

BURNING BRICK:
A STUDY OF A LOWCOUNTRY
INDUSTRY

BY

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TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS.....	iii
LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
ABSTRACT.....	xiii
CHAPTERS	
1 INTRODUCTION: FOOTPRINTS ON THE EARTH.....	1
Purpose of the Research.....	1
Historic Background.....	3
The Study Area.....	7
2 RESEARCH APPROACH AND METHODOLOGY.....	11
Research Framework.....	11
Methods.....	15
Review of Previous Research.....	21
3 THE WRITTEN RECORD.....	30
The Economic Background.....	31
Brickmakers and Brickyards.....	48
Production and Value.....	62
4 TO MAKE A BRICK.....	71
5 THE ARCHAEOLOGICAL EVIDENCE.....	95
Brickyards as Archaeological Sites.....	95
The Wando River Basin Sites.....	102
Changes in the Land.....	115

6	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	121
	The Role of Brickmaking in the Lowcountry.....	121
	Future Research Directions.....	126
	REFERENCES CITED.....	131
	BIOGRAPHICAL SKETCH.....	143

LIST OF TABLES

<u>Table</u>		<u>page</u>
1	Charleston District Agricultural Production 1860 Census.....	37
2	Wando Plantation Accounts of Dr. Anthony Toomer, 1785.....	39
3	Brickmakers Identified in the Charleston Area Between 1745 and 1860.....	51
4	Brickmakers Listed in the Charleston District Census of 1850.....	61
5	Medway Plantation Shipping Records 1852-1853.....	66
6	Boone Hall Brickyard Account Book--Sample Page, 1847.....	67
7	Boone Hall Yearly Production and Income Totals, 1850-1860.....	67
8	Brickyard Sites in the Wando River Basin, South Carolina.....	105

LIST OF FIGURES

<u>Figure</u>		<u>page</u>
1	Wando River Basin, Charleston and Berkeley Counties, South Carolina.....	8
2	Brickyards within the Wando River Basin, Charleston and Berkeley Counties, South Carolina.....	10
3	Lexington Kiln Site, Charleston County, South Carolina.....	40
4	Elm Grove Plantation Brickyards, Charleston County, South Carolina.....	41
5	Parker Island Brickyard, Charleston County, South Carolina.....	42
6	Addison and Martin Brickyards, Berkeley County, South Carolina.....	43
7	Brickyards Identified by Owner, 1745-1860, Wando River Basin, South Carolina.....	52
8	Pug Mill and Molding Table, Charleston Brick Company.....	77
9	Brickmolding, Charleston Brick Company.....	79
10	Removing Bricks from the Molds, Charleston Brick Company.....	83
11	Types of Kilns or Clamps.....	85
12	Kiln Arch Construction, Charleston Brick Company.....	87
13	Jamestown, Virginia Brick Kiln.....	89
14	Completed Kiln and Openings, Charleston Brick Company.....	92
15	Site Plan, Jamestown, Virginia Brickyard.....	97

16	Plan, Kiln at Jamestown, Virginia.....	98
17	Plan, Jimmie Green's Lime Kiln, Berkeley County, South Carolina.....	101
18	Lexington Kiln Site Plan, Charleston County, South Carolina.....	103
19	Aerial Photograph, Wando River Basin, South Carolina.....	109
20	Shoreline Deposition, Beresford Creek, Berkeley County, South Carolina.....	110
21	Timbers in Shoreline Deposit, Wando River, Berkeley County, South Carolina.....	111
22	Kiln Arches, Lexington Kiln Site, Charleston County, South Carolina.....	112
23	Brickyard Surface, Beresford Creek, Berkeley County, South Carolina.....	113

Abstract of Dissertation Presented to the Graduate School
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By

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May 1992

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Between 1740 and 1860, brickmaking was a viable industry in the Lowcountry of South Carolina. This was particularly true of the Wando River basin northeast of Charleston. This study uses the research approach of landscape archaeology to examine and document the role of this industry within the plantations of the region. Landscape archaeology is an approach that looks not only at why humans occupy a specific site or region, but also at how they modify the landscape to fit their own cultural pattern, and in turn, how these modifications affect the landscape itself through time.

This study combines historic and archaeological research with analysis of the environmental characteristics of the region to meet its objectives and look at this industry in terms of: (1) the occupants' perception of the

environment; (2) how the environment influenced adaptation and how these adaptations in turn affected the environment; (3) the technologies or processes employed to exploit the available resources; (4) the role of the marketplace and location in respect to that market; (5) the historic events which influenced development of this industry; and (6) interrelationships between sites.

The Wando River basin was a marginal area for the usual plantation crops of rice, cotton, and indigo. Therefore, the plantations which were developed in this region were based on diversified production of other products, primarily produce, livestock, firewood, and bricks for the Charleston market. The enactment of building codes in Charleston after 1740 provided a further impetus for development of the brickmaking industry. The presence of the necessary raw materials of clay, sand, firewood, and water, proximity to a transportation route, and the availability of slave labor made brickmaking a natural choice.

Over 60 brickmakers and at least 23 brickyard sites have been identified in this region. These brickyards, consisting of semi-permanent kilns, sheds, sand or clay piles, extensive clay pits, waterfront landings, and slave settlements permanently altered the landscape through shoreline modifications and creation of wetlands in the relic claypits. These alterations remain as evidence of the significance of this industry in the region.

CHAPTER 1
INTRODUCTION: FOOTPRINTS ON THE EARTH

The seeming abundance of natural resources encouraged practices that emphasized technological efficiency and speed of development with little thought for the effects on the future of the land and resources (Cahn 1978:201).

They appear at low tide along the Wando River--pile after tumbled pile of water-washed brick. The observer pauses in wonder at the sheer volume of brick exposed along the banks. When told that these are the remains of old brickworks, the viewer is in awe that so much remains of a 200-year old activity, and at the thought that, if these are merely the discards, the total output must have been tremendous. The wonder may be followed by questions: Who were the makers? Why were there so many in this river basin? Why were they located at these particular spots? How were the bricks made? Where did the output go? And, finally, why did it stop?

Purpose of the Research

The answers to these questions are not as simple as the questions themselves. The objective of this study is to document this industry, and demonstrate its role in the plantation economy of the Wando River basin of South Carolina during the period between 1740 and 1860. The

approach is interdisciplinary, encompassing historic research, archaeological investigation, and an examination of the environmental factors which facilitated development of the industry and were in turn altered by it. The emphasis is on describing the technology, documenting the local history of this industry, and evaluating its economic role within the plantations. The archaeological aspect of the study addresses the distribution pattern of these sites as well as the intrasite patterns. This pattern analysis concludes with an evaluation of the impact of this industry on the landscape itself.

Much of the research for this study was conducted in the archives of Charleston, South Carolina and in South Carolina Lowcountry family records. Comparative data were obtained from contemporary descriptions of brickmaking, technological histories, archaeological studies of brick kilns elsewhere in the United States, and contemporary reenactments of colonial brickmaking. Additional economic data were obtained from census records and an excellent regional study by Michael Scardaville (1985). Archaeological data for the project region were obtained from studies conducted on new developments in the area, including those by the author, analysis of aerial photographs, and a field survey of the Wando River and its tributaries. Environmental data were culled from geological studies, soil surveys, topographic maps, aerial photographs,

historic descriptions, and observations by archaeologists working within the region.

Historic Background

The European colonists of the Americas viewed the abundant resources of the New World as a source of wealth and prosperity; forests were cut down, fields were cleared, animals were hunted, and the earth was mined for ores (Cahn 1978:199-200; Cronon 1983:5). These activities would forever change the face of the land, not only in the form of the structures which were built, but also through the process of obtaining the resources for those structures. These effects are evident today along the rivers of the Lowcountry of South Carolina where brickyards active during the period between 1740 and 1860 have left a permanent legacy in the form of brick-covered shorelines and extensive wetlands in the abandoned clay pits.

The use of brick or clay building units has an ancient history based on a technology which remained virtually unchanged until the Industrial Revolution of the mid-nineteenth century. Brick is considered to be the oldest man-made building material (Beall 1984:2); its popularity is based on its ease of manufacture and construction, its durability and strength, its fireproof nature, its adaptability to many forms and variations in construction, and its attractiveness (Saylor 1943:8-10).

The technology began with the manufacture of sun-dried brick in the ancient Middle East. By the time of the Babylonian empire of Nebuchadnezzar (604 to 562 B.C.), the use of burning and glazing had been perfected (Graham and Emery 1945:1.1,547). The Romans used brick extensively in construction, particularly for arches and domes, but the techniques and materials were largely abandoned in the Roman colonies of Europe, including England, after the fall of the Roman Empire (Lloyd 1925:2).

Brickmaking and brick construction were revived during the 12th and 13th centuries in the Low Countries of Europe and in France. From there it was reintroduced to southeastern England where it was actively adopted because of a lack of local building stone. By the 15th century, brick was a popular building material throughout eastern England, with an increase in demand in London after the great fire of 1666. Since the largest single group of early European settlers in North America came from this area of England, it is likely that they brought the technique of brickmaking and masonry with them to the New World. Immigrants from the Netherlands and France may also have brought this tradition with them; in fact, the principal early period of brick building in the colonies in the late 17th century corresponds to the influx of French Huguenot settlers (Trindell 1968:486). A large group of these Huguenots settled in the South Carolina Lowcountry.

Brickmaking occurred wherever suitable clay and fuel were available. Often, the bricks were made at the site of the building to be constructed. However, if transportation was available, usually via water, brickyards could be established for large scale production and export. Kilns have been documented historically and archaeologically at the English colony of Jamestown, Virginia, as well as in the Spanish settlement of La Isabela in the Dominican Republic (Harrington 1950:16-19; K. Deagan, personal communication 1991). Although initially used primarily for chimneys and foundations, by the late 17th century brick buildings were common in many of the colonial cities, particularly in the Mid-Atlantic colonies (Trindell 1968:484).

Although the initial European settlement in South Carolina was at the Spanish towns of San Miguel del Gualdape and Santa Elena, these settlements were ultimately abandoned under pressure from the English. In 1663, King Charles II of England granted the land now known as Carolina to eight Lords Proprietors. The first English settlement was established in 1670 at Charles Towne on the Ashley River. By 1680, this settlement had been relocated to a more healthful site on the peninsula between the Ashley and Cooper Rivers. The new colony thrived, and the Proprietors established four counties, Berkeley, Craven, Colleton, and Granville, as the chief political units. These divisions would later be supplanted by the Anglican parishes

established in 1706 by the General Assembly (Scardaville 1985:31).

By 1682, Thomas Newe's letters from South Carolina stated that "here is excellent Brick made, but little of it" (Salley 1911:181). Within the next 20 years, brickmaking became common in South Carolina, although usually confined to production for single structures. The industry received an important impetus from a series of major fires in Charleston. In 1713, an act of the Assembly required all buildings within the fortified portion of Charleston to be of brick or stone construction; this act was repealed in 1715 as a result of complaints about the scarcity and expense of brick (Simons 1934:4).

When the disastrous Charleston fire of November, 1740 destroyed much of the center of the city, the Assembly again passed an act requiring

all the Outside of all Buildings hereafter to be erected or built in Charles Town to be henceforth made of Brick or Stone, . . . and be covered with Tile, Slate, Stone or Bricks (South Carolina Gazette 1740).

The act also set the price of bricks for the next ten years at 6 pounds per thousand for English brick, 5 pounds per thousand for Carolina brick, and 3 pounds 10 shillings per thousand for the less desirable (and smaller) New England bricks (Stoney and Staats n.d.:4). This act was probably instrumental in promoting the establishment of thriving brickyards in the region surrounding Charleston.

In order to be economically viable, the brickyards required proximity to navigable water, preferably water which led directly to the Charleston market. The necessary raw materials of clay, sand for temper, and wood for fuel also had to be present. Finally, brickmaking as practiced prior to the Industrial Revolution was a labor intensive operation; the plantation system was the ideal source for this labor in the form of slaves. Although all of these requirements were met along the numerous rivers in proximity to Charleston, one area seems to have supported a larger number of brickyards--the Wando River basin located northeast of Charleston.

The Study Area

The basin consists of portions of two counties or historic parishes. The area between the Wando and the Atlantic Ocean in Charleston County is traditionally known as the Wando Neck and was historically designated as Christ Church Parish (Figure 1). Unlike much of the area of coastal South Carolina described as the Lowcountry, the Wando Neck could not support the cash crops of indigo, rice and cotton. The soils are poorly drained and frequently wet, and the river itself is too saline to support rice cultivation except at the extreme upper reaches of its tributaries. A similar situation exists along the northern and western shoreline of the Wando River in the neighboring parish of St. Thomas and St. Denis in Berkeley County

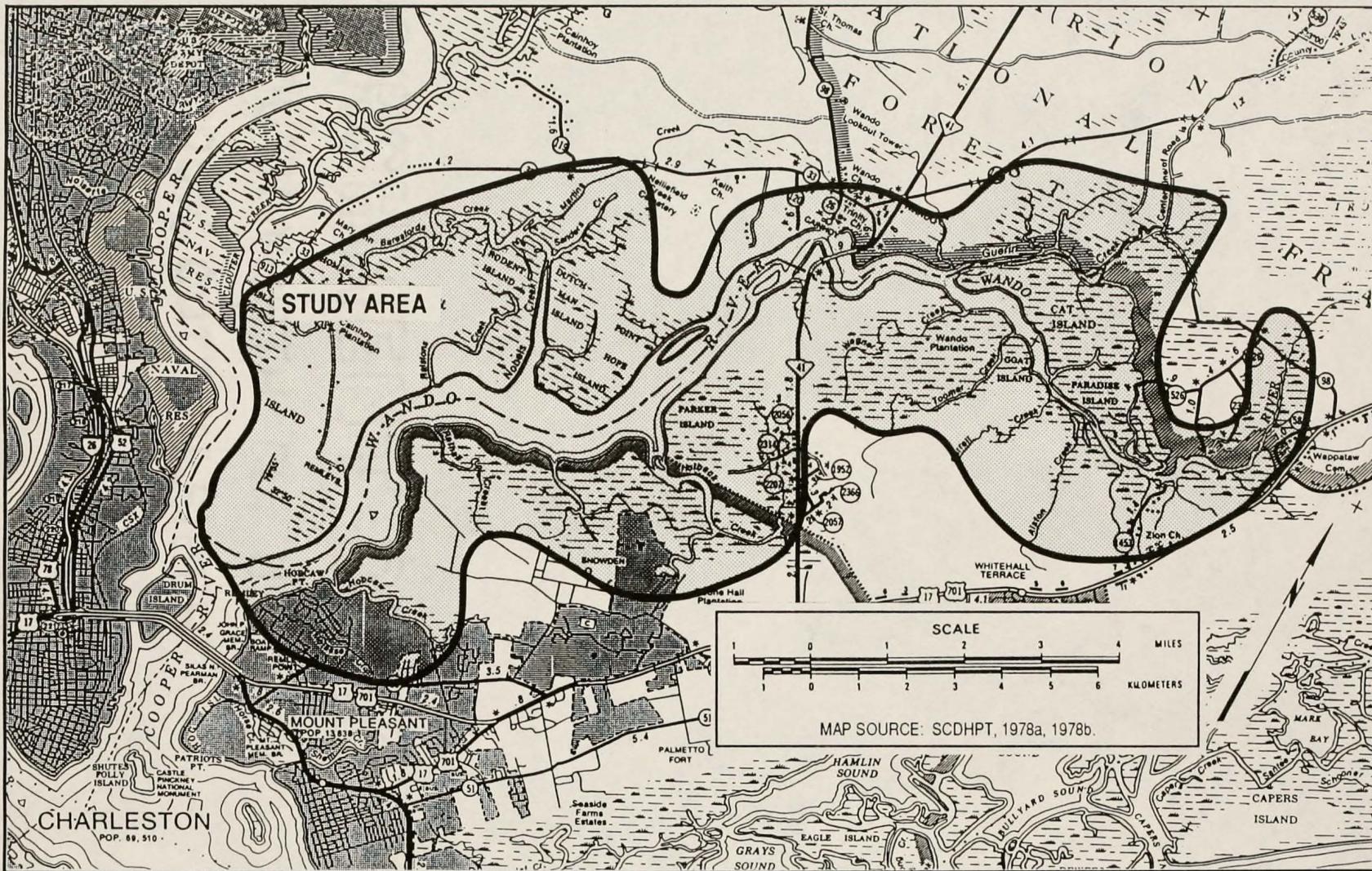


Figure 1. Wando River Basin, Charleston and Berkeley Counties, South Carolina

(Figure 1). The Wando River basin's proximity to Charleston led to development of this region as a production area for the urban market. Agriculture centered on produce and livestock; this was supplemented by cutting of firewood, timber, and production of naval stores (Scardaville 1985:35-42).

As a result of surveys made in the course of this study, 23 brickyards have been identified along the Wando River and its tributaries; others probably exist but were not confirmed during the field survey (Figure 2). The remains of these operations consist of brick-covered banks or wharves, kilns, sand piles, water-filled clay pits, and the occasional chimney. Many of these historic and archaeological sites are located in prime development areas, particularly within the Wando Neck in Charleston County. Some have already been developed or will be in the near future. In many cases, if not all, this development will lead to the removal or destruction of all evidence of these sites. At this time, although several of the sites have been recorded and many others are known, little archaeological or historic research has been conducted on the brickyards themselves. This study provides a beginning for that documentation as well as addressing some of the problems associated with dealing with this type of industrial site in terms of both archaeology and long-term resource management.

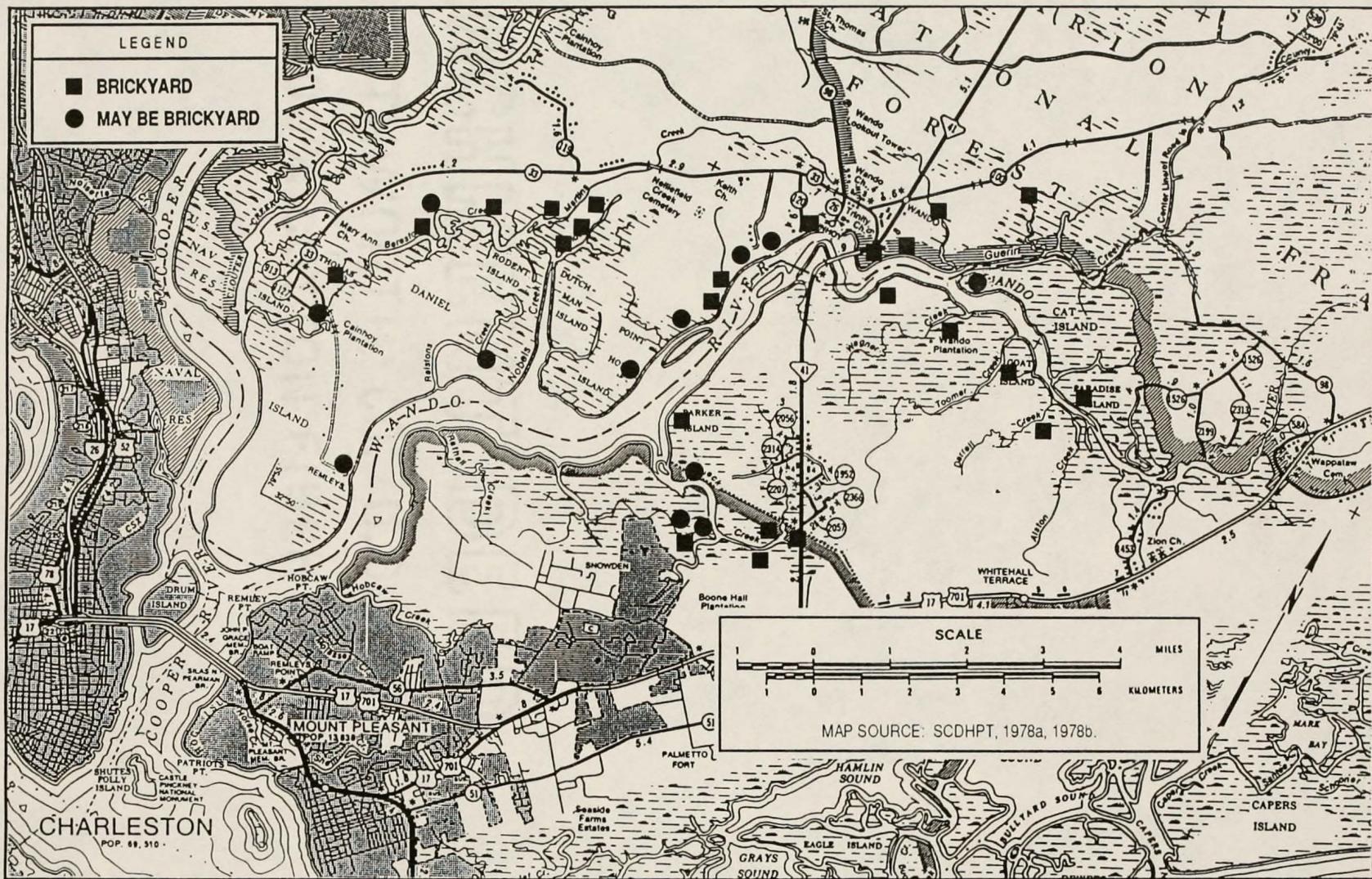


Figure 2. Brickyards Within the Wando River Basin,
Charleston and Berkeley Counties, South Carolina

CHAPTER 2 RESEARCH APPROACH AND METHODOLOGY

. . . sites (and settlements) interact with and are affected by processes of the natural environment (Schiffer 1987:199).

Research Framework

This study of Lowcountry brickmaking will look at the industry from the approach of landscape archaeology, a concept recently utilized by historic archaeologists to "consider entire regions that bear the imprint of a shared set of values" (Deetz 1990:2). In this approach, a landscape is defined by archaeologists as the physical and spatial manifestation of human interaction with the environment. This interaction is a process of continual evolution; each interaction leaves physical remains. The emphasis in landscape archaeology is on the continuity between sites and through time (Lewis 1991; Shapiro and Miller 1990:98-99).

Landscape archaeology is a powerful tool to integrate history, geography, and anthropology in order to study past human behavior. It addresses the spatial dimension of the human interrelationship with the environment through the integration of both natural and cultural factors (Green

1991). Unlike settlement pattern studies in archaeology, which focus on identifying the environmental factors which influence settlement and the distribution of sites throughout the land, landscape archaeology also addresses the effects of humans on the land and emphasizes change through time:

At the same time, this [archaeological] record is evidence of the social organization of space at different scales and at different times in history . . . and contributes to broader interpretations of space and how people use it, think about it, and are affected by it (Mrozowski and Beaudry 1990:189).

The study of landscape archaeology addresses adaptation to the environment in terms of: (1) the occupants' perception of the environment in the sense of how and why specific sites are chosen; (2) the technologies or processes utilized at a specific site; (3) the markets for products and the location of the cultural remains with respect to both resources and those markets; (4) the interrelationships between individual sites in terms of the idea of space as a continuous dimension; (5) the interrelationship of historic events and the activities documented at specific sites; and (6) how the natural environment influenced human behavior (Green 1991; Crumley 1991; Winberry 1991).

A complete account of a historical landscape must therefore take into account its evanescent qualities and the differences in the ways it was experienced . . . we must start with what we know and proceed gingerly to what we think we understand (Upton 1990:71).

In order to look at historic landscapes, Shapiro and Miller stated that:

To learn the meaning of a historical landscape, to "read" it, it is necessary to separate the natural and human factors and to understand their relationship. In this sense landscape may be viewed as a dynamic record of interactions between people and the environment--dynamic in that the process of environmental change is a continuous and long-term interplay between natural events and human events. Each has the potential of leaving some record or evidence on the landscape, and each has the potential of modifying, confusing, or destroying evidence of previous events. Landscape is a complicated accumulation of effects and is open to interpretation once the chronology of causes can be determined (Shapiro and Miller 1990:98-99).

This study identifies the natural resources available to the planters in the region as well as the historic events and economic aspects which influenced the development of this industry. Rather than focus on an individual brickyard site, the study takes a regional approach and looks at the environmental factors which led to the proliferation of these sites within the region, as well as the long-term ecological effects of brickmaking on the region.

Specifically, this dissertation demonstrates first, that the numerous brickyards along the Wando River played a major role in the economic life of the plantations of this region. The brickmaking process complemented vegetable farming, stock raising, logging, and naval stores, and helped fill the niche which existed due to the inability of the region to produce marketable amounts of rice, cotton, or

indigo. Brickmaking was a natural selection based on the presence of all of the necessary elements for the industry, as well as the close relationship which existed between these plantations and the Charleston commercial community (Zierdan 1986:37).

Second, this study addresses the permanent effect of brickmaking on the landscape itself; this effect has long-term consequences which are being felt today. Brickmaking altered the shoreline and adjacent uplands, created permanent wetlands which are now affecting development of these properties, and may have altered the natural environment in more subtle ways, particularly through deforestation.

This interdisciplinary study begins with an examination of the records of Lowcountry plantations for the economic and historic evidence of the role of brickmaking within the plantations. The colonial and antebellum brickmaking process as described in primary accounts, as well as in contemporary attempts at recreating the craft is presented next in order to provide a basis for understanding the existing remains of the industry. The archaeological and environmental aspects are addressed through a review of the existing studies of brickmaking sites, a walkover examination of identifiable sites, and examination of aerial photographs of the region, as well as use of published environmental data. The future research recommendations of

this study are designed to provide long-term resource management guidance for these sites.

Methods

This study had its genesis in research for the Dunes West development in Charleston County on the Wando River. During an archaeological survey of this 4,800 acre tract on the south side of the river, three antebellum brickyard sites were located, all with evidence of extensive operations. Archival research for one of the plantations within this tract led to the recognition that the brickyard was probably the primary focus of the antebellum plantation (Wayne and Dickinson 1990:6-4 - 6-7). During a site visit to Lexington Plantation's brickyard with Linda Stine of the South Carolina Historic Preservation Office, Dr. Stine mentioned that the entire Wando River basin contained numerous brickyards dating to the same period. She felt that a study of this industry would be an important contribution to Lowcountry history. At that point, this study began.

Although it was initially hoped that the opportunity to excavate other Dunes West brickyard complexes would occur in time to be incorporated in this study, that did not happen. Since it was clear that extensive archaeological excavations would not be possible, the decision was made to rely heavily on historic data, shifting the archaeological emphasis to a broader attempt to locate as many sites as possible,

combined with utilization of existing information from archaeological research in the region. Thus the initial research step was an effort to obtain all available information on known brickyard sites.

The majority of this archaeological data was obtained from the files of the South Carolina Institute of Archaeology and Anthropology in Columbia. The data consisted of published reports as well as a number of historic map references provided by the Institute's underwater branch. Additional data were obtained through conversations with other archaeologists working in the area, including staff members of private consultants, the Forest Service, the Charleston Museum, the University of South Carolina, the National Trust for Historic Preservation, and the State Historic Preservation Office.

The next step was an intensive review of aerial photographs of the region. This effort was conducted at the South Carolina Coastal Council in Charleston. Three different collections were utilized: 1:40,000 scale infrared aerials, 1:20,000 scale aerials, and 1:12,000 scale aerials. Two features were sought on the aerials: (1) evidence of shoreline modifications such as landings, and (2) wetlands which did not appear to be natural in configuration or location. Investigation began with the known brickyard sites in order to define the site signatures, and then progressed to an examination of the

rest of the basin. The shoreline evidence was the more difficult of the two features to identify, since, as it later became clear, many of the brickyards did not have projecting landings. Identification of the wetland pattern was very successful, and USGS 7.5. minute topographic maps were marked with the locations of possible brickyards based on these wetland patterns.

After the aerial photography study was completed, maps with the possible brickyard locations were sent to the region's major environmental consultant and land surveyor, to see if they could confirm any of the possible sites. Their information was utilized during the field survey and in the final map development (Figure 2).

The literature survey for the project focused on obtaining published accounts of brickmaking, as well as previous archaeological studies of brickyards in the United States. It soon became apparent that, while the literature on brickmaking is extensive, the archaeological research is not. In addition, most of the archaeological information is not published, except as technical reports. As a result, the majority of the information had to be obtained through personal contact with the archaeologists who conducted the work.

The historic research was oriented towards several specific foci. First, historic maps were sought showing the brickyards in the region, particularly those with sufficient

detail to determine the site plans. Second, plantation diaries, journals, daybooks, and accounts were sought to get primary information on the day-to-day operation of the brickyards as well as the economic aspects of these operations. Although initially confined to the Wando River basin, the search for such information was expanded when it became clear that very little information was available. Third, unpublished historic accounts, studies, and descriptions of brickmaking and brick use in the Lowcountry were sought. Last, published historic references such as newspaper advertisements, census data, and city directories were utilized to identify the brickmakers and determine the economic impact of the industry.

The primary source for historic material was the South Carolina Historical Society in Charleston. Research at this facility was conducted through use of the open catalog as well as through a computer search assisted by the Society's archivist. The Society's staff researcher assisted in searching for specific references, names, and documents. An advertisement was placed in the Society's journal soliciting information from members; this effort resulted in only one contact.

A second important source was the State Archives in Columbia, South Carolina, which provided both historic maps and census records for the region. The local Charleston County archives, the Records of Mesne Conveyance, was an

additional source of plat maps, as well as deeds, wills, and probate records. Many of these records were also available at the Charleston County Library.

The libraries of the University of Florida provided general historic references as well as microfilmed census records, and an account of brickmaking in Florida in the 19th century.

Numerous other Charleston archives were contacted for information or leads. Although most of these sources provided little or no specific data for this study, they did prove to be a source of contacts for people who might have information or know something about the sites. All potential sources were contacted by letter and telephone calls; several knew of brickyard sites but had very little specific information. One source, the Horlbeck family, does apparently have extensive family records from the Boone Hall brickyard; access to these records could not be obtained during the course of the project.

The initial attempt at completing the archaeological site survey was conducted on land. At that time, an effort was made to visit as many of the sites as possible. It rapidly became clear that the majority of the sites were relatively inaccessible with the exception of those at the Longpoint, Brickyard Plantation, and Dunes West Phase I development tracts in Charleston County.

A second, successful attempt was made via a small outboard boat in a two-day field effort. The initial stops were at known sites in order to familiarize the searchers with relevant site features. It was immediately apparent that at high tide it might be difficult to discern sites, since the upland portions were heavily overgrown and the shorelines were flooded. After the tide changed, a second attempt was made. This time, the sites were very apparent, and the distinguishing site signatures were noted for future use.

At most sites which were encountered, the site was photographed from the water and a landing was made in order to examine the upland portion of the site. When distinctive upland features existed, such as a kiln mound or a working surface, these were photographed. Field notes were maintained to record the approximate location, obvious features, and condition of each site. A map, either a navigation chart or a USGS topographic map, was marked with the site location. No attempts were made to delineate the site boundaries or expose features because of the limited time and resources available.

The final task undertaken for this study involved development of research recommendations for these sites. These recommendations were based on previous experience in cultural resource management as well as on conversations with other archaeologists working in the region, the South

Carolina State Historic Preservation Office, and members of the University of Florida College of Architecture historic preservation program.

Review of Previous Research

Previous research on brickmaking fell into four basic categories: (1) technological discussions, (2) historic accounts, (3) economic documentation, and (4) archaeological studies. Although there was abundant information available in the first two categories, and a more limited amount in the latter categories, with two exceptions (Atkinson and Elliott 1978; Wheaton et al. 1987) the previous research did not attempt to provide an interdisciplinary or regional approach which related the industry to the historic, environmental, and economic events which led to its development.

Brickmaking is a well-documented trade. There are historic descriptions dating to the colonial period from both Europe and the Americas, which provided the basis for the description of brickmaking presented in this study. These include Chambers' 1728 Cyclopaedia: or an Universal Dictionary of Arts and Sciences as well as Neve's 1726 City and County Purchaser's and Builder's Dictionary: or the Complete Builder's Guide. Chambers was the source for a description of the firing process, while Neve discussed the construction of a clamp kiln as well as the various grades of brick.

Antebellum brickmaking was recorded by Ure in his 1840 Dictionary of Arts, Manufacture, and Mines, and by Appleton in his 1852 Dictionary of Machines, Mechanics, Engine-Work and Engineering. Appleton was the source for a discussion of clay preparation, while Ure described clamp and crossdraft kiln construction.

First-person accounts of brickmaking are available in the diary of Lowcountry planter Charles Graves (1854-55), as well as in an article by Florida brickmaker John Crary (1889). Graves' account is particularly relevant as a Lowcountry source. It provides an understanding of the time and manpower committed to brickmaking at a yard which was producing brick for sale. Crary's article is helpful in terms of understanding the functions of the brickmaking crew and their rate of production.

Nathaniel Lloyd's 1925 History of English Brickwork provides a summary of the brickmaking operation, as does the work of contemporary Colonial Williamsburg brickmaker Bill Weldon (1990a; 1990b). Lloyd is useful in terms of understanding the entire brickmaking process from obtaining the clay to opening the fired kiln. Weldon's work correlates the demonstration brickmaking at Williamsburg with historic accounts in a step-by-step manner. In the course of this discussion, he identifies some of the problems encountered in brickmaking and discusses the importance of experience or knowledge in order to produce

usable bricks. This information is helpful in terms of understanding the role of the various personnel involved in brickmaking at the plantations. His step-by-step photographs of brickmaking clarify the mechanics of the process.

A series of studies by the Ceramic Engineering Department of Clemson University document the nature and location of good brick clays in the Lowcountry (Buie 1949; Johnson and Heron 1965; Robinson and Johnson 1960). These are very technical studies which address shrinkage, firing temperatures, color, and combinations of soils for brickmaking. They were used in developing the brickmaking discussion as well as contributing to an understanding as to why brickmaking developed in this region.

There are three historic studies of bricks, brickmaking, and brick structures in the Lowcountry written from the perspective of architects or historians. These studies are critical as sources of historic and economic data not readily available elsewhere, as well as an indication of other possible sources. More important, these works present a Charleston perspective on this industry.

A brief undated report by Lowcountry architects Samuel Gaillard Stoney and Henry P. Staats attempted to document the sources of brick in various Charleston structures (Stoney and Staats n.d.). Although this report is primarily concerned with determining the extent of the use of imported

brick in Charleston structures, it provides a chronological sequence for the development of colonial brickmaking.

In 1934, Harriet Stoney Simons prepared a report on colonial brick in South Carolina which summarizes the historic documentary evidence for brickmaking, primarily from newspapers and account books (Simons 1934). Like Stoney and Staats, Simons was particularly concerned with the question of the use of local brick versus imported brick; however, her report and research notes provide a digest of the printed primary information on brickmaking in the Charleston area, as well as numerous references.

In 1978, Marie F. Hollings completed a thesis at the University of South Carolina on 18th century brickwork in Charleston. While this study focuses on the sources of brick and the work of brickmasons in Charleston, it does summarize the craft as practiced at that time, as well as synthesizing the available information on the brickmakers within the region (Hollings 1978). Like Simons, Hollings provides information on the primary sources for brickmaking in the Charleston region.

Economic data are available in the U.S. Census documentation of manufacturers as well as through primary records from the Charleston region. None of this information had been correlated for brickmaking, other than what appears in the previously mentioned studies. The only regional economic studies which were helpful to this project

were a study of the rice industry (Swan 1975) and Michael Scardaville's history of the Wando Neck (Scardaville 1985).

Swan provides a brief summary, primarily from census records, of the status of manufacturing in the Lowcountry in terms of the costs of operation and the value of the products, including bricks. Scardaville's data were vital to the discussion of the agricultural production and economic history of the Wando Neck in this study, although he devotes little or no attention to manufactured goods. His data were used for the comparisons between the value of the output of the brickyards and the agricultural production of the region. One other article, a 1986 discussion of the rural-urban connection in the Lowcountry, provides important indications of the close relationship between Charleston and the nearby plantation districts (Zierden 1986).

Archaeological studies of brickmaking sites were very limited. This may be a function of the difficulties involved in excavating a kiln as well as the limited artifactual evidence which can be recovered from such sites. In addition, clamp-type kilns were often disassembled and the bricks used in other structures, leaving little structural evidence for investigation. Perhaps as Noel Hume states:

There is little that can usefully be said about the archaeological relics of brickmaking other than to add my personal opinion that, of all the features one could find, a brick kiln or clamp is probably one of the most arduous to excavate and the least interesting. It tells nothing about the

purpose to which the bricks would ultimately be put, and the chances of finding any datable artifacts in association with it are remote. This, of course, is true of the excavation of any manufacturing site whose end product is not an end product. . . . Bricks and tiles are complete and salable, but they have yet to be made into a house (Noel Hume 1975:174).

One of the earliest kiln excavations provides some of the most informative data on the nature of the archaeological remains at these sites. This is the excavation of the Jamestown, Virginia kiln site by J. C. Harrington (1950). Harrington's careful description of the remains of the kilns and the functions of the features is crucial to understanding the nature of brickyards as archaeological sites.

Research at the Nance's Ferry site in Alabama provides guidance in the correlation of archaeological evidence with historic local accounts of brickmaking, as well as additional data on the nature of the archaeological remains (Atkinson and Elliott 1978). This study's attempt to address the role of the industry within the plantation on which the kilns were located is helpful in terms of comparative data for the Lowcountry.

Limited excavations have been conducted at other kiln sites throughout the southeast. Documentation for these excavations consists of descriptive information rather than interpretation of the role of the kiln within the historic sites or periods. All of these studies are useful in terms of defining the nature of the brickyards as archaeological

sites. These studies include a field school excavation of a kiln in Alabama (Sheldon n.d.), kiln excavations at Brunswick Town, North Carolina (South 1963), and excavations near Williamsburg, Virginia (Steen 1991). The Alabama kiln was probably a one-time usage site; the information on this site is limited to field records and photographs. South's excavations at Brunswick Town were exploratory in nature, and the resultant report is a brief descriptive document. Steen's draft report provides an excellent description of the archaeological remains at two brick kilns near Williamsburg.

More recent industrial brickmaking sites have been documented by DesJean and Clark in Tennessee (1990) and by Gurcke in Oregon (1987). The Tennessee study documents a fully mechanized brickmaking operation of the early 20th century. Gurcke's book includes an excellent history of brickmaking, a discussion of the types of bricks and kilns, and a review of previous archaeological studies, particularly those which focused on identification of different brick types or manufacturers. Although these mechanized brickmaking operations are not directly relevant to the Lowcountry industry, the studies are useful for basic data on the nature of the brickmaking industry and its evolution.

Archaeological studies within the Lowcountry consist primarily of survey level data which provide information on

the location and nature of specific sites within the Wando River basin. In addition, these studies are useful secondary sources for economic and historic data, particularly for specific sites. Several brickmaking sites have been identified within the Wando River basin, but at this time, only one has been excavated. These surveys include sites within the Francis Marion National Forest (Zierden 1981; Watts 1979), two kilns on Parkers Island (Southerlin et al. 1988), three brickyards within the Dunes West development (Wayne and Dickinson 1989; 1990), an extensive brickyard at Boone Hall (Espenshade and Grunden 1991), and a brickyard at Darrell Creek (P. Brockington, personal communication 1991).

The majority of the information from these sites consists of descriptions of the readily observable features such as brick-lined shores, overgrown kilns, and brick rubble. A small brick kiln within the Longpoint development has been excavated, but the report was not yet available (P. Brockington, personal communication 1991). The initial survey report for this particular kiln provides an excellent brief historic account of brickmaking as well as a series of possible research questions concerning the role of this industry within the region (Trinkley 1987:57-61). The Boone Hall survey provides a limited amount of information on the economic records of that operation, as well as an indication

of the differences between this brickyard and others in the region (Espenshade and Grunden 1991).

The Jimmie Green Lime Kiln Site (Wheaton et al. 1987) contains comparative documentation for the excavation of a Lowcountry site from the closely related industry of lime-burning, as well as information on the economic and historic factors which led to the development of that industry in the Charleston area.

In summary, although each of these sources contributed data to this study of brickmaking, the previous research rarely offers a synthesis of the available data, nor does it provide a regional approach to the role of this industry in the economic development of the Lowcountry. None of the existing documents address the effects of the industry on the environment, or attempt to provide a multiple resource management approach for these sites.

CHAPTER 3 THE WRITTEN RECORD

They keep about 400 hands at work burning brick and make a large fortune at it too (Journalist with Union Army, 1864, cited in Perkerson 1952:101).

Examination of the written record of Lowcountry brickmaking attempted to determine why certain activities and sites were selected, what technologies or processes were utilized for brickmaking, and what historic or economic factors influenced development of these sites.

This landscape archaeology focus differs from that of plantation archaeology, which has been conducted extensively in the southeastern United States in recent years (see Orser 1984; 1989; Joseph 1989). In plantation archaeology, the focus has been on the socio-economic relationships within the individual plantations and between neighboring plantations, and on aspects of acculturation as evidenced in the archaeological remains (Joseph 1989:57-58). The emphasis has been on pattern recognition and comparison of these patterns between different social groups (Orser 1989:34-36). Landscape archaeology looks beyond the artifact or feature to the land itself, in terms of how people use it and modify it, and what these actions say about the culture (Deetz 1990:1-4).

Although the written record for Lowcountry brickmaking proved to be sketchy at best, it did provide evidence of the importance of this industry to its practitioners, as well as an explanation as to why it developed within the region. This record will be discussed in terms of: (1) the factors which gave rise to this craft; (2) who made the bricks; (3) the distribution of the brickyards; and (4) the value of the industry to the brickmakers.

The Economic Background

In 1955, the geographer Merle Prunty identified six distinguishing characteristics of the plantation system:

[1] a landholding large enough to be distinguishable from the larger "family" farm; [2] a distinct division of labor and management functions, with management customarily in the hands of the owner; [3] specialized agricultural production, usually with two or three specialties per proprietorship; [4] location in some area of the South [or world] with a plantation tradition; [5] distinctive settlement forms and spatial organization reflecting, to a high degree, centralized control of cultivating power; and [6] a relatively large input of cultivating power per unit of area. . . . the term "plantation" is never applied to a "system" of labor or capital employment alone, because, viewed geographically, any labor system is but one element in plantation occupancy. No one of the foregoing elements, alone, characterizes the plantation; instead, all six are necessary and interdependent (Prunty 1955:460).

Prunty did not emphasize production of a staple crop; rather, production of a specialized crop or crops destined for cash sale was the important criteria (Orser 1984:1). This system contrasts with the farm, which is generally defined as an operation in which a family supplies the

majority of the labor, and goods are produced for subsistence and domestic consumption (Singleton 1985:1-2). Adams (1987:9) describes the plantation as an agricultural factory in which capital investment was represented by acquisition of land and buildings, the means of production was the source of dependable labor, and there was a product for sale on the market. The source of labor could be human, animal, or machinery. The human labor could be slaves, indentured servants, free labor, or some combination of the three. In return for their efforts, the labor may have been provided with wages, a portion of the crop, housing, food, clothing, or other goods or services.

The southern plantation system can also be characterized as a system with wide variations in size, products, labor systems, location, degree of diversification, and markets. However, certain factors remain consistent. First, the plantation was always, in a sense, a frontier institution, functioning as a relatively self-sufficient system on the periphery of the world market. Second, there was almost always an identifiable element of status differentiation, both within the individual plantations and between plantations in the same region. Third, the settlement pattern reflected centralized control over the means of production, whether this was the workers themselves in the antebellum plantation, or the tools, animals, machines, and seeds in the tenant farm system. At

the individual plantation level, this settlement pattern was also affected by seasonality of production, nature of resource processing, environmental requirements of the specific products, transportation methods, storage requirements, defense needs, and any specialized functions within the system (Adams 1987:9-10).

Traditionally, the southern plantation system has been viewed as an outgrowth of the mercantilism of the 18th and early 19th centuries, in which the industrialized world markets such as England and the northern United States demanded raw materials. In exchange for these raw materials, the plantations were supplied with manufactured products (Zierdan 1986:33). Genovese (1962:422-423) states that the willingness of the South to participate in this system led directly to a lack of industrial development within that region, as well as retardation of the home markets. He points out that in areas characterized by the family farm or yeoman farm system, a network of local markets was developed in response to the need for an outlet for farm products, as well as the availability of cash to buy goods.

While the peasantry is tied to the land, burdened with debt, and limited to minimal purchasing power, the labor recruitment and market pre-conditions for extensive manufacturing are missing (Genovese 1962:423).

In the South, only the planters had expendable cash to any extent, and even they relied heavily on credit against crops

and the barter system. Adams (1987:10) states that this barter system functioned extensively between neighboring plantations in exchanges of everything from wood or seed to individual slaves.

In Genovese's analysis (1962:435-436), there was only one area of the South in which industrialization and a home or urban market could develop, and that was in proximity to cities having a population of over 15,000. There were only four cities which qualified in this category prior to the Civil War: New Orleans, Mobile, Savannah, and Charleston. It was this proximity to Charleston which defined the nature of the plantation development within the Wando River basin.

When South Carolina was originally settled, the Lords Proprietors sought a staple crop which would provide them with a lucrative return. In order to achieve this goal, they encouraged planters from Barbados to migrate to South Carolina with their slaves. Initially, this plan failed due to the new settlers' preoccupation with producing adequate subsistence for themselves, as well as the failure of the tropical crops which were attempted in this temperate climate. Although tobacco and naval stores were successfully produced during this early period, neither was a major export. The main product of the early years was deer skins acquired through the Indian trade (Stoney 1938:20; Scardaville 1985:32).

As a result of the reduction of the deer population and the Yemassee War of 1715, the lucrative deerskin trade came to an end and new products were sought by the settlers. Rice, initially introduced in the 1690s, became the dominant product of the Lowcountry. A fall in rice prices during the 1740s led to the introduction of indigo as a second staple crop. The two crops were complementary in terms of land use; rice required the flooded lowlands, and indigo was an upland crop. The royal bounty on indigo production also encouraged development of this labor intensive crop. The labor needs of both products resulted in a tremendous growth in the number of slaves in the Lowcountry, to the point that just prior to the Revolutionary War, the ratio of blacks to whites in this area was 15 to 1. By the time of the American Revolution, Charleston had become the dominant port in the southeast and the center of a network of large plantations (Stoney 1938:27-29; Scardaville 1985:33).

At the end of the Revolutionary War, the loss of the bounty on indigo combined with foreign competition led to the end of that crop as a plantation product in the Lowcountry (Stoney 1938:31). It was soon replaced by cotton, particularly the long-staple Sea Island variety which could only be produced in the coastal region. Cotton and rice would continue to dominate the plantation economy of the region until the Civil War, although cotton never achieved the prominence in this region that it would acquire

further west. In fact, during the 1820s and 1830s, there was a 10 percent drop in cotton production in South Carolina, compared to large growth in Alabama and Mississippi. This was followed by a modest resurgence during the 1850s, but South Carolina never regained its early 19th century dominance of the Southern economy (Scardaville 1985:34-35).

The parishes surrounding Charleston provide an interesting contrast to the state as a whole, and support Genovese's discussion of the development of an urban market and local industry. The growing city required an increased variety and quantity of subsistence products, which were soon supplied by the surrounding area. Thus, while these parishes produced only 1.8 percent of the state's cotton crop (Table 1), they produced 15.9 percent of the state's rice on only 2.8 percent of the improved land as shown in Scardaville's examination of census records (1985:36-37). This lowland rice production increased 11.8 percent in 1860, compared to a statewide decrease in rice production of 25.5 percent (Scardaville. 1985:36-37). These parishes also provided significant quantities of livestock and produce crops which were sent to the Charleston markets for local consumption. Scardaville (1985:38) states that the Charleston district produced 56.7 percent of all the commercially-grown vegetables in South Carolina on only 3 percent of the state's improved acreage. This included

Table 1. Charleston District Agricultural Production, 1860 Census

Category	South Carolina	Charleston District (All parishes)	% State	Christ Church	% District	St. Thomas & St. Denis	% District
Acres Improved	11,623,859	127,194	2.8	12,814	10.1	6,263	4.9
Value of Livestock	\$23,934,465	\$912,399	3.8	\$78,176	8.6	\$ 42,460	4.7
Value of Animals Slaughtered	\$ 6,072,822	\$185,304	3.1	\$ 5,270	2.8	\$ 3,145	1.7
Value of Orchard Products	\$ 213,989	\$ 5,009	2.3	\$ 1,035	20.7	\$ 0	0.0
Value of Market Produce	\$ 1,873,458	\$106,213	56.7	\$ 4,006	3.8	\$ 0	0.0
Indian Corn (bushels)	15,065,606	383,316	2.5	37,115	9.7	20,575	5.4
Oats (bushels)	936,974	13,757	1.5	2,825	20.5	900	6.5
Rice (pounds)	119,100,528	18,899,512	15.9	180,000	1.0	2,193,502	11.6
Ginned cotton (400 lb. bales)	35,412	6,381	1.8	111	1.7	220	3.4
Wool (pounds)	427,102	19,381	4.5	3,484	18.0	1,100	5.7
Peas & Beans (bushels)	1,728,074	52,546	3.0	5,870	11.2	1,685	3.2
Irish Potatoes (bushels)	226,735	28,144	12.4	915	3.3	0	0.0
Sweet Potatoes (bushels)	4,115,688	323,042	7.8	42,300	13.1	25,335	7.8
Butter (pounds)	3,177,934	54,068	1.7	3,240	6.0	1,100	2.0
Hay (tons)	87,587	13,551	15.5	464	3.4	278	2.1

Source: U.S. Census 1850 as compiled by Scardaville 1985:36-37

potatoes, sweet potatoes, and corn to support livestock such as cattle, sheep, hogs, and poultry. In addition, proximity to the major port provided an incentive for the production of naval stores within the district.

Evidence of the importance of these products to the plantations within the Wando River basin can be seen in an examination of ledgers and diaries of the antebellum period. Ledgers of Anthony Toomer, owner of Richmond plantation on Toomer Creek, list numerous sales of cords of wood, turkeys, corn, butter, cabbages, carrots, chickens, eggs, spinach, asparagus, calves, artichokes, peas, rice, hay, ducks, and building materials such as brick, lime, and lumber (Table 2--Toomer 1783-85). While similar records have not been located for other properties within the study area, these plantations' outputs were probably much the same.

One product which was noticeably important in Toomer's shipments was bricks; in a three year period, he lists shipments of 195,900 bricks to Charleston (Toomer 1783-85). Richmond plantation contains only one kiln (Wayne and Dickinson 1989:5-17 - 5-18); the adjacent Lexington plantation to the northwest has a pair of kilns and an associated brickmaking complex (Figure 3). Elm Grove plantation to the east has two brickyards (Figure 4); similar brickyards are recorded for many of the properties along the Wando and its tributaries (Figures 5 and 6).

Table 2. Wando Plantation Accounts of Dr. Anthony Toomer,
1785

Product	Income Listed (£)		
Bricks	52	12	8
Firewood (Oak)	104	14	-
Rice	34	14	-
Produce/livestock*	21	11	2

* Includes: corn, cabbages, carrots, chickens, eggs, butter, spinach, asparagus, peas, calves, artichokes, ducks, turkeys, hay, potatoes, pigs

Note: Plantation also produced lumber, but not in great quantities

Source: Toomer 1783-85

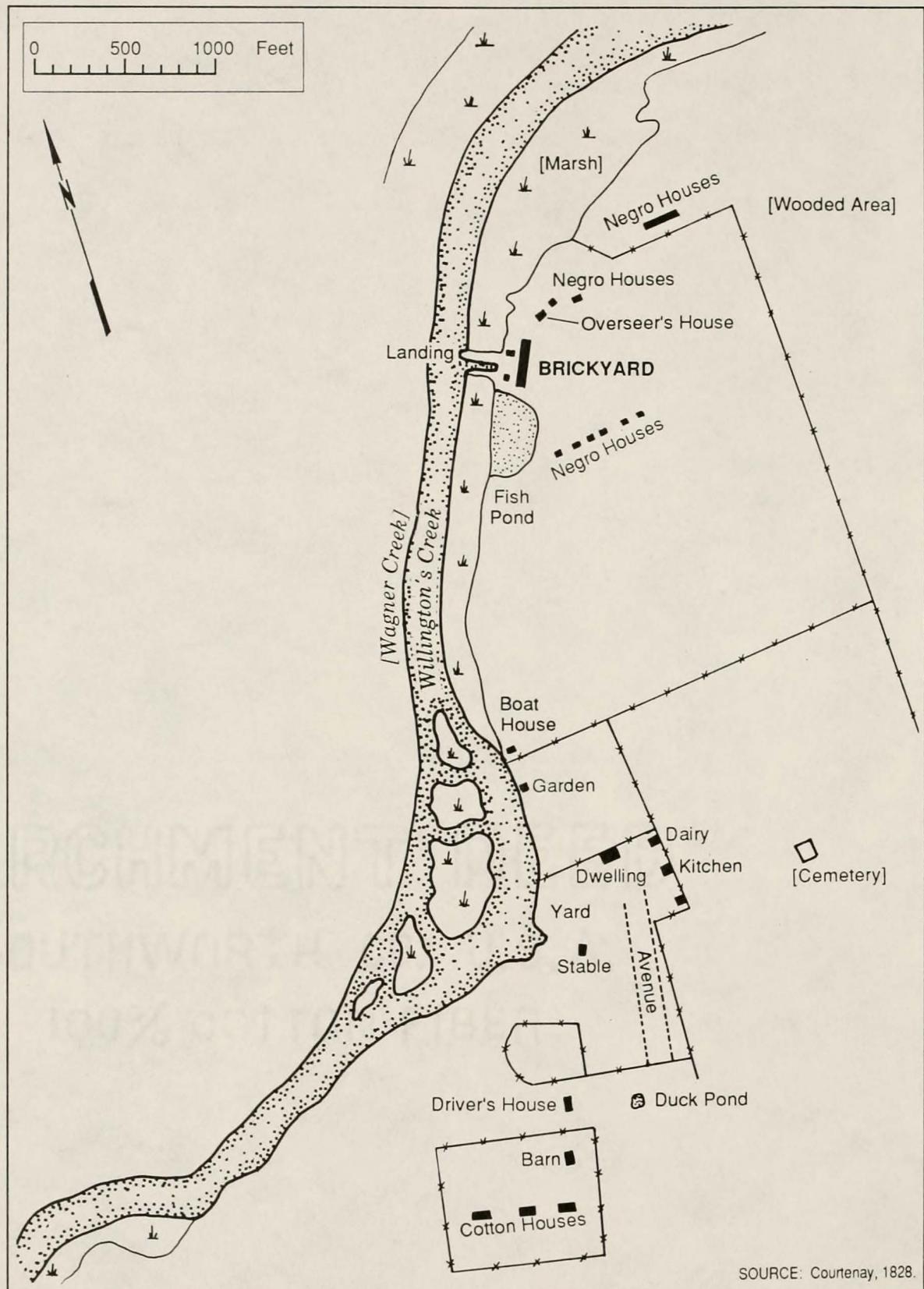
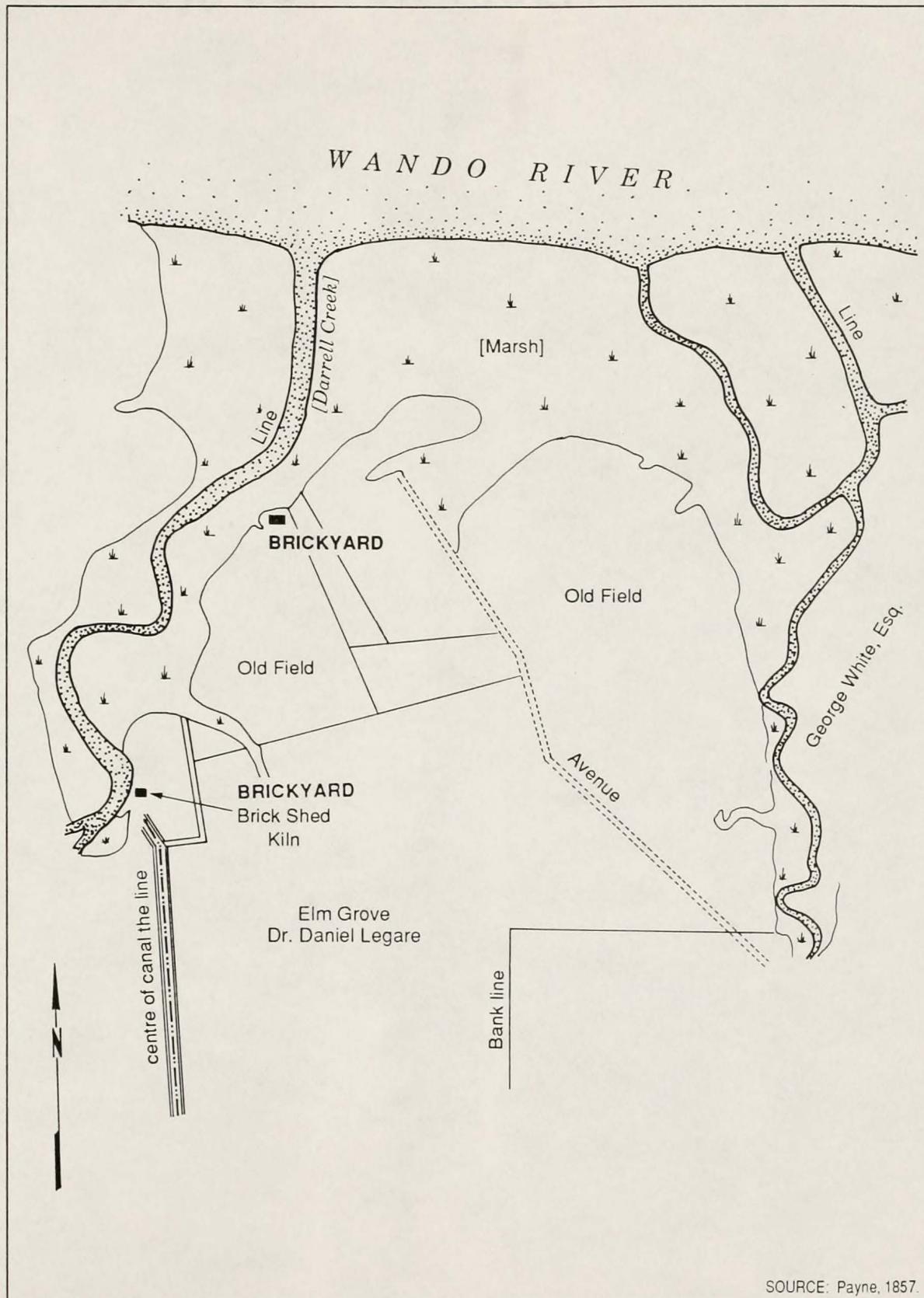


Figure 3. Lexington Kiln Site, Charleston County, South Carolina



**Figure 4. Elm Grove Plantation Brickyards,
Charleston County, South Carolina**

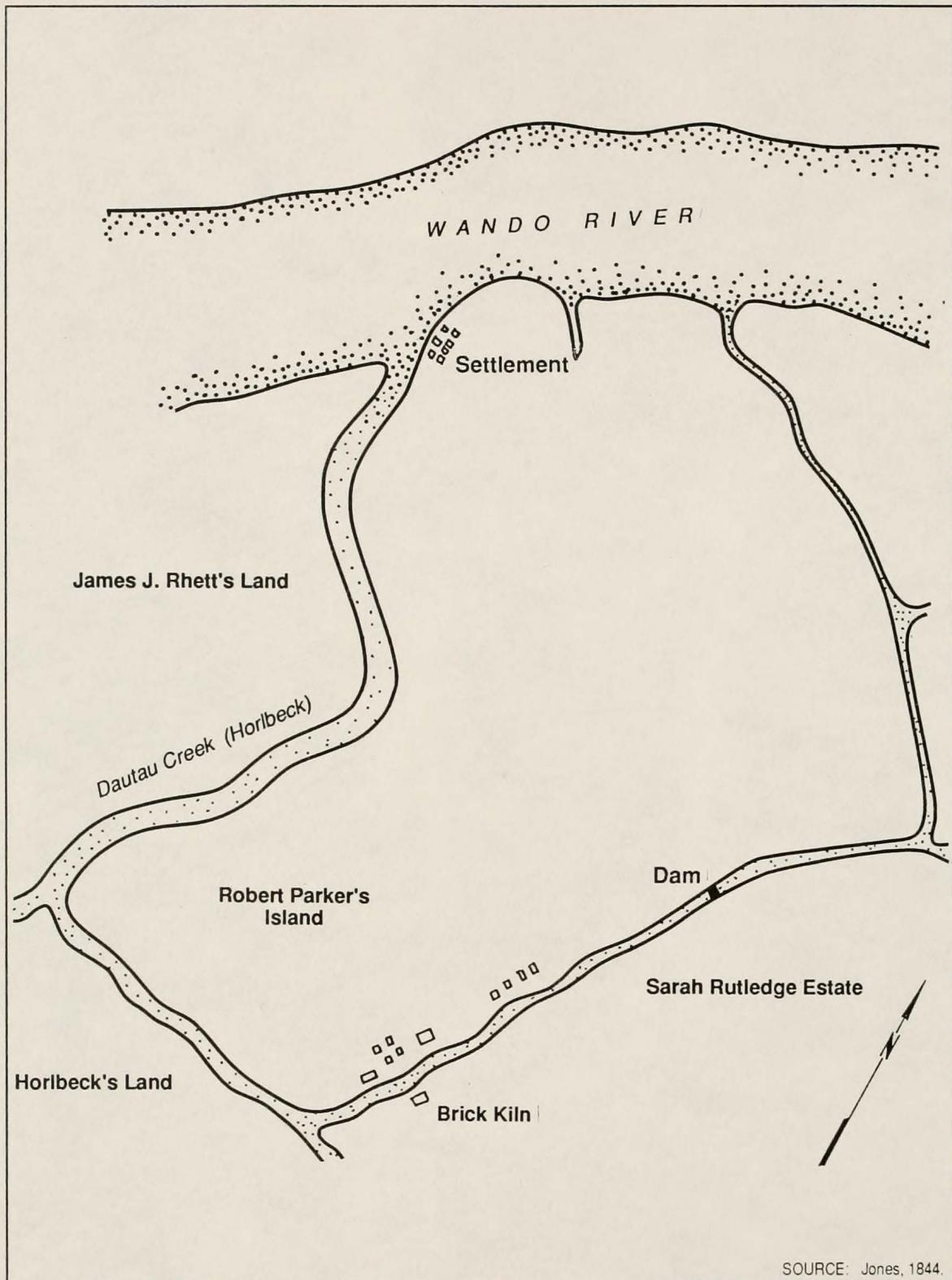
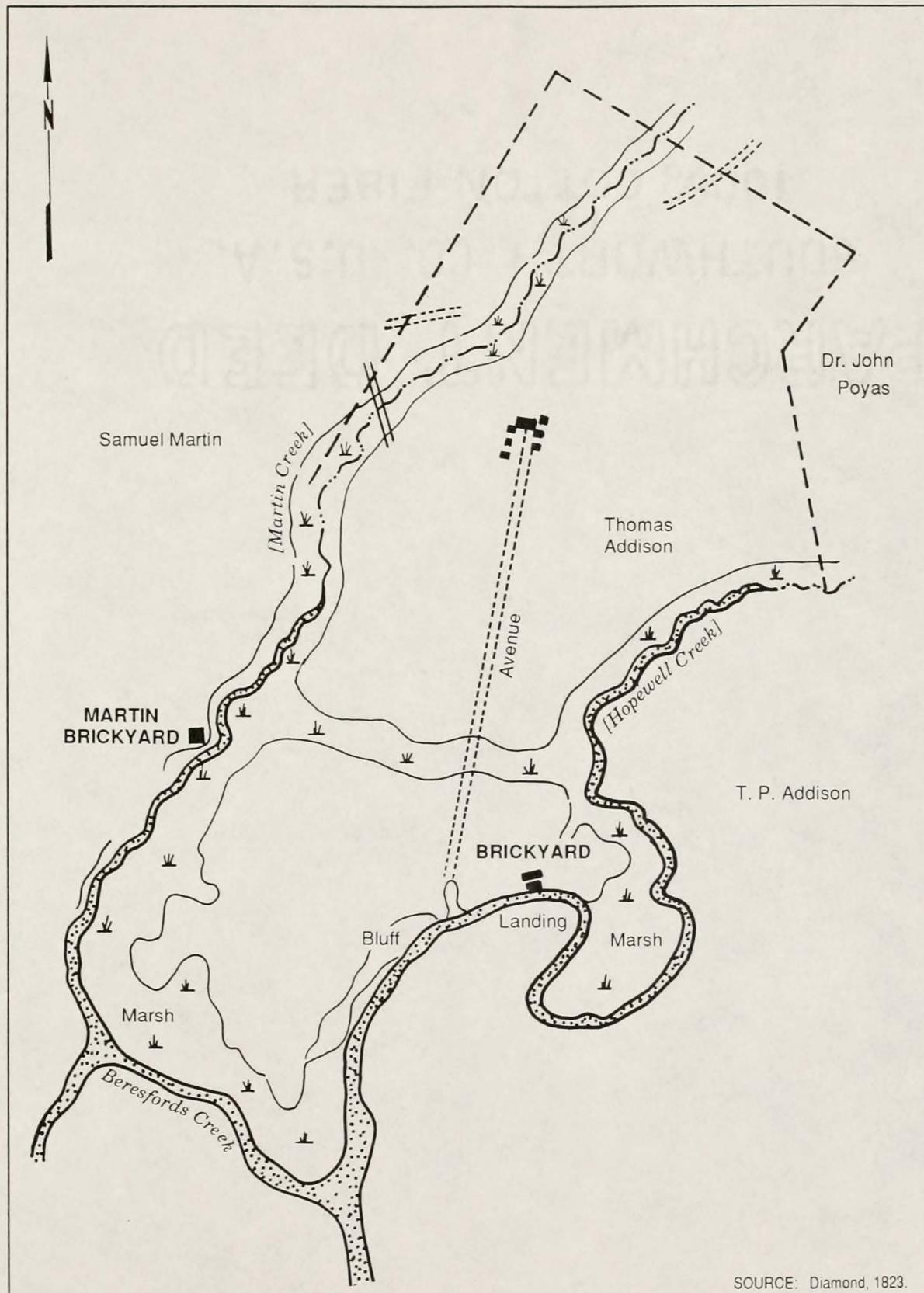


Figure 5. Parker Island Brickyard
Charleston County, South Carolina

SOURCE: Jones, 1844.



**Figure 6. Addison and Martin Brickyards,
Berkeley County, South Carolina**

As pointed out by Genovese (1962:436), Charleston was one of the few locations in the South which provided the market or demand for manufactured goods. As one of the largest of the South's cities, there was a particular demand for building materials, especially fireproof materials. In a brief study of the sources for brick in Charleston, Simons (1934:3) notes that when the occupants of the Lowcountry had to import every manufactured good, it is unreasonable to think that valuable cargo space would have been taken for brick when this product could be produced locally. She cites an architect's estimate that it would take the full cargo room of nine of the largest vessels available, or 45 loads of ballast to import sufficient brick for one structure, the Miles Brewton House (Simons 1934:11). Thus, although there is evidence of importation of bricks (Rauschenberg 1991:103-104), the builders of Charleston largely depended on local production for their materials.

This manufacturing enterprise was of sufficient value to the plantations, that when Arnoldus Vanderhorst of Lexington submitted his post-Revolutionary War claims for his losses to the British, he listed his building "200 feet long by 30 for Sheltering Bricks" as valued at 1000 pounds. This is half the value claimed for his dwelling on the Vanderhorst Kiawah Island cotton plantation (Vanderhorst 1780). His claims do not specifically cite bricks as a loss. The importance of this industry is also evidenced by

the plantation settlement patterns, in which slaves, the means of production, are often located in proximity to the kilns rather than to the owner or the agricultural fields (Figures 3 and 5).

The Wando River basin was an ideal location for the manufacture of brick for Charleston. Although brick was produced along all of the rivers which led to Charleston (Figure 1), this industry appears to have been particularly important along the Wando. The lands drained by this river in the Wando Neck and lower Berkeley County lacked the cash crops of the Cooper and Ashley River basins, but had a very strong tie to the Charleston market both economically and logically.

The region is well-suited for brick production. The Wando River is highly saline, inhibiting rice production except within small areas at the upper reaches of the creeks. Soils within this region are primarily poorly drained flatwoods types which are not particularly suitable for crops such as cotton or indigo. However, the area has all of the resources for brickmaking, as evidenced by a property advertisement which appeared in 1747:

To be Sold . . . the Plantation where the Subscriber now lives, convenient to a good Landing on Wando River . . . also great conveniency for Brick Works, there being excellent Clay close to the Landing with Plenty of Wood at Hand for burning . . . William Bruce (South Carolina Gazette 1747a).

In addition, brickmaking was often a winter and spring occupation (Gurke 1987:5; Graves 1854-55; Stoney 1938:48), which resulted in resource scheduling which complemented the produce farming, corn raising, livestock production of the region. As a result of the combination of available resources, a ready market, and a suitable labor force (slaves), the majority of the plantations in the area display evidence of brick kilns with associated landings along the streams. As one writer said of the Cooper River brickmaking industry:

The extensive brick-making on Cooper River was sometimes a very profitable second string to rice. One old lady, said to have been Mrs. Frost, advised by three successive dreams, turned to it as an industry, and like [John] Gordon, made a fortune (Irving 1932:23).

This statement clearly applies to the planters along the Wando River.

In addition to providing Charleston with subsistence and construction products, the plantations in the District served another important function.

Land and plantations were excellent investments for a business man's surplus or for the savings of a professional man or politician; a planter's life was a pleasant goal for their old age and an agreeable career for their children. So most prosperous town men were considerable planters as well (Stoney 1938:25).

By the same token, the dominance of the plantation products in the region's economy gave the planters tremendous political influence and leadership in both the city where

they maintained town houses, and within the state (Stoney 1938:41).

The plantations of the Wando River basin represented a nearby location for Charleston businessmen who wished to acquire the financial investment and status without the problem of distance from their major source of income--their Charleston businesses. At the same time, proximity to Charleston allowed those who were primarily planters to invest in Charleston businesses which complemented their plantation activities, such as factorages, shipping, and brickmasonry. An example of this interrelationship can be seen at Lexington Plantation: the Vanderhorsts, primarily planters, also owned wharves and stores in Charleston. The next owner of this property was A. S. Willington, who was primarily a Charleston businessman and newspaper publisher. The third owner, Effingham Wagner, was also involved in Charleston commercial activities. All of these owners of Lexington owned homes in Charleston (Wayne and Dickinson 1990:3-20 - 3-21). Their neighbors were equally involved in Charleston commerce: Anthony Toomer of Richmond plantation southeast of Lexington, and the Horlbecks of Boone Hall were brickmasons in Charleston (Hollings 1978:89, 91); William Hopton, owner of the property northwest of Lexington, was a lawyer (Gregorie 1950:604).

Thus, in the Wando River basin, a picture develops of plantations with close economic and social ties to nearby

Charleston. These plantations provided the foodstuffs consumed on Charleston's tables, as well as the firewood to cook it and heat the houses, and the materials for the buildings. At the same time, the properties provided an investment opportunity for a number of Charleston businessmen. It appears that in an agriculturally marginal area such as the flatwoods of the Wando Neck and lower Berkeley County, brickmaking became a significant factor in the economic success of these plantations, which seems to have been based on production of a diverse group of products rather than a single staple crop.

Brickmakers and Brickyards

As indicated in the introduction to this study, the origin of the craft of brickmaking as practiced in the Carolinas was from southeastern England, the Low Countries of Europe, and Huguenot France. Many of the early settlers of the Carolinas were French Huguenots who came to this region because of the liberal religious policies of the Lords Proprietors. A large Huguenot enclave was established in St. Denis Parish (Berkeley County), not far from the Wando River. Many of these Huguenot emigres had a background in the building trades and utilized that experience to establish businesses in Charleston. The landed families of the Lowcountry intermarried, providing an additional opportunity to disseminate the knowledge of

building and of manufacturing materials (Wheaton et al. 1987:54).

It is important to note, however, that although the planters and businessmen may have listed themselves as brickmakers, it is highly unlikely that they actually were involved in the manual labor of making brick. As Eaton points out,

During the eighteenth century and to a lesser extent in the ante-bellum period, household industries were carried on by slaves, who were employed on the large plantations to weave cloth, to make bricks, staves, and barrels, to manufacture nails, to boil soap, to do blacksmith work, and even to make artistic furniture (Eaton 1966:372).

Thus, the role of the named "brickmaker" in the Lowcountry was essentially that of the supervisor and instructor. Often, the "brickmaker" was, in fact, merely the property owner and an unnamed overseer directed the manufacturing. For example, in 1770, John Moore, identified as a brickmaker in St. Thomas and St. Denis Parish, advertised for an overseer who understood brickmaking (South Carolina Gazette 1770).

Little documentary evidence exists for the unnamed slaves and overseers who provided the labor and skill for brickmaking, other than an occasional advertisement such as that for a slave sale in 1849 which listed four female slaves as "brick stowers" (Capers and Huger 1849). This same advertisement provides evidence of the importance of this skill in its heading, which lists "Several

Brickmakers..." as the first skill of those being sold (Capers and Huger 1849). As a result of this lack of documentary information, this discussion of the brickmakers of necessity focuses on those property owners who were identified in the written record as practitioners of this trade.

Table 3 provides a list of the people who were identified as brickmakers in the Lowcountry, as well as the location of their brickyards when available (Figure 7). The gaps in time reflect the gaps in the written record as well as the nature of that record. It is interesting to note that, in a male-dominated society, several women were listed as brickmakers. At least two, Hannah Goodbe and Mrs. Frost, were actively engaged in providing bricks to the market (Irving 1932:23; Simons 1934:9).

The information on 18th century brickmakers was gathered primarily from newspaper advertisements and records of transactions for building materials. The later antebellum information was based largely on map references, city directories, and census records.

The first reference to brickmaking in the Lowcountry was in a 1664 letter which stated that there was a "rich ground of a grayer colour, they have made Brick of the Clay, which proves very good" (Carroll 1836:12). Apparently, little brick was being made, however, since a 1682 letter stated "tho here is excellent Brick made, but little of it"

Table 3. Brickmakers Identified in the Charleston Area Between 1745 and 1860

Period	Name	Location
1745-1760	John Cockfield	Ashley River
	Richard Lake	Wappoo Creek, Ashley River
	Zachariah Villepontoux	Parnassus, Back River
	Alexander van der Dussen	Cooper River
	Thomas Wright	Cooper River
	Nathaniel Snow	Cooper River
	James Coachman	Cooper River
	Hannah Goodbe	Cooper River
	Samuel Elliott	Foster Creek
	Benjamin and Isaac Mazyck	Foster Creek
	James and William Withers	Goose Creek
	John Moore	Mooreland, Thomas Is., Beresford Creek
	Peter & John Horlbeck	Boone Hall, Horlbeck Creek
	Peter Croft	Palmetto Grove, Horlbeck Creek
	James and Deborah Fisher	Cainhoys, Wando River
	James Sandeford	Cainhoys, Wando River
	Samuel Warnock	Cainhoys, Wando River
	Hugh Cartwright	Cainhoys, Wando River
	Mrs. (Thomas?) Lynch	Christ Church Parish, Wando River
	William Bruce	Wando River
	Lionel Chalmers	Wando River
	John Laurens	Wando River
	William Hopton	Wando River
	Elizabeth Hill	Wando Neck
	John Hutchins	
	Thomas Gordon	
	Dupont	
	Charles Cantey	
	Samuel Cordes	
	Joseph Palmor	
	John Williams	
1761-1776	Thomas Addison	Beresford Creek
	Anthony Toomer	Richmond, Toomer Creek
	John Daniel	Christ Church Parish
	Henry Gray	Fosters Creek
	Crosby	
	Joseph Verree	
	Blaike	
1790-1830	Peter Gaillard Stoney	Medway, Cooper River
	John Gordon	Brickyard Plantation, Moreland,
	Frost	The Grove, Cooper
	Edward and Samuel Martin	Cooper River
	William Marsh	Beresford Creek
	John and George Parker	Fairchild's Creek, Christ Church Parish
	John Horlbeck	Parker's Island, Horlbeck Creek
	James Rhett	Boone Hall, Horlbeck Creek
	Arnoldus Vanderhorst	Palmetto Grove, Horlbeck Creek
	Huger	Lexington, Wagner Creek
1850-1860	Robert and Thomas Parker	Parker's Island, Horlbeck Creek
	John Horlbeck	Boone Hall, Horlbeck Creek
	Daniel Legare	Elm Grove, Darrell Creek
	T.H.I. White	Christ Church Parish
	John Sanders	St. Thomas & St. Denis Parish
	John L. O'Hear	" " " " "
	John Marshall	" " " " "
	J. B. Gordon	" " " " "
	J. Venning	" " " " "
	G. Thompson	" " " " "

Sources: SCG 1741-1778; Commissioners of Fortifications 1755-70; Council of Safety 1903:18-23; Hollings 1978; Irving 1932:23; Huger 1812; Simons 1934; n.d.; Stoney and Staats n.d.; Ravenel 1835; Hilligan 1790; Mears & Turnbull 1859; McElligott 1989; U.S. Census 1850; Porcher 1944:160-164; Horlbeck 1770; Trinkley 1987:23-28; Wayne and Dickinson 1989:3-27 - 3-29; Rauschenberg 1991:105, 110

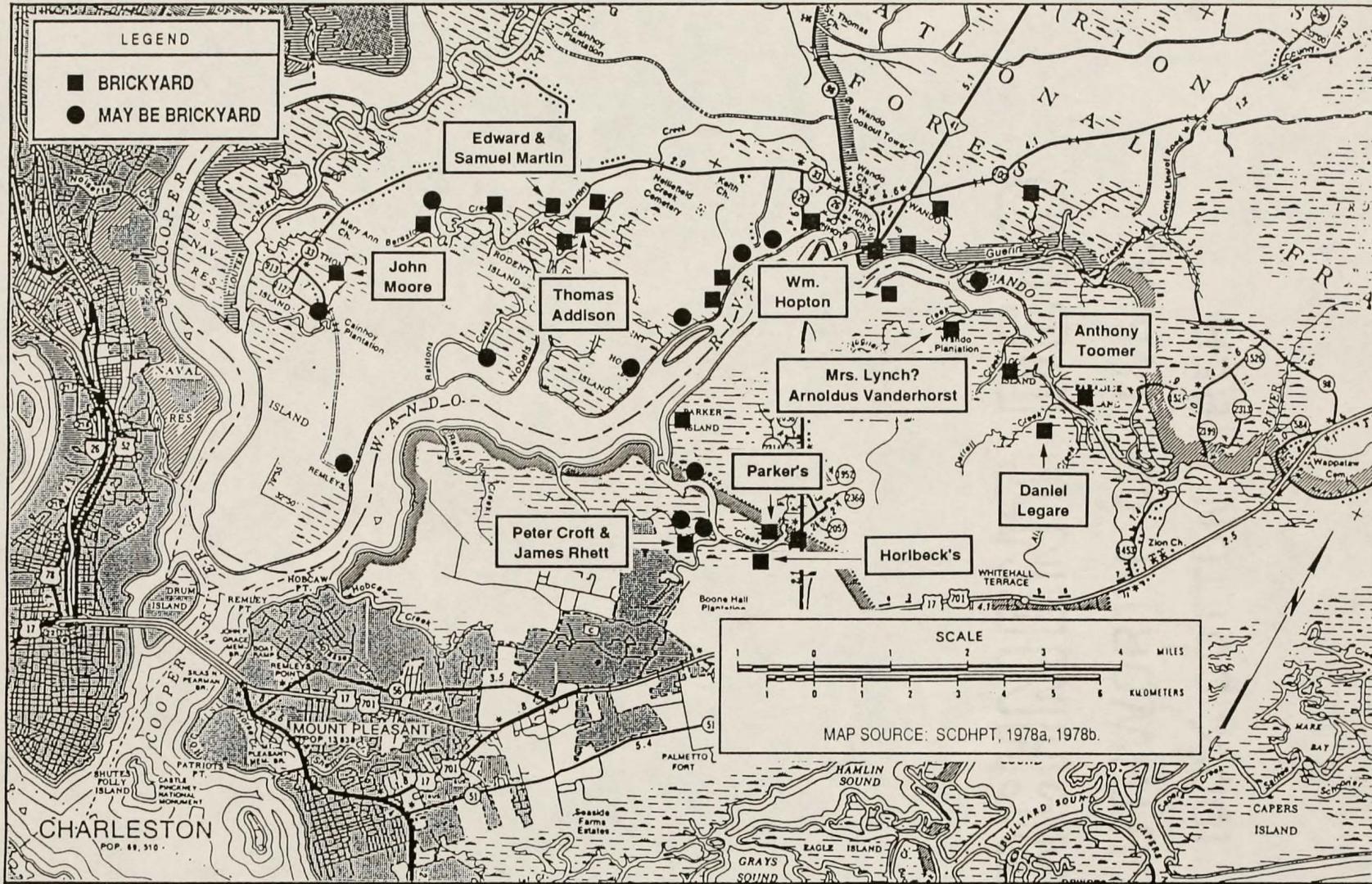


Figure 7. Brickyards Identified by Owner, 1745-1860,
Wando River Basin, South Carolina

(Salley 1911:181). Within 20 years, Lawson stated that there were numerous brick buildings in Charleston with additional large ones under construction using what he described as good brick and tile made locally (Lawson 1709).

By the 1740s, when Charleston's building code required the use of fireproof materials, numerous brickmakers and properties could be identified in the written record. The most important brickmaker of this period was probably the Huguenot, Zachariah Villepontoux of Parnassus plantation on the Back (Cooper) River. Villepontoux's bricks were cited as the standard when St. Stephen's Parish attempted to order bricks for construction of a new chapel in 1759 (Porcher 1944:165). Villepontoux had provided 194,400 of the bricks for Charles Pinckney's house in 1745; Nathaniel Snow, a Mr. Dupont, and Hannah Goodbe provided the balance of 81,400 bricks (Simons 1934:8). Villepontoux has also been identified as the brickmaker for St. Michaels Church in Charleston, a supplier to the merchant Henry Laurens, and provider of part of the brick for fortifications for the city (Hollings 1978:20; Rogers 1974:358-359; Commissioners of Fortifications 1755-70). In addition to making bricks, Villepontoux was a planter, tax collector, and leader of several charitable and religious organizations (Edgar and Bailey 1977:690-691).

St. Stephen's Parish records were the source for the names of other brickmakers who were not quite as successful

as Villepontoux (Porcher 1944:160-164). The parish initially contracted with Samuel Cordes in August of 1759 for 120,000 bricks, but when delivered in October of 1762, the church officials rejected the brick as "not being sufficiently burnt" (Porcher 1944:163). In April of 1765, the Commissioners of the Church met to examine bricks made by Joseph Palmer "by the size of Mr. [Ville]Pontoux", but also rejected these since "they are entirely too Bad, and are not Proper for Building a Church" (Porcher 1944:163-164). In June of 1766, the Commissioners contracted with Charles Cantey to make 150,000 bricks of a size equal to Villepontoux's (Porcher 1944:165). Since no further reference is made to bricks in the minutes, Mr. Cantey was evidently successful in supplying the church's needs.

Construction of the many fortifications in and around Charleston during the mid-eighteenth century utilized numerous brickmakers, including Villepontoux, James and William Withers, Thomas Gordon, Joseph Verree, Mr. Blaike, and Anthony Toomer. These fortifications included Dorrel's Fort, Ft. Johnson, and Broughton Battery (Commissioners of Fortifications 1755-1770; Council of Safety 1903:18-23). Toomer also supplied bricks for the Pringle house in Charleston (Toomer 1783-85).

Advertisements for property in the South Carolina Gazette provided many names of brickmakers during the 1740s. John Laurens offered a tract of land on the Wando River

"with conveniences for making Brick" (South Carolina Gazette 1741). A year later, Elizabeth Hill and Lionel Chalmers both offered land on the Wando "very convenient for making Brick or Lime" (South Carolina Gazette 1742a; 1742b). Similar descriptions were used for lands on the Wando River offered in 1746 by Samuel Warnock and in 1747 by James Sandeford, Sr. and William Bruce (South Carolina Gazette 1746a; 1747a; 1747b). The property in Christ Church Parish advertised by bricklayer Hugh Cartwright on behalf of Mrs. Lynch (perhaps Mrs. Thomas Lynch) included unburnt bricks (South Carolina Gazette 1746b). The most detailed contemporary description of a brickyard for this period came from the advertisement for the 1748 sale of the property of James and Deborah Fisher:

To be Sold, a Plantation on Wando-River, near Cainhoys, containing 500 Acres of Land, proper for Corn, Rice and Indigo, with a Dwelling House, Barn and Out Houses, and at the Landing a Good Brick Yard (with 2 large Houses, near 100 feet in Length, and about 30 in Breadth each) and a good Brick case for burning them. About 45 feet in Length, near 20 in Breadth, and 9 in Height, with 12 arches, and a Division in the Middle, a large quantity of Wood near at Hand, with other conveniences. Likewise a number of slaves, among whom are very good Coopers, several Sawyers and Brick Moulders; and also Household Furniture. . . (South Carolina Gazette 1748).

The two large houses referred to in this advertisement were probably drying sheds.

Other Cooper River brickmakers identified by the advertisements were Alexander van der Dussen, Benjamin Mazyck, Samuel Elliott, and Thomas Wright (Hollings

1978:17). Van der Dussen and Mazyck offered bricks for sale in 1745 and 1749, while the property being sold by Elliott's estate included a large quantity of burnt and unburnt bricks and tiles (South Carolina Gazette 1745; 1749a; 1778). Two brickmakers were identified on the Ashley River from these advertisements--John Cockfield and Richard Lake (South Carolina Gazette 1747c; 1749b).

Brickmaker John Moore, Jr. of Beresford Creek in St. Thomas and St. Denis Parish was identified by his previously mentioned advertisement for an overseer who understood brickmaking (South Carolina Gazette 1770). Moore was the nephew of brickmaker Zachariah Villepontoux and operated both brick and lime kilns on his plantation on Thomas Island. His relationship to Villepontoux undoubtedly provided him with exposure to brickmaking (Wheaton et al. 1987:54-55). In addition, he was married to Elizabeth Vanderhorst (Wheaton et al. 1987:59); the Vanderhorst family operated a brickyard at Lexington plantation on the Wando River. Besides brickmaking, Moore served in the Royal Assembly, the First Provincial Congress, and as a justice of the peace (Wheaton et al. 1987:54; Hollings 1978:19).

William Hopton, owner of a plantation on the Wando River opposite Cainhoy, was an excellent example of the Charleston businessman who also made bricks. Hopton was a well-known Charleston attorney and merchant who referred to his property on the Wando as "Starvegut Hall" (Berkeley and

Berkeley 1982:231). Examination of an 1819 plat map for this property shows a brickyard on the plantation (Wilson 1819).

At approximately the same time that Hopton owned property on the Wando, Peter Croft developed his plantation Palmetto Grove on what is now Horlbeck Creek. Since this property contains the remains of a brick kiln, it is assumed that Croft was making bricks, although the kiln could have been the work of the other long-term landowner of the property, James Rhett, who owned Palmetto Grove from 1834 to 1854 (Trinkley 1987:26).

The other major brickmakers of the 18th century were Peter and John Horlbeck. The Horlbeck family developed what would become the longest lasting of the brickyards in this region. The Horlbeck brothers were selling and laying bricks as early as 1766, including bricks for the U. S. Customs House in Charleston (Simons n.d.), but could not be tied to a specific brickyard until the early 19th century. In 1817, their sons, John and Henry Horlbeck, acquired Boone Hall plantation on what is now Horlbeck Creek. A deed issued just prior to this acquisition mentioned a brickyard as one of the property's features. By 1839, this brickyard was under the control of John Horlbeck, Jr. (Espenshade and Grunden 1991:14).

Within ten years, the Boone Hall brickyard claimed production of 4,000,000 bricks per year using 85 slaves

(U.S. Census 1850). This production, plus a reference in the census to the use of coal, indicated that the Horlbecks may have been using steam-powered brick-making machinery (Espenshade and Grunden 1991:15). The Boone Hall brickyard continued to operate throughout the Civil War up until the late 19th century (Espenshade and Grunden 1991); this is the only brickyard in the basin which seems to have operated after the Civil War. It is possible that the high production of the Horlbeck property forced the smaller brickyards out of business by 1860.

In 1875, John Horlbeck acquired a neighboring brickyard on Parker Island. This brickyard was probably originally developed by John and George Parker who are listed as brickmakers in the late 18th century Charleston city directories (McElligott 1989). An 1844 map shows the island and its brickyard as the property of Robert Parker (Jones 1844). Horlbeck acquired the property from Parker's son Thomas (Southerlin et al. 1988:22).

Although there were fewer brickmakers identified during the 19th century, they seem to have had larger operations. Peter Gaillard Stoney of Medway, for instance, was the major supplier of brick for Fort Sumter in 1830 (Stoney and Staats n.d.:10). John Gordon owned three properties on the Cooper River and its tributaries: Brickyard Plantation, Moreland, and the Grove on Beresford Creek. He was apparently making bricks at all of these, and when he offered the Grove for

sale, he included 11 oxen "used for trampling the clay" plus "the unburnt brick" (Ravenel 1835). Gordon was said to have gotten wealthy from brickmaking, inspiring a neighbor, Mrs. Frost, to do the same (Irving 1932:23).

Another indication of the extent of the brickmaking during this period was the move to mechanization. The Hugers of the Cooper River investigated a brickmaking machine made in Philadelphia; although the machine cost over \$1,000.00, Huger indicated it would be worth the money if it worked (Huger 1812). At least one plantation in the Charleston area did acquire such a machine; it is now in the collections of the Charleston Museum (News & Courier 1991). As previously noted, the Horlbecks were probably using steam power and possibly brickmaking machines at Boone Hall. At this scale of production and level of technology, these brickyards represent the transition to full-fledged manufacturing facilities, although they continued to be operated as an aspect of the plantations on which they were located.

Arnoldus Vanderhorst of Lexington plantation considered brickmaking to be so important that he located his slave cabins and overseer's house at the brickyard (Figure 3). He valued the brick shed at this operation at 1,000 pounds, half the value of his dwelling on Kiawah Island (Vanderhorst 1780). This operation boasted two kilns and a double landing with a slip (Courtenay 1828).

Beresford Creek remained a center for brickmaking during the 19th century. In addition to John Gordon's and John Moore, Jr.'s operations, the creek served as an outlet for the brickyards of Thomas Addison and Edward and Samuel Martin (Diamond 1823).

By 1850, only nine brickmakers were identified in the project region (Table 4), but with the exception of Daniel Legare of Elm Grove, all were making over 300,000 bricks per year. Two, John Horlbeck and John Marshall, were making over a million bricks a year (U.S. Census 1850).

Examination of a plat of Legare's property (Figure 4) does show two brickyards, but the census record indicates that he only operated them about two months of the year. It is possible that these brickyards originally dated to an earlier period of Elm Grove's operations.

With the exception of the Boone Hall operation, there is no evidence for the continuation of the brickyards after the Civil War. This may be a function of several factors. First, the South was economically devastated by the War and lost the cheap labor source of slavery. Second, many of the plantations in the Lowcountry were destroyed during the War, or lost or abandoned by their owners during the post-bellum period. Third, industrialization reached the brickmaking industry, resulting in enormous production increases at lower labor costs and with a better product. As a result brickyards using hand molding could not compete.

Table 4. Brickmakers Listed in the Charleston District Census of 1850

Name	Capital Invested	Raw Materials Kind, Qty., Value	Hands Employed Male Female	Average Monthly Cost of Labor Male Female	Quantities	Value
<hr/>						
CHRIST CHURCH PARISH						
Daniel Legare	\$ 7,000	pine 70 cords \$ 135	7 7 (about 2 months)	\$ 7 \$ 5	70,000	\$ 560
John Horlbeck	\$75,000	wood 3,500 cords \$5,250 coal 200 tons \$1,400	50 35	\$ 50 \$ 75	4,000,000	\$28,000
T. H. I. White	\$17,500	wood 600 cords \$ 900	13 17 (6 months)	\$ 91 \$ 60	700,000	\$ 5,600
<hr/>						
ST. THOMAS & ST. DENIS PARISH						
John Sanders	\$28,000		15 15	\$105 \$ 75	700,000	\$ 4,900
John L. O'Hear	\$20,000		11 11	\$ 77 \$ 55	580,000	\$ 4,060
John Marshall	\$45,000		30 20	\$210 \$100	1,500,000	\$10,500
J. B. Gordon	\$30,000		15 12	\$105 \$ 60	600,000	\$ 4,200
J. Venning	\$30,000		13 10	\$ 91 \$ 50	600,000	\$ 4,200
G. Thompson	\$10,000		7	\$ 49	300,000	\$ 2,100
TOTALS	\$262,500		161 127	\$785 \$480	9,050,000	\$64,120

Source: U.S. Census 1850

Brickmaking in the post-bellum period seems to have shifted to large scale operations in the piedmont region of the state with its extensive clay deposits (Johnson and Heron 1965:45, 47). Proliferation of rail transportation during the late 19th century facilitated this shift out of the Lowcountry.

Production and Value

The extent of the brick production and the value of these bricks has been mentioned in the previous discussions of the development of the industry and the brickmakers. This section will summarize that data and examine certain items more closely.

When the Charleston building code of 1740 required fireproof construction, it also established the cost for local bricks at 6 pounds per thousand (Edgar 1972:301). Even though New England bricks were available at the cheaper rate of a little over 3 pounds per thousand, merchant Robert Pringle stated that these bricks were unpopular and didn't sell because of their smaller size (Edgar 1972:301).

The 1740 price appears to have generally held through most of the 18th century, although there were occasional variations, probably based on quality or special contract arrangements. In 1749, one advertiser offered a discount price of 4 pounds per thousand for quantities over 10,000 bricks (South Carolina Gazette 1749c). During the building of the fortifications around Charleston in the late 1750s,

the Commissioners were paying between 5 and 12 pounds per thousand for bricks (Commissioners of Fortifications 1765). The Horlbecks offered bricks at 7 pounds per thousand during the period from 1766 to 1767 (Horlbeck 1770); however, St. Stephen's Church was paying only 6 pounds per thousand for brick at this time (Porcher 1944:160). At the time of the Revolutionary War, brick costs remained at 6 pounds per thousand (Council of Safety 1903:18-23). But in 1783, soon after the War, Anthony Toomer seems to have been selling his bricks at approximately 2 pounds per thousand (Toomer 1783-85).

After the establishment of the United States dollar in the late 18th century, brick prices seem to have stabilized at \$4.00 to \$7.00 per thousand based on the grade of brick. These prices remained in effect during the antebellum period (Ramey & Hughes 1839; U. S. Census 1850; Horlbeck 1856-75).

It is difficult to estimate the total brick production in the Wando River basin prior to the information provided in the 1850 census report. Some idea of the scale can be drawn from references to the amounts of brick ordered for specific projects. A single structure, the 1745 Pinckney house in Charleston, required a total of 275,800 bricks, ordered from three makers. During this same period, Zachariah Villepontoux provided almost 417,000 bricks for St. Michael's Church (Simons 1934:9). Hollings stated that it took about 100,000 bricks for a two-story, forty-five

foot square house (Hollings 1978:12). After the Revolutionary War, Arnoldus Vanderhorst of Lexington Plantation claimed losses of materials for construction of a "3 story brick house in Charleston" at a value of 2,500 pounds, which could represent over 400,000 bricks (Vanderhorst 1780). The many fortifications continually required bricks; Villepontoux and Goodbe provided 94,000 between 1757 and 1758, while two other brickmakers provided an additional 68,600 during the same period (Simons 1934:8; Commissioners of Fortifications 1765). Between 1775 and 1776, the Second Council of Safety purchased 40,500 bricks for Dorrels Fort from three brickmakers (Council of Safety 1903:21-23).

Gurcke estimated that an expert brick molder could make between 3,000 and 5,000 bricks per day (Gurcke 1987:19). This estimate is consistent with the records of Medway plantation as well as the description of Florida brickmaker Crary (Stoney 1852; Crary 1889). Thus, when Graves indicated he was molding two tables each day (Graves 1854-55), he was probably producing at least 10,000 bricks a day. Since he molded for about a week at a time and fired his kilns three or four times in a season (Graves 1854-55), he was conservatively producing 280,000 bricks per season. At even the lowest value during that period, \$4.00 per thousand, this would yield \$1,120.00 a season from an activity that evidently occupied only part of the labor

force, since Graves indicates that other slaves were cutting wood or manuring fields while brickmaking was in progress (Graves 1854-55).

Based on the available comparative data, it seems likely that the Lexington Plantation brickmaking complex on Wagners Creek, which included two kilns and was obviously an important part of the plantation as evidenced by the settlement pattern, could have been producing several hundred thousand bricks each season (Wayne and Dickinson 1990:6-10 - 6-11). This could translate into more than \$2,000.00 per year income for the planter, without the investment in seed or stock required for agricultural activities, or the risks of crop failure or insect damage.

Total annual production figures were located for three antebellum brickmakers prior to the 1850 census: Anthony Toomer, Peter Gaillard Stoney, and the Horlbecks. Toomer's brick production for the three year period between 1783 and 1785 totalled 195,900 bricks. The money received for these bricks represented approximately 25 percent of his plantation's income for a single year (Table 2--Toomer 1783-85).

Stoney's Medway plantation shipped 594,000 bricks in the ten month period from 1852 to 1853 (Table 5), while the Horlbecks shipped 158,150 bricks during a single week in 1847 (Table 6). If production was maintained at these levels all year, that would provide a brick value of

Table 5. Medway Plantation Shipping Records, 1852-53

Date	Number Bricks	Type	Vessel
5/18/52	12,000	brown	
5/25/52	12,000	grey	
6/1/52	12,000	grey	
6/8/52	12,000	grey	
6/15/52	12,000	grey	
6/22/52	12,000	grey	
6/29/52	12,000	grey	
7/6/52	12,000	grey	
7/12/52	15,000	grey	Mr. Fairchild's sloop
7/13/52	12,000	brown	Sloop Ann
7/20/52	12,000	grey	
7/27/52	12,000	grey	
7/28/52	14,000	brown	Mr. Fairchild's sloop
8/2/52	14,500	grey	Mr. Fairchild's sloop
8/3/52	6,500	grey	Sloop Ann
	5,500	brown	
8/5/52	15,000	grey	Mr. Fairchild's sloop
8/10/52	10,500	grey	Sloop Ann
	1,500	brown	
8/17/52	12,000	grey	Sloop Ann
8/31/52	12,000	brown	Sloop Ann
9/7/52	14,000	grey	Mr. Fairchild's sloop
9/9/52	12,000	grey	Sloop Ann
9/14/52	14,000	grey	Mr. Fairchild's sloop
9/14/52	12,000	grey	Mr. Stoney's sloop Ann
9/18/52	14,000	grey	Mr. Fairchild's sloop
9/21/52	12,000	brown	Mr. Stoney's sloop Ann
9/22/52	14,000	grey	Mr. Fairchild's sloop
9/28/52	12,000	grey	Mr. Stoney's sloop
10/29/52	7,000	brown	Mr. Fairchild's sloop
	7,000	grey	
11/2/52	8,000	grey	Mr. Fairchild's sloop
	6,500	brown	
11/3/52	6,000	grey	Mr. Stoney's sloop Ann
	6,000	brown	
11/5/52	9,000	grey	Mr. Fairchild's sloop
	5,000	brown	
11/8/52	12,000	grey	Mr. Stoney's sloop
11/10/52	9,000	grey	Mr. Fairchild's sloop
	5,000	brown	
11/16/52	12,000	grey	Mr. Stoney's sloop
11/23/52	6,000	grey	Mr. Stoney's sloop
	6,000	brown	
11/30/52	9,500	grey	P. G. Stoney's sloop
	2,500	brown	
12/7/52	12,000	brown	P. G. Stoney's sloop
12/17/52	12,000	brown	P. G. Stoney's sloop
12/19/52	12,000	grey	P. G. Stoney's sloop
1/4/53	12,000	grey	P. G. Stoney's sloop
1/11/53	12,000	grey	P. G. Stoney's sloop
1/17/53	10,000	brown	John Wright's boat
	5,000	grey	
1/18/53	12,000	brown	P. G. Stoney's sloop
1/25/53	12,000	grey	P. G. Stoney's sloop
2/1/53	12,000	grey	P. G. Stoney's sloop
2/8/53	12,000	brown	P. G. Stoney's sloop
2/15/53	12,000	brown	P. G. Stoney's sloop
Totals	177,000	brown	
	<u>417,000</u>	grey	
	594,000		

Source: Stoney 1852

Table 6. Boone Hall Brickyard Account Book, Sample Page, 1847

1847	Sloop Load	Grey	Brown	Red	Landing Place	Remarks
		71,269	480,261	134,320	BROUGHT FORWARD	
Dec. 17	107			10,000	Geiger wf	
Dec. 18	108		14,500		Fairfield wf	to be sold by him
Dec. 19	109		13,000	"	" "	" "
Dec. 20	110		13,000	"	" "	" "
Dec. 20	111	13,200			Howards wf	by Sureef boat
Dec. 22	112		10,250		Geigers wf	
Dec. 22	113	25,500	21,050		Fitsimmons wf	by Buena Vista
Dec. 24	114	13,350			Geigers wf	
Dec. 28	115	9,800			Geigers wf	

Source: Espenshade and Grunden 1991:16

Table 7. Boone Hall Yearly Production and Income Totals, 1850-1860

Year	Bricks Produced	Income	Income/1000
1850	3,127,930	\$ 18,701.01	\$5.98
1851	3,505,968*	\$ 17,905.40	\$5.11
1852	3,278,069	\$ 22,558.44	\$6.88
1853	3,451,696	\$ 26,210.53*	\$7.59
1854	2,693,675	\$ 21,855.75	\$8.11*
1855	1,573,014	\$ 11,313.40	\$7.19
1856	1,832,810	\$ 12,856.22	\$7.01
1857	1,812,520	\$ 12,505.71	\$6.90
1858	439,545	\$ 3,151.52	\$7.17
1859	1,557,715	\$ 11,009.91	\$7.07
1860	1,659,123	\$ 13,076.05	\$7.88
TOTALS	24,932,065	\$171,143.94	\$6.86

* Highest production, income, or income/1000

Source: Espenshade and Grunden 1991:17

\$3,564.00 and \$41,119.00 respectively, assuming a sale price of \$5.00 per thousand. In fact, during the ten years between 1850 and 1860, Boone Hall produced over 24 million bricks valued at more than \$170,000.00 (Table 7).

Examination of the 1850 census records (Table 4) shows that the nine brickmakers listed in these two parishes were producing over nine million bricks in 1849 (the year the data were collected), valued at \$64,000.00. This production utilized a relatively small labor force of 288 slaves. The item listed as invested capital represented the combined value of these slaves and the land in use. The variation in the average monthly cost for the labor was either a reflection of the quality of care by the various owners, or represented some estimation by the owners based on the slaves' employment as brickmakers on a part-time basis. Stoney's Medway plantation day book for 1852 provided an indication of the level of effort involved in a major brickmaking operation. This book listed a maximum of 18 hands a day in the brickyard; usually the record indicated either 6 or 12 hands supporting one or two molding tables. Maximum production from these two tables appears to have been 10,000 bricks a day. This production is comparable to that advertised earlier for brickmaking machines which cost \$4,000.00 (City Gazette 1797). Activities included molding, stowing the case (kiln), hauling wood, carting clay, and unloading the kiln (Stoney 1852).

In summary, brickmaking, while labor-intensive, could be conducted at a high level of production using a limited number of slaves, probably on a seasonal basis at most brickyards. The value of the end product compared favorably to that of plantation cash crops in the Lowcountry (Table 1). For example, in 1850 rice sold at an average price of 3.4 cents per pound (Smith 1985:215). This places the value of the rice production for Christ Church Parish at \$32,803.00 in that year, compared to \$34,160.00 for bricks (U.S. Census 1850; Scardaville 1985:37). In St. Thomas and St. Denis Parish, which produced a greater volume of rice, the value of the rice production in 1850 would have been \$119,041.00; brick value was estimated at \$29,960.00 (U.S. Census 1850; Scardaville 1985:37).

The growth of this industry in the Wando River basin provides an example of the importance of diversity within the plantation system. Archaeologist Craig Sheldon has suggested that planters in agriculturally marginal areas were forced to diversify and to acquire multiple properties in order to succeed. This diversification included providing goods and services to their neighbors as well as to the local market. He suggested that a group of diversified planters was a vital part of the support network which facilitated the development of the large specialized plantations which concentrated on staple cash crops (C. Sheldon 1990, personal communication). Diversity and

responsiveness to a market-driven economy certainly seems to describe the plantations along the Wando River and their complex interaction with the City of Charleston.

CHAPTER 4
TO MAKE A BRICK

There are also several steep Landings, very convenient to settle Brick Works upon, an excellent clay being found all round the Land, with Wood at hand for burning (South Carolina Gazette 1742a).

The Wando River plantations had an abundance of all of the elements of brickmaking, plus access to a market via the river. The soils of the area are underlain by a red clay stratum; in addition, sand is present in the Mt. Pleasant and Cainhoys scarps for use in tempering the clay. The pine-oak forests provided an abundance of fuel, while the large slave population provided the labor both for obtaining the raw materials and for the brickmaking.

Brickmaking begins with the clay. A 1664 account states that in the Charleston area, there was a "rich ground of a grayer colour" useful for brickmaking (Carroll 1836:12). These brick clays are Pleistocene marine clays deposited in ancient lagoons (Johnson and Heron 1965:50). The deposits can be up to 20 feet thick and are characterized as kaolinitic montmorillonites. This means that they consist primarily of kaolinite clays with a low water of plasticity, low shrinkage, low to medium drying strength, and require a medium to high maturing temperature.

The clay is mixed with montmorillonite, the proportion of which increases with depth. Montmorillonite clays are virtually the opposite of kaolinite clays, with a high water of plasticity, high drying and firing shrinkages, high dry strengths, and low maturing temperatures. They also have a tendency to pick up large amounts of water in a humid environment. Although not useful as a basic raw material, small quantities of montmorillonites as an additive improve plasticity and lower maturity temperatures (Johnson and Heron 1965:50-51). Sand in the clay promotes more rapid drying while iron oxide acts as a flux to produce a harder brick at a lower temperature (Buie 1949:97-98).

Lowcountry clays can be divided into five basic types: marls, clayey sands, sandy clays, rich clays, and vitreous clays. Marls are generally unsatisfactory alone due to their instability; however, small amounts added to other clays would increase strength and produce color changes. Clayey sands do not contain a high enough proportion of clay to be useful for brickmaking, although they can be used to sand the molds and table. Sandy clay is probably the best overall material for face bricks, with a shrinkage rate of less than four percent and good bonding strength. Rich clays have a high proportion of clay and make excellent bricks. Since this type of clay has a slow drying time with high shrinkage, it requires expert skills to produce good brick. Vitreous clays produce a glassy or glazed surface

during firing; bricks from these clays have good structural properties. Vitreous clays also make a good additive to other clay types (Robinson and Johnson 1960:11-13).

The sandy clays and clayey sands are found at elevations above 10 feet on sandy knolls and ridges in the pine flatwoods. They range in color from a mottled orange-yellow-brown-white sandy clay to a cream-colored to brown clay. Rich clays and marls are found below 10 feet in elevation in the flat swamplands and bottomlands along the rivers and creeks. These clays are generally dark brown to olive-green in color, grading down to marls (Robinson and Johnson 1960:9-10).

Digging or "winning" the clay is a seasonal activity:

All clay intended for working next season must be dug in the winter, and the earlier the better, so as to expose it as much as possible to frost and snow. Care must be taken, if there are small stones in it, to dig it in small pits, and cast out the stones as much as possible, and also to well mix the top and bottom of the bed of clay together (Dobson 1850 (2):97).

The diary of a Lowcountry planter from Prince William Parish near Beaufort stated that his slaves were digging clay during the period between February and April (Graves 1854-55). This would have still been primarily during the non-agricultural periods of the year. As Stoney stated, planters in the brickmaking areas of the Lowcountry "enjoyed a sound economic mixture of agriculture and industry by making rice while the weather was hot and brick when it was cold" (Stoney 1938:48).

In the Wando River area, the clay was normally dug by hand from shallow pits or trenches, which are still in evidence in aerial photographs of the region. The clay was then "wheeled to a level place...it is heaped up to a depth of several feet, and left through the winter months to be mellowed by the frosts, which break up and crumble the lumps" (Dobson 1850 (1):21). Rain also washed out some of the soluble salts during this period. The heaps were regularly broken up and turned over so that all portions of the clay were exposed to the weather (Gurcke 1987:7).

After weathering, the clay was then tempered. Tempering consisted of adding water and other materials, such as sand, and then thoroughly mixing the clay and temper. The most primitive methods were to spread out the clay, mix in the water and temper, and then trod on the mixture using men or animals until it was pliable:

Then we water the Earth well, and temper it with a narrow Spade about five Inches broad, that the Workman may hold out, with which we dig it down, and then temper it with our bare feet till it is in good case to make a Brick on, that is, like a piece of Dough such as will just stick in the Mould or Frame when lifted up, and not fall off of it self; . . . (Lloyd 1925:34).

An alternative method was to use a soak pit, in which a rectangular pit, approximately 4 x 6 feet, was filled with the clay and water and allowed to soak overnight. Temper was added and mixed the next day. A more elaborate soak pit might be board- or brick-lined with an animal powered iron wheel to mix the clay and temper (Gurcke 1987:7). It is

possible that the primitive soak pit without the iron wheel was the method utilized in the Wando River basin with its readily available slave and animal labor. As one advertisement for property stated, the brickyard included "a reservoir of water for swimming the cattle that tread the clay" (South Carolina Gazette 1766).

A few planters may have used pug mills during the latter years of the brickmaking era. A pug mill consists of a cylindrical barrel containing a revolving shaft with paddles. The clay, sand, and water were put in the top and kneaded between the rotating and fixed parts of the mill. The mixed clay was then forced out through an opening in the bottom of the mill (Figure 8) (McKee 1976:84).

Once the clay had been prepared, it was then molded or formed. Molding was considered to be a skilled process completed by the craftsmen among the brickmakers. "The molder is the head of the molding gang, or 'stool', and is usually the most skilled worker in the yard" (Gurcke 1987:15). The molder worked near the soak pit, at "a Table standing about three foot high, five foot and a half long, and three foot and half over" (Lloyd 1925:34) (Figure 9). He worked with a mold, sand, clay, and a "strike" or instrument to remove excess clay from the mold. Molds or "Frames" were made of wood in the chosen size, and could be constructed for multiple bricks. Charleston cabinetmakers'

Figure 8. Pug Mill and Molding Table
Charleston Brick Company

Photograph courtesy South Carolina
Historical Society, Whitelaw Collection

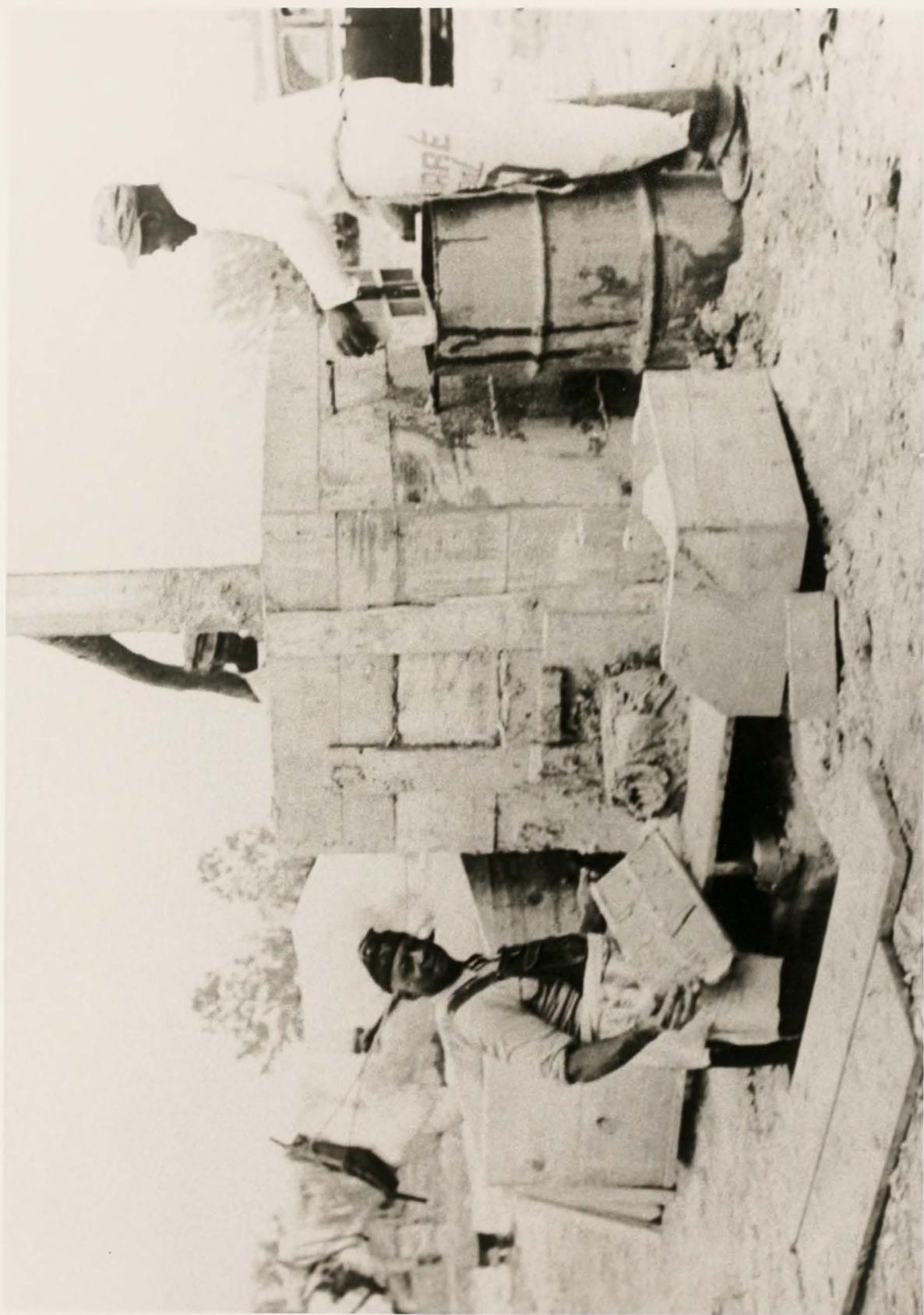


Figure 9. Brickmolding
Charleston Brick Company

Photograph courtesy South Carolina
Historical Society, Whitelaw Collection



records indicate that such molds were generally made of mahogany, a dense, durable wood (Elfe 1775; SCCC 1798). Hollings states that molds 9 x 4-1/2 x 2-1/2 inches were "the easiest for handling" (Hollings 1978:7); this is the approximate size of most of the Wando River bricks.

Molds were first dipped in "a little Trough that will hold about three or four quarts of water" (Lloyd 1925:34), and then dusted with sand prior to filling. A clot of "about 14-15 lbs. of" tempered clay was formed into a roughly rectangular shape about 25 percent larger than the mold (Lloyd 1925:31). This clot was then held over the mold and slammed into it with force; the molder then

levelling it at the same time with his hand by heaping up the material in it, the excess of which he throws into the second compartment. . . .

Seizing, at the same time, with his right hand the strike, the handle of which is conveniently placed at the edge of the wetting trough in which it has been soaking, he passes it firmly across the mould, to remove all that exceeds the 28 or 29 'lignes' of thickness that the two bricks should be [Figure 9]. He gives a tap with the flat of the strike, as with a trowel, on the middle of the mould to separate the two bricks one from the other and places the surplus earth by his side on the table (Lloyd 1925:31).

The Graves diary described "moulding" or "running" "tables" of bricks at the same time that other bricks were being loaded in the kiln and fired (Graves 1854-55). Crary stated that a good crew of five men and one boy could produce 9,000 bricks per day using a six-brick mold. The crew consisted of the molder, a carrier, a digger, a man to

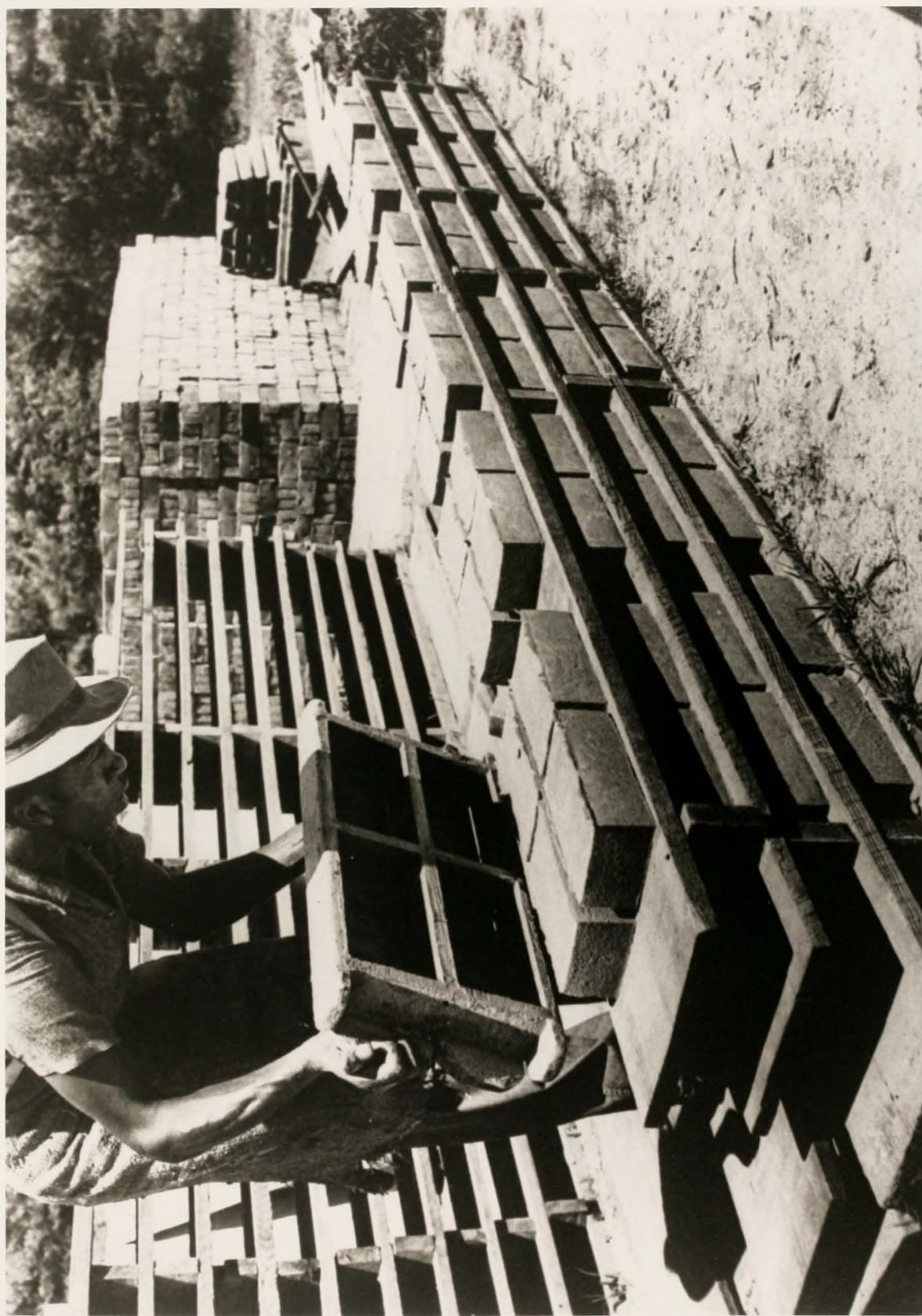
wheel dry bricks to the shed, and a boy to drive the oxen for tempering the clay (Crary 1889).

Once filled, the molds were taken by the carrier to the drying area where the bricks were turned out in rows to dry for approximately 24 hours (Figure 10). The carrier returned the empty mold to the sand bin for reuse (Lloyd 1925:31). The surfaces of the bricks were occasionally smoothed during this period and the bricks sometimes turned on edge after they were semi-dry to provide additional airflow to the other surfaces. When the bricks were dry enough to be handled, they were removed from the rows and placed in "Hacks (or places where they Row them up, like a Wall of two Bricks thick, with some small intervals betwixt them, to admit the wind and air to dry them)" (Lloyd 1925:36). Since drying required about two to three weeks, sheds would be used to protect the hacks from rain during this period (Gurcke 1987:26).

Firing was begun after the bricks were dried. The bricks must be carefully stacked on edge in the kiln with spaces to allow for even distribution of the heat and gases. Hollings (1978:8) stated that kilns held from 20,000 to 50,000 bricks at each firing. Scove or clamp kilns are constructed from the bricks being fired (Ure 1840:185). These may have been the most common kilns along the Wando River since they were the simplest to construct. A more

Figure 10. Removing Bricks from the Molds
Charleston Brick Company

Photograph courtesy South Carolina
Historical Society, Whitelaw Collection



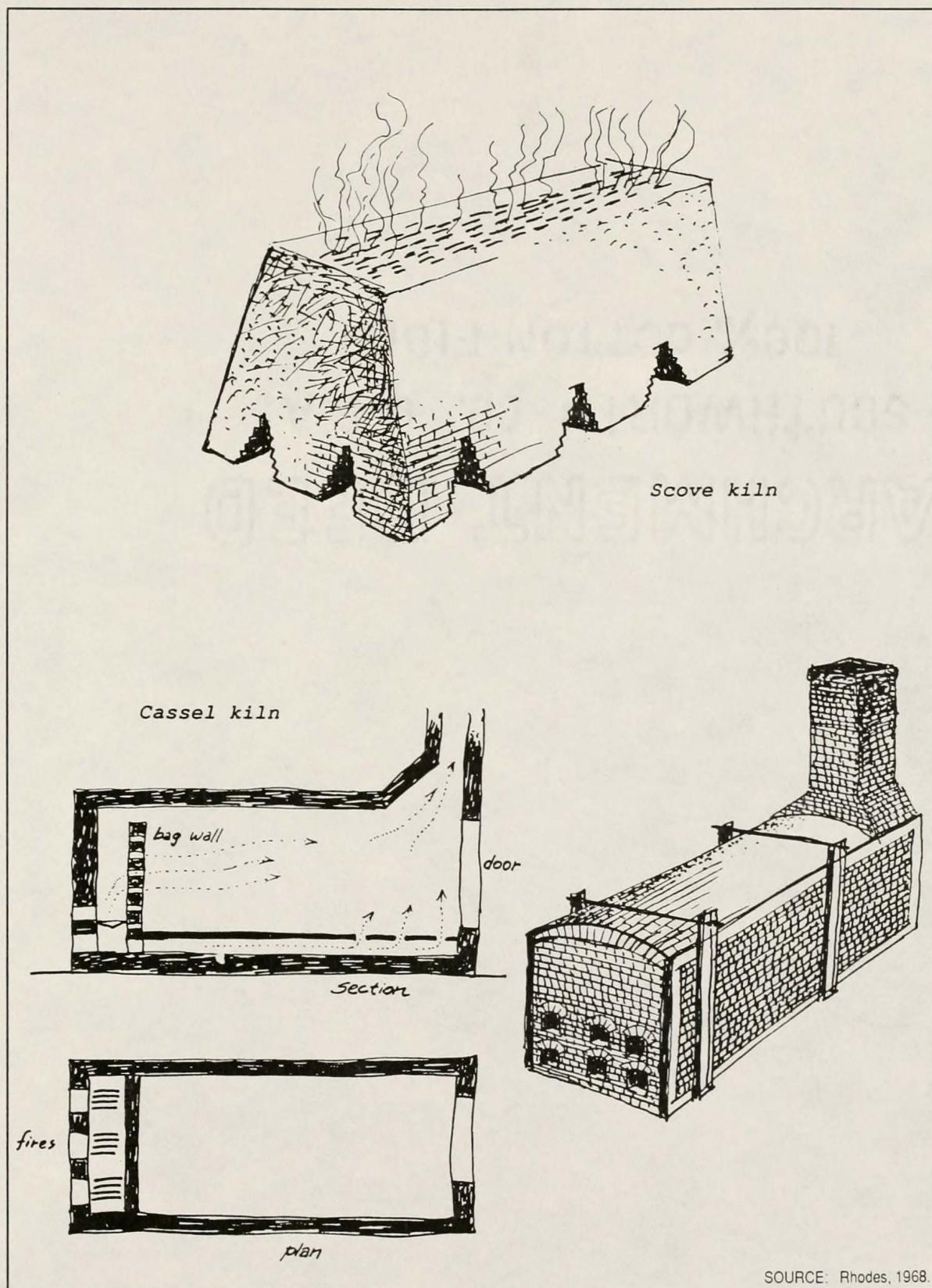
permanent form of kiln, the Cassel or Newcastle type, consisted of a permanent outer wall, base, and chimney with flues leading from the front of the kiln to the chimney in the rear. This type of kiln relied on crossdrafts for distribution of the heat (Rhodes 1968:45, 47) (Figure 11).

The more common scove or clamp kilns were begun with the construction of a corbel arch or flue running the length of the kiln:

They build their Clamps of the Bricks that are to be burnt something like the Method of Building the Arches in Kilns, viz. with a Vacancy betwixt each Brick's Breadth, &c. for the Fire to ascend by; but with this Difference, that instead of Arching, they truss, or span it over, by making the Bricks project one beyond the other, on both sides of the Place, for the Wood and Coal to lie in, till they meet, and are bonded by the Bricks at the Top, which closes up the Arch: this Place for the Fuel, they carry up straight at both Sides, or, which is the same thing, upright at both sides, 'till it is about 3 Feet high, and they then begin to lay the Bricks, projecting over inwards, till they meet in the middle, which they will do in about 3 or 4 Course of Bricks in Height, the Width of the Mouth being about two Feet and a half [Figure 12]. Above this Arch they lay the Bricks in the Order they do in a Kiln to 8 or 10 Feet in Height, according as the Clamp is to be in Bigness; for they usually burn a great many thousands in a clamp at a time. . . (Neve 1726:50).

The green brick may then be covered by previously burnt brick and earth to seal the kiln (Gurcke 1987:32; Weldon 1990b:24).

Gurcke described a clamp kiln as a series of walls of brick, about 60 bricks long by 3 bricks thick by 24 to 30



SOURCE: Rhodes, 1968.

Figure 11. Types of Kilns or Clamps

Figure 12. Kiln Arch Construction
Charleston Brick Company

Photograph courtesy South Carolina
Historical Society, Whitelaw Collection



bricks high. An upright of bricks was placed in the center of the clamp; this upright decreased in width towards the top of the kiln. As a result the clamp sloped inwards towards this upright. "Live holes" about 7 by 9 inches in size were placed along the length of the clamp for the fires. Once ignited, the holes were closed and the clamp left to burn. Gurcke said that firing could require three to six weeks and may have involved the use of charcoal rather than raw wood (Gurcke 1987:29, 32). Weldon indicated that only four to seven days were required for firing (Weldon 1990b:24).

A more permanent type of clamp kiln similar to that excavated in 1950 in Jamestown, Virginia may have been common along the Wando River (Harrington 1950:23). This type of kiln had permanent outer walls with arched openings at one end. The walls were placed on a previously prepared level area, possibly excavated below grade (Figure 13). The bricks in the walls were usually mortared with soft loam or clay rather than lime mortar in order to avoid damage during firing. The kiln may have been surrounded by a system of drains to keep the ground dry. There may also have been side openings in the kiln for ease of access. Within the kiln, the arched openings or fireboxes continued straight through to the back wall with hard packed clay floors. Between these areas previously fired bricks were laid on edge in rows two to three bricks wide as a base for the



Overall view of Brick Kiln "B" (Structure 102) from the front, or north, side at completion of excavation.



Overall view of Brick Kiln "B" from the rear at completion of excavation.

SOURCE: Harrington, 1950.

Figure 13. Jamestown, Virginia Brick Kiln

green bricks. This raised the green bricks to avoid absorption of too much moisture from the ground. The green bricks were placed in layers with openings between bricks; the layers gradually formed a corbelled arch or vault over the fireboxes. The outer layer of bricks was closely placed with no openings. Once the kiln was stacked or loaded, it was often covered with clay, or "scoved", to contain the heat. Fires were placed inside the arched openings and burned until the bricks were suitably baked (Harrington 1950:26-27).

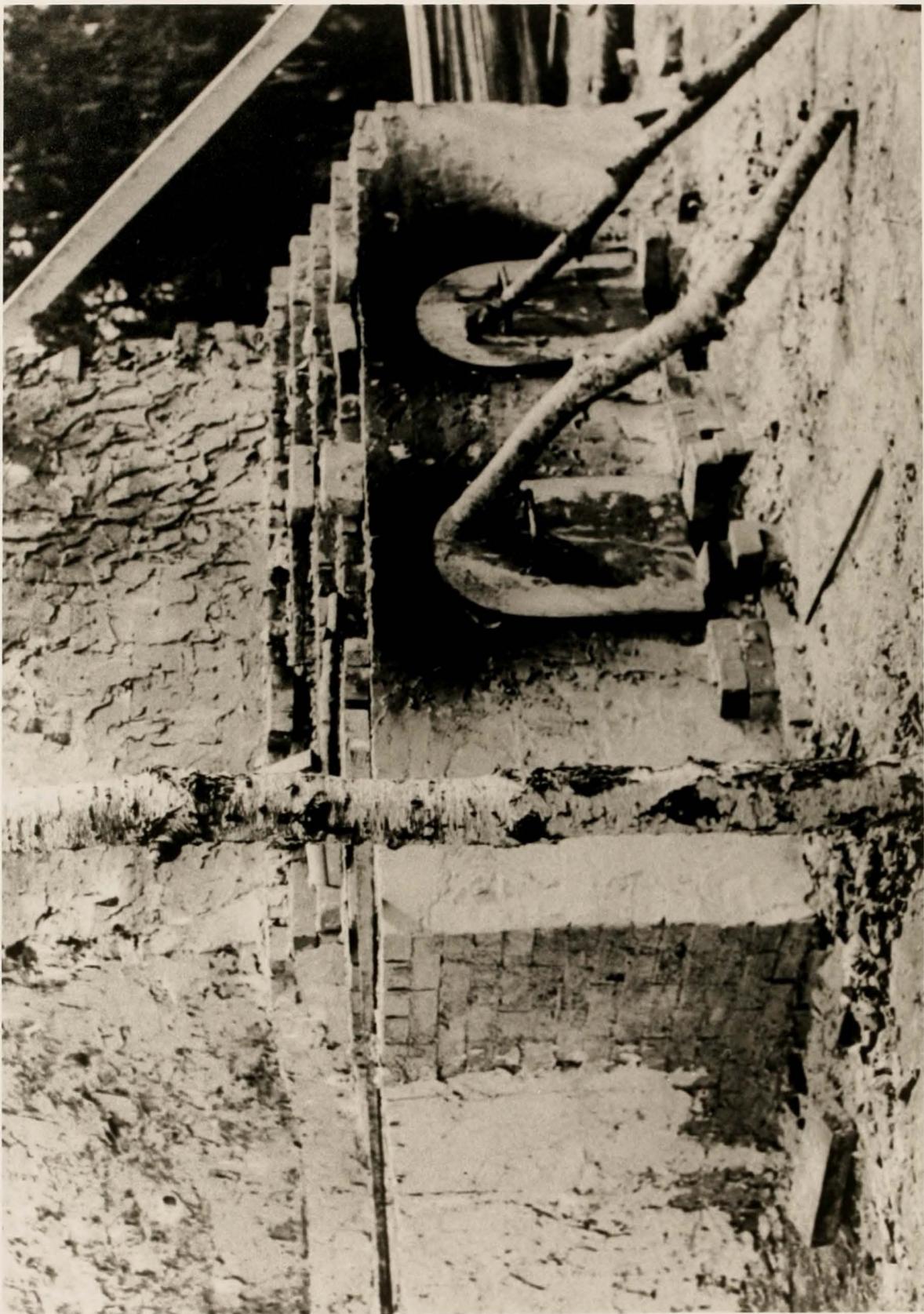
Once the clamp had been constructed, cords of wood were placed between the rows of brick and fires were set "to dry the Ware, with a gentle, even Heat or Fire; which Fire they continue till the Ware is pretty dry", which was determined when the smoke changed from a whitish color to black (Neve 1726:49). After the smoke changed color, smaller "faggots" of wood or straw were fed into the fire in order to complete the actual "burning" of the brick. At this point the mouth of the fire chambers might be partially blocked with a "shinlog" to contain the heat (Neve 1726:49) (Figure 14).

The fires were fed

till they make the Kiln and its Arches look white with Heat, and the Fire begins to appear at the Top of the Kiln, and the Kiln and Arches below begin to change from white to a greyish Colour; then . . . they slacken the Fire for some Time, viz. for about 1/2 an Hour, or an Hour, as they think fit, that the Fire, or Heat, may ascend to the Top of the Kiln, by the Motion of the Air in at the Mouth, and also that the lower Ware may settle and cool, and not be burnt more than that

Figure 14. Completed Kiln and Openings
Charleston Brick Company

Photograph courtesy South Carolina
Historical Society, Whitelaw Collection



above it. Thus they continue to do, heating and slackening alternately, till the Ware be thorough burnt, which it will be . . . in about 48 Hours . . . (Neve 1726:49).

According to contemporary accounts, firing could last from two to ten days (Harrington 1950:34). Graves' diary indicates that he fired his kiln for approximately six days (Graves 1854-55). Once firing was completed and the kiln cooled, the bricks were removed, sorted, and loaded on barges or boats for shipment. Waster bricks or brick bats (poorly fired or broken bricks) were tossed aside or reused for kiln construction. Wasters were also common in the slave cabins along the Wando River (Wayne and Dickinson 1990:9-4) and were apparently used for road or waterfront fill at times (Graves 1854-55). Once unloaded, the "black dirt of the brick floors" was apparently removed and spread in the fields (Graves 1854-55).

Bricks were classified according to quality, which was based primarily on their degree of firing. The softest bricks, used only as wall fill, were called soakers because they readily absorbed moisture (Hollings 1978:9). Clinkers were the hardest bricks, located closest to the fire; these bricks "have, as it were a Gloss on them, which proceeds from the Saltpetre inherent in them, which by the Violence of the Fire, runs and glazes them" (Neve 1726:51). Standard bricks were the next layer between clinkers and the outer bricks. These were the primary construction bricks. "Samel" or "sandel" bricks were the poorest bricks, which

probably correspond to the soakers described by Hollings: "those which lie on the outsides of the Kilns and Clamps where the Salt-peter is not digested for want of due heat" (Neve 1726:51). These bricks were soft and easily broken (Neve 1726:51). Neve also observed "that whilst Bricks are burning, those on the windy side of the Clamp, are the worst of all" (Neve 1726:51). In the Lowcountry, bricks were apparently also classified according to color (Hollings 1978:11). Several accounts refer to shipping grey bricks or brown bricks from kilns (Graves 1854-55; Stoney 1852; Horlbeck 1856-75); Carolina grey was apparently the preferred type, although they were not in actuality grey in color, but red-brown (Hollings 1978:11).

The brickyards along the Wando River sometimes produced other products such as tiles for flooring or roofing, as at Boone Hall Plantation (Baldwin and Baldwin 1985:67; Stoney 1932:xiv-xv; Rauschenberg 1991:105-108). It is also possible that the kilns may have been utilized for firing plantation-made pottery. A few bricks have been located in the Lowcountry with maker's marks or brickyard symbols pressed into the wet clay (J. Leader 1991, personal communication), but this has not been noted as yet at the Wando River brickyards.

CHAPTER 5 THE ARCHAEOLOGICAL EVIDENCE

Here and there, where a wide meander cuts into the yellow soil of the mainland, there will be smoking kilns, and near them piles of warm red or brown tile and brick, ready to be carried to town, or a landing where everything will come to life at the whistle of the approaching steamer (Stoney 1932:xiv-xv).

Today the brickyards of the Wando River exist only as archaeological sites. Since research on these sites has been largely limited to survey level data, it is necessary to look at excavations elsewhere in order to understand the configuration and nature of these remains. Fortunately, several well-documented excavations have been completed in the southeastern United States.

Brickyards as Archaeological Sites

It must be acknowledged that in one sense Noel Hume (1975:174) was correct in his lack of enthusiasm for brick kiln excavations--they do rarely yield a significant number of identifiable artifacts other than bricks. In many cases the artifacts are so few and fragmentary that they are not even helpful in terms of dating a site. Excavation of a brick kiln primarily provides information on the

configuration of the kiln itself. This information may be helpful in determining the level of sophistication of the operation as well as the level of production. Specialized chemical analyses of the clay, bricks, and ash may provide guidance as to the sources of bricks for specific structures. Underwater archaeology may yield information on vessels used to ship the bricks as well as on waterfront construction methods. But one of the most informative parts of a brickyard complex would undoubtedly be any associated worker housing areas.

The earliest, and possibly the best, archaeological excavation of a brick kiln was completed by J. C. Harrington at Jamestown, Virginia in 1950 (Harrington 1950). Harrington totally excavated a 17th century kiln associated with the Jamestown settlement. His site plan shows typical brickyard features: the kiln, drainage ditches, a clay pit, and a well (Figure 15).

His careful excavation of the kiln revealed a semi-permanent unmortared brick outer wall approximately 14 inches in width encompassing an area roughly 24.5 by 19 feet in size (Figure 16). This enclosure was placed on an excavated, prepared clay surface. The wider front wall (34 inches) contained five segmental arched openings for firing the kiln. These openings ranged in width from 20.5 to 23.5 inches and were approximately 20 to 26 inches high. Ash covered the floor of the firing chambers and extended out

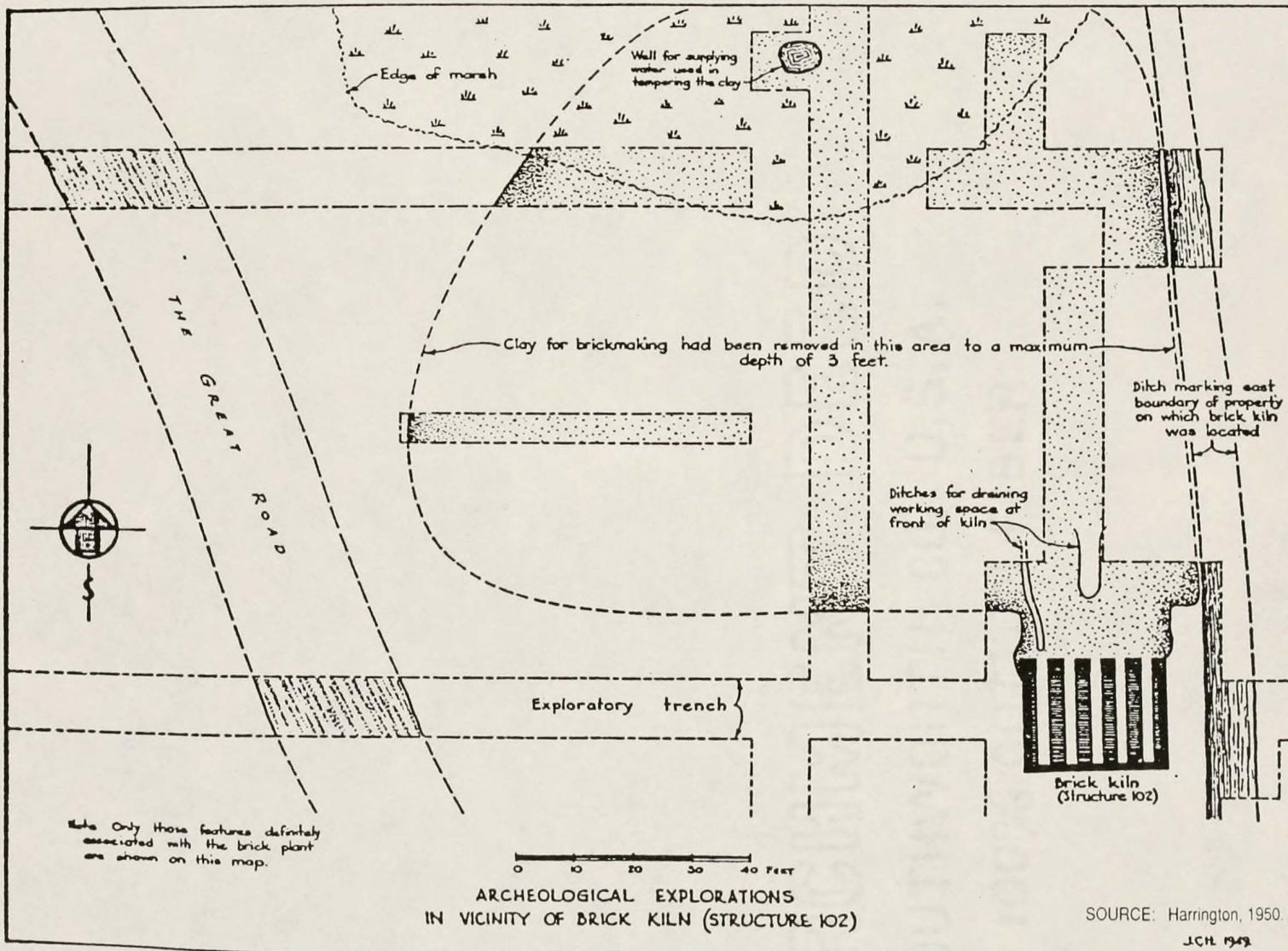


Figure 15. Site Plan, Jamestown, Virginia Brickyard

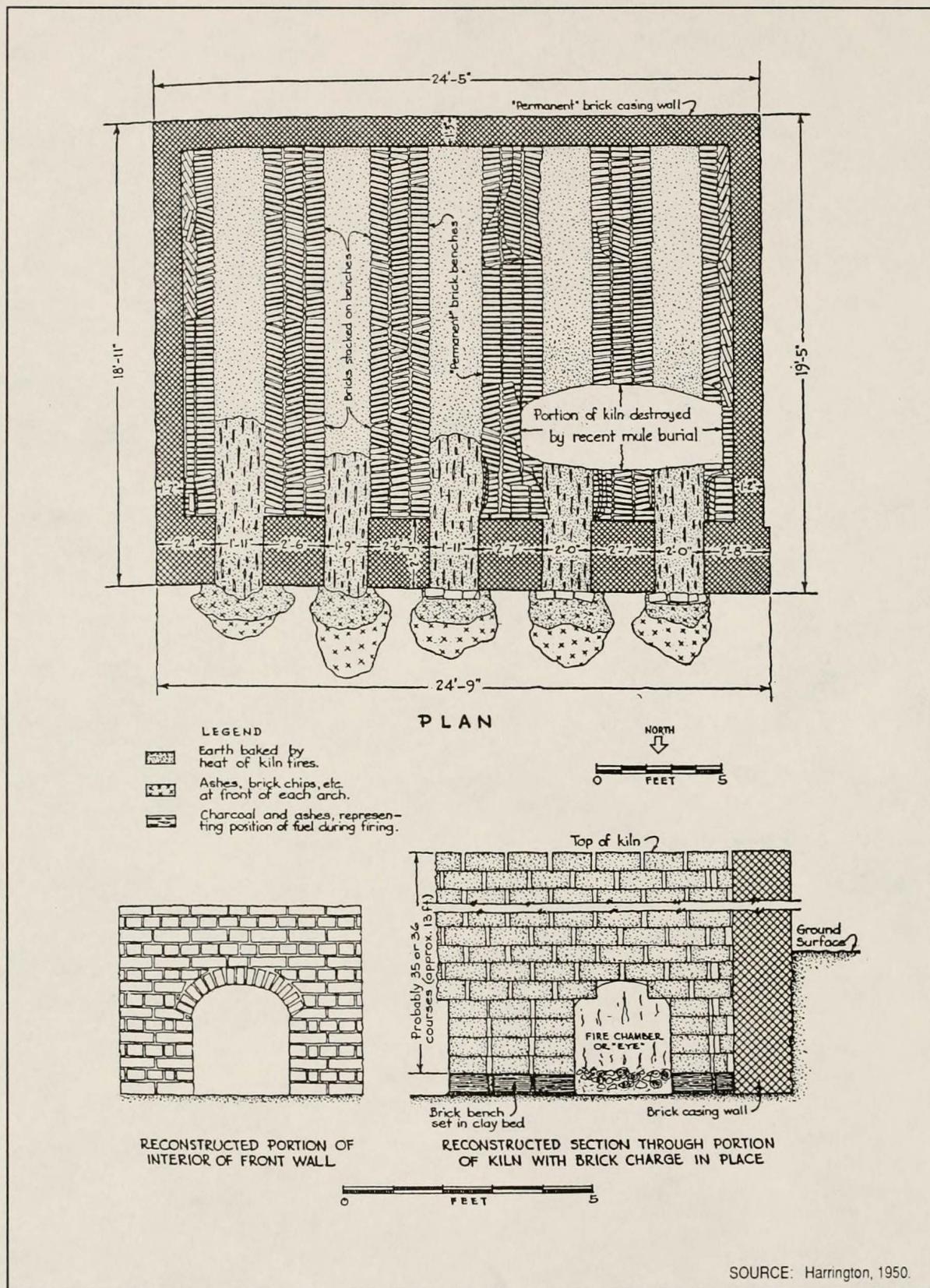


Figure 16. Plan, Kiln at Jamestown, Virginia

the openings onto a reddened fired-clay surface. The firing chambers extended the depth of the kiln. The bricks to be fired were stacked on edge in a herringbone pattern on permanent benches or bases between the firing chambers in order to allow the heat to circulate through the kiln. These bases were three bricks in width, laid end-to-end without mortar. The unfired bricks were placed on the benches and, beginning at the fifth layer, corbelled to form an arch or vault over the firing chambers. Based on smoke stains on the outer wall, Harrington estimated that the firing chambers were seven bricks high (Harrington 1950:25-28).

A 1963 test excavation of 18th century remains at Brunswick Town, North Carolina, revealed a similar construction pattern (South 1963:3-4). In addition, this excavation indicated that the kiln had been rebuilt at least twice over previous clamps and was evidently used to burn lime during its final firing.

The preliminary report on two 18th century kilns excavated near Williamsburg, Virginia, indicated that the remains were very similar to those documented at other kiln sites (Steen 1991:10-11). This report also demonstrated the difficulties in identifying the remains of associated activity areas or structures near the kilns. The author explained this in terms of the one-time usage of the site as well as the limited equipment and facilities necessary for

brickmaking (Steen 1991:13). Most brickyards contained few structures other than the kilns; the remainder consisted of post-construction drying sheds, or shelters for the kiln or molding table. Such structures leave little evidence beyond the postholes noted at the only excavated kiln in the Wando River basin (Steen 1991:7).

The Nance's Ferry excavations in Alabama documented both lime and brick kiln construction at a 19th century site (Atkinson and Elliott 1978). Unlike brick kilns, the lime kiln contained a single firing chamber plus the foundation of what would probably have been a domed or shaft-type structure (Atkinson and Elliott 1978:23). This site contained the remains of five brick kilns, all similar in construction to the earlier 17th century structure at Jamestown. The archaeologists interpreted the remains as those of temporary, single-use scove or clamp kilns containing 4 to 8 firing chambers (Atkinson and Elliott 1978:77). The report of this excavation is particularly useful to other archaeologists because it juxtaposes photographs of standing kilns with the archaeological remains.

Although the remains excavated at the Jimmie Green site in Berkeley County, South Carolina were interpreted as being those of a lime kiln (Wheaton et al. 1987:113), examination of the plans indicates a strong resemblance to the brick kilns recorded at Jamestown and Nance's Ferry (Figure 17).

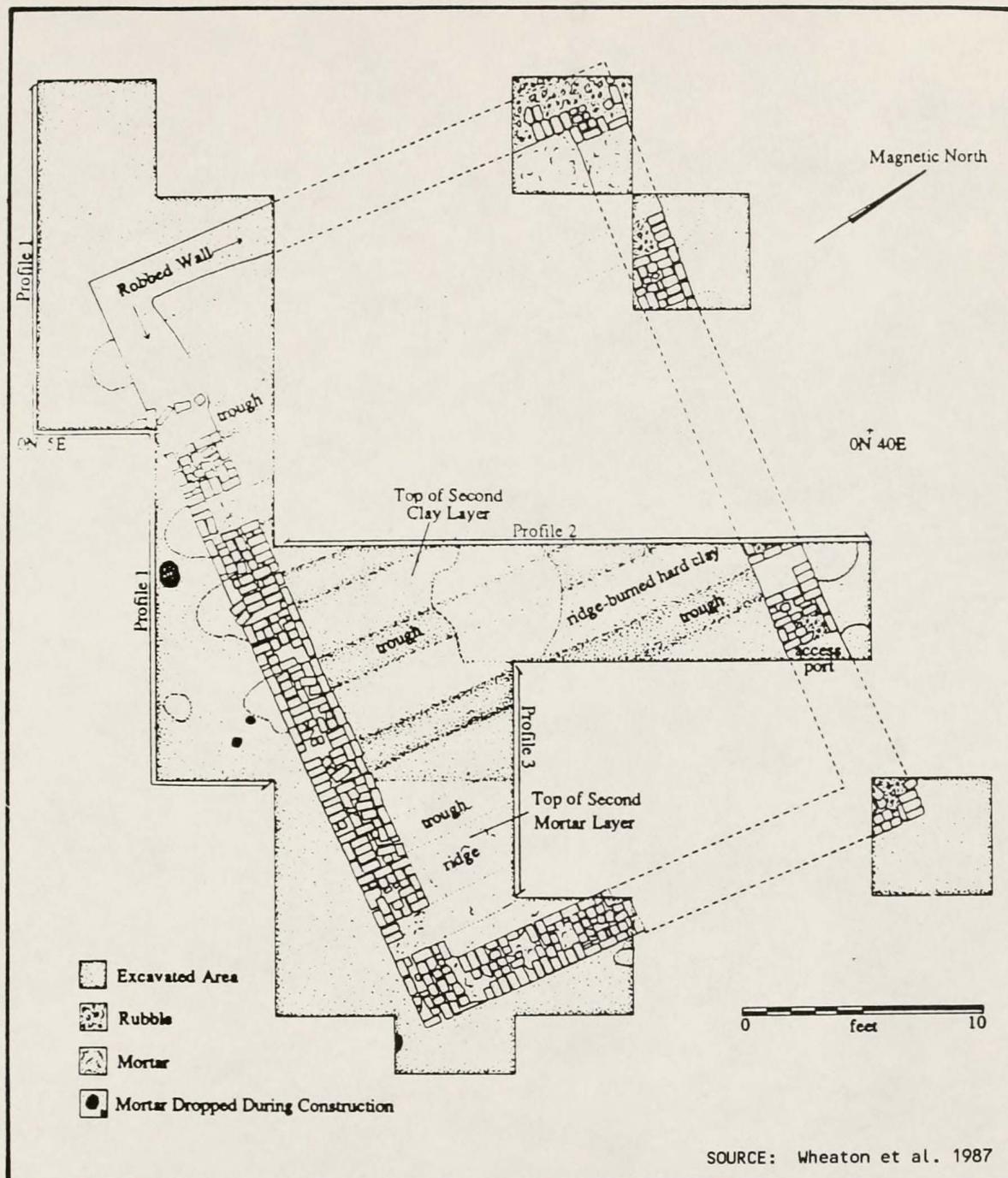


Figure 17. Plan, Jimmie Green's Lime Kiln,
Berkeley County, South Carolina

Since this plantation also contained a documented brickyard, it is probable that this kiln represented reuse of a former brick kiln for lime burning such as South found at Brunswick Town (South 1963:3). As the authors themselves noted, the kiln's configuration was unlike that of other documented lime-making operations (Wheaton et al. 1987:159-163).

Review of the previous excavations clearly confirms that the primary archaeological feature at a brickyard site would be the kiln itself. This feature should contain an unmortared outer wall built on a prepared surface, a series of firing chambers--perhaps with the ash remains of the last firing, and the remains of the benches used to support the bricks to be fired. In some cases, the kilns may contain poorly fired bricks abandoned by the operators after the last firing.

The Wando River Basin Sites

The typical brickyard site examined in the Wando River basin consisted of a brick rubble-covered shoreline or landing, one or more overgrown kiln mounds--sometimes with visible arches, sand or clay piles, and a series of extensive clay pits (Figure 18). At least one site, on Parker Island, contained an intact brick chimney, indicating the possible presence of a more sophisticated Cassel or updraft kiln (Southerlin et al. 1988:28). Soak pits were tentatively identified at the Toomer brickyard site on Toomer Creek (Wayne 1989).

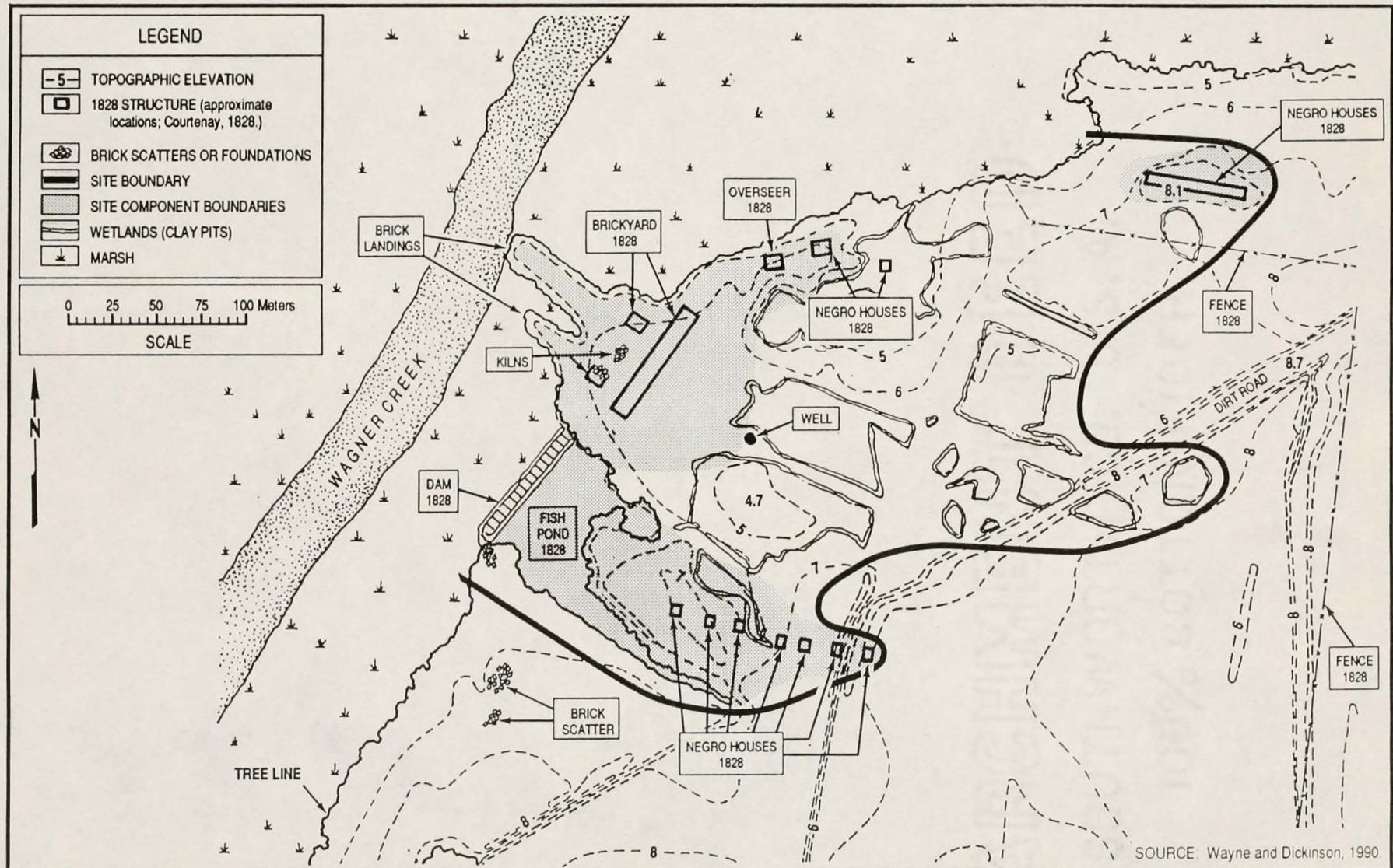


Figure 18. Lexington Kiln Site Plan,
Charleston County, South Carolina

The majority of the identified sites utilized the existing shorelines as landings and simply covered them with brick rubble to provide a hard surface. In at least three cases, however, finger piers or landings were constructed jutting out into the marshes or stream. These piers consisted of a clay, brick rubble and timber structure with sloping rubble-covered sides and a flattened brick rubble surface. At Lexington plantation and at the Toomer kiln site, there were two piers or causeways with a slip between them (Figure 18--Wayne and Dickinson 1990:8-5; 1989:5-17; Beard 1990:6). At the brickyard site opposite channel marker 30, the brick rubble forms a distinct point on the north shore of the river.

The historic maps (Figures 3 to 6), and surveys of six sites indicated that many of the brickyard complexes encompassed associated slave and/or overseer housing (Southerlin et al. 1988:28; Espenshade and Grunden 1991:37; Wayne and Dickinson 1989:5-6, 5-8, 5-18). In at least one case, Lexington Plantation, the long period of operation of this brickyard resulted in the encroachment of the clay pits on these structures (Wayne and Dickinson 1990:8-1).

Twenty-three brickyard sites have been identified within the Wando River basin (Figure 2; Table 8). Another dozen are probable based on examination of the aerial photographs and topographic maps. On the aerial photographs, the primary indicator for sites was the regular

Table 8. Brickyard Sites in the Wando River Basin, South Carolina

State Site #	Name	Location	Description	Condition and/or Threats
<u>Charleston County</u>				
	Elm Grove	Two sites on Darrell Creek east bank,	One site has large kiln mound and brick-covered shoreline; second site not visited	Good condition; development threat
38Ch1407	Toomer Brickyard	East bank of Toomer Creek, Dunes West,	Intact kiln mound with visible arches, brick covered landing, associated dwellings extensive clay pits	Good condition; potential development tract
38Ch1086	Lexington Kiln	East bank of Wagner Creek, Dunes West,	Did contain two kilns, clay pile, sand pile, double landings, associated dwellings extensive clay pits	Kilns bulldozed, landings intact; site has been documented by archaeologists
38Ch1400	Starve Gut Hall	South bank of Wando River, Dunes West	Two kiln mounds, associated dwellings, brick shoreline, clay pits	Good condition; potential development tract
38Ch1027	Parker Island	West end Parker Is.	Brick scatter, kiln foundation, clay and sand piles, brick piles	Subject to development
38Ch1031	Parker Island	East end Parker Is.	Intact kiln with chimney, brick piles, pit, kiln ruins, brick-lined depressions, dwelling area	Subject to development -- preservation recommended
	Horlbeck Creek	East bank of creek opposite Parker Is.	Brick mounds adjacent to road, brick along creek bank, clay pits	May have been impacted by defunct development
38Ch1075 & 38Ch1078	Boone Hall Brickyard	Brickyard Plantation Horlbeck Creek,	Brickyard includes boiler chimney, commissary, wells, kiln loci, brick covered shoreline, slag deposit, two large lakes; associated slave area with cabins, industrial structure	To be mitigated by archaeologists
38Ch876	Palmetto Grove	Longpoint Development Horlbeck Creek,	Brick rubble on bank and extending inland 130 feet, kiln mound, clay pits	Mitigated by archaeological excavation
<u>Berkeley County</u>				
	Paradise Island	West end Paradise Is. Wando River,	Brick shore deposition; report of visible arches; downed trees from Hurricane Hugo	Condition not determined; possible development threat
	Thomas Island	Beresford Creek	Not examined	Unknown
	Beresford Creek #1	West bank of creek north of Thomas Is.	Brick covered shoreline, partial kiln extensive wasters	Appears to be threatened by imminent development

Table 8--Continued

State Site #	Name	Location	Description	Condition and/or Threats
	Beresford Creek #2	North bank of creek	Brick covered shoreline, landing area, brick working surfaces, possible kiln walls	Good condition -- merits further study
	Addison Brickyards (3)	West bank Sanders Creek	Steep brick covered banks, some eroding intact kiln mound	Good condition, some erosion threat
	Marker 30 Brickyard	West of channel marker 30, Wando R.	Extensive brick shoreline deposition with exposed timbers, brick upland surfacing	Good condition -- merits further study
	Nelliefield Creek	North of Marker 30 site, Wando R.	Brick shoreline deposition, kiln loci, two large clay pit/lakes	Probably protected at this point in time
	Cemetery Creek	North side of junction of creek and Wando River	Brick covered shoreline, brick in road surface	Possibly impacted by later construction
	O'Hare Point	Northeast of O'Hare Point on Wando River	Brick covered shoreline, upland not examined	Unknown
	New House	North shore of Wando River northeast of O'Hare Point site,	Brick covered shoreline, kiln probably gone	Probably no longer exists in significant form due to existing development
38Bk379	Fogerty Creek	Head of creek in Francis Marion Forest	One or more kilns, multiple clay pits, brick landing	Reported in good condition, no present threats
38Bk402	Old House Creek	Head of creek in Francis Marion Forest	Kiln, two clay pits, brick shoreline	Condition unknown, no present threats

Sources: Wayne and Dickinson 1989:5-2, 5-6, 5-17 - 5-18; 1990:4-4, 8-1 - 8-2, 8-5 - 8-9; Trinkley 1987:43, 57; Espenshade and Grunden 1991:28, 30, 33, 37; Southerlin et al. 1988:2, 25, 27-28; Watts 1979

shaped, clustered wetlands which are the result of the clay extraction (Figure 19). In at least two cases, at Boone Hall and at Nelliefield Creek, these clay pits have become large tidal lakes. A secondary indicator, not present at all sites, was the shoreline modifications, particularly those which resulted in a landing or projection of the shoreline into the stream.

Identification of brickyard sites on topographic maps and from a boat relied on a similar set of signatures. In both cases, the key indicator was an area where the uplands met navigable water with little or no intervening marsh. Vegetation in such areas consisted of upland species such as palms, oaks, pines, and particularly cedars. At low tide, these areas were readily identifiable by the brick rubble along the shore (Figure 20). At least one site also contained timber shoreline stabilization perpendicular to the water's edge (Figure 21).

Location of the sites from the land was hampered by the relatively thick vegetation and lack of road access in most locations. When encountered, however, there was little doubt about the nature of the site due to the extensive brick rubble. The kilns themselves appear as mounds up to five or six feet in height and of varying outer dimensions. Close examination of these mounds may reveal arched openings or outer walls (Figure 22). Areas adjacent to the mounds may have flat, brick-covered work surfaces (Figure 23).

Figure 19. Aerial Photograph, Wando River Basin
(USDA 1941)

- A. Landings
- B. Claypits





**Figure 20. Shoreline Deposition, Beresford Creek,
Berkeley County, South Carolina**



**Figure 21. Timbers in Shoreline Deposit, Wando River,
Berkeley County, South Carolina**



Figure 22. Kiln Arches, Lexington Kiln Site,
Charleston County, South Carolina



**Figure 23. Brickyard Surface, Beresford Creek,
Berkeley County, South Carolina**

Site location was correlated with deep water access, clay or loam soils, and ground which was higher than the adjacent marshes. It should be noted, however, that some of the kiln sites were on land which would not normally be considered particularly desirable in terms of relative elevation. As a result, the brickyards probably had to have networks of drainage ditches in addition to the brick rubble used as fill. The brickyard sites appeared to stop at the point at which the Wando River was able to support large-scale rice cultivation (Figure 2). This may indicate that where rice was profitable on the Wando, it was not necessary to diversify, although on the nearby Cooper River, brickyards like those at Medway plantation coexisted with large rice plantations (Stoney 1938:48).

The occurrence of all of the identified sites on deep water, and the shoreline modifications underscores the importance to the brickmakers of being able to ship the product to a market. If these kilns had been established to provide bricks solely for the individual plantations, proximity to the structures to be built would have been the criteria, rather than proximity to water. In addition, these sites were much too large to have been utilized on a one-time basis. Examination of the existing plantation structures or remains of previous structures indicated that the majority were not of brick construction, with the exception of the foundations. In fact, many of these

foundations consisted of broken or waster bricks, further evidence that the best products were sold rather than utilized on site.

Changes in the Land

The archaeological remains of the brickyards provide mute testimony as to the way in which the occupants regarded the natural resources of the region, as well as how these resources were exploited. As Deetz stated, a landscape shows how the terrain has been "modified according to a set of cultural plans" (Deetz 1990:2).

When the Europeans arrived in the New World, they did not find a virgin wilderness. The Native American occupants had already impacted the land to an extent through the use of fire and by clearing patches of forest for horticulture (Cowdrey 1983:17). These impacts were minor, however, compared to what the new occupants would do. To the early Europeans and the entrepreneurs of the 18th and 19th centuries, the New World with its vast resources was a land to be exploited, conquered, and transformed (Cronon 1983:5; Cowdrey 1983:28).

These newcomers quickly began to assess and catalogue the available resources (cf. Lawson 1709). Although the poorly drained pine flatwoods of the Wando Neck and lower Berkeley County were recognized as poor agricultural lands, their other capabilities were noted. As one writer stated,

the soil "Foundation [was] generally clay, good for Bricks" (Carroll 1836:95).

According to the soil surveys for Charleston and Berkeley Counties (USDA 1971; 1980), the sites identified as brickyards are consistently located on loamy soils with a high clay content, particularly Wadmalaw fine sandy loam (USDA 1971), Meggett loam, and Wahee loam (USDA 1980). Natural vegetation on these poorly drained soils is primarily pine flatwoods, a community dominated by loblolly and slash pines. The best drained areas support a mixed pine and hardwood forest. Small, intermittent wetland areas are located in depressions within these woods; these wetlands contain species such as sweetgums, sawpalmetto, gallberries, blueberries, pitcher-plants, sundews, and similar water-tolerant species (Shelford 1974:76). The shores of the rivers and streams contain extensive tidal marshes; where deep water cuts close to the shore, the marshes are narrow or non-existent.

Changes in the land began with clay extraction. The natural forest was cut down and the clay and sand were excavated. This extraction resulted in large, steep-sided pits, often many feet in depth. For example, those at the Lexington Kiln site in Charleston County encompass over five acres and are at least three feet deep (Wayne and Dickinson 1990:8-9), while the two large pits at Boone Hall encompass approximately six acres and are even deeper (USGS 1971).

In this low-lying land, the clay-lined pits soon filled with water, forming lakes or ponds. Over time, natural succession vegetated these waterbodies. If there is sufficient connection to the tidal river, the vegetation is typical of natural tidal marshes within the basin, consisting of a variety of saltwater-tolerant grasses and rushes (Sandifer et al. 1980:277). More often, there is little or no connection to the river and the wetlands support freshwater vegetation. These plants can include the aquatic species, emergent rushes and grasses, shrub-scrub wetlands, and forested wetlands (Sandifer et al. 1980:315). Observation of the relic clay pits along Toomer and Wagner Creeks indicated a combination of all of these types of wetlands depending on the extent of the standing water.

As brickmaking progressed, additional deforestation probably occurred to provide fuel for the kiln. This deforestation would have altered the natural vegetation patterns for long periods of time, although this cannot be documented from the literature or observation of the existing sites. Removal of the pine and hardwoods from the natural forests would lead to succession of various scrub species and eventually, if no other use was made of the land, reforestation.

The deforestation and claypits altered the natural environment by increasing habitat diversity and introducing extensive freshwater wetlands in the previous upland

environment. These comparatively deep wetlands tend to retain water in periods of low rainfall, providing a further benefit for wildlife in the area. At the same time, construction of landings and deposition of brick along the shoreline replaced the natural edge habitat with a rock-like substrate, introducing additional diversity at the water's edge.

In addition to altering the vegetation patterns, brickmaking affected the topography of the sites, both through the clay pits and through construction of kilns, clay and sand piles, landings, and at some sites, drainage ditches. These deposits are readily observable at all of the existing brickyard sites in the form of tree-covered brick, sand or clay mounds which can be 6 to 8 feet high and up to 20 feet long. Shoreline deposits were often limited to deposition of bricks along the natural shoreline, as at Boone Hall and along Darrell Creek, but there were also more elaborate landings of wood, clay, and brick rubble such as those at the Lexington and Toomer kiln sites. In some cases, dredging of channels was undertaken to insure continued access to deep water; this was particularly true along the smaller creeks such as Old House Creek and Fogerty Creek in Berkeley County.

After the brickyards were abandoned, the alterations to the landscape remained as essentially permanent features. Although the kilns may have been levelled by later

occupants, the brick surfacing or fill is often a foot or more thick; this deposition is probably rarely removable in its entirety. The Boone Hall brickyard is an excellent example, where the kilns themselves have been dismantled, but the ground still contains an extensive brick deposit. A similar situation exists on the opposite shore of the Wando River at Nelliefield Creek.

The most important permanent changes were those along the shore and the clay pit wetlands. All of the observed brickyard sites contain extensive shoreline deposits; aerial photographs and site visits indicate that all contain clay pits distinguished by their geometric shapes, steep sides, and clustered pattern. While these changes have been beneficial in terms of promoting habitat diversity, they are a problem for developers. Modification or restoration of these shoreline deposits and extensive freshwater wetlands is presently severely restricted by both logistics and coastal regulations.

Thus the actions of the brickmakers have left an essentially permanent mark on the landscape. These landscape changes provide a statement of cultural identity for the brickmakers (Deetz 1990:2); they are a testimony to the credo of exploitation of the environment for a profit. The extent of the alterations in essence defines the level of success of the industry--the larger and longer-lasting

the brickyard, the greater the impact on the natural environment.

CHAPTER 6 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

So, in creating a landscape through making it useful to them, the settlers at the same time were making a powerful cultural statement, latently symbolic, that impresses to this day (Deetz 1990:1).

The Role of Brickmaking in the Lowcountry

This study uses the research approach of landscape archaeology to examine and document the role of brickmaking within the Wando River basin of South Carolina. Landscape archaeology is an approach which looks not only at why humans occupy a specific site or region, but also at how they modify the landscape to fit their own cultural pattern, and in turn, how these modifications affect the landscape through time. As Deetz says:

People, then, use the landscape, shaped in a planned and ordered manner, for purposes ranging from food production through formal design of the environment to the more or less explicit statement of their position in the world (Deetz 1990:3).

Landscape archaeology looks beyond the individual artifact or feature to the entire site or even to groups of sites. This dissertation combines historic and archaeological research with analysis of the environmental characteristics of the region to meet its objectives and look at this specific group of sites in terms of:

1. The brickmakers' perception of the environment;
2. How the environment influenced adaptation and how these adaptations in turn affected the environment;
3. The technologies or processes which were employed by the brickmakers in order to exploit the available resources;
4. The role of the marketplace and the location of the property with respect to that market;
5. The historic events which affected activities within this region; and
6. The interrelationship between the sites.

The European colonists perceived the New World in terms of commodities (Cronon 1983:166). They began almost immediately to catalog the resources available and devise ways to exploit those resources. The clay deposits in the South Carolina Lowcountry were identified at an early date as being suitable for brickmaking (Lawson 1709; Carroll 1836:12). Because there was a perception that the land was vast and the resources limitless, little concern was given to the affects of environmental exploitation. The land was something to be mastered and altered to suit a cultural mindset (Cronon 1983:169).

The process of adaptation was influenced by both environmental and historic factors. Indigo, rice, and cotton were the major cash crops of the South Carolina Lowcountry; the Wando River basin did not lend itself to production of any of these commodities at a profitable level. What it did have in abundance was clay, wood for

fuel, slave labor, and access to a market. Location was critical to development of the brickmaking industry in this region and is the key to the interrelationship between these sites.

Brickmaking has been documented throughout the southeastern United States, but it is often limited to production of small quantities of brick for on-site consumption (cf. Sheldon n.d.). It was proximity to the urban center of Charleston and that city's demand for fireproof construction materials that provided the impetus for the development of the brickmaking industry in the Lowcountry.

It is clear from examination of the brickyard sites that they were placed to provide access to the river so that the product could be efficiently transported to Charleston. Further, there is little evidence for extensive use of bricks on the plantations which contain brickyards; certainly not at the scale at which brickmaking was conducted in this region. Between 1740 and 1860, there were over 60 brickmakers operating in the vicinity of Charleston, almost half of them on the Wando River or its tributaries. Each brickmaker produced thousands of marketable bricks in a year, most of which went to the City for construction of houses, churches, commercial buildings, and fortifications. In some cases this production represented a third or more of the yearly income of the plantations, surpassing the

Lowcountry cash crop staple of rice in Christ Church Parish. Unlike agriculture, brickmaking was not subject to the problems of fertility, disease, or insect infestation, and only rarely to the effects of weather.

The technology employed for this industry was basic and required a relatively low level of manpower and technical skills. Brickmaking as practiced in this region consisted primarily of manual excavation of clay, hand molding of the bricks, and firing the product in a simple kiln which was constructed of the bricks to be fired. It was not until the latter years of the brickmaking era that mechanization was utilized, and then only at the larger brickyards such as Boone Hall.

The low level of technology, lack of mechanization, and heavy reliance on manual labor were important factors in the demise of brickmaking in this region. Brickmaking was conducted by slaves. The Civil War not only brought financial ruin and physical devastation to the Lowcountry, it ended slave labor. Without this cheap labor source and without mechanization, the brickmakers could not compete with brickmaking operations using machine-molding and continuous kilns. Even the low cost water transportation would be supplanted by the railroads. After 1865, brickmaking was essentially abandoned in this region and shifted to the Piedmont region of the state with its abundant, high quality clay resources.

This industry did leave an indelible mark on the region. Perhaps it can be said that " 'the handy work of Man has insted [sic] of improving destroy'd the works of Nature and made it a detestable place' " (Cowdrey 1983:67). Brickmaking certainly altered the vegetation, the topography, the drainage, and even the topsoil within the production areas. As Mrozowski and Beaudry (1990:190) state:

Very often human action can be the mechanism that sets in motion ecological processes, such as succession, in an environment like the urban garden--processes generated and controlled by people.

Brickmaking is a classic example of man's exploitation of the natural resources without regard to the long-term effects of that exploitation.

Brickmaking altered the landscape through the very nature of the process. It was essentially an extractive process; in these low-lying lands, such extraction inevitably left water-filled basins which were subject to natural succession. In addition, the process, as practiced during the period and in this region, resulted in a large volume of non-saleable goods. The practical brickmakers used these wasters to further alter the natural landscape to benefit their activities by building up the shorelines and filling in the low-lying areas surrounding the production centers.

The processes of succession are not complete at the brickyards of the Wando River basin. As Lewis said, the interaction between man and his environment is a process of continual evolution (Lewis 1991). Today the brickyards are subject not only to natural succession, but also to a new generation of man-made effects. While abandoned brickyards slowly decay through the effects of wind, water, and vegetation, the growth of the nearby urban area may bring a sudden and final end to their presence in the basin.

Future Research Directions

The clock is running for a large proportion of the 23 or more brickyard sites in the Wando River basin. Growth and development in the region surrounding Charleston are increasing. The impending opening of the new Mark Clark Expressway will provide access to areas of Berkeley County which have previously been relatively inaccessible. The Wando Neck in Charleston County has already experienced extensive growth; with the new highway this will only increase. Several major residential and commercial developments are already in progress or in the planning stages at this time. All are located on the old plantation properties; many contain brickyard sites.

Legal restrictions on development of historic or archaeological sites are limited. The only effective existing regulations are those which exist under the coastal zone management laws. Often, these regulations apply only

to major developments; individual properties can usually be altered without restriction except in the case of wetlands or waterfront activities. Although the wetlands on the old brickyard sites are the most pervasive and best protected feature, they are not the most significant in terms of archaeological or historic research. Future research at these sites must focus on the adjacent uplands. This research should follow a program which has specific goals and priorities. Deetz says

the cultural landscape is the largest and most pervasive artifact with which . . . archaeologists must deal, yet much remains to be done, and much thinking about the ways to do it must be indulged (Deetz 1990:4).

The following recommendations are an initial step towards dealing with the landscape of brickmaking. These recommendations are based on the results of this study as well as visits to many of the sites.

The first objective should be identification and documentation. Although many of these sites are known and readily observable from the water, the majority have not been officially recorded for the South Carolina State Historic Preservation Office. Given the number of sites and the regional distribution, it may be appropriate to establish a project to record all of the basin's brickyards at one time. This would facilitate evaluation of the condition, research potential, and significance of the sites

by providing a complete set of comparative data on a regional basis.

Documentation should minimally include delineation of the site size and identification of apparent features such as kilns, clay pits, landings, clay or sand piles, and particularly associated worker housing areas. It should be noted that, while housing was located in the vicinity of the brickyards, it may not have been immediately adjacent to the production areas. Site plans and photographs of major features should be included in the documentation. A title search sufficient to identify the probable brickmaker should be completed for each site.

The second objective should be an evaluation of which sites merit future protection or research in terms of significance and eligibility for nomination to the National Register of Historic Places. The archaeological excavation of brickmaking operations may not be particularly interesting or rewarding. In many cases, the only result is documentation of the kiln construction. It may be appropriate, however, to excavate at least a sample of the better preserved sites, particularly those threatened by development. The research goals of this excavation would be to: (1) determine the type of kiln utilized; (2) determine the size of the kiln in order to estimate the possible production volume; (3) identify details of the operation such as the type of wood used for firing and the nature of

the structures associated with the kiln; and (4) obtain appropriate samples for technological analysis of the bricks to address questions concerning the sources of bricks for specific structures in the Charleston historic district.

The final objective centers on the question of interpretation. Brickmaking was an important and vital industry in the Lowcountry. At this time, it is also a little known industry. It would be very appropriate to utilize a well-preserved brickyard site as an interpretative tool to inform the public of the role of this industry in the region, as well as the role of the African-Americans who actually produced the thousands of bricks. In addition, Charleston is a major center for historic tourism; the presence of an historic industrial site near the city could provide a source of funding for long-term management of the resource.

Selection of the site should be based on its integrity and its potential for interpretation. Accessibility is also a factor. Although it is possible that one of the large developments which contains a brickyard site might be persuaded to pursue interpretation, it may be more appropriate for a local or state agency or organization to acquire a site for that purpose.

Development of an interpretative site would warrant archaeological study of the site as well as possible reconstruction of the facilities, particularly the kiln.

Colonial Williamsburg has very successfully established a demonstration brickyard as one of their interpretative features (Weldon 1990a; 1990b). Such a living history demonstration could be very effective at a historic brickyard site in the Wando region.

The historic brickyards of the Wando River basin are an excellent example of a regional response to a market demand as well as evidence of the diversity of the southern plantation system. They provide strong evidence of the close ties between the planters of this region and the nearby city of Charleston. They also provide an example of the adaptive response of man to the environment in which he finds himself and the effects of this adaptation on the landscape itself. They form a regional historic resource which should not be ignored or lost without a record.

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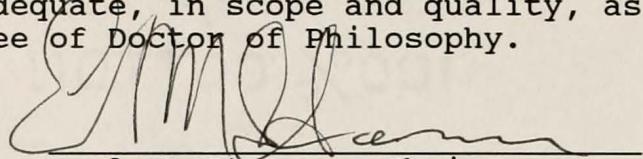
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BIOGRAPHICAL SKETCH

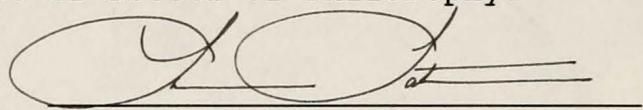
Lucy Bowles Wayne was born in Virginia in 1947. After attending schools throughout the country as the child of an Air Force father, she graduated from Robert E. Lee High School in Staunton, Virginia, in 1965. Four years later, she received a Bachelor of Arts in art history from Mary Washington College in Fredericksburg, Virginia. After marriage, six years of working, and two children, Lucy returned to graduate school at the University of Florida. In 1981, she received a Master of Arts in anthropology, specializing in archaeology. Since completing this degree, Lucy has worked as a consulting archaeologist and is co-owner of a firm specializing in archaeological and historical studies.

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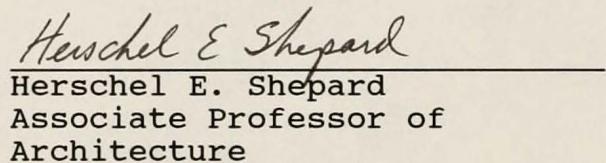
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Professor of Urban and
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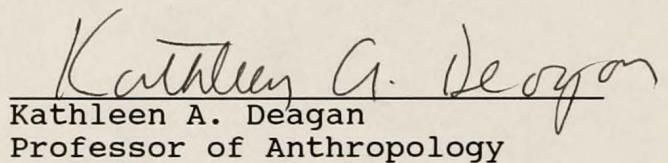
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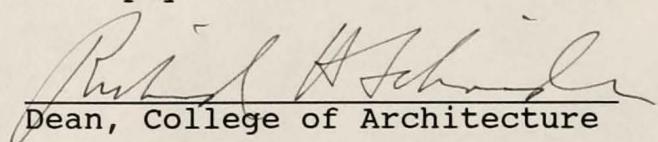
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This dissertation was submitted to the Graduate Faculty of the College of Architecture and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May, 1992



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