is to divide it into sections and let them out to contractors, who shall work under the general supervision of the engineer, and whose work shall not be accepted and paid for until approved by him. Col. Senf undertook not only the general supervision, but the immediate superintendence of the laborers, and in large measure assumed the functions of an overseer. Hence, of course, a great waste of time as well as loss of money.”

In practically the same breath, Porcher (1970:6-7) goes on to state that “we must always bear in mind when we hear [Senf] condemned for undertaking the details...” that this canal was a unique, pioneering effort and he was obliged to instruct his inexperienced and unknowledgeable subordinates.
Compounded delays and massive cost overruns resulted from a combination of the factors enumerated above. When finally opened to traffic in mid-1800, Senf stated in November of that year that the expense had surpassed twice the figure of £55,620 ($278,100) originally estimated because the "Dimensions of the Canal in length, width and depth likewise exceeded the first Intentions" (Webber 1954:119). Certainly the planned width and depth were exceeded where necessary, but the length was not. Obviously, expenses continued to mount after the opening of the canal: figures for the ultimate cost of construction, including principal and interest, range from $1,100,000-$1,615,000, or four to six times the original estimate (U.S. Army 1881:1152; Kohn 1938:267). At such a staggering sum, "the amount of capital invested was so large that there could be no prospect of a large rate of dividends from tolls" (Phillips 1908:41): thus, the economic viability of the Santee Canal was critically compromised from the outset.

The Tide-Lock

Since this report deals specifically with a survey conducted on the southernmost 1.25 miles (ca. 2,000m) of the Santee Canal (that portion of the canal well below double Lock No. 10, including the area of the junction of the canal and Biggin Creek at the terminal tide-lock and then along the creek to Stoney Landing), a complete description of all features of the Santee Canal is not warranted. Comprehensive, detailed, and well-written treatments are readily available to interested parties. Foremost among these are Senf's own contemporaneous account (Webber 1954), Porcher's historic retrospective (Porcher 1970), and a recently completed examination produced in conjunction with the current development of the Santee Canal Sanctuary by the State's Department of Parks, Recreation, and Tourism (Bennett and Richardson 1988). The following discussion is confined to specific features of the canal thought to be present within the immediate survey area of the proposed park boundaries - the tide-lock and associated floodgate, "constriction" points in Biggin Creek, and vessels used on the canal.

The southernmost water-control structures on the Santee Canal, a tide-lock and associated floodgate erected at the junction of the canal and Biggin Creek, are thought to be located within the present archaeological survey area at the northern end of the proposed park. A tide-lock is a water-control structure designed to take advantage of the natural rise and fall of tidally-influenced water, thus assisting the passage of vessels into and out of the canal or by adding extra depth to a final stretch of the canal which would be too shallow to navigate otherwise. In his final account of the construction of the Santee Canal, Senf stated that

"From the commencement of the Canal I have carefully avoided to recommend or make any work from Stoney Landing to the Double Lock No. 10 which might obstruct the Currents of Biggin Creek, not alone of account of its frequent and very height Freshes, but in giving a free Course the Current will keep the Canal more clean from Deposits. And in case the Water in the dry Summer seasons should prove insufficient, to establish a Tide Lock at the Junction of the Canal and Creek, which Lock was to be left open at other seasons. And if any Accident should happen to this Lock in Freshes, the navigation cannot be altogether interrupted" (Webber 1954:112).

Obviously, he found the tide-lock at the junction of the canal and creek to be necessary due to "insufficient" water; its presence was noted by Porcher who described it as a "large wooden lock, very
wide” installed so “that boats on leaving the canal may here trim their cargoes for river navigation” (Porcher 1970:16). With the gates of this lock open, the tide would have risen to Simpson’s Lock some 4km (2.4mi) to the north. The term “very wide” would seem to indicate a width in excess of the 10ft (3.0m) width of the other locks.

The following description of the location of the tide-lock and, more importantly, its appearance (or lack thereof) in 1880 are taken from the report prepared in a feasibility study for the reopening of the Santee Canal (U. S. Army 1881:1149 and 1150):

“The canal proper, however, terminated with a tide-lock on Biggin Creek, about 2 miles above [the confluence of Biggin and Fair Forest or Wadboo Creeks], the remaining 2 miles being creek navigation, with not less than from 4 to 6 feet depth of water at any time. The mean rise and fall of tide at the site of the tide-lock is about 2 feet....The lock chambers need some repairs, but are otherwise in a good and serviceable condition, except those of the tide-lock, which are destroyed. All the lock-gates are decayed” (emphasis added).

A supplementary report in the same volume (U.S. Army 1881:1156-1157) varies only slightly from the previous description:

“Eleven locks in all were constructed, eight single and two double locks, and one tide-lock, which was placed about one mile above Stoney Landing....All the locks were built of brick with wooden gates....At the present time [1880] the canal is considerably filled up; the banks are generally good, although much overgrown, and the locks, with the exception of the tide-lock, are in good condition, though all need some repairs. The tide-lock has been entirely destroyed and all of the gates of all the locks are decayed and valueless” (emphasis added).

From the above descriptions, it is unclear whether the tide-lock was constructed of wooden timbers, brick and stone, or possibly a combination of these components. Curiously, Porcher is the only authority who describes the tide-lock as a wooden construct. However, he may actually have seen the structure and, thus, his account would be most accurate - he was born in 1809 in the local area and died in 1888. Porcher’s manuscript on the Santee Canal was originally published in 1875, possibly as little as ten years after all activities on the canal ceased. The Army engineers who surveyed the canal in 1880 stated that the entire structure was destroyed, so it is quite possible that they never saw any traces of it and, therefore, could not have determined its true nature. Unfortunately, the one person who could clear up this seeming incongruity, Col. Senf himself, made no specific mention in any known manuscripts of the composition of the tide-lock.

Senf did, however, give a fairly good description of the dimensions of the tide-lock and its location (Webber 1954:20). It was positioned 977ft (298m) south of Biggin Bridge at the junction of the last straight stretch of the canal and Biggin Creek “on the east Side of the Bank of the Canal.” Senf proposed that the tide-lock was “to be of the same width as the others [10ft or 3m], and sixty feet [18.3m] between the upper and lower gates - and a Turning Floodgate, 12 feet wide [3.7m], connected on the west side of this Lock. The Floodgate is to assist to clean the Canal of the Sediments and to let off the force of water in Freshes....” Apparently, the “turning” floodgate at this location was only recommended initially. However, it too was found to be necessary because “the former Course of [Biggin] Creek could not be prevented from entering into the Canal” and “the washing of the High Banks” required that the
floodgate be erected so that this final stretch of the canal could be cleaned out from time to time (Webber 1954:115).

A final determination of exactly how the tide-lock chamber was constructed (i.e. whether it was of wood, brick and stone, or a combination, its length and width, etc.) can hopefully be determined following the impending excavation and documentation of the structure. Recent information confirms that there are wooden tide-locks still in existence on the surviving termini of at least two canals in Georgia and Virginia (Trout 1987: pers. comm.). It was felt that these structures should be investigated as an ancillary part of the present survey. For a preliminary description of the tide-lock structure as found during this phase of the project and the enlightening data obtained from the comparative survey conducted in February 1987 of the northern lock of the Brunswick-Altamaha Canal near Darien, Georgia, see “Results,” below.

**Biggin Creek Constrictions**

Other features of the Santee Canal which probably lie within the project area in Biggin Creek were simple structures designed to aid in the cleaning of the canal. Senf described a potential condition which these constructs might help to remedy: sediments borne by currents in the creek became greater after floods took waters over the brake banks of rice fields and reservoirs of the local planters. Thus, the necessity of keeping the course as straight as possible so as to keep the velocity up and, therefore, sediments mobile. Senf added, “it is likewise requisite that in several parts the Creek should be made narrower by projections in an obtuse Angle with the Currents. The Projections may be easily made by a rough Frame of any kind of Logs, and filled with that kind of Limestone of which the Creek abounds” (Webber 1954:113). The probability of several of these “projections” being located within the project area is high.

**Vessels and Their Use on the Canal**

Detailed descriptions of the types of canalboats used on the Santee Canal are wanting and those that exist are very general. Of course, the vessels had to fit within the dimensions imposed by the structure of the canal - the minimum depth of water (4ft or 1.2m) and width of the locks (10ft or 3.0m) being the prime determining factors.

In 1787, six years before actual construction of the canal began, Senf proposed the following general dimensions of vessels which would be used: “The Size of the Boats for the Canal, should have no more than fifty feet length, and to be nine feet wide, of course the Gates of the Locks will be only 60 feet [18.3m] apart, and the width of the Locks between 9-1/2 and 10 feet [2.8-3.0m]. Should the Boats be constructed larger, the waste of water would be increased...” (Webber 1954:119). Apparently, Senf changed his mind slightly over time and allowed that the vessels could be a bit longer without wasting excessive water. The year before the canal opened he wrote that “…Boats admissible into the Canal, be flat bottomed, nine feet Beam,...and from fifty to fifty four feet in length on the Top, to draw no more than two feet, six or eight inches Water” (Webber 1954:128). The survey report submitted to the U.S. Army Chief of Engineers (1881:1149) listed the maximum practicable generalized dimensions for boats which used the Santee Canal as a length of 54ft (16.5m), a beam of 9ft (2.7m), and a draft of 2ft 6 in to 2ft 8 in (0.76m to 0.81m) with a burden of about 20 tons, thereby confirming Senf’s 1799 figures. One account of boats’ dimensions which was authored during the life of the canal stated that “the locks are
calculated to pass boats 56 feet long, and 9 and a half feet wide, drawing 3 and a half feet water” (Kohn 1938:257). These figures differ slightly in the increased length and draft - 3.5ft (1.1m) draft seems excessive because it would allow only 0.5ft (0.2m) clearance over large sections of the canal and cause the vessel to ground out in the vicinity of the tide-lock where, during low tide, the water depth was said to be only some 2ft 8in (Webber 1954:118).

It must be remembered that vessels from both the Up Country and Lowcountry of South Carolina utilized the Santee Canal. On rivers, creeks, and streams in these two areas different terrain and, thus, different hydraulic conditions (e.g. depths, current velocities, and obstructions) dictated that vessels which traveled them be designed and constructed accordingly. Double-ended “mountain boats,” used on the turbulent, swifter upper rivers of the state, were generally 56ft (17m) long and 7.5ft (2.3m) wide and resembled bateaux (Fig. 8). “River boats” which plied the relatively still, sluggish waters of Lowcountry rivers were usually larger. “The boats best suited to the navigation of the Cooper, the Santee, Congaree and Wateree rivers, have 65 to 70ft. [19.8-21.3m] keel, and 16ft. [4.9m] beam…” (Kohn 1938:264). Squared-off “canal boats,” as mentioned, were specially designed to conform to dimensions imposed by the structures of the canal (Fig. 9). Of course, any vessels - mountain boats, bateaux, canal boats, smaller river boats, “cotton boxes” (Fig. 10), flats, etc. - that did not exceed the length and width of the locks, depth of water throughout the canal, and vertical clearance of its bridges could, and probably did, make use of the structure (cf. Table 2 for dimensions of various types of vessels utilizing the canal). In 1822 a proposal, quickly discounted as impracticable, was made to enlarge the locks on the canal to 70ft (21.3m) by 16ft (4.9m) in order to pass the favored-size river boats then in use on major waterways (Kohn 1938:257, 258).

An additional, unavoidable variable in design and construction resulted from the vessels having been made by numerous individuals - not mass produced at one source. The following paragraph from The Times of Charleston for 28 May 1801 illustrates the potential for variability of canalboat construction as a result of some of the factors enumerated above:

We are happy in being able to announce to the public, that Mr. William Buford, an
Figure 9: "Santee Canal Boat" rare illustration found by SCETV researcher Alan Reese and subsequently lost for lack of a reference (xerographic copy from notebook).

Figure 10: Drawing based on "A cotton box at the Black Oak Lock," a contemporary pencil sketch by Andrew Gibbes (Courtesy of Charleston Museum Library).
enterprising citizen, who lives on the banks of Broad River, near Pinckney Court House, which is more than ninety miles above Granby, arrived in this city, through the Santee Canal, on Tuesday the 26th inst. with his own boat, built on his own land, and loaded with his own crop, after having safely passed over all the falls and shoals that are between his plantation and Charleston (Porcher 1970:23).

Accommodations for propulsion of some sort - either by oars, paddles, punting poles, sails, or a workable combination of some or all of them - were obvious necessities of every boat using the rivers and canal. The Santee Canal Company intended to take possession of the boats after entering the canal and use mules or oxen to tow them along its length (Webber 1954:128); this they did for a period of time. However, "...as the navigation of the Santee required a strong force of hands to take the boats up the river [against the current], it was found that they could also draw the boats through the canal nearly as fast as the teams could do it, and these last were abandoned" (Porcher 1970:10). The usual time necessary to pass through the Santee Canal was two days (Crowson 1971:16).

"As you may be ignorant of the use and construction of a lock, it may not be amiss here to attempt a description of one. As a canal generally passes over an uneven country, it is usually constructed on several levels, and the locks are the contrivances by which boats are made to ascend or descend from one level to another. The locks on the Santee Canal are boxes of masonry 60 feet long, 10 feet wide, with a depth corresponding to the height or depth to be accomplished. When the canal comes to the end of a level it is finished with masonry and the wall carried perpendicularly to the depth of the next level. The bottom is also of masonry and the side walls are continued to the height of the draw-path on the higher level. Above this perpendicular wall are ten [sic] solidly constructed gates, which shut in upon each other, presenting a sharp angle to the water in the upper level. In the masonry about the perpendicular wall sluices are provided through which water is passed into the lock. At the lower end of the lock are two gates which open into the lock, and like the others, shut upon each other. Near the bottom of these gates are valves which are opened or shut by means of a crank at the top and by means of these the water is discharged from the lock when full. This gate is usually half open on account of the enormous pressure upon the works by the water. As soon as it enters the lock the gates are closed upon it and the sluices at the upper gate opened—as the lock gradually fills the boat rises, and when the water in the lock rises to the level of the upper level, the pressure now being equal on both sides, the gates are opened and the boat passes out of the lock. If there is a boat on the upper level wishing to descend, it passes immediately through the open gates, which are then closed upon it, and the valves of the lower gates opened to let out the water from the lock. When it has got down to the level of the lower canal the gates are opened and the boat passes out. It takes about half an hour to pass a boat through a lock" (Porcher 1970:11-12).

The first freight boat to pass through the Santee Canal was a vessel loaded with salt bound from Charleston to Granby at the foot of the rapids on the Congaree River below Columbia. This event occurred in July 1800, soon after the final completion of the locks and reservoirs (Drayton 1972:155; Orvin 1973:151; Phillips 1908:40). Thus began "...the use of this inland water-course which for many years was an important factor in the transporting of cotton, rice, naval stores, etc., to Charleston and supplies of all kinds from the metropolis to the upper part of the State, and even into Lincoln County, North Carolina" (Orvin 1973:151).
By far, the single product transported in greatest abundance on the Santee Canal was “King Cotton.” Packed in bales which weighed approximately 300 lb (136 kg), cotton was collected from the numerous plantations and farms throughout the Santee River watershed for transhipment to market in Charleston. The prodigious amounts of cotton which made its way through the canal included the majority of “the cotton raised on the Upper Santee, the Wateree, Catawba, Congaree, Saluda, and Broad rivers, and the country contiguous to these streams” (Kohn 1938:260). Traffic figures for the canal are scarce: increased commercial flow during the War of 1812 “resulted in approximately 1,000 boats and ‘cotton boxes’ using the...canal in 1814” paying a total of over $20,000 in tolls (Crowson 1971:15). Porcher (1970:17) related that in 1830, “the most prosperous period in the history of the canal,” some “720 boats arrived in Charleston bearing about 70,000 bales of cotton.” That averaged just under 100 bales per vessel.

Understandably, the amount of cargo each vessel could carry was dependent on their “freight volume” as determined by the length, width, and draft of each vessel. Table 2, below, lists typical boats involved in commercial transport on the canal and gives their sizes, draft empty and loaded, the number of cotton bales they ordinarily carried, the tolls charged for each, and the number of men necessary to navigate them. For example, the 7.5 ft-wide (2.3 m) mountain boats from upstate typically carried 65-70 bales, or about 10.5 tons (9.5 metric tons); the beamiest canal boats were loaded with an average of 100 bales, or some 15 tons (13.6 m tons) (Crowson 1971:15; Kohn 1938:264). Designed specifically to freight cotton, most of these vessels would have been given a distinctly box-like shape to maximize the number of bales each could carry; thus, the sobriquet “cotton boxes” used to describe some of these types of boats (Crowson 1971:15).

The tolls charged for use of the Santee Canal are one of the most disputed details of its operation: existing accounts are conflicting and confusing. Some sources, including Col. Senf, state that there was a flat rate for the passage with compensation for those boats not using the entire length of the canal. Others give variable rates based on the size of the craft and/or the number of cotton bales on board. One thing they do seem to agree on is that the charges started at a relatively high rate and decreased over time. Senf (Webber 1954:129), writing in the year before the canal opened in 1800, proposed that the rate be set at a flat £5 (ca. $25) regardless of the nature or quantity of cargo or even if the boat was loaded or not. Boats entering only the summit canal were to pay only half the toll but, if they descended the summit canal, they were to be charged the full rate. Those boats not entering the summit at all were to pay a toll in proportion to the number of locks they passed. This rate scale was derived from an estimation of the amount of water “wastage” involved in passing each lock. Every time a boat ascended or descended a lock, several tens of thousands of gallons of water were essentially lost from the summit.

Porcher (1970:17) stated that the toll was set at a single, non-scaled rate of $21 per craft per passage. An apparently extensive practice, designed to reduce the toll on the return trip, was to construct a pair of boats so that one was slightly smaller and nested within the other. Therefore, a pair of these boats on their way to Charleston with a load of cotton paid $42 in tolls on the first leg of the journey through the canal. “But after the load was discharged in Charleston the smaller boat was lifted into the larger, received the return freight, and the two returned to the Santee as a single boat” (Porcher 1970:17), thus paying only $21.00 in tolls for the return—a 25% saving on each roundtrip. No similar arrangement is presently known for any other vessels which operated on American canals (Trout 1987: pers. comm.).

By 1805, the tolls had apparently been structured on a sliding schedule based on the beam, or breadth, of the vessel. Tolls for each transit of the canal by boats or flats not exceeding a beam of 6.5 ft (2.0 m) were charged $10; each additional foot (0.3 m) of beam added $5 to the rate with the limit of 9.5 ft
(2.9m) costing $25 for boats. Flats with 9.5ft beam which carried 70 bales of cotton or less were charged $30; those which had more than 70 bales on board paid $35. Flats which had been charged the highest rates could return through the canal within 30 days for $20 (Crowson 1971:9; Orvin 1973:152). At the time, “these rates seemed high for the slow trip through the canal, but the expense by water down was generally about one half the cost of conveying, if one could, the same articles by land” (Crowson 1971:9).

By 1821, the tolls had been reduced to $15 per boat per passage (Phillips 1908:43). This reduction, an attempt to increase business, was probably necessitated by several factors which had adversely effected the amount of traffic: 1) The drought years of 1817-1819, during which the canal had been closed, forced planters and merchants to seek transportation alternatives. Their confidence in the endeavor was severely shaken. 2) Fewer canal boats had been built, as a result. 3) In late 1820, one steamboat had begun running from Columbia to Charleston, thus signalling the start of what was to become increasingly tough competition for the canal’s customers.

Kohn (1938) included a table, reproduced below as Table 2, of various attributes of vessels which used the Santee Canal including the tolls charged for each size category. Curiously his toll figures differ from those given by all other sources, but his comparatively detailed measurements of the boat types are unsurpassed. Perhaps all his data should be taken with a grain of salt. This information is included here to serve as further verification of the diverse, confusing details of this aspect of the canal’s operation.

By all accounts, the Santee Canal was not the profitable venture it was originally designed to be. In actuality, the lucrative dreams of those who conceived, executed, and invested in the idea were never fully met for reasons to be discussed below. However, a word on the dividends derived from the revenue generated by tolls and paid to investors is appropriate.

“Stockholders received varying amounts in dividends during the time the canal was in operation. In 1809 a dividend of $12.25 was declared. In 1814 the annual dividend was $10 per share, and it was announced that ‘in the future, in October and April in every year, semi-annual dividends will be declared out of the surplus money which may be on hand.’ In 1828 semi-annual dividends reached a high of twenty dollars per share, but by 1837 they had dropped to eight dollars, and kept dropping, and in 1845 it was down to fifty cents a share” (Orvin 1973:153).

Table 2: List of various vessel dimensions and the amount of cotton carried, tolls charged, and crew size of each (after Kohn 1938:267).

<table>
<thead>
<tr>
<th>Boat Type</th>
<th>Length</th>
<th>Breadth</th>
<th>Draft</th>
<th>Bales of Cotton</th>
<th>Toll</th>
<th>Crew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal boat</td>
<td>56ft</td>
<td>9.5ft</td>
<td>80-120</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat</td>
<td>54ft</td>
<td>9.5ft</td>
<td>120-130</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain boat</td>
<td>56ft</td>
<td>7.5ft</td>
<td>70</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain boat</td>
<td>56ft</td>
<td>6.5ft</td>
<td>50</td>
<td>14-17in</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Canal boat</td>
<td>56ft</td>
<td>8.5ft</td>
<td>60</td>
<td>14-17in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*The original figure listed in this category was $60. However, this was obviously erroneous as it exactly doubles the rate for flats of $30 given by other sources. Thus, the latter figure has been substituted.*
Canal Operations

Boats used the canal from October to June, inclusive. July, August, and September were customarily reserved as maintenance months in which the canal was cleaned of accumulated sediments, logs, etc. and lock gates, walls, and banks were repaired as needed. A maintenance force of 300 slaves was required by the Company for this purpose (Porcher 1970:17). Besides periodic maintenance, special operations were necessary as events warranted:

“Often navigation through the canal had to be suspended because of insufficient water, to make repairs, or to clear the stream of debris. In September of 1804 Superintendent George B. Artope found it necessary to completely drain the canal to clear it of obstructions which had become a menace to transportation and to repair or make more durable ‘some parts which had been completed at first too much in a hurry’” (Orvin 1973:152).

The standing operational contingent consisted of two toll receivers who were magistrates, ten lock keepers of whom three were constables, four carpenters or boat builders, two blacksmiths, two bricklayers or masons, and 20 young blacks who, before the use of horses and mules was discontinued, drove the teams which pulled boats through the canal. The toll receivers’ residences were located at either end of the canal and those of the lock keepers were adjacent to each of the locks, except the tide-lock (Webber 1954:129-130).

Regulations under which the Santee Canal was operated were relatively few in number. Some of the more interesting ones follow: Senf (Webber 1954:130) stated in 1799 that one of the Company’s operating regulations would be that “no Rafts are admissible through the Canal.” If “raft” in this usage adheres to the customary definition of a number of logs joined together, then the prohibition of their passage through the canal is understandable. Such contrivances would have been a hazard to navigation in the constricted waters of the canal and might have caused undue damage to lock gates and banks. Other rules proposed by Senf included the restrictions that

“...no Boat is to stop at any Place but public landings. That no Boat is to load or unload any Articles or produce at any Place but public Landings, except Boats who carry the Produce of the Lands adjoining the Canal, or which being Articles for the own use of the Owners, whose Lands join the Canal. If a Boat has been detained by some means not able to reach a public landing or Warehouse before dark, such Boat is to stop at the next Lock, till day light, and the Lock keeper will be watchful that no damage or irregularities may happen....If any Boat crew occasion disturbances or damages, the Lock keepers do immediately inform the nearest Peace Officer thereof” (Webber 1954:130).

Decline and Closure

After more than 50 years of service to South Carolina, the Santee Canal finally succumbed to a combination of environmental, economic, and technological determinants which led, inevitably, to its decline and eventual closure.

Because Col. Senf chose to construct the Santee Canal along a route which did not take advantage
of existing springs and "perennial limestone streams" (Porcher 1970:18) and, therefore, was utterly dependent on rainfall catchment basins or reservoirs as a supply of water for its operation, the canal was extremely sensitive to periods of drought. Even though Senf's plan was ingenious and daring - indeed, this method of water supply appears to have been unique among American canals (Leland 1970:10) - it did not stand the test of time, especially repeated and protracted droughts. Thus, serious shortcomings in the canal's planning and engineering became all too apparent when sufficient rainfall was lacking. Late in the second decade of operation of the Santee Canal (1817-1819) a devastating three-year drought occurred. The shortage of water was so severe that "during 1818, one of the principal reservoirs [of the canal] was planted in corn" (Crowson 1971:16). "All the ordinary springs were dried up" (Porcher 1970:18) and, as a result, better than half of the Santee Canal was un navigable. The canal was dry from White Oak Lock (No. 1) on the Santee River to Black Oak Lock (No. 7), a distance of almost 12 miles (19km).

"So protracted was the drought that at last the company determined to resort to the use of steam to fill the canal with water. Two engines were erected, one at White Oak to lift the water from the river, and one at Big Camp [Lock No. 3] to lift it to its summit level. After a great expenditure of time and money the engines began to play. That at White Oak barely furnished water to fill up the leakage; that at Big Camp...continued working for half an hour, when it stopped and never worked again" (Porcher 1970:18).

This first of two major droughts adversely effected the public's and principal users' confidence in the commercial viability of the enterprise. The Santee Canal Company was severely handicapped by the losses suffered during this period (Crowson 1971:16).

After the experience of this drought and its detrimental impact on the canal, a number of ideas regarding its immediate improvement were forthcoming. Among them was a proposal in 1822 to lower the level of the entire summit canal by four feet (1.2m) "...to take advantage of natural springs and water table which would be hit by digging down that depth" (Kohn 1938:258). Because of the immense cost and further interruption of traffic on the canal it was apparently considered an impractical solution.

Between 1848 and 1852 another succession of dry seasons caused the canal to be without sufficient water. This was near the end of the canal's life and during these years its abandonment was seriously considered. However, plentiful rainfall in 1852 relieved the Company of the necessity of closure and it was decided to continue operations; officers were elected that year, as usual (Orvin 1973:153).

Another problem which plagued the Company during the latter half of the operational life of the canal were its difficulties in collecting from debtors.

"Besides the loss of business because of water shortage and closing for repairs the company experienced so much difficulty in collecting from debtors that it was found in 1838 necessary to prohibit any boat entering the canal 'without either paying the amount of the Canal Toll due upon the trip in cash, or else to bring as security for the payment of the same a written order signed by some responsible person already known in the business transactions of the Canal...and against whom a bill may be rendered payable on sight'" (Orvin 1973:153, quoting from Charleston Mercury 27 March 1838).
In other words, from 1838 on, the Company’s operating slogan was “in God we trust, all others pay cash!”

Competition from steamboats was another serious factor in the eventual failure of the Santee Canal. In late 1820 or early 1821, steamboat service was inaugurated between Charleston and Granby Landing (just south of Columbia) via the Santee River (Crowson 1971:16). By 1826, ten steamboats were plying the major rivers of the state. Steamboats carried comparatively staggering numbers of cotton bales and other cargo. Their average burden was ca. 600 bales of cotton, plus people, etc. Most steamboats could transport as many as 1,000 bales per trip using tow boats and barges which were actually pushed by the steamers, not towed. “...On the other hand, the steamboat South Carolina [ca. 1822, and other later, larger vessels] could bring to Charleston nearly 1000 bales of cotton from near Columbia within 8 days” (Crowson 1971:16) without using barges. Thus, steamboats which carried six to ten times the amount of cotton of one of the flats or large canal boats can be seen to have cut deeply into the Santee Canal’s chief source of income.

As bad as drought, debt collection, and steamboat competition was for the canal, the coup de grace came with the opening of railroad lines from Charleston to Columbia, then Camden, which essentially cut off traffic from upstate. “...By a curious play of fortune, the movement for railroads started just about the same time that the success of the canal reached its crest” (Salley 1920). The Santee Canal “was a sad mercantile failure and a cause of bitter disappointment to its projectors, it continued for 50 years to be a useful commercial highway, until it was rendered useless by the extension of the South Carolina Rail Road to Columbia and Camden. By the first it was restricted to the trade of the Wateree River; when the latter branch was completed there was no more business for it” (Porcher 1970:10).

The South Carolina Railroad connecting Charleston and Columbia was begun in 1829 and completed in 1840. The extension to Camden, completed in 1846, was the last straw. Upstate canal traffic was decimated as the transportation monopoly on Up Country cotton was broken. Afterward, canal traffic was reduced to “near neighborhood trade.” The final installment in the death of the Santee Canal began in 1853 with the construction of the Northeastern Railroad. This line crossed the canal obliquely and rendered its revival, a proposition espoused by only a few local diehard proponents, even more difficult and doubtful (U.S. Army 1881:1150).

The exact date(s) of the Santee Canal’s closure and abandonment are yet another cause for debate. Porcher stated it was officially closed in 1850 following a requisite act of the State Legislature which nullified the enterprise’s “perpetual” charter. Other sources disagreed. As mentioned, in 1852 after another three-year period of drought officers were elected as usual. Phillips (1908:43) stated that “about 1858 the canal was finally abandoned and has never been revived.” Certainly, as an official chartered enterprise, the Santee Canal ceased to operate sometime in the 1850s. However, it is quite probable that portions of the canal, e.g. the southern section from Black Oak Lock to Stoney Landing, were still navigable long after formal closure. Indeed, this stretch may have been utilized by local planters and others until shortly after the Civil War (Bennett and Richardson 1988). Leland (1970:12) confirmed that “despite removal of whole sections for brick [reuse], it remained navigable for most of its lower reaches.” Transportation was not its only subsequent use: some locations became favorite baptismal spots for Primitive Baptist congregations.

Interestingly, in 1880 when the U.S. Army was requested by Congress to resurvey the canal with
the prospect in mind of reopening it for commercial traffic, three methods of resurrection and accompanying costs were devised (U.S. Army 1881). Without providing for adequate water supply, an innate shortcoming of the canal which could not be addressed even at that late date, the Army engineers stated that the facilities of the Santee Canal could be put into complete repair for an estimated cost of some $77,000. To insure an adequate supply of water, the estimated costs jumped radically. By lowering the summit level so that it could be fed directly from the Santee River, the cost was estimated at $891,000. Using steam pumps to furnish water to the canal would have cost $484,000. The third method outlined was a combination of use of steam pumps and restored old reservoirs; no cost estimates were included for this scenario. With these massive, though prohibitively expensive improvements, it was felt that traffic could once again use the waterway.

F. A. Porcher writing in 1875 (1970:19) aptly described the abandoned Santee Canal in these words: “It now lies as a noisome ditch, a nuisance to the neighborhood, but a monument of the enterprising spirit of the generation that conceived and executed it.”

Forgotten now for over a century by all but a few local historians and those involved in the study of American canal systems, the Santee Canal is currently at the center of a recent resurgence of interest. Those portions of the canal which have not been inundated by the construction of Lake Moultrie (more than half the length of the canal lies under its waters) or destroyed by subsequent development are still a “noisome ditch.” However, the establishment of the Santee Canal Sanctuary will once again make a small portion of the canal available for public use, enjoyment, and study, will emphasize the canal’s historical importance, and will hopefully allow it to continue to serve as an example of the technological daring and “enterprising spirit” of early South Carolinian engineers, entrepreneurs, and visionaries.
RESEARCH OBJECTIVES AND DESIGN PARAMETERS

The goals of this project, an archaeological survey, were:
1) to determine the nature and extent of cultural remains within the wet and dry portions (Areas A and B) of the Santee Canal (38BK102);
2) to document the remains of the Biggin Creek Vessel (38BK877); and
3) to systematically re-examine the underwater artifact scatter (38BK876) in the mouth of Biggin Creek.

The purpose for gathering this information is to provide a data base upon which PRT and Santee-Cooper can draw for impact-mitigation and comprehensive management of cultural resources within the Santee Canal Sanctuary.

The questions this research was designed to address fall into five categories:
1) If artifactual materials are present within the Santee Canal, then what types of materials are they (discontinuous scatters or distinct concentrations - remains of the tide-lock thought to be located within the sanctuary and/or canalboats), what are their associations, and what is their potential significance?
2) If deemed potentially significant, what types and degrees of mitigation will be necessary to eliminate or lessen the adverse effects of the proposed impacts?
3) What is the nature of the construction and technology exhibited by the Biggin Creek Vessel? Can it be identified as to style or type and probable use? What is its current state of preservation and what can be done to stabilize it while simultaneously insuring that it can be viewed and interpreted by the public?
4) Does the artifact scatter (38BK876) exhibit distinct horizontal and vertical associations or are the cultural materials thoroughly mixed within the sediment package and along the length of the entrance to Biggin Creek? It was thought that contextual associations might enable an interpretation of the range of activities along the north side of the Stoney Landing area through time and information relating to the lifeways and status of the various occupants could come to light. And,
5) can the identity of the suspected 20th-century wooden barge located in the entrance to Biggin Creek be confirmed? Although presently thought to be of little historical importance, the barge’s imminent disturbance and/or destruction necessitates examination and recordation for posterity since the means to do so will be available prior to the commencement of construction activities.

At least one additional research question was asked during the present project: is there potential for encountering prehistoric cultural and/or paleontological materials within the project areas? The possibility of discovering prehistoric cultural materials in the canal (Areas A and B) is quite slim due to the impact of the original construction of the canal and the ensuing half century of yearly maintenance during its operational life. However, prehistoric cultural deposits which might have been encountered during its excavation may have subsequently eroded out of the banks of the canal. Interestingly, mammoth remains were reportedly discovered in 1795 during the construction of the canal just to the north of the present project area (Drayton 1802:39). Therefore, finding similar megafaunal remains, perhaps in association with Paleoindian artifacts, in the bottom or walls of the canal under subsequently deposited sediments was possible. In Areas C and D, as elsewhere, the probability of such finds was quite low, but their potential importance cannot be overemphasized.

Based on recent research, it seems that Paleoindians of the Southeast occasionally hunted now extinct megafauna (e.g. mastodon, mammoth, sloth, and bison). Intriguing evidence of large-game hunting practices has been gathered from
several sites in the Southeast: excavation of a site on the Silver Springs River in Florida produced the remains of two juvenile mammoths in direct association with lithic debris and a Suwanee point (Hoffman n.d.; Michie 1984:19). Found below ca. 2.4m of marl and alluvium, soil analyses revealed that the young mammoths died in what was a shallow pond in a bottomland environment. A possible association between suspected Paleoindian lithic tools (a flake-like implement and well-used hammerstone) and the remains of a juvenile mastodon near Myrtle Beach, South Carolina, is speculated due to their common occurrence in Pleistocene-deposited peats (Michie 1984:19 and 1976; Wright 1976). This site, discovered during dredging operations of a small creek, is situated beneath some 2.4m of sandy Holocene sediments and peats. Also from a present riverine environment in Florida, a lanceolate point was found embedded in the skull of an extinct bison (Webb et al 1983). It is quite possible that future activities, especially those performed underwater, in and around other similar bottomland environments in South Carolina (e.g. Santee Canal and Biggin Creek) may reveal equally intriguing associations between Paleoindian artifactual materials and extinct megafaunal remains.

More recent prehistoric materials may also have been encountered in the project areas in Biggin Creek. At least one sherd previously recovered from Area D was tentatively dated to the Late Woodland period (Charles and Mills 1987:96).
METHODOLOGY

The methodology employed in the course of this project was designed to achieve the stated research objectives and answer posed research questions. A magnetometric survey combined with limited sub-bottom test excavations on detected anomalies was carried out in Area A—the wet portion of the Santee Canal within the sanctuary property. A magnetometric survey was conducted in Area B (Fig. 12); no anomalies were detected. The Biggin Creek Vessel (Area C) was preliminarily documented and a systematic examination, including controlled surface collection and test excavations, of the submerged portion of 38BK876 (Area D) was made.

Area A

Initially, a primary datum and seven sub-datum points were established at optimum locations alongside the canal throughout Area A. After overhanging branches and other minor obstructions were removed, the placement of these points provided clear line-of-sight coverage for the optical/electronic survey instrument of the four main reaches of the canal in Area A (Fig. 11).

The proton precession magnetometer, a Geometrics 866 with integral strip chart leased through Harvey Lynch Inc., of Houston, Texas, was mounted in a small, flat-bottomed aluminum jon boat with a land sensor head boomed-out over the bow on a 3m length of “angle” aluminum. The jon boat was propelled by paddle, thus providing a quiet environment for the mag and survey personnel and good control (slow speed and maneuverability) during the survey.

Due to the narrowness of the canal (average width of ca. 17m) and the numerous navigational obstructions, consisting principally of trees which had fallen into the canal, strictly spaced lane spacing was not possible. Fluctuating water level caused by tides and releases from the Pinopolis Dam and the subsequent effects on our ability to fully navigate within the canal were constant concerns. Attempts made to keep the water level of the canal elevated involved plugging the mouth of the culvert which connected the canal to the Tailrace Canal at slack high water. A large, one-way flapper valve, constructed of wood and similar in design to valves used in commodes, was successfully employed for several days. However, the combined forces of current and differential head pressures destroyed this fabrication in fairly short order. Therefore, survey operations were confined to the southern (deeper) end of Area A during periods of low water. At times, there was not enough water to operate anywhere within the canal and operations were moved to other areas.

Passes down the center line of the remnant canal and along either side, where permitted by obstructions and water level, effectively resulted in 6m wide lanes (Fig. 13). In some stretches only two lanes spaced some 7-8m apart were possible. Such spacing in the shallow depths insured that potentially small concentrations of ferrous metals such as iron hull fasteners and rudder hardware in potential canalboat remains and fasteners, sluice gate mechanisms, and the like in the tide-lock chamber and gates could have been discerned.

All detected anomalies were defined by a series of perpendicular runs, where possible. If deemed significant enough to warrant diver inspection, their locations were marked with easily-visible bamboo poles. The distance and bearing of these locations from the nearest sub-datum point with an unobstructed view was acquired with a Nikon NTD-2 total station. A number of anomalies were flagged and plotted within a particular stretch of canal before operations were switched to the diving/excavation mode. The magging equipment was disassembled and the jon boat was converted to serve as a diving platform.
Figure 12: Large scale sketch map of Area B.
Figure 12: Large scale sketch map of Ar
Anomalies were first examined by probing with bamboo poles from the jon boat. This was followed by a brief underwater search by divers who removed sediments by hand in an attempt to quickly identify the source of the anomaly. When it was necessary to remove greater volumes of sediment in order to accurately define anomaly sources and associated features, a 4in- (10.2cm-) diameter hydraulic induction dredge was employed. Dredge effluent was not screened because excavation was finely controlled and all encountered artifacts were readily detected by hand before they entered the dredge. The number of artifacts excavated at anomaly locations was quite small - all anomaly sources, with the exception of a magnet fragment from an electric motor, were articulated iron components of large timber and brick constructs (see Table 3 in Results section, below).

Measurements were taken and sketches made of the anomaly sources and associated features encountered within these excavations.

The entire sequence was repeated for each of the four reaches of the remnant canal in Area A.

**Area B**

Seven sub-datum points were established at optimum locations in Area B. After overhanging branches and other minor obstructions were removed, the placement of these points provided clear line-of-sight coverage of the six main reaches of the canal track in Area B (Fig. 12).

Two marshy areas on either end of the central portion of standing water were surveyed utilizing standard terrestrial magnetometry methods (Fig. 14). The mag “systems” unit was placed at strategic locations within each of the marshy areas and the hand-held sensor head was walked along the ca. 15m wide corridor to be dredged. This corridor, although filled with dredge spoil which has migrated down from the western embankment of the Tailrace Canal, follows the presumed original course of the Santee Canal and was usually discernible as a shallow depression. Two survey lanes, each ca. 3m on either side
of the previously flagged centerline of the corridor, were completed. Although numerous cypress trees had to be avoided, the marshy areas were satisfactorily covered.

The magnetometry survey of the central area of standing water was conducted in the same manner as that employed in Area A. Navigational obstructions consisting of felled trees, shoal water, and thick vegetation more or less dictated the tracks of the survey lanes. Generally, two lanes were run ca. 3-4m on either side of the approximate centerline of this 18m wide stretch of Area B.

Lane spacings such as those employed in Area B insured that potentially small concentrations of ferrous metals could have been located. Since no anomalies were detected there were no excavations in this area of the Santee Canal Survey.

Area C

Over a two-day period, a three-man team conducted a detailed examination of the in situ wooden hull remains and disarticulated components of the Biggin Creek Vessel (38BK877) which constitutes Area C. The general layout of the wreckage was noted and gross measurements were made. Sketches and a full range of fine measurements sufficient for a nearly complete reconstruction of the vessel and its construction details (e.g. keel, keelson, mast step, stem knee (deadwood), sternpost, planking rabbet in stem knee, garboard strake attachment to keel, framing pattern (room and space), fastener (square nail, treenail, and iron drift pin) patterns, futtocks, risers) were taken with flexible tapes and recorded on sketches made on submersible paper. In spite of the rather limited visibility of 0.3-0.6m with abundant suspended matter, sufficient data for drawings of various features were obtained (Fig. 15).

Small-scale, hand-fanned excavations of sediments from specific areas of the vessel were necessary to insure full documentation of key structural features. Disturbed areas were back-filled to prevent subsequent disturbance and damage by natural forces.
No artifacts were recovered from this site, but 12 wood samples were obtained from various hull members and were identified by Dr. Hon of Clemson University’s Forestry Department. A full report of the findings of this examination are reported in Appendix A.

Area D

A surface collection of the submerged artifact scatter in the mouth of Biggin Creek was made during investigations in 1986 (Charles and Mills 1987:95). The previous work revealed distinct concentrations of artifacts on the creekbed which apparently corresponded to the locations of three concentrations noted on the sloping southern bank (Charles and Mills 1987:76).

A systematic re-examination (surface collection and limited test excavations) was thought to be necessary because of features observed during the previous preliminary surface investigation. Six 1m x 1m test pits were placed at locations within the creek entrance (Fig. 16). A row of three excavation units (TP I-III) were located against the south bank centered over the previously located concentrations. Test pit I was placed 25m northwest of the flood gauge located at the juncture of Biggin Creek and the Tailrace Canal. A second row of three test pits (TP IV-VI) was established in the center of the channel directly out from squares I-III, although test pit IV had to be placed further to the southeast to avoid the wooden barge. A collection was made of all surface materials encountered in each square. Where the depth and nature of sediments permitted, excavations within the same 1m x 1m squares were conducted to underlying bedrock: some excavations were terminated when obviously sterile strata and/or impenetrable root mats were encountered.

Artifacts were collected from the surface of five test squares (I, II, III, V, and VI) and only two squares (I and VI) had enough sediments in which to excavate. Artifacts recovered from each square
were bagged and tagged according to their horizontal provenience and whether they were encountered at the surface or within the sediment package. For a full description of each excavation unit and the materials recovered from it see the Results section and Appendix C, below.

The 1930s-vintage wooden barge within Area D was documented by William Judd (See Appendix B).
RESULTS

Introduction

The archaeological survey of the Santee Canal Sanctuary resulted in the discovery of a number of historic sites of potentially major significance to the study and interpretation of South Carolina lifeways from the end of the 18th century to the mid 19th. Aspects of industrial development, agricultural development, transportation practices and vernacular watercraft construction are reflected in the record of sites and isolated artifacts recorded during the 20 day project.

The results reported below cover separate surveys of two sites, the Biggin Creek Vessel (38BK877) and the Stony Landing trash midden (38BK876) and extensive surveys of the last remaining flooded portion of the Santee Canal, Area A, and a section of ‘dry’ canal, Area B (Fig. 2). Also included is a survey of an early 20th century barge in the mouth of Biggin Creek. While not currently considered to be of archeological or historical interest, its recordation was deemed important for the record of a period to be studied by future historians.

Disturbance of the various features studied under this survey was limited only to that necessary to identify the general nature of the feature. Care was taken to avoid further de-stabilization of the environment in which these features were found since, at the time of the survey, the final impact of the contractor’s dredging activity and the availability of mitigation funding was not known.

The single most important result of the survey was the discovery of the terminal tide-lock of the Santee Canal. Current research indicates that the structure is the only one of its kind in South Carolina. Other discoveries included two of the four lock gates known to be used on the tide-lock and at least one vessel.

Magnetometer Survey

The magnetometer survey was designed to detect metal objects with a magnetic signature of 15 gammas and above. In Area B no magnetic anomalies were detected. In Area A a total of seven ‘targets’ were recorded ranging in signature strength from 39.5 gammas to 554.0 gammas (Table 3).

Target I.1, I.2

Target I.1 was not located by divers and appears to be a small object or group of objects buried in sand, mud and brick on the east side of the canal within the tide lock. Target I.2 was similarly difficult to find and also appears to be a grouping of small objects deeply buried in the overburden at the south end of the tide-lock. Extensive excavation to positively determine the source of the signatures was not conducted in order to avoid unplanned disturbance of tide-lock features in these same areas.

Target I.3

Target I.3 was the first of two lock gates discovered on the canal bottom south of the tide-lock. It was located ca. 100m south of the lock chamber (Fig. 18) just below the entrance of a small creek into
DATUM POINTS
AREA A
SANTEE CANAL
SCALE = 1:1000
ALL BEARINGS REL. MAGNETIC
[MAG. VARIANCE = 5° 35' W OF N (1987)]
DATUM POINTS
AREA A
SANTEE CANAL
SCALE = 1:1000
ALL BEARINGS REL. MAGNETIC
[MAG. VARIANCE = 5° 33' W OF N (1987)]

Figure 17: Enlarged map of magnetometer survey Area A: Part 1.
Table 3: Magnetic anomalies detected in Area A ("wet" portion of Santee Canal).

<table>
<thead>
<tr>
<th>TARGET</th>
<th>MAG SIGNATURE</th>
<th>APPROX. AREA</th>
<th>IDENTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.1</td>
<td>86.4 gammas dipolar</td>
<td>30 sq m</td>
<td>tide-lock chamber; hinge post base plate brick wall footing</td>
</tr>
<tr>
<td>I.2</td>
<td>80.4 gammas dipolar</td>
<td>30 sq m</td>
<td>tide-lock chamber; hinge post base plate brick wall footing</td>
</tr>
<tr>
<td>I.3</td>
<td>303.6 gammas dipolar</td>
<td>30 sq m</td>
<td>tide-lock gate; sluice gate mechanism, fasteners, straps</td>
</tr>
<tr>
<td>IV.1</td>
<td>116.5 gammas dipolar</td>
<td>6 sq m</td>
<td>ca. 2.3 kg of ca. 3cm-diam. wire; fish trap?</td>
</tr>
<tr>
<td>IV.2</td>
<td>554.0 gammas dipolar</td>
<td>100 sq m</td>
<td>tide-lock gate; sluice gate mechanism, fasteners, straps</td>
</tr>
<tr>
<td>IV.3</td>
<td>39.5 gammas dipolar</td>
<td>15 sq m</td>
<td>unid. timber construct; spikes and fasteners</td>
</tr>
<tr>
<td>VII.1</td>
<td>469.2 gammas dipolar</td>
<td>30 sq m</td>
<td>portion of electric motor magnet, ca.2.3 kg</td>
</tr>
</tbody>
</table>

the main Biggin Creek-Canal channel. The gate was deeply buried beneath ca. 3.5m of mud and partially covered by earth in the western canal bank. Sufficient overburden was removed to reveal the source of the signature - thick wrought iron reinforcing bands, through-bolted to the main structural members of the gate. A small number of brick fragments and stoneware sherds were also found beneath and against the upstream side of the gate. This material was photographed and returned to the site.

Target IV.1

Target IV.1 proved to be a small concentration of ca. 2.3 kg of 3mm thick wire, possibly a fish trap.

Target IV.2

Target IV.2 was the second lock gate and located ca. 300m south of the tide-lock. The gate was buried beneath 3.5m of mud against the eastern canal bank. Sufficient overburden was removed to identify the gate as similar in construction to target I.3, although it is thought to have a metal sluice gate mechanism (Fig. 19) which was not present at target I.3.

Target IV.3

Target IV.3 was located at the mouth of a small creek feeding into the Biggin Creek-Canal channel (Fig. 20). The source of the signature appeared to be metal nails, spikes and iron dowels in an unidentified wooden construct consisting of longitudinal planks and one curved cross member (Fig. 21). The target was found beneath ca. 3.5m of mud, lying on a bed of gravel on the original canal bed.
Tide-Lock Gate
Target IV.2
Santee Canal

concentration of iron
iron plate ca. 2 cm thick
sm. Fe pin
possible sluice gate
straps let into frame surfaces

Figure 19: Preliminary sketch of Target IV.2.
Sufficient overburden was removed to make a preliminary identification of the target. The fragile condition of the construct made further disturbance or removal for positive identification unadvisable at this time. It has been suggested that the construct may be the remains of one of the self-scouring features built into the canal (Joe Simmons, pers. comm.).

**Target VII.1**

Target VII.1 was a sizeable signature, 469.2 gammas, but proved small and difficult to find. After some difficulty, the mud yielded a ca. 2kg iron magnet fragment. With this removed from the area, no further signature was detected, identifying the magnet as the source of the signature.

**Visual Survey**

In addition to the magnetometer survey, a visual survey was made of Area A. This was done to ensure complete inspection of the area and to cover those areas of the canal bed over which the magnetometer could not be run due to obstructions - usually fallen trees. Field staff completed this survey by walking the entire length of both east and west banks of the canal, and by walking through the mud and water in the canal bed for the entire length of the area. As a result of this activity, three new features were noted. These were: concentrations of brick ca. 200m from the north end of Area A; earthworks on the west bank north of the brick concentrations; and the stern assembly of what appeared to be a small historic vessel against the east bank of the south end of the canal. An additional random artifact was encountered by the contractor’s staff during excavation activities. This was a large, carved timber raised in the bucket of the contractor’s backhoe. The timber was placed on the east canal bank for appraisal by the survey staff. Discussion of this artifact is included below.

**The Terminal Tide-Lock**

Concentrations of brick fragments on the east and west banks of the canal were noted at a location ca. 200m south of country road S-8-343. Two small anomalies were located in this same area previously
Target IV.3
Santee Canal

Figure 21: Preliminary sketches of unidentified wooden construct, Target IV.3.
by the magnetometer survey. Field staff ‘walked’ the canal bed between the brick fragment concentrations and immediately discovered features buried beneath ca. 0.7m of mud and ca. 1m of sand and gravel. The entire area was then carefully probed to delineate the extent and general nature of the features.

This initial investigation indicated a section of canal bed ca. 40m long and ca. 15m wide covered with a flooring of wooden planking overlaid with mortared brick. The flooring was observed at each end of the area - gravel and a thick layer of brick rubble preventing confirmation of a similar layer of the flooring in its center. Viewed as a unit, this area exhibits many of the features expected to be present in the remains of the wooden terminal tide-lock of the Santee Canal. The brick structures, with the in situ quoins, closely match the general appearance and characteristics of lock gate supports documented at Locks No. 1 and 2 of the canal on dry land at Pineville, SC (Judd 1988:1).

At the north end of the area, probing revealed a large concentration of brick rubble on the east side of the canal. Associated with the rubble were several carved stone blocks or quoins, exhibiting a square cross section with one corner carved to form a lock gate-post pocket. Opposite this area, on the west side of the canal, an intact brick structure was located. The structure, totally buried in mud and coarse gravel, was ca. 8m long. No quoins were found in association with this feature.

The north end of the area was found to contain two similar features, each with several quoin blocks in situ. Each feature was ca. 8m long, composed of brick set on a flooring of brick and planking. Each of these structures formed a brick platform set against the canal banks. The inner, or channel, edge of each exhibited indentations in its face and sloping edges on the up and downstream sides.

Numerous loose quoin stones were found in the mud and gravel downstream of both southern features. A loose timber was located against the wall of the south east feature, and next to this a large wooden construct of planks. After being identified as loose wooden artifacts in situ they were not disturbed further. The planking construct was buried beneath ca. 1.5m of mud, but lay on top of an additional ca. 0.75m of sand and gravel. This may indicate that it was deposited on the site some time after cessation of activities in the lock and its subsequent silting. Beneath the layer of sand and gravel a brick flooring was identified with an additional sub-flooring of planks. The plank sub-floor observed at both ends of the lock was severely eroded and fragmented.

During a subsequent period when contractor efforts to drain the canal had partially succeeded, the lowered water level revealed the eroded remains of two shaped timbers in the west bank of the canal, upstream from the south west feature. The timbers were severely eroded but appeared to be in their original positions at a 90 degree angle to the sides of the lock.

The terminal tide-lock was unique in its fabrication in that it had wooden walls - all other locks on the canal were of brick construction (as cited above). The only other wooden tide-lock known in the South East is on the Brunswick-Altamaha Canal in Georgia (American Canal Society: 1975). In order to better interpret both the features found in this area and the two lock gates, a field trip was made to the lock site on this canal in Georgia. Comparative sketches were made of the lock and the gate structure (Fig. 22). This study indicated certain similarities between the structure at the southern end of the Brunswick-Altamaha Canal and the Santee Canal tide-lock gate support structures - but few similarities in gate construction or side wall construction techniques (Judd:1988, Fig. 8) (Fig. 23).

The historical record gives little detail about the construction of the tide-lock (see Historical Background above). We are, however, given several accounts of the condition of the tide-lock after the canal was abandoned. In addition to the report made by the Corps of Engineers of 1881 (U.S. Army 1881:1156-1157 cited in Historical Background above) we are given several other accounts:
Tide-Lock Chamber

(388K1046)

Santee Canal
Berkeley County,
South Carolina

Figure 23: Sketch map of tide-lock area.
"Despite removal of whole sections for brick, it remained navigable for most of its lower reaches. Some points became favorite baptismal spots for Primitive Baptist congregations...." (Leland 1970:12);

"...for the last 130 years the unused locks and buildings have served as sources of brick for chimneys, brick pillars and foundations for persons in the vicinity who were building" (Cross 1985:214).

We get a hint of its construction from Senf himself:
“...If the sides of the locks are constructed of wood, the distance between each gate, would
be at least 10 feet more than the 60ft specified for locks constructed of brick and stone
(masonry)” (Webber ed. 1954:119).

These comments would explain the condition of the tide-lock area and the disassembled
condition of the north east structure. The distance between the original position of the gates on the tide-
lock was determined to be ca. 70ft (21.3m). The two single square timbers upstream of the south west
quoin may also indicate the former presence of a wooden support system for the lock walls. The width
between the two in situ quoins is 17ft (5.1m) - the same as that given for Lock No. 1.

Two additional wooden artifacts were encountered during the investigation of the tide-lock area.
These were a ca. 7m wooden plank, severely eroded, one end embedded in the west wall of the lock
downstream of the north west brick construct, and a partially buried log-like artifact with an iron dowel
or pin inserted in the exposed end. These features were noted and left in situ.

Extensive testing or disturbance of the tide-lock area was not within the scope of the survey. The
data gathered to this point did, in the opinion of the Principal Investigator, identify the area as the site
of the wooden terminal tide-lock.

The Boxmine Boat

The visual survey of the lower section of Area A also produced an archaeological feature of
considerable importance. During inspection of the east bank of the canal upstream of the culvert cut off
(Fig. 25), a small segment of a wooden sternpost was observed rising from the mud beneath a fallen tree
trunk. The tree, which extended across the entire canal width, was cut into segments and removed.
Sufficient overburden was removed from around the feature to identify it as the stem post assembly of
an historic vessel (Fig. 26). Probing in the mud over the vessel determined that the wreck was ca. 17m
long with a ca. 3m beam. A small section of the bow of the vessel was excavated to further assist
identification. This excavation revealed a narrow sternpost assembly consisting of a cutwater and
sternpost. A small stem knee braced this structure against the keelson. Two cant frames were also
revealed along with a small quantity of 3kg sized ballast cobbles. The bow timbers showed clear evidence
of burning.

The data thus recovered indicated the presence of an historic vessel ca. 17m by 3m, of light
construction. These minimal characteristics are suggestive of the size and construction of some types of
canal boats (see above), but could also represent almost any type of double ended vessel. More extensive
testing of the site was considered beyond the scope of this survey.

Artifact Scatter

Within the mouth of Biggin Creek lies a zone of scattered artifactual materials (Z 17: E 596,075;
N 3,672,945) thought to be associated with a trash disposal area noted on the steep southern bank during
the terrestrial archaeological survey of the Sanctuary property. Designated 38BK876 (Area D in Fig. 2),
the underwater component of the disposal area was also investigated in August 1986 by Mark Newell
of SCIAA’s Underwater Division. This cursory examination of the artifact scatter extending some 45m
east to west and averaging 11m out from the southern bank (ca. 500 sq m, 0.05 ha or 0.13 A) revealed
Figure 25: Sketch map of location of Boxmine Boat.

Figure 26: Photograph of sternpost of Boxmine Boat.
ceramics and glass fragments dating from the 18th to 20th centuries (Charles and Mills 1987:95).

It was initially thought (Simmons 1987:17) that further investigation of the underwater component of the dumping ground at Stoney Landing (Area D) might reveal distinct horizontal and vertical contextual associations of artifacts. Although three subtly distinct zones of artifactual concentrations were noted along the bank directly beneath and presumably associated with three concentrations recorded in the terrestrial scatter (Charles and Mills 1987:76), no discernible stratigraphic record exists within them. In fact, the upper sedimentary layer, in which all artifactual materials were encountered, is surprisingly thin - averaging only some 10cm in depth. Within the sandy, shell-rich matrix of this layer, artifacts, mussel and clam shells, shale, sand, and organic detritus are thoroughly mixed. Significantly, the resulting jumble of materials - probably caused by periodic scouring of tidal currents and the "plowing" action of current-born tree trunks, branches, etc. - is comparable to the disturbance observed in plow zones in terrestrial sites. A sterile layer of compacted mud and organic detritus from 0.15-0.50m thick underlies the lens of cultural debris and other materials. Beneath this layer is the marl and limestone bedrock characteristic of the area.

Artifacts recovered during surface collection and excavation within six designated 1m x 1m test squares include the following categories: bone, ceramics and brick fragments, glass, and iron. A tentative mean ceramic date determination (Table 4) yields a value of 1851 - a figure which compares favorably with that of 1836 calculated for the adjacent terrestrial trash disposal area (Charles and Mills 1987:77). The later date and lack of stratigraphic integrity may indicate that later deposits on the terrestrial area have slumped into the creek, rather than becoming embedded in the surface of the sloping bank as did the earlier ceramic materials.

<table>
<thead>
<tr>
<th>Ceramic Type</th>
<th>Range</th>
<th>Median</th>
<th>No.</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undecorated Pearlware</td>
<td>1780-1830</td>
<td>1805</td>
<td>2</td>
<td>3,610</td>
</tr>
<tr>
<td>Whiteware</td>
<td>1820-1900+</td>
<td>1860</td>
<td>45</td>
<td>83,700</td>
</tr>
<tr>
<td>Canton Porcelain</td>
<td>1800-1830</td>
<td>1815</td>
<td>4</td>
<td>7,260</td>
</tr>
<tr>
<td>Blue Edged Pearlware</td>
<td>1780-1830</td>
<td>1805</td>
<td>1</td>
<td>1,805</td>
</tr>
<tr>
<td>Transfer-Printed Pearlware</td>
<td>1795-1840</td>
<td>1818</td>
<td>1</td>
<td>1,818</td>
</tr>
<tr>
<td>Overglaze Enamelled Chinese Trade Porcelain</td>
<td>1790-1825</td>
<td>1808</td>
<td>2</td>
<td>3,616</td>
</tr>
</tbody>
</table>

Mean Ceramic Date = 1851.07
Terrestrial Features

During investigation of the tide-lock area associated earthworks were also noted. Accounts of the canal cited above indicate the existence of an overfall and turning basin at the tide-lock. The earthworks were located on the west bank of the canal, directly upstream of the tide-lock area (Fig. 27). Preliminary mapping of the area produced contours of an indentation in the west canal bank now silted in to within 1m of the top of the surrounding canal bank. The canal bank around the west edge of the indentation appears to have been modified, creating a narrow bridge of banking behind which is an eroded catchment area.

The configuration of these earthworks as illustrated in Figure 27 would appear to provide all the features neccessary for a turning basin and an overfall as described in contemporary descriptions of the tide-lock. The indentation in the west bank is in an appropriate location immediately behind the north entrance to the tide-lock. The overfall is located in an area which would facilitate direction of the runoff into the natural creek bed running into the main channel south of the tide-lock.

Accounts cited above also indicate the existence of a lock keeper’s house at each end of the canal. There are no indications of the size of such a structure and the only known functions performed in these facilities were the collection of fees and completion of traffic records. Visual inspection and mapping of the terrestrial features in the tide-lock area also revealed a small but high profile mound on the east bank of the canal adjacent to the southeast quoin (Fig. 27). A concentration of brick rubble was also noted in this area and may indicate the existence of a small land structure. Terrestrial investigations were not within the scope of this specific contract, so work on these features was limited to this preliminary recordation.

Isolated Wooden Artifacts

After completion of the magnetometric portion of the survey, the general contractor attempted to drain the entire canal. This was successful to the point where heavy duty trucks and tracked backhoes could enter the canal for the removal of mud in non-archaeologically sensitive areas. Prior to this phase of the project, sensitive areas were clearly marked with stakes and blue flagging. During the course of this work, which was monitored by the archaeological staff, three disassociated wooden artifacts were recovered. One was a segment of a ship’s frame, (Fig. 28), the second a crudely carved support knee - possibly for a sailing craft or bridge (Fig. 29), and the third a large carved timber, (Fig. 30). Preliminary measurements and photographs were taken of these artifacts. They were then stabilized for later detailed recordation.

The carved timber appeared to be a structural member of a larger construct of unknown configuration. The timber measured 3.12m in length and had a cross section of 29.0cm by 26.0cm (Fig. 31). Three mortises were carved into one face of the timber, each to receive a tenon ca. 2.45m wide, 11.5cm thick and 15.0cm deep. A ca. 6.0cm dowel hole was carved through the side of the timber over each tenon, a wooden dowel being forced through this to pin and secure the tenon into the timber.

During the survey there was considerable interest in recording loose timbers which might prove to be remains of the walls of the wooden tide-lock. During the excavation on the northern end of the canal bed by the contractor, several large timbers were revealed. Examination of these timbers resulted in the conclusion that they were fragments of the early 20th century bridges built over the canal. While there are no definitive methods for dating timbers by cutting techniques, there are generally accepted features
Figure 27: Map of tide-lock area and associated terrestrial features.

38BK1046

- SW QUOIN (IN SITU)
- SE QUOIN (IN SITU)
- N EXTENT OF BRICK FLOORING
- DATUM TIDE-LOCK CHAMBER
- OVERFALL
- Turning Basin?
Figure 28: Drawing of disassociated ship's timber (first futtock).

Figure 29: Sketch of 'breasthook'-like structural timber.
Figure 30: Ashley Chapman prepares temporary stabilization of carved timber.

Figure 31: Preliminary sketch of carved structural timber found during contractor dredging operations.
to which temporal periods may be applied (Fig. 32). The determination of the origin of these timbers was based on observed cutting features and creosote impregnation (Fig. 33).

**Temporary In Situ Stabilization and Flagging**

Following preliminary investigation of features found in the canal, steps were taken to mark and stabilize each site in anticipation of the impact of the activities of the contractor. At that time, it was the announced intention of the developers to remove the bulk of the mud and tree trunks from the canal and further drain it.

The major negative impacts possible were damage to artifacts by contact with contractor vehicles and the drying out of wooden materials left *in situ* as the canal was drained. Several measures were taken on each site to minimize these dangers. A trench was cut in the mud around each site, leaving a minimum 1m safety zone around the feature (Figs. 34 and 35). The entrenched area was then covered with a thick layer of burlap sacking over which was placed a layer of black plastic film. The plastic sheeting was then pinned in place with stakes and granite rock. In the event that water and mud levels were drastically reduced around the features, the plastic film and burlap sacking was expected to keep the mud moist enough to prevent deterioration of the protected features.

**Contributed Reports**

Three contributed reports are appended to this survey report. The first, Appendix A, was produced by Mr. Christopher Amer, Head of SCIAA’s Division of Underwater Archaeology and a specialist in the recordation of ship structures. Mr. Amer completed the preliminary documentation of the Biggin Creek Vessel as part of this survey with the assistance of the authors. The second, Appendix B, is a report on land excavations at the Stoney Landing house site by Mr. James L. Michie, Archaeologist with the Research Staff of SCIAA. Mr. Michie has extensive experience in the excavation and interpretation of historic plantation sites. The third report, Appendix C, is by Mr. William R. Judd, a Research Associate of SCIAA. Mr. Judd has extensive experience in the recordation of barges and small craft in riverine areas of South Carolina. He completed the recordation of the 1930’s era barge in the mouth of Biggin Creek.

![Figure 32](image-url)

*Figure 32: Sketch demonstrating approximate temporal range of hand and mechanised saw cut marks.*

*Used by kind permission of Mrs. Mimi Sloane from A Reverence For Wood by Eric Sloane, Ballantine Books, 1973.*
Figure 33: Circular saw marks and creosote impregnation identify modern timber.

Figure 34: Trenching operations around the perimeter of the Boxmine Boat.
Figure 35: Trenching operations around the Boxtine Boat site.
RECOMMENDATIONS

Introduction

In December of 1987, the South Carolina Department of Parks, Recreation and Tourism signed a Memorandum of Agreement with the South Carolina State Historic Preservation Office for the protection of cultural resources during the development and operation of the Old Santee Canal Sanctuary (Appendix D). The terms of this MOA were based in large part on recommendations made by the authors immediately after completion of the initial stages of the survey. As the work progressed, additional sites were located. These were covered under para. 7 of the MOA “Properties discovered during implementation of an undertaking.”

This section of the report will expand on recommendations made at the time of the issuance of the MOA, and will also report for the first time on recommendations for the resources encountered during the later stages of the survey.

The Biggin Creek Vessel

This vessel is considered one of the most important interpretive and archaeological features of the Sanctuary. Recommendations for further action have been authored by Christopher Amer, Mark Newell and Bruce Thompson (Underwater Archaeologist and SCIAA Conservator). These recommendations appear at the end of the special report on the vessel in Appendix A.

Artifact Scatter

Recommendations for the artifact scatter were submitted in a management summary for the site authored by Joe Simmons III (Appendix F). No further actions or monitoring activities are recommended.

The Boxmine Boat

The Boxmine Boat was discovered after execution of the MOA. The preliminary data recovered on the vessel construction and dimensions indicate a high probability that the ship is a canal boat or ‘mountain boat’ - as opposed to the larger and more heavily built vessels documented in the lower coastal plain. If this proves to be the case, the Boxmine Boat will be the only canal or mountain boat discovered to date in this State. The vessel will then be deemed eligible for the National Register of Historic Places and can make a unique contribution to our understanding of the design and construction of vernacular craft in South Carolina.

It is recommended that, subsequent funding and canal conditions permitting, the vessel be excavated, fully documented and either removed from the site for eventual conservation, or stabilized in situ as an interpretive feature of the Sanctuary. In the event that excavation is not possible at this time, a strategy should be developed for the stabilization and protection of the vessel and a large portion of
the surrounding mud and gravels. The site, as currently marked and protected, should be monitored throughout the ongoing contractor activity in the canal.

Target IV.2, South Lock Gate & Target I.3, North Lock Gate

The southernmost lock gate is one of only two surviving lock gates of the Old Santee Canal. As such, it can provide important data on the methods used for its construction, operation, and repair. Since the gate is no longer in its original context - having drifted down the canal some considerable distance from the lock before becoming waterlogged, no special attention should be paid to its current context.

It is recommended that the gate be fully excavated, documented, and removed to a suitable storage area to await conservation. If conserved, the gate will be available for minute study and for viewing by the general public, perhaps in a Sanctuary interpretive center.

The north lock gate is the second discovered in the canal and is especially important in that it can provide unique comparative data on construction and repair methods. Both gates may prove to be examples of some of the earliest lock gate technology employed in America. It is recommended that the gate be fully excavated, documented, and removed to a suitable storage area to await conservation. Minute examination of the gate after conservation can be expected to reveal important data about its construction, repair, and use in comparison with the south lock gate.

Target IV.3, Unidentified Wooden Construct

The overall size of this construct is small enough to permit complete excavation and removal. It is recommended that this be done in order to facilitate full identification and evaluation of the artifact. Limited testing of the site indicates that the construct is fragile and in danger of disarticulation. If, upon excavation, the construct proves to be a feature of historic importance, steps should be taken to ensure its preservation through removal and conservation or stabilization in situ. If the construct is associated with one of the self-scouring devices in the canal, investigation should extend to the canal bed beneath it and into the adjacent canal bank.

The Terminal Tide-Lock

The area identified as the terminal tide-lock is, without doubt, the single most important feature discovered in the remains of the canal. The existence of this feature beneath a protective blanket of mud and gravel may offer an opportunity for the study of America's earliest known summit-level canal lock with features, organic materials, and artifacts in a high state of preservation. Excavation and documentation of the tide-lock could make important contributions to the historical and archaeological record of South Carolina and the nation. The lock also has the potential for being a major interpretive feature of the Sanctuary.

It is recommended that, funds and canal conditions permitting, the lock be further tested and documented. It is also recommended that the Sanctuary management plan include measures for monitoring features within the lock for possible deterioration due to the effects of current and oxygenated water.
Associated Land Features

The ‘overfall’ and ‘turning basin’ features in the canal bank northwest of the tide-lock are integral components of the tide-lock site. It is recommended that the data recovery plan for the tide-lock include investigation of this area. At a minimum, 1m square test pits should be excavated at the overfall location to test the hypothesis that this is the location of an overfall device designed to reduce the level of water north of the tide-lock during flood conditions. Evidence of sills and sluice gate mechanisms should be revealed if this hypothesis is correct. Similarly, 1m test pits should be excavated into the west bank at the edge of the ‘turning basin’ area to test the hypothesis that this is in fact a turning basin area which has silted in since the canal was abandoned. If this hypothesis is correct, test pit profiles should reveal evidence of silting and artifacts at the level of the canal bed.

It is also recommended that test pits be excavated in the mound on the east bank adjacent to the lower lock gate quoins. These will test the hypothesis that the mound is the remains of a lock keeper’s hut or other structure associated with the operation of the lower lock gates.

Isolated Wooden Artifacts

It is recommended that the three wooden artifacts found during the survey be measured, drawn and photographed. They should then be removed or stabilized in situ in such a way as to ensure protection from the effects of current and oxygenated water.
APPENDIX A

THE BIGGIN CREEK VESSEL (38BK887)

by

Christopher F. Amer

Investigative Techniques

Over a two-day period, a three-man team conducted a detailed examination of the *in situ* wooden hull remains and disarticulated components of the Biggin Creek Vessel (38BK887) which constitutes Area C (Fig. 36). The general layout of the wreckage was noted and gross measurements were made. Sketches and a full range of fine measurements sufficient for a partial reconstruction of the exposed remains of the vessel and its construction (e.g. keel, keelson, mast step, stem knee (deadwood), framing pattern (room and space), fastener (square nail, trunnel, and iron drift bolt) patterns, futtocks, risers, etc.) were taken with flexible tapes and recorded on sketches made on submersible paper.

A flexible metric tape was stretched along the centerline of the hull to serve as a baseline to which other hull measurements could be related. Measurements of hull features were recorded on the sketches or added directly to existing drawings of the remains. Dimensions and timber associations were checked against an existing stylized plan and elevation of the wreck (William Judd, November, 1987) and where lacking, were added to it. This resulted in a revised wreck plan (Fig. 37) and elevation (Fig. 38) which more accurately reflects the remains of the vessel.

Selected timbers were carefully raised and recorded on the surface (Fig. 39). These included a first futtock from the mast step area and a scarfed section of a gunwale. The timbers were drawn to scale, traced 1:1 and photographed.

In spite of the rather limited visibility (0.3-0.6m), interpretable photographs of various features were obtained.

Small-scale, hand-fanned excavations of sediments from specific areas of the vessel were undertaken to insure full documentation of key structural features. Disturbed areas were back-filled to prevent subsequent damage to the hull timbers.

No artifacts were recovered from this site, but 12 wood samples were obtained from various hull members to aid in the documentation and interpretation of the boat. The wood samples were taken during two subsequent visits to the site in 1988 and were identified by Dr. David Hon of Clemson University's Forestry Department (Table I).

Catalog of Hull Remains

Keel

Since the remains of the vessel lie partially buried beneath the sediments deposited during the dredging of the Tailrace Canal, the forward extent of the keel could not be studied. The aft end of the keel, approximately 4.0m (13 ft) was examined in detail and a small section of the starboard side of the
Figure 36: Sketch map of Biggin Creek Vessel environs (Judd).
TABLE I
ANALYSIS OF WOOD SAMPLES FROM THE BIGGIN CREEK VESSEL
by Dr. David Hon, Department of Forestry, Clemson University, South Carolina

1. Keel - southern yellow pine (Pinus spp.)
2. Pinus - white oak (Quercus spp.)
3. Stern knee - walnut (Juglans nigra l.)
4. Floor timber - spruce (Picea spp.)
5. Floor timber - southern yellow pine (Pinus spp.)
6. Futtock - white oak (Quercus spp.)
7. Futtock - southern yellow pine (Pinus spp.)
8. Keelson - southern yellow pine (Pinus spp.)
9. Ceiling plank - southern yellow pine (Pinus spp.)
10. Shelf clamp - southern yellow pine (Pinus spp.)
11. Beam (mast support) - white oak (Quercus spp.)
12. Beam - southern yellow pine (Pinus spp.)

TABLE II
Principal Dimensions and Scantlings of The Biggin Creek Vessel

Length (estimated) ................................................. 14.0m (46ft) to 20.0m (65ft)
Beam (estimated) ..................................................... 4.9m (16ft)
Depth of Hold (estimated) ........................................... 1.3m (4ft)
Tonnage (estimated) ................................................... 15 long tons (16.6 metric tons)
Length: Beam Ratio ................................................... 2.9 : 1 to 4 : 1

Keel: of southern yellow pine, moulded 17.8cm (7in) to 12.7cm (5in), sided 38.0cm (15in) to 12.7cm (5in).
Sternpost: of white oak, moulded 30.0cm (12in), sided 11.5cm (4-1/2in) at base.
Frames: Floor timbers of spruce and southern yellow pine, moulded 12.7cm to 14.0cm (5in to 5-1/2in), sided 11.5cm to 14.0cm (4-1/2in to 5-1/2in). First futtocks of white oak and southern yellow pine, approximately same scantlings as floor timbers.
Hull Planking: 17.8cm to 36.6cm (7in to 14-1/2in) wide, 2.5cm to 3.0cm (1in to 1-1/4in thick); wale or sheer strake 3.5cm (1-3/8in) thick.
Keelson: of southern yellow pine, moulded 17.7cm (7in), sided 17.7cm to 27.0cm (7in to 10-1/2in).
Ceiling Planking: of southern yellow pine, 22.5cm (8-7/8in) wide, 1.2cm (1/2in) thick.
Shelf Clamps: of southern yellow pine, moulded 7.6cm (3in), sided 15.0cm (6in).
Beams: Mast support of white oak, moulded 9.0cm (3-1/2in), sided 10cm (4in); beam fragment of southern yellow pine, moulded 11.4cm to 16.5cm (4-1/2in to 6-1/2in), sided 10.0cm (4in).
Figure 37: Revised wreck plan (Amer, after Judd).
Figure 38: Elevation of Biggin Creek wrecksite (Amer, after Judd).
keel was excavated at the mast step.  
The keel of the boat is of straight-grained southern yellow pine (*Pinus spp.*)(Table II). It is moulded 17.8cm (7in) and sided 38cm (15in) at the maststep but tapers towards the stem to approximately 12.7cm (5in) square.

The upper surface is flat and is bisected by alternating pairs of iron bolts and trunnels which pass through both sided surfaces. The aftmost 50.0cm (18in) of this surface has been cut out to a depth of 3.0cm (1-1/4in) to accommodate the lower end of the post assembly which is tenonned into a 3.8cm (1-1/2in) long mortice.

Although both sides of the keel are heavily eroded, no evidence of a rabbet or other form of plank attachment could be found. Planks evidently were butted against the upper edge of the keel and held in place by attachment to floor timbers.

The abraded bottom of the keel showed no evidence of a shoe or false keel but the extent of abrasion suggests that the vessel may have suffered numerous groundings in her day.

The Stem

Surviving timbers in the stem include the stem knee and sternpost. Evidence suggests the presence of an outer, or false post, in the original construction.

The stempost survives to a height of 57.0cm (22-1/2in) above the keel and terminates in a break at a bolt hole. Fashioned from white oak (*Quercus spp.*) the aft raking post is moulded 30.0cm (12in) and sided 11.5cm (4-1/2in) at its base. It is attached to the keel with a wooden tenon inserted in a mortice in the keel and is fastened to the stem knee with 2.5cm (1in) iron drift bolts.

The lowermost bolt projects aft from the post suggesting the presence of a false post in that
position. No direct evidence for a rudder or gudgeon straps was found on the heavily eroded stem structure. However, an eroded hole which laterally bisects the stempost 23.0 cm (9in) above the keel may have once served as a fastening point for a gudgeon.

The stem knee, fashioned from naturally curved walnut (Juglans nigra l.) served as the support between the keel and the stempost. It is 122.0 cm (48in) long, is moulded and sided 12.7 cm. (5 in) at its forward end, and rises in a smooth curve to its broken upper extent.

A 1.3 cm (1/2in) deep and 10.2 cm (4in) wide V-shaped rabbet follows the curve of the knee 12.7 cm (5in) below its upper surface. At its upper end the rabbet apparently continued into the stempost while its lower end terminated at the keel several centimeters inside the keel’s sides. Three nail holes within the rabbet (one on port side and two on starboard side) attest to the method of fastening the plank ends to the stern of the vessel.

The knee is attached to the keel by three 2.5 cm (1in) iron drift bolts and to the stempost by at least two bolts which penetrate both timbers. Its aft face mirrors the approximately 26-degree-from-vertical rake of the forward side of the sternpost. Like the other components of the stern, the knee is severely eroded, most noticeably along its lower surfaces.

Frames

A total of 14 frames and evidence of frames are represented on the visible portion of the hull, including two cant frames. Six complete floor-timbers were measured along with positions for a further six square frames.

Floor timbers, of spruce (Picea spp.) and southern yellow pine (Pinus spp.), are set along the keel on approximately 46.0 cm (18in) centers. The dimensions of the floor timbers vary, but they average 12.7 cm to 14.0 cm (5in to 5-1/2in) moulded and are sided 11.5 cm to 14 cm (4-1/2 to 5-1/2in). Each floor timber is clamped between the keel and keelson and fastened in place by a 2.5 cm (1 in) trunnel and a 2.2 cm (7/8in) iron bolt, peened over an iron washer, both of which penetrate all three timbers.

Existing floor timbers average 3.0m (10ft) long; nail holes along their upper surfaces suggest that they were at least partially covered with ceiling planking. Limber holes were not observed on any of the floor timbers examined.

The first futtocks which were recorded, are approximately the same moulded and sided dimensions as the floor timbers. However, none of these first futtocks remain fastened to the floor timbers. Evidence from the starboard side (see Fig. 37) indicates that each first futtock was attached to the forward side of each floor timber and laterally fastened with a 2.5 cm. (1in) trunnel. The heels of the first futtocks are, on the average, 25.5 cm (10in) from the edge of the keel.

The fragmentary remains of a second futtock were observed attached to the port shelf clamp but were not measured. Futtocks observed were cut from naturally curved stocks of white oak (Quercus spp.), hemlock (Tsuga spp.) and southern yellow pine (Pinus spp.).

During the recording, two first futtocks were removed from their in situ locations and their features and fasteners traced on mylar. These timbers were also examined for tool marks, but erosion of the surface had eradicated any evidence of their shaping.

In the stern, lines of nail holes in the port planks and staining of the wood attest to the presence of two cant frames. However, no evidence of those frames could be found. Nor could matching fastening holes be located along the port side of the stem knee. The center-to-center spacing of the two cant frames is approximately 35.5 cm (14in). The sided dimension suggested by nail patterns and staining
of the planks is approximately 12.7cm (5in).

There may have been a Y- or V-shaped floor timber farther aft but no evidence for this was found.

**External Planking**

The bottom of the hull (i.e. that part of the hull planking from the keel to the turn of the bilge) is made up of five strakes each side of the keel. The planks that make up the strakes proved to be accessible at two locations on the wreck (Fig. 37).

On the starboard side, forward of the mast step, the outboard three planks could be measured where they were not covered with mud, bricks and debris. These planks are still attached to the floor timbers, although some distortion was apparent.

The planks, applied in the carvel fashion (i.e. edge-to-edge), vary in width from 28.0cm (11in) to 36.8cm (14-1/2in) and are 2.5cm (1in) to 3.0cm (1-1/4in) thick. Each plank is fastened to each frame component (i.e. floor timber, first futtock etc.) with either a nail and a 2.5cm (1in) trunnel, or two nails. The square iron nails used in this part of the construction of the vessel are approximately 0.7cm (1/4in) diameter. Trunnels used in the construction of the boat were hand-shaped to fit holes bored through the frames and planks. Evidently, a spoke shave or similar tool was used to roughly round the trunnel. Planks were butted over frames and their ends fastened with two or three iron nails.

Planks recorded in the port quarter indicate a similar pattern with regards to widths, thicknesses and fasteners, although they are in a greater degraded state from not being protected by frames and overburden. The garboard strake is 17.8cm (7in) wide at its aft end. Lines of nails and staining on the interior surface of the wood reveal the presence of two cant or half frames at that location. While the ends of the planks are severely eroded, and in several cases completely missing, their curvature could be reconstructed and matched to that of the rabbet in the port side of the stern knee.

Many planks and plank fragments were found scattered in the vicinity of the integral hull both on the creek bottom and embedded in the sediments. Covering an observable area approximately 11.0m (36ft) long and 9.0m (28ft) wide, these timbers, no doubt, represent components collapsed from higher on the hull.

While these planks were not recorded generally, one fragment of a possible gunwale or sheer strake was raised and measured (Fig. 40). The scarfed gunwale fragment, recovered from the port side of the hull remains, is 203cm (80in) long, 23.5cm (9-1/4in) wide and 3.5cm (1-3/8in) thick. The scarf is incomplete but evidence suggests that it had approximately a 52.0cm (20-1/2in) long table and 7.0cm (2-3/4in) nibs.

Although the scarfed timber could not be located on the hull, spacing and dimensions of fasteners is consistent with frame spacing determined elsewhere on the hull.

A second wale fragment, approximately 18.0cm (7in) wide, was observed still fastened to the exterior face of a loose futtock with a 1.3cm (1/2in) iron nail.

**Keelson**

The exposed section of keelson measures approximately 6m (19ft) in length. At its widest point (forward of the mast step) the keelson is sided 27.0cm (10-1/2in) but tapers to 17.7cm (7in) at its aft end. The moulded dimension is uniformly 17.7cm (7in).

Most of the exposed length of the straight-grained southern yellow pine (*Pinus spp.*) timber is
Figure 40: Composite photograph of a possible sheerstrake (Amer).
sound although the aft end is badly eroded with much wood loss. This erosion likely reflects the periodic drying and immersion of that part of the timber as the creek water level rose and fell with the tide and seasons and, more recently, due to the water release schedule at the dam located upstream.

The aft end of the keelson, although severely eroded, apparently once ended at, or fitted over, the forward end of the stern knee. Its lower surface contains evenly-spaced 3.8cm (1-1/2in) deep notches, allowing the timber to interlock over the tops of the floor timbers. Only the center of each notch is in contact with the upper surface of each floor timber, the wood having been subjected to the effects of erosion.

A 2.5cm (1in) wood trunnel and a 2.2cm (7/8in) iron bolt secure the keelson to the floor timbers and keel. The fastening pattern alternates at each successive frame location (Fig. 37).

A rectangular mortice, the mast step, was cut into the keelson’s upper surface 3.3m (10ft 8in) from its aft end. The mortice, centered over a floor timber, is 20.3cm (8in) long, 11.4cm (4-1/2in) wide and 8.9cm (3-1/2in) deep and shows evidence of having been chipped out.

**Ceiling**

The interior of the hull was once, at least partially, covered with a layer of ceiling planks. While ceiling planks were not found attached to the integral remains of the hull, 0.7cm (1/4in) nail holes in the interior surface of several floor timbers attest to its presence. It is likely, however, that ceiling planks remain in place in the forward, buried section of the hull.

Fragments of planks, thought to be part of the ceiling lie scattered around the wreck. One such southern yellow pine (*Pinus spp.*) fragment, which remains fastened to the interior surface of a loose futtock on the port side, is 22.5cm (8-7/8in) wide and 1.2cm (1/2in) thick.

**Shelf Clamps**

Two incomplete sections of shelf clamps were observed during the survey. Lying roughly parallel to, and approximately 2.80m (9ft 2in) from either side of the keel each section is approximately 173.0cm (68in) long, 15.2 cm (6in) moulded and 7.6cm (3in) sided. Nail holes through the clamps vary in their sparing but average 46cm (18in) apart. The southern yellow pine (*Pinus spp.*) timbers apparently were not notched to receive the ends of beams although the presence of beams on the vessel is evident.

**Knees and Beams**

There is evidence of at least two beams and locations for beams on the hull remains. Two lodging knees remain affixed to the port shelf clamp section. Each knee has 33.0cm (13in) long arms and is fastened through the shelf clamp and a futtock with a 2.5cm (1in) iron bolt peened on its outboard end and clenched over the inboard surface of each futtock. The location of these knees suggest the presence of a beam or possible mast support forward of the mast step and an additional beam approximately 92.0cm (36in) forward of that position.

An incomplete length of the mast support was located near the port shelf clamp. Cut from white oak (*Quercus spp.*), this 10.0cm (4in) sided by 9.0cm (3-1/2in) moulded beam fragment contains a 32.0cm (12-1/2in) long and 4.0cm (1-1/2in) deep notch to secure the mast. Because the ends of this beam were not present its location could not be verified against the knees.
A second beam fragment, of southern yellow pine (*Pinus spp.*), found near the stern of the wreck, was matched to a pair of attached knees recovered and drawn by an earlier team (Judd, 1987, manuscript). This 40.0cm (16in) long beam fragment is 10.0cm (4in) sided and varies from 11.4cm (4-1/2in) to 16.5cm (6-1/2in) moulded. Its moulded surfaces are bisected by a broken 2.5cm (1in) iron eye-bolt. Neither the beam fragment nor the paired knees could be located on the hull.

**Interpretation and Analysis**

Preliminary field and documentary investigation has revealed no direct historical evidence which would identify the craft or explain her presence in Biggin Creek. Nor can an exact date be provided for her construction or demise.

From what can be seen of the vessel's remains (remembering that very limited, localized test excavations were performed in and around the hull) it is evident that the boat was abandoned at its present location. Although no structural damage could be found to indicate a possible reason for the vessel's demise, it has been previously suggested that a fire may have been the reason for the abandonment (Judd, 1987, manuscript). Nor was evidence of repairs (which may have suggested a lengthy career for the vessel) or refitting found on the hull.

That the boat was abandoned sometime after the closure of the Santee Canal is self-evident when viewed within the context of the canal operations which required periodic cleaning of accumulated sediments, logs, and other debris (Porcher 1970:17; Orvin 1973:152). The Company was, therefore, sensitive to obstructions in the canal system which may have jeopardized the safe passage of canal traffic, and they would have certainly removed any abandoned craft that would have presented a navigational hazard.

The exact date of the closure and abandonment of the canal can be debated, however, its official operation ceased sometime in the 1850s. Although the lower reaches of the canal were still navigable after that time and were used until shortly after the Civil War, the Biggin Creek Vessel could not have entered this, nor any other part of the canal due to its beam (see discussion below) which exceeded the width of the canal locks.

After the canal's closure "whole sections of brick" were removed from the canal (Leland 1970:12) presumably for re-utilization. A quantity of bricks found on the wreck, may represent this activity and could, therefore, support speculation of a post 1850s date for the abandonment of the boat. During the 1880s there was a Brick, Stove and Lime works at Stoney Landing. The vessel may have been associated with these operations.

No comprehensive study of Southern brickworks and their product has yet been undertaken, so the bricks themselves can help little in providing us with evidence of a date or an origin of the vessel. To attempt to date the craft stylistically is, at this stage in the development of archaeological studies of boats in South Carolina, not a viable alternative. Analysis of the wood samples suggest a boat of local construction. She was, no doubt, designed and built to fill a particular need. As such, her design and construction would have been a product of certain boat building traditions which were adapted to meet that need.

A comprehensive study of the fasteners (type, frequency, pattern and composition) used in the construction of the boat would assist in placing her within a datable context. Also, dendrochronology (when a good, local dendrochronology is established in the South) could prove useful in dating the wood used in the construction of this craft.
In sum, the Biggin Creek Vessel evidently was abandoned sometime after the 1850s, and possibly during the last quarter of the 19th century.

Observations and Appearance of the Hull

Now that the construction and dating of the vessel have been examined, it would seem appropriate to provide some observations on the hull and to advance some speculation concerning the boat’s appearance.

The remains of the Biggin Creek Vessel, no doubt, represent a double-ended, flat-bottomed work boat. The hull was well-built and the craft was, evidently, constructed and used locally.

Notching of the keel and keelson has been recognized as a trademark of British shipwrights. Keelson notching, observed on our vessel occurs on several 19th-century British shipwrecks in North America (e.g. Amer, 1986; Cohn, 1984: 62), and has been recorded on an American warship from the War of 1812 (Crisman, 1985: 51, 59). The procedure of notching a vessel’s keelson, allowing it to interlock over the floor timbers, was used in North America throughout the 19th century so it is not surprising that the tradition would have been adopted regionally and integrated into local shipbuilding practices.

The shipwright used other techniques to ensure a strong, well-built construction. He used both iron nails and trunions for fastening hull components, including the keelson, keel and frame attachment and the application of the outer planking to the frames. The stem structure is heavily fastened with 2.5cm (1in) iron bolts, as are the beam knees; the sternpost is morticed into the keel.

The reconstructed section view (Fig. 41), taken at the extant mast step, shows a vessel of approximately 4.9m (16ft) beam. A fairly soft chine and no obvious deadrise to the floor timbers give the vessel a wide flat bottom enhancing cargo carrying capacity. However, the flat bottom of the boat was a poor hull form for a sailing vessel. Accommodations had to be made to reduce the tendency of the shallow draft hull to slide over the water surface to leeward when sailing near the wind.

The boat was probably equipped with a wide-blade rudder which would have compensated for lateral drift to some degree. To provide maneuverability and to further compensate for lateral drift either oars, paddles or punting poles, or a combination of all of them would have been necessary to operate the craft in the rivers of South Carolina.

The exact length of the boat remains in question because an undetermined length of the hull is embedded in the bank of Biggin Creek. Kohn (1938:264) states that, “the boats best suited to the navigation of the Cooper, the Santee, Congaree and Wateree rivers have 65 to 70 ft. [19.8 to 21.3 m] keel, and 16 ft. [4.9m] beam...,” and have the ability to carry up to 15 tons [13.6 m. tons]. This gives a length to breadth ratio of approximately 4:1. Unfortunately Kohn does not indicate the number of masts one of these vessels would have.

Our vessel, whether of the dimensions described by Kohn, or possessing a shorter overall length would require a second mast stepped near the bow. Any evidence for such a maststep is now hidden beneath the creek bank. The only step examined during the survey, if the sole mast support, would be located too far aft for efficient control of a sailing vessel longer than approximately 9.0m (29-1/2ft).

The shipwright, in forming the mast step, had cut 2/3 of the way through the keelson directly over a notch which had removed 3.0cm (1-1/4in) from its lower surface, effectively weakening the keelson. This weakness was compensated for with a mast support beam placed against the forward side of the mast at deck level and, undoubtably, with the addition of structural support to the maststep area. No evidence
for the latter structure was found. The presence of an eye-bolt in a deck beam fragment suggests a function associated with rigging.

A sailing vessel would require some form of ballast to provide stability when empty and to trim the hull. However, no rocks or iron which could be used as ballast were found on the wreck. A small quantity of "English" brick (Judd, 1987, manuscript) was observed around the mast step area. Whether this brick is the remains of ballast or whether it represents a cargo or some function associated with food preparation (e.g. a fire hearth) are questions that will require further excavation to answer.

Conclusions

The remains of the Biggin Creek Vessel (38BK887) represent a relatively beamy, double-ended sailing vessel. Her beam is estimated at approximately 4.9m (16ft) and her length between 14.0m (46ft) and 20.0m (65ft). She is fairly heavily framed, has little deadrise and a soft chine, making her a good workboat. However, her construction does not endear her to open and rough water.

She was likely used as a river work boat or coastal trader and was eventually abandoned near the mouth of Biggin Creek sometime after the closing of the Santee Canal in the 1850s, possibly during the last quarter of the 19th century.

![Hypothetical Reconstruction at Mast Step]

Figure 41: Reconstruction of hull cross section (Amer, after Judd).
Recommendations

by
Mark Newell, Christopher Arner, Bruce Thompson

Completion of the preliminary survey of the visible remains of the Biggin Creek Vessel confirms
the original finding that the site is eligible for the National Register of Historic Places. Initial concerns
for the integrity of the site resulted in recommendations that the viewing deck planned for this area of
the park be relocated so as to avoid impacting the buried portion of the wreck with support pilings. The
current condition of the vessel remains appears to be the result of the action of tidal action - erosion,
separation and migration of structural components, and the deterioration of the wood due to a tidal cycle
of drying and soaking. Removal of the tidal action as a negative influence on the preservation of the site
is a serendipitous result of the planned water control structure at the mouth of Biggin Creek. No further
recommendations on this aspect of the site is necessary.

According to the development plan, the vessel remains are to become an interpretive feature of
the park - and therefore need, obviously, to be visible to the public from the nearby observation deck.
In the absence of such a requirement it would be a normal precaution to recommend the sandbagging of
the site to further protect the timbers from public access (waders and canoeists) and from the accretion
of aquatic organisms. Since this is not possible it is recommended that signage be used to discourage the
public from wading on the vessel or canoeing over it.

The development plan also calls for a waterflow of approximately 10,000 gallons per hour
through the sanctuary. The South Carolina Department of Health and Environmental Control (DHEC)
has specified that this water shall be oxygenated above present levels. The effect of this oxygenated
current flow over the vessel cannot be determined in advance. Further erosion and deterioration of the
wood may occur. Finally, an increase in water clarity may aid photosynthesis and stimulate plant growth
on the wood.

It is recommended that the sanctuary management plan include an inspection program during the
initial period of operation to determine the potential for such problems. Erosion effects can be monitored
by periodic re-measurement of timbers of known dimensions. Structural deterioration can be monitored
by penetration testing of wood density in specified locations. A testing program - and mitigation
measures should they be needed - should be prepared by the Institute in consultation with PRT.

Several artifacts have been noted in possible association with the wreck (Fig. 42). Left in situ
during this preliminary survey, it is recommended that the wreck location be closely examined for
further artifacts which may aid in the interpretation of the site. These should be recovered, documented
and either returned to the site or conserved for eventual display in an interpretive center.

In general, recommendations made by the authors are advanced with an eye to the realities and
practicalities of funding. In the case of the Biggin Creek Vessel it is felt that the potential importance of
the vessel both as a visitor attraction and as a major resource for future researchers, warrants
the consideration of recommendations designed to ensure the preservation of the wreck.

The proposed plan calls for the construction of a coffer dam around the entire wrecksite. The
coffer dam wall would penetrate the underlying marl to a depth of 1m and rise approximately 2m above
the bottom to a height of 1m above the surface of the Creek. The dam would thereby effectively isolate
Figure 42: Artifacts associated with the Biggin Creek Vessel (sketch by Judd).
a body of water containing the vessel remains. This isolation would permit chemical treatment of the water (with environmentally safe materials) resulting in greatly increased clarity and the cessation of development of aquatic growth. The effects of erosion by current and deterioration by oxygenated water would be eliminated. Access to the wreck by large wildlife and boaters would also be eliminated. At the same time access to the site by park visitors would be greatly enhanced. A deck built over a section of the coffer dam wall would allow viewing of the site from directly overhead. The addition of a roof over a section of the wreck and the installation of underwater lighting would create conditions of extreme clarity - and would give visitors a high level of accessibility to the site. Such a facility would constitute a unique visitor attraction and ensure the in situ preservation of the vessel for future researchers and generations of South Carolinians.
APPENDIX B

THE BIGGIN CREEK FLATBOAT

by

William R. Judd

The Biggin Creek flatboat is of the basic flat boat design noted throughout South Carolina, although no two are built exactly alike. Construction methods appear to vary with each builder and location of construction and there is to date an insufficient data base on which to make accurate conclusions as to the exact origin of these workcraft.

Figure 43 shows the location of the boat in relation to the Stoney Landing house site and Tailrace Canal. It is partially exposed at low tide and the strong tidal current draining from Biggin Creek has deposited sand, shells and debris inside the wreckage.

The barge exhibits a deck which has deteriorated and of which half is missing. It measures 14m (40ft) in length, with a 5.6m (16ft) beam and a depth of 1.22m (3ft 5in).

As is the case in many of the later workboats of this type, the stem has a different configuration from the bow (Figs. 44 and 45). The bow has a cross timber at the top with the framing and front planking angling back toward the bottom, in this case 37 degrees. As mentioned above, the flat boat is sanded almost to the top at the stern but probing with a steel rod revealed these planks run straight down for a distance of 81.28cm (32in) then angle forward, for a distance of 1.4m (4ft), toward the bottom.

The barge has five deck supports running longitudinally. The center support is constructed like the sides, of 6.35cm (2-1/2in) by 24.13cm (9-1/2in) planks, one on top of the other. The two supports flanking each side of the center support are each one 6.35cm (2-1/2in) by 10.16cm (4in) timber. These are supported vertically by timbers of the same size, every six feet.

The decking is 3.81cm (1-1/2in) thick boards of random widths, varying from 15.24cm (6in) to 27.94cm (11in). No hatchway is apparent within the remaining deck. No cleats exist nor does it appear to have had any.

A forged eye bolt and ring is located in the top side plank at the right front of the flat boat which was used for tying off. A small piece of hardened rope remains attached. A portion of the top side plank at the right rear has fallen off but lies within the flat boat. A hold is located in this plank at the approximate location as at front. This probably held an eye bolt and ring at the stem. The left side of the flat boat could not be seen due to sanding but probably was typical of the right side.

The vertical frames for the side planking are 7.62cm by 15.24cm (3in by 6in) timbers on 60.96cm (2ft) centers. (This differs from other flat boats of this size in that this spacing is usually 76.2cm to 91.44cm (30in to 36in) on center).

The side plank construction uses both butt and scarf joints. They appear on the top plank on the right side. All other planking is concealed by a sheathing of three quarter inch boards. Apparently, as the boat aged, it began to leak. Instead of recaulking the seams, the bow, stem and sides (bottom too, probably) were covered with what appears to be “tarred paper” or roofing felt and then sheathed over with 1.83cm by 24.13cm (3/4in by 9-1/2in) boards. Bolted on the bow is a 8.89cm (3-1/2in) square timber used as a nose rail. A rub rail of the same dimensions appeared on each side at the top (right side missing). The interior bottom framing method was unattainable due to silting.
Figure 43: General sketch map of the Flatboat site.
Figure 45: Cross sectional views of flatboat.
Figure 44: Plan and elevation of Biggin Creek Flatboat.
APPENDIX C

ADDITIONAL ARCHAEOLOGICAL TESTING AT 38BK893 AND 884, STONEY LANDING, BERKELEY COUNTY, SOUTH CAROLINA

by

James L. Michie
Archaeologist II

Management Summary

Excavations conducted at Stoney Landing on the Santee Canal, Berkeley County, South Carolina, addressed the question of significance regarding the Main House site (38BK893) and the Overseer's site (38BK884). Based on the archaeological data and its interpretations, both sites appear eligible for inclusion on the National Register of Historic Places, and therefore, should be treated accordingly.

We would recommend that each site be avoided in terms of subsurface alterations and modifications, and that due consideration be given prior to any such planning. If these sites cannot be avoided, we would advise a substantive program of data retrieval and analysis through consultation with the State Historic Preservation Officer (SHPO).

Introduction

In the summer of 1986, the South Carolina Institute of Archaeology and Anthropology, University of South Carolina, conducted an archaeological survey of a property located on the Santee Canal. This property, containing some 224 acres, is the proposed location of the Santee Canal Park Sanctuary near Moncks Corner, South Carolina. The survey produced 13 sites which represent a diversity of historic and prehistoric occupations. Among these are the site associated with the Main House (38BK893) and the Overseer's House (38BK884), which concerns this report.

The Main House was probably constructed during the middle of the nineteenth century. Although it has been subjected to several modifications in the form of twentieth century additions, the overall style is typically Greek Revival. Occupations prior to its construction are questionable, but Charles and Mills (1987) have indicated the presence of eighteenth century activities because of its strategic location between the west bank of the Cooper River and the road that led to the Congarees. The area, therefore, may have served as a juncture connecting Charleston and the central interior of the state. The economic function of the extant house is currently unknown, but considerations have been given to a relationship of the limestone mining industry, or potentially, a plantation (Charles and Mills 1987).

The date of construction is relatively unknown but the presence of specific ceramics, especially undecorated whitewares, argues for a date in the range of about 1840-1850, which correlates with the architecture. The thickness of window fragments (Charles and Mills 1987) varies considerably, indicating a wide range of possible occupation dates beginning with the late 1820s. Although there is a primary mode of thickness (.095in-.105in) suggesting a later date in the vicinity of 1870-1900, the secondary mode (.075in-.085in) may be closer to the actual construction date somewhere in the
parameters of 1855-1885. This window glass data may well indicate a later construction, but it may also monitor the replacement of sashes or entire windows. Given the fact that Greek Revival styles had passed out of popularity shortly before the Civil War (McAlester and McAlester 1984:179) the initial construction may be restricted to a time shortly before or after 1850.

Archaeological testing beneath the house and in the immediate yard with post-hole diggers failed to produce many artifacts. The number of ceramic sherds totals only 16, and the number of nails is only 29. Window glass, however, was significantly higher with 181 fragments. The remainder of the artifacts, represented by fragments of glass containers and other assorted items, totals only 36. The relatively low number of materials, according to the authors (Charles and Mills 1987), is probably related to the convenience of Biggin Creek located a short distance behind the house. Scattered along the slopes of the bank and within the creek are numerous artifacts related to both the nineteenth and twentieth centuries. This notion of dumping garbage in the creek was further enhanced by the fact that artifacts failed to occur with any depth because of the shallow limestone existing immediately below a thin mantle of soils. Accordingly, the thin soil ranged from 2 in (5 cm) to 10 in (25 cm) and terminated on a hard marl/limestone (Charles and Mills 1987:10). Artifacts were found from the surface to a depth of 5 in to 8 in (13 cm-20 cm). Charles (personal communication) has reported that the soils were extremely difficult to penetrate and that the majority of artifacts appeared to be located near the surface. The general impression, then, is that the area beneath the elevated house and the contiguous yard contains few artifacts relative to the creek.

The Overseer’s House site, 38BK844, located some 1,400 feet to the northwest overlooking the limestone quarry, is also functionally questionable. The scattered remains of the former structure and the associated artifacts suggest a date during the middle part of the nineteenth century which correlates with the Main House. Because of its specific location, considerations were given to a managerial residence, potentially a foreman or overseer (Charles and Mills 1987:54). Although little is known of other property functions, this may have been a systemic component of either a cotton or rice plantation later used in conjunction with the limestone industry.

The site is characterized by a visible cluster of brick fragments in the edge of a forest and a scatter of artifacts in the adjacent cultivated field. Subsurface testing with post-hole diggers monitored artifacts within the top 10 in (25 cm) of a medium dark brown sandy loam. Below this horizon the authors (Charles and Mills 1987:55) noted the appearance of a tan sand, apparently void of historic artifacts. Historic materials were distributed over an area approximately 135 ft x 165 ft (45 m x 55 m) which defines the area of the site.

The presence of machine-cut nails, whitewares, and pearlwares, in addition to yellow wares and various pieces of stoneware, provides evidence for an occupation predating the middle of the nineteenth century. Distinctions between early and late machine-cut nails are not available, and the presence of a single window glass fragment (.060 in) fail to offer any additional temporal statements.

The authors of the report (Charles and Mills 1987), in concurrence with the Principal Investigator, Steven D. Smith, recommended additional investigations at these two sites for determinations of eligibility for inclusion on the National Register of Historic Places. Specifically, these people considered additional test excavations in the immediate vicinity of the Main House. Instead of limiting the investigations to post-hole diggers and shovel-sized units, Steven D. Smith suggested the excavation of much larger units for greater data recovery and the potential for recognizing site integrity.

On November 25, 1987, Tommy Charles and this writer returned to the sites and began the investigation. Initially, we had planned to excavate two units (5 ft squares) at each site, placing them in strategic positions relative to our objectives. The information generated from each site showed a greater
complexity than earlier realized, and consequently we returned on December 3 and 4, 1987, for additional investigations. This report discusses the results of our findings.

Investigations

Main House (38BK893)

As South (1977) has pointed out, refuse disposal patterns of the eighteenth and nineteenth centuries generally involved the immediate vicinity of the residence, especially the areas associated with the rear and the sides of the structure. The relatively low incidence of materials found in 1986 by Charles and Mills (1987) suggested that the residents were disposing of materials in Biggin Creek and that the area of the yard was relatively void. Furthermore, the scattered occurrences of ceramics and other artifacts generally tended to occur in the upper levels of the soil near the surface. If this observation was true, and if the majority of artifacts were disposed of in the creek, then a large test unit (5ft square) placed beneath the twentieth century addition and immediately behind the rear of the original structure should be able to confirm or reject this observation (Fig. 46).

The first test unit (Test Pit #1) was placed between the two pier foundations and aligned with the orientation of the house. As there were no previous indications of stratigraphy, the excavation approach was oriented towards shovel skimming and sifting the soil through a 1/4in hardware cloth with the assistance of a mechanical screen. Initial attempts at digging were extremely difficult because of compact, hard soil. In an attempt to alleviate this problem, the area was saturated with water. Permeability was slow, but at least 5in (13cm) were slowly loosened and removed with a hammer and screwdriver. The soil, although wet, was considerably softer but it became viscous and sticky and unable to pass through the screen. As a consequence, the soil was screened with water.

Through continued saturation with water the soils below the 5in level were also removed and screened in a similar manner. At variable depths the dark brown compact soil terminated with the appearance of a dark gray heavily mottled soil representing clayey marl (Fig. 47). The only observable stratigraphic differences noted were at this contact zone. Soil changes at this zone were not abrupt but rather a gradual change within an area of about 1in to 2in (2.5cm-5cm). This continuous change suggests the overlying deposit is relatively old and certainly not fill brought into the area during occupation.

At the north, west, and south corners of the pit the dark brown soil extends to a depth of about 7in (18.5cm), but at the east corner descends to a depth of about 12in (40cm). Artifacts representing the eighteenth, nineteenth, and twentieth centuries occurred throughout this deposit; the clayey marl was sterile. Cultural stratigraphy was not observed during the field excavation nor analysis. However, there is a general tendency for nineteenth and twentieth century artifacts to segregate below a depth of some 5in (13cm), but such separations are neither consistent nor dependable. Small brick fragments and pieces of mortar existed throughout the deposit rather consistently, and numerous oyster shells were also noted. The shells, which appeared confined to the northern area of the unit, were encountered at various depths and scattered horizontally.

The soil is highly acidic because of its limestone content. Its effect on nails and other pieces of metal is destructive, rendering former objects into anomalous, and sometimes, unrecognizable shapes. Nails, for example, regardless of their age, are generally transformed into linear globs of rust with little or no indication of temporal affiliations. Brass shell casings, which normally resist deterioration, are pitted and discolored by the acidic soil. Bone and shell, however, are not affected.
Figure 46: Main House test pit locations.

TEST PIT LOCATIONS
MAIN HOUSE - STONEY LANDING
38BK893
0' 4' 8'

- brick piers 7' high (typical)
- pipes
- 20th century additions
- exposed earth
- 19th century construction
- TEST PIT 1
- TEST PIT 2
- 35'
- 5'
- 5'
- grass yard
- TEST PIT LOCATIONS
- MAIN HOUSE - STONEY LANDING
- 38BK893
- 0' 4' 8'
dark brown soil containing historic and prehistoric materials - dense, fine grained, sandy loam and marl (typical)

TEST PIT 1 - NE PROFILE

TEST PIT 1 - SE PROFILE

dark gray soil, mottled clay marl, highly impermeable - void of artifacts (typical)

TEST PIT 2 - NE PROFILE

TEST PIT 2 - SE PROFILE

water pipe

TEST PIT PROFILE DATA
MAIN HOUSE - STONEY LANDING
38BK893
The second unit (Test Pit #2) was placed 35 ft to the southeast and situated in the grassy yard (Fig. 46). The excavation procedure was duplicated, i.e. shovel skimming and water-screening the soil through 1/4in hardware cloth. Both the soils and the stratigraphy are virtually the same as those noted in the first unit. Artifacts associated with the late nineteenth and twentieth centuries generally tended to be noted in the upper levels of the unit, but they were also mixed with earlier historic materials. Consequently, cultural stratigraphy is not consistent. Small brick fragments and eroded pieces of mortar were noted throughout the dark brown soil containing artifacts. At a depth of about 5 in to 6 in (13-17 cm) the dark brown soil began to terminate on a dark gray and heavily mottled clayey marl. This dense marl was penetrated to a depth of about 2 in (5 cm) without any indication of cultural materials (see Fig. 47 for soil profiles).

The acidic soil in this unit has the same detrimental effect on iron objects: extreme deterioration. A water pipe (3/4in) was discovered near the center of the unit at a depth of 4-1/2 in (11.5 cm). The age of the pipe is unknown, but it too has suffered a great deal of surface deterioration. Beyond the acidic nature of the soil, its color and texture precludes the identification of subsurface features. This is especially noted in the absence of disturbances relative to the placement of the water pipe; the profile was unable to show any indication of former diggings. Although it is possible to discover features and other cultural disturbances at the contact zone between the dark soil and the lighter colored marl, no such disturbances were observed in either unit.

Interpretations of 38BK893

Recent investigations by the South Carolina Institute of Archaeology and Anthropology at Stoney Landing have shown that a relatively high incidence of historic artifacts are situated in the immediate vicinity of the main house. These artifacts are not temporally confined to the nineteenth century, but rather include the occupations of the twentieth century and reflect a much earlier activity associated with the eighteenth century. This is demonstrated by the preliminary work of Charles and Mills (1987) in terms of historic documentation and limited testing, and by the recent excavation of two large units (see Tables 1-3).

Many chronological indicators exist for both the eighteenth and nineteenth centuries, which includes nails, ceramics, bottles, tobacco pipes, window glass and other architectural items, buttons, beads, firearms and their related components, various tablewares, and certainly, coins (see Noel Hume 1982; South 1977). Among these indicators ceramics and window glass provide a more sensitive chronology, in addition to the early machine-cut nails. At Stoney Landing, the badly deteriorated nails are virtually meaningless as temporal indicators, which leaves only window glass and ceramics. The earlier work by Charles and Mills (1987) concerning the primary modes of window glass has offered a great deal of information about time. Quite clearly, the glass is associated with the mid-nineteenth century, and it shows continuity through the beginning of the twentieth century. Given the fact that a great deal of glass throughout the area was used to obtain relative dates, little could be gained through a redundant study. During the analysis and sorting of window glass there were no indications of thinner glass relative to earlier times.

Based on the ceramic assemblage, there is an apparent continuity from the mid-nineteenth century until the present with the recognition of undecorated ironstones and whitewares, in addition to the Bennington wares, blue willow whitewares, yellow wares, and the appearance of thin polychrome hand painted porcelains which probably represent the twentieth century. The appearance of lead glazed
### TABLE 1

Artifact Analysis, Test Pit #1, Main House, 38BK893
(5 ft square, 0in-5in level)

<table>
<thead>
<tr>
<th>Kitchen Group: (662)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceramics</strong></td>
<td></td>
</tr>
<tr>
<td>3-polychrome underglazed hand painted porcelains (20th century?)</td>
<td></td>
</tr>
<tr>
<td>13-undecorated white porcelains (20th century?)</td>
<td></td>
</tr>
<tr>
<td>64-undecorated white ironstones</td>
<td></td>
</tr>
<tr>
<td>27-undecorated whitewares</td>
<td></td>
</tr>
<tr>
<td>2-blue willow transfer-printed whitewares</td>
<td></td>
</tr>
<tr>
<td>1-polychrome hand-painted whiteware</td>
<td></td>
</tr>
<tr>
<td>1-blue hand-painted whiteware</td>
<td></td>
</tr>
<tr>
<td>1-annular ware pearlware</td>
<td></td>
</tr>
<tr>
<td>1-undecorated yellow ware</td>
<td></td>
</tr>
<tr>
<td>4-Bennington wares</td>
<td></td>
</tr>
<tr>
<td>1-Albany glazed earthenware</td>
<td></td>
</tr>
<tr>
<td>1-undecorated delft</td>
<td></td>
</tr>
<tr>
<td>1-British brown stoneware</td>
<td></td>
</tr>
<tr>
<td>1-brown glazed earthenware</td>
<td></td>
</tr>
<tr>
<td>1-lead glazed slipware</td>
<td></td>
</tr>
<tr>
<td>11-Colonowares</td>
<td></td>
</tr>
<tr>
<td>133-total ceramics</td>
<td></td>
</tr>
<tr>
<td><strong>Wine Bottles</strong></td>
<td></td>
</tr>
<tr>
<td>21-dark green</td>
<td></td>
</tr>
<tr>
<td>21-total</td>
<td></td>
</tr>
<tr>
<td><strong>Glass Containers</strong></td>
<td></td>
</tr>
<tr>
<td>(late 19th and 20th century pharmaceutical, soft drink, beer, and whiskey bottles, and possibly tumblers)</td>
<td></td>
</tr>
<tr>
<td>356-clear fragments</td>
<td></td>
</tr>
<tr>
<td>18-emerald green (Sprite bottles) fragments</td>
<td></td>
</tr>
<tr>
<td>3-light purple (S.C. Dispensary bottle?)</td>
<td></td>
</tr>
<tr>
<td>34-brown fragments (beer bottles?)</td>
<td></td>
</tr>
<tr>
<td>6-dark blue (seltzer bottles?) fragments</td>
<td></td>
</tr>
<tr>
<td>1-intact dark blue seltzer bottle</td>
<td></td>
</tr>
<tr>
<td>8-milky glass (cold cream jar) fragments</td>
<td></td>
</tr>
<tr>
<td>43-light green (soft drink and pharmaceutical bottle) fragments</td>
<td></td>
</tr>
<tr>
<td>469-total containers</td>
<td></td>
</tr>
<tr>
<td><strong>Glasswares</strong></td>
<td></td>
</tr>
<tr>
<td>1-stemmed wine glass base</td>
<td></td>
</tr>
<tr>
<td>9-pressed glass goblet fragments</td>
<td></td>
</tr>
<tr>
<td>10-total glasswares</td>
<td></td>
</tr>
<tr>
<td><strong>Bone</strong></td>
<td></td>
</tr>
<tr>
<td>25-small cortical fragments</td>
<td></td>
</tr>
<tr>
<td>2-teeth (pig?)</td>
<td></td>
</tr>
<tr>
<td>2-fish scales</td>
<td></td>
</tr>
<tr>
<td>29-bone</td>
<td></td>
</tr>
<tr>
<td>Architecture Group: (1,123)</td>
<td></td>
</tr>
<tr>
<td><strong>Window Glass</strong></td>
<td></td>
</tr>
<tr>
<td>679-clear fragments, variable thicknesses</td>
<td></td>
</tr>
<tr>
<td>679-total window glass</td>
<td></td>
</tr>
<tr>
<td><strong>Nails</strong></td>
<td></td>
</tr>
<tr>
<td>1-late machine cut, brass</td>
<td></td>
</tr>
<tr>
<td>1-late machine cut, iron</td>
<td></td>
</tr>
<tr>
<td>433-badly deteriorated iron nails</td>
<td></td>
</tr>
<tr>
<td>8-wire brads used in wire fences</td>
<td></td>
</tr>
<tr>
<td>443-total nails</td>
<td></td>
</tr>
<tr>
<td><strong>Window Locks</strong></td>
<td></td>
</tr>
<tr>
<td>1-badly deteriorated vertical window lock</td>
<td></td>
</tr>
<tr>
<td>1-total window lock</td>
<td></td>
</tr>
<tr>
<td><strong>Arms Group:</strong></td>
<td></td>
</tr>
<tr>
<td>(6)</td>
<td></td>
</tr>
<tr>
<td><strong>Centerfire Shells</strong></td>
<td></td>
</tr>
<tr>
<td>2-.45 caliber, automatic cartridges</td>
<td></td>
</tr>
<tr>
<td>1-12 gauge shotgun shell case</td>
<td></td>
</tr>
<tr>
<td>3-total</td>
<td></td>
</tr>
<tr>
<td><strong>Rimfire Shells</strong></td>
<td></td>
</tr>
<tr>
<td>1-.22 caliber shell case</td>
<td></td>
</tr>
<tr>
<td>1-total</td>
<td></td>
</tr>
<tr>
<td><strong>Lead Shot</strong></td>
<td></td>
</tr>
<tr>
<td>2-buckshot-sized pellets</td>
<td></td>
</tr>
<tr>
<td>2-total</td>
<td></td>
</tr>
<tr>
<td><strong>Clothing Group:</strong></td>
<td></td>
</tr>
<tr>
<td>(16)</td>
<td></td>
</tr>
<tr>
<td><strong>Buttons</strong></td>
<td></td>
</tr>
<tr>
<td>1-red plastic</td>
<td></td>
</tr>
<tr>
<td>1-white ceramic, four hole</td>
<td></td>
</tr>
<tr>
<td>1-white ceramic, two hole</td>
<td></td>
</tr>
<tr>
<td>1-two piece metal button, partial</td>
<td></td>
</tr>
<tr>
<td>4-total buttons</td>
<td></td>
</tr>
<tr>
<td><strong>Shoe</strong></td>
<td></td>
</tr>
<tr>
<td>10-brass grommets</td>
<td></td>
</tr>
<tr>
<td>1-brass rivet washer</td>
<td></td>
</tr>
<tr>
<td>11-total shoe</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 1
Artifact Analysis, Test Pit #1, Main House, 38BK893
Cont.

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Count(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass Beads</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-red glass bead</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1-total bead</td>
<td></td>
</tr>
<tr>
<td>Personal Group: (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Items</td>
<td>2-writing slate fragments</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1-copper number 8</td>
<td>1</td>
</tr>
<tr>
<td>Tobacco Pipe Group: (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco Pipes</td>
<td>5-kaoline pipe stem fragments</td>
<td>5</td>
</tr>
<tr>
<td>Activity Group: (33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1-whetstone fragment</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1-alloy disc, 1&quot; diameter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-chrome tire stem cap</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-flashlight battery core</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-brass T-handle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28-badly deteriorated iron fragments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>33-total misc.</td>
<td></td>
</tr>
<tr>
<td>Total Historic Component, 0in-5in level =</td>
<td>1,864 artifacts</td>
<td></td>
</tr>
</tbody>
</table>

Aboriginal Artifacts

Lithics:

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Count(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-small basalt triangular projectile point</td>
<td>1</td>
</tr>
<tr>
<td>1-total lithic</td>
<td></td>
</tr>
</tbody>
</table>

Ceramics:

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Count(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-small, eroded and unidentifiable pottery sherds</td>
<td></td>
</tr>
<tr>
<td>11-total ceramics</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 2
Artifact Analysis, Test Pit #1, Main House, 38BK893
(5ft square, 5in-9in ± level)

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Count(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen Group: (55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceramics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-light green (pharmaceutical?) fragments</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>27 total containers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-small cortical fragments</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1-pig tooth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-shark tooth (fossil?)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9-total bone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture Group: (75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Window Glass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34-clear and light green fragments</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>34-window glass</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Glass Containers

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Count(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-emerald green (Sprite bottles) fragments</td>
<td></td>
</tr>
<tr>
<td>21-clear fragments</td>
<td></td>
</tr>
<tr>
<td>1-brown fragment (beer bottle?)</td>
<td></td>
</tr>
<tr>
<td>1-dark blue (seltzer bottle?) fragment</td>
<td></td>
</tr>
<tr>
<td>41-badly deteriorated</td>
<td>41</td>
</tr>
<tr>
<td>41-total nails</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 2
Artifact Analysis, Test Pit #1, Main House, 38BK893
Cont.

<table>
<thead>
<tr>
<th>Tobacco Pipe Group:</th>
<th>Aboriginal Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco Pipes</td>
<td>Lithics:</td>
</tr>
<tr>
<td>3-kaolinite pipe stem fragments</td>
<td>4-orthoquartzite flakes</td>
</tr>
<tr>
<td>3-total pipes</td>
<td>1-coastal plain chert flake</td>
</tr>
<tr>
<td>Activity Group: (6)</td>
<td>5-total lithics</td>
</tr>
<tr>
<td>Miscellaneous Items</td>
<td>Ceramics:</td>
</tr>
<tr>
<td>4-badly deteriorated pieces of iron</td>
<td>12-eroded and unidentifiable pottery sherds</td>
</tr>
<tr>
<td>1-threaded, T-headed brass object</td>
<td>12-ceramics</td>
</tr>
<tr>
<td>1-small chrome spring</td>
<td>Total Aboriginal Artifacts, 0in-5in level = 12</td>
</tr>
<tr>
<td>6-total misc.</td>
<td>Total Aboriginal Artifacts, 5in-9in level = 17</td>
</tr>
</tbody>
</table>

Total Historic Component, 0in-5in level = 1,864 artifacts
Total Historic Component, 5in-9in level = 139 artifacts
Total Historic Component, all levels = 2,003 artifacts

### TABLE 3
Artifact Analysis, Test Pit #2, Main House, 38BK893
(5ft square, 0in-6in deep)

<table>
<thead>
<tr>
<th>Kitchen Group: (96)</th>
<th>Bone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramics</td>
<td>2-cortical fragments</td>
</tr>
<tr>
<td>1-undecorated white porcelain (20th century?)</td>
<td>1-pig tooth</td>
</tr>
<tr>
<td>2-salt glazed stonewares</td>
<td>3-total bones</td>
</tr>
<tr>
<td>6-undecorated white ironstones</td>
<td>Architecture Group: (162)</td>
</tr>
<tr>
<td>11-undecorated whitewares</td>
<td>Window Glass</td>
</tr>
<tr>
<td>1-Bennington ware</td>
<td>50-clear and light green</td>
</tr>
<tr>
<td>1-lead glazed slipware</td>
<td>50-total window glass</td>
</tr>
<tr>
<td>2-small delft tin enamelled sherds</td>
<td>Nails</td>
</tr>
<tr>
<td>1-unglazed red earthenware</td>
<td>7-wire nails</td>
</tr>
<tr>
<td>25-total ceramics</td>
<td>15-late machine-cut</td>
</tr>
<tr>
<td>Wine Bottles</td>
<td>90-badly deteriorated</td>
</tr>
<tr>
<td>10-olive green fragments</td>
<td>112-total nails</td>
</tr>
<tr>
<td>10-wine</td>
<td>Arms Group: (2)</td>
</tr>
<tr>
<td>Glass Containers</td>
<td>Centerfire Shells</td>
</tr>
<tr>
<td>35-clear fragments</td>
<td>1-.38 caliber pistol shell case</td>
</tr>
<tr>
<td>13-light blue fragments</td>
<td>1-16 gauge shotgun shell case</td>
</tr>
<tr>
<td>10-brown fragments</td>
<td>2-total arms</td>
</tr>
<tr>
<td>58-total containers</td>
<td></td>
</tr>
</tbody>
</table>

93
TABLE 3
Artifact Analysis, Test Pit #2, Main House, 38BK893
Cont.

Tobacco Pipe Group: (7)
- Tobacco Pipes
  - 6-kaoline pipe stems
  - 1-plain pipe bowl fragment
  - 7-total tobacco pipes
- Lithics:
  - 11-orthoquartzite flakes
  - 1-coastal plain chert flake
  - 12-total lithics

Total Historic Component, 0in-6in deep = 267 artifacts

Ceramics:
- 12-small eroded and unidentifiable pottery sherds
- 12-total ceramics

Total Aboriginal Artifacts, 0in-6in deep = 24

---

TABLE 4
Mean Ceramic Date for the Eighteenth Century Assemblage
Test Pits #1 and 2
(based on South 1977:210-212)

<table>
<thead>
<tr>
<th>Ceramic Type</th>
<th>Range</th>
<th>Median</th>
<th>No.</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>White salt-glazed stn.</td>
<td>1740-1775</td>
<td>1758</td>
<td>3</td>
<td>5274</td>
</tr>
<tr>
<td>Delft, plain white</td>
<td>1640-1800</td>
<td>1720</td>
<td>3</td>
<td>5160</td>
</tr>
<tr>
<td>Lead-glazed slipware</td>
<td>1700-1775</td>
<td>1738</td>
<td>2</td>
<td>3476</td>
</tr>
<tr>
<td>British brown stn.</td>
<td>1690-1775</td>
<td>1733</td>
<td>1</td>
<td>1733</td>
</tr>
</tbody>
</table>

Mean Ceramic Date = 1738.1

---

TABLE 5
Mean Ceramic Date for the Nineteenth Century Assemblage
Test Pits #1 and 2
(based on South 1977:210-212)

<table>
<thead>
<tr>
<th>Ceramic Type</th>
<th>Range</th>
<th>Median</th>
<th>No.</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undecorated ironstone</td>
<td>1813-1900</td>
<td>1857</td>
<td>72</td>
<td>133704</td>
</tr>
<tr>
<td>Undecorated whiteware</td>
<td>1820-1900$</td>
<td>1860</td>
<td>42</td>
<td>7812</td>
</tr>
<tr>
<td>Annular pearlware</td>
<td>1790-1820</td>
<td>1805</td>
<td>115</td>
<td>213629</td>
</tr>
</tbody>
</table>

Mean Ceramic Date = 1857.6

(Note: the remaining whitewares represented by hand-painting and the blue willow transfer-printed design - only 4 ceramics - should fall within the above mean date.)
slipwares, delft, British brown stoneware, salt-glazed stonewares, and colonowares signify an earlier occupation but not a continuity into the past. By the very fact that the archaeological record is void of late eighteenth century ceramics, i.e. Jackfield, creamware, China trade porcelain, black basalts, and an absence of early nineteenth century ceramics, such as Canton porcelain, creamware, luster ware, early pearlware, and other key ceramics, there is an inherent unconformity in the archaeological record. The record, therefore, exhibits two separate historic occupations; one during the early to mid-eighteenth century and another beginning during the mid-nineteenth century. A computation of the mean ceramic date on the presence of ceramics would not present with any accuracy a meaningful date of occupation. Rather, it would reflect a date during which time the site was probably not occupied.

If we concede the notion of two separate occupations, and compute separate mean ceramic dates, then we may be able to arrive at a more meaningful time frame. By utilizing key ceramics of known dates and the mean ceramic formula devised by South (1977:210-212, 217), two separate dates are determined: 1738.1 (eighteenth century) and 1857.6 (nineteenth century), a difference of 119.5 years (see Tables 4 and 5). Because there are no key ceramics for the late nineteenth century or the twentieth century, it is impossible to determine a true mean ceramic date for the later occupation, which should be in the range of about 1900-1910. The date of 1857.6 is by no means an occupational median, but rather a reflection of undecorated ironstone and whiteware manufactured sometime between 1813 and the beginning of the twentieth century. If mean dates existed on the polychrome, hand-painted porcelain and other such ceramics noted in Tables 1-3, then the dates would move the mean far to the right and probably close to the suspected range.

Neither of the occupations are understood in terms of function. The extant Greek revival home may well monitor the beginning of the nineteenth century occupation in the 1840s or 1850s, but neither the artifact assemblage nor the structure provide any indication of an economic base. As the former authors, Charles and Mills (1987), have proposed, it may have been related to the mining industry, an upland plantation, or some other unrecognized function. The earlier ceramic assemblage (Tables 1-3) may evidence a rendezvous point where early travelers and traders connected with the route to the interior of the state. Both Charles and Mills (personal communication) have suggested the possibility of a trading post, and while it may have existed, the scant amount of data is not sufficient for any such determination. Our current knowledge only recognizes the presence of an early and separate activity relative to the earlier part of the eighteenth century. Until additional opportunities are presented in the form of field work, analysis, and additional archival research, this question will remain unanswered.

**Overseer's House (38BK884)**

The former investigation by Charles and Mills (1987) has shown that remnants of nineteenth century occupations lie scattered along the edge of the bluff from the Main House (38BK893) to the Twin Oaks site (38BK883) in differential frequencies. At areas where cultural materials increase in number, the authors tried to delimit the spatial extent of each site with a series of subsurface tests. Not only was the intent to determine the horizontal distribution of artifacts, but it was intended to determine depth. The Overseer's House site, which exists partially within the forest near the edge of the bluff and the old mining operations, is one such site (Fig. 48).

Cultural materials in the form of brick fragments lie scattered along the edge of the cultivated field within the mixed hardwood forest. At one location near the corner of the field, and near a large live oak tree, there is a relatively large mound of brick fragments which may mark the location of a former
LOCATION OF TEST PITS RELATIVE TO 38BK884

Figure 48: Test pit locations at the Overseer's House.
residence. Immediately adjacent to this brick pile in the cultivated field is a light scatter of other materials, primarily in the form of ceramics and pieces of bottle glass. Subsurface testing and the occurrence of artifacts suggested the site is approximately 150ft (45m) wide and 180ft (55m) long, and about 10in (25cm) deep.

The artifact assemblage is typically from the nineteenth century. The predominant ceramics, mainly ironstones and whitewares, suggest a possible continuance into the twentieth century although there is a pre-mid-nineteenth century date of 1834.7 generated from the ceramics. The presence of machine-cut nails is also evidence of a nineteenth century structure. Whether or not these were early or late machine-cut nails is unknown. If the pearlwares were correctly identified, then we should expect to find some representation of early machine-cut nails, especially given the fact that pearlwares constitute nearly half of the ceramics with recognized median dates and ranges (46.5% pearlware and 53.5% whiteware). Based on the totaled parameters of ceramic ranges, the site may have been occupied sometime between 1801 and 1867, hence the median date of 1835.0. If the median date, totaled parameters, and pearlwares have any degree of accuracy, then additional investigations should determine the presence of early machine-cut nails since they were being manufactured from the beginning of the nineteenth century to about the time of the proposed median date (see Nelson 1968).

Beyond the temporal question, the recent investigation also sought to answer questions of site integrity, and confirm spatial extent. Both Mills and Charles (personal communication) have expressed a concern for limiting the site's extent to the mentioned parameter because of continued artifact scatters noted in the cultivated field between the Overseer's site and the Twin Oaks site. Furthermore, there is a near continuous brick scatter along the edge of the forest between these sites, suggesting perhaps, the removal of bricks from the cultivated field and a subsequent discard. Given these observations, there is a possibility for more than one site; potentially a cluster of former residences.

The area was tested with 12 subsurface units placed at locations relative to the Overseer's site (Fig. 48). Because there are no indications of earlier disturbances in the immediate vicinity of the brick pile, such as cultivation or brick scavenging, the first unit was removed by shovel skimming in the event that partial or intact foundations existed below the surface. The remaining units, 2-12, which were located in the cultivated field, were also removed with a shovel, each being taken beyond the apparent zone of occupation and into sterile deposits. All soil was sifted through 1/4in hardware cloth with the assistance of a mechanical screen, and the recovered artifacts were placed in separate bags with specific information corresponding to each unit.

The placement of the first two units was designed to: 1) test the area immediate to the brick pile for potential subsurface footings and related architectural/cultural features, and 2) obtain differential artifact frequencies relative to the proposed chimney foundation. The remaining units were placed in a line oriented with the Twin Oaks site to monitor the density and continuation of artifacts across the field, and determine if subsurface features exist below the plow zone.

The results of the investigation are presented in the corresponding Figures and Tables (Fig. 49). The area immediately juxtaposed to the chimney, or brick pile appears to be relatively undisturbed since occupation, except for the emergence of a forest. At a depth of about 8in (20cm) the artifact bearing zone, characterized by dark brown sandy loam, disappears rather abruptly on a sterile, tan sand previously discussed by Charles and Mills (1987:54). Throughout this deposit were artifacts relative to both the nineteenth and twentieth centuries, including late machine-cut nails suggesting an occupation after the late 1830s. The unit located in the field produced a similar set of information, but there was a significant rise in the number of kitchen related artifacts and architectural debris other than bricks.
TEST PIT 1

brick fragments

plowing not indicated

TEST PIT 2

artifact zone (typical of all units)

plow scars (typical of most units)

NORTH PROFILES

TEST PIT 3

TEST PIT 7

TEST PIT 12

TEST PIT DATA

<table>
<thead>
<tr>
<th>TEST PIT</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5'</td>
<td>8&quot;</td>
<td>1&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>2</td>
<td>5'</td>
<td>8&quot;</td>
<td>1&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>3</td>
<td>2'</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>4</td>
<td>2'</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>5</td>
<td>2'</td>
<td>7&quot;</td>
<td>3&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>6</td>
<td>2'</td>
<td>7&quot;</td>
<td>3&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

TEST PIT PROFILE DATA
GENERAL AREA OF 38BK884

Figure 49: Test pit profile data.
The units moving successively towards the Twin Oaks site also produced a similar assemblage, all suggesting temporal association. There was a significant decline in artifacts beyond Test Pit #7, although the occupation never completely disappeared. Throughout the area there were no indications of subsurface features nor any indication that the occupation penetrated below the existing plow zone.

**Interpretations of 38BK884**

The information generated through this investigation brings several earlier interpretations into question, especially considering the size of the site, its temporal association, and the significance of the old brick pile. Clearly, the site is larger than previously suspected, it may be later in time, it may actually represent a cluster of former residences, and the residences may have been located in the area of the field. The function of the site(s) is currently uncertain.

Based on the mean ceramic date computed on ironstones, whitewares, and a single pearlware, the occupation may be moved well into the middle of the nineteenth century (1857.2) (see Table 6). The date corresponds to the predominate appearance of late machine-cut nails and relatively thick window glass fragments recovered from the second unit (see Tables 7-9). Although the sample of glass is insufficient to compute any reliable date, thicknesses in the range of .065in-.085in reflect temporal associations consistent with the nails and ceramics, i.e. 1845-1885 (Roeneke 1978:116).

The site, however, was apparently occupied during some period of time in the twentieth century. This is suggested by the presence of a few unfamiliar ceramics which are inconsistent with known types of the nineteenth century, i.e. undecorated porcelain, and fragments of South Carolina dispensary bottles. According to Huggins (1971), the earlier dispensary bottles with palmetto trees were in production in the last decade of the nineteenth century, and with the beginning of the twentieth century the monogram, or scroll, “SCD” replaced the palmetto tree. Dispensary bottle fragments found in the unit adjacent to the brick pile clearly have the monogram “SCD”, which demonstrates a post twentieth century occupation. Clear glass with obvious manganese properties producing a slight purple tint, also associated with dispensary bottles, was noted in other provenience units. If these are fragments of dispensary bottles, then other areas of the site extend into the twentieth century.

Based on the above data, the area was probably occupied from the mid-1800s into the 1900s. The earlier mean ceramic date of 1835.0 is probably the result of having to deal with the identification of pearlwares and whitewares. Depending on the criteria used for identification, either ceramic may be categorized accordingly (Miller 1980). The earlier identification of pearlwares had a dramatic effect on the mean ceramic date, which is not supported by the preponderance of additional evidence. The more recent mean ceramic date of 1857.2 is not necessarily a median date for the site and its occupation; it is merely a statement regarding the ceramic evidence. In reality, a median date for the site may be closer to 1875-1885.

The relatively low incidence of cultural materials from the first provenience unit may bring into question the significance of the old brick pile, formerly considered a chimney foundation. If it is actually a foundation, then we may expect to find a much higher incidence of both architectural and kitchen related artifacts. However, relative to the second provenience unit, the number of nails and kitchen artifacts are much higher 55ft to the west, suggesting that the bricks may be nothing more than an area of refuse disposal generated by clearing the field. The linear scatter of brick that extends from the first test unit towards the north for a distance of about 300ft (100m), also may have resulted from clearing.
TABLE 6
Mean Ceramic Date for the Ceramic Assemblage, Overseer’s Site, 38BK884
Combined data from Test Pits #1 through #12
(based on South 1977:210-212)

<table>
<thead>
<tr>
<th>Ceramic Type</th>
<th>Range</th>
<th>Median</th>
<th>No.</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undecorated ironstone</td>
<td>1813-1900+</td>
<td>1857</td>
<td>6</td>
<td>11142</td>
</tr>
<tr>
<td>Undecorated whiteware</td>
<td>1820-1900+</td>
<td>1860</td>
<td>19</td>
<td>35340</td>
</tr>
<tr>
<td>Undecorated pearlware</td>
<td>1780-1830</td>
<td>1805</td>
<td>1</td>
<td>1805</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>26</td>
<td>48287</td>
</tr>
</tbody>
</table>

Mean Ceramic Date = 1857.2
(Note: the remaining whitewares represented by edged, blue transfer-printing, and underglazed polychrome hand-painting should fall within the above mean ceramic date)

TABLE 7
Artifact Analysis, Test Pit #1, Overseer’s House, 38BK884
(5ft square, 0in-8in deep)

Kitchen Group: (26)

Ceramics
1-undecorated white porcelain (20th century?)
1-total ceramics

Wine Bottles
1-dark green fragment
2-light green fragment
3-total wine

Whiskey Bottles
16-clear “SCD” dispensary bottle fragments (20th century)
16-total whiskey

Pharmaceutical
6-light blue panel bottle fragments
6-total pharmaceutical

Architecture Group: (30)

Window Glass
1-light green fragment
1-total window

Nails
21-late machine-cut
1-large late machine-cut
7-shaft portions

Clothing Group: (1)

Buttons
1-white ceramic, two hole button
1-total button

Tobacco Group: (1)

Tobacco Pipes
1-kaolinite pipe bowl fragment
1-total tobacco

Activity Group: (14)

Miscellaneous
1-badly deteriorated harness buckle
8-deteriorated pieces of a tin bucket
5-deteriorated pieces of thin, flat cast iron
14-total misc.

Aboriginal Artifacts

Ceramics: (2)

2-Deptford linear check-stamped pottery sherds
2-total ceramics
TABLE 8
Artifact Analysis, Test Pit #2, Overseer’s House, 38BK884
(5ft square, 6in-8in deep)

Kitchen Group: (82)

Ceramics
3-undecorated white ironstones
2-white salt-glazed stonewares
1-white salt-glazed, blue transfer-printing
10-undecorated whitewares
1-undecorated pearlware
1-flow blue transfer-printed whiteware
1-blue transfer-printed whiteware
3-annular whitewares
1-blue edged whiteware
1-underglazed polychrome hand-painted whiteware
24-total ceramics

Wine Bottles
11-dark green fragments
11-total wine

Glass Containers
4-brown fragments
4-green fragments
2-emerald green fragments (20th century?)
11-light purple fragments (manganese) (SCD dispensary bottle?)
14-clear fragments
11-light blue fragments
46-total containers

Kitchenwares
1-cast iron pot fragment
1-kitchenware

Architecture Group: (64)

Window Glass
8-clear (light blue tint) (.065”-.085” thick)
8-total window

Nails
1-L-headed machine-cut

27-late machine-cut
27-shaft portions
55-total nails

Spikes
1-large spike, machine-cut (?) with beveled tip
1-total spike

Clothing Group: (1)

Buttons
1-brass two piece with soldered eye, eagle and 13 stars on face, and "STANDARD" stamped on back
1-total button

Personal Group: (1)

Personal Items
1-purple faceted glass inset for jewelry
1-total personal

Activity Group: (6)

Miscellaneous
1-portion of a riveted brass band
4-deteriorated pieces of flat cast iron
1-melted glob of lead
6-total misc.

Aboriginal Artifacts

Lithics:

1-chunk of coastal plain chert with flake scars
1-total lithic
TABLE 9
Artifact Analysis, Test Pits #3 through #12, Overseer’s House, 38BK884
(combined assemblages)
(2ft squares, 0in-7in ± deep)

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen Group:</td>
<td>(49)</td>
</tr>
<tr>
<td>Ceramics</td>
<td></td>
</tr>
<tr>
<td>3-undecorated white ironstones</td>
<td>1-total staple</td>
</tr>
<tr>
<td>1-brown salt-glazed stoneware</td>
<td>Construction Hardware</td>
</tr>
<tr>
<td>1-tan glazed stoneware</td>
<td>1-large cast iron rivet</td>
</tr>
<tr>
<td>9-undecorated whitewares</td>
<td>1-total construction hardware</td>
</tr>
<tr>
<td>5-annular whitewares</td>
<td>Spikes</td>
</tr>
<tr>
<td>1-underglazed hand painted whiteware, blue leaves on olive glaze</td>
<td>1-hand-wrought spike</td>
</tr>
<tr>
<td>1-underglazed polychrome hand-painted whiteware</td>
<td>1-total spike</td>
</tr>
<tr>
<td>21-total ceramics</td>
<td></td>
</tr>
<tr>
<td>Wine Bottles</td>
<td></td>
</tr>
<tr>
<td>6-dark green</td>
<td></td>
</tr>
<tr>
<td>2-olive green</td>
<td></td>
</tr>
<tr>
<td>8-total wine</td>
<td></td>
</tr>
<tr>
<td>Glass Containers</td>
<td></td>
</tr>
<tr>
<td>8-clear fragments</td>
<td></td>
</tr>
<tr>
<td>3-light purple (manganese) (SCD dispensary bottles?)</td>
<td>51-small brick fragments with manganese inclusions</td>
</tr>
<tr>
<td>5-light blue fragments</td>
<td>51-total bricks</td>
</tr>
<tr>
<td>1-aqua blue fragment</td>
<td>Tobacco Group: (4)</td>
</tr>
<tr>
<td>1-light green fragment</td>
<td>Tobacco Pipes</td>
</tr>
<tr>
<td>18-total containers</td>
<td>2-plain kaolino pipe bowls</td>
</tr>
<tr>
<td>Tumblers</td>
<td></td>
</tr>
<tr>
<td>1-pressed glass rim fragment, diamond pattern</td>
<td>1-ribbed kaolino pipe bowl</td>
</tr>
<tr>
<td>1-total tumblers</td>
<td>1-kaolino pipe stem</td>
</tr>
<tr>
<td>Bone</td>
<td></td>
</tr>
<tr>
<td>1-cortical fragment</td>
<td>4-total pipes</td>
</tr>
<tr>
<td>1-total bone</td>
<td></td>
</tr>
<tr>
<td>Architecture Group:</td>
<td>(39)</td>
</tr>
<tr>
<td>Nails</td>
<td></td>
</tr>
<tr>
<td>21-late machine-cut</td>
<td>Aboriginal Artifacts</td>
</tr>
<tr>
<td>15-shaft portions</td>
<td>Lithics:</td>
</tr>
<tr>
<td>36-total nails</td>
<td>1-orthoquartzite chunk</td>
</tr>
<tr>
<td>Staples</td>
<td></td>
</tr>
<tr>
<td>1-large wire fence staple</td>
<td>1-total lithic</td>
</tr>
</tbody>
</table>

*Bricks not included in Architecture total
### TABLE 10

**Frequency Distribution of Artifacts, Test Pits #3 through #12, 38BK884**

<table>
<thead>
<tr>
<th>Artifact Classes</th>
<th>Test Pits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Kitchen Group:</strong></td>
<td></td>
</tr>
<tr>
<td>Ceramics</td>
<td>7</td>
</tr>
<tr>
<td>Wine Bottles</td>
<td>2</td>
</tr>
<tr>
<td>Glass Containers</td>
<td>7</td>
</tr>
<tr>
<td>Tumblers</td>
<td>-</td>
</tr>
<tr>
<td>Bone</td>
<td>-</td>
</tr>
<tr>
<td><strong>Architecture Group:</strong></td>
<td></td>
</tr>
<tr>
<td>Nails</td>
<td>9</td>
</tr>
<tr>
<td>Spikes</td>
<td>-</td>
</tr>
<tr>
<td>Staples</td>
<td>1</td>
</tr>
<tr>
<td>Construction Hard.</td>
<td>1</td>
</tr>
<tr>
<td>Bricks</td>
<td>6</td>
</tr>
<tr>
<td><strong>Tobacco Group:</strong></td>
<td></td>
</tr>
<tr>
<td>Pipe Bowls</td>
<td>-</td>
</tr>
<tr>
<td>Pipe Stems</td>
<td>-</td>
</tr>
<tr>
<td><strong>Aboriginal Artifacts:</strong></td>
<td></td>
</tr>
<tr>
<td>Lithics</td>
<td>-</td>
</tr>
<tr>
<td>Ceramics</td>
<td>3</td>
</tr>
</tbody>
</table>
This notion is reinforced by the very fact that only small brick fragments were recovered from other provenience units.

The continuation of cultural materials towards the north (see Tables 8-10), and the continuation of bricks along the forest edge, argues strongly for multiple dwellings rather than a single dwelling. Although the limited excavations are insufficient to determine the number of houses and their spatial arrangement, it does suggest a linear organization or a cluster parallel to the edge of the bluff.

This investigation has provided some alternative interpretations, but it too has inherent limitations. While there are indications of an extended settlement in a north/south direction, we have little knowledge of the east/west extent. There are no current indications of subsurface features, but there is a possibility that former foundations and chimney footings extend below the plow zone, or that disturbances created by construction activities are relatively extant. Future research at the site should be directed towards a finer definition of spatial extent through subsurface testing and the interpolations of artifact densities. Furthermore, we should investigate the old brick pile and determine its significance, i.e. debris from a collapsed chimney or debris from the cultivated field.

Summary

These investigations were conducted as a result of recommendations set forth by Charles and Mills (1987), under the direction of Steven D. Smith, Deputy State Archaeologist and Principle Investigator. Specifically, this work was intended to address the potential of eligibility for the inclusion of these sites on the National Register of Historic Places. Based on the results of our work, both sites appear to be significant because they are likely to yield information important to understanding the past.

The Main House site (38BK893) not only reflects activities of the mid-nineteenth century in the form of a diversity of artifacts, but it demonstrates the presence of an early eighteenth century occupation which may exist in the form of a trading post, or at least some juncture between the piedmont and the low country. The stratigraphic profiles in both provenience units alert us to the fact that at least 6in (15cm) of soil contains artifacts relative to both occupations, and that its static appearance, i.e. relatively undisturbed, has an opportunity to yield cultural disturbances and related artifacts. While the upper zone of this deposit may not reflect salient color changes, the contact zone between the dark brown soil and the gray marl provides an excellent opportunity for discovery of features. Significance, then, is seen in its ability to yield a diversity of cultural materials and a high potential for buried features.

The Overseer's site (38BK884) has shown us that the site is much larger than previously suspected and that its genesis begins during the middle of the nineteenth century. Although its function is poorly understood, the sandy deposits contain a diversity of artifacts readily amenable to recognizing spatial organization and, potentially, architecture. Furthermore, the frequency relationships between artifact classes, i.e. kitchen, architecture, faunal remains, clothing, etc., etc., can make significant statements concerning relative socioeconomic conditions during antebellum and postbellum times.
APPENDIX D

MEMORANDUM OF AGREEMENT

between

THE SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

and

THE SOUTH CAROLINA STATE HISTORIC PRESERVATION OFFICE

SUBJECT: Protection of Cultural Resources During the Development and Operation of Old Santee Canal State Park, Berkeley County, South Carolina

DATE: May 12, 1988

NOTE: All site references are from AN ARCHAELOGICAL RECONNAISSANCE SURVEY OF THE PROPOSED SANTEE CANAL SANCTUARY, BERKELEY COUNTY, SOUTH CAROLINA: Compliance Edition (SCIAA Research Manuscript Series 202) by Tommy Charles and James O. Mills

WHEREAS it is the desire of The South Carolina Public Service Authority (SCPSA), in cooperation with the South Carolina Department of Parks, Recreation and Tourism (SCPRT) to develop and operate Old Santee Canal State Park, and at the same time preserve as fully as possible the cultural and natural resources of the property while providing reasonable public access, and;

WHEREAS The South Carolina Institute of Archaeology and Anthropology (SCIAA) has surveyed and reported on the cultural resources of the property in the report referenced above, and;

WHEREAS The State Historic Preservation Office (SHPO) and the U. S. Army Corps of Engineers (COE) have completed consultation on the report and agreed, regarding the cultural resources of the park, in a determination of no adverse effect with the following conditions:

1. That the permit area is defined as the canal bed proper, Biggin Creek proper and the planned boat docking facility proper, and;

2. That the Old Santee Canal is listed and that the Biggin Creek Vessel (38BK8877) is eligible for the National Register of Historic Places, and;
3. That the effect of the undertaking at the Old Santee Canal is of Conditional No Adverse Effect, and;

4. That the Trash Disposal Site (38BK876) is not eligible for the National Register of Historic Places, and;

WHEREAS SHPO and SCPSA, with the consultation of SCIAA, have agreed

1. That the Industrial Site (38BK885) is eligible for the National Register of Historic Places, and;

2. That sites 38BK880, 38BK881, 38BK884 and 38BK886 are potentially Register eligible, and;

3. That the Stoney Landing House (38BK877) is not Register eligible, and;

WHEREAS it is the desire of SCPSA and SCPRT to protect those identified cultural resources that lie outside of the permit area as much as feasibly possible,

THEREFORE, SCPSA and SHPO, in consideration of the requirements of U. S. Department of the Army Permit #87-38-034 and the understandings listed above, agree to the following conditions on the development and operation of Old Santee Canal State Park.

1. The Industrial Complex (sites 38BK880, 38BK881, 38BK884 and 38BK886) will be crossed by an interpretive trail. All construction work in this area will be approved by a qualified archeologist before work begins and will be done as much as possible by adding to the existing grade. Ground penetration will be kept to an absolute minimum and all artifact removal will be done by the archeologist.

2. The Biggin Creek Vessel (38BK877) has been fully surveyed and documented. The boundaries of this site have been field marked to assure avoidance during construction of the park, and the site will be monitored during construction to assure the vessel's protection. The vessel's future protection will be included in SCPRT's management plan for the property, which will be developed before the opening of the park. The section of the plan dealing with this vessel will be submitted to the SHPO for review.

3. Twentieth century additions to the Stoney Landing house (38BK893) will be removed to restore the historic profile of the House. All ground connections to the removed additions (piers, water and sewer connections, etc.) will be cut off at grade and mapped. The brick patio to be installed under the house will be built on a raised bed and the bricks will be infilled with swept sand to allow removal for future archeological investigation without damage to the underlying site.
4. The Twin Oak (38BK883) and Overseer’s Sites (38BK884) and the areas between the two sites will be effected during construction by a small post hole and a gravel cover on one corner. An archeologist will be on site during the digging of the post hole.

5. The sites located within the bed of the Santee Canal will be treated as follows:

   A. The Tide Lock assembly will be excavated and preserved in place as a major interpretive resource for the park.

   B. The North Lock Gate will be documented and removed to a storage area that will ensure its preservation until such time as conservation on the gate can be carried out.

   C. The South Lock Gate will be documented and removed to a storage area that will ensure its preservation until such time as conservation on the gate can be carried out.

   D. Other objects discovered in the Santee Canal bed during park construction will be treated in consultation between SCPSA, SCPRT, SCIAA, and SHPO.

6. During the development of the park, a qualified archeologist will be on site during the beginning of construction in previously identified historic resource areas to provide guidance to the contractor(s) in the best manner to avoid or minimize necessary effects to those areas, and to provide immediate identification and emergency mitigation recommendations for previously undiscovered cultural resources discovered as work progresses. All such areas known at present have been flagged on the property to allow project contractors easy identification of sensitive areas during work. All contractors working at the site and on-site park management staff will be provided with a project map with all known cultural resource sites clearly marked and planned mitigation outlined. SCIAA is under contract to respond on an on-call basis in the event that new discoveries are uncovered during construction. Any necessary work stoppages caused by the discovery of previously unknown cultural resources will be in accordance with the applicable sections of the construction contract, copies of which are attached.

7. All archaeological investigations will be conducted by a qualified archaeologist. Results of investigations at all archaeological sites will be provided in a final technical report of investigations, a copy of which will be provided to the SHPO for review.

8. All archaeological materials will be cleaned, stabilized and catalogued for curation by SCPRT in consultation with SCIAA.
It is the intention of SCPSA and SCPRT to provide the greatest level of protection of the site's cultural and natural resources possible while providing reasonable public access to the property. It is hoped that the resulting Old Santee Canal State Park will become one of the most important historic and scientific interpretive sites in South Carolina.

Agreed to on May 12, 1988.

[Vice President, South Carolina Public Service Authority]

[Vice President, South Carolina Public Service Authority]

South Carolina State Historic Preservation Officer

WITNESSES:

[Executive Director, South Carolina Department of Parks, Recreation and Tourism]

[Executive Director, South Carolina Department of Parks, Recreation and Tourism]

South Carolina State Archeologist
APPENDIX E

MAGNETOMETER SURVEY TECHNICAL DATA

Target I.1

Dipolar signature over an area of approximately 30 square meters. Total deflection values of 65.5 δ, 86.4 δ and 80.4 δ.

Target I.2

Dipolar signature over an area of approximately 30 sq m. Total deflection values of 66.8 δ, 68.0 δ and 80.4 δ.

Target I.3

Dipolar signature over an area of approximately 30 sq m. Total deflection values of 22.0 δ, 51.0 δ, 19.0 δ, 89.8 δ, 303.6 and 134.6 δ.

Target IV.1

Dipolar signature over an area of approximately 6 sq m. Total deflection values of 116.5 δ, 11.5 δ and 103.5 δ. Diver inspection revealed anomaly source as approximately 5lb of 1/8in wire at a distance of 1.2m (4ft) from sensor head.

Target IV.2

Dipolar signature of strong amplitude over an area of approximately 100 sq m. Total deflection values of 554.0 δ, 525.5 δ and 489.0 δ. Diver inspection and localized dredging revealed source of anomaly as forged metal fastenings on wooden construct believed to be one of the wooden tide lock gates. Potential Ferrous mass is estimated to be approximately 75lbs (34 kg).

Target IV.3

Dipolar signature over an area of 15 sq m. Total deflection of 39.5 δ and 16.8 δ. Diver inspection revealed source of anomaly as a wooden construct of planks with attached spikes and iron drift pins of presently (12-01-87) extent.

Target VII.1

Dipolar signature over an area of roughly 50 sq m. Total deflection values of
402.4 8, 469.2 8, 198.8 8, and 236.8 8. Nomogram (Breiner 1973:43, Fig. 56) indicates Ferrous mass of approximately 100lbs (45.5kg) if source is 6ft from sensor head.

Figure 50: Target I.1.
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>132929</td>
<td>51963.8</td>
<td></td>
</tr>
<tr>
<td>132931</td>
<td>51959.8</td>
<td></td>
</tr>
<tr>
<td>132933</td>
<td>51958.2</td>
<td></td>
</tr>
<tr>
<td>132935</td>
<td>51959.4</td>
<td></td>
</tr>
<tr>
<td>132937</td>
<td>51959.2</td>
<td></td>
</tr>
<tr>
<td>132939</td>
<td>51963.2</td>
<td></td>
</tr>
<tr>
<td>132941</td>
<td>51961.9</td>
<td></td>
</tr>
<tr>
<td>132943</td>
<td>51956.6</td>
<td></td>
</tr>
<tr>
<td>132945</td>
<td>51956.4</td>
<td></td>
</tr>
<tr>
<td>132947</td>
<td>51956.8</td>
<td></td>
</tr>
<tr>
<td>132949</td>
<td>51957.6</td>
<td></td>
</tr>
<tr>
<td>132951</td>
<td>51958.8</td>
<td></td>
</tr>
<tr>
<td>132953</td>
<td>51958.4</td>
<td></td>
</tr>
<tr>
<td>132955</td>
<td>51958.8</td>
<td></td>
</tr>
<tr>
<td>132957</td>
<td>51958.6</td>
<td></td>
</tr>
<tr>
<td>132959</td>
<td>51959.2</td>
<td></td>
</tr>
<tr>
<td>133001</td>
<td>51959.8</td>
<td></td>
</tr>
<tr>
<td>133003</td>
<td>51959.8</td>
<td></td>
</tr>
<tr>
<td>133005</td>
<td>51959.4</td>
<td></td>
</tr>
<tr>
<td>133007</td>
<td>51960.8</td>
<td></td>
</tr>
<tr>
<td>133009</td>
<td>51961.2</td>
<td></td>
</tr>
<tr>
<td>133011</td>
<td>51964.4</td>
<td></td>
</tr>
<tr>
<td>133013</td>
<td>51970.8</td>
<td></td>
</tr>
<tr>
<td>133015</td>
<td>51984.8</td>
<td></td>
</tr>
<tr>
<td>133017</td>
<td>52002.8</td>
<td></td>
</tr>
<tr>
<td>133019</td>
<td>52009.8</td>
<td></td>
</tr>
<tr>
<td>133021</td>
<td>52013.6</td>
<td></td>
</tr>
<tr>
<td>133023</td>
<td>51994.2</td>
<td></td>
</tr>
<tr>
<td>133025</td>
<td>51992.2</td>
<td></td>
</tr>
<tr>
<td>133027</td>
<td>51996.8</td>
<td></td>
</tr>
<tr>
<td>133029</td>
<td>51995.4</td>
<td></td>
</tr>
<tr>
<td>133031</td>
<td>51997.2</td>
<td></td>
</tr>
<tr>
<td>133033</td>
<td>51994.2</td>
<td></td>
</tr>
<tr>
<td>133035</td>
<td>51942.8</td>
<td></td>
</tr>
<tr>
<td>133037</td>
<td>51945.8</td>
<td></td>
</tr>
<tr>
<td>133039</td>
<td>51958.8</td>
<td></td>
</tr>
<tr>
<td>133041</td>
<td>51952.4</td>
<td></td>
</tr>
<tr>
<td>133043</td>
<td>51953.8</td>
<td></td>
</tr>
<tr>
<td>133045</td>
<td>51957.0</td>
<td></td>
</tr>
<tr>
<td>133047</td>
<td>51959.0</td>
<td></td>
</tr>
<tr>
<td>133049</td>
<td>51962.4</td>
<td></td>
</tr>
<tr>
<td>133051</td>
<td>51964.2</td>
<td></td>
</tr>
<tr>
<td>133053</td>
<td>51964.8</td>
<td></td>
</tr>
<tr>
<td>133055</td>
<td>51965.2</td>
<td></td>
</tr>
<tr>
<td>133057</td>
<td>51978.8</td>
<td></td>
</tr>
<tr>
<td>133059</td>
<td>51980.2</td>
<td></td>
</tr>
<tr>
<td>133101</td>
<td>51988.6</td>
<td></td>
</tr>
<tr>
<td>133103</td>
<td>51998.4</td>
<td></td>
</tr>
<tr>
<td>133105</td>
<td>52015.8</td>
<td></td>
</tr>
<tr>
<td>133107</td>
<td>52012.4</td>
<td></td>
</tr>
<tr>
<td>133109</td>
<td>51986.8</td>
<td></td>
</tr>
<tr>
<td>133111</td>
<td>51990.2</td>
<td></td>
</tr>
<tr>
<td>133113</td>
<td>51985.9</td>
<td></td>
</tr>
<tr>
<td>133115</td>
<td>51989.8</td>
<td></td>
</tr>
<tr>
<td>133117</td>
<td>51992.9</td>
<td></td>
</tr>
<tr>
<td>133119</td>
<td>51992.6</td>
<td></td>
</tr>
<tr>
<td>133121</td>
<td>51991.4</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 51: Target 1.2.**

- **E side run**
  - target 1.2, dipolar
    - 32, 0\(\infty\) 6
    - 51.9±1.8 66.6\(\infty\)
    - large oak tree, part of pair termed "arcing oaks."
  - approaching target I.1
    - target 1.1
    - 52, 0\(\infty\) 5.0
    - 51, 7\(\infty\) 11.4 65.6\(\infty\)
Figure 53: Target IV.1.
Figure 54: Target IV.2.
Figure 55: Target IV.3.
Figure 56: Target VII.1.
APPENDIX F

MANAGEMENT SUMMARY FOR 38BK876

Biggin Creek Artifact Scatter

Within the mouth of Biggin Creek lies a zone of scattered artifactual materials (Z 17: E 596,075; N 3,672,945) thought to be associated with a trash disposal area noted on the steep southern bank during the terrestrial archaeological survey of the Sanctuary property. Designated 38BK876 (Area D in Fig. 2), the underwater component of the disposal area was also investigated in August 1986 by Mark Newell of SCIAA’s Underwater Division. This cursory examination of the artifact scatter extending some 45 m east to west and averaging 11 m out from the southern bank (ca. 500 sq m, 0.05 ha or 0.13 A) revealed ceramics and glass fragments dating from the 18th to 20th centuries (Charles and Mills 1987:95).

It was initially thought (Simmons 1987:17) that further investigation of the underwater component of the dumping ground at Stony Landing (Area D) might reveal distinct horizontal and vertical contextual associations of artifacts. Although three subtly distinct zones of artifactual concentrations were noted along the bank directly beneath and presumably associated with three concentrations recorded in the terrestrial scatter (Charles and Mills 1987:76), no discernible stratigraphic record exists within them. In fact, the upper sedimentary layer, in which all artifactual materials were encountered, is surprisingly thin—averaging only some 10 cm in depth. Within the sandy, shell-rich matrix of this layer, artifacts, mussel and clam shells, shale, sand, and organic detritus are thoroughly mixed. Significantly, the resulting jumble of materials—probably caused by periodic scouring of tidal currents and the “plowing” action of current-born tree trunks, branches, etc.—is comparable to the disturbance observed in plow zones in terrestrial sites. A sterile layer of compacted mud and organic detritus from 0.15-0.50 m thick underlies the lens of cultural debris and other materials. Beneath this layer is the marl and limestone bedrock characteristic of the area.

Artifacts recovered during surface collection and excavation within six designated 1 m x 1 m test squares include the following categories: bone, ceramics and brick fragments, glass, and iron. A tentative mean ceramic date determination yields a value of 1832—a figure which compares favorably with that of 1836 calculated for the adjacent terrestrial trash disposal area (Charles and Mills 1987:77).

It is the opinion of SCIAA that no further archaeological investigations, as per The South Carolina Underwater Antiquities Act of 1982 (Section 54-7-400 et seq.), are warranted for the underwater portion of 38BK876.

Joe J. Simmons III
Field Archaeologist,
Underwater Antiquities Management Program
South Carolina Institute of Archaeology & Anthropology
BIBLIOGRAPHY

Amer, C. F.
1986 The Construction of the Browns Bay Vessel. Master's thesis, Texas A&M University, College Station, TX.

American Canal Society

Bennett, C. and C. Richardson

Charles, T. and J. O. Mills
1987 An archaeological reconnaissance survey of the proposed Santee Canal Sanctuary, Berkeley County, South Carolina. Institute of Archaeology and Anthropology, University of South Carolina, Research Manuscript Series 202 (Compliance Edition).

Cohn, A.

Cohn, A. (ed.)

Crisman, K. and A. Cohn

Cross, J. R.
1985 Historic ramblin's through Berkeley. L. R. Brian Co., Columbia, SC.

Crowson, E. T.

Drayton, J.
1972 A view of South Carolina. Facsimile reprint of the 1802 edition. The Reprint Company, Spartanburg, SC.
Epting, C. L.

Garrett, W. E.

Hoffman, C.

Huggins, P. K.

Judd, W. R.
1987 *Biggin Creek Vessel.* MS on file, South Carolina Institute of Archaeology and Anthropology, Columbia, SC.

1987 *Santee Canal Locks No. 2 & 3, Pineville, SC.* A report prepared for South Carolina Department of Parks, Recreation, and Tourism, on file at PRT main offices, Columbia, SC.

1988 *Brunswick-Altamaha Canal northern tide lock.* A report prepared for South Carolina Institute of Archaeology and Anthropology, Underwater Antiquities Management Program, on file at UAMP main office, Columbia, SC.

1988 *The Santee Canal, Locks No. 1, No. 2, & No. 3.* A report prepared for South Carolina Department of Parks, Recreation, and Tourism, on file at PRT main offices, Columbia, SC.

Kohn, D. (compiler and ed.)
1938 *Internal improvement in South Carolina, 1817-1828.* The Reports of the Superintendent of Public Works, Washington, D.C.

Lesler, H. T. (ed.)

Leland, J.

McAlester, V. and L. McAlester
Michie, J. L.

1984 An initial archaeological survey of the Wachesaw/Richmond Plantation property, Georgetown County, South Carolina. Institute of Archaeology and Anthropology, University of South Carolina, *Research Manuscript Series* 191, Columbia, SC.

Miller, G. L.

Nelson, L. H.

Noel Hume, I.

Orvin, M. C.
1973 *Historic Berkeley County, South Carolina, 1671-1900.* Comprint, Charleston, SC.

Perry, M. F.
1965 *Infernal machines: the story of Confederate submarines and mine warfare.* Louisiana State University Press, Baton Rouge, LA.

Phillips, U. B.

Porcher, F. A.
1970 *The history of the Santee Canal.* Prepared by the late Prof. F. A. Porcher and dedicated to the South Carolina Historical Society, 1875. Berkeley County Tricentennial Committee, Moncks Corner, SC.

Robinson Fisher Associates

Roenke, C. G.
Salley, A. S.  

Shank, W. H. (ed.)  
1985 *Towpaths to tugboats: a history of American canal engineering*. The American Canal and Transportation Center, York, PA.

1983 The best from *American Canals*, Number 1. A collection of major articles originally published in *American Canals* (March 1972 to November 1979), the journal of the American Canal Society. The American Canal and Transportation Center, York, PA.

Simmons, J. J.  

Solomon, R. S.  
1970 *The C.S.S. David*. Comprint, Charleston, SC.

South, S. A.  

Trout, W. E.  

1987 Personal communication. President, American Canal Society, Richmond, VA.

U. S. Army  

Wamsley, J. S.  

Webb, S. D., Milanich, J. T., Alexon, R. and J. Dunbar  

Webber, M. L. (ed.)  

Wright, N.  