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ARCHAEOLOGICAL INVESTIGATION
of the
MARINE RAILWAY SITE
HUTCHINSON'S ISLAND, SAVANNAH, GEORGIA

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by
Lawrence E. Babits
and
Julie A. Barnes

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of the
MARINE RAILWAY SITE
HUTCHINSON'S ISLAND, SAVANNAH, GEORGIA
in fulfillment of
PURCHASE ORDER NO. DACW21-84-M0758

Submitted to
U.S. Army Corps of Engineers
Planning Division
Environmental Resources Branch
P. O. Box 889
Savannah, GA

by
Lawrence E. Babits
and
Julie A. Barnes

ABSTRACT

In July and August 1984, the Center for Low Country Studies of Armstrong State College conducted historical research and test excavations at the Marine Railway Site located on Hutchinson Island in the Savannah Harbor, Chatham County, Georgia. The work was conducted for the U.S. Army Corps of Engineers, Savannah District, under the terms of Purchase Order No. DACW21-84-M0758. A portion of the site will be impacted by the construction of emergency bend wideners on the shipping channel.

The archaeological investigation produced a small amount of material. Some 2242 artifacts were recovered, most of which dated to the later nineteenth century and were concerned with ship or machinery repair. The significant artifacts, however, were the remains of structures relating to the operation of a marine railway which occupied the site during the last quarter of the nineteenth century.

The marine railway site consists of three extant features important to understanding nineteenth century shipping related activities. These features are specifically associated with H. F. Willink's marine railway and shipyard and include the railway itself, a plank flooring eroding from the shoreline spoil ledge and an extensive brick scatter along the shoreline west of the railway. These were mapped to determine their spatial relationships and tested to evaluate their integrity and significance.

Six, three foot by three foot test pits and two six foot by six foot surface collection units were investigated to determine the relationship between surface and subsurface deposits to the extant features. Since the area had been utilized as a spoil dump, no significant conclusions could be drawn regarding artifacts recovered from the site. The surface collection from the area of the railway yielded artifacts clearly related to the repair of

machinery and the resheathing of ships's bottoms. These activities are those expected of a marine railway.

Fill on the site was extensive, ranging from one to over seven feet in depth. A brick feature located on a "beach" where wave action from passing vessels, combined with tidal fluctuations, was also noted. This may have been a paving to protect a wooden dock.

Research indicated that the marine railway was built and operated by H. F. Willink, Jr. from 1873 to 1898. The historical research revealed that the site appeared to be eligible for inclusion in the National Register of Historic Places based on its association with people and events important to Savannah's history. Cultural features discovered during the testing included the railway track, plank flooring, and a brick scatter. The testing revealed that, due to mixing of railway era deposits with layers of fill material, archaeological excavation of the site would provide little additional significant information. Preservation in place was not recommended.

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Judy Wood, Savannah District, U. S. Army Corps of Engineers made available a large collection of maps. Her help in obtaining information about historic harbor changes proved very valuable, as did her advice in revising the final report. Her interest in the history of Savannah Harbor added extra dimension to the work. The staff of the Georgia Historical Society assisted in obtaining documentary material. Their ready availability and suggestions were greatly appreciated.

Finally, the field crew of John Parks, Gina Cupstid, Susan Simmons and Tim Foard were most helpful. Without their help, the project could never have been completed. Their good nature and hard work were crucial as time began to run short.

Susan Simmons and Nancy Mayer-Babits provided some editorial assistance with the final drafts of the report. Susan also helped put the final report together. Diame Wagner provided word processor guidance and moral assistance when most needed.

One and all, we give you our thanks. Any errors are those of the authors.

INTRODUCTION

The U. S. Army Corps of Engineers, Savannah District, is planning to construct emergency bend wideners on the Savannah Harbor shipping channel. One of these wideners will impact a portion of the Marine Railway site, a site considered potentially eligible for the National Register of Historic Places. The site is located on the south shore of Hutchinson Island approximately 1500 feet downstream from the Talmadge Memorial Bridge (Figure 1).

The marine railway site was originally recorded during a shoreline survey of the Powell Duffryn Oil Company waterfront in 1983 (Babits 1983:20-24). Babits' research indicated that this was the site of a nineteenth century marine railway owned H. F. Willink, Jr., a prominent Savannah citizen. Babits' survey revealed that most of the site is covered with an undetermined amount of harbor disposal material. He did, however, record a portion of the railway and a plank floor which were eroding into the river, as well as a scatter of marine artifacts. Babits recommended that the site appeared to meet criteria of eligibility for inclusion in the National Register of Historic Places (1983:20).

The U. S. Army Corps of Engineers, Savannah District scheduled the site for further testing and evaluation in 1985 as a part of their proposed 1986 Savannah Harbor Widening Project. Legislation passed by Congress in 1984 to construct emergency bend wideners, however, caused a rescheduling of the marine railway testing.

The Savannah District determined, in coordination with the Georgia State Historic Preservation Officer, that construction of the upstream bend wideners would result in increased erosion and slumping of the Marine Railway site and that this action would constitute an adverse effect upon the site. Therefore, in June 1984, Savannah District provided Dr. Babits a copy of the scope of

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GEORGIA—SOUTH CAROLINA
7.5 MINUTE SERIES ORTHOPHOTOMAP (TOPOGRAPHIC)

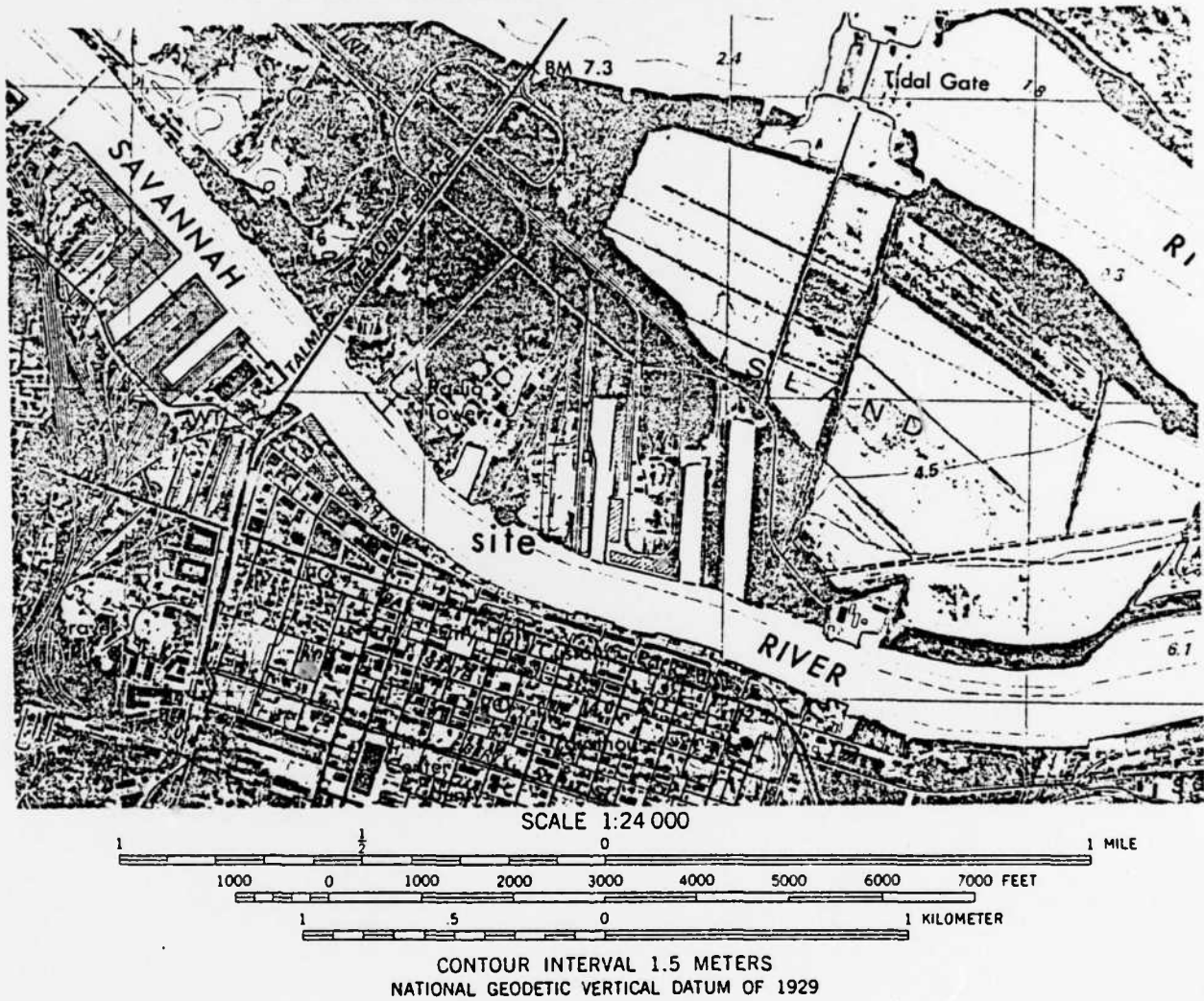


Figure 1

USCS MAP SHOWING SITE LOCATION

services for further testing on the Marine Railway site and requested a budget for the proposed work. The budget was submitted and accepted. Purchase Order No. DACW21-84-M-0758 was awarded to the Center for Low Country Studies on July 3, 1984.

The overall research objectives for the work as outlined in the scope of services were:

1. A detailed background archival and literature review of existing data pertaining specifically to the Marine Railway Site with a more general overview of the Savannah Harbor and the City of Savannah;
2. National Register testing of that portion of the Marine Railway Site which will be impacted by the construction and maintenance of the bend widener;
3. A determination of effect upon those portions of the site within the testing area;
4. Analysis of data and recovered materials; and
5. Preparation of a detailed report.

From these objectives a preliminary research design was formulated encompassing documentary and archaeological research. The railway's known owner, Henry F. Willink, Jr., was the primary focus of the documentary research. From Willink's ownership, investigation into previous owners was conducted. Information presented by Babits in "Archaeological Survey of the Savannah River (Ranges 75+500 to 77+500)" (1983), added direction for determining research questions.

Before initiating the literature search, several research objectives were posed. These questioned the length of site occupation and the significance of various owners to local and regional history. Moreover, the presence of a dry dock prior to the Civil War suggested that the site may have seen similar utilization during this earlier period.

Additional questions addressed the function and significance of the Marine Railway. The technical aspects of the site and its significance to Savannah's shipping industry led to questions answerable through documents and archaeology. For example:

1. How was the railway constructed?
2. How did it function?
3. How extensive was the railway and the associated shipyard?
4. What additional shipping related activities took place on the site?

From these origins, the investigation into the Marine Railway site was initiated.

Time was a limiting factor in the Marine Railway investigations. Due to the emergency nature of the bend wideners, only six weeks were allocated for total completion of the survey, historical research and draft report preparation. Work on the site began on 11 July 1984 after ten days historical research had been completed as stipulated in the research design. This work was conducted at the Savannah District Office, U. S. Army Corps of Engineers, the Georgia Historical Society, and the Chatham County Court House. During this time the site was briefly inspected to determine where and how work should begin. The shoreline area was dense with marsh grass. The grasses were cut to just above ground level to facilitate mapping.

Extant features were mapped and test units established. Mapping and digging was conducted by the crew chief and from two to four crew members digging half days and conducting laboratory analysis during the remainder of the day. Full work days on the site were not possible due to tidal fluctuation.

In addition to the time restraints in the contract, difficulties with

tide schedules and abnormally high tides restricted work time and flooded test pits, greatly reducing the total amount of field time available. Furthermore, fill (1 to 7 feet) and the remains of a previous oil spill on the site impeded excavation.

The draft report was turned in to the U.S. Army Corps of Engineers, Savannah District on 15 August 1984, as specified by the contract, for evaluation by Corps archaeologists and the Georgia State Historic Preservation Officer. The official review comments were received by the Center for Low Country Studies on 2 January 1985 for final revisions.

SITE HISTORY

Hutchinson's Island has been involved in each cultural phase of Savannah's history. Initially utilized for wet rice cultivation (Wilson 1858:133), the area has since been utilized as a spoil dumping ground for dredging operations continuing to this day. It has also been used for docking space as Savannah's commerce grew over the years. Hutchinson's Island bordered the harbor and has been "an integral part of the early colony of Georgia and of its continuing growth to the present day" (Granger 1968:4).

Specifically, the area associated with the marine railway changed with local adaptations in cultural focus and has directly contributed to shipping in Savannah. Although ownership changed frequently in the two hundred plus years of site occupation, each successive change is indicative of current land use patterns in the Savannah area. Tables 1-5 show the line of ownership for the marine railway site. For the period after 1870, wharf lots numbered four through nine were associated with Willink's Marine Railway and Shipyard (Plate 1). Historical information is presented chronologically with emphasis concentrated on those periods when activity was apparently at its height.

The earliest definition of wharf lots four through nine occurs when they

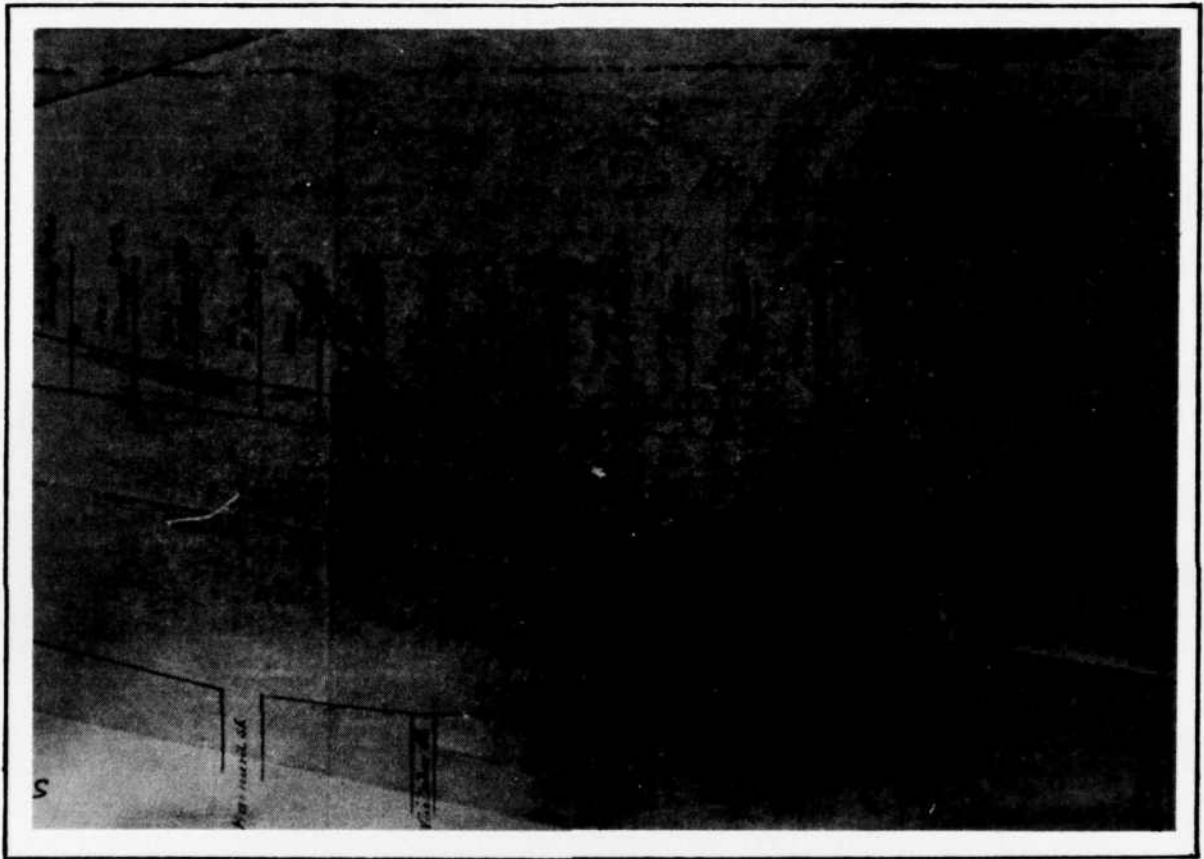


PLATE 1

Wharf Lots on Hutchinson's Island
(Anonymous n. d.)

A Marine Railway

B Authorized Dredging Line

were obtained by Mein in 1806 (Chatham County 2G-492) as part of a transaction involving the transfer of James Mossman's plantation to Mein. Prior to this time the property was used for wet rice cultivation (Wilson 1858:133).

Mein, a local attorney, divided the southern marshlands on Hutchinson's Island into wharf lots (Plates 1, 3). The necessity for altering use from rice cultivation to wharves may have been occasioned by the City of Savannah which tried to eliminate disease by irradiating wetlands around the city. Under the provisions of the dry culture law of 1817, wet cultivation of rice within two miles of the city was forbidden (Ledbetter and Doyon 1984:21).

Mein sold the wharf lots at public auction in 1817 (Chatham County 2G-492). This sale was an important step in the development of Savannah's harbor because it provided additional docking space. While many of the lot owners from 1817 to 1898 were prominent merchants, ship builders and shipping agents in Savannah, no specific evidence of structures built within the permitting area occurs until 1850 when the Floating Dry Dock Company of Savannah began operations.

The Savannah Floating Dry Dock was constructed by Charles P. Lander-shine, who continued to be employed by the company as a blacksmith. The Savannah Morning News covered the launching of the dock which was built according to "the plan of Gilbert's Patent Balance Floating Dry Dock" and measured 220 feet long, 65 feet wide and 20 feet deep (Savannah Morning News 23 Aug 1850:2, col 2). The dock was capable of receiving a vessel as large as 2500 tons. When completed, with two engines and twelve pumps, the dock would "be equal to any other merchant ship dock in the United States" (Ibid). This enterprise was recognized as important to Savannah's shipping industry as the Savannah Morning News stated:

Table 1

Chain of Title Wharf Lot 4

<u>Year</u>	<u>Grantor</u>	<u>Grantee</u>	<u>Chatham Co. Deed Bk.</u>
1898	Willink, H. F.	Ga/Ala Terminal Co	7Y:466
1897	Purse, D. G.	Willink, H.F.	7S:21
Gap in records			
1817	Mein, William	Denton, Gabriel	2G:498
1806	Mossman Estate	Mein, William	2A:182

Table 2

Chain of Title Wharf Lot 5

Year	Grantor	Grantee	Chatham Co. Deed Bk.
1898	Willink, H. F.	Ga/Ala Terminal Co	7Y:466
1870	Dickerson, Wm. H	Willink, H. F.	4G:183
1865	Dickerson, H. J.	Dickerson, Wm. H.	3X:195
1862	Floating Dry Dock	Webber, Christian	3V:121
1862	Padelford, Low & Tupper	Floating Dry Dock Co.	3V:118, 119, 120
1817	Mein, William	Bulloch, A. S.	2G:500
1806	Mossman Estate	Mein, William	2A:182

Table 3

Chain of Title Warf Lot 6

Year	Grantor	Grantee	Chatham Co. Deed Bk.
1898	Willink, H. F.	Ga/Ala Terminal Co	7Y:466
1870	Dickerson, Wm. H.	Willink, H. F.	4G:183
1865	Dickerson, H. J.	Dickerson, Wm. H.	3X:195
1862	Floating Dry Dock	Webber, Christian	3V:121
1862	Padelford, Low & Tupper	Floating Dry Dock Co.	3V:118, 119, 120
Gap in Records			
1817	Mein, William	Minis, Isaac	2G:503
1806	Mossman Estate	Mein, William	2A:182

Table 4

Chain of Title Wharf Lot 7

Year	Grantor	Grantee	Chatham Co. Deed Bk.
1898	Willink, H. F.	Ga/Ala Terminal Co	7Y:466
1870	Hartridge, A. S.	Willink, H. F.	4G:350
1869	Mills, T. R.	Hartridge, A. S.	4G:234
Gap in Record			
1862	Floating Dry Dock	Webber, Christian	3V:121
1862	Padelford, Low & Tupper	Floating Dry Dock Co.	3V:118, 119, 120
1847	Crabtree, Wm.	Hall, George	3E:84
1839	Balfour, John	Hall, Geo. & William Crabtree	2W:284
1836	Mein Estate	Balfour	2U:194
1806	Mossman Estate	Mein, William	2A:182

Table 5

Chain of Title Wharf Lot 8

<u>Year</u>	<u>Grantor</u>	<u>Grantee</u>	<u>Chatham Co. Deed Bk.</u>
1898	Willink, H. F.	Ga/Ala Terminal Co	7Y:466
1874	Cummings, George	Willink, H. F.	4P:497
Gap in Record			
1817	Mein, William	Campbell, R. & George Cummings	2G:506
1806	Mossman Estate	Mein, William	2A:182

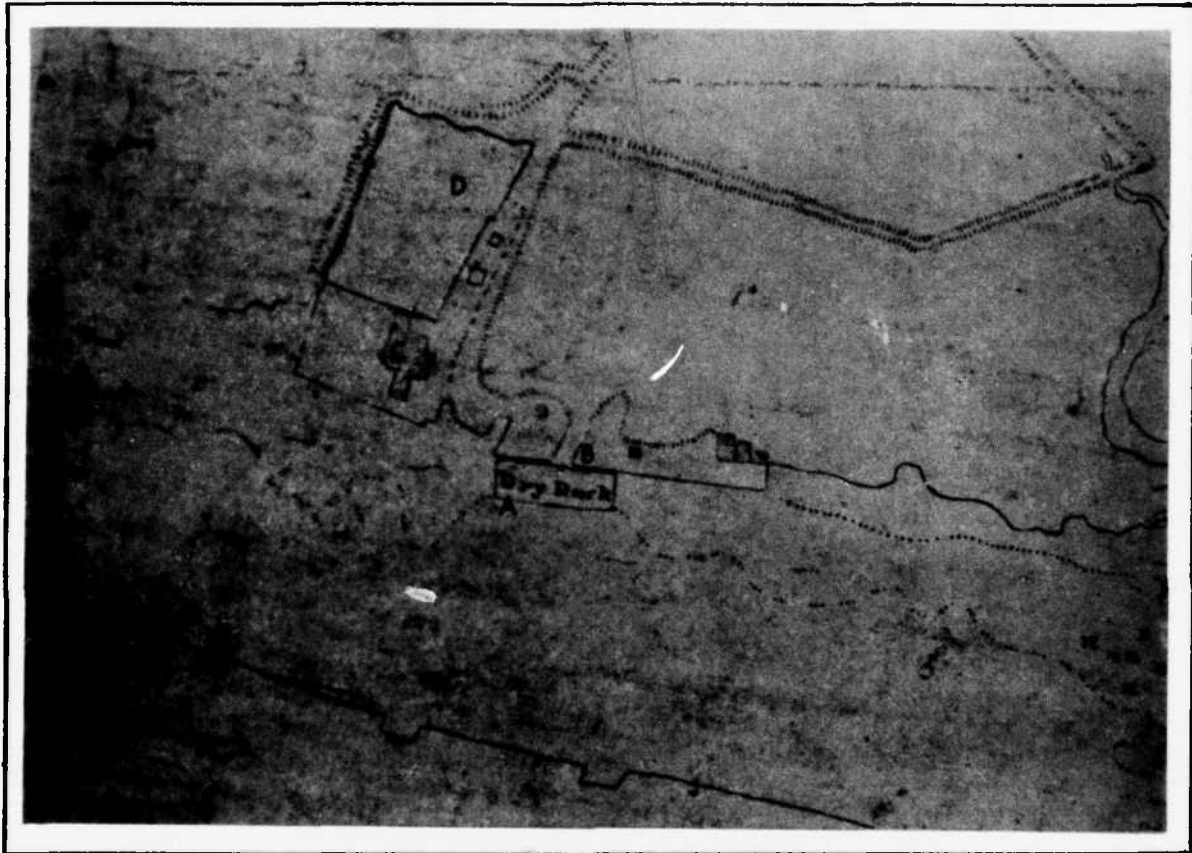


PLATE 2

Savannah Floating Dry Dock
(Smith 1852)

- A Dry Dock
- B Low's Wharf
- C Sawmill
- D Sawmill Pond

"We take pride in the Savannah Floating Dry Dock, which we regard as another and important movement towards that commercial eminence and prosperity which is the sure destiny of our city." (Ibid)

The dock was tied up at Andrew Low's wharf on Hutchinson's Island (Ibid)(Plate 2). No additional information about Low's wharf or the Floating Dry Dock was found.

Ownership of the Floating Dry Dock Company has not been established. A city ordinance passed in 1852, however, granted the company, "the control of the wharves leased or hired by them for their own use" (Daily Morning News 14 Feb 1852:1, col 2; City Council 12 Feb 1852). This suggests that the company was leasing land from the city. The newspaper account placing the dock at Low's wharf and three indentures in 1862 between the company and Edward Padelford, Andrew Low and F. A. Tupper, however, suggest a lease from private owners. These three indentures were the means by which the company purchased wharf lots five, six and seven on Hutchinson's Island. The Dry Dock Company then sold the property to Christian Webber (Chatham County 3V:118-122). No information involving the company was found after this sale indicating that the company may have gone out of business during the Civil War. No cartographic evidence about the company exists after 1852.

No mention of a dry dock is made during the Civil War in the Official Records or the local newspapers. A city resolution was made in 1868 stating that "the City of Savannah desires to encourage, by all legitimate means, the construction of a dock for the repairing of damaged vessels" (Chatham County-Savannah). The city resolved to lease such land on "the northern side of Savannah River as the city owns..."(Ibid). The construction was to take place between March 1869 and March 1870. This resolution indicates that no dry dock was available in Savannah in 1868, also suggesting that the floating dry dock no longer existed. No structures are identifiable on the site between

1852 and 1873. Thus, since the dry dock was only tied up at the site, structures associated with Willink's marine railway are the most significant part of the permitting area's cultural history.

The Marine Railway was part of an extensive shipyard complex owned and operated by Henry F. Willink, Jr. It was used to pull large ships out of the river for repair. Willink's Marine Railway was the second major riverine operation at the site. Willink obtained wharf lots five, six and seven in 1870 (Chatham County 4G-183, 350). The marine railway was constructed mainly on these lots in 1873 (Plate 3). In 1874, Willink purchased lot eight and in 1897 bought lot four (Plate 4)(Chatham County 4P-197, 7S-21). Although plates 3 and 4 show Willink as the owner of lot nine after 1874, no evidence of this acquisition was found.

Construction of the marine railway began in 1873 and the project was completed in 1874. Upon the railway's completion, the Savannah Morning News noted that two tugs were being hauled into dry dock for repairs. The paper stated further that:

The work of constructing these railways was commenced nearly two years since, and has progressed slowly to completion in order that the latest improvements might be utilized. As they now stand they are probably largest of the kind in the United States, and with the exception of the marine railways at Philadelphia, the finest. A visit to Hutchinson's Island and an inspection of these railways will prove a pleasure to all who are interested in the commercial importance of our city (Savannah Newspaper Digest 1874:512).

The complex also included "facilities for doing all work with dispatch..." (Savannah Morning News 1 July 1875:4, col. 8). There was also an agent for the Southern Wrecking company prepared to contract for "Raising and pumping out Vessels of any size. Has on hand for hire Steam Pumps, large lifting,

lighters, diving apparatus, Hydraulic Jacks &" (Ibid). The marine railway maintained a steady trade throughout the 1870's and 1880's hauling ships in for examination and repair (Savannah Morning News Newspaper Digest 1873-1891).

The marine railway was a significant business contributing to the shipping industry in Savannah. A cursory survey revealed that the Savannah Morning News reported three instances in 1875 when ships in port were taken up on the railway. On July 28, 1875, the Revenue Cutter Boutwell was hauled up for repairs (Savannah Newspaper Digest 1875:584). In August 1875, the disabled New York Steamer Ashland was "towed to the city..., and will go on Willink's Marine Railway where she will receive repairs" (Ibid:586). Lastly, in September 1875, the steamer Lizzie Baker was "run upon Willink's Marine Railway for repairs..." (Ibid:588). These accounts indicate that the railway was being utilized by both local and regional shippers. The presence of a facility to aid and repair disabled ships was definitely a significant asset to Savannah's shipping industry.

It's owner, Henry F. Willink, Jr. was likewise of local and regional significance. Henry F. Willink came from a shipbuilding family. His father, H. F. Willink, Sr. was a Savannah shipbuilder with a large shipyard and a marine railway on the eastern wharves before the Civil War. H. F. Willink Jr. continued in this tradition, building such ships as the Robert Habersham in 1859 for H. J. Dickenson and Son (Daily Morning News 1 Sept 1859:1, col 1).

Willink is best known as a Civil War contractor who built ships for the Confederate States Navy. According to his daughter, "at the opening of the Civil War, H. F. Willink's shipyard at the eastern edge of Savannah, was the largest and best equipped yard in Savannah." (Willink n. d.:1).

While Willink's involvement in preparing harbor defenses and his direction of harbor obstructions during the war made him a locally significant figure, his most celebrated contribution was warship construction. Indeed,

"when the war broke out, the Confederate government recognizing his valuable services, at once put him to work on the herculian task of building a navy..." (The Times 1879). The result of these efforts included the ironclads CSS Savannah, and CSS Milledqville, and the gunboat CSS Macon (Times 1879; Lawson 1978:6-9). Willink's wartime activities led to his arrest during Savannah's occupation. He returned to Savannah after war's end to rebuild his shipyard which had been burned during the evacuation of Savannah (The Times 1879; Fleetwood 1982:128).

In May 1866, the Treasury Department contracted with H. S. Wells, a salvor, to remove several wrecks from the river, including the CSS Georgia (Granger 1968:35-6). Willink worked with Wells removing obstructions from the river, many of which had been placed under his direction (The Times 1879).

The construction of the marine railway in 1873 continued Willink's involvement in Savannah's shipping industry. This endeavor proved to be "of great convenience and advantage to steamers and other vessels" (Ibid 1879).

The Times summed up Willink's importance to Savannah when they wrote:

"Mr. Willink has devoted his entire business life along the banks of our river, and if there is any enterprise going on in that direction he is pretty apt to have a hand in it" (Ibid.).

Willink was involved, not only in shipping, but in local politics and the fire department (Ibid). Willink represents a prominent local and regional figure. His association with the marine railway contributes to the historical significance of the site. The importance of this structure to ship maintenance and harbor effectiveness makes the site significant to the history of the City of Savannah and southeastern shipping.

In 1898, a considerable portion of Hutchinson's Island wharf property was bought by the Georgia and Alabama Terminal Company. Included in the

purchase were wharf lots four through eight which contained the marine railway site. The deed included the wharf lots and "that certain marine railway plant located upon said lots and known as Willink's Marine Railway with all of the machinery, tackle, engines, boilers, improvements, buildings, tools, equipment, appliance and appurtenances..." (Chatham County 7Y-466). This sale changed the focus of the railway from a private local service to a part of a large corporate structure. After the sale, little information about Willink's activities and no information on the marine railway is included in Savannah's newspapers.

In 1899, the company began construction of a large terminal complex on Hutchinson's Island. The project was "designed to widen the river at point of location at least 135 feet, the result being, including the slips, a water frontage of 9,452 feet, accommodating thirty-one steamers 300 feet long, which will have all facilities for loading or discharging cargoes at the same time..." (Savannah Morning News 7 Sept 1899:24). This facility was extremely important to river trade in Savannah as no other comparable facility existed at the time (Ibid). It is difficult to say exactly what impact the terminal facility had on the marine railway. Shoreline changes related to the project, however, must have impacted the marine railway since the river was widened to some extent. (Figure 2; Plates 1, 3)

Detailed historical information about the site is limited. Operations which took place were sporadic, apparently seasonal in nature, and significant to Savannah's shipping and harbor activity. Furthermore, the involvement of Willink in the marine railway company located on the site from 1873 to 1899 adds to the site's regional significance.

After initial fieldwork on the site was completed, additional, volunteer research on the topic of Savannah River shipping was undertaken. This work

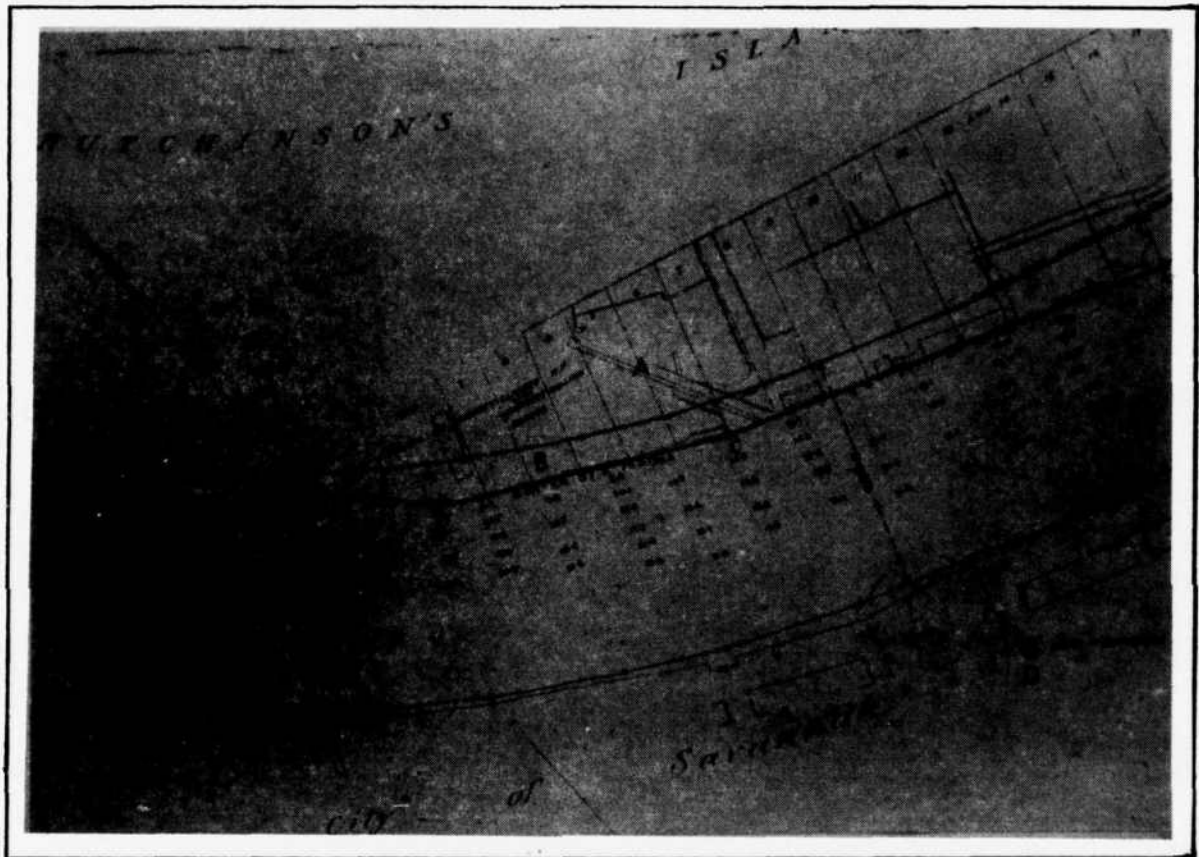


PLATE 3

Wharf Lots on Hutchinson's Island
(Anonymous 1897)

- A Marine Railway
- B City Sawmill Complex
- C Authorized dredging line
- D Cotton Exchange

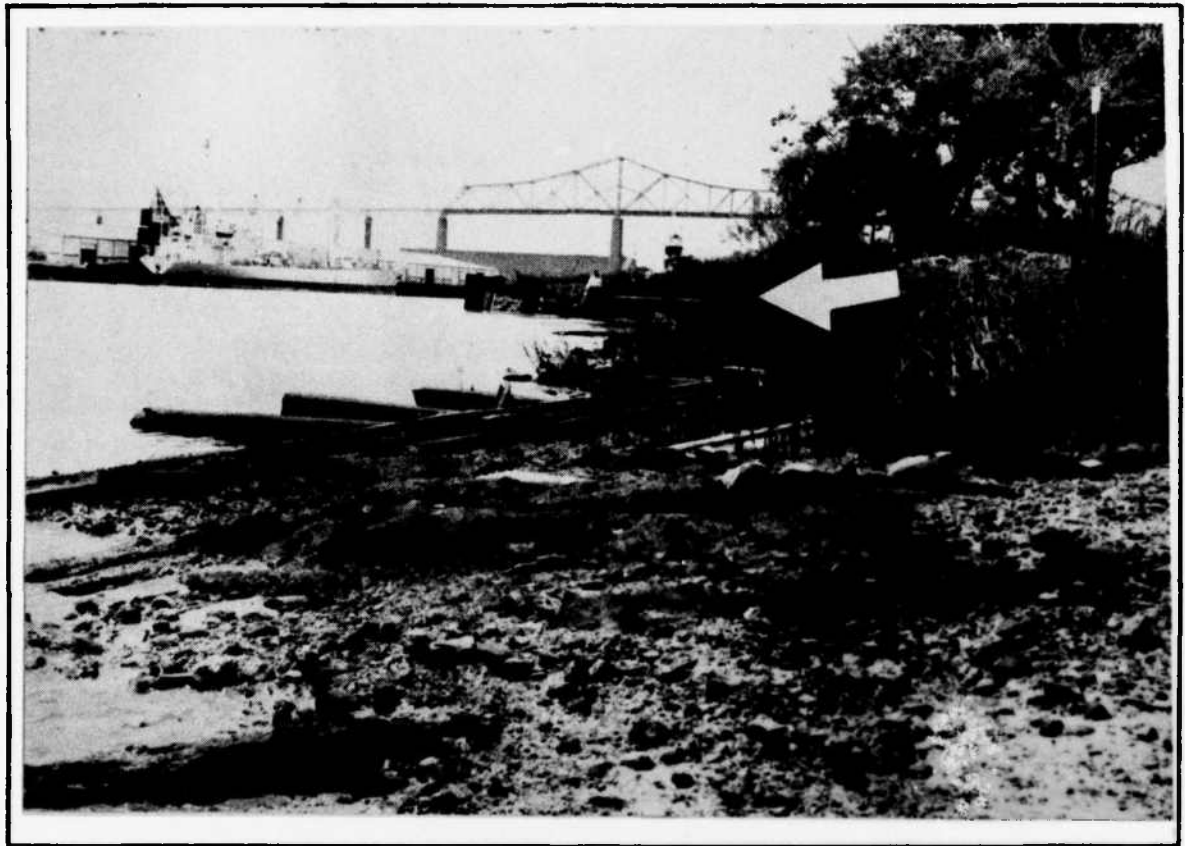


PLATE 4

The Marine Railway Site viewed from downstream
Talmadge Bridge in Background
Stringers (horizontal) and rail (diagonal) in foreground
Plank Flooring indicated by arrow

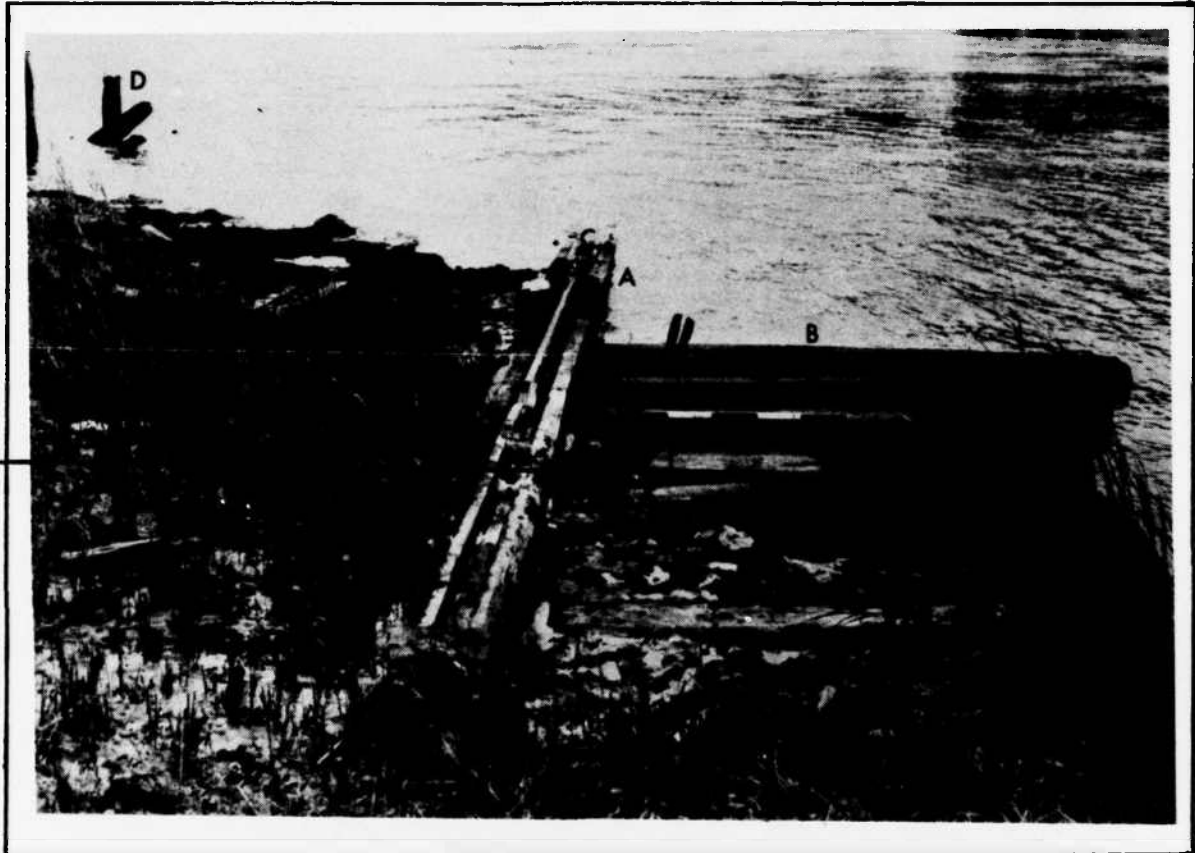


PLATE 5

Marine Railway Site looking south toward Savannah River

A Stringer

B Sleepers

C Rail

D "Fence" Line supporting structure

(Scale in one foot increments)

revealed that cargoes shipped out of the port participated in a seasonal cycle of exportation affecting types of ships, tonnage, cargo types, time of repair and volume of trade.

Prior archaeological work on the site consisted of a riverine magnetometer survey which did not find the site (Garrison et al 1980). This was odd considering the volume of metallic debris found during the testing and the heavy iron rails. Mitigating factors were the amount of material acting as "noise" on the river bottom and the non-detailed nature of the survey. The first evaluation of the site, limited to a surface collection and preliminary documentary research was carried out during the 1983 survey by Babits. This consisted of photodocumentation and cartographic study of the site. No excavations were conducted (Babits 1983).

After the fieldwork and submission of the draft report, the site was removed by dredge and clam shell excavation during the fall of 1984.

METHODOLOGY

Based on contract requirements and the historical research, a research design was produced to guide both the archaeology and additional documentary research. The basic aim of the field work was to assess site integrity. Results of the documentary research are included as site history.

In order to assess the site integrity and evaluate its potential for yielding information, the site was first mapped (Figure 3). Each feature was recorded from a datum established central to the site. The datum was positioned on a ledge created by spoil deposited after the site ceased to function as a railway. The spoil has since eroded due to wave and tidal water movements.

Six systematic three foot square test pits were established. Five test pits were located between mean low water and 25 feet inland to identify cultural

resources which were not visible. One test pit was sited beyond the 25 foot permitting area to determine the condition of the railway. The test pits were placed to allow inspection of a brick scatter, the extension of the railway onto the island and to inspect the plank flooring reported by Babits (1983:24)(Plate 5). Systematic placement of test pits was necessary due to temporal and financial constraints on the project. Two surface collection units were established to recover material adjacent to the railway.

Profiles of the test pits were not drawn because they reflected only the spoil overburden. Ground water seepage caused slumping of test pit walls even as they were under excavation. Instead, a profile of the entire site was drawn showing the amount of spoil deposited over the features (Figure 4). All material removed from the ground was screened through one-fourth inch hardware cloth. Since the soil matrix was composed of spoil ranging from clay to sand, the material was wet screened in the river. This was not totally satisfactory due to the mixture of residue from an oil spill which remained on the site and permeated the spoil matrix. Artifacts were removed, cleaned, catalogued and placed into storage at Armstrong State College. Photographs and drawings made during the field work were also placed in storage at Armstrong State College where they may be inspected by interested parties.

Some adjustments to the original plan were made when heavy machinery involved in dredging a spoil retaining pond produced evidence about the railway not otherwise available. Remains of pilings were noted during dragline excavations for Powell-Duffryn's new docking facility. While none of the pilings were still supporting structures, there was evidence of tie beams and other cross-timbers. These portions of the marine railway were removed during excavations. No evidence for plank flooring or for a brick pavement around the marine railway was noted in the area of the spoil retaining pond.

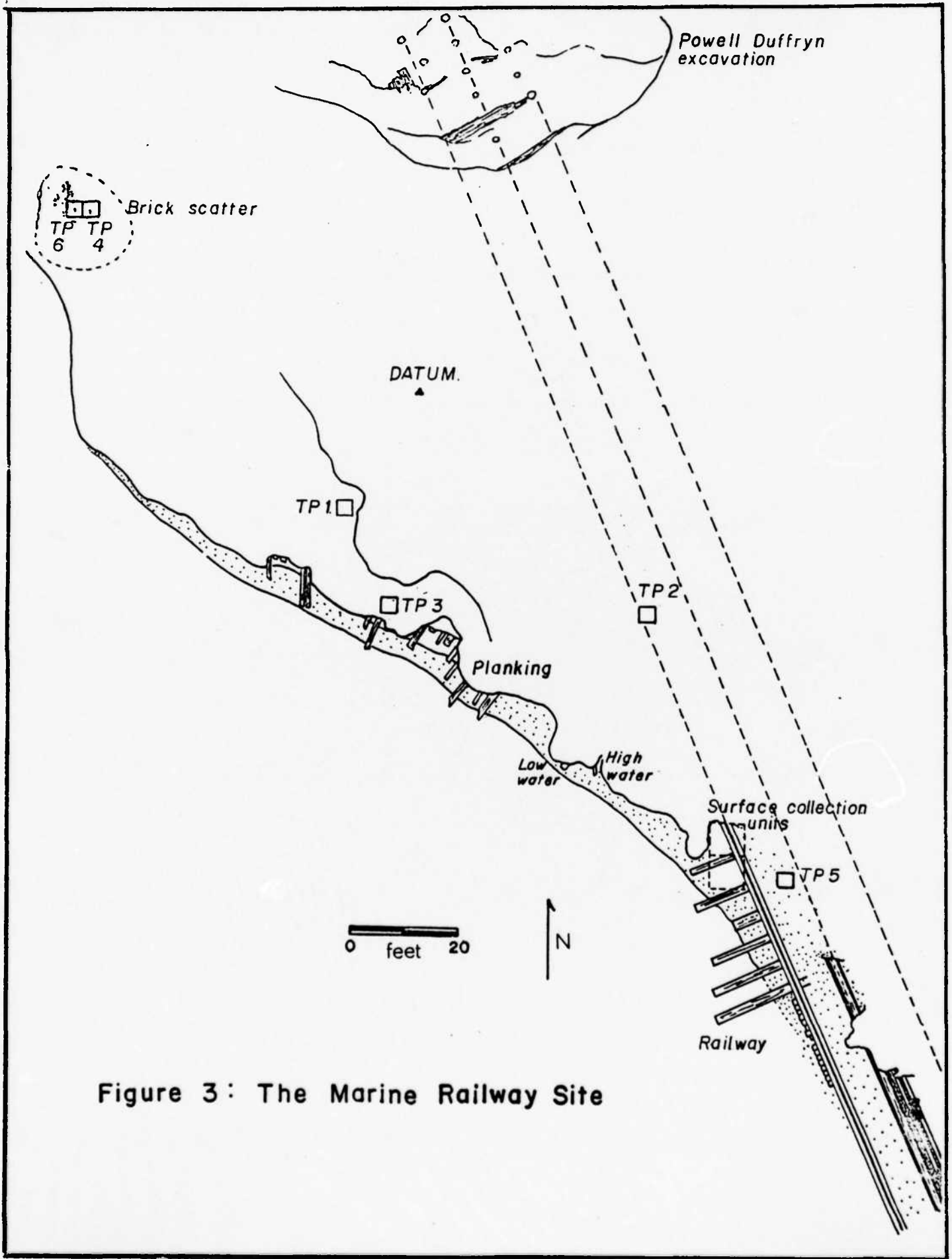
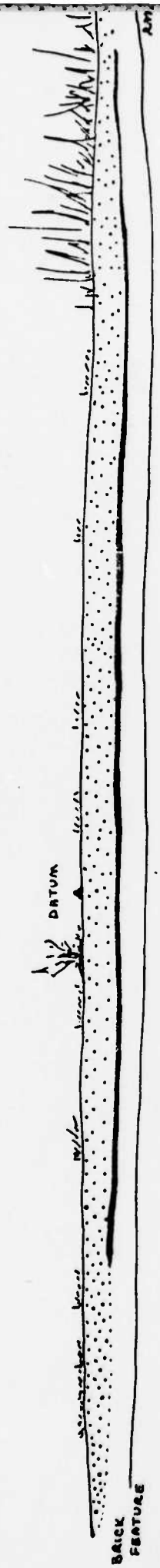


Figure 3: The Marine Railway Site

resources which were not visible. One test pit was sited beyond the 25 foot permitting area to determine the condition of the railway. The test pits were placed to allow inspection of a brick scatter, the extension of the railway onto the island and to inspect the plank flooring reported by Babits (1983:24)(Plate 5). Systematic placement of test pits was necessary due to temporal and financial constraints on the project. Two surface collection units were established to recover material adjacent to the railway.

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- FILL ABOVE PLANKING
- BELOW PLANKING
- PLANKING LEVEL

0 ft 10

Figure 4: Profile showing spoil material over planking

FINDINGS

The archaeological investigation addressed several questions noted in the Introduction. These included determining the extent of the site, how it was constructed, and how it worked. Archaeological data needed to answer some of these questions were obtained. The initial mapping of extant features provided a good sense of the site's size, especially the area specifically associated with the railway within the permitting area.

Site construction and function were only fully understood through post-project monitoring of the site's removal for the Powell Duffryn terminal outside the permitting area. Measurements taken after spoil removal and personal communications with people knowledgeable of marine railway construction allowed partial reconstruction of the site.

Six excavation units were placed to test specific features. Surface collections were undertaken to sample an extensive scatter of ship related artifacts. Although test pits yielded some artifacts, site-related material was indistinguishable from material mixed with spoil. Therefore, the significant artifacts were the features themselves.

Three features were identified at the Marine Railway site which are important to the understanding of nineteenth century shipping-related activities. These features include the railway itself, a plank flooring and an extensive brick scatter (see Figure 3).

The Railway

The railway was the most extensive, and intact, feature noted. The rails and remnants of the supporting structure are visible and represent the focal point of the site. The portion most likely to be affected by harbor widening extends more than 75 feet from under the spoil out into the river at low tide.

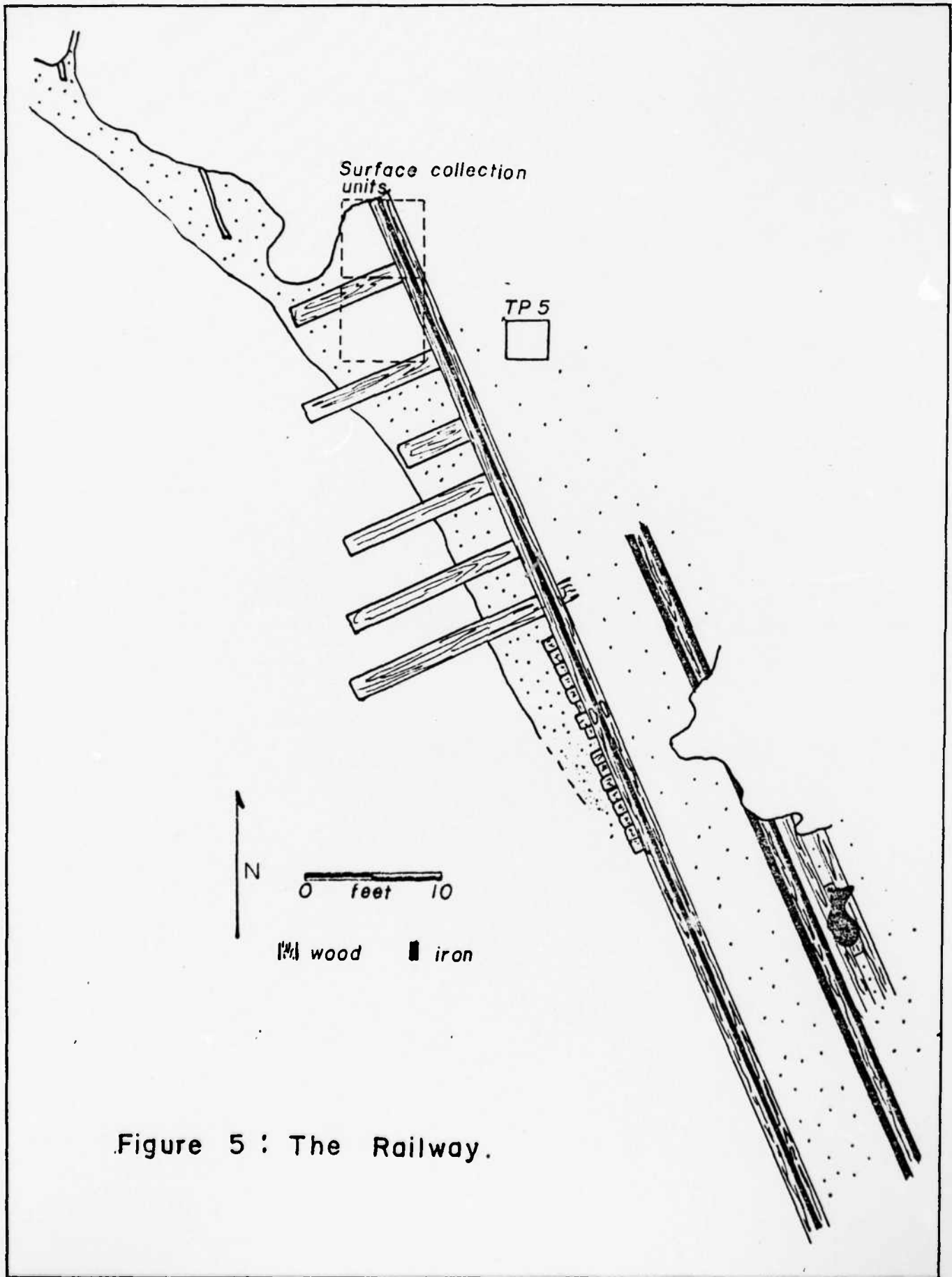


Figure 5 : The Railway.



PLATE 6

Marine Railway Site - Detail of Sleepers, Stringer and Rail

A Stringer and Rail

B "Fence" Line supporting structure

Sleepers run horizontally across picture

(Scale in one foot increments)

The railway extends further than this, but was not recorded additionally due water depth.

The visible portion of the railway consists of six sleepers which vary in length from 5 to 15 feet, before disappearing under spoil, and are roughly 15 inches square (Figure 5). These lie perpendicular to track stringers which extend more than 75 feet into the river. The rail resting on the stringer is a T rail (American Iron 1981:7) 1.4 inches high with a head 2.5 inches wide (Figure 6, Plates 6-8).

Parallel to the stringers (and between them) are a series of three wood planks, two of which are 6 inches wide while the third is 15 inches wide. The larger "plank" has two 6 inch iron plates (Plate 9) which run the length of the exposed wood. The railway was mapped and drawn in detail (Figure 7).

Two test pits (TPs 2 and 5) were placed to determine the nature of the railway beneath the fill. These units were not productive. Fill material in TP 2 was over five feet deep and yielded no artifacts. This test pit was abandoned when seeping ground water flooded it faster than it could be bailed out.

Test Pit 5 was located inland from exposed portions of the railway in an attempt to determine how intact the structure was under the spoil. This excavation unit produced only post-use fill. The railway was, nevertheless, found to extend between the extant stringer and the parallel plank section east of the stringer. Additional testing of the railway area was by probing north of the visible rail, following the rail another 40 feet beyond where it disappeared under depths of fill deeper than the four foot probe.

The two surface collection units placed over the northern edge of the railway yielded artifacts specifically associated with shipbuilding. The artifacts recovered from the surface in this area included large amounts of

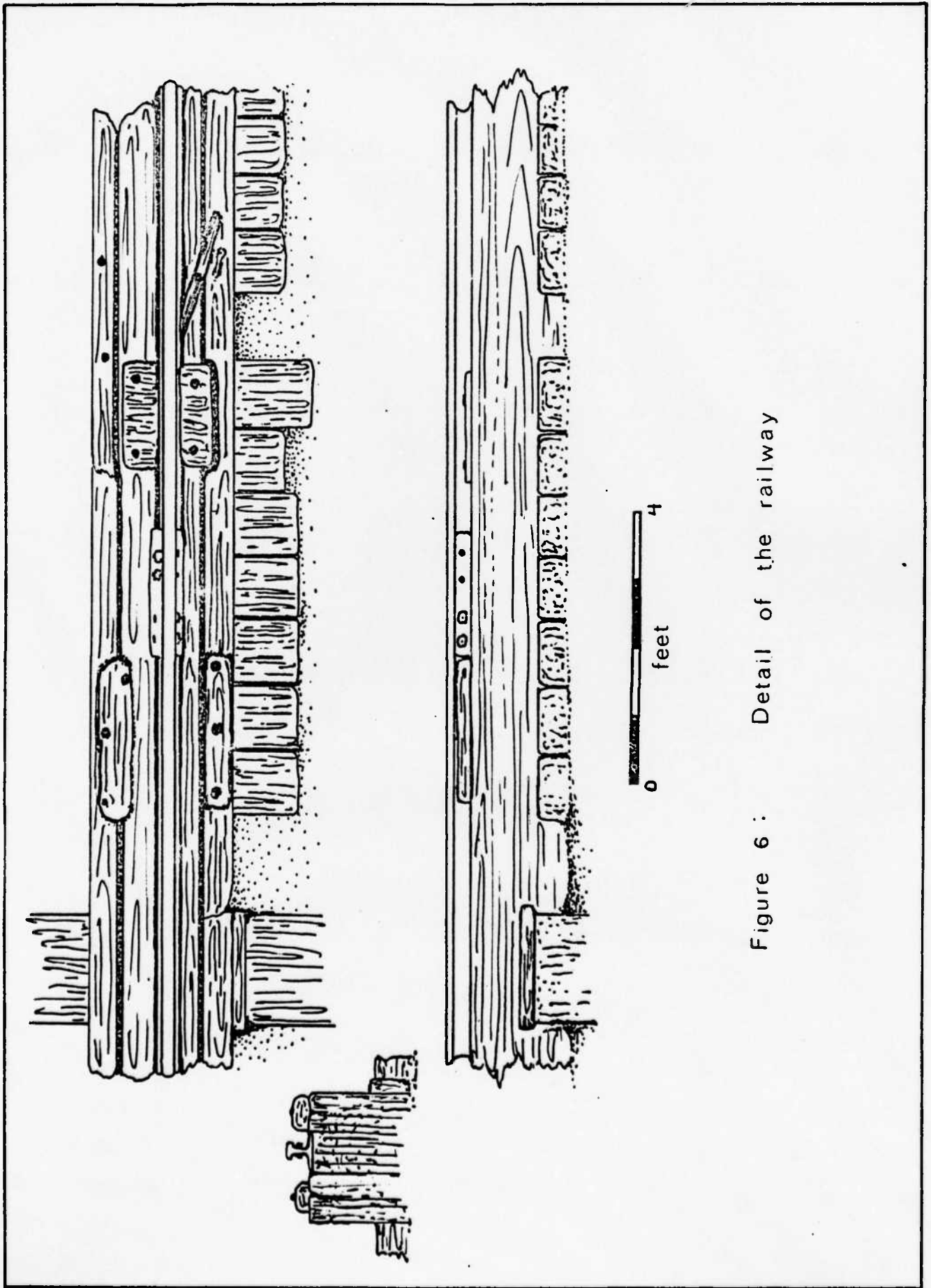


Figure 6 : Detail of the railway



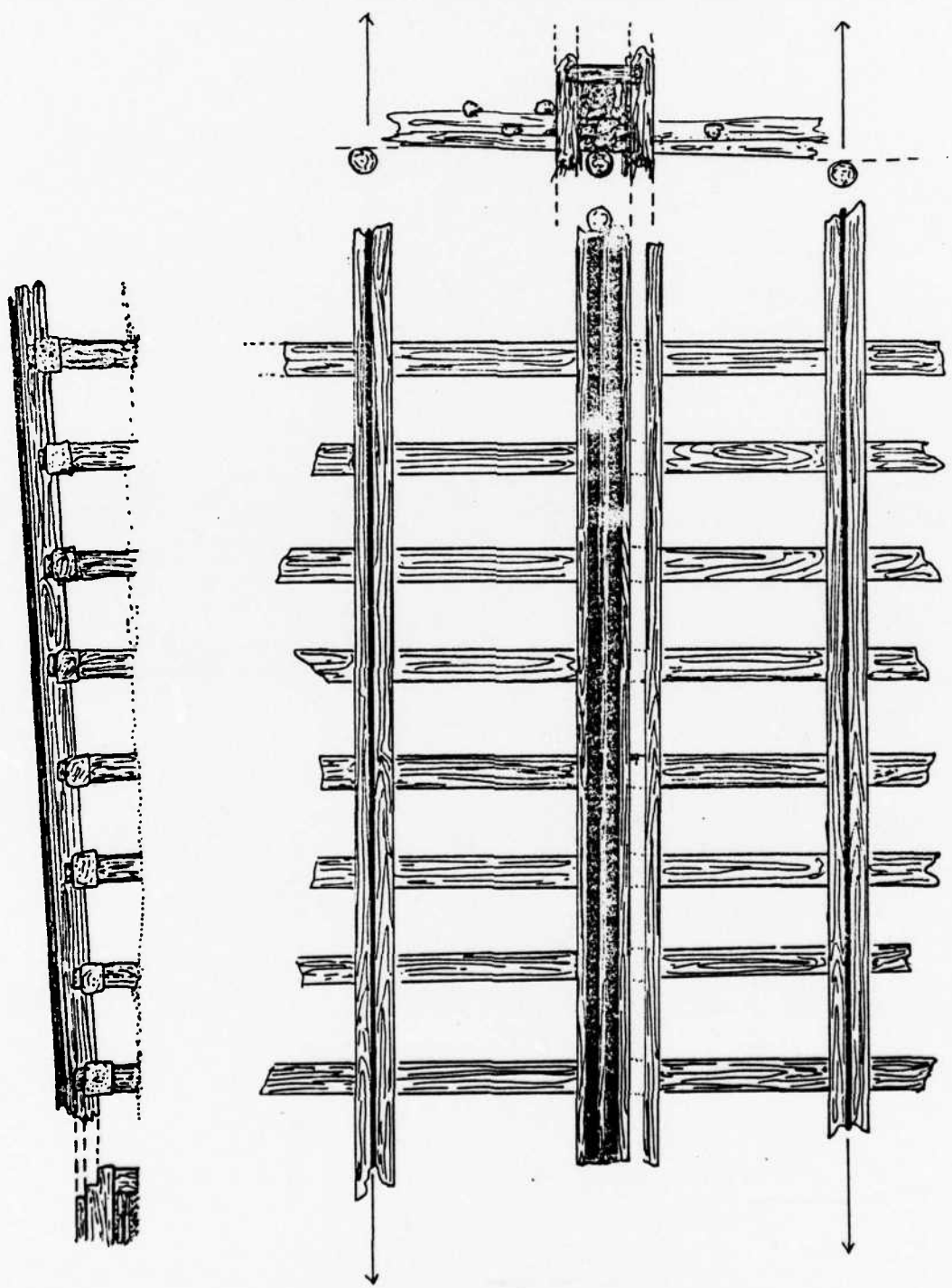
PLATE 7

Marine Railway - Detail

A Stringer

B Rail

(Scale in one foot increments)



0 feet 10

Figure 7 : Possible reconstruction of the railway.

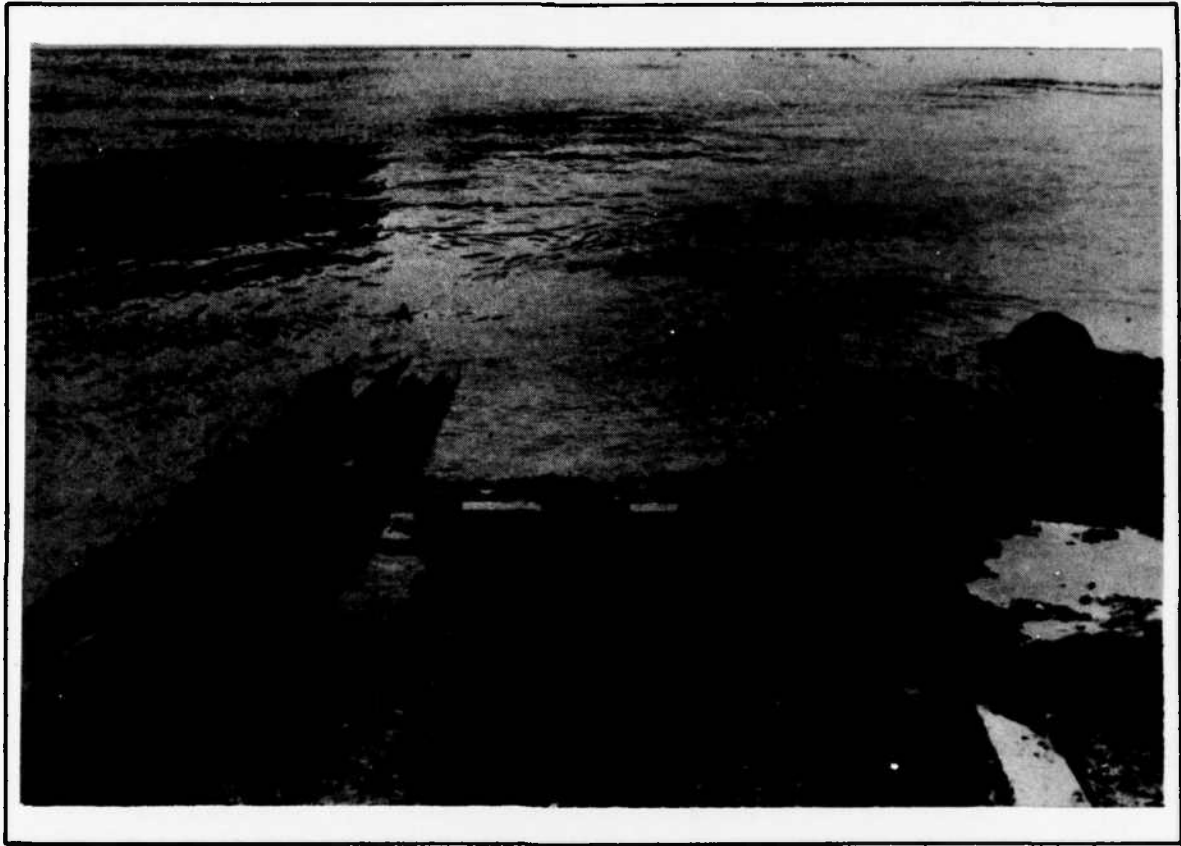


PLATE 8

Marine Railway
Lower Extremity at low tide

A Rail and Stringer

B Planks and Metal Plate

(Scale in one foot increments)

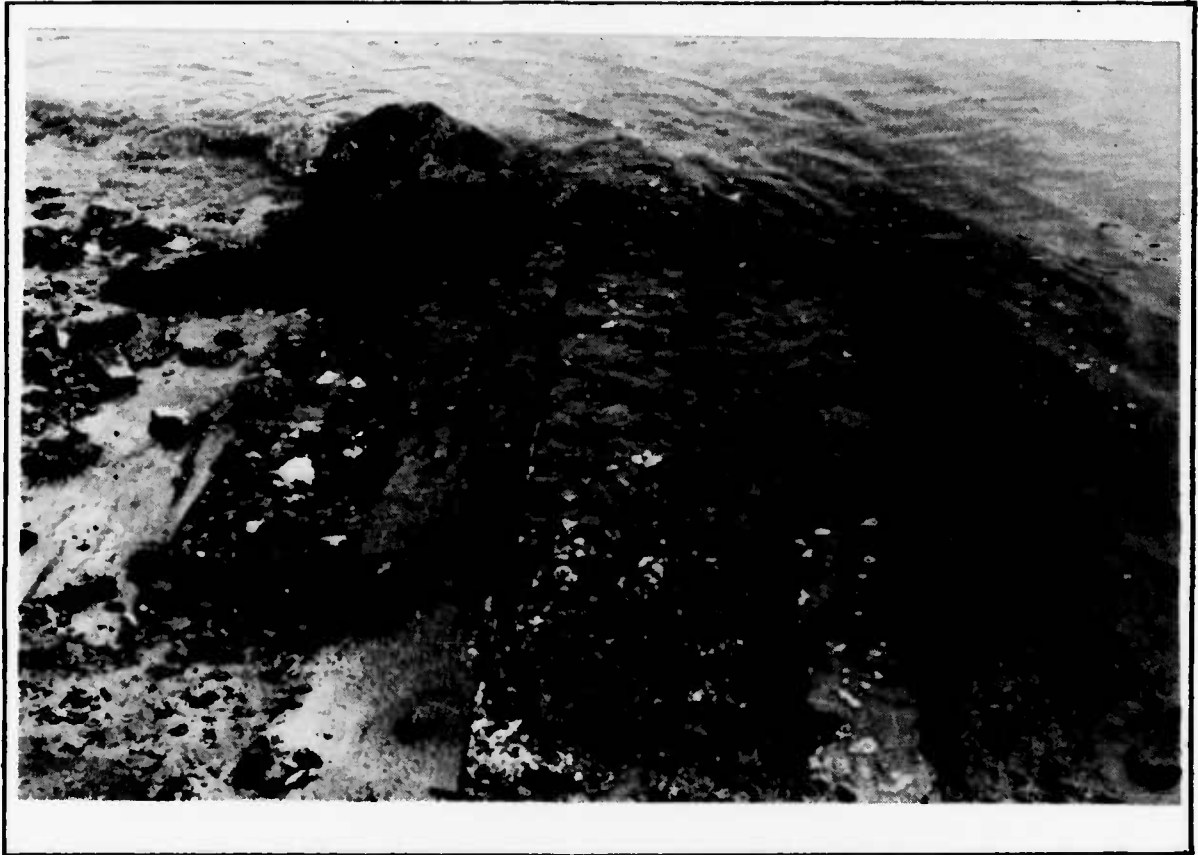


PLATE 9

Detail of Wooden Planks and Iron Plates

Munz metal nails and sheathing, copper nails and sheathing, as well as bolts, iron nails and treenails (Plate 10). Munz metal is an alloy of copper widely used after the Civil War for naval purposes (Alan Albright, personal communication dated May 1983). Both Munz metal and copper resisted marine corrosion while protecting the hull from marine borers and a rapid buildup of fouling.

Additional information about the railway was obtained through monitoring the railway's removal outside the permitting area. Clam bucket excavation of the upper layers of fill revealed pilings which supported the marine railway. Although the complete railway was not observed because the rails and stringers were gone, supporting piles offered information about the railway's construction and how it operated. Three rows of pilings were uncovered. Interviews with the crane operator indicated that the rails were laid on two rows of outer piles. The planks bearing iron plates were apparently located on the central row of piles. Although not closely inspected, these planks appeared to those noted where the railway was visible nearer the Savannah River.

From this information, reconstruction of the railway was possible (see Figures 5-7). The piles supporting the railway were sixteen feet apart indicating that the railway was at least this wide. Spacing between the piles was 4.5 feet in the outer lines and 2.5 feet in the center section. This is indicative of different support demands because the main load would be born by the metal plates on which the carriage supporting the vessel's keel rode.

Associated with the railway as it entered the water were some square timbers arranged at an angle on the downstream side of the rails (Plates 5, 6). These were not inspected but they appear to be the remnants of a "fence", or buffer, shown in a painting (Koch 1891) of the site (Plate 15). h



PLATE 10

Detail of Surface Collection Unit

Plank Flooring

The apparent plank floor extends along the ledge of the shoreline westwards (upstream) from the railway to a point where the ledge has eroded away (Figure 8, Plates 11, 12). The planks vary in size and extend out different lengths. Each plank termination shows erosion. The planks are overlain by ballaststone and spoil fill. Erosion of fill in this area has been extensive, and probably rapid, chiefly by undercutting the bank of deposited fill. Nails, both iron and copper, and other ship-related artifacts are abundant along the shoreline at this point.

Test Pits 1 and 3 (Figure 8) were sited to investigate the planking extending along the ledge. The surfaces of these units, especially Test Pit 1, yielded an abundant scatter of iron and copper sheathing nails. Pit 1 also contained ballaststone, copper nails, iron concretions, glass, ceramics, brick, bone, shell and a porcelain button fragment from the mixed spoil overburden.

Test Pit 3 contained a similar assemblage. The artifacts were found in a level which extended to a depth of 0.4 foot below surface. Below this depth, additional artifacts were not recovered until a depth of 1.25 feet was reached. The lower assemblage contained ballaststone resting directly on the planking as well as a mixture of artifacts above the stone. Probing of the floor indicated that the planking continued throughout the unit.

The test pits placed over the planking were largely unproductive. More than four feet of post-use fill had been dumped over the planks resulting in a very mixed assemblage. The overburden served to protect the planks although it also served as a reservoir for tidal water which then seeped into the pits. Planking continued under the fill but the exact extent is unknown due to depth of the overburden. Aside from the ballaststone, no artifacts were found

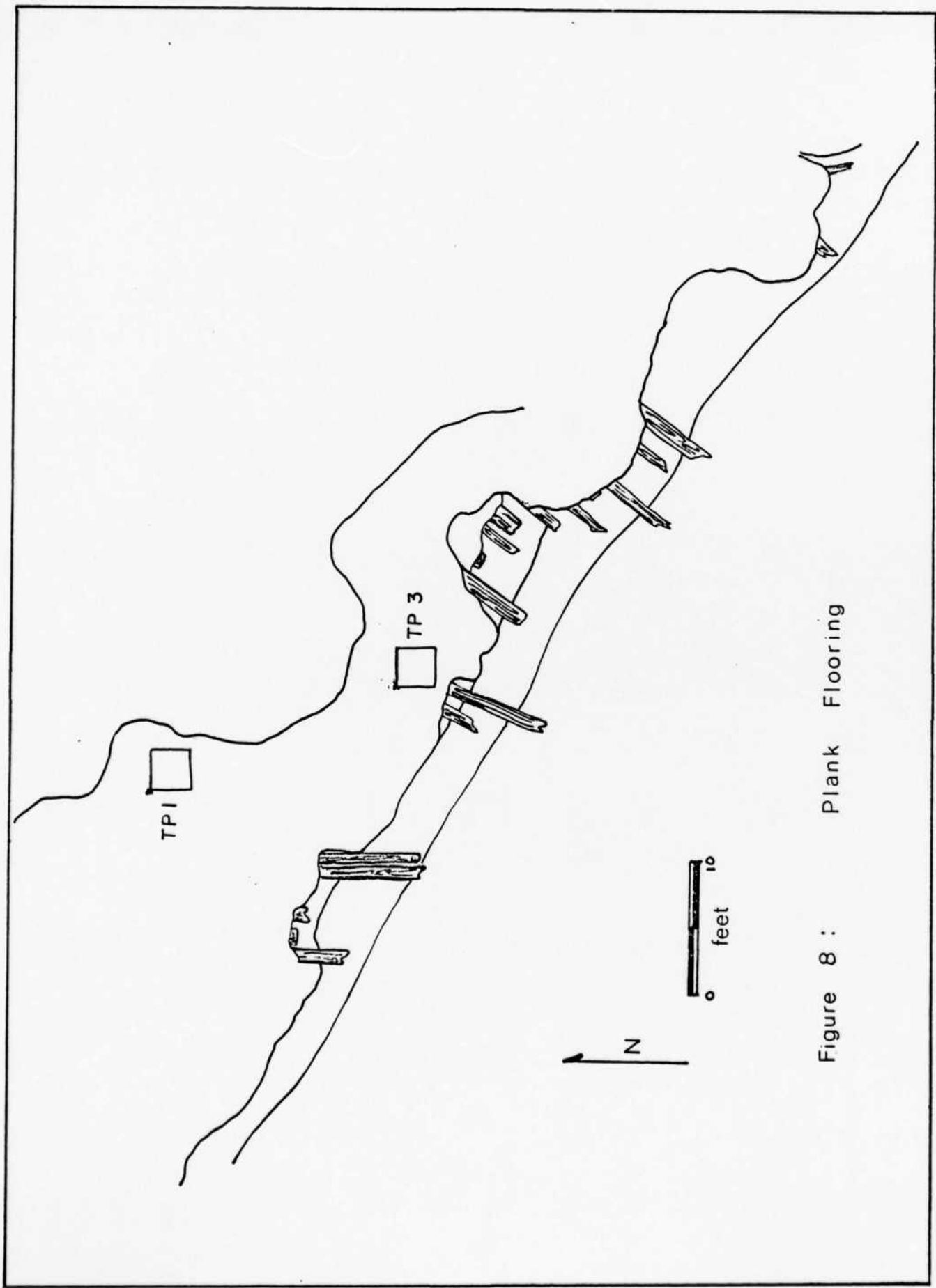


Figure 8 : Plank Flooring

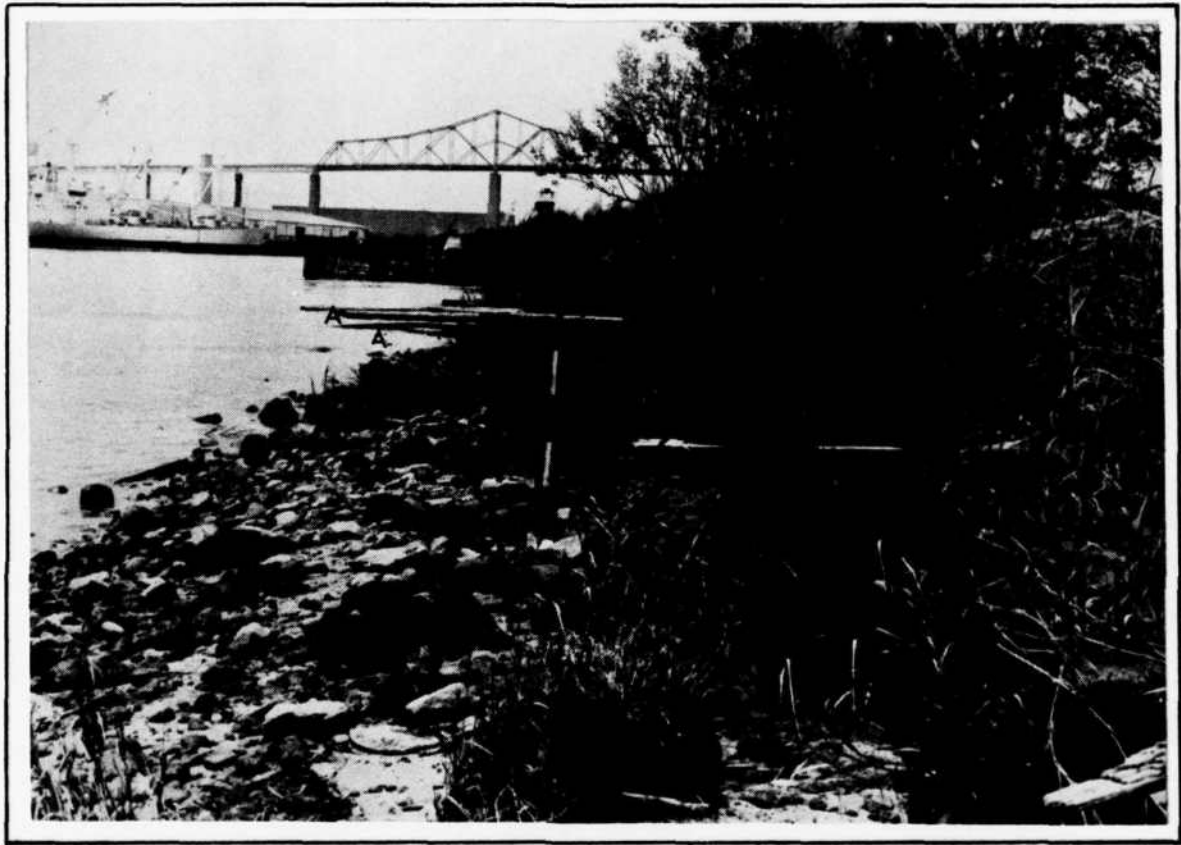


PLATE 11

Plank Flooring seen from railway

Talmadge Bridge in background

A Planks

(Scale in one foot increments)



PLATE 12

Detail of Plank Flooring

(Scale in one foot increments)

directly associated with the planking. The ballaststone seems to be a post-use deposition since they were deposited irregularly and not laid in either sand or mortar.

These test pits were abandoned due to ground water seepage after reaching the planking but probing indicated flooring below the ballaststone extended north towards the interior of the island. No bricks were noted on the planking in this area.

Brick Scatter

The brick feature is at the western edge of the site (Figure 9, Plate 13) where riverine erosion had created a small "beach" north and west of the railway. Although bricks are scattered throughout the area, portions of the scatter show an alignment suggestive of some sort of order. The feature was mapped and photographed. Two test pits were placed adjacent to the alignment of bricks to determine if subsurface integrity were present.

Test Pits 4 and 6 were placed to investigate the brick scatter. These units revealed a brick layer over planking (Figure 10, Plate 14). Artifacts recovered from these units included brick fragments, wood, charcoal, ceramics, glass and clay pipe fragments. Iron concretions and nails were also recovered.

Bricks were the most abundant artifact in these units. They measured 9 x 4 x 2 inches and were scattered over a large portion of the eroded "beach". With the exception of those uncovered in the test pits, none of the bricks were in situ. The bricks noted as part of the brick feature were dry laid on wooden planking similar to that discussed earlier sticking out from the bank.

The two test pits revealed the remains of a brick paving overlying a wooden planking. This feature corresponds to a view of Savannah made in 1891 (Plate 15) in which a dock is shown running west along the river's edge. An

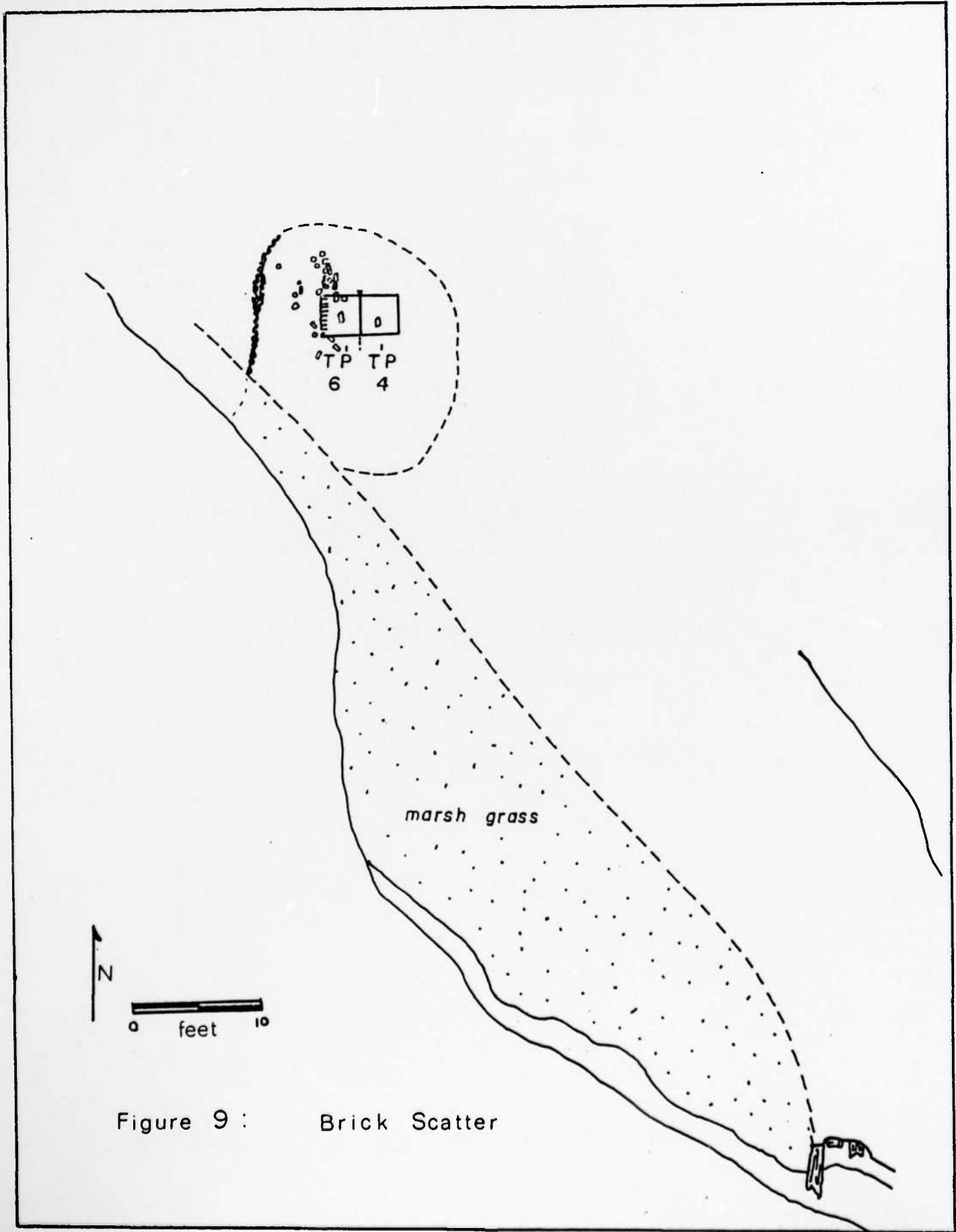


Figure 9 : Brick Scatter



PLATE 13

Brick Scatter before excavation of Test Pits

(Scale in one foot increments)

Figure 10: Detail of brick feature

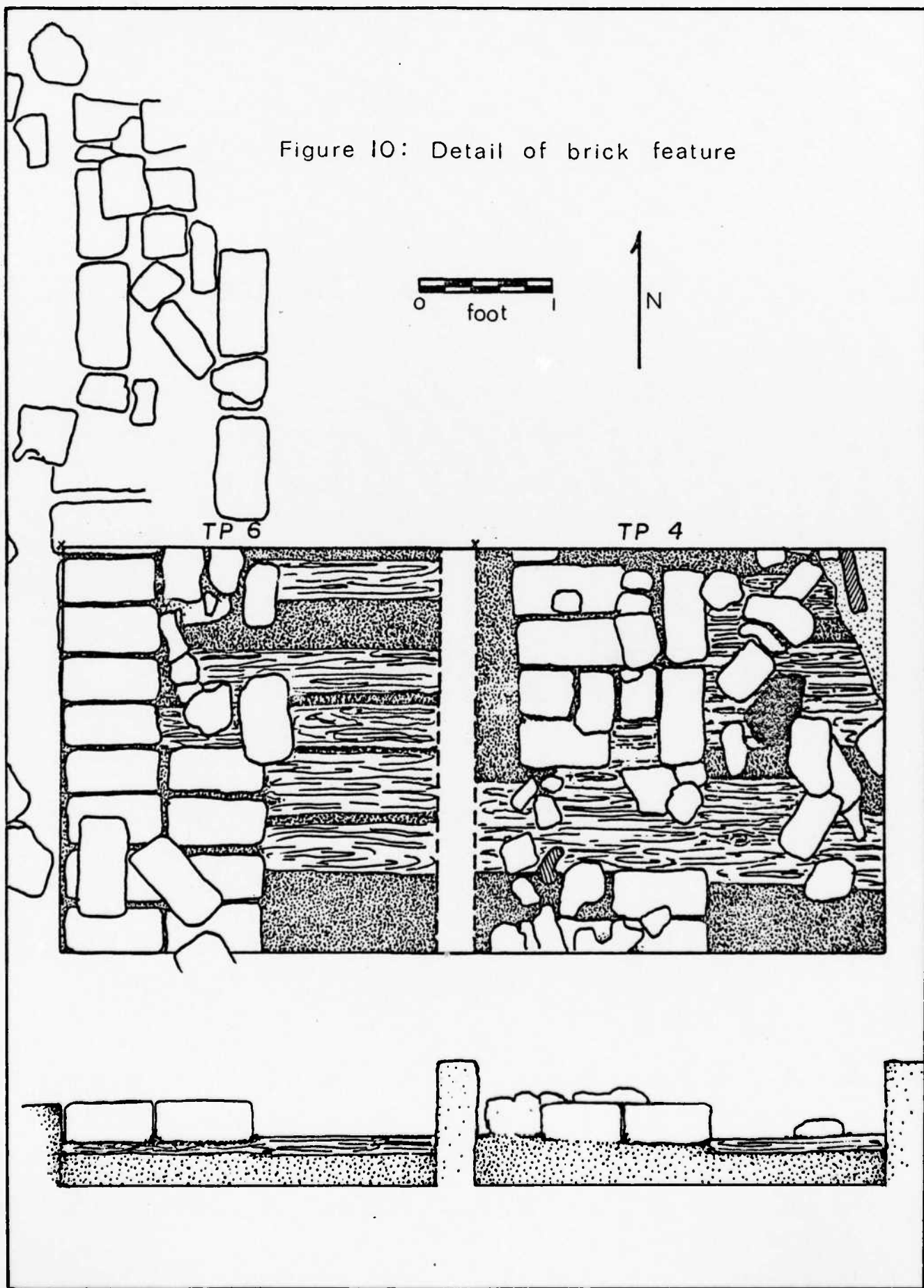




PLATE 14

Brick Scatter after excavation of Test Pits

(Scale in one foot increments)

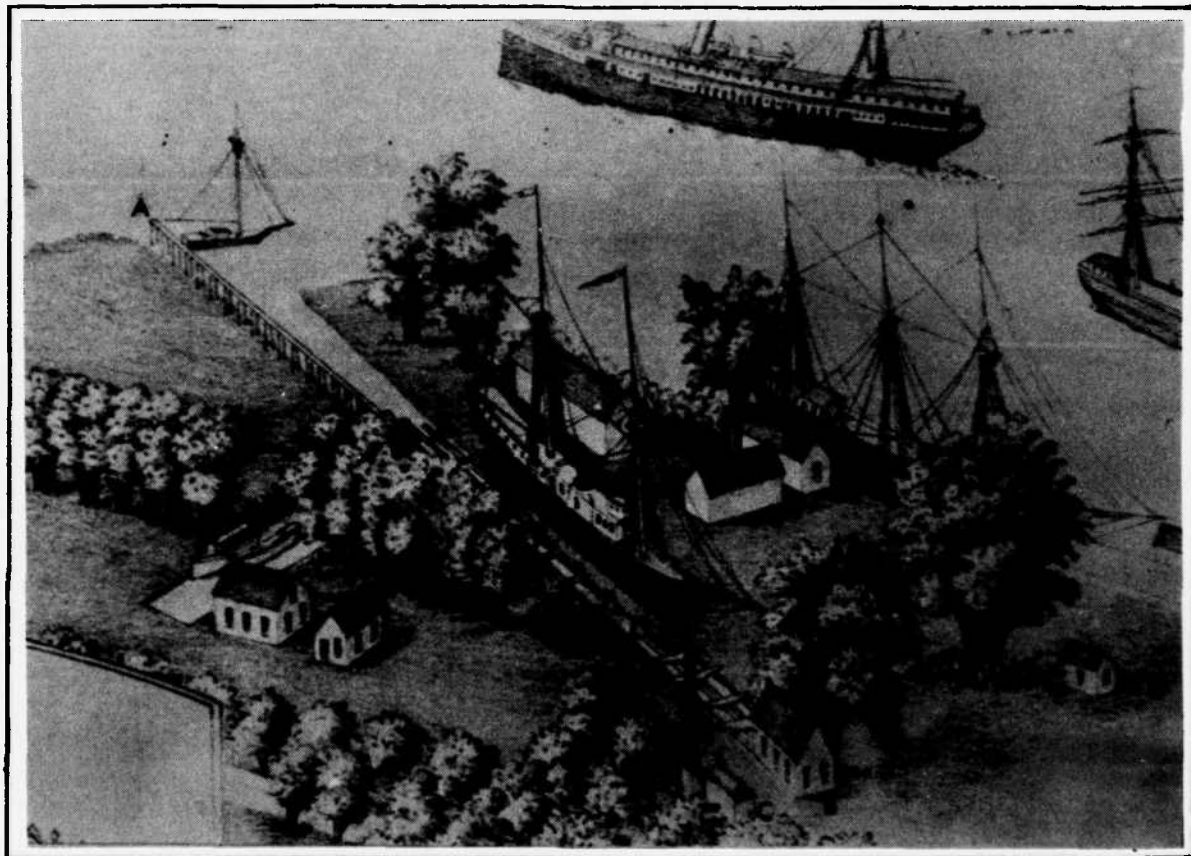


PLATE 15

1891 View of Marine Railway
(Koch 1891)

- A "Fence"
- B Engine House
- C Power Plant
- D Railway
- E Dock Area

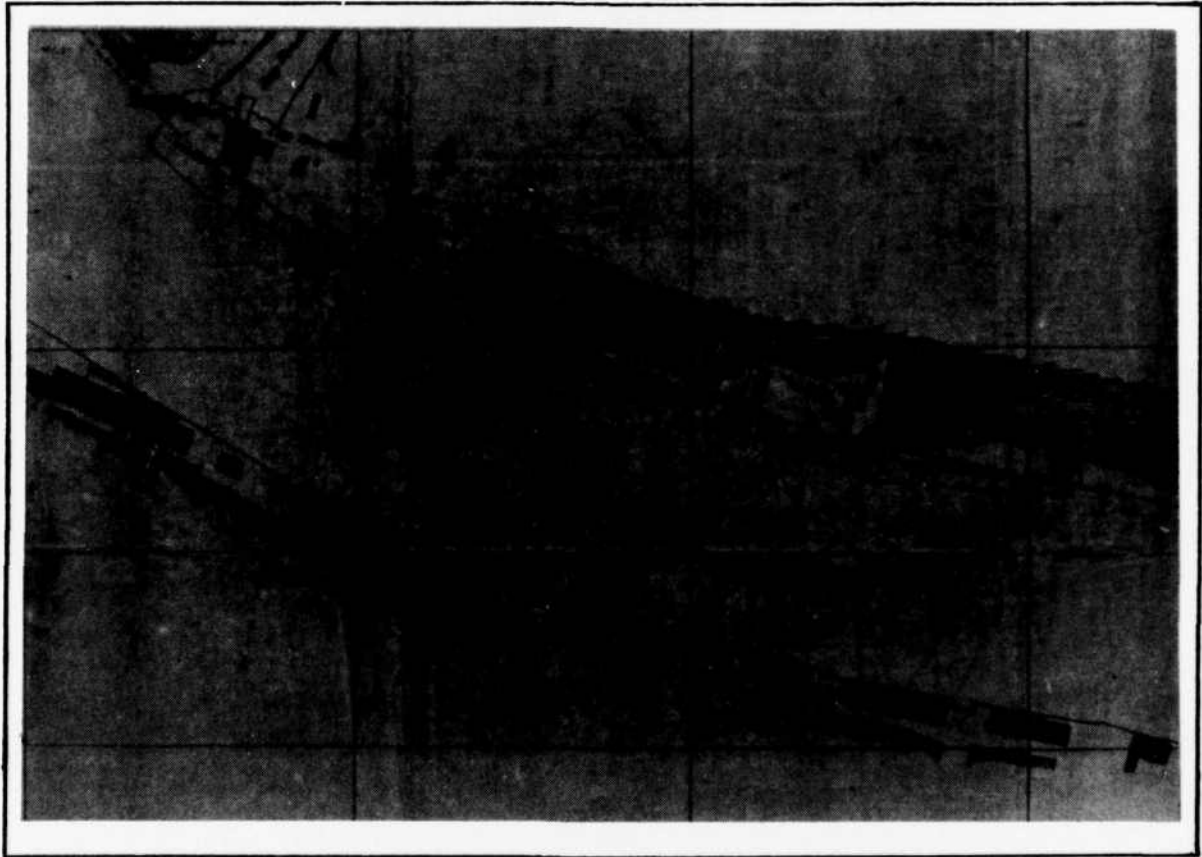


PLATE 16

Structures at Marine Railway Site in 1879
(Fremont 1879)

- A Power Plant
- B Railway
- C Dock Area
- D City Saw Mill Complex
- E Line of Authorized Dredging

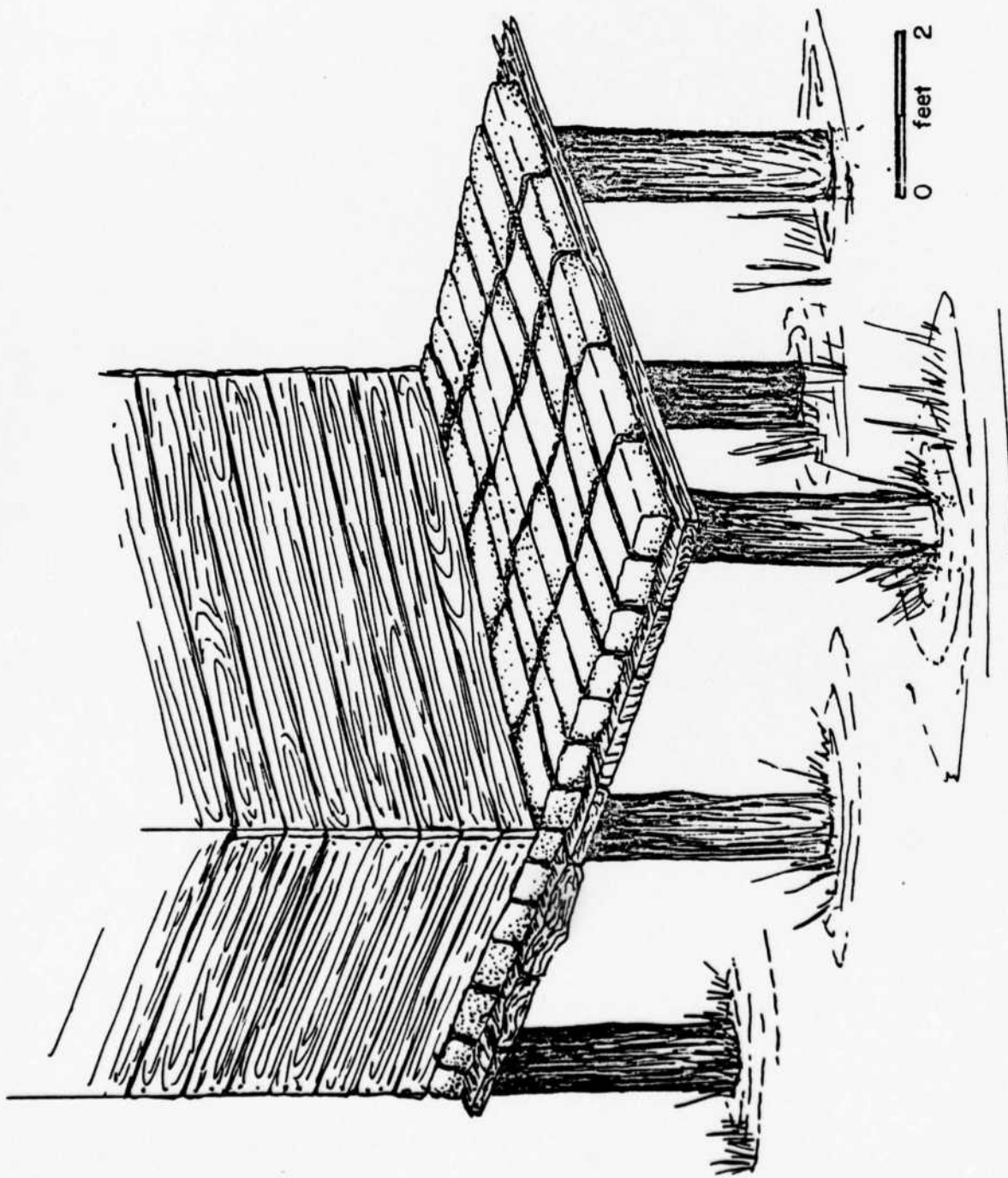


Figure II: Possible reconstruction of brick feature .

1897 map (Plate 16) shows what may be a wharf in the same area as the brick feature and planking. It is also possible that this feature is related to buildings shown in 1879 although the dry laid bricks seem to preclude this interpretation. It is, however, possible that the bricks represent flooring within a structure. If this is the case, then the most likely interpretation for the bricks would be that of a blacksmith shop since it would be necessary to prevent fire. This has some additional weight since Charles P. Landershine was hired as a blacksmith by Willink (Savannah Morning News 23 August 1850:2, col 2).

Another possible interpretation is that the bricks were simply paving laid down to protect the planking from heavy traffic (Figure 11). This interpretation has the added value of being supported by a small dock immediately upstream from the site. Here a paving of bricks was laid directly over the wooden planking. Subsequent erosion in this area has produced a brick scatter similar to that noted in the vicinity of the brick feature.

INTERPRETATIONS

The marine railway site is eligible for National Register inclusion on the grounds of historical association. The site is significant locally and regionally, both because of its association with H. F. Willink Jr. and because of its role, as documented by local newspapers, in the shipping activities of Savannah. Changes in use of the site are keyed to local and regional changes relating to health, industry and agriculture of the coastal region.

The change from wet rice production to use as wharf lots reflects a growing concern with health as paddy agriculture gave way to dry rice cultivation. It also reflects industrial and commercial growth as the city shipping interests continually expanded to available land along the river

(Granger 1968:53).

The sale of the property in 1898 reflects another shift in Savannah's focus. This was a shift to railroad connections between the Atlantic and the interior of the deep south. It also reflects a shift in the harbor from relatively small, locally owned companies to large, nationally oriented corporate structures with much greater capital outlay and the desire to monopolize specific aspects of the shipping industry.

This can be seen by referring to Tables 1-5 and tracing ownership of the wharf lots. Prior to Willink's acquisition of the lots in the 1870's, they had been in private, usually individual, hands. Willink consolidated the holding, utilized it for a generation and then sold the property to a much larger operation. This shift from smaller to larger is reflected in other aspects of turn-of-the-century American industry ranging from iron/steel smelting (Schallenberg 1975:350) to agriculture. As such, the site reflects a portion of American industrial modernization.

The involvement of Willink in the marine railway, his prior involvement in the development of Savannah's shipping and Confederate naval construction, gives the site additional importance. A Savannahian thus moved from local shipping to a wider, regional orientation through his importance to Confederate defensive efforts. While the railway development came after the more popular Civil War period, this should not detract from the important role Willink played in Savannah's commercial rebirth following the war.

Coupled with Willink and local history, the site is important to regional shipping history. Savannahians recognized the railway's importance to the city at the time because it could handle both local and foreign vessels, thereby allowing them to utilize the port. Since the marine railway was the only one of its kind in the port, and the only one of its size south of

Philadelphia (Savannah Newspaper Digest 1874:512), its importance to the revitalization of Savannah following the Civil War can not be underestimated.

A marine railway is a device for raising vessels from the water so that they may be inspected on dry land. In general, a railway of this sort consists of tracks laid of sleepers, a carriage and a system for providing power to move the carriage up onto higher land. In use, the carriage is let down into the water on the rails, the vessel is warped over it at high tide and, as the tide goes out the vessel is lowered onto the carriage. Motive power then brings the vessel up the inclined railway to a point above the water where inspections and necessary repairs can be made.

The marine railway site is the earliest known site of this sort on the Savannah River although the possibility of earlier ones can not be discounted since there were major shipbuilding operations on the opposite bank of the river (Daily Morning News 1 September 1859:1, col. 1). A modern, small scale marine railway exists just to the north of the Powell Duffryn slip which is used to refurbish tour boats.

The marine railway site (Figure 12) was able to take fairly sizeable vessels up for repairs. The type of carriage used is unknown as details of the 1891 (Plate 15) painting are not clear in this regard. The presence of a chimney over a small building at the landward end of the rails in the 1891 painting suggests that power was provided by steam engines. This seems confirmed by the property transfer in 1898 when boilers and engines are mentioned specifically (Chatham County 74-466). The exact location of the railway power plant was outside the permit area. During dredging activity for the Powell Duffryn docking and spoil area, a section of pilings was noted east of the line of the railway pilings. These may have been the support pilings for the steam engine plant because they are located in approximately the same

- A- The railway
- B- The planking
- C- The bricks
- D- The piling in P.D.'s excavation.
- E- The "fence"

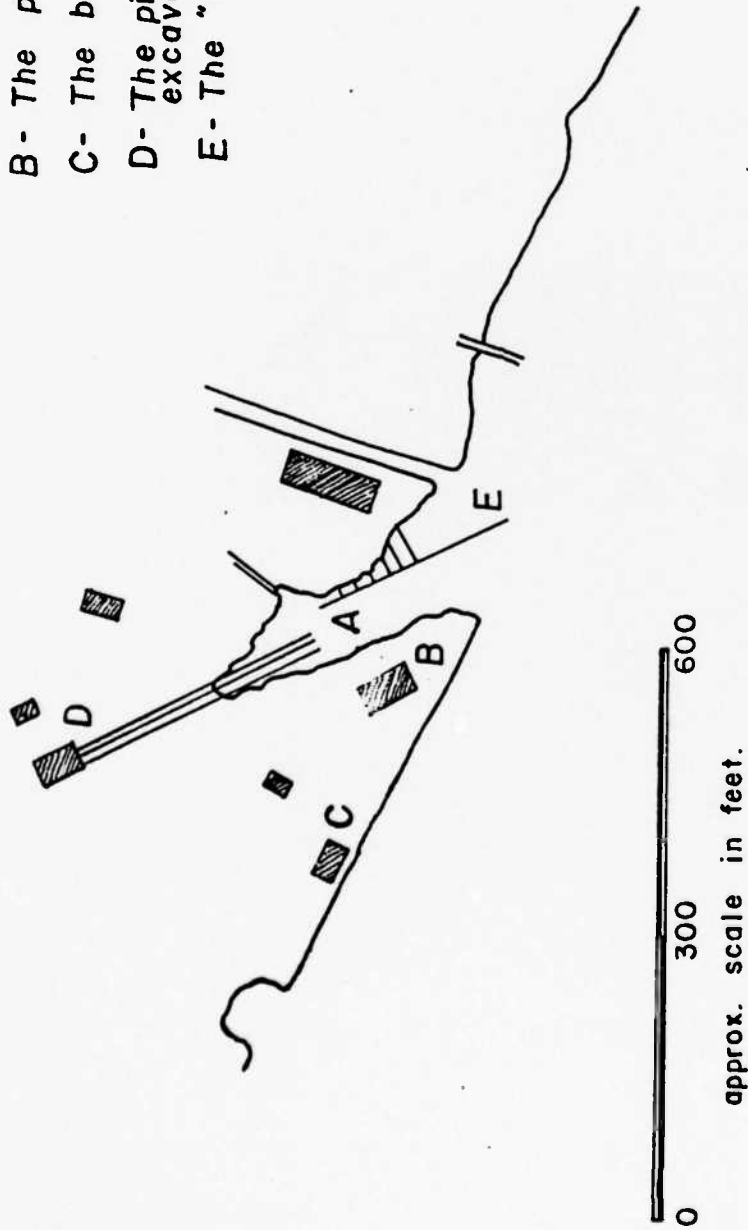


Figure 12: Composite map showing known structures at Willink's shipyard as they relate to archaeological features .

(after Fremont 1879, Anonymous 1897)

position as the house with a chimney shown on the 1891 painting.

The only intact remains of the marine railway operation which were noted during the field work were the sleepers, stringers and rails of the railway itself. Carriage, power plant and out-buildings shown in the 1871 (Ruger 1871) and 1891 (Koch 1891) paintings were missing. The piles upon which these structures were built probably still existed but these would shed little light on the operation. The pilings would, however, give some indication of the spatial area which is not conveyed in the paintings of the site in the late nineteenth century.

The Howard Map (1900)(Figure 1) suggests that the railway did not extend into the river at the time of use. A line leading into a "U" shaped "cove" on the river bank indicates that the railway was dug below water level within the riverine border of Hutchinson's Island. A dotted line paralleling the river, but inland from the bank, suggests a line of cutting back done after the site was acquired by the Georgia and Alabama Terminal Company in 1898 (Savannah Morning News 7 September 1899:24). If so, widening of the river by cutting back the edge of Hutchinson's Island would account for the disappearance of dock pilings along the outer edge of the plank flooring because the original river frontage of the dock was removed. It might well account for the burial of the Willink era docks and ground surface as the spoil had to be deposited somewhere close by.

The plank flooring and the brick scatter are probably related to each other since the bricks overlay a flooring of heavy planks. There are two probable explanations for the bricks. The first is that they represent the paving of a dock area to reduce wear on the planks (Figure 11). A similar situation was noted upstream from the site close to the Powell Duffryn slip. This decayed dock consisted of the remains of small pilings covered with

planking overlain by a layer of bricks. The flat "beach" exposed at low tide at the other dock site was covered with a "flooring" of bricks which had apparently dropped from the, now-gone, planking as the outer extremities of the dock decayed and/or washed away.

High water and soggy ground may have necessitated "flooring" the entire work area. Limited space with structures would have required piling. Heavy use of marshy ground would have churned it up. A solution would have been to fill behind the immediate dock area and then cover it with planking. Planking of the filled area, without pilings, has a good fit with the observed situation along the present river edge. This type of solution was also used in the Central of Georgia railyards on West Broad Street in the 1840-1850 period (Babits and Barnes 1985:56)

A second interpretation is that the brick paving is a special use area at the site. If it is a special use area, then it may have been utilized as a smithy since bricks would serve to cut down the possibility of damage through burning or the incidental handling of large metallic objects. A smithy would be useful at the site since forging of metallic elements would be an ongoing process. However, no evidence of any forge or cinders was noted, nor were any indications seen which suggested a superstructure such as a building over the area. This may be due to the small area investigated, loss of these elements, or the fact that they were never there.

The planking closer to the edge of the river was not covered with bricks suggesting that the brick scatter area served a different purpose. The most likely use of the non-bricked area would be that it was a planked area for the ship repair facility built by Willink. The paintings done in 1871 and 1891 (Plate 15), together with maps of the harbor all show docks in the area where the planks were found. Given the lack of additional information recovered from

the field, flooring for a dock has the best fit with documentary and archaeological evidence.

This is reinforced by references to widening the river at this point after Willink sold the property. Any widening would necessarily have to go through the old dock area, removing the pilings. Without the support of the pilings, none of which were observed during the fieldwork, the dock, or a flooring, would simply collapse as the fill under it eroded away.

If, as seems likely, the widening did cut back the bank of Hutchinson's Island, then the extent of of such work could be determined by evaluating the 1900 Howard map in conjunction with the archaeological work. Such evaluation was attempted in 1984 and over 50 feet were estimated to have been removed from the edge of the pre-1898 dock area. This information should be of utility to future harbor studies for the immediate area. Seemingly, the docks along the island edge created a stable environment suitable for building up the interior land elevation. Once done, the higher ground could be cut back as seems to have been done around 1900 and again in 1984.

CONCLUSIONS

Within the temporal constraints of the fieldwork and the financial parameters of the bend widener archaeological project contract, the marine railway site was inspected, tested and information relating to its operation recorded. Documentary evidence proved far more useful than the results of the field work.

Although the site represented a major effort by Savannah's citizenry to provide ship repair facilities during the late nineteenth century, its current state of disrepair, coupled with necessary harbor widening, led to allowing its removal.

While the site was first identified by its physical remains, most of the

information relating to its history was acquired through documentary research. The lack of site integrity beyond extant pilings and the damaged remains of the railway itself, argued for it not having the potential to provide additional, meaningful information about the site in terms of the cost involved.

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 1852 Map of comparisons of the channels of Savannah River. Copy on file, Savannah District, U. S. Army Corps of Engineers, Savannah.
- The Times
 1879 Alderman Henry Frederick Willink. The Times 31 May 1879, Vol 1, Number 33, column 1.
- Willink, Daisy
 n.d. Statement. Manuscript Collection Number 872, Collections of the Georgia Historical Society, Savannah.
- Wilson, Edmund G.
 1858 A digest of all the ordinances of the City of Savannah. John M. Cooper, Savannah.
- Wood, Judy
 1983 A cultural resources investigation of the proposed Savannah harbor widening area, Chatham County, Georgia. Draft report on file, Archaeology Laboratory, Armstrong State College, Savannah.

APPENDIX A

CURRICULUM VITA

PII Redacted

NAME Lawrence E. Babits

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

EDUCATION

Surrattsville High School, Clinton, MD, 1961

B.A., University of Maryland, College Park, 1969
Anthropology with History Minor

M.A., University of Maryland, College Park, 1974
Anthropology with Ethnohistory Concentration. Thesis
Title: The Evolution and Adoption of Firearm Igni-
tion Systems in Eastern North America: An Ethno-
historical Approach.

Ph.D., Brown University, Providence, RI, 1981
Anthropology with a concentration in Historic Sites
Archaeology. Dissertation Title: Military Documents
and Archaeological Sites: Methodological Contribu-
tions to Historical Archaeology.

EMPLOYMENT

U. S. Army 1963-1966 - Honorable Discharge, Sergeant E-5

Department of Anthropology, University of Maryland, Coll-
ege Park, Graduate Teaching Assistant, 1969-1973.
Courses Assisted: Introductory Physical and Cultural
Anthropology, Introductory Archaeology, Ethnography
of the American Southwest, Human Osteology.

Archaeology Section, North Carolina Department of Cul-
tural Resources, Raleigh. Archaeologist 1973-1976.

Department of Anthropology, Brown University, Providence,
RI, Graduate Teaching Assistant, 1978-1979.
Courses Assisted: Introductory Physical and Cultural
Anthropology
Teaching Fellow: 1979-1980-Archaeological Field
Methods

Department of Sociology and Anthropology, Washington and
Lee University, Lexington, VA, 1980-1981.
Courses Taught: Survey Archaeology, Physical Anthro-
pology, Anthropological Theory, Introductory Anthro-
pology, North American Prehistory, Archaeological
Field Methods.

Department of History, Armstrong State College, Savannah, GA, Assistant Professor.

Courses Taught: Early American Civilization, Archaeological Analysis, American Material Culture, Military History, Historical Archaeology, Archaeological Field Methods, European Civilization I.

**PROFESSIONAL
EXPERIENCE**

- 1968-1969 Volunteer Worker, Chickadee Site (18WA13)
Multi-Component Site: Archaic to Historic
- 1969 Volunteer Worker, Monacacy Site (18FR100) Multi-Component Site: Archaic to Woodland
- 1971 Principal Investigator, controlled surface collection (18HO14) Multi-component Site: Archaic to Woodland
- 1972 Worker, Claggett Ossuary, Prince George's County, Maryland (Proto-Historic)
- 1973-1976 Archaeologist, Archaeology Section, North Carolina Department of Cultural Resources, Raleigh
- 1973: Preliminary Investigation of underwater wreck (31PT1), (NC Revolutionary War Bicentennial Commission Grant #12-2 PM 73).
- 1974: Supervisor, A-95 Review Process for Archaeology, January Internship Program (research projects on early shipbuilding, rowing galleys, chains of title, fortifications), Principal Investigator: Exploratory archaeology at Bentonville Battleground State Historic Site, Newton Grove, NC (plantation kitchen and slave quarters), Principal Investigator: Excavation of Town Lot 52, Halifax State Historic Site, Halifax, NC (with a field school from Meredith College, Raleigh, NC) (18th and 19th century domestic structure), Principal Investigator: Excavation of engine mill house, Reed Gold Mine State Historic Site, Cabarrus County, NC (with a field school from Queen's College, Charlotte, NC) (18-20th century gold mine).
- 1975: Principal Investigator: Excavation at Fort Dobbs State Historic Site, Statesville, NC (French and Indian War fortification), Supervisor, A-95 Review Process for Archaeology.
- 1976: Resigned position as Archaeologist in May to study vernacular housing in Brittany, Normandy, East Anglia and Southern Britain. Six months visiting archaeological sites in western Europe.
- 1977 Summer Research Supervisor, Public Archaeology Laboratory, Brown University, Providence, RI (Middle Archaic to Historic sites)
- 1978 Principal Investigator, Preliminary archaeological testing at Fort Butts, Portsmouth, RI (NPS matching grant #44-8178)
- 1979 Summer Research Supervisor, Public Archaeology Laboratory, Brown University, Providence, RI (Middle Archaic to 20th Century Historic) Principal Investigator, Preliminary archaeological testing at Fort Barton, Tiverton, RI (NPS matching grant)

- 1980 Principal Investigator, Excavations on Ravelin, Magazine Privy and Enlisted Privy, Fort McHenry National Historic Shrine, Baltimore, MD.
Director, Archaeological field survey, Rockbridge County, VA.
- 1981 Principal Investigator, Excavation of Knick Site (44RB121)
- 1982 Principal Investigator, Law Site, Savannah, GA (Black urban site), Berth 52 Vessel (ship), Red Building, Designer, Georgia's Coastal Forts, a brochure (Georgia Semiquincentenary Grant #84)
- 1983 Principal Investigator, Survey of the Savannah River, Remote sensing of Old Ebenezer (Georgia Semiquincentenary Grant # 60), Preliminary and Phase II Investigations of Long Point, Whitmarsh Island, Ga., (Aboriginal and Antebellum Plantation),

Preliminary cultural resources survey, Causton's Bluff, Savannah, GA (Archaic through 19th century)
- 1984 Principal Investigator, Archaeological Investigations-Central of Georgia RR Train Shed, Savannah, GA, Archaeological investigations of Julianton Plantation, McIntosh Copunty, GA (Georgia Endowment for the Humanities Grant #81-137), Marine Railway, Hutchinson's Island, Savannah, GA

FORUMS/WORKSHOPS

- 1983 Military History Workshop, ROTC-TRADOC, US Military Academy, West Point, New York
- 1985 Shell-Faculty Forum, Houston, TX

PUBLICATIONS

- 1974 A North Carolina Revolutionary War button. Military Collector and Historian XXVI:52.
Excavation of Halifax Town Lot 52 Tarheel Junior Historian Fall 1974:4-5.
Continental army buttons from North Carolina. Tarheel Junior Historian Fall 1974:5-6.
The guns of Fort Branch. Military Collector and Historian XXVI(2):115.
- 1975 The continental soldier. Tarheel Junior Historian Fall 1975:6-10.
A Napolean breech face table of fire. Military Collector and Historian XXVII(3):126-7.
Dating a Confederate frock coat. Military Collector and Historian XXVII(4):160-162
- 1976 Exploratory Archaeology at Bentonville Battleground State Historic Site. North Carolina Department of Cultural Resources, Raleigh.
The evolution and adoption of firearm ignition systems in eastern North America: An ethnohistorical approach. The Chesopeian 14(3,4):40-82).
Special units of the continental line. Tarheel Junior Historian Winter 1976:31-33.
The militia. Tarheel Junior Historian Winter 1976:33-36.
- 1978 Some ideas on early firearms. Artifacts VII(3):3-4).

- 1981 The Chicod Creek wreck, Pitt County, North Carolina. Underwater Archaeology: The Challenge before us., Proceedings of the 12th Annual Conference on Underwater Archaeology. pp 3-9, Fathom Eight, San Marino.
- 1982 A note on the roster of the South Carolina Continental Corps of Artillery. South Carolina Magazine of Ancestral Research X(1):3-5.
 French and Indian War button backmarks: A clue to movements after June 1758. Military Collector and Historian XXXIV(1):35-6.
 Shoe life in the 71st Regiment of Foot. Military Collector and Historian XXXIV:84-6.
 A reevaluation of Revolutionary War "MB" buttons. Military Collector and Historian XXXIV:81-84.
- 1984 Greene's strategy in the southern campaign, 1780-1781. Air Force Journal of Logistics VIII(1):10-13.
 Historical archaeology and the analysis of a region. IN Historical Archaeology west of the Blue Ridge edited by John McDaniel and Kurt C. Russ, James G. Leyburn Papers in Anthropology 1:78-90.
 "Log Cabins" and other structures in the lower Shenandoah Valley. IN Historical Archaeology west of the Blue Ridge, edited by John McDaniel and Kurt C. Russ, James G. Leyburn Papers in Anthropology 1:67-77 (with William Cole)
- 1979 Thinking Rugby, by John Dawes IN Rugby 5(4):33
- 1981 Weapons: An international encyclopedia from 5000 BC to 2000 AD, by Diagram Group IN Choice May 1981
Fields of praise: The official history of the Welsh Rugby Union, by David Smith and Gareth Williams IN Choice May 1981
Fighting knives: An illustrated guide, by Frederick J. Stephens IN Choice May 1981
Forward Skills, by Gareth Edwards IN Rugby 7(4):27
- 1982 Artifacts and the American past, by Thomas J. Schlereth IN Georgia Historical Quarterly LXVI:98-99.
Charleston blacksmith: The work of Philip Simmons, by John M. Vlach IN Georgia Historical Quarterly LXVI(2):258-9.
Relic hunter: The field account of Civil War sites, by Howard R. Crouch IN Military Collector and - Historian XXXIV(1):46-7.
The Salisbury prison - A case study of Confederate military prisons, by Louis A. Brown. IN Military Collector and Historian XXXIV(1):47.
Investigating the remains of the USS Monitor, By Gordon P. Watts, Jr. IN Military Collector and Historian XXXIV(3):142.
- 1984 Forts and supplies: The role of the army in the economy of the southwest, by Robert W. Frazer IN Choice May 1984
The Virginia militia in the seventeenth century, by William L. Shea IN Choice February 1984
Arms and independence: The military character of the American Revolution, Edited by Ronald Hoffman and

BOOK REVIEWS

REPORTS

- 1974 A preliminary investigation of 31PT1, Pitt County, North Carolina, Manuscript on file, Archaeology Section, North Carolina Department of Cultural Resources, Raleigh
An archaeological and historic structures survey of the X-81 Site, Davie County, North Carolina. Manuscript on file, Archaeology Section, North Carolina Department of Cultural Resources, Raleigh (with Stephen J. Gluckman)
- 1976 Archaeology at town lot 52, Halifax, North Carolina Manuscript on file, Archaeology Section, North Carolina Department of Cultural Resources, Raleigh
Archaeology at Fort Dobbs State Historic Site, Iredell County, North Carolina. Manuscript on file, Archaeology Section, North Carolina Department of Cultural Resources, Raleigh
Archaeology at the Reed Gold Mine Engine Mill House. Manuscript on file, Archaeology Section, North Carolina Department of Cultural Resources, Raleigh
- 1978 Chapter 6 - Foncin Parade components IN A final report of archaeological investigations at Fort Independence: 1976-1977. Edited by William Stokinger and Geoff Moran. Manuscript on file, Public Archaeology Laboratory, Brown University, Providence, RI (with Myron Stachiw and Stephen Mrzowski).
- 1979 Report on preliminary archaeological investigation: Fort Butts 1777-1781. Manuscript on file, Rhode Island Historical Preservation Commission, Providence, RI
- 1980 Phase I archaeological testing at Fort Barton, Tiverton, RI. Manuscript on file, Rhode Island Historical Preservation Commission, Providence, RI
- 1981 Archaeological investigations, Fort McHenry National Monument and Historic Shrine, Baltimore, Maryland. Manuscript on file, Denver Service Center, National Park Service (with Patricia Rubertone and William Stokinger)
- 1982 Report of an initial archaeological reconnaissance, Temple Boat Landing, Camden County, GA. Report on file, USDA, Soil Conservation Service, Athens, GA

Report of an initial archaeological reconnaissance, Rincon, GA 201 Facility Planning Area. Report on file, Savannah Laboratories and Environmental Services, Savannah, GA

Preliminary investigation, Richmond Hill Plantation power plant chimney. Report on file, WAPORA, Inc., Norcross, GA

Phase I test excavations, mortar battery, Fort McAllister, Richmond Hill, Georgia. Report on file, Fort McAllister State Historic Site, Richmond Hill, GA

Preliminary archaeological survey of the Highway 17 Farm Tract, Richmond Hill, Georgia. Report on file, Archaeological Laboratory, Armstrong State College, Savannah, GA

The berth 52 vessel (09CH691): The interim report. Report on file, Georgia Historical Society, Savannah, GA

1983 Archaeological survey of the Savannah River (Ranges 75+500 to 77+500). Report on file, Savannah District, US Army Corps of Engineers, Savannah

Archaeological survey of the Savannah River (Ranges 81+500 to 83+500). Report on file, Savannah District, US Army Corps of Engineers, Savannah

Preliminary archaeological investigation - Long Point, Whitmarsh Island, Chatham County, Georgia.

Report on file, Archaeological Laboratory, Armstrong State College, Savannah, GA

Phase II archaeological investigation - Long Point, Whitmarsh Island, Chatham County, Georgia. Report on file, Archaeological Laboratory, Armstrong State College, Savannah, GA

1984 Cultural resources survey of Causton's Bluff, Chatham County, Georgia. Report on file, Archaeological Laboratory, Armstrong State College, Savannah, GA

Archaeological survey and testing at Hunter Army Airfield, Savannah, Georgia. Report on file, Archaeological Services Branch, National Park Service, Atlanta (with Robin L. Smith, R. Bruce Council and Nicholas Honerkamp), Archaeological Investigations of the Central of Georgia Train Shed, Savannah, GA.

PAPERS PRESENTED

1975 Archeology at the Reed Gold Mine. 8th Annual Meeting, Society for Historical Archaeology, Charleston.

1976 After the private's test-What then?: Diversity in Maryland Revolutionary War uniforms, 1780-1781. Winter Meeting, The First Maryland Regiment, Baltimore

1979 Preliminary indications of ethnic groups at an eighteenth century military post, Fort Butts, Portsmouth, Rhode Island. 12th Annual Meeting, Society for Historical Archaeology, Nashville.
Possible Hessian remains at British Fort Butts, Portsmouth, Rhode Island. Spring Meeting, Council for Northeast Historical Archaeology; Kingston, New York.

1980 Trash and disease in the eighteenth century. 13th

- Annual Meeting of the Society for Historical Archaeology, Albuquerque
 Cultural transmission: A military example in the eighteenth century. 13th Annual Meeting, Society for Historical Archaeology, Albuquerque
 Military central place theory and historic sites archaeology. 45th Annual Meeting, Society for American Archaeology, Philadelphia
 Papers, privies and the patterned record. 21st Annual Meeting, Conference on Historic Sites Archaeology, Wilmington
- 1981 Forts and privies - Why Bother? November Meeting, Coastal Georgia Archaeological Society, Savannah
- 1982 Fort Dobbs on the Carolina frontier. 15th Annual Meeting, Society for Historical Archaeology, Philadelphia
- 1983 Nathanael Greene's Southern Campaign 1780-1781: Strategic conceptions of space. Triumph of the American Revolution Symposium, Keene, New Hampshire.
 Greene's strategy in the Southern Campaign, 1780-1781. Tenth General Brown Conference - War and Society in the Eighteenth Century, Tuscaloosa
- 1984 Oral tradition and eighteenth century cartography: Archaeology's role in a seaport city. 17th Annual Meeting, Society for Historical Archaeology, Williamsburg
 Modern regional landscape terminology and the interpretation of an urban archaeological site. 49th Annual Meeting, Society for American Archaeology, Portland.
- 1985 The berth 52 vessel. Paper presented at the sixteenth annual meeting, Conference on Underwater Archaeology, Boston.

**MEMBERSHIP IN
 PROFESSIONAL SOCIETIES**

Society for American Archaeology
 Society for Historical Archaeology
 Company of Military Historians
 First Maryland Regiment
 Anthropological Society of Washington
 South Carolina Archaeological Society
 Georgia Archaeological Society

**CURRENT RESEARCH
 INTERESTS**

Refuse Disposal in America
 Cultural Transmission and Change
 Minorities and Illiterates in 18th and 19th Centuries, Experimental Archaeology
 Blackwater Underwater Archaeology
 Individuals in Material Culture
 Urban Domestic Patterns, Living History

OTHER EXPERIENCE

Sports writer, Diamondback, University of Maryland 1971-1973, Buena Vista News, Buena Vista, VA 1980-1981, Georgia Gazette, Savannah, GA 1984-Present
 Director, Center for Low Country Studies, Savannah,

GA 1982-Present

Director, Coastal Heritage Society, Savannah, GA

1982-Present (Secretary 1982-1984)

Acting Director, Museum and Preservation Studies

Program, Armstrong State College, Savannah, GA

June 1982 - Present

GENERAL INTERESTS

Rugby: Referee (ERU B-3), Coach (RFU course 1976)

Living History, Carpentry Scuba Photography

HONORS

Eagle Scout

Phi Alpha Theta

APPENDIX B

VITA

Julie A. Barnes

PII Redacted

[Redacted]
[Redacted]
[Redacted]
[Redacted]

Education: Eastern Wayne High School, Goldsboro, NC 1973-1976
Georgia Southern College, Statesboro, GA 1976-1980
University of Nevada, Las Vegas 1980-1984

Degrees: BA Art, Minor in Anthropology, Georgia Southern College.
Degree conferred, August 1980.

MA in Anthropology, emphasis in Historical Archaeology,
University of Nevada, Las Vegas. Degree conferred,
May 1984.

References:

Dr. Claude N. Warren
Department of Anthropology
University of Nevada, Las Vegas 89154

Dr. Margaret M. Lyneis
Department of Anthropology
University of Nevada, Las Vegas 89154

Dr. Rochelle A. Marrinan
Department of Anthropology
Florida State University
Tallahassee, FL 32306

Dr. Lawrence E. Babits
Department of History
Armstrong State College
Savannah, Georgia 31419-1997

Archaeological Experience:

Center for Low Country Studies
Department of History
Armstrong State College
Dr. Lawrence E. Babits, supervisor
Position: Archaeologist
July 1984 - present

Department of Anthropology
University of Nevada, Las Vegas
Dr. Margaret M. Lyneis, supervisor
Position: Teaching Assistant-Archaeology and Physical Anthropology
September 1982-May 1983

Department of Anthropology
University of Nevada, Las Vegas
Archaeological investigation at the Bowman Site, Pahrump, NV
Dr. Margaret M. Lyneis, supervisor
Position: Field Director
May 1982-August 1982

Department of Anthropology
University of Nevada, Las Vegas
Dr. Margaret M. Lyneis, supervisor
Position: Research Assistant
October 1981-May 1982

Central Arizona Water Control Study-3
Arizona State University, Tempe, AZ
Dr. Glen E. Rice, Principal Investigator
Position: Archaeological Technician, survey
June 1981-August 1981

Department of Anthropology
University of Nevada, Las Vegas
Dr. Claude N. Warren, supervisor
Position: Research Assistant
February 1981-June 1981

Field Class in Historic Archaeology
University of Nevada, Las Vegas
Dr. Claude N. Warren, instructor
Excavation and Lab
January 1981-May 1981

Lab. Methods in Historic Archaeology
University of Nevada, Las Vegas
Dr. Claude N. Warren, instructor
August 1980-December 1980

Archaeological Field Class
Georgia Southern College
Dr. Rochelle A. Marrinan, instructor
Excavation and Lab, Historic Archaeology
March 1979-June 1979

Museum Experience:

Independent research in exhibit preparation.
University of Nevada, Las Vegas
Mr. Jean Giguet
August 1982-December 1982

Illustration Experience:

Illustration of lithic material from the California Desert.
For manuscript prepared by Dr. Claude N. Warren, in California
Archaeology, Michael J. Moratto, Ed., Academic Press, 1984.
February 1982-March 1982

Illustration of historic artifacts from New St. Joseph.
For MA Thesis prepared by Carolyn Grattan, University of Nevada,
Las Vegas.
November 1981

Department of Geology
Museum of Natural History
Georgial Southern College
Dr. Gale Bishop, supervisor
Position: Illustrator, Mosasaur Preparation project
June 1980-August 1980, January 1981

Illustrative reconstruction of aboriginal house construction.
For Doctoral Dissertation prepared by J. Mark Williams,
University of Georgia.
January 1980-June 1980.

Other Experience:

Survey of Historic Houses in Las Vegas
Nevada State Museum
Position: Surveyor and photographer
April 1984-May 1984

Department of Institutional Development
Georgia Southern College
Steve Ellwood, supervisor
Position: Photographer and darkroom technician
October 1979-August 1980

Papers presented:

"Technology and Evolution in Western Mining Communities"
Presented at the 18th Biennial Great Basin Anthropological Conference,
Reno, Nevada.
October 1, 1982

Thesis Title:

Technology and Evolution in the Mining Region of California and
Nevada: 1848-1880.
May 1984

Awards and Grants:

Patricia A. Rocchio Memorial Scholarship
Department of Anthropology
University of Nevada, Las Vegas
Fall 1981

Graduate Student Association
University of Nevada, Las Vegas
Research Grant
Research conducted at the California State Library, Sacramento
April 1982

APPENDIX C

ARTIFACTS FROM MARINE RAILWAY SITE

Test Pit 1 - Level 1

Brick, fragments	18
Ceramic	
Handpainted soft white paste	1
Mocha, soft white paste bowl, brown/black	1
Plain, soft white paste bowl	1
Plain, soft white paste cup	1
Plain, soft white paste, unid.	1
Glazed stoneware, white, unid.	1
Porcelain, shirt button	1
Glass	
Brown bottle fragments	4
Clear molded jar	1
Clear bottle fragments	6
Light green bottle fragments	3
Metal	
Iron, machine cut nail, common	4
Iron, sheet metal, unidentified	46
Iron, unidentified	12
Iron concretions	21
Yellow metal, nails,	93
Yellow metal, washer	1
Yellow metal, sheet	6
Yellow metal, shell case	1
White metal, sheet metal	9
Faunal	
Mollusk	19
Gastropod	6
Bone, fish tooth	1
Bone, pork, tooth	3
Bone, pork, mandible	3
Bone, mammal, tooth	5
Bone, mammal, unidentified long bone	7
Bone, unidentified	1
Miscellaneous	
Tile, untyped	4
Mortar	23
Tabby	2
Sandstone "brick"	10
Chalk	1
Coal, anthracite	26
Shale	1
Wood, charcoal	5
Slag	5

Test Pit 1 - Level 2

Brick, flat	1
Ceramic	
Transfer printed soft white paste, unid.	1
Transfer printed soft white paste, unid.	1
Glass	
Light green, molded glass bottle	1
Green, molded glass bottle	1
Metal	
Iron, unid.	6
Iron, sheet	10
Yellow metal, nails	3
Yellow metal, sheet	1

Test Pit 1 - Level 2A

Brick	30
Ceramic	
Hand painted, tin glazed, bowl	1
Mocha, soft white paste, bowl	1
Glazed, buff paste tankard	2
Plain earthenware, unid. vessel	6
Faunal	
Shell, oyster	9
Shell, mollusk, untyped	7
Shell, gastropod -	6
Shell, unidentified	10
Bone, mammal, articulating surface, unid.	1
Bone, mammal, long, unid.	1
Bone, mammal, vertebra	1
Bone, bird	1
Leather, unid.	1
Miscellaneous	
Fuel, slag	17
Limestone	1
Sandstone "brick"	25
Tile	3

Test Pit 1 - Level 2B

Brick	1
Metal	
Iron	2
Yellow metal, sheet	1
Faunal	
Shell, mollusk	11
Shell, gastropod	5
Shell, coral	4
Shell, unid.	1
Miscellaneous	
Fuel, coal, anthracite	3
Sandstone	1

Test Pit 1 - Level 3

Ceramic	
Soft red paste earthenware, unid.	1
Metal	
Iron	2

Test Pit 2 (No Artifacts)

Test Pit 3 - Level 1

Brick, flat	9
Ceramic	
Hand painted soft white paste bowl	1
Transfer printed soft white paste bowl (?)	1
Plain soft white paste bowl	3
Plain pearlware, unid.	1
Sponged buff paste saucer	1
Hand painted buff paste, unid.	3
Soft red paste, glazed, unid.	2
Kaolin pipestem, (4/64)	1
Glass	
Window glass	10
Light blue, soda hottle	3
Aqua-turquoise soda bottle	1
Dark green wine bottle	11
Light green, soda bottle	3
Clear bottle	1
Clear medicine bottle	1
Pink medicine bottle	1
Unidentified medicine bottle	1
Brown bitters bottle	4
Clear glass tumbler	1
Metal	
Iron, machine cut common nails	36
Iron, common wire nail	1
Iron, railroad spikes	22
Iron, sheet	11
Iron, bar iron	1
Yellow metal nail	88
Yellow metal sheet	13
Unidentified metal, screw	1
Faunal	
Shell, mollusk	1
Bone, fish, drum tooth	1
Bone, four whole button	1
Miscellaneous	
Tile	9

Test Pit 3 - Level 4

Ceramic

Soft white paste, unid. 1
Stoneware, unid. 1

Metal

Iron, unid. 1
Yellow metal, nail 1

Test Pit 4 - Level 1

Brick

3

Glass

Clear bottle 1
Green bottle 1

Metal

Iron, machine cut nail, common 159
Iron, sheet 226
Iron, brad 2
Iron, unid. 109
Iron, spikes 4
Iron, treenail 1
Yellow metal, nail 16
Yellow metal, sheet 6

Faunal

Bone, mammal, unid. 1

Miscellaneous

Coal, anthracite 3
Lithic, gypsum (?) 2
Lithic, unid. 34

Test Pit 4 - Level 2

Ceramic

Hand painted soft white paste cup 2
Plain soft white paste plate 1
Kaolin pipe stem (7/64) 1

Glass

Aqua molded bottle 5
Brown bottle, whiskey 36
Window glass 2
Green bottle 1

Metal

Iron, sheet 25
Iron, machine cut, common nails 45
Iron, concretion 24
Yellow metal, nails 1
White metal (Lead) sheet 2
Unidentified metal, sheet 1

Faunal

Shell, mollusk, oyster 2
Bone, mammal 1

<u>Miscellaneous (Test Pit 4, level 2 continued)</u>		
Fuel, coal, anthracite		20
Fuel, wood, charcoal		34
Wood, cut		6
Chalk		14
Schist		8
Lithic, unidentified		3
<u>Test Pit 5 - Level 1</u>		
Brick		1
Glass		
Clear glass bottle		2
Lt Green bottle		1
Green bottle		1
Metal		
Iron, unid.		4
Miscellaneous		
Wood, plank		3
<u>Test Pit 6 - Levels 1-3</u>		
Brick, flat		1
Ceramic		
Annular, soft white paste cup		1
Kaolin, pipebowl		1
Kaolin, pipestem (7/64)		1
Glass		
window glass		1
<u>Surface Collection Unit 1</u>		
Brick		1
Glass		
Brown, bottle, whiskey		1
Clear bottle		2
Clear, case bottle		1
Aqua, blown glass bottle		1
Metal		
Iron, Hinge		1
Iron, washer, square		2
Iron, washer, round		2
Iron, bolts		1
Iron, wire bolts		7
Iron, spikes, railroad		7
Iron, spikes		5
Iron, treenail		4
Iron, nut		6
Iron, wire nail, common		6
Iron, machine cut nail, common		7
Iron concretion		10
Yellow metal, sheet		8
Yellow metal, sheet, holed		3
Yellow metal, nail		77
Yellow metal, four hole button		1

Miscellaneous (Surface Collection Unit 1 continued)

Lithic, unidentified	1
Asphalt shingle	4
Wood, plank fragments	3
Wood, burnt	1

Surface Collection Unit 2

Glass

Clear soda bottle	1
Dark green wine bottle	1

Metal

Iron, treenail	4
Iron, spikes, railroad	23
Iron, wire bolts	11
Iron, nuts	5
Iron, washer	2
Iron, bar iron	3
Iron, machine cut nail, common	12
Iron, wire nail, common	6
Iron, wire	5
Yellow metal, nail	369
Yellow metal, screw, machine cut	1
Yellow metal, sheet, holed	9
Yellow metal, sheet	16
Yellow metal, bar copper	2
Yellow metal, four hole button	3
White metal, lead blob	6

Miscellaneous

Leather, shoe fragments	3
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TOTAL

2242

GEORGIA ARCHAEOLOGICAL SURVEY

State Site No.* _____ Site Name Marine Railway
Instit. Site No. 09CHA8317 Site Photos at ASC

Location (County Chatham Lat. _____ Long. _____)

UTM References

A	ZONE	EASTING	NORTHING	B	ZONE	EASTING	NORTHING
C				D			

Owner PD Oil Company/US Address Hutchinson Island, Savannah, GA
Description (Acreage 2 1/2; Site Elevation, above sea level 2; Soil Type[s]; Present Condition and Use; Intrusions; Topography; Vegetation; Erosion, Etc.) Site was composed riverine deposits covered over by spoil. Marse grass and small bushes were on site before excavation.

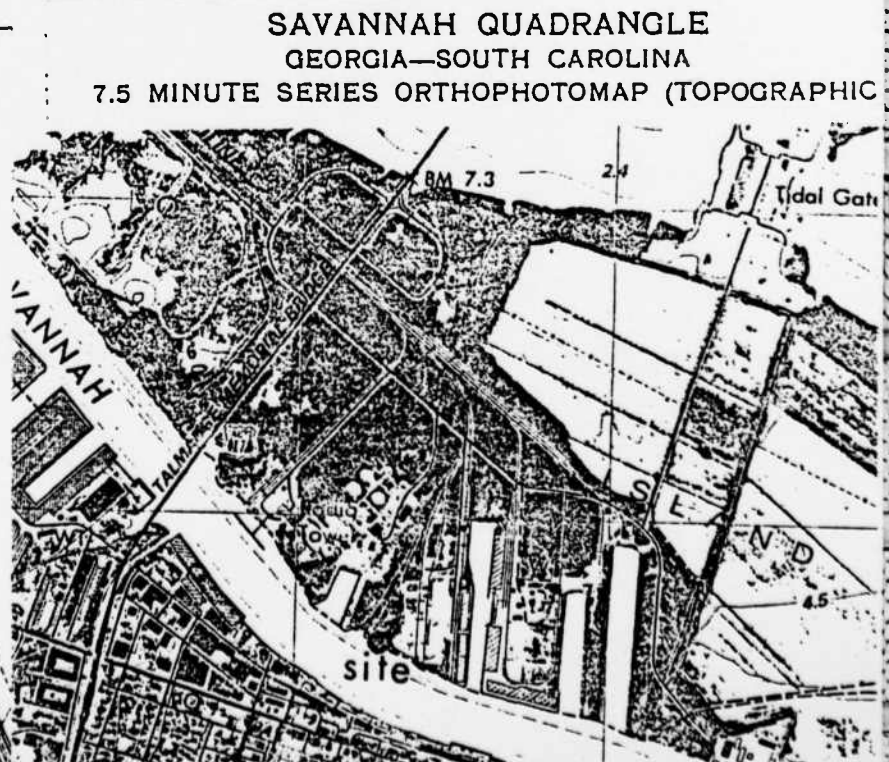
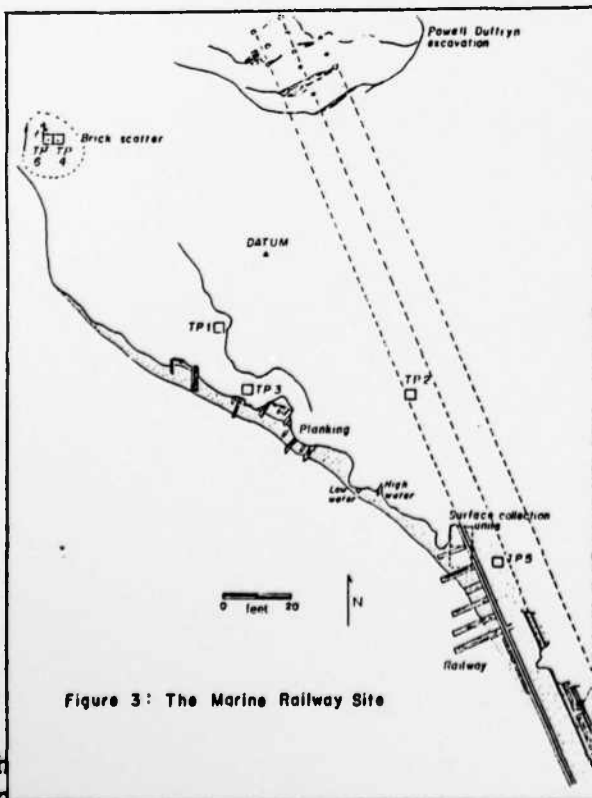
Remarks and Recommendations Site has been dredged and destroyed (Aug-Oct 1984)

Map Reference Savannah Quad USGS

Aerial Photo Reference _____

Sketch Map of Site**

Official Map



roads, streams, and major landmarks, and

**Sh
1
*Complete all categories even if unknown (U/K), unavailible (U/A), incomplete (I/C), or see attachment (S/A); explain if necessary.

State Site No. _____

Inst. Site No. 09CHA8317

RECORD OF MATERIALS

Collected by Survey 19th century metal, glass, ceramics - Spring 1983

Acc. No./Storage at Armstrong State College

Subsequent Collections	Date	Acc.No./Storage
Collector <u>ASC</u>	<u>Jul-Aug 84</u>	<u>ASC</u>
Collector _____	_____	_____
Collector _____	_____	_____

Private Collections

Collector _____ Address _____

Type of Material _____

Collector _____ Address _____

Type of Material _____

Excavation Record	Date	Acc.No./Storage
Supervisor <u>Julie A. Barnes</u>	<u>Aug 84</u>	<u>ASC</u>
Supervisor _____	_____	_____

Published Record Babits 1983, Babits and Barnes 1985

CULTURAL AFFINITY

Preliminary Classification Historic, 19th century marine railway

Subsequent Classification confirmed

NATIONAL REGISTER OF HISTORIC PLACES

Eligible for Nomination (circle appropriate response): Yes No Nominated Registered

Justification rarity, association with important local figures. Was not nominated because of decayed nature of site, removal of all structures. Site was destroyed by dredging Aug-Oct 1984

Cultural Significance (circle appropriate evaluation): Local State National

Justification Local, State. Civil War and importance to southeastern shipping

FORM COMPLETION/UPDATE

Date	Name	Prof. Status/Inst.Affil.	Contract/Proj.	Punch Card Submitted (Circle Response)	
				Yes	No
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____