The Conference on Historic Site Archaeology Papers 1970 - Volume 5

Stanley South
University of South Carolina - Columbia, stansouth@sc.edu

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THE CONFERENCE ON HISTORIC SITE ARCHAEOLOGY PAPERS
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THE HISTORICAL ARCHAEOLOGY FORUM
Volume 5, Part 2

Stanley South, Editor

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The Institute of Archeology and Anthropology
University of South Carolina
Columbia, South Carolina 29208

August, 1971
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PREFACE

THE CHAIRMAN’S REPORT

The Eleventh Annual Conference on Historic Site Archaeology was held at the Wade Hampton Hotel in Columbia, South Carolina on October 29, 1970, with the host being the Institute of Archeology and Anthropology at the University of South Carolina. This Volume 5 of The Conference on Historic Site Archaeology Papers contains some of the papers presented at that conference, plus those submitted to THE HISTORICAL ARCHEOLOGY FORUM.

William Kelso's paper on "Captain Jones' Wormslow" is being published elsewhere. Stephen S. Lawrence's paper "A Guide to the Reading and Study of Historic Site Archaeology" was published immediately following the conference through the cooperation of Alden Redfield, Director of the Museum of Anthropology at the University of Missouri. This manuscript by Richard Hulan and Stephen S. Lawrence is available as Museum Brief #5 from Alden Redfield, 100 Swallow Hall, University of Missouri, Columbia, Missouri, 65201, $3.30. The publication of this bibliographical guide was a fine contribution toward the primary goal of the Conference on Historic Site Archaeology, the publication of papers.

Georgeanna Greer's paper on alkaline glazed ware in the South has been used as this year's pivot paper for THE HISTORICAL ARCHEOLOGY FORUM, and appears in that section of this volume. Thanks are due those who participated in the FORUM. Stanley South's paper on Ninety Six is illustrated by three maps to be found in the jacket pocket, the cost of which was paid by the Institute of Archeology and Anthropology at the University of South Carolina. The paper on "The Log Cabin Syndrome" was not read at the conference, but is an outgrowth of his paper on historic site development, and for this reason is presented here as a companion paper.

Thanks are due to those at the Institute of Archeology and Anthropology at the University of South Carolina who assisted with the preparation of this volume. I would like to thank Maryjane Rhett, Francis Brockington, Betty Williams, Carleen Regal, Alan Shoemaker, Jim Frierson, Gordon Brown, Nancy Duffie, and Bob Stephenson, all of whom played a part in bringing this volume to print.

Stanley South, Chairman
The Conference on Historic Site Archaeology
Preface

An earlier and more detailed version of this paper was presented in Appendix B of my doctoral dissertation, "Archaeological Research at Fort Michilimackinac, an Eighteenth Century Historic Site in Emmet County, Michigan; 1959-1966 Excavations" (Stone 1970a). Appendix B of this report contained a formal classification, description, and interpretation of all major artifact categories found at Fort Michilimackinac during the 1959-1966 excavations. The descriptive section on gunflints was adapted for the present paper since it provides an excellent example of the principles, mechanics, and advantages of formal classification. In addition, this formal analysis of gunflints yielded several important conclusions with respect to the significance of metric variation within and between gunflint types. The model for formal classification was originally presented in a paper to the Third Annual Meeting of the Society for Historical Archaeology, held in Bethlehem, Pennsylvania, in January of 1970 (Stone 1970b). This conference paper, which illustrates formal classification with Jew's-harps, has been rewritten and will appear in the near future (Stone n.d.).

Introduction

The gunflint sample to be described was recovered during the 1959-1966 excavations of Fort Michilimackinac, Michigan. This site was occupied for approximately 66 years; controlled first by the French from ca. 1715 until 1761 and then by the British until 1781. During this period the fort was located at the extreme northern tip of the Lower Peninsula of Michigan (Figure 1). The fort was dismantled and re-established on Mackinac Island, located in the Straits of Mackinac, during the winter of 1780 and 1781. The relocated site, known as Fort Mackinac, was controlled by the British from 1780 until 1796 and from 1812 to 1815. American forces held the fort from 1796 to 1812 and from 1815 until 1895. Fort Michilimackinac has been under archeological investigation by the Mackinac Island State Park Commission and the Michigan State University Museum since 1959; during this time the fort has been partially reconstructed (Figure 2).

The purpose of this paper is to describe the results of the Fort Michilimackinac gunflint sample analysis and thereby provide an illustration of formal classification. This paper is presented in three parts: the first outlines the principles and mechanics of formal classification, the second consists of a formal description of the gunflint sample, and the third presents conclusions relative to gunflints and the formal
Figure 1
The Mackinac Straits Area of Michigan
Figure 2  Fort Michilimackinac Reconstruction, 1969, Looking Southwest
approach to classification.

PART 1 FORMAL CLASSIFICATION: DEFINITION, THEORETICAL BASE, AND MECHANICS

The formal analytic approach is closely related to both the principles of biological taxonomy and quantitative analyses commonly applied in the classification of prehistoric archaeological remains. This approach is based on a formally structured taxonomy, termed "formal classification" which, as applied in this study, may be defined as the hierarchical ranking of formal properties on the basis of their relative importance. Relative importance refers to ranked differences in attribute significance as distinguished during manufacture or use. For example, a distinction made on a structural basis is considered to be more important in terms of manufacture and use than are distinctions based on shape, material, or color. Attributes which, during manufacture or use, necessitate a higher level of technical discrimination or decision are assigned to a higher classificatory level. Attributes which necessitate a lower level of technical discrimination or decision are relegated to lower levels of distinction.

Formal classification is predicated on two interrelated views which are:

1. A classification of historic artifacts must be based on observed physical properties, regardless of any presumed analytic or cultural significance of these properties.

2. Classification is an analytic tool which is useful in evaluating the significance of variation within the spatial, temporal, and formal dimensions of a site. As such, the classes and attribute differences defined need not necessarily correspond to differences recognized by the society which produced or used them.

A list of steps necessary to complete the formal classification of an artifact category is presented below. It will be noted that the mechanics and rules of formal classification duplicate in many respects the principles of binomial nomenclature developed in the biological sciences.

Step 1. Compare all specimens within a given artifact category and note the physical properties which they possess. This results in a list of variable physical properties which characterize an artifact category.

Step 2. Evaluate the properties defined and decide which will be used as descriptive measures. This decision reflects the classifier's concept of property significance and is based on his knowledge of the manufacturing technology and function of the artifact category being studied.

Step 3. The attributes identified are then ranked in a hierarchy according to their relative formal importance. It should be pointed out that
although form consistently receives the highest order of attribution, other attributes may vary in rank depending on the specific artifact category under study.

Step 4. Name the different ranked levels and describe the attributes upon which their distinctions are based. The terms class, series, type, and variety are used here in descending order of formal importance.

Step 5. Sort and tabulate artifacts according to the classificatory levels defined. Descriptive categories which include incomplete artifacts or those which do not exhibit all physical properties necessary for formal classification are added at this point. At this step, we must also check the resultant classification against classification (see, for example Powell 1962).

   a. Only one basis of attribution can be used on each level; however, several attributes may be used at the same time, if a functional relationship can be positively demonstrated.

   b. Levels must permit the placement of artifacts into mutually exclusive groupings.

   c. Classes must be exhaustive or capable of including all specimens. This is often difficult in dealing with archaeological remains because of the presence of badly preserved or fragmentary specimens, although the problem is partially solved with the use of category distinctions described above.

Classification is complete at this point. Three additional steps are then necessary to permit artifact comparisons, interpretations, and analysis of the derived data in terms of the temporal, spatial, and formal dimensions of the site.

Step 6. Measure all specimens, note any metric relationships between variables and types, and test for the presence of dimensional categories.

Step 7. Evaluate the derived classes and classificatory attributes in terms of contextual (distributional), comparative, and historical evidence. This permits the identification of classes and attributes which have temporal, spatial, and formal significance and thus provides a basis for final site interpretation.

Step 8. A final step, that of description, serves a comparative purpose.

If the reader will consider each of these steps in the context of the following formal classification and description of guntflints, he will find that a number of unique analytic and comparative qualities result from their application. To list several, formal classification:
--is not structured by any specific interpretative problem. Therefore, there are no limitations imposed on the interpretative purposes to which its results may be applied.

--produces a classification free of built-in interpretative error and permits a reevaluation of existing artifact interpretations on an objective basis, because attribute distinctions and rankings are not based on assumed knowledge of attribute significance but on the presence or absence and relative formal importance of empirically defined physical attributes.

--permits a maximum recognition of and discrimination between physical properties representative of an artifact category, so that each variable property can be tested against the many factors potentially responsible for its contextual and formal variation. Any specific attribute or class can thus be isolated and evaluated in terms of its contextual and interpretative significance at the site. Any specific attribute can be compared with other attributes on a similar level of formal differentiation; this yields evidence of co-variation between attributes. In certain cases, it is also possible to compare related but different artifact categories on the same level of discrimination in order to identify functional co-variation between artifact categories.

--produces an internally consistent arrangement of artifact classes. This permits the description and comparison of any specific artifact within a category in terms of attributes which define any other artifact within the same category.

--through its descriptive features permits the quantification and statistical evaluation of artifact properties.

--is both easily modifiable and is flexible enough to include additions of new data.

--is capable of efficiently accommodating a large and formally complex artifact sample, thereby systematizing the task of description.

--facilitates the analysis of fragmentary or badly preserved artifacts through the use of category designations.

--produces artifact descriptions of a caliber adequate for comparative research.

--enables discrimination between behavioral norms of manufacture, since the classificatory levels defined in a formal classification of historic artifacts are based essentially on differences
A total of 2536 gunflints were recovered from Fort Michilimackinac during the 1959 to 1966 excavation seasons. Of this total, 348 specimens (13.72 percent) are "blade flints" (Wiffhoft 1966:28-29) or "gunflints" (Hamilton 1964:52). "Wedge-shaped flints," "Dutch flints" (Witthoft 1966:25-26), or "gunspalls" (Hamilton 1964:52) are represented by 2183 specimens (86.08 percent). The former will be referred to as blade gunflints and the latter as spall gunflints. This terminology reflects the major technological distinctions between the two. A third form of gunflint, termed the "blade-spall" gunflint, is represented by 5 specimens. "English" gunflints, distinguished from blade and spall gunflints by both color and technique of manufacture (Wiffhoft 1966:34-39; Hamilton 1964:53; Smith 1960:46), have not been recovered at Fort Michilimackinac.

Several important historical and archaeological sources discuss the history and technology of gunflint production. The reader is referred to the following sources for detailed treatment of these subjects: Hamilton (1964); Witthoft (1966); and Smith (1960).

The following attributes are recognized in the description of gunflints: form, which distinguishes gunflints on the basis of different techniques of manufacture; shape, which refers to the longitudinal cross section dimension of a gunflint; color; evidence of secondary flaking and firing; the presence or absence of a chalk heel, which identifies a gunflint derived from a core cortex; and the dimensions of length, width and thickness. Only complete specimens have been used to identify these dimensions.

A source of potential confusion is inherent when discussing the length and width dimensions of gunflints. T. M. Hamilton (1969) has indicated that the French dimension of blade length actually referred to the short dimension of a gunflint. This is a result of the blade gunflint manufacturing process in which a number of blade gunflints were produced from a single length of flint blade. In French usage, the width of the blade blank becomes the width of the finished gunflint, and the length of the detached blade segment becomes the finished gunflint length. In this report, length and width refer to the current, commonly accepted gunflint specifications; length is the axis of a gunflint which is parallel to the gun when mounted in a lock. Although this usage violates the known eighteenth-century system of reference, it is used here to avoid confusion and to maintain consistency with gunflint descriptions which have been published in the past. The reader should be aware of these distinctions and should consider them when comparing gunflint measurements with eighteenth-century French gunflint specifications.
The descriptive terminology in this report corresponds to accepted usage in the literature (Smith 1960:44). The parts of a gunflint are: the edge or bevel, the side or end which strikes the frizzen; the back, the side or end which is clamped in the gun cock; the face, the top face; and the bed, the bottom face.

Three levels of classification are defined on the basis of three of the above attributes. These are: (1) series—distinguished by differences in technique of manufacture (form); (2) type—distinguished by differences in shape; and (3) variety—distinguished by differences in color. The following gunflint descriptions include comparative, metric, distributional, and associational evidence whenever possible.

Series A Blade Gunflints

Series A gunflints are produced by detaching individual blade segments from a long, narrow blade which is derived from a flint core. The bed of a blade gunflint is nearly flat and is approximately parallel to the face. The bed also bears secondary retouch flaking on the edge. The top bears transverse flake scars (the negative flake scars produced by the prior removal of a blade from this core surface) and evidence of retouch flaking on all sides except the edge.

Type 1 Beveled edge and back, flat face, rounded back heel (see Figure 3A-B for cross section shape)

Varieties within Series A, Type 1 have not been distinguished since the flint color is relatively consistent and varies from blond to light grey. This color is commonly referred to in the literature as "beeswax."

Figure 4A-D; Figure 3A-B

50 specimens (4 chalk-heel and 2 burned specimens)
Dimensions (18 specimens): length, 18.3-26.1, average 22.85.
standard deviation, 2.1; width, 18.6-32.0, average, 27.12,
standard deviation, 3.0; thickness, 3.9-8.8.

Type 1 specimens bear 3 transverse flake scars on the top, with the center scar, or face, parallel to the bed; the other 2 flake scars form the front and back bevels. Type 1 gunflints (as well as Types 2 and 4) may be termed "fine" grade. Fine grade gunflints exhibit a parallel correspondence between face and bed. "Ordinary" grade blade gunflints lack this parallel correspondence. This distinction is presented for descriptive convenience, although it is felt that a similar distinction was applied to gunflints produced during the nineteenth-century (Hamilton 1969). The 18 Type 1 specimens measured exhibit a high degree of association between length and width, expressed by a correlation coefficient of .85. The correlation coefficient squared, .72, expresses the percent of variation within 1 variable which is explained by variation in the other variable. These values suggest that a desired ratio between length...
and width was closely maintained during manufacture. This ratio is expressed as 1 unit of length to 1.19 units of width. The high correlation coefficient permits the calculation of regression formulas which may be used to predict either the length or width of a specimen (or sample of specimens) when 1 dimension is known. This is particularly useful in the analysis of used gunflints since the dimension of length is normally unknown, whereas the width dimension is normally preserved. The formula which defines the regression line for Type 1 blade gunflints (based on a known width value) and which is applicable to Type 1 blade gunflint length prediction is:

\[ Y = A + BX \]

Where:
\[ A = 5.20 \]
\[ B = .65 \]
\[ X = \text{known blade width} \]
\[ Y = \text{unknown blade length} \]

The regression line described by this formula is shown (Figure 5) as it relates to the distribution of 18 specimens of known dimension. It should be stressed that this formula is applicable only to the 18 measured blade gunflints at Fort Michilimackinac and that its validity and usefulness have not been tested against other samples of known dimension.

Predictions based on this formula are not totally accurate. When considering the highly significant correlation coefficient, however, the derived predictions are sufficiently reliable to permit the computation of an unknown dimension with a degree of reliability acceptable for comparative research. In this sense, the greater the correlation coefficient, the more reliable the results of regression analysis.

This formula may then be applied to the remaining 14 Type 1 specimens (measurable on the width dimension only) in order to predict an average length for this sample of 24.18 mm.

This procedure will be useful in analyzing gunflints from the majority of sites which have produced specimens that are measurable only on the width dimension. This analysis of individual specimens may permit the identification of gunflint size categories based on 2 dimensions rather than on 1. Moreover, it is the author's opinion that length is a more critical variable in terms of gunflint function. Any procedure which permits the approximate calculation of this dimension will therefore be very useful in evaluating the significance of variation in gunflint specifications.

The possible presence of Type 1 gunflint size categories has been studies in 2 different ways: (1) by an inspection of the dimension scattergram based on 18 complete specimens (Figure 5); and (2) by considering the frequency distribution of the width dimension of all 32 specimens in 2.9 mm increments. Within the sample of 32, 90.6 percent measure between 24.0 and 32.9 mm, with nearly equal frequencies within each of the three increments, which are: 24.0-26.9 (9 specimens);
Type 2 Beveled edge, flat face, rounded back heel, no back flake
(See Figure 3C-D for cross section shape.)

The regression line described by this formula is shown in Figure 6.

This formula may be applied to an additional 27 specimens which are measurable on the width dimension. The derived length value is 24.21 cm.

Where:
\[ Y = A + BX \]

\[ A = 3.40 \]
\[ B = .74 \]
\[ X = \text{known blade width} \]
\[ Y = \text{unknown blade length} \]

The regression line described by this formula is shown in Figure 6. This formula may be applied to an additional 27 specimens which are measurable on the width dimension. The derived length value is 24.21 cm.

The possible presence of Type 2 gunflint size categories was evaluated by means of a dimension scattergram (Figure 6) and by a width frequency distribution graph. Neither approach demonstrates that size categories were present, although the broad range of gunflint specifications indicates that different sizes were available for use in different types of guns. There may have been considerable flexibility in the specifications of a gunflint which would serve any particular type of gun. Either the gunflint sample was too small to yield evidence of size differences, if present, or Type 2 gunflints at Fort Michilimackinac only appear in 1 very broad size range. Although gunflint size distinctions were apparently intended during manufacture (Hamilton 1964: 41-45), evidence for this does not appear in this sample.
Type 3  Beveled edge and back, no face flake, triangular in cross section
(See Figure 3F-H for cross section shape.)

Figure 4I-L; Figure 3F-H

66 specimens (6 chalk-heel, and 2 specimens which have been used against fire-steels)
Dimensions (24 specimens): length, 18.027.1, average, 21.95,
standard deviation, 2.20; width, 21.3-32.8, average, 27.56,
standard deviation, 2.76; thickness, 5.0-11.1.

Type 3 specimens exhibit transverse flake scars on the tip, neither of which is parallel to the bottom face; this distinguishes Type 3 blade gunflints as ordinary grade. The 24 Type 3 specimens measured exhibit a moderately high degree of association; the correlation coefficient is .77. This figure squared indicates that 59 percent of the variation within 1 variable is explained by variation in the other variable. This figure is too low to justify the computation and use of a regression formula for predictive purposes. The formula is presented below for the purpose of description only:

\[ Y = A + BX \]
Where: \[ A = 2.84 \]
\[ B = .69 \]
\[ X = \text{known blade width} \]
\[ Y = \text{unknown blade length} \]

The presence of Type 3 gunflint size categories could not be demonstrated. The length to width ratio is 1 unit of length to 1.25 units of width.

Type 4  Long, flat face, rounded back (See Figure 3I for cross section shape.)

Figure 4M-N; Figure 3I

3 specimens
Dimensions (2 specimens): length, 24.1, 23.4; width, 25.3, 30.4;
thickness, 6.2-6.4.

The 3 Type 4 specimens exhibit a very broad transverse flake scar on the top (face) which is approximately parallel to the bed. These specimens can probably be termed fine grade gunflints.

Series A, Category 1

This category consists of specimens which represent blade gunflints but which could not be identified as to specific type because of their fragmentary and worn condition. All specimens were made from the same type of flint as that described for Series A types. This category consists
of 135 specimens (14 chalk-heels, 9 specimens used on fire-steels, and 6 specimens which have been burned); these specimens have not been measured. Random specimens of Series A, Category 1 gunflints are illustrated in Figure 40-R, and Figure 3J-L.

Discussion: Series A Blade Gunflints

Four types of blade gunflints have been distinguished (See Table 1 for a comparative tabulation of metric data). Series A types are distinguished on the basis of differences in longitudinal cross section shape, as defined by the number and orientation of transverse flake scars on the gunflint surface. A more generalized system of classification would distinguish between fine grade specimens (Types 1, 2, and 4) and ordinary grade specimens (Type 3) on the basis of correspondence in angle between the top and bed of a gunflint.

An attempt has been made to distinguish gunflint sizes within Series A types. The presence of size categories could not be demonstrated. Moreover, there are no significant differences in gunflint sizes between types.

A comparison of other quantitative attributes, however, reveals certain between-type differences. The 2 major fine grade types (Types 1 and 2) exhibit a more consistent ratio between length and width than does the single ordinary grade type (Type 3). In terms of individual dimension variation, however, Type 3 gunflints have significantly smaller standard deviations in both dimensions than do either Type 1 or 2 specimens. In comparing fine with ordinary specimens, it is evident that although the length and width dimensions of ordinary specimens are less closely associated, individual length and width dimensions are more restricted. Type 3 specimens thus vary to a relatively greater degree in terms of rectangular shape but, to a lesser degree, in terms of size. In terms of length and width ratios, Type 3 specimens are wider in proportion to length than are either Type 1 or Type 2 specimens. The ratio of ordinary specimens to fine specimen is 1 to 2.18. Although these type distinctions between fine and ordinary blade gunflints are real, they are thought to represent normal products of gunflint manufacture, rather than intentionally or desirably produced types; that is, to produce fine quality blade gunflints, it is also necessary to produce a certain amount of ordinary quality gunflints.

The pattern of Series A gunflint distribution appears to duplicate the distribution of other artifact categories which appear randomly at the site. Although blade gunflints occur in nearly all excavated areas, they are much more frequent in the area south of the 220 grid line. In evaluating this distribution, it was also noted that there are no distributional differences between used and unused blade gunflints. The distribution of unused blade gunflints, therefore, cannot be used to define areas of storage or supply. The most significant observation on Series A gunflint distribution is that Series A specimens occur very infrequently in a large area within the center of the earliest French
stockade (ca. 1715-1725 (1735)); this may indicate that blade gunflints were not in use until at least after 1735. This suggested date is supported by specific structure-feature associations which indicate that Series A gunflints rarely occur in features which date from the earliest French occupation.

Series A gunflint comparative evidence (Table 2) is inconclusive regarding dating or differential spall to blade ratios through time. This evidence indicates that Series A gunflints occur commonly in sites which were occupied during the eighteenth century; however, they rarely occur in sites occupied earlier than 1700. Series C spall gunflints occur commonly during the seventeenth and eighteenth centuries and are found in direct association with Series A blade gunflints at many sites. In Witthoft's (1966:28) interpretation of this evidence concerning Series A gunflints (his "blade-flints") he maintains that:

A few French flints may have been made before 1675, but that they were not an ordinary article of commerce until later than 1740. Judging in terms of evidence from military sites in North America, by 1775 the French flint was the only type made.

Also (1966:30):

Prior to 1760, the majority of French flints were designed for the fire-steel.

Hamilton (n.d.:37) notes that:

Though I believe that French flints were in the American trade before 1700, they did not become significant factor until an as yet undetermined later date. Also, I suspect that French flints were used first in quantity by the French military, and only later by what may be loosely termed the civilian population, including the fur trade and Indians.

Several additional comments may be added to these interpretations. The differential frequency of spall and blade gunflints at a site may not necessarily be entirely a function of differential availability through time but may also be related to differential preferences of the inhabitants of different types of sites. At many sites, both spall and blade gunflints occur frequently, although spall gunflints generally occur in greater numbers. This suggests that either spalls were more readily available or that spalls were preferred over blades.

Comparative evidence, site distribution, and feature associations indicate that Series A gunflints were initially used at the site between
1730 and 1740; they appear to have been used from this time until the site was abandoned.

Series B Blade-Spall Gunflints

Figure 4S-U; Figure 3M-N
4 specimens
Dimensions (4 specimens); length, 22.9, 23.2, 25.4, 22.3; width, 31.2, 25.2, 29.3, 28.2; thickness, 6.8-9.1 (range).

Series B gunflints are distinguished by the presence of 1 transverse and 1 longitudinal flake scar on the top face. The longitudinal flake scar has a central bulb of percussion, as in Series C specimens below. The transverse flake scar is a characteristic of Series A gunflints described above. The flake junction is marked on the spall side by a central bulb of percussion. Both flakes taper down to the gunflint ends. The end produced by the longitudinal flake appears to have been the edge of the gunflint. The flint used in Series B specimens is dark grey; this coloration most closely resembles that of Series C, Type 1, Variety B. These specimens are anomalous in bearing evidence of both Series A and Series C flaking techniques, although they resemble Series C gunflints most closely in flint types. It is tentatively suggested that Series B specimens represent salvable by-products of standard Series C spall gunflint production.

Series C Spall Gunflints

Series C gunflints are produced by the removal of individual spalls from a flint pebble or nodule. The top face of the gunflint has a slightly convex surface on the edge side of the bulb of percussion and is sharply beveled toward the back by secondary flaking. A number of specimens bear a heel which has only been slightly retouched and thus retains evidence of the original core cortex, or the bottom face of a previously removed spall. The bulb of percussion is evident on many specimens and occurs at the approximate center of the gunflint near the heel end. The bed of the gunflint is slightly concave to flat in longitudinal cross section and often bears negative flake scars from the prior removal of gunflints. The bottom face of a spall gunflint is the outside face of the core from which it was produced. The heel and side edges of a spall gunflint are normally retouched and shaped during manufacture, whereas the edge appears to have been left in its original sharp condition, to be retouched later by the user. Many unused Series C specimens in the Fort Michilimackinac sample exhibit very fine retouching along the bed edge. Hamilton (1960:28-79) and Witthoft (1966:26-28) include more detailed accounts of spall gunflint manufacture.

Type 1 Wedge-shaped

This type distinction is for convenience in classification only and applies to all Series C specimens.
Variety a  Grey to brown

Figure 8A-m; Figure 620; Figure 7A-H

2032 specimens (46 chalk-heel, 113 burned, 106 used against fire-steels (Figure 8S-V), 92 specimens which exhibit negative flake scars on the bed)

Dimensions (177 specimens): length, 15.9-38.3, average, 25.11, standard deviation, 3.71; width, 18.3-36.4, average, 27.85, standard deviation, 3.98; thickness, 4.0-10.4; correlation coefficient, .79.

The moderately high correlation coefficient of .79 between length width indicates that 62 percent of the variation in 1 variable can be explained as a result of variation in the order. The ratio between these dimensions is 1 unit of length to 1.10 units of width. A comparison of standard deviations between each of the 2 dimensions indicates that the relative amount of metric variation between dimensions is nearly the same; that is, the pattern of deviation from the mean is about the same for either dimension.

A sample of 42 specimens which had negative flake scars on their bottom face were also measured. A correlation coefficient of .70 between length and width indicates that the ratio between the 2 dimensions in Series C, Variety a spall gunflints with negative flake scars were less consistent. These specimens also exhibit a greater width dimension (29.66 mm average) relative to length (25.72 mm average) than other Series C, Variety a specimens. These observations indicate that Series C, Variety A spall gunflints which have negative flake scars on their bottom face were less consistent in size and shape and were probably less desirable gunflints than specimens which did not exhibit this trait.

A regression formula is presented below which may be used to predict the length of specimens of samples if the width is known. This formula is not considered sufficiently reliable for comparative purposes, however, and is presented for descriptive purposes only. The regression line described by this formula is presented in Figure 9.

$$Y = A + BX$$

Where:  
A = 3.74  
B = .77  
X = known width  
Y = unknown length

The possible presence of Series C, Type 1, Variety a size categories was evaluated in 2 different ways: (1) by the construction of a graph which shows the independent frequency distribution of length and width dimensions of 177 specimens in 1.9 mm increments (Figure 10); and (2) by the construction of a dimension scattergram (Figure 9). The first method provides no evidence of size categories. The second method yields similar results, although there may be a very slight tendency for size clustering in three areas, as expressed by the following approximate size
ranges.

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<th>Length</th>
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<td>27.0-30.5</td>
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<td>29.5-31.5</td>
<td>32.5-35.5</td>
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</table>

The above size categories were defined on an admittedly subjective basis. If these sizes were actually intended during manufacture, they were maintained with a great deal of variation. The concept of sizing gunflints in terms of anticipated type application, then, has little, if any, empirical validity. Although the range of acceptability of gunflint sizes which would have efficiently served any specific gun type must have been large, the users of gunflints probably consciously selected those which were in a specific, but broad, size range.

**Variety b** Dark grey to black

Figure 8N-Q; Figure 7I-J

139 specimens (14 chalk-heels, 16 specimens used against firesteels, 12 specimens with negative flake scars on the bed)

Dimensions (29 specimens): length, 21.2-32.5, average, 27.68, standard deviation, 2.94; width, 24.5-36.2, average 29.28, standard deviation, 3.49; thickness, 5.0-11.9.

Variety b specimens are easily identified on the basis of flint characteristics. The flint is dark grey to black in surface color and is very dark brown when viewed through an intense light. Most specimens have white to light grey inclusions. The dimensions of length and width exhibit a moderate to low degree of association; the correlation coefficient is .70. This low correlation does not justify the use of a regression formula for predictive purposes. The formula has been computed, however, and is presented below for descriptive purposes only.

\[
Y = A + BX \quad \text{Where:} \quad A = 10.0 \\
B = .60 \quad X = \text{known width} \quad Y = \text{unknown length}
\]

The shape of Variety b specimens may be described in terms of a length to width ratio of 1 unit of length to 1.06 units of width. On this basis, Variety b spall gunflints are more nearly square than either Series C, Variety a, or Series A gunflints. A comparison of length and width means and standard deviations reveals that Variety b spall gunflints are also larger than Variety a spall gunflints. Series C, Variety b size differences could not be distinguished.
Variety c Brownish-red

Figure 8R; Figure 7K
4 specimens
Dimensions (3 specimens): length, 24.3, 23.7, 18.8; width, 31.2, 28.1, 20.3; thickness, 5.5–8.3.

These specimens differ from Variety a spall gunflints in color only.

Discussion: Series C Spall Gunflints

Three varieties of Series C, Type 1 spall gunflints have been distinguished above on the basis of differences in flint color. Each of the 2 predominant varieties (a and b) are represented by a small percentage of specimens which exhibit negative flake scars on their bottom faces. It has been pointed out that Variety a specimens which exhibit this attribute differ significantly from the remaining specimens which do not exhibit this attribute in terms of size, shape, and length to width ratio consistency.

A comparison of dimensions and ratios between Series C, Type 1, Variety a and Variety b specimens indicates that Variety b spall gunflints are both larger and more nearly square in shape than Variety a specimens. Size categories have not been defined for either major Series C variety, although the noted tendency of Variety a specimens to cluster within 3 very broad size ranges may indicate that specific gunflint sizes were intended during manufacture.

The distribution of both Series C spall gunflint varieties approximate the random distribution defined for Series A blade gunflints in that specimens appear in nearly all areas of excavation but are present in high frequencies south of the 220 grid line. The heaviest concentration of specimens within this area occurs in the western 6 to 10, 10 foot squares. More specifically, Series C spall gunflints occur very frequently within the suspected garden areas south of the 2 southern rowhouse units. Specimens within these rowhouse units are significantly less frequent than in the adjoining garden areas and, when present, are associated with basement features. The Priest's house is the only well-defined area of frequent occurrence north of the 220 grid line. Several areas of absence or low frequency have also been noted: (1) north of the earliest French stockade (F.5) which includes such features as the provisions storehouse, an area included within the first stockade expansion to the north, and the north-northwest rowhouse unit; and (2) a large area within the west-center and northern part of the earliest French stockade which includes most of the north-northwest rowhouse unit. Differences between areas of high and low frequency are difficult to explain in chronological terms and are thought to more closely reflect the spatial distribution of areas which are characterized by activities such as gunflint supply and distribution or trash deposition. The occurrence of Series C, Variety a gunflints in specific structure-feature
contexts supports this suggested correlation.

The presence of Series C gunflints on other sites indicates that spall gunflints commonly occur in sites which date from the mid-seventeenth century through the eighteenth century. The occurrence of Series C spall gunflints at Fort Michilimackinac in both French and British contexts corresponds with a portion of this suggested broad date range, although spall gunflints (and blade gunflints) do not appear to have been common during the early years of French control from 1715-1735. This may have been due to the relatively small permanent population at the site during these years. Although the permanent population of the fort increased very little during the French period, the site serviced increasing numbers of itinerant traders throughout this period. This may explain the noted increase in frequency of gunflints at the site, when a major permanent population increase did not occur.

Both Witthoft (1966: 25) and Hamilton (1964: 62-53) have commented on the dating of spall gunflints. Witthoft maintains that spall gunflints were in use from 1650 until 1770, at which time the blade gunflints succeeded in popularity. Hamilton essentially concurs with this interpretation. Hamilton, speaking of Witthoft's conclusions (1968: 117), notes that he (Hamilton) has repeatedly used a system of dating based on the "proportion of one type, such as Dutch, to another, such as French" with "encouraging results." To this author's knowledge, however, neither Witthoft nor Hamilton have reported the basis for or the results of this system. Interpretations of the present data will remain tentative, then, until this additional comparative information is available.

On the basis of the above comparative and distributional evidence, the Fort Michilimackinac spall gunflint sample is dated throughout the period of site occupation. A definite increase in frequency is noted after 1730 to 1735. A number of British period features associations indicate that spall gunflints were in common usage throughout the period of British control.
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Figure 5  Series A, Type 1, Gunflints, Dimensions of 18 Specimens
Figure 6  Series A, Type 2, Gunflints, Dimensions of 31 Specimens
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Figure 9  Series C, Type 1, Variety a, Gunflints, Dimensions of 177 Specimens
Figure 10 Series C, Type 1, Variety a, Gunflints Length and Width Relationship by Frequency of 177 Specimens
PART 3 CONCLUSION

The preceding gunflint classification has permitted an evaluation of physical variation within and between gunflint types as this variation reflects differences within the temporal, spatial, and formal dimensions of the site. The formal dimension of an archaeological site, as distinct from the spatial and temporal dimensions, is defined by the presence of and interrelationships between the physical attributes which characterize a site and which result from human activity. The classification and attendant gunflint descriptions also provide a basis for a critical evaluation of the relevance of formal classification to the study of historic artifacts. A review of this information suggests the following observations and tentative interpretations.

1. Spall gunflints (Series C) are much more frequent at the site than blade gunflints (Series A); this is expressed as a ratio of 1 blade gunflint to 6.25 spall gunflints. This difference may reflect either the differential availability and/or desirability of blade and spall gunflints. This observation should probably receive additional study from an historical-documentary perspective.

2. Spall gunflints are larger in size and are less consistent in shape in terms of a length to width ratio than are blade gunflints.

3. Blade gunflints are wider in proportion to length than are spall gunflints.

Observations 2 and 3 suggest that blade gunflints served a more specialized purpose than did spall gunflints—perhaps adapted to a specific style or make of weapon. This may also partially account for the noted lower frequency of blade gunflints.

4. Blade gunflints may be distinguished as fine (Types 1, 2, and 4) and ordinary (Type 3). The difference between spall gunflints which have negative flake scars on the bed and those which do not may represent a spall gunflint equivalent of this distinction.

5. The spatial distributions of spall and blade gunflints are similar with the exception of several distributional differences which indicate that spall gunflints were present throughout the period of site occupancy, whereas blade gunflints may not have appeared at the site prior to 1730 to 1740. Specific feature associations support this conclusion.

6. Neither Series A nor Series C gunflints exhibit distributional differences between used and unused specimens.
7. The noted consistency in the length-width ratio of several gunflint types permits the computation of unknown gunflint length dimensions from known gunflint width dimensions. This procedure is based on regression analysis.

The rationale for, mechanics, and advantages of a formal approach to artifact classification and analysis have been described and exemplified in this report. Although the approach is based in part on current methods of archaeological taxonomy, it is a new and useful concept in the archaeological study of historic sites. It is hoped that this approach will be evaluated and tested by others in the field who are interested in developing a formal analytic model which will facilitate the interpretation of artifacts from historic sites.
NOTES

1. All measurements are given in millimeters.

2. The standard deviation provides a measure of dispersion of values around the arithmetic mean computed from these values. The larger the standard deviation, the greater the dispersion of values about the mean. This measure has been used in a number of cases to evaluate the reliability of the mean and to facilitate the comparison of means between samples.

3. The correlation coefficient, or Pearson's product moment correlation (r) is a measure of relationship or of co-variation between variables and is expressed on a scale between -1.0 and +1.0. A negative value indicates that there is a negative linear correlation between variables; this correlation increases in degree between zero and -1.0. A positive value indicates that there is a positive linear correlation between variables; this correlation increases in degree between zero and +1.0.
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Woolworth, Alan R., and W. Raymond Wood


Hamilton, T. M.

EXPLORATORY ARCHEOLOGY AT
HOLMES' FORT, THE BLOCKHOUSE, AND JAIL REDOUT AT NINETY SIX

Stanley South

Historical Perspective

In May 1780, Charleston fell to the British under Sir Henry Clinton, and Lord Cornwallis was assigned the task of ending the rebellion in South Carolina. Particular attention was focused on the South Carolina militia under Brigadier General Andrew Williamson, and a march was made toward the village of Ninety Six by Lieutenant Colonel Nisbet Balfour, senior field commander under Cornwallis (Bass 1962:2). Before he reached Ninety Six, however, General Williamson surrendered his force to the British with no resistance, and three days later Andrew Pickens did the same.

On June 22, 1780, Balfour reached Ninety Six and made the settlement the headquarters for the British in the Back Country. The Ninety Six regiment was placed under the command of Colonel Robert Cunningham who was to play an important role in the British cause, and exactly five months after marching into Ninety Six, Balfour would make him the only brigadier general appointed by the British while they were in South Carolina (Bass 1962:43).

Within a month after the surrender of his militia and supplies, General Williamson was cooperating with the British. To get him completely committed "Cornwallis used the old money trick," and gave him 200 guineas (Bass 1962:7). Andrew Pickens was paroled, and in the months to follow, both the British and his Tory neighbors pressed Pickens to declare his loyalty to the king. The Whigs also worked on this leader of proven ability in an effort to get him to break his parole promises and join in the American cause. For months he had periodic conferences with both sides without committing himself, but finally in December 1780, he made up his mind and gathered members of his old regiment around him, and, with the help of a diversion to tie down Cunningham's force at Fort Williams to allow them to move unresisted, marched to join General Morgan and the cause of the Revolution. His decision was a significant one and a blow to the British cause in the Ninety Six district, for the regiment under Pickens had been considered "the best in the rebel service" (Bass 1962:52).

Lieutenant Colonel John Harris Cruger, commander of the New Jersey Volunteers, was ordered by Cornwallis to take charge of the important district of Ninety Six, and he urged Cruger to keep possession of the Back Country, for "the success of the war in the Southern district depends totally upon it" (Bass 1962:7).
During the year from the time of his arrival at Ninety Six until
the end of the month-long siege by General Nathaniel Greene's army
from May 22 to June 19, 1781, Colonel Cruger was involved with the
fortification of Ninety Six. The village of Ninety Six itself was
palisaded and protected with flanking blockhouses, and two blockhouses
were built utilizing log barns on the hill west of the town to protect
the water supply and this side of the village. This stockaded fort,
with a ditch and parapet in the shape of a hornwork, was Holmes' Fort,
connected to the town by a covered way. The jail was fortified by
ditching and embankments, as well as a palisade (MacKenzie 1787:142-
64; SCA, BPRO, Cornwallis Papers F220, 50/11/2). By the latter part
of November, Cruger was disillusioned regarding the ability of the
militia to be of much help in an encounter, and expressed these reserva­
tions to Lord Cornwallis. This news did not cheer Cornwallis regarding
the safety of Ninety Six, so he sent his senior officer of engineers,
Lieutenant Henry Haldane, who was also his Aid de Camp, to check on the
fortifications Cruger had constructed (Bass 1962:35; MacKenzie 1787:143).
Haldane found the works in a much better state than he had expected.
For additional protection he ordered construction of a star shaped
redoubt on a hill to the northeast of the town, and ditches were opened
to create embankments connecting it with Cruger's works (MacKenzie 1787:
143; SCA, BPRO, Cornwallis Papers, December 1780, 30/11/4, F296).

These works, composed of the fortified town protected by blockhouses,
the Star Fort, and related ditches and parapets on the east of the town,
with Holmes' Fort on the hill to the west of the town, were surrounded
by the army of General Nathaniel Greene on May 22, 1781, and besieged
by him until June 19th. On June 18th, Greene assaulted the Star Fort,
while Colonel Henry "Light Horse Harry" Lee attacked and captured
Holmes' Fort. Greene was repulsed from the Star Fort and withdrew from
Ninety Six rather than face the army of Lord Rawdon which was only a
few miles away (MacKenzie 1787:142-64; SCA, BPRO, Ordnance-Colonies,
1787, 5/103/5).

During the siege, a number of classic moves in besieging and
defending a fortification were used. A mine was dug by Greene's engi­
neer, Count Kosciuszko, in an attempt to tunnel beneath the Star Fort
to blow it up; flaming "African arrows" were used in an attempt to
set fire to buildings inside the fort; Greene and Lee both cut approach
ditches and parallels for moving troops and artillery close to the
fortifications; Mayham towers were used to raise sharpshooters and
artillery high enough to fire down into the Star Fort; and an attempt
was made to set fire to the stockade around Holmes' Fort (MacKenzie
1787:142-64; Lee 1812:120-30). Cruger in the town and Major Greene
in the Star Fort defended their works with equal ingenuity. The roofs
of the buildings were removed to prevent their catching fire from the
"African arrows"; an attempt was made to heat shot to use in destroying
the Mayham towers; a counter-ditch was dug inside the Star Fort to
provide additional protection from the sharpshooters in the towers and
to intercept the mine when it came beneath the fort (amputating a point
of the star, so to speak). A well was dug inside the Star Fort in an
unsuccessful effort to reach water for the besieged garrison, and water was obtained by sending naked blacks crawling into the night with buckets to the stream which was under the watchful eye of the pickets of Lee's Legion. Sandbags were used to raise the parapet at the Star Fort and to casemate the artillery pieces to reduce the effect of the sharpshooters in the towers, and sallies by small groups outside of the fort to attack the besiegers and backfill the approach trenches were outstandingly successful (MacKenzie 1787:142-64). These features of the besieged and the besiegers make the Ninety Six Site one of the most fascinating in the annals of the Revolution.

The historical account of the events surrounding the 1781 Battle of Ninety Six has been presented by many historians. The account upon which most of these have been based is that provided us by Roderick MacKenzie in his 1787 publication Strictures on Lt. Col. Tarleton's History of the Campaigns of 1780 and 1781, in the Southern Provinces of North America. This account is from a witness, Lieutenant Hatton of the New Jersey Volunteers, who was at Ninety Six (MacKenzie 1787:132-64). Another first hand version of the battle is provided by a letter from General Nathaniel Greene (SCA, BPRO, Ordnance-Colonies, 5/103/5, June 20, 1781). Lt. Colonel John Harris Cruger reported on the siege by Greene in letters to Lords Cornwallis and Rawdon, and these too are an important report on the events at Ninety Six (SCA, BPRO, Cornwallis Papers, F). From these accounts the reader can obtain good first hand summaries of the events at Ninety Six in 1781. Another basic source of primary information regarding correspondence of Lord Cornwallis is a manuscript by Robert Duncan Bass entitled "Lord Cornwallis and Ninety Six", in the files of the Greenwood County Historical Society, the Star Fort Historical Commission, and the Institute of Archeology and Anthropology at the University of South Carolina (Bass 1962:M.S.). In this manuscript Bass has included extracts of letters from the Cornwallis Papers that are not available elsewhere.

Exploratory Archeology at Holmes' Fort (38GN2)

As we have seen, Holmes' Fort was the defensive bastion on the high ground to the west of the village of Ninety Six. It was often referred to as a stockaded fort (MacKenzie 1787:155) containing abatis before a ditch (Lee 1812:122,128). The maps all indicate that Holmes' Fort was a square with corner bastions or blockhouses, yet only two blockhouses are known to have been in the fort (BPRO, Greene, June 20, 1781, Ordnance-Colonies, V:103-05); (see map in jacket pocket, Figure 1). Other than this we know little about the physical appearance of the fort, except that provided by archeology.

We do have a reference that may well apply to Holmes' Fort, and if it does, it will be of importance in the excavation of the fort site. After Holmes' Fort was captured and then abandoned by Lee, Cruger set about the demolition of the works. On July 3, 1781, a servant of Colonel O. H. Williams, who had been held at Ninety Six by the British, made his
escape. The servant, Dominique, had heard orders given to march soon and had seen "all their swivels . . . broken off before he came away . . ." Another man reported to Williams that iron and other articles which could not be transported were covered in the trenches. Another report stated that the British were to move out on July 10th (Cann 1969: 58-59). From these observations of the last days at Ninety Six we can expect some interesting artifacts to emerge from the fort ditches.

Exploratory trenching on the suspected site of the fort was done during four days in May 1970, and as a result, the south ditch of the fort was located (South, September 1970:11,35). The October-November Project of 1970 was designed to locate, through exploratory trenches, the shape of the entire fort, and hopefully begin excavation of the contents of the ditches. One week was devoted to trenching on the site to locate the ditch outline of the fort, and the evidence found was drawn onto a map (jacket pocket, Figure 1). From this map it was possible, for the first time since the Revolution, to know the actual shape of the ditch around Holmes' Fort. The fort was not at all shaped like the historical documents had indicated, but like a British hornwork, typical of those of the mid-eighteenth century (Vauban 1740: in Rothrock 1968:94). The main ditch was found to be in the form of two bastions, a large one enclosing an area of slightly over 50 feet across, with a smaller bastion half the size. The overall size of the fort including the ditches was 100 by 200 feet. It was built on the edge of the high hill overlooking the town of Ninety Six, and in general outline is like that of a large mitten. Hornworks were connected to the town by covered ways or ditches, by means of which free travel between the hornwork and the town was possible. Muller (1746:98) has stated the purpose of a horn or crown-work:

When there is neceffity to conftruct horn or crown-works, either to cover a gate, or to occupy a spot of ground which might be advantageous to the besiegers, and which can no other ways be taken into the fortification... (Muller 1746:98).

From Figure 1 we can see that the ditch for Holmes' Fort was eight feet wide, with a parallel, burned, firing wall trench located 12 feet inside of it. In interpreting these parallel features we see that the earth taken from the ditch was likely placed on the inside on the 12 foot space between the ditch and the smaller trench in which vertical post impressions could be seen. The small trench held vertical posts for a firing wall and allowed the inside of the parapet wall to be a vertical one. The fact that the subsoil around this trench was burned would clearly point to the picketed firing wall having been burned. We suspect that this burning took place in July 1781 when we know Cruger was destroying the works at Ninety Six before withdrawing his force after having withstood the siege of General Nathaniel Greene's army (Cann:1969:58-59).
Inside the outline formed by the main fort ditch, a short ditch at a right angle to the axis of the smaller bastion was found to measure from six to eight feet wide and 35 feet long. This may have been a ditch for obtaining earth for building a traverse to provide additional cover for the entrance to the covered way leading to the town of Ninety Six. Similar traverses are seen in the hornworks of the eighteenth century. Another ditch was found extending from the north fort ditch a distance of 70 feet, allowing only four feet remaining between the end of this ditch and the west wall of the large north bastion, possibly as a passage-way. This ditch very likely also represents a traverse thrown up to provide added protection for the covered way entrance inside the fort.

The two blockhouses known to have been inside the fort have been tentatively positioned on the map (Figure 1) based on the evidence at hand. Further work will be necessary to test the accuracy of these conjectures.

To the north of the small bastion on the west ditch of the fort an additional ditch extends from the fort ditch toward the west. The function of this ditch is not known as yet, and it is conjectured to be an additional traverse or protective arm to provide added protection. Further work will be needed to properly interpret this and any related features.

To the northeast of the large bastion, near the edge of the drop-off of the hill, a trench was found to parallel the main ditch. This may have been a palisade around the outside of the larger ditch. An abortive attempt was made to burn the stockade by a squad composed of a sergeant and nine infantrymen of Lee's Legion. They were discovered, however, and six of the men were killed, including the sergeant (Lee 1812:122). It is interesting to note that Sergeant Major William Seymour of Lee's Legion reporting on the successful capture of Holmes' Fort by Lee on July 18, 1781, said that Holmes' Fort was captured "with the redoubt therein", indicating an inner "redoubt" inside the main wall line of Holmes' Fort (Seymour 1910:28).

The plan of excavation at Holmes' Fort has been as follows: The exploratory slot-trench work to constitute the first phase of the project, during which time the outline of the fort is determined. The second phase is the machine removal of the blanket of plowed soil over the site in a one hundred yard square area so the outline of the fort can be studied in greater detail and additional maps drawn of the features. The third phase is the actual cleaning and dressings of the subsoil level to reveal the features, those already discovered through slot-trenching and any others not revealed before. This work requires the services of a large crew with shovels to properly achieve the smoothness of the ground required to reveal the archeological features. The fourth phase involves the excavation of the ditches and other features recovered, with profiles being reached through drawings and photographs so that an understanding of the deposition of the soil in the features can be achieved for proper interpretation of the events that took place on the site. In this process
artifacts are recovered from the various layers examined, with drawings, measurements, and photographs recording the position of these in relation to significant associated features. The fifth phase of the project is the rebuilding of parapets, replacing of firing wall and palisade posts, and the ditches and embankments covered with protective sod to prevent erosion. The sixth and final stage in the process is the analysis and writing of the report on the project, with a correlation of the data discovered through archeology with the historical documents to produce a greater understanding of the site than has been possible since it was last seen intact at the time of the Revolution.

With the first phase of this sequence completed at the end of the first week on the site in October 1970, machines were brought to the site to begin the second phase, the removal of the plowed soil zone. However, as soon as they were on the site rain began and continued off and on for some three weeks, thus putting a large dent in the excavation schedule at Holmes' Fort. During this time it was impossible to work on the red clay subsoil of Holmes' Fort, exploratory slot-trenching was carried out in the area north of the intersection of the roads inside the village of Ninety Six. This type work is possible with wet ground whereas the work at Holmes' Fort was not possible under wet conditions. During this alternate work program, an impressive blockhouse ruin was discovered which will be discussed in the next section of this paper.

When the rain stopped and the ground dried enough to support the machines, a belly-loading, scoop-type, self-loading, earth moving machine was brought to the site to remove the plowed soil. A road grader was then used to cleanly cut the subsoil surface so that a minimum of hand labor would be necessary to reveal the features. This process was carried out on the west half of the fort, including both the bastions. At this time the rain began again and work was continued on the exploratory trenching on the blockhouse site. Two weeks later some cleaning of the Holmes' Fort Site was possible, during which brick footings and a cellar hole for a structure north of the main fort bastion were discovered. This ruin probably represents a house of the town of Cambridge of the late eighteenth and early nineteenth century which was located on the site of Holmes' Fort. With only two weeks remaining and rain still being a factor, the work at Holmes' Fort was discontinued for the season, with the final emphasis being placed on the blockhouse site and exploratory work at the site of the jail.

Since we have an account of a witness who saw destruction taking place at the Ninety Six fortifications in July 1781 (Cann 1969:58-59), and we have found evidence that the firing wall burned, and since we have seen that in 1821 when the map of Ninety Six was made no one recalled, apparently, that the fort was a hornwork, and since the town of Cambridge replaced the town of Ninety Six as a center for the area after the Revolution, we are led to suspect that the ditches of Holmes' Fort were filled in by Cruger in 1781, or by the time Cambridge was begun in 1784, thus accounting for the lack of specifics remembered about this feature.
only a few decades later. Archeology will be able to answer this question for us through an examination of the artifacts from the fort ditch.

The artifacts found in this project at Holmes' Fort were all from the plowed soil zone, so have a limited usefulness. However, they do provide a clue to the period of occupation of the site and from these we see that the site was occupied from the 1780's to the mid-nineteenth century, judging from the pearlware, creamware, banded ware, transfer printed ware, and small amount of ironstone present on the site. An analysis of these and all other artifacts recovered will be included in later reports, when more work has been carried out on the site.

The major effort of the 1971 excavation will be the revealing of Holmes' Fort in its full visual outline as represented by the ditches which formed its main defense. This archeological expedition is expected to cost about $20,000. If funds are made available for stabilization of these ditches once they are opened through archeology and for replacing the embankments accompanying the ditch, as well as the palisades around the outside of the fort and the posts in the firing wall, Holmes' Fort will emerge as an impressive companion to the well-known ruin of the Star Redoubt.

The Palisade and Ditches Around the Town of Ninety Six (38GN5)

Exploratory trenching in the area of the intersection of the roads just north of the ruins of the town of Ninety Six revealed palisade trenches, fortification ditches, and a cellar hole. At the junction of the ditch from the Star Fort with the northeast corner of the town, a palisade trench was found to form a small bastion 18 feet wide, located just north of a fortification ditch eight feet wide. Twelve feet south of this fortification ditch another palisade trench was found to parallel the large ditch. The fort ditch angled toward the north near the Charleston Road to form what may have been a protective arm flanking the entrance to the town at this point (Map in Jacket Pocket, Figure 2). A smaller ditch and trench just south of this entrance may well represent a structure from the town of Ninety Six. The palisade trench along the east side of the town was followed for several hundred feet. From the evidence found at the junction of the ditch to the Star Fort with the northeast corner of town, a fortification ditch has been postulated as paralleling the east palisade wall to the outside of this wall (Figure 2).

It is thought that the palisade trench seen along this side of town, along with the northeast corner bastion, represents the original defensive palisade built by Cruger in 1780. On October 13 of that year he stated:

I Have Palisaded ye Courthouse & the Principal houses in about one hundred yards square, with Block House flankers... (GCL, BPRO, 30/11/2, Cornwallis Papers, Cruger to Cornwallis: October 13, 1780:F220).
On the opposite side of the Charleston Road this palisade trench was found to intersect at the corner of the fort ditch, and after 23 feet, make a right angle turn toward the south and continue to the edge of the bank at the north edge of the connecting road to Augusta (Figure 2). This palisade line parallels that on the east side of the town of Ninety Six and is 220 feet away from it. It is thought that this palisade represents the original palisade around the houses of Ninety Six. This palisade should continue on toward the south, forming a west protection to the houses located along the west side of the Charleston Road, until it intersects with the south palisade around the entire area found in the earlier exploratory survey of the site (Figure 3). If this is the case, the town palisade built by Cruger would measure 220 by 400 feet, which fits his description of "about one hundred yards square" for his palisade. At the junction of this west palisade with the south palisade trench found earlier, it is thought that a comparable bastion should be located, like that found at the northeast corner of the area.

Along the west side of the Charleston Road, north of the fort ditch found on this side of the road, the edge of what is thought to be a ditch comparable to that across the road, was found. This may, however, be merely the edge of an old road bed to the town, but more archaeology can answer this question. At a point 60 feet north of the north palisade trench for the town, a separate trench was discovered extending toward the west from the Charleston Road. This palisade trench was followed by cutting slot-trenches and was found to extend for 330 feet, at which point it made a right angle turn toward the south and extended for 125 feet more until it ended about half way down the side of the steep bank beside the road to Augusta (Figure 2). This compound is thought to have enclosed the encampment area for the Royal Provencials defending Ninety Six. This conjecture is supported by the fact that during the visit of Lt. Anthony Allaire of Major Ferguson's Corp to Ninety Six in June 1780 he:

Took quarters in town, opposite the jail, where I have the constant view of the Rebels peeping through the grates, which affords some satisfaction to see them suffer for their folly (Draper 1954:499).

This clearly refers to a point to the north of the jail, which would be inside the compound outlined by this palisade trench.

Cornwallis sent his Aid de Camp, Lt. Henry Haldane, to inspect Cruger's works in December 1780, and he ordered the Star Fort built and the ditches connecting it with the town palisade built by Cruger (GCL, BPRO, 30/11/4, Cornwallis Papers, December 9, 1780:F296, 394; MacKenzie 1787:143). When this was done the ditch was apparently dug inside Cruger's north town palisade, causing an intrusion of the large ditch across the neck of the northeast palisade bastion of Cruger (Figure 2). A new trench for a firing wall of vertical posts was then dug 12 feet south of Haldane's ditch along the north side of town. On
the east side, however, slot-trenching tends to indicate that Cruger's fort ditch extended along the outside of Cruger's east palisade wall. This would allow this palisade wall to be used as a firing wall protected by a parapeted embankment from the soil from Haldane's ditch, thus making the east wall much better protected against artillery fire.

This interpretation is supported by the fact that MacKenzie states that the town of Ninety Six was surrounded by a stockade, and that:

The commandant immediately fet the whole garrifon, both officers and men, to work, to throw up a bank, parapet high, around this fstockade, and to ftregthen it with an abbatis (MacKenzie 1878:142).

Since we know that during Haldane's visit he ordered ditches dug and abatis placed in front (GCL, BPRO, 30/11/4, Cornwallis Papers, December 9, 1780:F394), we see that MacKenzie is mistaken as to who ordered the earth thrown against the stockade; it was not the commandant, Cruger, who ordered this done, but Haldane. The important fact is not this, however, but the bank that was thrown against the stockade "parapet high." This surely fits the situation as we see it archeologically along the east wall of the town. The job that now needs to be done to check out this hypothesis is to cut trenches along the outside of the east palisade wall in order to locate the large fort ditch ordered by Haldane to be dug along the outside of the stockade to provide a bank "parapet high."

A profile of "...a field Work such as we have generally built..." was drawn by Major Patrick Ferguson in February 1780 (WCL, Clinton Papers, February 1780). This profile fits well with what we see the evidence along the east wall of the town of Ninety Six as representing. The only change was the insertion of the palisade post into Ferguson's profile to indicate how the parapet high embankment would appear against the palisade wall (Figure 2). As was mentioned above, more archeological work will need to be done in this area to determine whether the large fort ditch does indeed continue along this east wall as conjectured.

The Blockhouse Site at the Northwest Corner of the Town of Ninety Six (38GN5)

Inside the northwest corner of the palisaded compound for the town of Ninety Six, a fortification ditch eight to ten feet wide was found to form a corner angle inside a similar angle formed by the palisade trench forming the northwest corner of the town palisade. Twelve feet inside this fortification ditch another palisade trench was found, and this also formed a right angle paralleling the large ditch. This trench is thought to be a firing wall such as was found at the Holmes' Fort Site, the measurements at both sites being virtually the same. This inner palisade trench held pickets or vertical posts designed to hold back the dirt taken from the fort ditch.
Inside of this firing wall and a distance of eight feet from it on the west and 15 feet on the north, a cellar hole was found (Figure 2). This dark cellar fill outline measured 20 by 33 feet, with a seven foot wide step-well extending a distance of four feet from the northwest corner. This cellar hole would represent a structure 15 by 30 feet if the foundation wall were placed inside the cellar, or it would probably represent a building about 25 by 35 feet if the cellar were totally enclosed inside a structure whose footing was wider than the cellar. Since there are two palisade walls, a fortification ditch and a firing wall trench surrounding this cellar, all inside an outer ditch built by Haldane, we might begin to suspect that this cellar was something more than merely a cellar for a house in the town of Ninety Six in which a store of wine and potatoes was cached. For this reason we have conjectured that this cellar represents Cruger's blockhouse site in this corner of town (Figure 2).

To the east of this cellar hole the edge of a disturbance was seen that may represent a trench along this side of the blockhouse, and the interpretive parapet embankment is shown here on the map (Figure 2). The entire area between this edge and the Charleston Road is disturbed to a considerable depth (In one test hole to a depth of over three feet), indicating a feature deeper than a roadbed along this side of the blockhouse. Extensive work in this area is needed to determine the exact nature of this disturbance.

In most cases we would not expect to find evidence for a blockhouse other than perhaps a cellar, particularly when horizontal logs are used, as was the case with most blockhouses. The early nineteenth century blockhouse at Fort Hawkins in Macon, Georgia, had a stone-lined cellar, with horizontal logs above, in association with a palisade wall, which is the usual case. However, a blockhouse accompanied by major fortification ditches, parapets, firing wall, and cellar is not the usual combination of features.

For an interpretation of this type blockhouse we have an excellent written description provided by Patrick Ferguson, as well as profile drawings. Ferguson was in Savannah in February 1780 and drew his plans for an improved type blockhouse. In May of the same year he outlined a "Plan for Securing the Province of South Carolina" (WCL, Clinton Papers, May 1780) which provides details of value in addition to the February plan. Ferguson suggests that in South Carolina, where roads cross each other, that four or five "Block house redoubts" be built to command all the principle avenues. He explains that:

These block houses are singularly advantagious as forming at once barrack Citadel & Cassmate, they may be raised of strong rough Timbers by means of Negroes in 4 or 5 Days & covered from cannon by a redoubt, which could not be looked at without a force deliberately assembled with Cannon, nor taken or maintained whilst ten men remained in the Block house within. For each Post 30
Invalided Soldiers with as many Militia & 2 Iron Guns
would prove Sufficient (WCL, Clinton Papers, May 1780).

This summarizes Ferguson's opinion of what he considered a major improvement on the blockhouses of the time. Fortunately we have his profile drawings and description to demonstrate what he was talking about. He illustrates two trenches set close together with obstructions set in the bottom of these, along with brush abatis placed in front of the counterscarp of the main ditch. The main ditch is somewhat different from those usually seen in that it has in the bottom four parallel ditches set close together, also having brush and obstructions set in and above these ditches. Near the toe of the scarp he illustrates an outward sloping palisade pole set deeply into the bottom of the fort ditch, behind which was another small trench at the toe of the scarp. Palisade or fraize poles are placed on the surface of the ground with the pointed end facing, and extending over, the ditch. Above this and slightly back from the edge of the ditch is the embankment of earth thrown from the ditch over the butt ends of the fraize. The embankment earth is allowed to lie at a natural angle rather than being shored up with fascines. Back of this is the firing wall and step, and then inside of this, the cross-section of his blockhouse is shown. The firing ports point upward in line with the top of the parapet so as to intercept anyone coming over the parapet. Two levels are shown, both having firing ports, the bottom story being entirely below ground surface with the firing ports along the top of the cellar level being all that is above ground. The second floor was to be covered with a thick layer of earth three to four feet thick. An alternative to this was suggested where the upper story could serve as a barracks for the men. Ferguson says of his countersunk, low profile, earth-covered, bunker-type structure:

This Block house being entirely covered by the Rampart from direct shots is not in any degree to be injured by artillery from without; as the wall being made of 18 Inch Oak Timbers dove tailed at the Angles would not be pierced by ricochet shot, and the roof being Beams well supported in the center, would resist any shell when covered with 3 or 4 feet of Earth (WCL, Clinton Papers, February 1780).

He reiterates the advantages of this type of casemated blockhouse, pointing out that a work without casemates can be reduced without trouble or delay by a few howitzer shells. He states that the usual casemated structures are of masonry construction and are therefore expensive and not suited to the quick need for fortification sometimes found in outlying areas. Yet, something must be done, he says, if England is to have remote colonies. He offers the solution:

Happily the abundance of Timber & of rough Carpenters in America enable an Engineer to procure by contract without any Trouble in a very short time & a Trifle of Expense block houses to answer every purpose of Casemates & to secure the Garrison from assault.
These Block houses should have five sides Bastion Fashion. The Timbers both of the walls & roof of Oak Eighteen Inches square, & dove tailed at the corners, so as to resist ricochet shot & shells. One block house upon this Principle for every Bastion of the Fort placed within & sheltered by the Ramparts from Direct shots, with a loop holed stockade by way of Curtain to run from the one to the other, would for a mere song of expense form at once Barracks that would last forever (without affording a pretence for repairs & last longer than the Band Boxes usually erected)... (WCL, Clinton Papers, February 1780).

According to Ferguson, it "would be madness to assault a Citadel with blockhouse Bastions". Such a blockhouse would be utterly covered from musketry and could pour:

...a continued loop-holed fire of Musketry rejoining on all sides, to destroy the assailants as fast as they could Possibly crowd within the ramparts, where indeed a Rat could not exist for many Seconds, from the multiplicity of the fires, the shortness of the distance & the unerring safety of the Defendants (WCL, Clinton Papers, February 1780).

With this it surely appears that Ferguson was sold on his concept, but whether Cornwallis and others were equally impressed remains to be seen. We do know, however, that Ferguson was at Ninety Six in June 1780 (Bass 1862:5), and that in July he wrote to Cornwallis asking that he be allowed to build a works, such as he had proposed, at Ninety Six (GCL, BPRO, 30/11/2, Cornwallis Papers, July 1780:F269). Lieutenant Colonel John Harris Cruger and his New Jersey Volunteers arrived at Ninety Six late in June (Bass 1962:6-7), and we might suspect that Ferguson discussed with the new commander of the fort his ideas regarding fortifications. Cruger may not have responded as enthusiastically as Ferguson had expected, and this may have resulted in Ferguson's letter to Cornwallis urging that he be allowed to build the fortification at Ninety Six. Just how much effect Ferguson's plans had on Cruger is not known, but the archeological evidence at the blockhouse site certainly appears to closely parallel Ferguson's plans for a casemated blockhouse.

On September 3, 1780, Cruger reported to Cornwallis that he had thrown up two redoubts and was building a blockhouse (Bass 1962:10). These were probably the redoubt at Holmes' Fort, a redoubt around the brick jail (to be discussed next) and the blockhouses represented by the archeological evidence discussed here. It is suspected that he later built a second blockhouse at the southeast corner of the palisaded area of the town, for he mentions on October 13, 1780, that the palisaded houses and courthouse had blockhouse flankers, which would indicate more than one blockhouse, probably on opposite diagonal corners of the palisaded area (GCL, BPRO, 30/11/2, Cornwallis Papers, Cruger to Cornwallis: 46
October 13, 1780:F220).

In summary of the yet to be excavated blockhouse site at the northwest corner of the town of Ninety Six, once detailed excavation is completed it would appear that we have excellent evidence for use in making reconstruction drawings and possibly a diorama of the appearance of this blockhouse. It is not often that we have such excellent correlation between the historical and archeological data with which to work in making conjectural reconstruction drawings. The artifacts recovered in this exploratory phase of the project at the blockhouse are primarily of the 1760's to the 1780's and will be covered in detail in a later project on the blockhouse site.

The Jail Redoubt at Ninety Six

Exploratory excavation was carried out in the area around the site of the brick jail, and the slot trenches here revealed a fortification ditch from four to ten feet wide forming a pointed bastion 80 feet across around the site of the jail. The shape of this bastion or redoubt was much the same as the large bastion seen on the hornwork at Holmes' Fort. A particularly interesting fact was that it was located about half-way down the slope of the hill, rather than on more level ground.

Two ditches were found to the east of Reference Point 38, south of the jail redoubt, that appear to be palisade trenches. These may have accompanied the fortification ditch around the side of the hill as an additional defense. Also to the south of the jail redoubt, to the east of Reference Point 37, a palisade trench was seen extending from the fortification ditch toward the southeast. Slot trenching followed this ditch for some 80 feet, revealing that this trench probably represents the west palisade around the entire area. This trench may be a continuation of the palisade around the area thought to be the Royal Provincial's encampment area north of the road to Augusta. This could have been built by Cruger before the fall of 1780 as an outer defense line connecting the jail redoubt to the stockade around the town, or it may well have been suggested by Haldane at the time of his visit in December of that year (Figure 2). Considerable excavation on the jail redoubt site is needed before further conjectures as to its details are made. One question that further excavation would surely answer is the nature of the narrow jail redoubt ditch after it turns toward the south, appearing to form a ditch along the west side of the town area inside the palisade wall. This would be expected, but only excavation can answer this question.

Plans for Further Work at Holmes' Fort

Additional work is planned on the Holmes' Fort Site in an expedition beginning June 7, 1971, and ending November 5, 1971. During this period, a great deal of work can be done on the important western bastion of the Ninety Six complex of fortifications. A report on these extensive excavations at Holmes' Fort will be written during the winter of 1971-72.
Hopefully questions raised in this exploratory excavation can be answered in that report.

A Note on the Exploratory Slot Trenching - One Hundred Yard Square Stripping Method

The exploratory slot-trenching method used here, and at the Charles Towne Site reported on previously in Volume 4 of these papers, is seen to be a method highly recommended for obtaining the maximum amount of data in the shortest time. This can then be utilized to outline archeological projects of greater scope with much greater efficiency and assurance than if the slot-trenching exploration is not undertaken prior to launching the major expedition. With the maps based on the exploratory work in hand, the archeologist can more realistically build a long-range archeological proposal or outline a more intensive research program to reveal the archeological data. As can be seen from the maps, these exploratory trenches do not need to follow the traditional five-foot-wide trench pattern so ingrained into our archeological practice, nor do they have to religiously follow the right angle lines of the master grid system. This method provides for maximum speed, efficiency, and flexibility in data recovery for exploratory projects. It does require that the archeologist competently utilize the standard tools of the profession, either the transit or the alidade. He should manage these with facility if he is to undertake to recover data from sites such as towns, cities, and forts whose features sprawl over many acres through woods and fields, valleys and hills. It is time to look beyond the womb-like comfort of the involvement with dissecting burials, cellar holes and five foot squares if we are to meet the interpretive challenge presented by villages, ceremonial centers, towns, cities and fortified areas.

Too long have we practiced the ritual of the cult of the square, impotently arriving at feeble interpretations of complex cultures in extensive settlements from the meager evidence presented by a few postholes and a stratigraphic sample from a five foot square. We have often failed to adapt our tools to the scope of the project. We have used a spoon on villages and towns as well as burials. We have looked at cultures through keyholes when we should have been opening doors. This does not suggest the abandonment of the five foot square, but it does emphasize that there are times when it is a totally inadequate tool, like excavating a village with a spoon. Through exploratory trenching to determine the nature and scope of the features, then totally removing large blankets of topsoil from extensive areas of the site, stripping football field size "squares" instead of minuscule five foot areas, we can begin to open a few doors. Once the archeologist is rewarded by the view of the culture revealed through such doors he is thereafter highly unsatisfied by peeping through keyholes.

The maps accompanying this article and those illustrating the Charles Towne article in Volume 4 of these papers should clearly demonstrate the value of the exploratory slot-trenching method as a preliminary phase in historic site archeology projects, laying the groundwork for the removal of one-hundred-yard squares, allowing the archeologist the luxury of the view in the light of an open door.
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BPRO British Public Records Office

GCL Greenwood County Library

WCL William Clements Library

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A FRENCH COLONIAL WELL: ITS CONSTRUCTION, EXCAVATION AND CONTENTS

Donald A. Harris

Introduction

The well to be discussed in this paper was one of three dug during the excavation of the site of French Fort Conde, located in downtown Mobile, Alabama. This fort site was subjected to an extensive archaeological excavation by the University of Alabama Museums through a grant funded by the state of Alabama and the Department of Transportation. As a highway salvage project begun in June 1967, and continued through December 1969, it had the primary purpose of obtaining as much information as possible about Fort Conde before the construction of the Interstate 10, twin-tube tunnel interchange plaza.

Although a number of distinct features of the fort were excavated during the course of the project, the well discussed here is probably the single most important feature in terms of artifacts recovered. Located near the southwest corner of the parade, its contents were found to have been undisturbed since its final sealing in the early part of the nineteenth century. This feature was originally constructed between 1724 and 1731, but the earliest artifacts it contained date only to the early 1760's. This is the result of a well cleaning operation conducted by the British at the inception of their occupation (Hamilton, 1910).

The purposes of this paper are to (a) present an indication of French well building techniques along the Gulf Coast of the United States, (b) provide useful information concerning the excavation of well structures in general, and (c) present a closely dated artifact collection from the three colonial periods as well as the later American occupation of the Mobile area.

Historical Background

Mobile Bay, discovered in 1519 by Pineda and visited on numerous occasions by other Spanish explorers, was not permanently settled until 1702 when the French, under the direction of the Le Sieur de Iberville and his younger brother, Bienville, established a colony at the site now known as Twenty-Seven Mile Bluff on the west bank of the Mobile River. This first town was badly flooded in 1709 and the colony was subsequently moved down river to a new location which has since grown into the present city of Mobile. Construction on a wooden stockade was begun in 1710 and the town was laid out in a crescent fashion to the north, west, and south of the fort. In 1717 this wooden structure was superseded by a more substantial fort of brick and stone, which, like its predecessor, bore the name Fort Louis de la Louisiane. In 1720 the name was changed to Fort Conde and the French maintained it until 1763, although much of the
FIGURE I. FORT CONDE OVERLAIN BY 1967 STREET MAP.
activity that had centered around the town was shifted to New Orleans in 1722 when that city was made the capital of the Louisiana Empire. In 1763 the French relinquished Mobile along with the rest of their holdings in West Florida to the British with the signing of the Treaty of Paris, and with these new occupants came another name change from that of Conde to that of Charlotte. That name was to outlast the British by a number of years, for in 1780 the fort was successfully besieged by a Spanish expeditionary force approximately 2000 strong led by Don Bernardo de Galvez. After about two weeks of fighting the British surrendered and were conveyed to Pensacola, which still remained in British hands. The Spanish retained possession of the fort until 1812, when, in April of that year, it was surrounded by the United States Army and the Spanish Commandant, Captain Cayetano Perez, was persuaded by Major General James Wilkerson to remove his garrison, like the British before him, to Pensacola.

The occupancy of the United States Army ended the colonial status of Mobile, because it was then incorporated into the Mississippi Territory which had been extended along the Gulf Coast as far east as the Perdido River. The United States government maintained a garrison at the fort until 1821, at which time the property was sold at public auction and the walls were razed with gunpowder. Most of the debris from this demolition was used as fill to raise the area between Royal Street and what is now Water Street. After the fort was leveled, that site was subdivided into city lots and more modern structures began to appear.

Building Techniques

Figure 1 represents Fort Conde as it appeared in 1768 in relation to the 1967 city street layout. The block upon which the greatest part of the excavations were conducted was city block 340, and the well, depicted in cross-section in Figure 2, lay approximately 185 feet north and 165 feet east of the center of the intersection of St. Emanuel and Theatre Streets. The top course of brick in the well was 16.8 feet above sea level, and that curbing had an inside diameter of 3.5 feet. The outside diameter measured 6.7 feet. These courses were laid in two rows of rectangular shaped brick of different dimensions. The bricks of the inside row measured 0.66 feet by 0.30 feet by 0.15 feet, while those on the outside row measured 0.88 feet by 0.30 feet by 0.15 feet, giving the bricks in the outside row an overall length 0.22 feet longer than those of the inside row.

The well was constructed in a manner similar to that described by Noël Hume (1969) with some variations. First, the curbing was not constructed solely of one material, and second, the wooden plate upon which the curbing was laid was of a more complex nature than that described in Historical Archaeology.

The curbing was of a composite nature, constructed partly of brick and partly of sandstone. As can be seen in Figure 2 the brickwork only extended to an approximate depth of 4.0 feet and from there to the bottom,
FIGURE 2. CROSS-SECTION OF WELL
the curbing consisted of flattish, ferruginous sandstone. These sandstones were quarried from a local outcropping on the other side of Mobile Bay, and were also used for the foundations of the fort walls.

This use of undressed stone was not uncommon on the site, for it was also found in the other two wells excavated. It is also not an unusual feature in other New World French sites, for the author has noted a similar type of stone well construction on many farm sites in the province of Quebec, Canada.

The wooden plate at the bottom of the well upon which the curbing was constructed differed a great deal from the flat wooden ring described to date. Fortunately, the author was still in the Mobile area when the well was disinterred by a dragline, and was able to inspect this feature which is now in the possession of the Mobile City Museum system. Figure 2 presents this plate in cross-section, and from this it is possible to see how the bevelled lower side of the plate distributed the weight of the curbing stone evenly along the outer cutting edge. This not only permitted it to sink at a more constant rate, but also maintained the integrity and strength of the plate.

This plate measured 7.0 feet across its external diameter and had a maximum thickness of 1.3 feet. It was composed of four wedge-shaped pieces of wood tied together on the topside by plank braces and wrought iron spikes. The wood from which the plate was hewn was probably oak, and the entire construction weighed from seven to eight hundred pounds. The inside diameter of the plate was 3.5 feet and the thickness at this circumference was 0.4 feet.

The plate had been placed in a shallow pit, designated Pit 117, approximately 5.0 feet deep and from 8.0 to 10.0 feet in diameter. Atop it were lain courses of sandstone. The plate was then undercut and allowed to sink into the ground and as it sank, more and more sandstone was added to the curbing until the ultimate depth of 15.7 feet was reached. At this depth a layer of blue clay was encountered making further excavation extremely difficult. The well did continue on to a depth of 16.6 feet, but it was uncertain as to whether this scooped out indentation in the clay was due to the initial excavation or later well cleaning operations. Because of the density of the clay, it appeared unlikely to be the result of the scooping action of a bucket.

After this depth had been reached the sandstone was even with the bottom of Pit 117 and discontinued. At that point a brick curbing was added to the top to finish off the construction. The pit was then backfilled and a well head of some sort was probably erected. Hamilton (1910) in his discussion of Fort Conde stated that these wells were covered, but by what is unknown.

The other two wells within the confines of the fort were also excavated and were of similar construction with minor exceptions. The well
on the southeastern side of the parade was slightly smaller with an internal
diameter of 3.0 feet and shallower with a depth of 11.4 feet. The wooden
plate for this well was also circular, but it was not recovered. The other
well in the mouth of the northwest bastion, though similar in construction,
predated the two mentioned above by at least fourteen years and was probably
the well in the original wooden stockade, Fort Louis de la Louisiane. The
interior diameter of this well was much larger than the others, measuring
6.0 feet, but it only had a depth of 9.0 feet. Though similarly constructed
of sandstone capped with brick, the wooden plate at its bottom was octagonal
in shape. This well was completely devoid of artifacts and now lies beneath
a city sidewalk.

Excavations

When excavated by the University of Alabama this well lay beneath a
twentieth century concrete slab eight to ten thick. This slab was removed
by hand and the area around the well was completely cleared before ex-
cavations were begun. Excavation of the well was then begun and continued
until ground water was encountered at a depth of 3.5 feet. Operations were
halted at this depth and a well point system was installed. Unfortunately,
this did not prove satisfactory and after four days of fruitless pumping
the system was removed. The well point system failed because the water
present did not represent an aquifer, but trapped water held in a very fine
clayey sand which could not be kept from clogging the well points. Next,
a large hole was dug on the outside of the well in the hope that by keeping
it deeper than the inside of the well it would act as a sump into which the
surrounding water could drain and be bailed out. This solution proved sat-
isfactory to a depth of approximately 10.0 feet, but had to be abandoned
because the soil had almost no load bearing ability and continually slumped
into the sump hole despite efforts to shore up its walls.

The next and most successful attempt involved excavating one-half of
the fill inside the well, while leaving the other half standing. When this
was accomplished, the remaining side was allowed to drain before it was re-
moved by a workman suspended from an "A" frame above the well floor. The
eastern side acted as the sump while the western, drier side provided the
stratigraphy. Elevations were taken on any artifacts obtained from the
eastern side which was always kept one to two feet lower than the western
and these were later correlated with the natural stratigraphy. In this
manner the well was taken down to its lowest depth. All of the fill re-
moved from the well was first screened through 1/4 inch hardware cloth
and then washed through window screen. This processing enabled the re-
cover of many minute objects such as seed beads, brass pins, small bones
and seeds.

Stratigraphy

There were a total of eighteen strata discerned in the well, and these
were divided very definitely along occupational lines. In discussing these
strata, all measurements mentioned were taken from the top course of brick
in the well casing which, as stated above, was 16.8 feet above sea level. Table 1 illustrates the depths, occupational relationships and soil compositions of the various levels. Levels 1 through 11 represented the American occupation and dated from 1812 to 1821, levels 12 through 14 represented the Spanish occupation and dated from 1780 to 1812, and levels 15 through 18 represented the British occupation and dated from 1763 to 1780. This combination of levels will be maintained throughout the discussion of the artifacts. As previously stated, the British were known to have cleaned out the well at some point during their occupancy, so there were no levels that could be ascribed to the French. However, it is felt that the artifacts obtained from the excavation of pit 117 are representative of that period. A list of these artifacts is not included in tabular form, but some of them are illustrated in the figures that follow. It was also possible and quite probably that some of the other occupants partially cleaned the well which would explain several inconsistencies in the rate of debris accumulation.

**Artifacts**

The artifacts recovered were many, varied, and fortunately, in a good state of preservation. This is especially true of the American material, for in those levels the ooze was compact enough to prevent any considerable oxidation of the metal artifacts, although sulfur liberating bacteria took their toll (Plenderleith, 1962). Within these levels leather and wooden objects were particularly well-preserved, and the iron objects had suffered only slightly. This was not the case in level 15 where there were spaces between the bricks in the fill allowing for the flow of ground water. In this level the iron artifacts were heavily incrusted with rust and other corrosive products.

Table 2 is a presentation of the artifacts obtained from the well although it is not entirely complete, for it does not contain an inventory of the floral and faunal material, which has not yet been systematically analyzed.

The illustrations that follow are representative of the many artifacts found and they have been grouped by type, not age. The dates ascribed them have been arrived at by a combination of documentary and contextual evidence.

The bulk of these artifacts now reside in the Mobile City Museum, while the remainder were sent to the University of Alabama Museums.
### TABLE 1

**STRATIGRAPHIC SEQUENCE OF COLONIAL WELL**

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>Depth</th>
<th>Occupational Zone</th>
<th>Soil Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0-0.6</td>
<td>Post 1821</td>
<td>Brick Rubble</td>
</tr>
<tr>
<td>2</td>
<td>0.6-0.9</td>
<td>1821 U. S. A.</td>
<td>Yellow Sand</td>
</tr>
<tr>
<td>3</td>
<td>0.9-1.1</td>
<td>1821 U. S. A.</td>
<td>Orange Sand</td>
</tr>
<tr>
<td>4</td>
<td>1.1-3.5</td>
<td>1820 U. S. A.</td>
<td>Jumbled Brick and Mortar</td>
</tr>
<tr>
<td>5</td>
<td>3.5-5.1</td>
<td>1820 U. S. A.</td>
<td>Grey Clayey Sand</td>
</tr>
<tr>
<td>6</td>
<td>5.1-7.1</td>
<td>Brownish-Black, Brick Laden Mud</td>
<td>Brownish-Black Mud</td>
</tr>
<tr>
<td>7</td>
<td>7.1-8.2</td>
<td>Through</td>
<td>White Plaster and Greenish-Grey Clay Lumps in Dark Brown Mud</td>
</tr>
<tr>
<td>8</td>
<td>8.2-9.7</td>
<td>Through</td>
<td>Finely Ground Brick and Shell Fragments</td>
</tr>
<tr>
<td>9</td>
<td>9.7-10.4</td>
<td></td>
<td>Greyish-Brown Sandy Clay</td>
</tr>
<tr>
<td>10</td>
<td>10.4-10.8</td>
<td></td>
<td>Brick Laden Yellow Mud</td>
</tr>
<tr>
<td>11</td>
<td>10.8-11.9</td>
<td>U. S. A. 1812</td>
<td>Grey Clayey Muck With Patches of White Sand</td>
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<tr>
<td>12</td>
<td>11.9-13.0</td>
<td>Spanish, 1812</td>
<td>Grey Sand</td>
</tr>
<tr>
<td>13</td>
<td>13.0-13.1</td>
<td>Through</td>
<td>Greyish-Yellow Sand with Patches of White Sand</td>
</tr>
<tr>
<td>14</td>
<td>13.1-13.3</td>
<td>Spanish, 1780</td>
<td>Brick Ladened Reddish-Grey Sandy Mud</td>
</tr>
<tr>
<td>15</td>
<td>13.3-15.7</td>
<td>British, 1780</td>
<td>Finely Ground Brick and Shell Fragments</td>
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<tr>
<td>16</td>
<td>15.7-16.3</td>
<td>Through</td>
<td>Grey Sand</td>
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<td>17</td>
<td>16.3-16.4</td>
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<td>Coarse Yellow Sand</td>
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<tr>
<td>18</td>
<td>16.4-16.7</td>
<td>British, 1763</td>
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TABLE 2

ARTIFACT DISTRIBUTION, UNIT 2

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Levels 1-11</th>
<th>Levels 12-14</th>
<th>Levels 15-18</th>
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<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Ceramics, Aboriginal</td>
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<td></td>
</tr>
<tr>
<td>Sand tempered, red slipped</td>
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<td>3.33</td>
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</tr>
<tr>
<td>Shell tempered, red slipped</td>
<td>14</td>
<td>46.62</td>
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</tr>
<tr>
<td>Shell tempered, plain</td>
<td>6</td>
<td>19.98</td>
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<tr>
<td>Curvilinear incised</td>
<td>1</td>
<td>3.33</td>
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<tr>
<td>Grit tempered, brushed</td>
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<td>Temperless, plain</td>
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<td>19.98</td>
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</tr>
<tr>
<td>Sub-total</td>
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<tr>
<td>Ceramics, Non-Aboriginal</td>
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<tr>
<td>Sewer pipe</td>
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<td>0.64</td>
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</tr>
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<td>Roof tile</td>
<td>9</td>
<td>5.76</td>
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<td>Cream-colored Earthenware, green glaze</td>
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<td>1.28</td>
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<td>Cream-colored Earthenware, red glaze</td>
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<td>3.20</td>
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<td>Terracotta Ware</td>
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<td>Spanish Olive Jar</td>
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<tr>
<td>Redware, lead oxide glaze</td>
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<tr>
<td>Tin Enamelled Ware</td>
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<td>8.32</td>
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<td>Whieldon Ware</td>
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<td>Creamware, Rockingham</td>
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<td>Whiteware, plain</td>
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<td>19.84</td>
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<td>Artifact</td>
<td>Levels 1-11</td>
<td>Levels 12-14</td>
<td>Levels 15-18</td>
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<td>Percent</td>
<td>Number</td>
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<td>Ceramics, Non-Aboriginal (continued)</td>
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<td>Whiteware, transfer printed, blue</td>
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<td>3.20</td>
<td>1</td>
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<td>Whiteware, featheredge, blue</td>
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<td>Whiteware, banded, swirled</td>
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<td>Doll's head, wooden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Total Artifacts by Levels

<table>
<thead>
<tr>
<th></th>
<th>Levels 1-11</th>
<th>Levels 12-14</th>
<th>Levels 15-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Artifacts by Levels</td>
<td>1257</td>
<td>281</td>
<td>385</td>
</tr>
</tbody>
</table>

TOTAL NUMBER OF ARTIFACTS - 1923
Figure 3


b. Middle Style Olive Jar coated with greyish-white clay slip, interior may have had a green lead oxide glaze. Period and context same as (a).

c. Light green, free-blown, wide mouth storage bottle, context early American, circa 1814.

d. Free-blown olive-green rum bottle, context same as (a).
FIGURE 3.
Figure 4

a. French faience with Rouen decorative motif, context, Pit 117, 1724-1731.

b. Queensware, creamware paste with green tinted pearlware glaze, context, British occupation, circa 1770-1780.

c. Creamware with brown and yellow underglaze, context, same as (b).
Figure 5

a. Whieldonware or Rockingham ware teapot lid, creamware paste, context, British occupation circa 1770-1780.

b. Green glazed creamware cup bottom, context same as (a).

c. Creamware, lattice worked serving dish, context same as (a).

d. White salt glazed stoneware plate sherd, context same as (a).
Figure 6

a. Shell-tempered, red-filmed plain. Red film covered interior side of vessel and extended over rim down exterior side approximately one-fourth of an inch, context Pit 117, 1724-1731.

b. Grit-tempered, brushed, context same as (a).

c. Pipe stem, shows no evidence of temper, context, British occupation, 1770-1780.

d. Temperless, plain bowl sherd. Surface was pebble smoothed on both interior and exterior surfaces. White specks in lower left hand corner are tiny mica flakes, context, early American occupation, circa 1812. May be of Greek origin.
FIGURE 6.
Figure 7

a. Cock mechanism of a North-west gunlock sold by the Hudson Bay Company circa 1750 (Gooding, 1960). Note shape of lock and evidence of three hole mount, shape of gooseneck cock and unbridled tumbler. Lock had a rounded pan and frizzen spring lacked bridling as well. There was also no evidence to indicate that the frizzen spring screw was hidden, context early American occupation.

b. British Infantry officer's sword hilt of the type that came into use in the British Army during the 1750's (Peterson, 1956). Hilt was fitted with wooden handle panels and wrapped in braided brass wire, context, British occupation, 1763-1780.

c.-d. Grenade fragments found in Pit 117, note lip around fuse hole on fragment (c), context, French occupation, 1724-1731.
FIGURE 7.
Figure 8

a. Leather rosette hat or bridle ornament with brass U. S. Army Infantry button in center, context, American Occupation, 1816-1821.

FIGURE 8.
a.-b. Dutch made kaolin clay pipes bearing the crowned 16 mark and rouletting on the rim of the bowl, context, Spanish occupation, 1780-1812.

c. Aboriginal clay pipe. Paste similar to 6d. Possibly of Greek origin, context, Spanish occupation, 1780-1812.

d. English export kaolin clay pipe found at very bottom of well, context, English occupation 1780's.
FIGURE 9.
Figure 10

a.-b. British Infantry buttons representing the 16th and 9th Regiments of Foot, context, American occupation 1813-1816.

c.-d. Cast whitemetal buttons with gas expansion holes in back, possibly of French manufacture, context, c, British occupation, 1763-1780, d, American occupation, 1813-1821.

e. Plain roughcast brass button with wedge-shaped cast shank found on surface near edge of well, 1700-1765.

f. Bone button with four holes, but no center hole is present. The outside edge has been turned to permit fastening of button cover, context, American occupation, 1816-1821.

g. Brass cuff-links, British occupation, 1763-1780.
Figure 11

a.-d. United States Army Infantry cast white-metal buttons, context American occupation, 1814-1816.

e.,-i. United States Army Artillery Corps, enlisted man's one piece brass, no back marking, 1812-1814.

g.,-h. Obverse and converse sides, United States Army Infantry one piece cast pewter button manufactured by Crumpton in Philadelphia, Pa., 1811-1827.

j. United States Army, 3rd Artillery, enlisted man's one piece brass button, no back marking. Note difference in script 'A' and 'llf', 1812-1814.

k. United States Army Infantry, 2nd Regiment, one piece cast pewter button. Note: Col. Richard Sparks and five companies of the 2nd Regiment were stationed at Fort Conde in August, 1814.

FIGURE II.
Figure 12

a. Barrel or samovar spigot, brass, context, Spanish occupation, 1780-1812.

b.-c. Anterior and posterior end rampipes, (c) is of a type found on early to mid-eighteenth century French trade guns (Harris, Harris, Blaine and Blaine, 1965), rampipe (b) may have come from the same gun, context, Spanish occupation 1780-1812.

d. Scabbard tip, brass with iron plug, American occupation, 1812-1821.

e. Scabbard clip, brass, British occupation, 1763-1780.
FIGURE 12.
Figure 13

a. Hand wrought nut, 1813-1821.
b. Hand wrought bolt, 1763-1780.
c. Brass key, 1763-1780.
d. Harness buckle, 1812-1816.
e. Small jam anchor, 1812-1816.
f. Small door or shutter pintle, 1780-1812.
FIGURE 13.
a. Bayonet, United States Army M. 1812 (Webster, 1964). Length of blade 15 1/2 inches, length of socket, three inches.

b. Two-prong hafted hook, may have been used for wad remover or cannon scraper (Manucy, 1949).

c. Axe head, iron single sheet bent double, context, British occupation, 1770-1780.

d. Two-pronged hook which may have been used for weighing meat on a balance, context, American occupation, 1812-1814.
FIGURE 14.
Figure 15

a.,-b.,-d. Bone handled knives found in an American context, 1813-1816.

c. Clasp knife fragments, context, Spanish occupation, 1780-1812.

e. Antler handled knife, British occupation, 1770-1780.
FIGURE 15.
Figure 16

a.,-b. Shear steel scissors, Spanish and British occupations, respectively.

c. Trigger guard, wrought iron, context American occupation, 1812-1816.
FIGURE 16.
Figure 17

a. Two views of the wooden well plate.
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A PIPE TOMAHAWK AND ASSOCIATED MATERIAL FROM AN EIGHTEENTH CENTURY CHEROKEE SITE

Richard R. Polhemus

In the summer of 1967 excavation of an eighteenth century Cherokee site adjoining Fort Prince George in Pickens County, South Carolina, under the direction of Dr. William E. Edwards, produced two closely related features containing a number of important English trade items. Recent laboratory analysis at the Institute of Archeology and Anthropology has shown that the previously unidentified features containing the pipe tomahawk, trade gun, and other trade items were in reality graves. These items, as well as a quantity of non-aboriginal ceramics recovered in the general excavation, indicate an occupation date contemporary with the English occupation of Fort Prince George. Although no field notes or other excavation records are in the possession of the Institute of Archeology and Anthropology it was found that it was possible to determine vertical and horizontal provenience and the relative position for nearly all of the artifacts within each grave and to determine the form of burial through a detailed analysis of the uncleaned artifacts, clues in the artifact catalog, and a small number of slides taken at the end of the excavation. In spite of the serious impairment to any analysis or interpretation of the excavated material caused by the lack of field records, it was felt that the nature of the trade material and the short occupation of the site warranted the effort to salvage what was possible from the excavation.

The Rock Turtle Site was situated on the east bank of the Keowee River in Pickens County, South Carolina about 70 Meters south-southeast of Fort Prince George. The site is presently under the waters of the Keowee Reservoir impounded by the Duke Power Company. The excavation consisted of twenty-one two-meter squares situated in three areas of the alluvial bottom down-river from the fort. Excavation area "A", consisting of eight squares located nearest to the fort, excavated to a depth of 0.3 meters, contained the two features of concern in this paper. Excavation area "B", consisting of six squares located twenty-eight meters south of area "A", excavated to a depth of 1.6 meters, contained evidence of a structure on the edge of a slope deposit dipping toward the Keowee River. Excavation area "C", consisting of a row of seven squares located eighteen meters east of area "B", excavated to a depth of 1.8 meters, contained no evident features. The stratification in excavation area "A" consisted of plowed soil overlying a sandy subsoil, into which Features Three and Four were intruded. The stratification in areas "B" and "C" consisted of a zone of water deposited layers overlain by plowed soil and underlain by the sandy subsoil.

Features Three and Four were located in the center of area "A" and were parallel to each other. Feature Three consisted of a narrow rectangular pit 0.7 meters wide and 2.3 meters long with a depth of 0.6 meters. This feature, like Feature Four, was oriented northeast-southwest. The presence of thirty-four wrought, rose headed, nails bearing
Figure 1

Map showing location of the Rock Turtle Site in relation to Fort Prince George

Figure 2

Excavation area A showing location of the features and the relative position of the associations.
Figure 1

SITE LOCATION MAP

NIMMONS BRIDGE
FORT PRINCE GEORGE
PICKENS COUNTY

OCONEE COUNTY
STEEL RD.

SCALE-FEET
0 275 550 825 1100

Figure 2

ROCK TURTLE SITE
EXCAVATION AREA A
38PN4

SCALE-METERS
0 1 2

Figure 2
traces of preserved wood and a swag in the upper pit fill suggest that the burial had been made in a wooden coffin. The only trace of bone preserved was a portion of the right mastoid adhering to a bone handled clasp knife located in the southwest end of the feature. A cluster of four brass wire earrings was also found adhering to the knife, and from the position of the earrings relative to the mastoid bone the position of the body could be determined within the grave. The body had been placed in an extended position on the back with the head to the southwest. The pipe tomahawk and other associations were placed at the right side of the head and bear traces of woven textiles indicating the possibility of either a bag containing the associations or a covering for the body. The associated goods include a small pair of scissors, a pair of straight razors, a rectangular glass mirror, the four brass wire earrings, and the bone-handled clasp knife. Four additional brass wire earrings are assumed to be from the left side of the head and the position of two pairs of iron buckles could not be determined. [Figure 2 illustrates the relative position of the associations found in Feature Three.] The poor condition of all bone on the site accounts for the small amount of human bone in Features Three and Four, only calcined bone and tooth enamel fragments having been found in the general excavation.

Feature Four consisted of a rectangular pit 1.2 meters wide and 1.9 meters long with a depth of 0.6 meters oriented northeast-southwest. During excavation of this feature, a band of compacted light colored soil was detected running down the center of the long axis of the feature, dividing the pit into two long narrow rectangular pits similar to Feature Three. Feature Three was located only 0.5 meters northwest of Feature Four. Small fragments of bone preserved in each section of the feature indicated the presence of two burials. Burial One, situated in the southeast section of Feature Four was represented by a set of enamel tooth caps located in the southwest end of the pit. The position of the teeth in relation to the pit form suggested an extended burial with the head to the southwest. Burial Two, in the northwest section of Feature Four, was represented by traces of bone preserved by direct contact with the associated trade gun. The trade gun, like the other iron material from the Rock Turtle Site, was in a poor state or preservation with little of the original metal remaining.

The material associated with the burials in Features Three and Four represents a sample of the English trade goods available to the Cherokee Indians during the occupation of Fort Prince George. The relatively short period during which the fort was occupied 1753-1766, and therefore the possible period of occupation of the Rock Turtle Site enhance the value of the material for comparative purposes.

The pipe tomahawk shown in Figure 3 most closely resembles a specimen illustrated and described by Harold L. Peterson in American Indian Tomahawks identified as mid-eighteenth century in date (1965:103). Both examples are well forged with sharply defined moldings and a circular eye. The eye tapers slightly toward the handle. The relatively thin blade is of half-hatchet form, expanding on the lower or handle side only.
Figure 3

Photograph and drawings of the pipe tomahawk after treatment

a. top view
b. sectional view
c. side view
d. end view
Figure 3
The bowl of the Rock Turtle example is circular with two slightly flattened sides and a constricted circular neck. A portion of the wooden handle was preserved by contact with the iron inside the haft and inside the tapering iron mouthpiece. The mouthpiece consists of a tapering iron sleeve fitted over the end of the handle. The presence or absence of a maker's mark could not be determined due to the poor condition of the pipe tomahawk, with little metal remaining in either the bowl or blade portions.

The pipe tomahawk was cleaned by picking and brushing utilizing a flexible shaft machine similar to a dental drill. Fragments loosened by vibration were temporarily held in place with Elmer's Glue-All until the entire object was cleaned to the original surface. After cleaning, the object was boiled in several changes of distilled water and allowed to dry. Loose fragments were replaced and the pipe tomahawk heated slowly in an oven to remove residual moisture content. While still quite warm, it was sprayed with Krylon crystal clear spray coating. Several thin coats of Krylon produced a tough non-shiny surface which can be easily removed with an acetone bath if necessary. The condition of the pipe tomahawk after treatment is illustrated in Figure 3.

The clasp knife associated with Feature 3 is identical to clasp knives found at Fort Loudon (40MRI1) and the eighteenth century Overhill Cherokee Town of Chota (40MR2). The poor condition of the knife prevented an examination for a maker's mark. The clasp knife and other material associated with Features 3 and 4 are illustrated in Figure 4. The two straight razors retained traces of the wooden handles. The pair of small scissors has straight tapering blades and simple circular handles. The two pairs of iron buckles are of unknown position within the feature and retain traces of leather and cloth in the oxide layer. The mirror bears traces of silvering on the undersurface and appears to be altered on one end. The glass is 3MM thick and has a slight green color. Brass wire 1MM in diameter was utilized to make four pairs of simple earrings. The four earrings found at the right side of the head were spaced 4MM apart as if fastened at intervals along the edge of the ear. The remaining four were loose and are presumed to be from the left ear area.

An attempt was made to reconstruct the form of the coffin utilizing the thirty-four wrought nails listed in the field specimen catalog and the traces of wood preserved on them. The size of the coffin could not be determined due to the lack of information regarding the position of the nails within the feature. Although several groups of nails could be segregated by the direction of woodgrain, clinching, and length, no definite form of construction could be determined. The boards utilized averaged three centimeters in thickness.

The trade gun associated with Feature 4 has a barrel length of 65 centimeters and an interior bore diameter of 1.3MM (.52 caliber). The lock is in poor condition and has no flint in the jaws of the lock. A single sheet brass ramrod pipe is present and the trigger guard is of thin cast brass stamped with a large capital "B" on the interior face.
Figure 4

Material associated with pipe tomahawk

a. mirror  
b. brass wire earrings  
c. scissors  
d. pairs of iron buckles  
e. clasp knife  
f. straight razors  
g. brass serpentine side plate from trade gun  
h. brass trigger guard from trade gun and detail of mark  
i. brass butt plate from trade gun
Figure 4
of the tang. The sideplate is of cast brass in the form of a serpent in very simple form. The body of the serpent is plain rather than scaled, and the head faces forward rather than back towards the tail. The butt plate is of sheet brass having five small square nailholes similar to example described by Hamilton (1960:137) and identified as an early form. The nailholes are irregularly spaced and small iron nails held the butt plate to the stock. The tang is missing.

The material recovered from the general excavation of the Rock Turtle Site suggests a close relationship with nearby Fort Prince George. Although outnumbered by aboriginal ceramics, the European style ceramic include a wide range of types. European style ceramics include tin-clayed earthenware with both blue and polychrome painted decoration, combed and dotted slipware, Whieldon-Wedgwood style pineapple ware, Wedgewood style engine turned green glazed earthenware, feather edged creamware, and porcelain with both underglaze blue and overglaze red enamel decoration. A sherd of red earthenware with a clear green lead glaze recovered in area A is similar to ware made by Gottfried Aust at Bethabara, North Carolina from 1756 to 1771 (South, personal communication). Other European style ceramic types recovered from the excavation are English red stoneware, white saltgazed stoneware, white saltgazed stoneware decorated in scratch blue, rhenish stoneware decorated with cobalt blue, brown saltgazed stoneware, and a sherd of a white saltgazed stoneware tea or coffee pot lid decorated in Littler's blue. William Littler produced both porcelain and white saltgazed stoneware decorated with Littler's blue at the Longton Hall Works in Staffordshire, England, from 1751 to 1760 (202, Godden:1966). Several sherds from a porcelain saucer decorated with a wide streaky dark under-glaze blue border embellished by over-glazed red enamel may also have been produced at the Longton Hall Works.

Material other than European ceramics fills out the picture but adds little to establishing a date other than mid-eighteenth century. Artifacts recovered from the general excavation include numerous wrought nails, musket balls, brass shoe and knee buckle fragments, wine and case bottle fragments, pewter and brass buttons, kaolin pipe fragments, a sheet brass hawkbell, spall type gunflints, and french prismatic blade type gunflints. A fragment of a patent medicine bottle with an inscription in relief is from a Turlington Balsam of Life bottle identical to one from Fort Prince George.

Aboriginal material is represented by 1,667 grit-tempered pottery sherds, clay pipe fragments, and two triangular projectile points. The Indian ceramic sample duplicates that from both Fort Prince George and from the Cherokee Town of Keowee, including a variety of complicated stamped, check stamped, simple stamped, corncob and roughened and plain varieties. The predominate rim form consists of an applique rim strip notched or pinched along the lower edge. The majority of the sherds are small and quite worn.
The excavated material from the Rock Turtle Site does not differ materially from that of Fort Prince George and suggests that the occupation of the Rock Turtle Site is closely related to Fort Prince George. It has been suggested that the Rock Turtle Site represents one of a number of structures associated with the Fort, but outside the fortification (Combes, personal communication). These structures could have been used to house visiting Cherokees or the Rock Turtle Site could represent the temporary occupation of a group of Cherokees settled under the protection of Fort Prince George. Such a group was referred to in a document from the British Public Records Office of June 19, 1761:

"60 or 70 of the Cherokees, near forty of them men, have put themselves under Col. Grant's protection. Whome he has permitted to settle in the eastward of Fort Prince George and given them corn and peas to plant. He represents those poor creatures in a starving condition, subsisting chiefly on acorns, as he cannot allow them to hunt for dear [sic] and buffalo." (SCA, BPRO:1761)

The occupation of the Rock Turtle Site was contemporary with that of Fort Prince George as indicated by an identical range of European ceramics recovered from each site. The pipe tomahawk and associated material from the Rock Turtle Site are thus placed in the third quarter of the eighteenth century. In spite of the lack of any field records, it is felt that the nature of the trade material and the short occupation of the site warranted the effort to salvage what was possible from the excavation. It is hoped that the information provided will be of use for comparative purposes in identifying other pipe tomahawks.
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THE HISTORICAL ARCHEOLOGIST AND HISTORIC SITE DEVELOPMENT

Stanley South

In his little booklet *Archeology and the Historical Society*, J. C. Harrington has pointed out the increasing involvement of historical societies in historic sites archaeology in the following words:

> With the increasing interest throughout the country in the preservation and interpretation of historic sites and structures, historical societies are becoming more and more involved in historic sites archaeology. It is hoped that this manual will help societies and other historical organizations meet this growing responsibility (Harrington 1965:4).

The historical archeologist who has been in a position to work with historical societies and commissions in their efforts at preservation and interpretation of historic sites in the past few years will surely affirm this statement. In fact, with the availability of grants and federal aid programs, there is a continuing florescence of such interest. Harrington has indicated that in many restoration projects the motivation has been

> To preserve the physical remains of our past and to employ them in perpetuating our historical heritage. Concomitant with this—and in most instances an explicit objective—has been public indoctrination in the importance of historical preservation (Harrington 1965:8).

The thesis of this paper is that this public indoctrination of which Harrington speaks, includes the historical societies and commissions who are undertaking the development and interpretation of historic sites through evidence provided by the historical archeologist, often through on-site exhibits and interpretation, and that the historical archeologist is the person on whom the responsibility of such indoctrination and education often falls. A particular emphasis of this paper is to illustrate the responsibility of the historical archeologist in advising and guiding historic site development through his contact with historical societies and commissions.

Foley (1968:67) has pointed out that such activity is outside the strictly archeological activity of the archeologist:

> He may, and when possible should, advise the people concerned with such activities, and he may even become actively involved -- but his doing so is extra-archaeological.
This writer agrees with Foley and has pointed out elsewhere some views on historic site development and archeology, emphasizing the fact, however, that the historic site archeologist is perhaps the most qualified man to make many of the judgments regarding development and interpretation of historic sites (South 1969:81). In Foley’s point, and elsewhere (Cleland and Fitting 1968:124) there is an implication that archeologists who do become involved in guiding and advising local groups in their efforts at historic site development are somehow prostituting themselves to a less noble effort than one directed only at archeology and the interpretation therefrom. It is my view that "genuine research" goals and historic site development can be carried out on the same project, and are not mutually exclusive. Long range research goals outlined by the archeologist are not prostituted by projects whose sponsors are primarily interested in developing a site for public use unless the archeologist himself limits his goals to the narrow scope of the project’s sponsors. No competent archeologist would allow this to happen.

A classic example of on-site explanatory interpretive exhibit for public use is that carried out by J. C. Harrington at Fort Raleigh National Historic Site in North Carolina (Harrington 1962). This fort has been interpreted as an on-site exhibit by shaping a parapet embankment beside the archeologically revealed fortification ditch. A similar explanatory exhibit was developed at the site of the 1670 settlement at Charles Towne, South Carolina (South 1971:37).

Palisade construction based on archeologically revealed postholes has its classic prototype at Town Creek Indian Mound State Historic Site near Mount Gilead, North Carolina, where an Indian ceremonial center was surrounded by a protective palisade (South 1959, 1965:27). Similar interpretive palisades have been built on the basis of archeological data at Fort Fisher State Historic Site and Bethabara, in North Carolina, and Charles Towne in South Carolina.

Because of an attitude of associating such historic site development with a "carnival atmosphere" not conducive to a "genuine research" (Cleland and Fitting 1968:131), and the fact that development of historic sites is not, strictly speaking, archeology, statements on historic site development are not considered proper for inclusion in archeological reports. A colleague recently reflected this view in commenting on a report in which a chapter on historic site development was included for the benefit of the sponsoring commission. The comment was to the effect that a chapter on historic site development might have a place in a limited distribution report, but should never be included in an archeological report for publication. This is correct when using the line of demarcation between archeology and historic site development as a criteria for defining the "proper" archeological report. However, this archeologist finds that in almost every report on an archeological project involving historical societies and commissions, he feels a responsibility to include a chapter on historic site development recommendations based on the results of historical archeology. These "master plan" chapters
are expunged from the archeological manuscript before publication in order to separate the master planning from the archeology. However, such chapters are a basic facet of the relationship between the historical archeologist and the historical society and commission members, often forming the basis from which more funds are obtained and further archeological work proposed and executed.

The literature on historic site archeology scarcely does more than touch on this question of historic site development and the role of the historical archeologist. A great deal of literature involving what has been done from an interpretive point of view has been published, particularly in books dealing with the National Parks, but these usually do not deal with the detailed steps of master planning for historic site development, and research leading to these interpretations. The National Park Service has long directed its efforts at the interpretation of historic sites through visitor centers, however, for too many years their efforts were hampered through official policy preventing them from engaging in archeological and developmental research prior to interpretation. Fortunately, however, this policy has given way to an active involvement with research and master planning, toward providing a foundation for historic site development. Those in the National Park Service have long since become familiar with the problems of relating the historic site to the visiting public in an accurate and meaningful manner. J. C. Harrington is a fine example of the kind of archeologist I am talking about who has involved himself not only with research in the field and archives, but with the problems of interpretation that are immediately thrust on the archeologist from the moment he approaches the neighborhood of a project destined to become a public historic park. We must have the broad interpretations emerging from problem oriented research specifically designed to answer cultural and historical questions, but we must also have archeologists who can step across these archeological boundaries and become visionaries who can project not only something of the meaning of what was, but can envision what an historic site can become. The primary reason this paper is being written is to introduce into the published record a sample of one of the site development chapters typically present in historical archeology reports to sponsoring groups, but absent when the report is published. Presented here is an excerpt from the report to the Star Fort Historical Commission of work carried out for them at the site of Ninety Six. It can easily be seen from this sample the reason for not publishing such invectives. Parts of these "indoctrination" chapters are an appeal to the emotions of the commission members as well as to their desire to do a competent job and, as such, have no place in an archeological report. However, they produce results in the form of additional funds for archeological research, and, upon occasion are directly responsible for saving historic sites from the ill-advised efforts that are sometimes destructive to archeological features. They also provide a guideline for the use of the intelligent, conscientious people who volunteer their time, in many instances, to serve on the historical commissions. The guidelines outlined by the archeologist may not be used by the commission, but it appears to this archeologist that
part of the responsibility of the competent historical archeologist is to provide such goals and guidelines based on research and interpretations, as well as experience in constructing on-site explanatory exhibits. To fail to do this leaves in the hands of a group of citizens, with no archeological background, an archeological report describing ruins and features, postholes and potsherds, complete with statistical tables and interpretive drawings; a product that may still leave the historical society members at a loss as to know what to do next. The statement on what to do next, however, might not be included in the report by an archeologist who felt that such considerations have no place in an archeological report. In a report to the sponsoring agency, however, such chapters are thought to form an important part of the archeologist's responsibility.

The following paragraphs are taken from a report entitled, "Exploratory Archeology at Ninety Six, South Carolina," which was presented to the Star Fort Historical Commission. They are taken from Chapter 8, which follows seven chapters of the publishable archeological report. Chapter 8, entitled "Comments on Explanatory Exhibits for Interpretation of Ninety Six and Recommendations for Further Archeological Research" would, under present ground rules, not be published with the first seven chapters. It is a sample of the type of discussion designed to lay the groundwork for historic site development.

Site of the Town Palisade of Ninety Six (38GN5)

In order to properly explore and interpret the palisade around the town of Ninety Six, along with the deeper and larger defensive ditches between the town palisade and the Star Fort, the entire area over the ditch line will need to be stripped of its overburden of plowed soil. This can best be done by a front loader under the watchful eye of the archeologist. However, in the area of these ditches there are pine trees that must be removed by chain saw crews, or rather pulpwood cutters, and the trees and tops removed from the site. The stumps remaining must then be removed by a backhoe, and the holes filled in. When this is done, a front loader or grader can then be brought to the site to strip away the overburden to reveal the ditch outline for plotting and photography. Once this is done, the contents must be archeologically excavated, which, on a ditch one hundred yards long, involves sifting several thousand cubic feet of soil to remove artifacts for analysis and exhibit purposes. All of this results in an expensive project, but a necessary one if the goal is to open the original ditch and install proper drain lines, rebuild the protective parapets, cover them with sod to prevent erosion so that the visitor can obtain a comprehensive view of the complex nature of the site at Ninety Six and its original relationship to the town of Ninety Six.
Again, the Star Fort Historical Commission would have to have made the decision to become involved in such an undertaking before any archeology is begun on the ditches. In other words, the archeologist must know before he begins whether such a plan is to be carried out, or whether the whole thing is to be back-filled after archeology is completed. The time has come, therefore, for decisions in the form of master site planning and development, research and interpretation to be made by the Star Fort Historical Commission. To proceed without a Commission decision on such long range plans is the expensive way to approach the problem.

The town palisade itself is apparently a relatively small palisade ditch, and the uncovering and recording of this feature is less time consuming than the major fortification ditch connecting the Star Fort with this town palisade. However, more exploratory trenches must be cut in order to determine exactly its position on the west side, and most of the north and east sides. Such a slotting project would take two weeks, with the complete uncovering of the entire line another two months. After this is done, new palisade poles could be placed in the original ditch, as has been done on a number of sites elsewhere, and a most impressive explanatory-interpretive exhibit would be the result.

The search for the various blockhouses would require a month with more time required if ruins such as powder magazines beneath these were discovered. A further examination of the open fortification ditch and embankment along the northwest face of the town should be made, with the determination as to whether it was palisaded being a prime question to be answered.

The search for the Caponier or Covered Way ditch, connecting the palisaded town of Ninety Six with Holmes' Fort, was ten to twelve feet wide, and would require at least a week of digging time to locate; and once located by this means, it could require several months to remove the contents and replace the parapet on each side of the ditch as was the case originally. This double parapet would have to be covered with sod, and drains installed at periodic intervals to prevent serious erosion, but once this was done, a constant maintenance crew would be required to keep it maintained and properly trimmed and landscaped. Unexpected features, and expected ones such as palisade ditches on both sides of the Covered Way would require excavation and interpretation also. Palisade poles replaced in any ditches found here would
require additional funds for purchase and installation according to the archeologist's specifications, based on the archeological findings.

As has been mentioned previously, the analysis of the artifacts, drafting of maps, writing of conclusions, all will take at least three times the time required for field work, and this phase of the project must also be planned for and funded.

These abstracted paragraphs illustrate the type of discussion usually seen in the chapters of historical archeology reports that are designed for planning and guideline use, and not for other archeologists. Following this chapter, in which archeology time schedules, interpretive suggestions, excavation priorities and similar advice is presented for consideration, is a chapter on "Historic Site Development." This chapter summarizes some of the problems encountered by historic site development commissions and societies, and presents a vision which is a projection into the future of the developed site as the archeologist sees that it can be; in this case, the site of Ninety Six. The summary statement in this section deals with "Our Responsibility," consisting of a harangue of the type never seen in published archeological reports. Nevertheless, such statements have proven their functional utility beyond doubt in dealing with historical societies and commissions involved in historic site interpretation and development for public education. The following is Chapter 9 from the Ninety Six report to the Star Fort Commission. The site is now in thick woods and undergrowth.

HISTORIC SITE DEVELOPMENT

A Tour of Ninety Six

We can envision the site of Ninety Six as it is developed in the years to come as a place of outstanding interest to all generations of history-aware Americans. Parents with their children leave their car at the parking lot in Savage's old field and tour the visitor center museum where the exciting panorama of history unfolds through artifacts and documents, through sight and sound, as the historic site they are about to visit is introduced. The introduction over, the group stands for a moment before the large window in the lobby which reveals a dramatic view of the parapet mounds of Holmes' Fort, with the palisade of the town of Ninety Six in the background. They perhaps walk past a well which, they are told by means of a field exhibit, was dug in November 1775, inside Williamson's Fort, which was a temporary affair. They move on to a more substantial work, the interpreted ruin of Holmes' Fort, and they enter the opening where the original gate
once stood. Perhaps they will see a stockade around the area as well as the protective ditch and parapet mound. After reading the field exhibit on the site, the parents follow the children's excited cries as they run down the Covered Way ditch toward the stream at the bottom of the hill, and across a small bridge and through the palisade wall into the town of Ninety Six. The open cellar ruin of the brick jail is seen near the entrance, with stabilized walls standing a few feet above the level of the ground to prevent accidents, and to protect the ruin itself. Interpretive field exhibits here guide the group to the depression of the Charleston Road, where they see other open cellar ruins, and a drawing of how the town must have appeared when the houses were standing. The children find the east corner of the palisade and follow inside a parapet ditch toward the Star Fort, where they visit the remaining earthworks, left very much as it has survived through the centuries, and here they see a field exhibit showing how the Fort looked in all its glory. Another exhibit to the north of the star explains Greene's siegeworks, but the highlight of the visit to this area is the view of the mine dug by Kosciusko; here, steps lead down to where you can see into the actual tunnel dug two hundred years ago, and they remember the diorama in the visitor center museum that showed the Americans digging this tunnel in an attempt to reach beneath the fort.

Leaving here, they walk past the graveyard of those who died in the battle, and follow a depression into the Island Ford Road, then down a path near a ditch and embankment that has remained intact for hundreds of years; a ditch so shallow that a few plowings would have destroyed it, but yet it remains today! On a walkway bridge across a road leading to the Star Fort parking lot they stop for a moment and watch cars pass beneath them on their way to see the Star Fort. Some people cannot make the entire trip by foot, and prefer to visit the Star Fort by car. They walk back up the Covered Way and, before going to the parking lot, they stop by the mound and ditch of Lee's Parallels to see the exhibit telling about the capture of the Fort by Lee's men on June 18, 1781.

They buy refreshments at the visitor center, and then back to the car for the ride to the site of the Trading Post, which they have learned is located a short drive south of the site of Ninety Six. They drive beneath the bridge they stood on a short time before, and past the Star Fort, and then down a quiet road through fields and trees, then along a great depression which the signs tell them is the two hundred-year-old Charleston Road. As they approach the top of a pleasant hill, the curious children
cry out in surprise and excitement as they see on the lower hill below them yet another palisade wall, that of Fort Ninety Six at Goudy's Trading Post. They park in the parking lot and get out to view the ruins of cellars. Here they see not only a single palisade fort, but parts of two or more forts with exhibits pointing out that these were additions made at various times to protect against the Cherokee Indians. In a small exhibit pavilion they learn about an Indian attack that occurred here, and about a scalp being run up with the British flag to the top of the flagpole, and about the bones of Indians being fed to the dogs of the colonists. While the parents rest in the shade of the roof of the exhibit pavilion, the children run along the nature trail which goes to a small stream where they see the stones placed there when the Charleston Road was in use as a help for wagons trying to get across the ford. While they are gone, the parents talk with the guide who is on hand to answer questions. They had seen a similar guide at the town of Ninety Six and at the Star Fort, but had not talked with them. Now they find that the guide is a great help with some of the questions that had come up on the tour. When the children return, they drive back to the top of the hill where they can look down on the site of Fort Ninety Six, and here they stop to eat their picnic lunch at tables in the shade of the trees.

Throughout America, American historical societies who have never had more than a few hundred dollars in their treasury are finding that grants from foundations and federal agencies have resulted in their becoming involved in a business where hundreds of thousands of dollars are available. Some of these restoration-sponsoring groups have done an outstanding job of research and development with their funds in bringing to reality their dream of creating a bridge for understanding between the past and the present.

Other groups often begin spending the funds they have suddenly acquired in a rapid manner, sometimes without proper regard for historical and archeological research to insure the authenticity of the restorations they are undertaking.

Through the Institute of Archeology and Anthropology at the University of South Carolina, we are providing needed archeological assistance to local societies and commissions, and in this capacity we have encountered examples of projects where entire seventeenth-century villages have been on the drawing board and in the model-
making stage, with a million dollars reserved for the project, before any thorough research or any archeological work was undertaken. Needless to say, we had quite a struggle in convincing the supporters of the "Reconstructed Village" type of interpretation that there was a need to keep such unauthenticated constructions off the original village site until proper study had been undertaken; and then we could support it only if documents and archeology had abundantly demonstrated that a valid reconstruction of this type could be competently undertaken.

Another example illustrating how not to go about planning a restoration project was seen when the interpretive museum for an archeological site was proposed to be constructed directly on top of a documented plantation house, the ruins of which were clearly visible. Again we were placed in the role of trying to protect the historical sanctity of an archeological site from the developers who were determined to destroy a relic of the past, ironically, in the name of "preservation of our heritage." The fact that a million dollars was planned for the construction of the museum seemed to be sufficient cause to destroy a pile of brick and stone from an old ruin. Fortunately, we were able to convince the sponsors to move the museum site, and thus save the ruin.

The site to which the museum was planned to be moved had no history of early occupation by man. At the meeting at which the archeologist was asked to explore the new site for possible ruins, Jim Fowler, of television's "Wild Kingdom" fame, made the remark that it might be risky to allow the digging to take place on the new pavilion site because the archeologist might find an Indian pavilion on the site and ask that the museum be moved again. Everyone, including the archeologist, had a laugh over this suggestion. However, the archeological work did reveal an Indian pavilion or ceremonial center two hundred feet square, with an adjoining one hundred foot compound with a circular bastion attached. No such ceremonial center with a temple ruin, ceremonial sheds, and circular bastion tower had ever been discovered before, and the archeologists set about trying to save the site by attempting to point out the unique significance of the discovery. If the pavilion construction could be moved over only two hundred feet, the Indian structure could be saved, and new posts placed in the original postholes would make a most impressive explanatory exhibit for public enjoyment and education. However, in spite of a great outcry from the public, including news coverage on the Huntley-Brinkley Report, this historic Indian structure was destroyed, ironically, by a structure designed ostensibly to interpret the history of the site.
Another restoration group, dealing with a Revolutionary War site on which ruins of nine military fortification features and the ruins of an entire palisaded town are located, felt it necessary to use their restoration funds to buy log cabins, dismantle them, and reassemble them on the historic site, using exposed California redwood in the process. Another commission, involved with a site on which is located a standing Revolutionary War fortification and six other fortifications from the French and Indian War period and the Revolutionary War, is also planning on hauling log cabins on the site; a site already incredibly blessed with historic archeological treasure. This is being done, it is said, in order to provide the public with something of interest to look at. My question is, how many log cabins can the public absorb on historic sites before they begin to reject as bogus pseudo-history all such attempts to interpret the past? Will we not reach the saturation point with such efforts? Is not the public now more sophisticated than to require a log cabin on every historic site it visits? We are all working toward a dream of competently-researched historic sites through archives and archeology, with the resulting authentic restorations and reconstructions. The evaluation as to whether our efforts have a permanent educational and beneficial result depends on whether, in bringing our dreams to reality, we maintain a high standard of values anchored in thorough research, translated into competent restorations, reconstructions, and on-site explanatory exhibits.

Somewhere in between our visionary projection into the future and the historic sites and structures we see today, the dream meets the reality. Our responsibility to the future lies in first having a dream worthy of our striving, and reaching for its conversion to reality through the most competent means at our disposal. We must take care not to spoil the dream in our eagerness to bring its fuzzy edges too quickly into the sharp focus of reality. For, to do so, is to warp our understanding of history through the creation of distorted images that do a disservice to the past as well as to the future. We must constantly, in our role as stewards of the past, be aware of this responsibility. All our efforts should be directed toward achieving the greatest degree of accuracy in our historical and archeological research, to insure the closest correlation between the reality of the past and our explanatory exhibits. These parapets and palisades, cabins and ruins, are the bridges leading the minds of men to a greater appreciation of our heritage. We must not fail in our role as historical engineers who are shaping the attitudes and understanding of generations yet unborn. For it is only through what we do today, in
developing our historic sites, that the future can know the past through them. If we, in our enthusiasm, and in the name of history and "restoration," damage, destroy and distort the clues that have survived, rather than competently interpreting them, we have burned the bridges behind us and the future can no longer build on the true evidence, but must forever depend on our interpretation. We, the researchers and developers of historic sites, are the only ones who have the opportunity of observing the maximum amount of historical and archeological evidence. Once the pages in the earth have been revealed through archeology, there is never another chance for those pages to be read, for the archeological process itself is a destructive force, erasing as it reveals. There is no second chance!

We should guard against first-impulse planning and development; against the log cabin syndrome, where the countryside is stripped of all log cabins, to be planted in a cluster like pseudo-historical mushroom towns springing up overnight, regardless of the historical focus or archeological merit a site might otherwise possess. In our enthusiasm, we may go so far as to use California redwood in our "restorations," implying trade routes and resources undreamed of by our forebears. Yet the minds of children and unsuspecting adults are shaped by such distortions, that are springing full-blown as creations of our own age rather than anchored in the past through research and archeology.

Let us guard against the pitfalls of creating "instant history," insufficiently rooted in the rich humus of our heritage of people, their things, and the historic sites that were the stage for their drama. Rather, as we engineer our explanatory exhibits in the form of parapets and palisades, ruins and cabins, restorations and reconstructions on historic sites, we should be constantly aware of our role as creators of historical images to become burned into the minds of men. If our efforts to interpret history on historic sites are insufficiently supported by research and archeology, and we find that the palisade we built must be taken down in favor of a more accurate presentation, the damage has already been done by false images carried away by all those who have viewed the bastard child.

Therefore, we should look closely at our responsibility. These are not games we are playing with history! Our involvement in the past is our investment in the future!
After this chapter was read to the commissioners, several members expressed the view that after living in the community of Ninety Six all their lives, and serving on the commission for several years, now, for the first time, they were able to envision the potential of the historic site of Ninety Six as it could be. One commissioner stated, "I see that our job is only begun; but now we have a vision to bring to reality at Ninety Six."

Such master guideline chapters from historical archeology reports, seen only by historical societies and commissions, are definitely not (it is generally agreed) an acceptable part of historical archeology reports. However, they have proven their usefulness on numerous occasions in the relationship between the historical archeologist and the historical society, as a part of the archeologist's responsibility in attempts (as Pinky Harrington has said):

...to preserve the physical remains of our past and to employ them in perpetuating our historical heritage. (Harrington 1965:8).

No less important is such communication between the archeologist and the layman toward:

...public indoctrination in the importance of historical preservation. (Harrington 1965:8).

The point we have attempted to make here is that although historic site development is not archeology, the construction of interpretive explanatory exhibits such as parapets and palisades on historic sites should lie firmly and literally rooted in archeological ditches and postholes. The archeologist, therefore, is the one on whom the responsibility of such interpretation must rest. We cannot afford to ignore the need for competent guidance by qualified archeologists of groups undertaking historic site development.

A second point of emphasis is that historical archeologists have a responsibility to write planning and guideline chapters outlining recommendations for historic site development by sponsoring agencies, even though such guidelines are not favorably acted upon and brought to fruition. These chapters of the archeologist's report will not be printed, and will remain buried in the files in manuscript or progress report form in the offices of historical societies and commissions. As such, they cannot become a part of the archeologist's bibliographical ditty bag, but this should be of less concern to him than that he has contributed to a more accurate and sound development and interpretation of an historic site through competent guidance based on archeology.

It seems within the realm of possibility that these advisory chapters might conceivably be of some use to others working with historical groups toward interpreting our heritage through archeology and historic site research and development. The purpose of this paper has been to present a sample of such chapters that, while not archeology, do represent what is increasingly seen as a part of the responsibility of the historical archeologist.
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THE LOG CABIN SYNDROME

Stanley South

In the previous article the process of historic site development using as exhibits parapets, palisades, and ruins anchored in archeological research was contrasted with log cabins moved from their original sites and replanted as focal points at interpretive centers. Excellent explanatory exhibits rooted in archeology, such as those parapets, palisades, and ruins at Jamestown, Virginia; Brunswick Town, North Carolina; Fort Frederica, Georgia; Bethabara, North Carolina; Fort Raleigh, North Carolina; Charles Towne, South Carolina; and Camden, South Carolina were contrasted with the "log cabin syndrome" where old log cabins are "...planted in a cluster like pseudo-historical mushroom towns springing up overnight, regardless of the historical focus or archeological merit a site might otherwise possess". Having thus introduced the "log cabin syndrome," we will, in this paper, examine it somewhat closer to determine the reasons behind this desire to preserve a tie with the past through log cabins.

In his book, The Log Cabin Myth, Shurtleff (1939:5) points to the strong emotional ties Americans hold for log cabins and their use as a symbol of democracy and the colonists' struggle with the wilderness. He points out that "Americans today feel a sense of outrage when told that neither Captain John Smith nor Governor Bradford nor any of the founding fathers dwelt in a log cabin, or ever saw one" (Shurtleff 1939:6). This obsession with the log cabin as a symbol of early American pioneer life has been termed "log-cabinitis" (Shurtleff 1939:5).

As early as 1770, Moravians at Bethabara, North Carolina, erected a stone marker on the site of the Hans Wagner log cabin which had been torn down in 1768, it being the first cabin they lived in when they moved to North Carolina from Pennsylvania in 1753 (Fries 1968: I, 381, 411). Such an early historical awareness of a log cabin site is seldom on record. Excavation at that very site in 1967 revealed the small storage cellar dug in front of the fireplace in that cabin on November 18, 1754 (Fries 1968: 112), thus verifying the traditional site location.

In New York in 1850 the Washington's Headquarters building in Newburgh was set aside in order to save it, thus opening an early historic site to the public (Wirth n.d.:10). Many other early examples could be cited to illustrate that the business of marking or preserving log cabins and other historic sites, the "log cabin syndrome," is not a new phenomenon but has roots extending beyond the threshold of the American Revolution. It is not surprising that in these times of national interest in preservation of historic sites and structures, that the "log cabin syndrome" should emerge from the "log-cabinitis" that has long been with us. This paper deals with horizontally laid log structures commonly termed "log cabins" and does not include the entire range of historic houses, a topic outside the scope of this paper.

With this in mind the criteria used by The National Historic Landmarks Program in determining the significance of a historic site or structure can
be summarized, and from this base, we can begin to develop a scale with which
to evaluate efforts at saving log cabin structures. Criteria for determining
the significance of buildings, sites, objects, or districts are abstracted
here from a leaflet "The National Historic Landmarks Program" (United States
Department of Interior Leaflet).

1. Structures or sites where events occurred that have broad cul­
tural, political, economic, military, or social significance.

2. Structures or sites connected with the lives of significant
individuals.

3. Structures or sites associated with an important event repre­
senting an ideal or idea.

4. Structures that embody the distinguishing characteristics of
an architectural type specimen of value for the study of a
period, style, or method of construction, or a notable struc­
ture representing the work of a master builder, designer, or
architect.

5. Objects that figured prominently in significant events or are
related to significant individuals.

6. Archeological sites that have produced information of major
scientific importance by revealing new cultures or relating to
major theories and ideas.

7. When preserved or restored as integral parts of the environ­
ment, historic buildings not sufficiently significant indi­
vividually by reason of historical association or architectural
merit to warrant recognition, may collectively compose a
"historic district" that is of historical significance to the
nation in commemorating or illustrating a way of life in its
developing culture.

8. A historic site, district, structure, or object must possess
integrity. For a historic or prehistoric site, integrity re­
quires original location and intangible elements of feeling
and association.

9. For a historic structure, integrity is a composite quality
derived from original workmanship, original location, and
intangible elements of feeling and association.

10. For a historic district, integrity is a composite quality
derived from original workmanship, original location, and
intangible elements of feeling and association inherent in
an ensemble of historic buildings having visual architectu­
ral unity.

11. For a historic object, integrity requires basic original
workmanship.
12. Structures, sites, and objects achieving historical importance within the past 50 years will not, as a general rule, be considered unless associated with persons or events of transcendent significance.

We can use as a hypothetical example for examination a typical log cabin to be found in almost any locality. Interest begins to center on this lonely relic and an effort is launched to "save" it. As has been mentioned elsewhere, this phenomenon is widespread. Of the five archeological sites we have dealt with in the past two years, sponsoring groups have moved or are in the process of moving, log cabins to four of these sites, with the fifth group having plans underway for rebuilding an entire town before the historical and archeological work was undertaken. Similar situations are also known from other areas and where log cabins are not plentiful or available, the "log cabin syndrome" becomes the "old house syndrome," a closely related phenomenon.

The first step to take with our hypothetical relic is to determine its age. This can be done through documents, tradition, a study of the structure, and archeology on the site. We may find that what we have been taking for a respectably old log cabin is actually an old tobacco barn later converted into a log dwelling. An illustration of the need for caution is seen in a personal example. In the western North Carolina mountains, there is a log cabin nestled in a picturesque spot on the bank of a stream at the foot of a steep mountain. Many people stop to look at it and comment on how fortunate that it has been "saved." The only catch is that as a boy I watched as the broad ax cut the notches and waited with anticipation as each log was custom fitted into position. I sometimes wonder how long it will be before this cabin too becomes dilapidated with age and neglect and becomes of interest to some group determined to "save" it. The point is that there are log cabins of all ages, from the present to the seventeenth century, with appropriate architectural and construction details that allow for their age to be determined.

Suppose that we have been able to determine a verifiable age for our log cabin through documents and/or an examination of the site, and this cabin dates from around the middle of the nineteenth century, then we may ask:

1. Does our cabin represent an event of significance? No.
2. Is it connected with the life of a significant individual? No.
3. Does it represent an event connected with an ideal? No.
4. Is it an architectural type specimen? Yes.
5. Is it related to significant objects? No.
6. Is it related to a significant archeological site? No.
7. Is it part of a "historic district"? No.
8. Does it have integrity by being on its original location? Yes, so far.
9. Does it have original workmanship? Yes, but it has been gutted and altered through the years by different owners.

10. Does it have age beyond fifty years? Yes.

Our survey has revealed a "yes" to four of the ten questions, but our group is going to move the cabin for use as a reception center to the site of a significant battle that took place two hundred years ago (seventy years before the cabin was built). In doing this it loses its site integrity. What about the original workmanship for which a qualified "yes" was obtained? In order to move the cabin most economically, it will be totally taken down, reconstructed on its new site, and a new chimney built to go with the logs. In doing this the small claim to original workmanship is lost. We are now left with "yes" answers relating to "architectural type specimen" and "acceptable date." What of the "intangible elements of feeling and association"? What about integrity? These, of course, are lost in this effort at preservation.

At this point a new element enters the scene with the idea of moving several log cabins to the site of the battle and thus creating a pseudo-historic district which, from a tourist visitation point of view, seems like a good idea. A pseudo-historic district, it is argued, is better than no historic district, and log cabins are being saved in the process. Not only that, but a souvenir shop, visitor center, toilet facilities, and equipment shed can each be put into its own log container with one of the group serving as a house museum. What tourist, afflicted with "log-cabinitis," could possibly resist the lure of such bait dangled by the well-meaning historic preservation group? Thus the "log cabin syndrome" flourishes.

We now observe that: (1) the cabin has lost its integrity through dismantling and removal from the original site, (2) is not connected with any significant person, event, or idea, (3) is not related to an archeological site or significant object, (4) its workmanship has been violated, (5) it is located on a site where it is in disconformity with the type of log cabins made at the time the battle was fought, (6) it has lost what "intangible elements of feeling" it may have had, (7) it has no historic "association" with the site on which it sits or with the other cabins in the cluster, and (8) its function as a unit in a "historic district" is a false one arising from the pseudo-historic nature of our log cabin cluster. Since this is the case, are our efforts not a waste of time? The answer does not lie with a simple "yes" or "no." The relative value of such a depressing prospect can best be judged by a comparative scale of log cabin criteria ranging from excellent to poor. With this in mind, we present an outline which will hopefully be of use to those who have been, and will continue to be, caught up in the "log cabin syndrome." This outline presents a scale whereby log cabin salvage efforts can be evaluated to hopefully act as a guide in making decisions regarding undertaking log cabin projects and once begun, to aid in achieving a result as high on the scale as possible. The ten topics listed here are in decreasing order of significance, with the best first and the worst last.
I. **Restoration as a Log House Museum**

1. The cabin has a verifiable age through documents and/or archeology.

2. It has **architectural integrity** in that it has not been drastically violated through alterations, additions, or gutting. It may have interior details of extreme interest, wainscoating, moulding, stairs, ceiling, fireplace, and other details of original workmanship that are relatively undisturbed through preservation beneath later paneling, etc.

3. It is a fine example of an **architectural type specimen** representing, for instance, a particular style of German mortised hewn log construction characteristic of the mid-eighteenth century.

4. It is a survival of one of many such cabins built by German immigrants into the area representing, for example, the struggle of these people to establish a foothold on the Carolina frontier after pressures of various kinds drove them from Pennsylvania.

5. The cabin was the home of a **prominent citizen** of the area, and a state governor was born there, thus connecting it with **significant persons** and an **event**.

6. One room was used by a committee who made the decision to fix the capitol of the state at a particular site—a **significant event**.

7. It is standing on its **original site** with little violation and encroachment by later structures, thus maintaining its integrity and its "**intangible elements of feeling and association.**"

8. **Objects** associated with the cabin, such as furniture, have **survived**, and are in the hands of those who will make them available for use in the restoration. **Drawings and/or photographs from an earlier time reveal the position of various objects within the cabin. Objects not surviving are listed in an inventory of the house made when its most prominent figure was living there.**

9. Exterior drawings and photographs taken at various times are an excellent guide for restoration, and living informants were witnesses to past appearance and events associated with the cabin. They also remember being told by their grandparents significant details of the cabin that relate to what happened 140 years ago and this oral history involving the **location** of a structure is **verified** through historical archeology.
10. The ownership of the cabin has been transferred to the historical group interested, and an active membership is working toward obtaining funds through grants, donations, campaigns, and projects to finance the historical research, architectural recording, and archeological investigation necessary before any restoration is undertaken.

Needless to say, such a project is an ideal one but many of the requirements outlined here were present at the Vance Birthplace State Historic Site in North Carolina, and many other projects are also anchored with equally firm roots. We have an obligation and a responsibility to save and preserve such structures. The interpretation of this house in its original setting as a house museum restored to a particular time range would be a good treatment for such a fine log structure as we have described. An unobtrusive visitor center could serve as an introduction to the historic structure, but this should never force itself on the visitor as some centers have done, dwarfing the historic structure into insignificance by the pretentiousness of the interpretive center. This allows the log structure to maintain its integrity by not having its interior violated by the intrusion of foreign elements such as display cases and interpretive signs.

II. Restoration as a Log House Museum with Interpretation within the House

The house is the main focus but some interpretation must be done in the house itself through exhibit cases, signs, displays, etc., usually in one section of the house only. The services of a full-time, competent guide to conduct tours is ideal to allow for a minimum of interpretive devices within the house itself which is having its integrity as a house museum violated by the presence of the interpretive devices.

Needless to say, original materials found in the attic, basement, or elsewhere should be used in the restoration, but replacements of the same time period are used when available and reproductions that are carefully researched and executed are called on when required. These should duplicate the originals as to material and quality, and if redwood is used where pine was originally, it should be made to give the appearance of pine. If red colored cement is to be used as a practical alternative to clay daub chinking, it should look as much like daub as possible. In other words, if foreign, out of context, violating materials are used, they should be so used as to almost avoid detection if at all possible, so as to eliminate the violation.

III. Restoration of a Log House for Exterior Viewing

This type of restoration utilizes the log structure for some purpose other than a museum. This might be for an office, a home, or storage. In fact, the restoration of an historic structure in an authentic manner on the exterior, with non-violating adaptation of the interior as a home is, to some people, a far better use of a historic house than as a house museum.
IV. Restoration as a Log House Museum on Other Than the Original Site

It seems more the rule than the exception to move log structures from their original locations. This is dictated by many factors, such as saving the house from destruction because the land was sold for new construction, placing it on a site where a greater visitation will be possible, etc.

V. Restoration as a Functional Building on Other Than the Original Site

This is a frequently chosen alternative where the log structure is seen as a visitor center, office, or equipment storage shed to attempt to remain authentic only on the exterior of the building. The interior, however, if adapted for an office, is much better completely adapted for the modern purpose rather than trying to fit a modern office among the furnishings and plan of a log cabin home. This alternative produces neither a good office nor a valid or attractive restoration. A receptionist's desk alone, however, often can be worked well into a restored livingroom setting without the fact being very obvious. Taste is the main guide in this respect and many local historical groups have persons of excellent taste who could guide them, provided they choose one oriented to restoration practices and techniques and not one encumbered with a burden of preconceptions as to what looks "old."

If the functional use of the structure is as an equipment shed, then only the exterior is presented in its restored condition for viewing. Use as a gift shop, ice cream parlour, camera shop, etc., is an alternative sometimes chosen, but here again, concern is more with the exterior than with the interior integrity of the cabin.

If utilized as a museum, exhibit cases and interpretive displays virtually exclude any attempt to use the interior for anything but this purpose.

VI. Moving a Log Cabin to Another Site Completely Intact

This can be accomplished at considerable cost when proper care is taken and professional advisors are on hand through all phases of the project. For the historical society president to hire the first house mover he finds to move an historic cabin is not the approach recommended. The cabin move, complete with chimney, can be accomplished, for there are movers who, with competent guidance, can accomplish this successfully. This step of moving the log cabin is a serious one, however, for it does severely violate the integrity of the house.
VII. Moving a Log Cabin to Another Site by Dismantling it Completely

Sometimes log cabins are dismantled and moved to a new site, the chalk marks used to key the logs are "washed off in the rain," and the pile of logs remaining and the cabin made from them, is sometimes a product virtually devoid of any redeeming value. However, through persistence, perserverence, and a great deal of money, any dog of a log cabin can be torn down and the logs used in some manner to make a log building. The point is that if this alternative is chosen, then we are at the point where the extreme cost of rebuilding, plus the total loss of integrity, begins to seriously outweigh any historical value the termite-ridden logs may have had to begin with.

VIII. Dismantling a Log Cabin for Salvaging the Logs

Sometimes the best that can be done for a log cabin is to salvage the logs, treat them with proper preservatives for prevention of further decay and insect damage, put them in a protected place, and use them in some future restoration where such logs may be needed. Many logs have been allowed to rot when a little care could have saved them. Some well-preserved log houses have been raped of their fine logs, resulting only in their more rapid deterioration. With proper care and understanding, such timbers can again become vital parts of a log cabin structure.

Wainscoating and other interior details, such as doors, can be salvaged for use in restorations. In fact, this type of thing is one of the primary reasons that many of the early houses are devoid of their interior details, these having been robbed for use in private and public restorations. Historical societies undertaking restoration of log cabins and other houses are well advised to closely watch their materials, for nationally prominent restorations have been robbed of fine eighteenth century window casings, mantels, and moulding while restoration was underway.

IX. Log House Replication Based on Documentary and Archeological Research

In the absence of the log structure known from documents to have stood on a particular site, and with the presence of photographs, drawings, descriptions, plus archeological data establishing the exact site location, it is conceivable that an undertaking could be launched to replicate a hewn log structure. This would be a very unusual case, however, with abundant documentary and archeological evidence being required, plus the availability of trained broad ax craftsmen. Such craftsmen have been developed at Old Salem, Inc. in North Carolina through the process of replication of half-timbered structures. Elaborate techniques, utilizing materials and methods never employed by Colonial craftsmen, have emerged in order to maintain visual and actual accuracy in the replication of construction detail while keeping in the interest of economy and maximum investment returns. Such knowledge and
techniques take years to develop and is not something that can be undertaken casually by the town carpenter who happens to be available.

X. Log House Replication to Represent a Structure "Of the Period"

The bottom of the barrel, so to speak, would be the replication of a log house designed to merely represent a structure "of the period." Such structures are being built with this "justification" in mind. In fact, this is sometimes the reason given for building a number of outbuildings such as the smokehouse, milk house, cooper shop, pottery shop, or loom house in conjunction with a standing historic house. These structures are said to be desired to show the visitor how such a complex of utility buildings might have looked if gathered onto one plantation and are intended to represent utilities "of the period." Needless to say, such contrived groupings of replicated houses represent the ultimate in abuse of the "log cabin syndrome" and are certainly not recommended as an alternative unless there is absolutely no other choice.

With these ten alternatives for the treatment of log cabins, those who find themselves involved with the "log cabin syndrome" can perhaps have a better idea of just where their project fits this scale. There is a constant balancing of historical values against monetary values in this process and often groups pour large sums of money into an old, unresearched relic of a log cabin, while under their noses, workmen are tearing down an old frame house which, if properly researched, may prove to be of more historical value than any log cabin in the area. We may find other more valid projects to be sponsored than the cabin that first catches the eye. We should remember that it costs from $10,000 to $20,000 per room to restore a log house, not to mention purchase and removal to a new site. It behooves us then, before we jump eagerly to the task of saving the log cabins, barns, and tobacco barns that dot our landscape, to take a long look at the step we are about to take. We should evaluate it from all sides, utilizing the resources, consultation, and literature bearing on the subject, for this involvement with historic site development is not simply a matter to casually be voted on at the monthly meeting of the historical preservation group.

A basic project of historical or archeological research may be a far more urgent goal than a cabin project. In the nineteenth century the first thought in interpreting an historic event or site was to "erect a statue." Some archaic thinking still dictates "statues" as an alternative to historic site interpretation, just as some immediately think "log cabin" when historic site development is mentioned. There are alternatives to log cabins, however, such as interpretations centered around the archeological features with ruins revealed as exhibits, fortifications revealed as parapets, and stabilized trenches or palisades replaced in the original ditches. Architectural interpretation through structures still standing on the site can be utilized, plus field exhibit cases, self-guided tours over the site, etc. Tours of historic districts can be organized, significant houses marked as to date of construction, and research done into private and public documents.
to reveal data of primary significance to the understanding of local history, as could an intensive, systematic, oral history research project. These alternatives should at least be considered by the historical group before the step is taken to begin restoration of the log cabins in the area.

Historical preservation groups such as the Camden District Heritage Foundation, The Star Fort Historical Commission, The South Carolina Tricentennial Commission, and The Spartanburg Historical Preservation Commission are working with such state agencies as their department of archives and history, their archeological research institutes, departments of anthropology and archeology at the various universities, departments of parks, recreation and tourism, etc., in weighing their choices for historic site development through log cabins and buildings as well as through parapets, palisades, and other alternatives. National agencies are also being consulted, such as the American Association for State and Local History, the National Trust for Historic Preservation, and the National Historic Landmarks Program of the Department of the Interior. We fully realize there is no stopping the "log cabin syndrome," but hopefully historical groups can eventually come to make more informed evaluations of their alternatives before undertaking to add yet another restored log cabin or "mushroom town" to the landscape. It is hoped that the evaluation scale provided in this paper will be a step toward achieving this goal. Suggestions are welcomed for refinement of these criteria by those involved with the "log cabin syndrome."
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SURFACE INFORMATION FROM THE PRESUMED SITE OF SAN PEDRO DE MOCAMO MISSION

Jerald T. Milanich

Introduction

During June 1970 Dr. William R. Bullard of the Florida State Museum and this author made a brief survey of Cumberland Island, Georgia, primarily to locate Deptford-Wilmington village sites. In the course of this survey an extensive shell midden area displaying Spanish and historic Indian ceramics was found. This preliminary collection was added to during subsequent visits to the site in July and August. From the collected artifacts and from physical characteristics of the site, tentative conclusions regarding the historic and proto-historic occupations of the site and of the Camden County area can be made. Identification of the site as the Timucuan village of Tacatacuru, location of the San Pedro de Mocamo Mission, also seems justified.

Ethnographic and Archeological Survey

The Tacatacuru site is located on the island waterway side of Cumberland Island bordering tidal marshes and Cumberland Sound. Erosion of a portion of the site by the Sound has exposed small, separate shell middens scattered along the four to five foot high bank. The site runs almost one-half mile along the island's edge, extending from the old Carnegie estate Dungeness northward one-quarter mile to the Dungeness Wharf, and north beyond the wharf for another quarter mile. From the relative amounts of potsherds lying on the eroded bank and on the Sound bottom, it is apparent that the most intensively occupied portion of the site is the northernmost 300 yards. Interestingly, the erosion along this sector has exposed a line of individual shell piles, each 20 to 30 feet in diameter and appearing from the surface to have been circular. These piles, thought to have been individual house sites or adjacent to them, are evenly spaced about every 100 feet along the bank. Back about 100 feet from the bank is another line of individual piles. Undergrowth made it difficult to locate or map this line, but the 4 piles located are parallel to the bank. The eroded piles are of uniform thickness, 0.6 to 0.8 foot.

This unique erosion situation seems to have cut through a line of 9 or 10 of the piles, creating a large profile across at least a portion of a village which appears to have been laid out on an elongated rectangular grid.

1 The July and August excavations of Deptford sites on Cumberland were made possible by a grant from the National Science Foundation grant number GS 3105.
Identification of the site as Tacatacuru is not absolute though likely. Information regarding the village and mission is scarce, but it does identify the village inhabitants as Timucuan and gives hints as to its location.

In 1587 Fray Baltasar Lopez founded the mission (Geiger 1950:68). A Spanish garrison (presidio) had been established on the Island in 1569. Its proximity to the mission is unknown, but it is likely that it had been located near the main Indian village Tacatacuru (Lowry 1901:289). Spanish colonists never settled on Cumberland.

By 1596 Lopez had been joined by Frays Pedro Fernandez de Chozas and Francisco Pareja. It is generally believed that Pareja wrote his dictionary of Timucuan while on Cumberland (Larson 1958:73; Gatschet 1877-80). That the Island's early historic inhabitants were Timucuan is further verified by the visit of the Spanish governor Ibarra in 1604. Ibarra was able to use the same interpreter from St. Augustine until he left Cumberland Island and traveled farther north (Swanton 1922:15). Also, Baltasar Lopez was known to have spoken Timucuan well (Geiger 1936:12), and during his stay in Spanish Florida seems to have been stationed only at San Pedro (Geiger 1940:68).

In 1597 the Guale Rebellion occurred and the Mission was attacked by canoe. The Timucuan chief Don Juan was instrumental in repelling the Guale, cementing Spanish-Indian relationships on the Island (Geiger 1937:103-104). After the attack the island was briefly abandoned, the priests withdrawing to St. Augustine and at least a portion of the Indians (led by Don Juan) moving to San Juan del Puerto. By February 1958 the Governor noted in a letter that the priests had returned to the Island (Geiger 1937:104).

From the accounts of the Guale invasion of the Island it is apparent that the Mission is south of the north end of the Island (where the town and Mission station of Puturiba was located). How far south is not apparent. One account places the Mission one league from two Mission stations thought to have been on Amelia (Napoyca) Island (Geiger 1940:121), which would place the site at the presumed location. Another suggested location two leagues north of the barra of San Pedro would put the Mission much farther north (Swanton 1946:187). However due to the extensive midden deposits at the presumed site and the lack of such late deposits elsewhere on the Island, it seems permissible to locate Tacatacuru by Dungeness Wharf. The water depth at this point is 30 feet, a sufficient amount for the Spanish brigatines (U.S. Coast and Geodetic Survey, Map 841-SC).

In 1603 the Spanish Governor Canzo visited the Island and was appalled at the dilapidated condition of the Mission. Masons and carpenters and supplies were sent for and the church rebuilt. Present at the dedication March 10, 1603 were the governor and the niece of Don Juan,
Dona Ana, now chieftainess of the Island (Geiger 1937:160-63). By 1604
Dona Ana was replaced by Dona Melendez who greeted Ibarra on his visit
(Geiger 1937:173). Fray Juan Bautista Capilla was sent to the Island
in 1605 and remained until 1607 (Geiger 1940:38-9). Pedro Ruiz, who
arrived in 1604, used San Pedro as a base for his missionary trips into
the Georgia interior.

Certainly the Mission prospered in the period 1607-1655 when no
published documents are available. In 1655 the Mission's name appears
on a list of the Florida missions (Geiger 1940:125). Between this time
and 1675, the Timucuan population withdrew from the Island (Swanton 1952:
144), pushed southward by the Guale who were in turn forced south by the
English and the slave trade. Calderon's letter of August 14, 1675 does
not list the Mission (Wenhold, 1936). A letter from Governor Pablo Hita
Salazar to the Spanish king dated August 24, 1675 mentions two Yamassee
settlements (Yamassee and Guale are probably inseparable at this time)
on Cumberland (Geiger 1940:129). One, Mocamo, has sixty residents, and
the other, Ocotoque, has forty. The Mission's name does not occur on a
1680 list (Swanton 1952:144). Thus, at the time of the Yamassee settle­
ment the Mission seems to be temporarily defunct. However, in 1690 Frays
Francisco de Rojas and his assistant Leon de Lara were sent to the San
Pedro Mission (Geiger 1940:65, 98). Perhaps an effort to reestablish
the Mission was made at this time.

The ethnohistorical documentation of the replacement of the in­
digenous Timucua by the Guale proves to be highly significant in light
of the pottery types collected at the site. It would be expected that
the Timucua occupation of the site would be represented by St. Johns
ceramics and the historic Guale by San Marcos types (Goggin 1952:80, 61;
Larson 1958:12, 14). Likewise, St. Johns (Timucua) middens, tending to
be large consolidated areas or mounds (as at Nocoroco) (Smith and Griffin
1949), and Guale middens, described by Larson (1958:14) as small shell
piles located by salt or brackish water (as Pine Harbor of the Central
Georgia coast), should also be present.

Two very distinct ceramic traditions are evident (as expected) at
the presumed Tacatacuru site. However they are a sherd or clay-tempered
ware and San Marcos types rather than a St. Johns series with San Marcos.
Sherd types and percentages from the surface collection is as follows
(type descriptions follow Smith 1948; Goggin 1968; Jennings and Fairbanks
1940; Willey 1949):
Of the 452 sherds only the fiber-tempered and the feather-edges sherds are known to be out of the chronological range of the Mission (ca. 1587-1700). Thus, it seems highly likely that the remainder of the collection dates from the period of the site's historic occupation. The percentages suggest that the Timucuan inhabitants made a sherd-tempered plain and cob-marked ware rather than St. Johns type pottery. The replacement of Timucua by Guale is further reflected in a breakdown of the ceramic categories. Of the 61 San Marcos Stamped sherds, 47 are grit tempered with inclusions of quartz (up to 1/8 inch); the other 21 are sherd-tempered. Seven of the sherd-tempered San Marcos Stamped sherds are check stamped, no check stamped San Marcos are grit tempered, suggesting check stamping is not late (post-1675), relative to the historic San Marcos tradition. The sherd-tempered plain and cob marked vessels seem to have been simple globular bowls with rounded (44%), flattened (44%), or folded (12%) rims. One flared lip sherd-tempered sherd is present, a copy of the San Marcos flared lip, thick bottom, cylindrical pot which is common for the historic and prehistoric Guale. The origin of cob-marking is unknown; it may be diffused from the Potano area (Milanich MS). These descriptions indicate a replacement of ceramic categories, sherd-tempering being replaced by the San Marcos varieties which are known to be the latest aboriginal ware on the Island.

The hypothesis that the Timucuan speakers on Cumberland Island differed in material culture from other Timucua to the south is strengthened by three other sources of information. First, from other surveys on Cumberland Island we know that the St. Johns Timucua type of village midden (consolidated areas or mounds) is not present on the Island. Rather the pattern is like that of the central Georgia coast. These surveys have also failed to locate any site which has yielded more than one or two St. Johns sherds. (Excavations of Transitional-Deptford sites has revealed about 5% St. Johns pottery.) There is no history then of St. Johns settlement pattern or St. Johns pottery on Cumberland Island.
Secondly, correlations between linguistic tribes and material culture, especially ceramic industries, are often tenuous and, in the case of the Timucuan speakers, such correlations have not proven true. The Potano Indians, historic Timucua speakers of north-central Florida, had a material culture quite different from the coastal Timucua, though the two shared a common language (Goggin 1953; Milanich MS). By analogy Timucua speakers on Cumberland need not have had a St. Johns culture.

The third source of information is based largely on Larson's survey of Camden County, Georgia (1958). Larson postulates that Camden County's cultural ties during the Florida St. Johns I and early II periods are with central and northern Georgia rather than with the St. Johns area. At the end of Savannah II times, however, a St. Johns II culture moves into Camden County, accounting for the Timucua on Cumberland at the end of the 16th Century. Larson notes that this Georgia St. Johns culture is very peripheral to and differs from the coeval St. Johns cultures to the south. He attributes the pull-out of the Savannah peoples to an influx of Muskogean, complicated-stamped-pottery-making Guale from central Georgia, the predecessors of Irene and Pine Harbor. This population movement causes cultural trauma which weakens and then replaces the Savannah peoples, its effects reaching even into Camden County.

I would disagree with Larson's theory that a St. Johns II culture moved permanently into Camden Island (and Cumberland Island). Previously there was an embarrassing need to get St. Johns culture onto Cumberland in time to greet the Spanish, since it was known a Timucuan tongue was spoken on Cumberland. With the realization that the Cumberland Timucuan differed from the St. Johns Timucua, there is no need to weave a tenuous theory which would bring the St. Johns peoples across the (even then) state line. Rather we should weave a tenuous theory to explain the development of the Cumberland Timucuan speakers. This author's theory, which is left for someone with excavated data in hand to disprove, is as follows.

At the end of Savannah II in Camden County the cultural contact which provided the impetus for the Irene and Pine Harbor developments to the north did not occur, though the Savannah II peoples are cut off from the mainstream of coastal Georgia developments. This results in the Camden area Savannah peoples turning away from the north and toward the south to the St. Johns cultures, whose influence, always present, now increases somewhat. Already probably related linguistically due to geographical proximity, these peoples increase their adoption of the Timucuan language, having completed this process by the late 16th Century, though not adopting other aspects of St. Johns material culture.

The historic, linguistic Timucua peoples on Cumberland have developed out of a long history of sherd-tempered pottery makers, the Wilmington-Savannah Tradition. Surface collections on Cumberland have revealed late-Swift Creek and cord marked sherd-tempered pottery. Sherd or clay tempering may be a trait which continues from Wilmington up to the historic period in Southeast Georgia, in cultures peripheral to the center
of the Wilmington-Savannah Tradition. Certainly excavated data, especially from Wilmington-Savannah cultures in Camden County, is needed.

Summary

The location of the San Pedro de Mocamo Mission and the Timucuan village of Tacatacuru is postulated to be on the island side of the south end of Cumberland Island, Georgia. Surveys show that the most intensely occupied portion of the village is 100 to 300 yards north of Dungeness Wharf. Erosion of the bank at this point reveals a line of evenly spaced shell piles, suggesting a planned village pattern, perhaps due to Spanish influence. Ceramics from this location show that the Timucua-speaking inhabitants were not makers of St. Johns ceramics and differed also from the St. Johns culture in midden depositional pattern. It is probably that the Cumberland Timucua evolved from local (Camden County) cultures which were peripheral to the Wilmington-Savannah and St. Johns culture centers. Declining Savannah II influence, increasing St. Johns II diffusion, and geographical proximity all contributed to the adoption of a Timucuan language by these Woodland peoples. By the historic period the result was a Timucuan-speaking, mission Indian population who retained their Wilmington-Savannah-derived culture traits.
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SELECTIVE ANALYSIS OF TWO HISTORIC INDIAN TRASH PITS FROM NEW ECHOTA

Steven G. Baker

ABSTRACT

Archaeological salvage operations carried out at the site of the former Cherokee National Capital of New Echota near Calhoun, Gordon County, Georgia located two trash pits which provide indications of the ceramics and other material goods in use during two important periods in the history of this site. The remains of what was probably the Negro house of Elijah Hicks, a wealthy Cherokee Resident of New Echota, were badly damaged by construction activity but still provide through salvage an informative look at some of the white and aboriginally manufactured ceramics. Other material goods in use on the site during the period 1820-1840 serve as a departure point for continued inquiry into 19th century Cherokee Culture.

The second feature presumably dates to the latter one-half of the eighteenth century and prior to the establishment of the site as the Cherokee National Capital. Aboriginally derived ceramics and potter's tools used in their manufacture are illustrated and discussed.
A program of salvage archaeology conducted on the golf course of the Calhoun Elks Club at Calhoun, Gordon County, Georgia by the Georgia Historical Commission during the fall months of 1969, resulted in the salvage of important prehistoric and historic information threatened with destruction by additional course expansion. A nine hole addition was made in an area that once was within the town limits of the Cherokee National Capital of New Echota, a site generally dating to the period 1820-1840 and associated with the terminal Cherokee occupation of Georgia. The salvage work resulted in the recovery of information relating to the last Cherokee occupation of the site in the 19th century as well as to earlier occupation by presumably Cherokee speaking people.

HICKS CABIN SITE

During the process of land contouring, the contractor reported that he had encountered a large trash pit in the vicinity of the main club house. This area was originally the New Echota property of a wealthy Cherokee by the name of Elijah Hicks. Until excavation of the area was complete, it was not apparent that the feature had been totally destroyed when cut into by a large motor scraper. What had originally appeared to be minor damage was, in essence, near total destruction of the fireplace pad and other building remains. In the name of discretion, the operator had very kindly replaced the contents of the feature without divulging himself to the archaeologist or to his boss, consequently reversing the stratigraphy and annihilating the ground context. Except for the recovery of artifacts (Figs. 1-4) which had been returned to their context with some shuffling around, some limited but valuable stratigraphic information, and the recording of one large posthole, little data was recovered from what was probably the site of the "Negro house" of Elijah Hicks. It is known from the Cherokee Property Valuations (Hargraves 1838: valuation 303) that there was such a structure of round log construction with a plank floor, fireplace, and chimney, measuring 14 feet square.

Due to these circumstances, it would be dangerously presumptive to interpret this feature specifically in terms of the "Negro house" of Elijah Hicks; it can with safety, however, be stated that the feature under discussion relates to a domestic occupation of a cabin located on the property of Elijah Hicks during the New Echota Period of 1820-1840.*

A variety of artifacts from the feature (Figs. 1-4) provides indication for a good date in the 2nd quarter of the 19th century and does support the dates suggested by documentation. Although no formal methods of analysis have been undertaken on the ceramics, they are generally consistent with the trend in wares apparent from other areas of the site and reported on by Fairbanks (1962). The ceramics recovered, in addition to simply adding further support for the popularity of certain European

*Elijah Hicks was already in residence at his property at New Echota when the capital was established there in 1825 (Cherokee Nation 1852-64).
NON-CERAMIC ARTIFACTS FROM THE HICKS CABIN SITE

Figure 1

a. copper musket rampipe  
b. wrought iron brace, perhaps from a wagon box or saddle  
c. brass seamstress' thimble  
d. 1821 U. S. Dime (silver)  
e. perforated Spanish one half Real piece, possibly used as a decorative ornament. No date legible  
f. lead musket ball  
g. brass straight pins  
h. "London Gilt" brass button  
j. blade from clasp knife  
k. jewelry inset of stamped brass with gold watch  
l. unidentified ivory object, (piece of a comb?)  
m. broken rat-tail file, unmodified  
n. small brass grommet from a garment fastener  
o. tailor's scissors  
p.-q. L-headed wrought nails  
r.-s.-t. machine cut nails

Figure 2

lid from cast iron "Dutch oven" (Scale is five centimeters)

Figure 3

a. eye portion of a wrought iron hoe, this type is popularly referred to as the "Scovill Hoe"  
b. specimen of comparative "Scovill Hoe" taken from non-archaeological context in local area. Hoe was in use until 1970. Scale is ten centimeters.
CERAMICS FROM THE HICKS CABIN SITE

Figure 4

a. Transfer-Printed Pearlware Items

1, 3, 4, 5, 6, 7, 8 are "floral pattern" prints and 3 and 4 are "pastoral" scenes printed on exterior of vessel having pattern 5, 6, 7 on interior
2 is a "blue willow" pattern transfer-printed plate fragment

b. "Feather or Shell" Edged Pearlwares Items

1 and 2 are green edgedware sherds from plates
3 is blue edgedware sherd from plate

c. Blue Hand-Painted Pearlware Items

all items are blue hand-painted pearlwares

d. Polychrome Hand-Painted Pearlwares Items

all items are polychrome hand-painted pearlwares in colors: yellow, brown, blue and green

e. Banded Pearlwares Items

1 is a blue rimmed over brown banded ware of style often called "Mocha"
2 is brown and white banded blue to brown "swirl pattern" ware which closely resembles common Mocha
3 green banded polychrome spongeware bowl in brown, blue and orange

f. Coarse Redwares Items

1 is basal portion of fine lead glazed redware jar and items 2 (two sherds) are from body of same vessel and show a "turned relief"
3 is the rim of a coarse redware bowl

g. Aboriginal Ceramics Items

1 is rim of small sand tempered finely check-stamped bowl with no lip fold
2 rim of sand tempered, roughened surface bowl with no lip fold
3 impressed rim sherd from small jar, smooth surface and perhaps burnished, no rim fold
derived wares at this period in time, also, by the presence of a seriously limited quantity of aboriginally manufactured sherds, perhaps relative to the Colono-Indian wares reported by both Hume and South (Hume 1962: 172) (South 1959: 70-81 and 1962: 3, and plates X and XI), become important in establishing a framework of inquiry into 19th century Cherokee Culture, a period which can be deemed culturally "terminal" in Georgia due to its forced removal, and perhaps often dangerously considered to be typified in the site of New Echota which it is not.

By far the most abundant, and presumably the most popular wares evident from this and other features at the site, are the blue transfer-printed pearlwares present in a number of designs and patterns (Fig. 4a). No cobalt blue transfer-printed wares were recovered from this feature and they seem to be generally rare at the site. Blue and green-edged ware is abundant, along with blue hand-painted pearlwares which are generally common (Fig. 4b). Polychrome hand-painted wares occurred and very generally can be referred to as a "steady minority" ware for the site. This is not to say that it is not very common but it is not a highly dominate type either. Banded ware (Fig. 4e) is present and is seen as a major type in its presence at this and other features. The occurrence of a single polychrome green-banded sponge ware bowl (Fig. 4e3) seems to be a rare case but it is not temporally out of place with the other materials. Banded polychrome sponge ware should have been available during the occupation of New Echota and the implications from the seeming lack of it are not now understood.

Red earthenwares are represented by two classes of vessel (Fig. 4f), a very coarse lead-glazed red ware of suspected regional manufacture and a more finely made lead-glazed earthenware, more "delicate" than most earthenwares, in forms suggestive of table service. Interestingly, salt-glazed or heavy stonewares were conspicuously absent from the site.

In functional form the ceramics from this feature, as with the site as a whole, indicate a trend to general table service, even in the courser earthenwares. This trend is also suggested by the limited materials of aboriginal manufacture.

There are portions of at least three small sand-tempered vessels (Fig. 4g) representing check stamping, roughened surface, and burnished pots.* Represented by only a few small sherds, these vessels seem to be unusually small, and on the basis of suspected vessel size, projected rim circumference, rim treatment, and body form suggests the possibility of deviance from what are supposedly more typical historic Cherokee wares

*Aboriginal sherds were found to be stratigraphically underlain by green-edged pearlware in a small undisturbed portion of a stratified ash deposit at the feature and this supports the opinion that the materials are contemporaneous.
from this site (Figs. 5 and 6) which generally appear to be from larger sized vessels. Size estimates from these sherds (Fig. 4g) suggest that they are probably not much larger than a large soup or small serving bowl. Furthermore, the flat and slightly protruding lip on the small check stamped bowl fragment (Fig. 4gl) does seem to be rather unusual.

We do not have any footrings, pouring spouts, or handles normally suggestive of European imitations, and for the moment can only speculate on the validity of the suggestion for a shift in vessel size and the question of motivational parallels in Colono-Indian wares.* Although it is possible that there actually is no shift in vessel size, it is foreseeable that as more dependence was placed on metal cooking pots and more durable "White made" utility containers, smaller vessels still manufactured in "traditional styles" and designed for purposes other than cooking and heavy utilitarian use would tend to predominate as the aboriginal portion of a ceramic assemblage. With the exception of the lack of the rim folding on other Cherokee wares (Figs. 5 and 6), the vessels seem to be rather typical of Cherokee pottery and we now need more data concerning size and stylistic evolution through time for this potting tradition.

While in themselves important, the questions of shifts in vessel size and Colono-Indian pottery also lead to more fundamental considerations regarding Cherokee pottery of the period. Is the site of New Echota representative of the 19th century Cherokee and what ceramic differences will continued investigations demonstrate for sites associated with individuals less highly acculturated to a white society? Essentially, at this time, we still must ask: "What was the state of the Cherokee ceramic art during this stormy and terminal cultural period in Georgia?"

The questions arising from such admittedly, yet intentionally speculative considerations, have, in part, led to the formulation of a research approach for the study of 19th century Cherokee occupations by investigation of individual homestead sites in North Georgia. Much emphasis has been given to Cherokee archaeology, but to this writer's knowledge, there has been little interest in the Cherokee of the 19th century, and even less to changes within their ceramic art, when considered in regard to most efforts to define a Cherokee ceramic type assemblage.

Coe (1961) and Fairbanks (1961) have both pointed out the pitfalls and problems associated with attempting to pin pottery types to language groups and it is only with these points in mind that one can with any safety approach the subject of "Cherokee ceramics." However, by combining information contained in the pre-removal United State Government Property Eval-

*Noel Hume has suggested that the "common denominator" for the presence of Colono-Indian wares at various sites might be the presence of slaves on the sites (Hume 1962: 172). This would seem valid to treat ourselves to speculation on this subject since we have not only some suspicious sherds, but also the probable provenience of a slave cabin for them. The term "negro house" almost certainly implies a slave or at least servants' quarters.
utions of the Cherokee Nation, the census of the same concern, and map coverage of the Nation during this period, it should be possible to locate and research documented homesteads of specific individuals who are known to have been removed to Oklahoma in the late 1830's. Such investigation via the direct historical approach could probably do much to add to our understanding of stylistic and form preference in ceramic art, as well as to demonstrate the true role of sites such as New Echota in expressing 18th and 19th century Cherokee Culture, or perhaps better said, in reference to Georgia's Terminal Cherokee Period. The sites are plentiful, documentation often good, and in some cases the original cabins are still extant.

The late historic period in Georgia provides a virtual treasure-house for demonstrating a meaningful and logistically feasible means of developing a workshop in historical archaeology on a high level of practical, in addition to theoretical contribution. Even the possibilities of looking "Oklahomaward" begin to become more plausible when one considers that at least a few adult potters must have survived the "Trail of Tears" and may have continued potting.

THE LUM-MOSS PIT

In addition to the Hicks Cabin Site, a very rich trash pit of Cherokee association probably dating to the latter 18th century was excavated during the salvage program. This pit was located just outside of the town limits of New Echota on a portion of the historic area known as the Lum-Moss Site, 9 Go 2. The heaviest occupations of the Lum-Moss Site were in prehistoric times although it was the location of the ferry crossing of the Oostanaula River during the New Echota Period.

Faunal remains were abundant in this feature and analysis has suggested a short term occupation of probably only a few months during a winter period (Gilbert 1970). The remains recovered were predominately deer, with bear and other species being present, but no domestic species such as are found in 19th century features in the area. The absence of any stratification within this 6 foot diameter, basin-shaped pit was the only evidence other than faunal analysis for a short term occupation. Although there was abundant pottery and other artifacts present in the pit, it is at this time felt that the contents were deposited during a winter occupation in the period 1755-1800. The presence of white trade items, including, silver "ball and pendant" earrings, copper tinkling cones, gun parts, and miscellaneous iron and metal fragments place this occupation in the historic period, but the absence of any European derived ceramic types would seem to restrict the time to the pre-New Echota Period or prior to about 1820.

That the occupation is later than 1755 can only be presumed from the general consideration that the Cherokee did not supposedly settle in north-central and northwestern Georgia until after the Battle of Taliwah in 1755, as recorded by Mooney (1900) and cited by Caldwell (1955: 277). It is possible that the occupation is earlier than this, but both the quantity
LUM-MOSS PIT CERAMICS

Figure 5

a. shell tempered vessel reflecting general "Lamar-Overhill" attributes (Lewis and Kneberg 1946:98)

b. sand tempered vessel of general "Lamar-Course Plain" informal type (Halley 1970:14)

c. Lamar Complicated Stamp pottery (Jennings and Fairbanks 1939) *Note that the rim and body sherds illustrated are strongly suggested as being from the same vessel, although it was not possible to obtain an actual cross-mend

d.-e.-f.-g. sand tempered rim sherds suggestive of historic Lamar ceramic type
LUM-MOSS PIT CERAMICS

Figure 6

a. "Lamar Course-Plain" pottery with wrought iron bar used to impress rim

b. photo demonstrating use of wrought iron bar in impressing rim of vessel

c. potter's wooden scraper or shaping tool

d. potter's shell scraper or shaping tool

e. small anthropomorphic clay figure

f. small Lamar tradition pottery vessel

g. rim sherd of a very poorly made pottery vessel which reflects strong Lamar attributes
and nature of the "white" derived items lead this writer to favor a date previous to New Echota, yet relatively late in the historic Cherokee Occupation, 1755-1820. Regardless of these considerations, the feature almost certainly relates to the 18th century.

The most important information presently recognized from the artifact inventory is, as is to be expected from ceramics. The entire ceramic assemblage was made up of wares of aboriginal manufacture, and the point when European derived wares generally became available in this area is not known but could prove valuable in the dating of individual sites and features. It would appear likely that the moving of the capital to New Town from Oostanaula by 1819 would have brought these materials first into the local vicinity and finally to the specific site of New Echota itself when the capital was moved there in 1825.* We have no indication for European ceramic wares at the site much before this period.

The ceramics are all wares that are best termed "Lamar-like" (Jennings and Fairbanks 1939) in such areas as surface treatment and particularly rim form. Attempts have not been made to formally type the wares other than to place them in the general Lamar ceramic tradition. Hopefully our material will eventually fit into formal types and subtypes resulting from the research of individuals in the Southeast who are actively pursuing studies in this direction.

The pottery (Figs. 5 and 6) is nearly all sand-tempered and only one shell-tempered vessel is present. There is heavy rim folding in nearly all cases, and the rim treatment is oriented to fingernail or finger impression and pinching. Punctuation and the use of nails (meaning metal structural nails) and other metal objects in rim decoration is noted. Although there is some variety in the ceramic assemblage, there is a general continuity and all of the materials are consistent with the general definition of historic Indian wares from the area and particularly those

*The community of New Town was serving as a seat of Council as early as 1819 but the size and extent of this community is not known. However, New Town sits so close to New Echota (within one mile) as to lead one to suspect overlap in occupations in any one site. Subsequently, one can only exercise great caution in assigning dates specific to the establishment of New Echota as the Capital in 1825 to any unidentified structures or features in the vicinity. It is foreseeable that occupational evidence paralleling that for the New Echota Period will be found at features earlier than 1825. However, all present evidence suggests that after 1820 the occupations reflect a great dependence on items of White manufacture and design. We cannot say that the residues of previous occupations (1820-) will not appear similar to those of the New Echota Period, but features lacking any European derived ware in a ceramic inventory most certainly date sometime prior to about 1820. (Sources from Cherokee Nation 1852)

Evidence for at least one accomplished potter and the recovery of not only her wares, but also the tools (Fig. 6a–d) used in their manufacture offer an important dimension to our analysis of this occupation. Furthermore, the presence of a poorly made untempered, miniature pot (Fig. 6g), by its clear indications for a lack of technical, as well as artistic accomplishment, point to the probability of a child’s imitation of a more accomplished potter’s product and further demonstrate the strength in the potting tradition of such attributes as rim form and decoration.

POTTERY

Vessel "a" (Fig. 5a) should best be described as manufactured in the general "Lamar-Overhill" ceramic tradition (Lewis and Kneberg 1946: 98–100, Jennings and Fairbanks 1939). The vessel, while bearing the rim folding and decorative rim treatment of such a "Lamar-Overhill" form, also suggests the pottery of the Dallas Component from Hiwassee Island in the shell tempering, vessel form, and plain smoothed surface (Lewis and Kneberg 1946: 100). Sears (1958: 183) has pointed out that variants of Lamar must still be recognized as Lamar on the basis of attributes such as rim form and surface finish. Much variation is known within Lamar and on this basis this writer could probably say that the vessel is indeed Lamar but is somewhat confused about just what this term has come to imply.

Descriptive Ceramic Data

Vessel "a" (Fig. 5)

Temper crushed shell exclusively.

Texture this is rather arbitrary, but generally medium to coarse with some lamination.

Color brick red to dark grey where leached heavily.

Surface finish smoothed and light burnishing possible.

Decoration body undecorated, rim punctated with head of wrought nail.

Rim generally vertical with extreme outward fold and punctation.

Vessel form shouldered jar.
Vessel "b" (Fig. 5)

**Temper** coarse sand, very abundant comprising approximately 50% or more of paste.

**Texture** very coarse with soft sandy patches.

**Color** light orange.

**Surface finish** roughened, method unknown.

**Decoration** intentional roughening of surface and impressed rim.

**Rim** extreme outwardly folded with "line impression" on rim made by iron bar recovered with vessel (Fig. 5b and 6a, b).

**Vessel form** specifically unknown, but suggestion is for globular jar.

**Comment** vessel is very soft and could be said to be an inferior ware, overly tempered and underfired, particularly when compared to vessel "a" (Fig. 5).

Vessel "c" (Fig. 5) is easily placed in the Lamar Complicated Stamp range (Jennings and Fairbanks 1939). Curvilinear motifs with thumb nail impressed rim that seems typical of Cherokee pottery in "Lamar-Overhill" tradition (Lewis and Kneberg 1946: 98).

Vessel "c" (Fig. 5)

**Temper** fine to medium micaceous sand.

**Texture** medium.

**Color** dark brown to black.

**Surface finish** complicated stamped.

**Decoration** curvilinear stamp with fingernail-impressed rim.

**Rim** extreme outward fold with fingernail impression.

**Vessel form** specifically unknown, but suggestive of globular jar.

Sherds "d", "e", "f" (Fig. 5)

The sherds shown are all either pinched or impressed folded rims with sand tempering. The sherds demonstrate some of the variety within the basic
theme of rim treatment and it is possible that they are all the product of one potter.

Sherd "g" (Fig. 5)

Sherd from sand-tempered rim of vessel which had a pronounced outward flare, but no detectable rim fold. It is apparently carefully pinched or fingertip-impressed. Although form of flaring lip is not apparently common, it is not unfitting to the trend in the rest of the Lamar materials.

Vessel "f" (Fig. 6)

Vessel "f" consists of the shoulder, neck, and rim portions of a small sand-tempered jar with a highly folded rim impressed with a fingernail that suggests general Lamar attributes. Rather subjectively, it seems that this vessel is not quite of the same "fabric" as those illustrated in Figure 5. It is certainly not an inferiorly made piece such as vessel "g" (Fig. 6) but nevertheless seems somehow out of pattern although there is no empirical reason for stating so.

Vessel "g" (Fig. 6)

Vessel "g" is notably an inferiorly produced vessel with a sloppily folded fingernail-impressed rim that is manufactured in the general Lamar tradition, but lacks temper, sound annealing of coils, and sufficient firing. A very poor piece of ceramic art which is suggestive of the attempts at potting by a nearly complete novice potter. This is in contrast to what could sometimes be termed a "bad pot" by a good potter.

Figurine "e" (Fig. 6)

Item "e" is a small lump of medium sand-tempered clay (probably potting clay) which has been molded into a rough elbow shape, then fingernail impressed with eyes and mouth. Fingerprints are evident in top and back side of figure. Apparent decay of included organic material has produced fissure-like scar in right side of face although it is possible that the fissure was produced intentionally. Interpreted as a "doodle object," perhaps made by the individual who produced the pottery and particularly the inferior ware (Fig. 6g). The possibility that the object was intended as a pipe blank was considered.

*Potters Tools (Fig. 6a-d)

In figure 6a is illustrated a wrought iron bar which is of a rolled

*Not shown is the nail which was in all probability used to produce the punctations illustrated in Vessel "a" (Fig. 5). Comparative observation has been made on wrought nails from this provenience which were impressed into wet clay and produced near identical punctations.
and flattened configuration such as from the rim of a metal bucket. This bar has been cut from a longer piece of metal stock by either a hatchet or cold chisel and this has left the end sharp and somewhat "wedge shaped" (Fig. 6a and b). The pointed end has been demonstrated in laboratory observation to have produced the rim impression and subsequent trailing scars in the sherd illustrated in Fig. 6a and also in 5b and maybe 5d, as well as some other suspected vessels.

A pine wood scraper is shown in Figure 6c and is interpreted as being a scraping and shaping tool for use in producing the ceramics recovered from the same provenience.

Figure 6d shows a fresh water clam shell altered for use as a potters scraping tool and probably used in the manufacture of many of the vessels shown here.

SUMMARY

The contents of the previously discussed trash pit would seem to reflect the accumulated debris surrounding a short term occupation. Significant within this occupation is a homogeneous group of ceramics which together provide a detailed look at some of the wares produced by Cherokee speaking individuals in the 18th century. More importantly, there is evidence to suggest that the wares may have been produced by a limited number of individuals over a short period of time, perhaps by as few as only one or two people. In this capacity the materials provide an indication of the potential variation by such a limited number of potters over such a short time period. The specific tools used by these potters in the production of the described wares provide an even more detailed insight into their potting. When compared to the Hicks Cabin Site, the data provides a fleeting, yet clear contrast of the ceramics of two different periods in the culture history of the same general group on the same site.
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THE RADIOGRAPHIC ANATOMY OF CIVIL WAR EXPLOSIVES*

James B. Smith, Jr.

In any study of military operations there is a persistent clash between the official reports and the reality of what actually transpired. As in any historical analysis, documents and objects achieve a fuller potential when directly related to one another and also to the place of physical involvement. Here the realization of potentials can best occur when these are combined with a concomitant production of valid references drawn from this type of combined data. This relationship is equally true of the artillery shell as an archeological recovery. Surprising as it may be, these objects can command a monetary value which would simply shock many personalities who are not aware of their ever-increasing value as collectors' items. Equally surprising to some is the fact that many of these objects are in fact highly dangerous and may even be in a process of becoming more dangerous with the passage of time. The explosive agents employed in these missiles gradually pick up oxygen which unites chemically to the material, making it progressively more and more sensitive to environmental stimuli.

Regardless of the point of view entertained, it then becomes more important to know not only the exterior geometry, but also the internal details as well. Here the ability to recognize basic detail can provide significant interpretative and diagnostic information. Furthermore, external topographic features can be misleading unless they are directly related to an exacting awareness of significantly related internal features. Obviously, photography can record considerable external detail. Radiography, on the other hand, can produce extensive information of cross-sectional structure, detail of deterioration and/or corrosion, as well as internal relationships. It will also automatically provide a permanent record for study, a conservation laboratory tool, and an unyielding legal or forensic identification of the specimen per se. Here then emerges a more accurate historical interpretative technique as well as a purely technological diagnostic capability. It is only when the actual objects, tools, or weapons become known that the tangible upon which human activity was circumscribed becomes recognizable. What then might we look for within this specialized area?

Types of basic missile design include: simple shell, the case shot or shrapnel shell, bolts or solid shot, and canister. In addition, one may anticipate other varieties such as the diaphragm and/or incendiary shells, phosphorous shells, and poison gas or asphyxiating shells. There is a virtual plethora of official material with which to work. In fact such an intellectual saturation point can be so quickly reached that the average intelligent personality can quickly throw up his hands in utter frustration. Further complicating the situation is the fact that many varieties were supplied without official sanction, especially for rifled ordnance. In spite of this, the problem is not insurmountable.

* Photography by Ron A. Gibbs, Museum Clearinghouse, NPS, and Artwork by Michael R. Thomas, Artist Consultant.
Similar objects may easily seem identical, but are they? Consider the humble friction primer in both Federal and Confederate varieties. When examined finitely or even side by side, they are definitely not alike! In the same manner consider these ordinary pieces of wood. To the casual observer they seem only slightly heavier than ordinary. There is, however, a significant reason for this. A definite loss of weight due to structural deterioration of the wood has occurred, and this is masked by the increase in weight of the included object. Thus the overall effect is that of a piece of wood which is somehow only slightly heavier than anticipated. In this case we are radiographically observing fractured remnants of a structural beam with implanted Minie balls. One has undergone an explosive fracturing or splintering concurrent with penetration. Technical awareness of this was largely limited to field surgeons of the day who, being unable to repair destroyed tissues, were forced to amputate when the wound involved an arm or leg. This problem was in addition to the actual explosive bullet which no one wished to admit that they were actually using.

In the interest of brevity imposed here, we will remain within the perimeter of basic functional ordnance patterns and these only as primary examples of type. The simple shell was an artillery missile containing a chamber which was only loaded with an explosive bursting charge. Case shot was a refinement which was designed largely for antipersonnel work and dramatically extended the range of canister. It contained bullets or suborder missiles (shrapnel) which would enhance the work of the missile on bursting and possessed the range of the simple shell. The "bolt" or solid shot was literally just that. It was primarily designed for smashing structures or penetrating armor and could be playfully used to disrupt cavalry formations. "Canister" turned the field gun into an overly large shotgun and at very close range was one of the deadliest weapons employed. Canister could be loaded with either lead or cast iron balls and, on occasion, both lead and iron were employed together. The lead balls possessed a greater velocity on firing, due to their weight/inertial ratio characteristic.

In this very brief report we will not attempt to describe fuze mechanisms, inasmuch as they are an area of their own. In passing, let us consider one fuze in particular, for it is very dangerous. This is the Tice. On its round brass external surface will usually appear the legend "TICE". If it should be armed, it will be far too much of a risk to casually handle. In these cross-sectional drawings, we see one of the most easily recognized warning features — the spring. When the spring is fully extended, the fuze is armed, when compressed, it is still on safety. In releasing the spring a metal protective sleeve is thrust upward exposing a glass vial of highly sensitive fulminate. On jarring or even exposure to transmitted vibration, the sand will break the thin glass and detonate the fulminate trigger. Those usually encountered are later production models in which the sand was replaced with lead shot. This type of specimen is very rare due to its very high degree of efficiency in use. Surviving specimens must be treated with all due respect.
The diaphragm shell originally was a spherical design containing a plate cast into the shell body forming a diaphragm which separated the explosive charge from the shrapnel balls, and was an attempt to increase the range of the shrapnel. Radiographically in lateral presentation, it will appear as a thin chamber partially following the interior wall of the shell. Other variations have appeared in both case shot and in incendiary shells. In the latter the purpose is largely to separate explosive charges from incendiary materials which sometimes were in solution.

The anti-personnel mine appeared in the early days of the fray and again in the later part of the war, particularly in the closing days. From time to time it worked with simple and startling efficiency and was used by both sides in siege operations. It could range in shape from modified spherical shells to ten gallon kegs. Its very sensitive bulbous protruding fuze designs mark it as an obvious item of careful interest to the working excavator. When one is working frontal areas of fixed fortifications or static positions related to the later part of the conflict, the appearance of these specimens might logically produce little surprise. Another anomaly is the poison gas shell which was first developed by the French in secret experiments at Brest c. 1851. British citizens and other national groups were horrified at this startling development. Public reaction be what it may, British government researchers were competitively driven in accomplishing innovative experiments at the Royal Arsenal "with projectile asphyxiants combining in a frightful degree incendiary with suffocating effects." To date, no reports of American finds of this type have yet been published. We must realize then that a considerable body of design and technical data existed and was extensively known by ordnance engineers prior to the onset of the conflict and in simple virtu was available for use.

External identification characteristics may be as elementary as physically lifting and making comparisons between specimens of different weight. Obviously the bolt will usually weigh more than a case shot unless the specimen is loaded with lead shrapnel balls rather than iron ones. The simple shell will weigh least of all. While visual examination has very limited information potentials, some variations of both the Hotchkiss and Schenkl case shot can be distinguished from similar simple shells by the far more rounded exterior of the nose.

A method of identifying Confederate spherical shells has already been reported. It is based on the different types of molds employed by Federal and Confederate ordnance systems. The Confederate technique left a mold line running laterally like an equator line across the sphere. Federal mold lines when visible will appear on the vertical axis.

A further point in identification involves a more precise diagnosis of metallic content. Late in the war Confederate non-ferrous metals were "usually" of copper while Federal specimens were "usually" of yellow brass or zinc. This is a favorite generalization which must be carefully employed and related to the object design. The Confederate shell could be ringed with raised rings called "bourrelet," and not infrequently will also demonstrate a lathe tool mark at its base.
The explosive charge within shells of the period was usually black powder. Other compounds such as gun cotton were known, had been used elsewhere, and hence might be encountered. A complicating factor can occur and was considered a problem a century ago. Simply, this involves the penetration into both fuze compositions and explosive charges of oxide protruding from the surrounding metal structures. The phenomena can occur to such a degree that the material will become partially or even completely inert! When lacking a definite technique for finite determination, a prudent technologist can only assume that every specimen is loaded and that every specimen is still loaded until proven inert!

While there are technical distinctions between both "high and low order" explosives, it is sufficient to emphasize here that either can produce a tremendous headache for the careless technician's heirs. In any technological process, where extreme consequences can accrue when one zigs where one should have zagged, it is of vital importance to be well-acquainted in advance with the chemistry, physics, and, in particular, the structural characteristics of the objects to be inerter and preserved. To date, radiography provides the only qualitative method of assuring this.

Clearly involved then is an intensive and precise, highly professional non-destructive type of pre-training for the successful specialist who would attempt this work. It is indeed regrettable that these personalities are few and far between. Furthermore, a special plant facility, either building or sandbag revetment with equipment, is necessary not merely for safety, but in order to effectively perform the work without damage to the specimens. In short, prudence being the better part of valor, the work should be done by a thoroughly qualified expert. It is interesting to note that as in auto mechanics, medicine, physics, chemistry and other specialties including ordnance, that the mere attainment of professional status does not necessarily qualify an individual in a particular specialized area. This is also true of Explosive Ordnance Disposal personalities where a relatively small number are actually experienced in inerter techniques for antique ordnance. In daily workaday activity, the general EOD practitioner must be so completely aware of the fantastic variety and diversity of modern explosive devices that his cogency is generally circumscribed by this driving necessity. Therefore, as in all fields, some selectivity in obtaining a specialist may be desirable. In performing the work, the qualified personality will be prepared to cope with the many potential problems involved. This includes the physiology of human fear as well as euphoric excitement. For example, when doing this demanding work the technologist cannot tolerate the presence of any individual who exhibits even nervous behavior. There is nothing more dangerous or contagious than fear in any form, nor is there anything more difficult to control or direct. Compared to this, even a flaming match can be accepted under certain conditions. As a result, the inerter specialist must be in complete charge of the inerter procedure.
While there are no pragmatic guarantees of safety if your specimen is actually alive, there are some mollifying procedures to minimize accidental explosion. Explosives of this type when wet are temporarily inert. The safe moisture content of the explosive charge may be as low as 30%. However, the basic working rule is to bring the explosive charge as close as possible to the saturation point with water. The problem of transportation from the site to the laboratory remains as a problem. The specimen may be placed in a waterproof container and surrounded by a heavy slurry of non-chemically treated vermiculite, wet wood shavings, wet cloth rags, or even wet paper. This can prevent moisture loss and inhibits accidental rolling and jarring in transport. It can also inhibit external heat transfer or flame exposure to the specimen. While these benefits are desirable, the procedure is not an absolute guarantee that the specimen is hydro-inerted. Here we must recall that the Civil War state of the art in iron casting could and did produce from time to time high density metals with reduced porosity. Furthermore, if rapid inter-crystalline oxidization and/or corrosion occurred within the metal wall, then instead of a porous cast iron, there could exist a near perfect moisture seal inside the shell walls protecting a dry and active explosive bursting charge. Beyond any question of a doubt, one is enjoined to adopt an attitude of tender love and care in minimizing exposure of the specimen to external shock, heat, and static electrical charge.

Although modern technical studies of the alloyed metals employed are sadly lacking, there remains a critical need for such information. In examining specimens, one cannot simply assume that a red metal is just copper or that yellow metals are just brass (e.g. copper used in shells a century ago could be alloyed with phosphorus (2 to 4%); with tin (10%) to produce a bronze; or with aluminum (10%) to produce an "aluminum bronze"). In a like manner, sterro metal (copper 60%, zinc 41.88%, iron 1.94%, tin 1.56%) was a yellow metal which looked like brass and was cheaper to produce. Technical reports might then include statements of analysis which more precisely describe this missing data. Such information would not only constructively contribute to final reports of recovery, but could also be of considerable assistance in the subsequent conservation treatment of the specimen.

Interesting design variations also occurred when Confederate forces captured or recovered Federal material. The most obvious example that has been reported in the literature is that of the Schenkl case shot which was occasionally re-equipped with a Confederate fuze plug and a different sabot for expeditious return to the owner.

Many innovative designs and concepts emerged in this time period. However, today it remains from a purely technical point, an imperfectly known subject. There are in fact a variety of personalities who have accomplished significant personal studies of Civil War Ordnance. Unfortunately, few of them have published precise qualitative modern information to date. Notable exceptions are the works of Kerksis and Dickey, Peterson, Ripley, Hazlett, and Lord. It is of considerable importance that new finds be included in published papers in
order that interested individuals may become aware of significant or unusual variations in design, construction and performance. It is only then that a more finite cognizance of this subject can be made available to all.
Figure 1

FEDERAL NAVY GUN CREW, FRICITION PRIMERS, AND CROSS-SECTION DRAWINGS

a. An excellent rare photo of a Federal navy gun crew engaged in practice drill with a spherical shell. Note that rifled examples of this gun also existed. (Brady photo Nat'l. Archives)

b. A Radiograph of a brass Federal Friction Primer.

c. Cross-sectional drawing of the TICE fuze. The specimen on the right is still relatively safe. The specimen on the left has its sheath pulled upward and is **fully armed**.

d. A Copper Confederate Friction Primer on the left and a Brass Federal Friction Primer on the right. No single feature is actually identical in the opposing specimens.

e. Cross-sectional drawing of a simple shell design. Note the large chamber for the bursting charge. This is a Federal Hotchkiss shell design.

f. Cross-sectional drawing of a classical type of case shot. Note the shrapnel balls in the interior of the shell. This is a very early Federal Hotchkiss design.

g. A cross-sectional drawing of a bolt or solid shot. Note that the missile consists of a solid mass. The voids which might appear here would be those of porosity, gas inclusions, or other casting imperfections. This is an artist's projection of what the specimen "might" look like and was drawn from available, but incomplete, data.
Figure 2
RADIOGRAPHS OF VARIOUS SHELLS

a. Observe the extent of corrosive destruction of the structure as well as the extensive internal corrosion masses. The brass fuze plug on the other hand is in excellent condition and appears much as it did a century ago.

b. Minie Balls embedded in sections of wood. Observe that even the wood grain has been recorded.

c. A radiograph of an actual three inch shell. Note the large chamber for the bursting charge and that the nose is a weighted mass to counterbalance the lead sabot on the posterior end. The design is that of a late model Dyer-U. S. provenance.

d. A radiograph of another basic case shot design. Note the shrapnel balls, the slider head piston of the fuze, and the now visible rotation vanes in the posterior end. This is a James missile design.

e. On radiographic presentation the missile design emerges in clearer light. Note that the base of this particular specimen is actually a hollow cup to provide an air cushion for the base unit and that distinctive imperfections exist within the solid mass.

f. Photograph of a three inch Hotchkiss canister.

g. Radiograph of the three inch Hotchkiss canister. Here can be seen the varied details of construction including surplus or wasted solder along the seam and around the base.

h. Radiograph of another type of canister. The difference in shadow intensity is due to the variation in atomic number of two different metals. We are viewing lead and cast iron shrapnel balls; the lead providing the darker images.
Figure 2
Figure 3

PHOTOGRAPHS AND RADIOGRAPHS OF ARTILLERY SHELLS

a. A photograph of a Hotchkiss bolt without its base cup or lead expansion ring. Note the relatively pointed nose silhouette.

b. Here we have one type of Hotchkiss case shot with its base present, but its lead expansion ring is missing. Note the more fully rounded nose silhouette.

c. A three inch Schenkl case shot. Once again we see the more rounded anterior portion which is a limited identification clue in particular types of ordnance design.

d. A radiograph of companion types of Hotchkiss missiles. Here we see more easily the reason for the difference in the external shape in addition to other information. In this case the shell on the left struck a non-yielding target, and the force of impact drove in the iron nose plug. This in turn crushed the lead slider-head piston of the fuze right down into the inner chamber causing a malfunction.

e. A Federal Hotchkiss shell with its powder chamber completely occluded by penetrating oxide.

f. Confederate spherical shells with Confederate Borman Fuze in badly mauled condition. These fuzes were officially phased out of service by 1862 as unsatisfactory and are very rare. The distinctive equatorial mold line is quite visible on the exterior of the shell.

g. Here we see two Confederate ordnance designs. On the right is a different variety of the Read-Parrott shell design, and it was equipped with a percussion fuze. Clearly visible are two bourrelet rings and a copper sabot at the base. On the left is a Burton shell which was developed for use in the Federal Three Inch Ordnance Rifle. The Confederate Army had a healthy respect for the Ordnance Rifle and was relatively successful in combat requisitions of the weapon. Once this was in the Confederate ordnance inventory, an obvious need for a Confederate ammunition supply arose. The Burton was an attempt to satisfy this need.
Figure 3
a. These radiographs are of a distinctive Confederate design. The larger of the two specimens shown here is actually a rare yellow brass rather than a red copper.

b. Radiographs of two variations of the zinc Parrott time fuze design for field artillery shells. Note the gas inclusions in the specimen on the left.

c. Radiographs of two yellow brass Hotchkiss time fuze plugs.

d. A Confederate time fuze made of copper. Notice the two spanner wrench holes in the exterior border of the outer surface. Once again this is an example of the Confederate Read-Parrott shell design.

e. Photograph of the basal end of a so-called Confederate Read-Parrott shell. This was in reality a design of the Confederate ordnance engineer John B. Read of Tuscaloosa, Alabama; a remarkable individual who had been associated with Richard P. Parrott before the war. Note the lathe mark in the center of the posterior surface.
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Introduction

Artifacts, Inc. is a small, private, non-profit organization which presently holds three permits in South Carolina. These permits allow for varying stages of underwater archaeology including artifact discovery. Of these permits, two are for underwater sites believed to contain Civil War munitions. Without going into specifics this writer will describe diving in South Carolina, the nature of the two Civil War sites, and a newly formed organization, SCUWARC.

South Carolina Diving

Most people who like to dive do not do so within the state. These so-called "fair weather" divers have no interest in history or archaeology and restrict themselves to Florida where there are warm, clear waters. They prefer to spear fish or loot already overworked wrecks which are readily available to even a novice diver with a basic knowledge of SCUBA gear. Any artifacts recovered by these treasure hunters are simply costly souveniers taken home to show friends without any attempt made to preserve the archaeological significance which they may have.

The not so typical diver actually dives in South Carolina. The less than optimum conditions often include cold, pollution, and visibility measured in inches rather than feet. This new breed of diver faces extreme hazards with almost no safety margin and is sincerely interested in history and archaeology. Coupled with this is the recognition for government control and accurate record keeping. Most of the recovered artifacts are used to finance future operations, with selected specimens going to the state archeologist's study collection to aid in future research.

Beside these two extreme types of divers are the majority who fall in between this wide gulf. Some divers are not interested enough initially to bother obtaining a permit and do not want to be limited by state guidelines. Getting a permit itself can take up to a year and cost several hundred dollars. While they work a wreck without legal consent, they do keep records and, upon completion, turn samples and records over to the state. This is risking a year in prison for violation of the state's underwater salvage law, but since the state does benefit, it has not prosecuted the violators.

Another group of divers just skim the surface of a site taking the loose, unburied artifacts which are readily available. No records are kept or samples donated, and only collectors and dealers ever see the recovered
material as they have little interest in history or archaeology. Since they have little respect for the law, feeling that it is powerless to do anything to them, it is a shame that the state has little chance of ever catching them with enough evidence for a conviction as seldom is a site ever visited more than a few times. The only possible way to stop their activities would be to channel their energy into a more productive line. Some of these people could be talked into helping on a legitimate archaeological object and see first hand what they should have done in the past. Once they saw that the state is trying to accomplish something worthwhile, then they might at least keep records of their activities.

A diver who wishes to be law biding and obtain a permit should also be a knowledgeable student of other laws and a good bargainer if he hopes to retain a fair share of what he recovers. Before going farther, let it be known that in every instance in the past, the state has been more than fair once it came time to divide the artifacts, and has sincerely tried to help the diver recover his investment. The problems arise in getting a contract and then protecting the site.

A salvage contract once was issued to an individual for work on what later turned out to be private property. The state, in its eagerness to help, had not thoroughly checked out the limits of its own jurisdiction. The artifacts, which never were found, were believed to be worth a considerable amount of money and had the artifacts been recovered, the property owner would conceivably lay claim to recover them.

Even if a site is definitely within state waters, the diving archaeologist or would-be salvor should determine who owned the wreck in the first place. Failing to do so could mean forfeiting everything that is found to the actual owner. A few examples would be: the U. S. Army transport Boston wrecked near Beaufort, the U. S. Navy gunboat Dai Ching sunk in the Cambakee River, and the Confederate ironclade Palmetto State scuttled in Charleston Harbor. All three ships were sunk during the Civil War and are in state waters but the Boston still belongs to the U. S. Army, the Dai Ching to the U. S. Navy, and the Palmetto State to the General Services Administration of the Federal Government. This means therefore that correct identification of the wreck is extremely important and preliminary research must be done by the diver to determine the name and original owner of the vessel. Then the diver has to check back and see if salvage rights have been granted or transferred to any other party. There are dozens of legal problem which can arise so it is best to be prepared for them.

Once the correct name of a vessel is verified and a salvage contract secured, the odds of making enough money to cover the research, let alone actual diving, weigh heavily against the diver. In this state there is very poor visibility and, consequently, very few trained personnel to help in an operation. This limited visibility and small number of divers, however, makes South Carolina an ideal location for underwater archaeology. Since there is almost no regular diving here, most sites are still untouched.
Since most diving is done in spare time or weekends, there are many problems which can arise. A correct combination of wind, tide, and weather is needed for good visibility. Rain up to a week previous can ruin an otherwise suitable weekend. Once all the conditions are favorable, a partner should be present who is somewhat interested in underwater exploration. He should also be one whom the diver can trust with his life, not to mention his secret diving location.

Since few people invade the vertible underwater sandstorm, there is an extremely large number of virgin wrecks awaiting discovery and salvage. Most are still laden with cargo years after they were sunk in storms, lost through carelessness, scuttled to avoid enemy capture, or sunk by pirates. Poor navigation and out of date charts added to the list of lost ships. The location of many wrecks is known through surprisingly accurate records and first hand knowledge by the commercial fishermen who know that wrecks teem with fish.

After the salvage rights are secure, the name and possible cargo having been verified, the diver must familiarize himself with the site. The diving archeologist should completely explore the wreck, plotting all major objects and concentrations of small debris, noting carefully which areas are sandy and which areas are muddy or covered with silt. All lines and shrimp nets that may be caught on the wreckage should be cut and large pieces of loose iron that may dislodge and trap a diver on the bottom removed. All of this should be done prior to any attempt at excavating artifacts and only when there is good visibility. Wrecks are extremely dangerous and should be treated that way. Once a diver has become familiar with a wreck and removed the obvious hazards, it then becomes possible for him to dive on the wreck in limited visibility with a reasonable amount of safety. It should be clearly understood that this may mean several months of delay while waiting for enough visibility to do the initial plotting and clearing, as days suitable for that type of work are extremely rare.

When the wreck has become familiar territory to the diving archaeologist, all hazards having been reduced to a minimum, there will be relatively few days that are unsuitable for working. Visibility is almost always a few inches or more, allowing the diver to work on at least one spot once he has started. Even when the visibility is zero, the diver should be able to work if he is confident of his knowledge of the wreck layout. Although some photography can be done on the few days when there is visibility on the wreck, it is almost impossible at all other times.

South Carolina's shallow coastal waters have caused many ships to be lost a considerable distance from shore and well out of the turbulent surf. As a result these wrecks are in far better condition than those found in areas where the ships were lost in the surf. Many of South Carolina's wrecks are largely buried in the sand and mud with only the remains of the superstructure sticking out of the sand. In these wrecks the cargo is often still packed in crates that have never been exposed to the ravages of the sea. Most of the wrecks are in water so shallow that little regard
has to be given to decompression, as a diver will never be down long enough to worry about getting the bends.

While an archaeologist on land is beset with a number of problems equally as difficult as those facing the diving archaeologist, the terrestrial archaeologist has the experience of dozens of others before him which he can rely on for solving difficult problems. The diving archaeologist must solve his own problems through the limited experience that he himself has. The results that he does achieve however are likely to be far more spectacular than those of his land-bound colleague. This is due to the fact that the land archaeologist is often uncovering artifacts that were normally used over a long period of time until they were damaged and thrown away or lost. The diving archaeologist is uncovering a tightly dated group of artifacts that were probably intact until the ship was wrecked. And he is working with a far larger number of artifacts than the land archaeologist is likely to find. The land archaeologist is limited mainly to trash pits and old privys for artifacts while the diving archaeologist is often working with undamaged tons of assorted cargoes that are reasonably intact. It is all of these features combined that make underwater archaeology in South Carolina a real opportunity for those who are interested in getting started in a new field in a perfect location.

Current Sites

Artifacts, Inc., it was mentioned earlier, has permits to work two Civil War sites. One is in a river in Columbia. Divers are searching for up to 43 cannons, 14 thousand rifles, 2 thousand swords and sabres, thousands of cannon balls, tons of accouterments, and over 1 million musket balls. The cannons are of assorted kinds, and include one repeating battery. The rifles include horse carbines, Yaegar carbines, Enfields, Whitney rifles, and Palmetto muskets. These supplies were captured by General Sherman’s army when Columbia was taken and were thrown into the river to destroy them. Also thrown into the river were printing presses for the Confederate money and steam engines from the factories. Sherman destroyed this material rather than taking it with him because his army was on a successful campaign which captured far more than it was capable of carrying with it. In its march through the Carolinas, over 700 Confederate cannons were captured and destroyed, most of them simply dumped into the nearest river.

Artifacts, Inc.’s second site is that of an iron wreck that we believe to be the Constance sunk off of the Isle of Palms in October of 1864. The wreck that we have located however is approximately 400 yards from where we expected to find the Constance and may be an entirely different wreck. The Constance was supposed to be carrying a valuable cargo on government account. She was in-bound and apparently struck an existing wreck, causing her to flood and sink in 14 feet of water. The wreck was not salvaged during the war and by the end of the war was too badly sanded to salvage. It was a sidewheeler of the Clyde River type but there are no known pictures or plans of it. Government cargo could be anything from fly
buttons for soldiers uniforms to barrels of salted pork but since the cargo was repeatedly referred to on government accounts as a valuable cargo, it was probably lead, tin, or munitions. A single ship of this period could carry as many as 40,000 rifles. Hopefully the cargo will be assorted, as it would be nice to recover a large collection of nautical or surgical instruments. Lead and tin would certainly make the salvage worthwhile from a monetary point of view but the archaeologists are hoping to find more than just scrap metal.

**SCUWARC**

SCUWARC, the organization I mentioned earlier, is a group being formed to promote cooperation between divers, diving archaeologists, archaeologists, and historians. Standing for "South Carolina Underwater Archaeological Research Council," it is chairmained by Mr. Roland Young of Columbia, Mr. Drew Ruddy of Charleston, and the author. Membership is open to anyone who has something constructive to offer in the way of research, equipment, or special skills. A person need not be a diver to participate. SCUWARC intends to organize the raising of at least one Civil War gunship, excavate underwater refuse sites of the Colonial period, stockpile research on shipwrecks from all over the world, and build files that will be available to all persons doing serious research. No work will be conducted by the organization without the supervision of a diving archaeologist. It is hoped that the organization will be able to enlist the aid of former members of CHAOS, Cannon Hunters Association of Seattle, and similar organizations. Although the Council will be centered in South Carolina initially, plans are being made to extend it to all states conducting underwater archaeology. If the organization gets the support that it is hoping for, it will support a reorganization of the old International Conference of Underwater Archaeology.

If other people are willing to donate copies of their research, the author will donate copies of his notes on over 20,000 shipwrecks and Artifacts, Inc. has pledged the free use of its Decco underwater metal detector, an extremely fine piece of equipment. If there is anyone who would be interested in this organization, please call at 883-3356 (Area Code 803). The mailing address is P. O. Box 211, Sullivan's Island, South Carolina 29482.
Part 2

HISTORICAL ARCHAEOLOGY FORUM

Centered around a paper on Alkaline Glazed Stoneware

by

Georgeanna H. Greer
INTRODUCTION

HISTORICAL ARCHAEOLOGY FORUM

This fourth HISTORICAL ARCHAEOLOGY FORUM is devoted to the subject of alkaline glazed stoneware, found primarily in the South. This type of stoneware is of particular interest to anyone who has ever recovered it on sites of the nineteenth century, where it is most often found. This forum centers around the paper of Dr. Georgeanna Greer, a pediatrician from San Antonio, Texas who has devoted many years to an intensive study of this type of stoneware. Little has been written about this type of regional ware, so Dr. Greer's paper and the comments that follow by those who participated in the forum constitute a major statement on this type stoneware. It is hoped that enough interest can be stimulated by this forum topic that comments and observations can be passed on to Dr. Greer to incorporate into a book she is writing on the subject. Her address is 213 Blackhawk, San Antonio, Texas 78232.

Through the years, as more research is carried out through excavation and documentation of kiln sites and individual potters who were making alkaline glazed stoneware, we can expect that various types of alkaline glazed ware can be associated with specific potters at particular sites. When this is done for a series of potters throughout the nineteenth century in the various areas of the South, the local wares of this type can well come to be used to specifically pinpoint temporal brackets for a site in a manner not yet possible through the use of mass produced English and American ceramics alone. Archaeologists working with nineteenth century sites would do well to research their local alkaline glaze potters with this goal in mind. Dr. Greer's paper and this forum are a step in that direction.

Since alkaline glazed stoneware has not been the subject of much research in the past it is understandable that several of the comments on the subject for this forum were necessarily short. Because of this the chairman has edited these short comments into a single paper entitled "Comment on Alkaline Glazed Stoneware from Various States".

Thanks are due to those participants who have contributed toward the success of this fourth HISTORICAL ARCHAEOLOGY FORUM.

Stanley South, Chairman
HISTORICAL ARCHAEOLOGY FORUM
The Conference on Historic Site Archaeology
American stoneware glazes fall roughly into three categories: pure salt vapor glazing, slip clay glazing, and alkaline glazing. It is this last method with which we shall be concerned presently. A glaze is nothing more than a glass-like mixture applied to pottery to make it more attractive and more serviceable. It is usually applied before the firing process and matured by heat into a solid form. There are high and low temperature glazes, and stoneware falls into the high temperature group of ceramic ware; therefore the glazes with which we shall be concerned will be high temperature glazes. The firing range of most stoneware and porcelain is between 1200°C and 1300°C. At this temperature the clay of the pot undergoes a change in which the components fuse together into a more or less solid mass which is termed vitrification. The components of the glaze melt at this same temperature and form a sheet over the body. These are theoretical points and not all of the early stoneware fired in more or less primitive kilns possess these qualities. The clay of the body was often refractory and did not completely vitrify at the temperature of the kiln, therefore remaining somewhat open and porous. Other ware was overheated to the point of sagging or melting. One purpose of the glaze is to cover porous bodies and prevent leaking, and this is true of stoneware as well as earthenware.

Glazes consist, like glass, of silica and some form of flux or melter. This is often an alkaline compound such as sodium or potassium, and may be a combination of several alkaline compounds. Borax, common salt, plant ash, and felspars are natural sources of some of these alkaline elements. The plant ash and felspars also contain amounts of silica which may be increased by clay or sand in the glaze. Calcium is another common alkaline flux added to a glaze and is usually obtained from lime or whiting. Lead, perhaps the most universally helpful flux, is an acid compound. It vaporizes at about 1200°C, and will blister and blacken the glaze in reduction; therefore it is not frequently used in high temperature glazes. Slips are nothing more than clay mixed with water to the consistancy of a thick cream. They have been used for decoration and painting on pots almost since the beginning of the manufacture of pottery. When high temperature firing came into use, it was found that certain natural clays could be used to coat stoneware and porcelain, and that they would melt in the firing process, producing what is called a slip glaze. The slip clay mined near Albany, New York, has probably been the most widely used American slip glaze for stoneware.

The European methods of pottery manufacture were brought to the colonies by English and German immigrant potters. Crude earthenware was being made in the colonies before the eighteenth century. It was the pottery of common household use and was almost always covered with a lead glaze. Slips were often employed for decoration.
Salt vapor glazing was a western development in high temperature ware. The Germans along the Rhine Valley developed this form of glazing about 1300-1400. It is thought to have been introduced into England by John Dwight about 1671 and was being produced there in very large amounts within the next century. It was manufactured in the colonies as early as the second quarter of the eighteenth century (Hume 1970:100). There was great development of this type of glazing for utilitarian pottery in the United States and the major portion of American stoneware produced before 1900 was covered with a salt glaze. It was popular in the South as well as the North and was being used by the Cribbs family in Tuscaloosa, Alabama, as early as 1830 (Ramsey 1939:87). In salt technique glazing when the kiln has reached a sufficiently high heat, common salt is thrown into the fire box and vaporized. The free sodium then combines with the silica in the clay of the pot and forms sodium silicate or soda glass as a glaze over the surface of the pot. Salt vapor glazing was often combined with interior slip glazing after the first quarter of the nineteenth century. This provided a smooth and easily cleaned lining and overcame the problem of leaking when the clay body did not vitrify properly.

The background of the alkaline glaze is more difficult to determine. Historically, alkaline glazes were very low temperature glazes developed by the Egyptians, the earliest form of glazing (Rhodes 1957:57). This information was carried through the Near East with contributions by the Persians, and low temperature alkaline glazes were being used by the Chinese before the time of Christ. The Protoporcelains of the Han Dynasty are almost identical to the alkaline glazed stoneware of the southern United States in composition of body and glaze, the latter consisting mainly of wood ash and clay (Rhodes 1957:56-59, 188). Boettger developed a method of producing porcelain in Germany about 1708 (Cox 1944:644), but the letters of the Jesuit Father, Pere D'Entrecolles, describing the methods and materials used by the Chinese for the manufacture of porcelain and stoneware were written in 1712 and 1722 and published soon after. The French and the English were developing formulas for soft paste porcelain at the time. William Cookworthy, a Quaker druggist at Plymouth, England, began experimenting with clays and glazes. He stated in a letter written in 1745 that he had read the Jesuit accounts of the materials and methods used by the Chinese in the manufacture of porcelain. He even tried a white earth from the Cherokee Nation in America called "Unakey" -- this was Carolina clay. Cookworthy developed the first true hard paste porcelain manufactured in England using clay and stone from Cornwall. The body was made of equal parts by weight of clay and ground Cornwall stone. The glaze was produced by melting together one part of quicklime with two parts of fern ash into a glass or frit. This was ground and used in the proportions of one part to fifteen parts of ground Cornwall stone to make a glaze (Burton 1921:94-95). This surely introduced the use of plant ash as a flux for high temperature ware to the English. About 1770 Cookworthy took Richard Champion of Bristol as a partner and built a new plant at Bristol to produce his porcelain. In 1772 he retired and Champion continued the manufacture of porcelain until he sold the patent rights to a group of Staffordshire potters in 1781. In 1784 he moved to Camden, South Carolina. We do not know whether or not he attempted the manufacture of porcelain or stoneware with a hard alkaline glaze there, but he was familiar with Carolina clays and has used them in England. He died in South Carolina in 1791 (Burton 1921:98-99).
There are other potters who entered the states of North Carolina, South Carolina, and Georgia at early periods and may have been responsible for or contributed to the development of the alkaline glaze. Andre Duche, the son of an English potter who had come to Philadelphia, moved to Savannah, Georgia, and began working before 1732. He is supposed to have made traditional earthenware, but is also known to have been the first to experiment with the white burning clays of the South, and is recorded as having made "China Ware" in 1738. This was probably a low temperature ware resembling English ceramics of the period, but no known examples of his work exist (Ramsey 1939:83). Peter Craven came to Moore County, North Carolina, about 1750 with a group of immigrants from Staffordshire. He is supposed to have made earthenware, but his sons and grandsons were making salt glazed stoneware before the Civil War (Mrs. Dorothy Auman, Seagrove, North Carolina, personal correspondence). About 1770 a "Mr. Bartlam," a master potter from Staffordshire, came to Charleston, South Carolina, and set up a shop on Church Street. He advertised "Queensware," but no known examples of his ware exist and the pottery was short-lived (Ramsey 1939:84). In 1773 William Ellis, a potter known to have come with Bartlam, appeared at Salem, North Carolina, having lived two years in Camden, South Carolina, and taught the Moravian potters, Brothers Aust and Christ, how to make pottery in the English manner. They, however, did not produce ware of this type in quantity until some ten years later* (Stanley South personal correspondence). About 1810 Abner and John Landrum began to produce pottery at Pottersville in Edgefield District, South Carolina. We are sure that they were producing alkaline glazed ware in this area by 1840 (C. McClendon, Columbia, South Carolina, personal correspondence). James B. Long was making alkaline glazed stoneware at Byron, Georgia, in 1840. He was the son of an English potter who had come to South Carolina and then moved to Georgia in 1820 (Ramsey 1939:87). All of the presently known early potters using the alkaline glaze in the Carolinas and Georgia were of English descent, though so far there is no evidence that their type of glazing was used in England for stoneware.

This is the background which we have at hand on the development of the alkaline glaze. I feel sure that it originated about 1800, for there are several potters who came to Texas in the 1840's and 1850's and were using the same type of alkaline glaze there at that time as was being used in the Carolinas, Georgia, and Alabama. These men were all born about 1800 in the Carolinas and Georgia and had come through Alabama to Texas. Early potters were faced with the problem of manufacturing ware in areas where the importation of glaze materials was difficult and expensive. The alkaline glaze was generally called the "sand and ash" glaze by the potters using it. All of

*[Editor's Note] Polychrome-glazed creamware of the "Tortise-shell" type and creamware with Leeds type beading and sprigged double intertwined handles, made with non-English white clay, has been found in a 1780's context in excavations at Camden, South Carolina, and is thought to be examples of ware made either at the Bartlam factory, or by William Ellis while he was living there. These fragments are being studied at the Institute of Archaeology and Anthropology at the University of South Carolina.
Presently Known Sites of Alkaline Glaze Manufacture

I. A rough location of kiln sites where the alkaline glaze was used between 1820 and 1970
the materials were usually near at hand and very cheap. The development of easily built kilns which would fire to stoneware temperatures and the demand for this more durable ware helped it become more widespread. The Civil War undoubtedly had a great influence on the development of this method of glazing, for neither Albany slip clay nor Northern ware were available. The need for locally made pottery was so great that potters were exempt from military service. There is a report of the large factory at Bath, South Carolina, with dozens of Negro men and boys busy making cups, saucers, pitchers, bowls, and even insulators necessary for the Army of the Confederacy (Barber 1901:465-66).

The identification of alkaline-glazed stoneware calls for some knowledge of the variations of the glaze and what produces them. The variations are vastly greater than those found in salt-vapor glazing and slip glazing. The basic body clay is first in importance. Most stoneware clays are suitable, but varying amounts of iron impurity in the clay may make the body fire white, buff, salmon, or deep red-brown. This iron content influences the color of the glaze -- the more iron present in the body, the darker the glaze will be. The components of the glaze are next in importance. Here too, the amount of iron in the clay used in the glaze produced color variations. Some potters used sandy or lean clay from the same pit as the body clay in the glaze, while others used sands and clays of both lighter and darker colors. The most striking example is the use of a reddish clay in the glaze over a light body. It is more than likely that pure silica sand was not used in the glaze as the name might indicate, for this would necessitate a very high heat to produce melting. Many other natural compounds such as volcanic ash, granite sand, and felspar sands have the appearance of true sand, but would produce a much more suitable glaze. These granular components were often ground in a mill to produce finer glazes. Common wood ashes were used in combination with the clay or sand. Most of the time these were washed once to rid them of an excess of soluble sodium. Both hard and soft wood ash and grass, fern, or weed ash could have been used. The combination was often a half and half mixture, sometimes more sand or clay than ash was used. Formulas varied with the raw materials, and at times lime or salt were incorporated to help the melting. Ground glass was employed for this same purpose in the later periods. Lead may have been added, but is generally not used because of the high temperature of firing and the reducing atmosphere often present in the kiln. Some preliminary testing by Mr. Harding Black of San Antonio shows that 50% clay, 25% hardwood ash, and 25% salt produces a very similar glaze. Artist potters have been using ash glazes to a considerable extent in the past 25 years with results very like those of the early potters (Rhodes 1959:160-62). There is a variation in the character of the glaze from area to area because of the different raw materials, the manner in which the kilns fired, and the method of applying the glaze. At times the pots were dipped in a very thin solution of the glaze, while at other times the glaze mix was made into a thick paste and the pot almost rolled in it.

The firing of the ware took place in most instances in a simple ground-hog kiln. This is a sort of dug-out kiln which is usually quite low and from 5 or 6 feet in length to not over 20. It is a variation of the English
Groundhog Kiln

2. A diagramatic representation of the usual plan of early Southern kilns used in the firing of alkaline glazed ware
Newcastle kiln (Rhodes 1968:45-47). The pieces were stacked in the kiln much as in a salt kiln — mouth to mouth and bottom to bottom. This ware had been dipped in glaze when leather hard and then allowed to dry thoroughly. No shelves or saggers were used. A wall was built up in front of the pots after the stacking. This was to protect them from the intense heat of the fire which was built up at the mouth of the kiln. The flames and smoke were allowed, however, to pass around the sides of this wall and through the ware. The chimney is very short, although usually of a down-draft type with the opening at the floor of the kiln (Rhodes 1968:47). This produced a poor draft most of the time and the ware was subjected to a natural reduction, which produces the often seen Celadon colors. The heating was irregular, and underfiring and overfiring were common defects. There is also evidence of fire flashing and blistering off of glaze. The kilns generally had earth and rocks piled up over the brick work for insulation. Two or three days of constant firing produced the desired temperatures of between 1200° and 1300°C. The mouth was then sealed, the chimney covered, and the kiln allowed to cool for three or more days before opening.

Almost all of the ware made in the southern potteries using the alkaline glaze were utilitarian in nature. Most were turned on the potters wheel. Jugs, churns, bowls, and storage and preserve jars were the commonest products. Pitchers, cups, saucers, colanders, water coolers, fat lamps, ant traps, and pipes were also made. The so-called Voo-doo jugs are some of the few whimsies made. There were some potters who decorated the pieces somewhat, but the greatest number were simply covered with glaze. The forms of the pots show development from the early globular and ovoid forms to the more or less modern straight sided forms and shouldered jugs, but this change seems to have developed much more rapidly in some areas than in others. Potters in remote areas used older forms to a much later period.

The color and the texture of the glaze are the most positive points of identification. There are points at which it is difficult to differentiate them from salt glazes on one hand, and slip glazes on the other hand. Most commonly the glaze shows a runny or streaky configuration. One can tell that the same glaze was used inside and out, and extra runs have often dribbled over the surface. There may be irregular patches of body exposed without glaze which cannot be accounted for in the stacking. The surface may show a very smooth and shiny texture, or be rough and show a sort of agglutination or clumping that is much heavier and less regular than that of a salt glaze. This is very typical of ash glazes when they are applied heavily (Rhodes 1957:189). Often small grains of undissolved material which looks like sand may be seen within the glaze. A hand lens helps differentiate the above characteristics from those of salt vapor glazing. The colors of the glaze are essentially all due to the iron impurities present in the clay body and the glaze. The oxidized glazes show colors from a sort of dirty cream through yellows and browns to occasional black. They are often opaque, though tend to clear and darken with higher temperature. The reduced glazes show the color range generally spoken of as Celadon colors — pale greens, blue greens, and grays to deep olive greens and greenish black (Rhodes 1957:173-76). There is often a clear glass-like quality to the glaze.
True iron reds may result in glazes containing large amounts of iron. The red color is generally in splotches or streaks associated with brown. It may be from blood red to rusty red. Iron blues will occasionally develop in high concentrations of iron with the presence of calcium in the glaze. They are most often seen in small areas around handles and rims and pools inside of pots -- this is a sort of sky blue with milky overtones. We have an immensely wide color range here, and some pots will show oxidation colors in some areas and reduction colors in others. The muddy light olive to brown which is fairly often seen is the result of an uneven atmosphere of partial reduction and oxidation.

Decoration has been done on these pots in some instances. The most common decoration is rows of incised lines. At times this becomes more elaborate and there is wavy combing between the lines in a sort of sgraffito pattern. This decoration is most effective when the tooling is deep enough to allow the glaze to pool and show deeper color. The most extensive decoration which I have seen on alkaline glazed pots was done in the Edgefield District of South Carolina. Here kaolin or pipe clay was used in slip trailed patterns under the glaze. Iron oxide was also mixed with clay and used for an underglaze decoration in this area, though to a lesser extent than the white slip. Nearby, and perhaps somewhat later, cobalt was used in bands and occasional brush strokes under the glaze. We do have one instance of cobalt slip trailing in Rusk County, Texas, but this seems only to extend to calligraphic numbers. Occasional pieces are stamped with the name of the maker impressed into the clay and the pieces made by Dave at the Louis Miles pottery in Edgefield are often hand inscribed and dated.

The difficulties encountered in separating this glaze from salt vapor glazes and slip glazes must be discussed. The very typical piece will involve no difficulty, but the thinly glazed piece and the immature piece often present a problem. It has been reported that salt vapor glazing was sometimes done over the alkaline glaze, and I have no clear distinguishing features here. The characteristics seem to be more nearly those of alkaline glazes than of salt glazes. The bricks of many of the kilns are covered with a salt deposit, but I am not sure that this was done by salt ing the kiln or whether it might have resulted from the sodium in the glaze vaporizing and depositing on the bricks. Many poorly fired pieces were sold, since there was such a high incidence of defects. The extremely thin alkaline glaze may appear almost the same in color as a salt glaze. Patches of surface without glaze, obviously a defect of dipping, pouring, or handling, are evidence that the pot was glazed before firing. The presence of a glaze within the pot which is not a typical slip glaze, though it may vary in color from the outer surface, suggests that the alkaline glaze was applied. Vapor glazed pots which have no lining often show only a tanning or toasting of the inner surface (Rhodes 1959:162). The very inner bottom of pots with a poured glaze usually shows a thickening of the glaze, except in the case of jugs -- which were often not well lined. The outer surface of the bottom may be helpful in that one can often see that a glaze has been wiped off, in contrast to the scars and vapor toasting seen in salt glazing.
The underfired pot is perhaps the most difficult to differentiate. An underfired salt glaze may appear as a dry grayish crust and the same points must be used to differentiate vapor glazing from dipping or pouring. The presence of drops of glaze from the surface of the kiln onto the pot are not sufficient to assure pure salt glazing, since this deposit is in many alkaline glaze kilns. The underfired alkaline glaze prepared with a dark clay is most difficult to separate from true slip glazes -- in fact it cannot be separated at times since the methods of application were the same. The presence of a small matured area which shows true alkaline glaze characteristics will help. Here again we must be very careful, for heavy salt vapor or ash falling onto an area of slip glaze will produce a result indistinguishable from alkaline glazing. Pieces of slip-glazed ware totally salted over present a picture very much like that of an alkaline glaze, but the texture of a salt glaze can sometimes be proven by the use of a hand lens. The presence of a normally colored salt glaze on the bottom or rim of the pot, and a normal appearing slip lining are also helpful in proving that it is a salted over slip glaze. The last point of differentiation is one that may seldom arise. This is the differentiation of an oxidized light alkaline glaze from a Bristol type glaze. The Bristol type stoneware glaze with zinc as an opacifier came into popular use in the United States in the 1890's and 1900. If it is fired in an old salt kiln or an unmuffled kiln with wood or coal, it may show greenish and grayish tones with some clarification. There is usually a dirty white smear across the bottom where the glaze was wiped away. In general it is whiter and more opaque than alkaline glazes, and the pots are always very late in form. It will show a fairly white color over a tan or buff body, while the alkaline glaze becomes deeper in color over these bodies.

The conclusions which we may draw from this discussion are that the alkaline glaze was brought to or developed in the Carolinas by potters of English origin about the beginning of the nineteenth century. This glaze may be expected to be encountered in any nineteenth century context in the states of South Carolina, North Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, and Arkansas. Typical pieces are not difficult to differentiate. The ware is for the most part of local manufacture, most whole pots being found within a radius of about one hundred miles of the pottery of origin. The glaze was abandoned in some areas by 1900, but remained in use in Alabama and Georgia through World War I, and has been used until the present time in Cleveland, Georgia, by the Meaders family. The closing of this pottery, probably in the near future, will mark the end of the use of the alkaline glaze for utilitarian stoneware in the United States.
Fig. 3. Three alkaline-glazed one gallon jugs.

left- a light grassy green glaze from South Carolina showing an ovoid form
center- a deep caramel to black glaze from Georgia showing a taper to the bottom
right- a pale thin, yellowish green glaze from Texas with a very sloping shoulder, but no taper at the bottom
All of these jugs were probably made between 1840 and 1860.

Fig. 4. Four alkaline-glazed preserve jars of about two quart capacity. All were made in Rusk County, Texas, between 1846 and 1880 by John Leopard. There is change in form from ovoid to almost straight, the ovoid probably being the oldest. The body clay in all instances is a very light buff. The ovoid jar has a very dark glaze with evidence of iron reds, and a darker clay was surely used in this glaze. The others vary from light olive green to a creamy tan, this variation was probably caused by the atmosphere of the kiln rather than the composition of the glaze.

Fig. 5. Three alkaline-glazed pitchers of about two quart capacity.

left- a heavily glazed pitcher with streaks produced from the running of the glaze. This is a very deep olive green to black glaze over a dark red body and was made in Georgia.
center- a creamy tan opaque glaze which shows the effects of true oxidizing firing- from Rusk County, Texas.
right- a clear smooth olive green glaze which was made in Texas.

The dating of pitchers is very difficult since their form changed very little in over a hundred years.
Fig. 9 & 10. Two views of an alkaline-glazed jug made in Guadalupe County, Texas, about 1860. This jug was placed on its side on top of a jar and shows streaking and running typical of alkaline glazes. One side was in a reducing atmosphere and shows a clear light olive green glaze, while the other side was in an oxidizing or free burning of flame and shows an opaque creamy tan glaze. The large drops visible on the surface are light blue-green and fell from the salt glaze crust on the dome of the kiln during the firing.

Fig. 11. A four gallon preserve jar from Rusk County, Texas, which shows marked clumping of the alkaline glaze with olive green in the clumps and a light brown background. It dates about 1870-1880.

Fig. 12. A six gallon preserve jar from Rusk County, Texas, which shows a very dark brown alkaline glaze with a metallic sheen. The bubbles are produced by gases liberated within the clay body during the firing process and is termed "bloating" by potters. This was made about 1850.
Fig. 13. A large five to six gallon jar made in Edgefield District, South Carolina, and marked LM, signed "Dave" and dated January 29, 1859. It is a deep olive green alkaline glaze.

Fig. 14. A five gallon churn made in Georgia, probably about 1880. It has a very dark green to black alkaline glaze.

Fig. 15. A five gallon churn made in Rusk County, Texas, about 1880. It is marked "J R" and has a medium olive green alkaline glaze showing typical runs and separation.

Fig. 16. A five gallon churn made in Alabama, probably after 1900. It has a light olive green alkaline glaze.
Fig. 17. Two quart alkaline-glazed pitcher made in Texas which shows a very light yellowish alkaline glaze. The top was dipped into an iron bearing slip before the glaze was applied and the sgraffito decoration appears in the light area of the glaze. This may date about 1890.

Fig. 18. Sherds from Edgefield District, South Carolina, showing Kaolin slip decoration under a very smooth, transparent, gray-green alkaline glaze. A slip bearing iron oxide was also used in this pottery, but to a much lesser extent than the kaolin. This was about 1840-1860.

Fig. 19. Sherds from Rusk County, Texas, showing decoration with cobalt ore in a white clay slip, resulting in a very light blue, under a light olive-green alkaline glaze, 1880-1885.
Fig. 20. One quart jug with a yellowish brown alkaline glaze made about 1890 in Aiken County, South Carolina. This shows modernization of form to the tooled shoulder type of jug.

Fig. 21. Three gallon alkaline-glazed churn made at the Meaders Pottery, White County, Georgia, probably between 1920 and 1950. It shows some straightening of the sides, but still has the rounded shoulders and handles of the older type.

Fig. 22. An alkaline-glazed pitcher and vase made at the Meaders Pottery, White County, Georgia, in 1970. The vase is a light olive-green while the pitcher was thickly glazed and heavily reduced and is a deep olive-green.
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A COMMENT ON ALKALINE GLAZED STONEWARE

Stanley South

Nineteenth century historic sites in the South often have fragments of alkaline glazed stoneware present along with the better known European and American ceramics. With the appearance of Dr. Greer's article, those of us working on historic sites now have a much clearer picture of this southern made stoneware, which is characterized by its hardness and glossy glaze. Since, as Dr. Greer has pointed out, South Carolina is a possible area of introduction of this type stoneware into America, those of us working on historic sites in this state are faced with a fascinating research challenge in the years to come in working out a greater understanding of this ware in time and space. This comment is designed to present an outline of some of the areas of exploration that must be pursued by those of us involved with nineteenth century ceramics (South 1970b: 3). These areas are: (1) an examination of the clues to the origin of the alkaline glazed stoneware in America, and (2) a general summary of some of the sites and potters in South Carolina that offer opportunities for detailed research in the years to come.

I. AN EXAMINATION OF THE POSSIBLE ORIGIN OF ALKALINE GLAZED STONEWARE IN AMERICA

Dr. Greer has mentioned the "Queensware" pottery manufactory established by John Bartlam in Charleston in 1770 (Ramsey 1947: 84-85, 92, 98, 237). As Ramsey points out, no examples of Bartlam's "Queensware" exist, so work on this Church Street site in Charleston is of primary importance for the determination of the product of this factory. Ramsey states, "it is within the bounds of possibility that Bartlam knew the secret of the alkaline glaze, just beginning to replace lead glazes in the English potteries of 1765" (Ramsey 1947: 92).

The evidence from Charleston is still to be forthcoming but clues to the ware being made by Bartlam have been found at Salem, North Carolina, and Camden, South Carolina, through the potter William Ellis, who worked in the Bartlam factory (Fries 1968: 762-63; Rauschenberg 1968: 111; Clement 1951: 137). The superintendent of the Bartlam factory came to Bethabara in May or June of 1771 (before the pottery shop was moved to Salem), and, in exchange for lodging and clothing, he showed Brother Gottfried Aust how to make "Queensware" and "Tortoise-shell" ware, "A fine pottery resembling porcelain," and gave Aust the formulas for the glazes (Fries 1968: 762-63). The fact that this potter "had been the superintendent of a factory which made such pottery," indicates that the factory (the Bartlam venture) had probably closed by that time, since the superintendent was traveling through the country and had expressed a desire to stay among the Moravians for awhile (Fries 1968: 762-63). It appears then, that the Bartlam factory was not in operation more that a few months in 1770 and possibly during the early months of 1771. This coincides with the fact that in 1770 there are
advertisements for the factory on Church Street but none are seen in 1771 (Elias Bull research, personal communication). Two and one half years later, in 1773, William Ellis appeared in Salem and offered to demonstrate the manufacture of "Queensware" and "Tortoise-shell" ware, which he did, making a special kiln and successfully firing both "Queensware" and stoneware, no doubt as he had done at the Bartlam factory when he worked there (Fries 1968: 762-63, 775, 817).

Fragments of the "Queensware" made as a result of the visit of Bartlam's superintendent to Bethabara in 1771, were found in the 1965 excavation of the kiln waster dumps of Gottfried Aust (South 1967: 33). Excavations were conducted on Lot 49 in Salem, North Carolina, in 1968, and an impressive collection of Leeds type, English-tradition wares were recovered from waster dumps used by Aust and the master potter who followed him, Rudolph Christ (South 1970a: 70). Christ specialized in the "fine pottery" demonstrated by Ellis and the superintendent of the Bartlam factory and apparently learned his lesson well. From this collection of the ware of Rudolph Christ, as learned from two of Bartlam's potters, we know what kind of pottery Bartlam's factory was likely turning out and predict that it will appear much like the "fine pottery" of Rudolph Christ.

Our look at alkaline glazed stoneware relates to the preceding discussion in that the formulas for making alkaline glazed stoneware may well have been left with Aust in Bethabara in 1771 by the superintendent of Bartlam's factory. However, it appears that the first actual firing of stoneware was done in 1774 by William Ellis when he completed his special kiln and made his successful firing (Fries 1968: 817). This apparently was alkaline glazed stoneware, for fragments of alkaline glazed stoneware made in the form of English plates were recovered in the 1968 excavations on Lot 49, the lot on which Ellis built his special stoneware kiln. These sherds resemble very closely the salt-glazed stoneware so popular in the 1760's and 1770's, but are glazed not with a vaporized salt technique but with a transparent glassy alkaline glaze (Figure 1). This glaze is pale cream in color similar to that seen on English creamware but on a stoneware body. Only a few fragments of this type were found but this only tends to lend support to the fact that they may well represent Ellis' firing of 1774. This then may well be the earliest firing of alkaline glazed stoneware in America outside of a possible production at the Bartlam factory.

In September 1780, Rudolph Christ requested permission to begin production of what he called "salt-pottery" but the request was denied (Salem Archives: Auf. Col., September 21, 1780). Additional requests were made in the following two years, but it was not until 1782 that Christ was allowed to begin making "fine pottery" by the piece under Aust's supervision (Salem Archives: Auf. Col., August 1, 1782). Whether he fired alkaline glazed stoneware using salt as an ingredient of the formula at this time is not known but we suspect that the "salt-pottery" mentioned in 1780 relates to the 1774 "stoneware" made by Ellis in that the Ellis ware was probably an alkaline glazed stoneware using salt in the glaze formula.
Figure 1

Alkaline glazed stoneware sherds from a "Queens" pattern plate, thought to have been made by William Ellis in a special demonstration firing in 1774, on Lot 49 in Salem, North Carolina. This may well represent the earliest firing of alkaline glazed stoneware in America outside of a possible production at the Bartlam factory in Charleston.

Figure 2

A delicate mug with floral terminals and double-intertwined, reeded handles, covered with a glossy, greenish-brown, alkaline glaze, with chevron rouletting copied from scratch-blue salt-glazed stoneware. This type ware was found in a pit during excavations at Lot 49 in Salem, North Carolina having a provenience from 1795 to 1798.

Figure 3

An alkaline glazed "voodoo head" jug with brown eyebrows and moustache of iron glaze, and hat of cobalt blue glaze thought to be a South Carolina piece. This jug is similar to sherds from South Carolina kiln sites. Eventually enough specific information may be available to provide close temporal and potter assignation of various types of alkaline glazed wares.
In 1795, however, Christ "showed a piece of stone-ware which he had made in our pottery, and we are glad that this first burning seems to have turned out so well" (Fries 1968: 2542). We know, of course, from the 1774 Ellis demonstration that this was not literally the first firing of stoneware but as a commercial venture it may well have been.

During the 1968 excavations on Lot 49, on which the Fifth House once stood, fragments of stoneware were found that apparently represent the stoneware Christ was making after this "first" firing of 1795. In fact, through archeological context and historical data, this particular collection of stoneware can be pinpointed as having been made between 1795 and 1798. The particular significance of this ware is that it is alkaline glazed stoneware. This stoneware has been giving trouble for some time in terms of typological description. It is clearly stoneware in hardness but is covered with a glossy lead-like glaze, but from the physics of firing stoneware we know that only alkaline or feldspar type glazes will successfully withstand the high temperatures of stoneware firing. Because of this the catalog reference would read "Lead glazed? stoneware" and published reference to the type would call it "an olive-green glazed stoneware product" (South 1970a: 70). We now know it as alkaline glazed stoneware (Figure 2). Because of the significance of this type ware, a discussion of its provenience is presented here.

The Fifth House stood on the lot adjoining the Aust-Christ pottery in Salem, and in the area between the Fifth House and the pottery shop a stone foundation wall was found. The major portion of the structure was on Lot 48 and therefore not available for excavation, but the few feet that extended onto Lot 49 was of particular interest because the erection of this structure can be dated at 1798. Christ reported that his workshop was too small and planned to build a twenty-two foot addition that would take in the entrance to the yard of Lot 49 (Salem Archives, Aufl. Co1.: Nov. 21, 1797; Lot 48, 49 Records). This addition would encroach onto Lot 49, and therefore, the wall found there apparently represents the foundation for this 1797 addition (it was probably not constructed until 1798). This foundation of 1798 relates to the question of Christ's stoneware of post-1795 in that a pit was found to extend beneath the foundation wall of 1798. In this pit was a concentration of the finest ware yet known to have been made by Christ, Leeds-type ware of outstanding significance and uniqueness unknown outside the English factories (South 1970a: 70). The ware had been thrown into this pit before the 1798 addition was made and probably after the 1795 introduction of stoneware manufacture (unless, of course, it represented the wasters from the 1774 Ellis firing). Short, "thumb-shaped" lengths of clay, heavily coated with sand by rolling in quartz sand while the clay was wet, were found, some still fastened to the rim of vessels and saggers from the running of the alkaline glaze. Similar pugging or separator coils of sand covered clay have been found by Dr. Greer on other alkaline glazed stoneware sites. These were separators for saggers which would allow for circulation between vessels and saggers. Some sagger fragments appear to have had holes cut into the side to allow
Delicate mugs with floral terminals and double-intertwined, reeded handles, covered with a glossy, greenish-brown, alkaline glaze were found in this pit (Figure 2). We can guess that these delicate mugs were the type of ware Christ was firing as stoneware after 1795 and before 1798. In addition to these stoneware mugs of the "fine pottery" were milk pots and pans, jugs, and similar heavy ware. Of particular interest on the alkaline glazed stoneware mugs is the chevron rouletting around the exterior of the rim, a detail also seen on English scratch-blue salt-glazed stoneware, a fragment of which was recovered from the Lot 49 excavation in Salem. It would appear that Christ was copying this motif from English scratch-blue salt-glazed stoneware forms for his own stoneware.

Besides revealing the delicate forms and detailed treatment being used by Christ for his "fine pottery" and stoneware between 1795 and 1798, this waster deposit revealed that rather than using salt thrown into the kiln to produce a vaporized glaze, Christ was using an alkaline glaze dip for his stoneware. The discovery of a few fragments of stoneware made on a "Queensware" mold and covered with an alkaline glaze (possibly representing the stoneware firing of William Ellis) reveals that the use of an alkaline glaze on stoneware probably dates from 1774. This is a significant point in determining the origin for the extensive use in the South of alkaline-glazed wares by nineteenth century potters. Dr. Greer's research on alkaline-glazed stoneware has revealed a distribution in Texas, Alabama, Georgia, and the Carolinas, with all roads pointing toward the Carolinas as the origin of the alkaline-glazed stoneware tradition. With the 1774 date for the introduction of stoneware firing at Salem, the absence of locally made vaporized salt-glazed ware at the Salem site, and the presence of alkaline-glazed stoneware probably representing both the 1774 and the post-1795 manufacture of stoneware at Salem, we may very well have the origin of alkaline-glazed stoneware through the John Bartlam factor of Charleston. This may have occurred through men such as William Ellis who worked at the Bartlam factory and who shared the secrets of the trade with potters such as Gottfried Aust and Rudolph Christ. There were potters at work in the Carolinas prior to the 1770 Bartlam factory but whether or not they made high fired, alkaline-glazed ware is yet to be determined.

Camden (Eighteenth Century "Pinetree"), South Carolina

When William Ellis showed up in Salem in 1773 and made his firing of "Queensware" and stoneware "so that [the] process is now fairly understood here", he was referred to as "the potter from Pinetree" (Fries 1968: II, 817). The community of Pinetree was changed to Camden between February 13 and April 12, 1768 (Woodmason 1953: 49; Kirkland and Kennedy 1905: 12, 94-95). There are no records at this time indicating that

* Since delicate ware was being fired, saggers were used. However, as these were replaced by the coarser, more massive forms, saggers were given up as not necessary. Dr. Greer has noted that alkaline glazed stoneware kiln sites seldom reveal the use of saggers.
William Ellis moved to Camden after the closing of Bartlam's factory in 1771, but the fact that he was known as "the potter from Pinetree" might lead us to suspect that he may have made his home in Camden from 1771 until his trip with the Moravians to Salem, North Carolina in 1773. The important question is whether he operated a pottery shop there during those two years. The documents do not help us for nothing is yet known by this writer of Ellis's stay in Camden.

While cataloging excavated materials from the Cornwallis House ruin in Camden, Richard Polhemus, Laboratory Supervisor for the Institute of Archeology and Anthropology at the University of South Carolina, discovered a number of fragments of creamware and polychrome painted creamware made with non-English clays (Figure 4). This material was from around the pre-Revolutionary War house site known as the "Cornwallis House". One pit contained several of these fragments as well as delft, porcelain, brown salt-glazed stoneware, wrought nails, and English creamware, clearly revealing a context probably dating no later than the 1780's. Most of the fragments recovered by the Camden excavators and cataloged by the Institute were from the plowed soil zone in the area around the house.

Richard Polhemus recognized these fragments as similar, and in some cases almost identical, with those found in excavations at Bethabara and Salem (South 1967: 33; 1970a: 70). These important fragments are all characterized by having holes and inclusions in the light clay body not found in English ceramics. The "Queensware" pieces vary in color from very light cream to a richer buff. One fragment is from a sauceboat or similar vessel with a relief floral motif, similar to an example made by Christ at Bethabara (South 1970a: 71). The polychrome "Tortoise-shell" fragments, as well as applied terminal sprigs on double-intertwined handles, are typical both of Leeds creamware and Rudolph Christ's ware (Rowner 1965: 148; South 1970a: 70). These are illustrated in Figure 4. We might conjecture that these pieces may be from Salem, North Carolina were it not for the fact that some are bisque-fired and not glazed, and are probably kiln wasters from a near-by kiln site (Figure 4 G, H, J). A red paste fragment is slipped, polychrome glazed on the interior, clear lead glazed on the exterior, and identical to the work being turned out by Aust and Christ in Salem using red paste (Figure 4 K).

From this comparison it becomes clear that there is a very close connection between the Camden sherds and those of Christ at Salem. No alkaline glazed stoneware sherds such as those found on the English type ceramics at Salem have been found at Camden, although a fragment of a large jug with "IEC" or "IEG" impressed inside a circle was found in the plowed soil zone at Camden. This indicates that the high-fired alkaline glazed stoneware was probably not being made in the same kiln as the lead-glazed, locally made, English tradition pottery represented by those sherds found in the Camden excavation.

We might conclude then, that William Ellis may have made these pieces in a Camden kiln between 1771 and 1773, since he is the common agent both for Camden and Salem. We can now predict that when excavation is carried
ENGLISH TYPE CREAMWARE AND TORTOISESHELL WARE MADE IN SOUTH CAROLINA, PROBABLY BY WILLIAM ELLIS OR JOHN BARTLAM

Top row:  a.-b.-c. Cream colored ware with pearl gadrooning. Cream colored ware sauceboat rimsherd with roccoco design in relief.

Second row:  d. Cream colored ware sherd with applied terminal spring similar to those from Leeds and Salem, North Carolina.

    e.-f. Polychrome glazed "Tortoiseshell" type sherds with beaded rim decoration.

Third row:  g.-h. Bisque fired fragments of cream paste ware with relief decorations.

    j. Bisque fired sherd with feather edge motif similar to English forms and Salem, North Carolina examples made by Rudolph Christ.

    k. Polychrome glazed slipware fragment identical to those made by Rudolph Christ at Salem, North Carolina.

Bottom row:  l.-m.-n. Polychrome glazed "Tortoiseshell" type sherds showing pearl gadrooning around the base of mugs, applied terminal sprigs and glaze characteristics almost identical to those found on Lot 49 in Salem, North Carolina, known to have been made by Rudolph Christ. They are also like those seen on Leeds pottery.
out in Charleston in order to recover examples of ware from the Bartlam factory, it will look very much like that produced by Rudolph Christ at Salem, as does the ware from Camden. An additional question to be answered will be whether the ware from Bartlam's factory will consist only of the lead glazed earthenware sherds such as the Camden examples, or whether among their number will also be sherds of the alkaline glazed stoneware such as those recovered from Lot 49 in Salem. Needless to say, this fascinating search for the origin of alkaline glazed stoneware in the South is only beginning, but the clues so far point toward the Bartlam factory and its superintendent who visited the Moravians in 1771 and William Ellis who did the same in 1773, who actually fired stoneware, fragments of which we think have been recovered from excavations on Lot 49 on which he built his special kiln in 1774 (Figure 1). It seems, therefore, that Ramsay was likely correct in his statement that Bartlam may have known the secret of the alkaline glaze which was "just beginning to replace lead glazes in the English potteries of 1765" (Ramsay 1947: 92).

The information now available surely points to Bartlam in Charleston, the superintendent of his factory, and an employee of that factory, William Ellis, as the first to spread the word of this glossy stoneware glaze to other potters in the South. As the word spread and more potters undertook to produce stoneware with a glossy alkaline glaze, the classic English forms used by Bartlam, his superintendent, William Ellis, and Rudolph Christ, gradually gave way to more coarse wares, crocks, milk pans, churns, and jugs so typical of nineteenth century potters in the South, as described and illustrated in Dr. Greer's paper.

II. A SUMMARY OF SOME OF THE SITES AND POTTERS IN SOUTH CAROLINA MAKING ALKALINE GLAZED STONEWARE

Richard Champion of Camden, South Carolina

Ramsay has mentioned Richard Champion, "who bought Cookworthy's patent in 1774, and made porcelain for seven years, retired to a home at Camden, South Carolina in 1784, dying there in 1791" (Ramsay 1947: 98). He reports that tradition has it that Champion made porcelain there, but this cannot be verified. Ramsay also assumed that Champion was "certainly familiar with it [alkaline glaze]", which is probably correct, but whether he ever operated a pottery in Camden is still to be determined (Ramsay 1947: 92).

The Edgefield District, South Carolina

From around 1810 to the Civil War, Pottersville in the Edgefield district of South Carolina was an important pottery producing area (Smith 1970: 9-13). Names associated with the district are Landrum, Harris, Miles, Rhodes, Lofton, Ramey, Gibbs, Drake, Kemp, Corley, Hill, Mitchell, Wardlaw, and Chandler and Bodie. An important potter associated with Abner Landrum in the pottery business as well as in publication of a newspaper The Edgefield Hive, was Dave, a free black man whose pottery often carried charming verses (Smith 1970: 12). The ware made by these potters
is alkaline glazed stoneware, some of which is marked with incising, some with trailed kaolin slip, and some with an impressed die. A number of fine pieces of this ware can be seen in the Pottersville Museum just north of the town of Edgefield, South Carolina. This museum is a project of the Ralph T. McClendon family, whose interest is in preserving information relative to the once flourishing Pottersville community as a pottery making center (Smith 1970: 9-13).

In the Pottersville Museum are jars and jugs of alkaline glazed stoneware with various incised or slip applied marks. One jug has a "3" in a cartouche, with "Southern Make • C.B. Rhodes • Edgefield District, S.C." applied with trailed white slip. Another has "C.B. Rhodes • Maker" with a "3" in a cartouche, also in white slip. A double loop-handled jug with an iron dip on the upper half has in large script letters written all the way around the jug, "C.Rhodes Maker" with a "5" in a cartouche, applied with brown slip and edged with white slip, with a row of white dots in the center of each brown letter. A jar with the iron dip on the upper half was the work of Lewis Miles and is marked with the incised inscription "L.M. July 6, 1857". A similar vessel at the South Carolina Library is incised with "L M January 17, 1850. Another in the Pottersville Museum reveals that the Negro Dave also apparently worked for Lewis Miles, for it is inscribed "L M July 25, 1857 Dave".

A large vat in the Charleston Museum was also made by Dave and is inscribed "Great and Noble Jar • Holds Sheep, Goat and Bear". Another of Dave's jars has the single word "Ponderosity" while another states: "Made at Stony Bluff for Making [Lard] enuff" (South Carolina Library Notes, University of South Carolina). A vessel in the South Carolina Library has the inscription "a pretty little girl on a virge • Volcaic mountain, how they burge • Dave", and on the opposite side "L m Aug 24-1857". Of particular interest is the fact that this vessel is covered with Albany Slip, with a wash of alkaline glaze around the rim and running down the inside of the vessel. These vessels are just clues to the rich field of research that is yet to be done in South Carolina on various potters and their wares.

In August 1970 Dr. Greer and I visited the site of a kiln waster dump near the Pottersville Museum pointed out by Carl T. McClendon of the museum. This site revealed some fragments of alkaline glazed stoneware, was designated as 38ED11, and is thought to be the kiln site of Abner Landrum's pottery of 1810.

Another kiln site is located about twenty miles north of Edgefield at the community of Kirksey (38GN16) in Greenwood County and contains quantities of slip decorated alkaline glazed stoneware. This site is thought to be that of Chandler's Pottery of around 1847 to 1867 when Reverend Bodie, a Baptist minister, took over from Chandler (Dr. Greer, personal communication). Through her research in Texas, Dr. Greer has developed a considerable knowledge of the potters and their sites in South Carolina and has been most helpful in pointing us in the right direction with the alkaline glazed challenge in this state.
In Aiken County Dr. Greer has worked on locating the kiln site of Landrum's Pottery at Miles' Mill, called Sunnybrook in recent years (38AK17). She has worked out a tentative sequence at the Sunnybrook site as follows:

1843 - Rev. Landrum's Pottery (?1830's-1850's)
1850 - Lewis Miles listed in census as stoneware manufacturer (Mr. Carlee McClendon notes)
1870-80's - Hawn Pottery HAHN -TRENTON impressed mark
1890's - 1900's Baynham Pottery

At the Pottersville Museum there are jars impressed with the mark "W.F. HAHN • TRENTON • S.C.", the same mark appearing on the jug in Figure 20 of Dr. Greer's paper. An impressed mark in an oval with "Trenton, S.C." was found on a jug of alkaline glazed stoneware at Fort Jackson, Savannah, Georgia, by Bill Kelso. Unfortunately the potter's name was not legible (Kelso 1971: 19, 24).

About twelve miles from the Sunnybrook site is the town of Graniteville where pottery was apparently in existence in the late nineteenth century, judging from a jar in the Pottersville Museum with the inscribed words: "Peter R. Emanuel of Graniteville, S.C. Edgefield County 1879". The location of this site is unknown as yet.

Another site in the area of Trenton and Graniteville was once located in Bath, South Carolina, but is now apparently beneath a large factory site (Dr. Georgeanna Greer, personal communication). This site according to Ramsay is associated with the name of "Thomas J. Davies," during the period from 1861-1865, and manufactured "coarse brownware, black or brown glazed some "voodoo head" jugs; no mark" (Ramsay 1947: 235). However, Ramsay confuses Bath, in Beaufort County, North Carolina, with Bath in Aiken County, South Carolina, placing the pottery in "Beaufort County, South Carolina" (Ramsay 1947: 235). Since Spargo (1926: 341) places "Thomas J. Davis", not "Davies", in Bath, South Carolina, in his earlier book, and since Dr. Greer has found local tradition for a pottery being destroyed by the construction of a factory, we suspect that "Davis" is correct and that Bath, South Carolina is the correct place for this pottery, and that Ramsay is in error in his details. Dr. Greer mentions in her paper that there was a large factory at Bath, South Carolina employing large numbers of men and boys making table ware and insulators for the Army of the Confederacy (Greer 1971; after Barber 1901: 465-66).

Alkaline glazed "voodoo head" jugs such as those mentioned by Ramsay are frequently seen in collections of southern ceramics and are usually alkaline glazed stoneware. These interesting jugs are apparently closely related to the production of alkaline glazed stoneware, and as more information on one is collected, details on the other will emerge. Data on these whimseys is being collected for a paper on the type and distribution of this interesting form, and a vessel of this type is illustrated in Figure 3. This vessel in the writer's possession was purchased in an antique shop in North Carolina but was said to have come from
South Carolina. It is similar to alkaline glazed stoneware sherds from sites in South Carolina and hopefully enough information will eventually be compiled to allow for specific pieces to be assigned to particular kiln sites on the basis of typological characteristics. Collections from kiln sites, some controlled excavation on dated sites used by known potters, and documentary research should contribute toward this understanding.

In the South Carolina Library are notes indicating that the "Southern Porcelain Company was established at Kaolin, S. C. by William H. Farrar who had been a Bennington stockholder. Numerous potters followed him here. The modeller, Joseph Jones, was manager in 1857 ... Until a fire destroyed the factory in 1863-4, only a 'fair porcelain' was produced at Kaolin, such as the coarsely designed corn pitchers of 1859-61" (South Carolina Library, Notes of Lalla Stevenson of Columbia). The site is thought to be located near Bath, South Carolina, but no research by this writer has yet been done on this company.

Another site whose location has not been discovered is that at Hamburg. This pottery is known from vessels such as the one in the South Carolina Library having a stylized floral spray applied with slip, similar to those from the Rhodes Pottery at Pottersville. This is an alkaline glazed stoneware vessel with the light olive green color often seen from South Carolina sites. The slip applied words on the two ear-handled bulbous jar is: "H.A.Kendrick · Hamburg, S.C."

Also in the South Carolina Library is an alkaline glazed vessel with the inscription in light slip: "Scott Hewart · No. 1 Merchants Row · Columbia, S.C. 1850". This piece also has a stylized floral spray similar to the pieces from marked vessels from the Rhodes Pottery at Pottersville. No research by this writer has yet been done on this Merchants Row manufactory in Columbia.

Another Columbia pottery is said to have been on Almshouse Road and was known as the Stork Pottery. The kiln was begun about 1832 by Dr. Abner Landrum and was operated by his descendants until about 1900 (South Carolina Library, Notes of Mrs. R.M. Stork).

The Charleston Museum has a fine collection of alkaline glazed ware and notes on potters in South Carolina. Dr. Greer has carried out some research there but this writer has yet to launch into a definitive study of the South Carolina potters and their sites, a study that hopefully will be undertaken before too long now that Dr. Greer's fine paper has opened a door for those of us working with nineteenth century archeological sites.

Climaxing such a study, of course, would be an oral history account from the potters now working in South Carolina and a technical account of the methods now being used and the ware being produced. A step in this direction has been taken with a photographic study of the operating pottery at Bethune, South Carolina, where Otto Brown and Otto Brown, Jr.
Figure 5
The Otto Brown ware at the Bethune, South Carolina kiln site

Figure 6
The kiln entrance with the waster dump to the left, and the rubble from kiln repairs in the foreground. Note the iron rods and turnbuckles used to control the tension on the kiln during firing to provide maximum support as the kiln expands and contracts during firing and cooling. Without these controlling rods the kiln would collapse much sooner.
are firing pottery in a ground-hog type kiln (Figure 5, 6). The children of Otto Brown, Jr. are the seventh generation of the Brown family to produce pottery. They do not use alkaline glaze, preferring to fire most of their ware as bisque, flower pots, bird baths, etc., with an occasional rabbit or dog feeding bowl being glazed by applying Albany slip (Carson 1968: 226-28).

As can be seen from this examination into the possible origin of the use of alkaline glazed stoneware in America in the Bartlam-Ellis-Christ pottery production of the eighteenth century, and this short superficial survey of the pottery sites producing alkaline glazed stoneware in South Carolina in the nineteenth century, the work of Dr. Greer has opened a window that casts a fascinating shaft of light on potential ceramic research in South Carolina, as well as throughout the South. We are indebted to her for providing us with this challenge. Hopefully we will be able to obtain funds and time to follow the research path along which she has pointed the way. We look forward to the publication of the definitive book for which Dr. Greer is conducting her research. She welcomes any information on alkaline glazed stoneware that may be forthcoming from excavations by historical archeologists. In return, she gladly shares the information emerging from her continuing research, as illustrated by the paper presented at the Eleventh Annual Conference on Historic Site Archaeology, and presented here as the focal point of this HISTORICAL ARCHAEOLOGY FORUM.
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COMMENTS ON GREER'S PAPER ON ALKALINE GLAZE

Ripley P. Bullen

I would like to comment on Georgeanna H. Greer's excellent paper on alkaline glaze as used during the nineteenth century in the Southeast. Using her descriptions and criteria, we have been able to identify similar glazes on various stoneware vessels in the Florida State Museum's Research Collections. The data presented below has been abstracted from that Museum's records.

There were three recognized nineteenth century potteries in Florida. The most prominent and longest lived was The Southern Pottery Works at Pensacola, owned and operated by John W. Kohler from about 1868 to 1915. Most of his production consisted of unglazed dishes, jars, flower pots, and funeral urns, examples of which are in the Museum's collections. If any were made of hard stoneware or were glazed, they have not survived.

Another pottery was started by H. F. York at Lake Butler, Union County, Florida, in 1884. Having successfully fired bricks for house supports, chimneys, and fireplaces, he decided, after receiving advice from a Mr. Craig of Atlanta, "an expert potter from Scotland," to attempt the manufacture of pottery vessels. He engaged Will Gregg, "another expert from Scotland," who supervised the building of a "great Down Draft pottery kiln" and the making of many large saggars. Also provided was machinery to liquify, screen, and then evaporate or dry the clay. This operation was a major undertaking and the kiln alone is said to have cost $1500. The initial firing proved successful, but York became sick and died before another firing occurred and the project was abandoned.

This initial firing produced an amazing assortment of jars, jugs, churns, bowls, pitchers, flower pots, and cuspidors including -- if our records are correct -- two-part mold-made pitchers with roses, leaves, and stems in low relief on each side. Made of a gray-bodied stoneware, one has a thin yellow-brown glaze on both inner and outer surfaces. The other exhibits a clear yellow glaze with underglaze red and green painting which, in places, ran. The glaze on these containers is not salt glaze. It has a high reflecting power like alkaline glaze but I do not know the type of glaze used. Clearly these were experimental pieces and the glaze material may have been imported from Georgia or further north.

Several of the specimens attributed to the Lake Butler pottery are described as having a brown glaze. The only readily available example is a large storage vessel like a churn but with a solid clay lid (FSM-63178). It has a thin overall coat of brown glaze, both inside and out, with an extra coat or coats applied to the lower outside half and around the lip and neck. The latter has in places run down the sides. This glaze is not very shiny and covers the surfaces rather poorly. There are oval spots
where the glaze did not adhere in a manner typical of alkaling glazes.

As it is not a salt glaze nor like the thick brown glaze found on northern stoneware, it is probably an alkaline glaze although it does not exhibit a bubbling or pronounced streaking.

The third and oldest pottery was that at Knox Hill, a little south of De Funiak Springs in Walton County. It was started in 1859 by M. M. Odom and Robert Turnlee but was in operation only a little over a year. Of the specimens in the Florida State Museum's collections from the Knox Hill works, five, probably six, were unquestionably finished with alkaline glaze. While varying considerably among themselves, they all exhibit shiny, bubbly, greenish glaze which is markedly streaked and shows in places small oval bare areas. The color ranges from a light green to a very dark brown-green which is practically black. The most interesting (FSM-50309) bears "M. M. Odom" incised on one side, the numeral "3" on the other, and an incised line over each handle. It is attractively covered with light green "dots."

Some Knox Hill stoneware was covered with brown glaze. It is fairly evenly applied and has a surface less shiny than those with a green glaze but shinier than the Lake Butler example mentioned above. Knox Hill brown glazed containers also exhibit a purplish subsurface color which shows through the glaze in various places. It is believed they are also alkaline glazed with the addition of a brown pigment or substance that became brown with firing.

Our best example of alkaline glaze (FSM-50123) came from the Meaders pottery located four miles south of Cleveland, Georgia. As illustrated in the upper left hand corner of Figure 73 in John Ramsey's 1939 book, Meaders products and much better than anything produced at Knox Hill, an example of which is shown in the lower right hand corner of the same illustration.

Those using this reference (Ramsey 1939) should correct page 239 in that Knox Hill is in Walton County, Florida, not Georgia; and Lake Butler is in Union, not Walton, County, Florida.

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COMMENT ON ALKALINE GLAZED STONEWARE FROM VARIOUS STATES

Stanley South, Editor

North Carolina, South Carolina

A comment on the clues to the possible origin of alkaline glazed stoneware in South Carolina and North Carolina have been presented by this writer in a separate paper of this forum. Not mentioned in that paper is the wealth of information waiting to be examined relative to alkaline glazed stoneware made by North Carolina potters, in particular, in Jugtown, North Carolina, near Seagrove.

Georgia

Dr. Greer has mentioned the fact that alkaline glazed stoneware is still being made in Georgia and she is continuing her research into the potters and sites in that state.

Florida

Ripley Bullen of the Florida State Museum has written a comment on alkaline glazed stoneware in Florida which appears as a separate paper in the forum.

Alabama

Craig Sheldon and Jerry Nielsen of the Archeological Museum at Mound State Monument, Moundville, Alabama, feel that:

Primarily, the paper fails to adequately define what is alkaline glazed pottery. That is to say that at no point in the paper is there a good concise definition of the pottery which allows us to recognize the ware in our collections. Dr. Greer states that, 'The color and texture of the glaze are the most positive points of identification'. Then she goes on to describe the colors as:

'...dirty cream through yellows and browns to occasional black... (to) pale greens, blue greens, and grays, to deep olive greens and greenish black... (to) red... associated with brown.', (page 10-11).

(All these colors being for oxidized and reduced glazes). This is a rather lengthy and varied list of colors to be a positive identification factor. As for the texture Dr. Greer states the surface of the glaze:

'...may show a very smooth and shiny texture or be rough and show a sort of agglutination or clumping, much heavier and less regular than that of a salt glaze.', (page 10).

Again the diagnostic criterion are somewhat broad and vague.
For persons less familiar with historic ceramics in particular glazed stonewares than Dr. Greer, we feel that more definite description is necessary for the reader before an attempt is made to give a history of the development of glazes and technical aspects of stoneware manufacture.

Using Dr. Greer's description of alkaline glazed stoneware, an attempt was made to recognize specimens of the ware in collections of historic ceramics recovered from the site of the French Fort Conde recently excavated by the University of Alabama. Mr. Sheldon and I were unable to identify alkaline glazed sherds using Dr. Greer's criteria.

With regards to the remainder of the paper it is most informative, and presents a good concise description of glazed stoneware pottery, its development, and technical aspects.

Tennessee

Richard Polhemus has worked in Tennessee on Cherokee Indian sites and is now Laboratory Supervisor for the Institute of Archeology and Anthropology at the University of South Carolina. His comment follows:

I have read with interest the paper on alkaline glaze stoneware by Dr. Greer. She has made an important contribution to the study of 19th century ceramics in the southern United States. I trust further contributions on this interesting subject will follow.

Although a small number of alkaline glaze stoneware sherds have been found on early 19th century sites in Tennessee, no kiln sites for this ware have been located. Three kiln sites which have been located in upper east Tennessee produced salt glaze stoneware decorated with cobalt blue and lead glaze earthenware. The salt glaze stonewares produced by D. Decker near Greenville, Tennessee, included jugs, crocks, harvest jugs, chicken drinkers, spittoons, banks, tile, stove flues, caps, pipes, and two forms of tombstones. This pottery dated from 1872 to about 1905. The kiln site producing the lead glaze earthenware has not been closely examined by either Mr. Beverly Burbage or myself. Mr. Burbage is presently doing research on the Decker pottery.

Alkaline glaze stoneware sherds were found associated with polychrome painted pearlware and blue edge ware during excavation of a settler's cabin on the Holston River in upper east Tennessee. Sherds of alkaline glaze stoneware also occur at several late Cherokee sites in the Little Tennessee River valley associated with Clews dark blue transfer printed pearlware, polychrome painted pearlware, and blue edge ware - dating after 1819 but prior to 1838 when the Cherokee
Alkaline glaze stoneware does not seem to have been produced in east Tennessee. The occurrence of only minor numbers of fragments in contrast to the predominant salt glaze and Albany slip wares suggests that east Tennessee was more closely associated with the North than other southern states.

Routine laboratory work at the Institute of Archeology and Anthropology has resulted in the classification of a large quantity of 19th century ceramics. The laboratory crew readily sorted out the alkaline glaze stoneware from other stonewares during this work, even prior to a visit by Dr. Greer. Although we had no precise name for the sherds or glaze, it was classified separately from the other stonewares. At times it appeared that sherds from several individual potteries or groups of potteries might be recognizable in our samples. I feel that this is a distinct possibility after we have investigated a number of identified kiln sites in South Carolina and accumulate large kiln samples on which to work.

The most difficult variation to recognize appears to be underfired, light green to grey-green in color and having numerous unvitrified sand particles in the glaze - these producing a rough surface rather than the normal smooth glasslike surface found on most alkaline glaze stoneware. This variation was sometimes classified as salt glazed at first glance although close examination readily disclosed the slightly protruding sand grains rather than the pitting which is present on salt glaze stoneware.

Mississippi

Richard A. Marshall of the Department of Sociology and Anthropology at Mississippi State University reports that a pottery is operating presently in Ocean Springs, Mississippi, known as the Sheerwater Pottery (Box 737, Ocean Springs). The Mississippi Geological Survey, Bulletin No. 6, lists a number of potteries which were operating during the early 1900's, the "slip-type" glaze being the most common type used at that time.

Arkansas

William A. Westbury of the University of Arkansas Museum has sent photographs of vessels in storage at the Museum that are part of a large collection of materials given the Museum by Mrs. Maude Henderson of Fort Smith, Arkansas. A fragment of kiln furniture of alkaline glazed stoneware found at the Cane Hill Pottery which was in existence from roughly 1867 to 1887 was also reported by Dr. Westbury. However, he also reports that pots from the factory are either unglazed or salt glazed. Some of the Arkansas Post materials from excavations at Arkansas Post National Memorial appear to be alkaline glazed stoneware.
The photographs of the pots in the University of Arkansas Museum are shown in Figures 1 through 4, and a description by Dr. Westbury with editorial comments by South follow:

Figure 1 This vessel has a glaze which is quite rough. It can be felt with the fingers quite easily. The interior of this piece is also glazed. Colour is 5YR 2/1 on the Munsell Soil Colour Chart. No. 54-1-283.

[This roughness from the puddling and running of the alkaline glaze is typical of alkaline glazed stoneware pieces.]

Figure 2 This light vessel is glazed on the exterior, but has lost a great deal of the glaze around the rim through what appears to be flaking. Colour is 2.5Y 6/2 on the Munsell Soil Colour Chart. No. 54-1-295.

[This light vessel with running streaks of glaze of a slightly darker color is also typical of the lighter "celadon" appearing alkaline glazed stoneware vessels.]

Figure 3 The glaze is soft and satiny in appearance. The bottom of the vessel has wipe marks where the glaze was wiped off while it was wet. The interior of the vessel is not glazed but does show run marks where some of the glaze ran into it. Colour is 7.5R 3/2 on the Munsell Soil Colour Chart. No. 54-1-293.

[This lusterous jug is typical of Albany slipped vessels. Notice the absence of the typical alkaline glazed runs on the exterior surface, and the uniform appearance of the opaque slip glaze.]

Figure 4 The glaze on this vessel is quite poor, with areas which are unglazed. Run marks are on both the interior and the exterior of the vessel. The bottom shows wipe marks where the vessel was wiped before firing the glaze. Colour on the Munsell Soil Colour Chart is 10R. No. 54-1-306.

[This vessel also is an Albany slip glazed vessel. However, it was also apparently glazed with an overcoating of alkaline glaze, as evidenced by the runs and bare spots mentioned by Dr. Westbury and seen in the lower left side of the jug. This combination Albany slip and alkaline glaze sometimes occurs in a very selected manner on the surface of the vessels. Where a blast of hotter air sometimes hits an Albany slipped vessel for instance, the result is an alkaline glazed spot over Albany slip. Apparently the more extreme heat will catalize the]
ingredients of Albany slipped vessels. Then too, the practice of combining the opaque, even, brown of Albany slip with a more glossy alkaline over-glaze may have been practiced by some potters as a more desirable combination than Albany or alkaline glazes alone could produce.

Summary

From these comments of archeologists working with nineteenth century ceramics in the South, we see that there is a need for more work with the use of the direct historical approach from the present potters and the documents to the alkaline glazed stoneware sites of the nineteenth century. Through the excavation of documented sites with known time brackets, we will be able to define various specific ceramic types in a pinpointing manner. The knowledge of specific wares may well provide the key for temporarily fixing sites more effectively than is now the case by using general English and American ceramics alone. These local potters may provide the time markers in a specific manner not often found in the more universally distributed ceramic types.

Interpretations of life styles, socio-economic levels, cultural adaptation to the environment, architectural horizon studies, acculturation studies, and similar cultural phenomena build on a base of tradition, and tradition is anchored in a specific framework of time-space studies. This skeletal frame is made up of specific forms in time and space, often allowing an entire archeological complex to be related to forms that went before and came after. Alkaline glazed stoneware may well provide us with the means for locally building a more rigid framework upon which to prop our house of cards, to hang our cultural interpretations, and to indulge more freely our flights of fancy. The archeological process requires both the left hand of the cultural reconstructionists and the right hand of the potsherd analysts to effectively wash the data from an archeological site.
COMMENTS ON DR. GEORGEANNA H. GREER'S
"PRELIMINARY INFORMATION ON THE USE OF THE
ALKALINE GLAZE FOR STONEWARE IN THE SOUTH 1800-1970"

Jacqueline S. Olin

The material covered in this study actually is a large body of techn­
ological and industrial history and Dr. Greer has done well in setting
up the outline. There may have been a place for more detail of what is
known about glazing technology that Dr. Greer gives in the first three
pages, but I'm sure she was eager to get on to the task of identifying the
problem in terms of 19th century American technology.

The purpose of my comments will be to show some of the approaches
which come to my mind as being valuable to consider in a detailed study of
the technology of alkaline glazing as it was used in 19th century America.

The study of glazes on American pottery by chemical methods has only
recently been given any attention. The Research Laboratory of the Henry
Francis du Pont Winterthur Museum has used an energy dispersive x-ray
fluorescence instrument to analyze the glazed surface of ceramic objects
and fragments. This instrument can be used to non-destructively analyze
the glaze on the surface of an object. It is possible to obtain quantita­
tive results so that not only differences in the chemical components pre­
sent can be determined but also differences in the amounts of elements
present can be measured.

It is difficult to say what distinctions can be made between salt
vapor glazing, slip clay glazing, and alkaline glazing without actually
having analyses of examples of each of them. The fact that an alkaline
glaze is made with wood-ash as the source of alkali suggests quite
strongly that varying concentrations of sodium, potassium and calcium can
be expected to result from the use of wood-ash from different plant
sources. The following table was compiled by Professor W. E. S. Turner
pp. 508-9.\(^1\) It shows the percentage ash content and the composition of
the ash from various air-dried vegetable materials.

\(^1\)Turner, W. E. S., "Studies of Ancient Glasses and Glassmaking Processes.
Part V. Raw Materials and Melting Processes." Journal of the Society
The manufacture of potash in the colonies is known to have been introduced by 1757. In January 1757, Thomas Stephens came over from London to place on sale his pamphlet, The Method and Plain Process for making Pot-Ash, Equal if not Superior to the best Foreign Pot-Ash. The Virginia Assembly voted a sum of money to build a potash furnace at the capital, but for some unexplained reason Stephens returned to England. In 1763 the Society for the Encouragement of Arts, Manufactures and Commerce at London sent James Stewart to New England and he remained in the North instructing in the methods of manufacturing potash.

I have examined a cross-section of an alkaline glazed sherd from a South Carolina site at a magnification of 50X (Fig. 1). One can actually see the glassy material which forms the alkaline glaze at that magnification. The thickness of the glaze on the specimen I photographed was approximately 0.25 millimeters. It would be possible to analyze the glaze layer on a potsherd using an electron microprobe where a beam of electrons can be focused on an area of 0.001 millimeters in diameter. This method could also be used to obtain a quantitative analysis of the glaze and might be used in conjunction with energy dispersive x-ray flourescence.

The chemical composition of the glaze would of course be a combination of the composition of the wood ash and the feldspar or whatever was combined with the wood ash to make the glaze. The resulting composition might be expected to characterize a glaze from a given provenance if, as Dr. Greer states.

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3Sherd provided to Jefferson Miller by Stanley South, from the Kirksey site (38GN16).
Polished section of an alkaline glazed sherd showing the glass-like layer on the surface of a stoneware body. The layer between the glaze and the stoneware body may be a slip. 50X magnification
on page 6, "All of the materials [for making the alkaline glaze] were usually near at hand...." However, there seems to be some possibility that if potash were being manufactured, it may, in some cases, have been used in the manufacture of alkaline glazed ware.

Taking a larger view, it will be very valuable to develop a more complete description of the technology of alkaline glazing as it was used in the nineteenth century in the United States. This is the period during which serious attention was being given to the synthesis of soda and potash in Britain. Equally important is the knowledge which the craftsmen working in the eighteenth century had of the alkali industry developing in the colonies.4

ACKNOWLEDGEMENT

The author would like to thank Miss Martha Goodway of the Conservation-Analytical Laboratory for taking the photograph in Figure 1 and Mr. Grover Moreland, Department of Mineral Sciences, for cutting and polishing the section.


Fig. 6. A three to four gallon alkaline-glazed jar from the Edgefield District of South Carolina probably between 1840 and 1850. The glaze is thick, smooth, and a yellowish tan in color. A marked crackle developed and this is stained from use.

Fig. 7. A pair of alkaline-glazed storage jars of about three gallons capacity made in Rusk County, Texas, between 1846 and 1860. One shows the olive green reduced form of the glaze and the other is a creamy white with only a hint of green where the glaze is thick.

Fig. 8. The typical bowl form of the deep South. This form made on the wheel with only a small flared rim was used from early to late and from sizes suitable for porrigers to wash basins. The larger sizes frequently had handles. This jar is glazed with a caramel brown alkaline glaze over a deep buff body. It was made about 1900 in Randolph County, Alabama.
on page 6, "All of the materials [for making the alkaline glaze] were usually near at hand..." However, there seems to be some possibility that if potash were being manufactured, it may, in some cases, have been used in the manufacture of alkaline glazed ware.

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