BULLETIN NO. 15

SOUTHEASTERN ARCHAEOLOGICAL CONFERENCE

# Proceedings of the Twenty-Eighth Southeastern Archaeological Conference

Edited by

Bettye J. Broyles

Morgantown, West Virginia

1972

EDITOR'S NOTE:

This Bulletin contains most of the papers presented in Macon, Georgia, on November 12 and 13, 1971, at the 28th Southeastern Archaeological Conference. Several of the papers (printed and not printed) have been included in other publications, and the remainder were not received from the speakers for inclusion.

In order to save money on this publication, the text was typed on multilith masters (offset masters), therefore your editor would beg forgiveness for any messy spots from erasures. With my one-finger typing technique, it is more difficult to avoid mistakes and to make corrections on the masters.

I have taken the liberty of placing all of the References Cited at the end of the Bulletin, thereby saving some space and duplication of references.

The symposium on Federal Agencies and Archaeology has been eliminated from the Bulletin for the reasons stated on page 54. If there is a reason in the future to publish this symposium, it can always be issued as Part 2 of Bulletin 15.

Bulletin 16 containing the proceedings of the 29th Conference held in Morgantown in 1972 should be completed sometime after the first of the year. The tapes have not yet been transcribed, and only a few papers have been received from participants.

Bettye J. Broyles
Editor SEAC (Retired)
Morgantown, West Virginia
December 1975

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## PROGRAM

## TWENTY-EIGHTH SOUTHEASTERN ARCHAEOLOGICAL CONFERENCE

## MACON, GEORGIA

Session I: Friday Morning, November 12, 1971

CONTRIBUTED PAPERS-- Chairman: Joseph Granger

"Human Ecology and Settlement Pattern on the Coast of Louisiana"
James W. Springer, Yale University

"Hopewellian Elements in the Lower Valley of the Little Tennessee River"
Jefferson Chapman, University of North Carolina

"The Deptford Phase: An Adaptation of Hunting-Gathering Bands to the Southeastern Coastal Strand"
Jerald T. Milanich, Smithsonian Institution

"The Melton Site, A-169, An Intensive Harvest Locality in North Central Florida"
Charles Fairbanks, University of Florida

"The Mississippian-Woodland Transition in Tennessee: Migration or Internal Culture Change?"
Charles Faulkner, University of Tennessee

"A New Look at Cahokia Chronology"
Nelson Reed, Washington University

"Southwestern Virginia: A Prehistoric Crossroads Area"
Howard A. MacCord, Archeological Society of Virginia

"A Preliminary Report on the Andrew Site, Houston County, Georgia, and Its Significance to the Study of Weeden Island Culture"
John W. Walker, National Park Service, and Joseph A. Murciak, U.S. Air Force (Retired)

"Earth Lodges at Carters Dam and Elsewhere in the Southeast"
Arthur R. Kelly, University of Georgia

Session II: Friday Afternoon, November 12, 1971

SYMPOSIUM-- Moderator: Hester A. Davis

FEDERAL AGENCIES AND ARCHAEOLOGY: POLICIES, PROBLEMS, AND POSSIBILITIES

Participants:
Rex L. Wilson
National Park Service, Division of Archeology, Washington
George Cattanach
National Park Service, Office of the National Register
David Scott
U.S. Forest Service, Region Eight, Atlanta
Donald E. Lawyer
U.S. Army Corps of Engineers, Environmental Resources Branch, Washington
Robert D. Bee
U.S. Bureau of Public Works, Office of Right-of-Way and Environment, Washington

Session III: Saturday Morning, November 13, 1971

SYMPOSIUM-- CHEROKEE Moderator: Alfred K. Guthe

"The Space-Time Background for Cherokee Ethnohistory"
Hatold A Huscher, University of Georgia
"Development of Middle Town Cherokee"
Roy S. Dickens, Jr., Georgia State University
"A Site in the North Carolina Mountains"
Max E. White, Western Carolina University
"Structures"
John Combs, University of South Carolina
"Features"
Richard Polhemus, University of South Carolina
"Ceramics"
Duane King, University of Georgia
Discussion
David J. Hally, University of Georgia, and Alfred K. Guthe, University of Tennessee

Session IV: Saturday Afternoon, November 13, 1971

CONTRIBUTED PAPERS-- Chairman: David J. Hally

"Comments on the Field Preparation of Radiocarbon Samples"
Betty Lee Brandau, University of Georgia
"Edge Angles and Activity Analysis: A Western Example"
George A. Teague, University of South Carolina
"Experiments in Soil Chemistry, or I AM Curious Dirt"
Anne Gatewood Leaf, University of Missouri
"Tracing the Origins of Georgia Copper Artifacts by Neutron Activation Analysis"
Kent Schneider, Jim Spaulding, and John E. Noakes, University of Georgia
"The Wells Creek Site: An Early Lithis Site in the Southeast"
Don Dragoo, Carnegie Museum
"The Edgefield Scraper: An Early Tool of Infered Antiquity"
James L. Michie, University of South Carolina
"The Cultural Ezcuses for Fiber-Tempered Pottery"
Drexel Peterson, Memphis State University
"Fiber-Tempered Ceramic Fabric and Late Archaic Culture Historical Problems"
Donald Crusoe, University of Georgia
"The Late Archaic Through Early Woodland Periods in West Tennessee"
Gerald P. Smith, Memphis State University
"Empirical and Social Structure at Poverty Point, Northwest Louisiana"
Jon L. Gibson, University of Southwest Louisiana

# ENVIRONMENTAL CHANGE AND PREHISTORIC SETTLEMENT ON THE COAST OF LOUISIANA *

James W. Springer
Northern Illinois University

The study of well dated minor fluctuations in the environment presents a peculiar opportunity for the archaeologist. He can relate his relatively brief cultural-chronological units to comparable time periods defined by natural scientists in such a way that the influence of one class of events upon another becomes apparent. One of the finest opportunities for such research is presented by the Louisiana coast, a 20- to 50-mile-wide zone along the Gulf of Mexico (Fig. 1). The coast is by definition confined to Recent (post-Pleistocene) deposits of rivers, lakes, and the sea. Most of the surface deposits date to the last 4,000 years. The largest part of the coast consists of the delta of the Mississippi River, in which the river breaks up into a series of smaller channels (distributaries or bayous) that follow their own courses to the sea. The delta is bordered by two other divisions of the coast with separate drainages: the Pontchartrain Basin to the north and the marginal plain to the west. The coastal environment is extremely favorable to hunters and gatherers or mixed cultivators, due to the abundance of fish, shellfish, and game, and the long growing season. It is through the study of physiographic features that prehistoric adaptations are most easily understood and environmental changes dated. Among the most important land surfaces used for settlement are natural levees (ridges of high ground bordering the Mississippi River and its distributaries), lake shores, marine beaches (particularly common in the marginal plain), and the contact between the Recent coastal deposits and the Pleistocene Prairie Terrace to the north. Far from being stable, such land surfaces are constantly in the process of being built up of water-lain silt, and altered or destroyed by subsidence or marine transgression. A few hundred years, a very short time by geological standards, is enough for an environmental change at any particular place. While such changes are valuable in explaining human settle-

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* This article is a revised version of the paper read at the 28th Southeastern Archaeological Conference. It is based upon the research carried out for my Ph.D. dissertation at Yale University. I should like to thank Sherwood Gagliano, William G. Haag, and Robert Neuman, all of Louisiana State University, for their help in the field and laboratory work and for their opinions on Louisiana ecology and archaeology. Professor K.S. Chang, Michael D. Coe, and Irving Rouse of the Department of Anthropology, Yale University, provided valuable advice on planning the research and writing the dissertation.

ment, they also are responsible for the burial of some sites. The reader should keep in mind that our knowledge of site distribution is incomplete due to such losses. The present paper will attempt an explanation of this imperfect record by combining geological studies with the results of two recent excavations.

The first site to be considered (Fig. 1) is Bruly St. Martin, a village accompanied by a rectangular platform mound (see Springer 1973 for detailed information on the two excavated sites). Pottery decoration places the site in the Troyville and Coles Creek cultures, and radiocarbon analysis of charcoal provides a date of about A.D. 700.. The site occurs on the natural levee of a bayou that once drained away from the Mississippi River. The excavated remains came from the authors own 10- by 30-foot test trench and a 5-foot square excavated by Mr. Glen Fredlund of Plaquemine, Louisiana. The refuse in the trench extends to a depth of about 4.5 feet below the surface. Toward the bottom, the remains occur as scattered sherds, bones, and shells (occasionally concentrated into lenses) dispersed through the clay of the natural levee. The higher levels contain much more abundant refuse, and suggestions of house and other constructions. The uppermost level, now represented by a plow zone, is particularly rich. The settlement was initially one of small, temporary occupations of perhaps a few weeks duration. The bayou probably was flooding every year, building up the natural levee, but making permanent settlement undesirable. Just after the levee reached its full development, and was no longer being flooded, a sizeable village with a temple mound was constructed. The subsistence at Bruly St. Martin was derived largely from fishing, secondarily from the hunting of mammals. A few wild seeds occurred, but no evidence of domestic plants.

The second site, Pierre Clement (Fig. 1), occurs on a chenier--a former marine beach about 10 miles from the present shore. In this western region of the coast, most sites occur on the cheniers or on lake shores, the surrounding land being marsh. The lowest level of Pierre Clement is a layer of oyster shells, probably dating from the time when the chenier was an active beach (about 800-500 B.C.). The two upper layers have similar remains: brackish-water clam (Rangia) and oyster shells, and pottery similar to that of the Plaquemine culture of the Mississippi Valley. The higher of the two is dated by radiocarbon to about A.D. 1300. The shift from exclusively oyster to predominately Rangia indicates a decrease in salinity as the ocean retreated southward and the nearby lagoon was replaced by the present day Mermentau River. The earliest residents subsisted exclusively upon oysters (at least at this site), while the two later occupations combined mammals and fish with their shellfish.

The second recent body of information which contributes to an understanding of coastal settlement is geological. Figures 2 and 3 contain a map and chronology of delta development, showing five major complex further divided into 17 minor episodes of delta building, all dated by radiocarbon analysis of peat. While any one complex tends to be older or younger than others, the minor episodes overlap. Although delta building was concentrated within one complex for 1,000 or 2,000 years, there were intermittent episodes of building in other areas. At any given time, the flow of the Mississippi might be divided between two or three major distributaries, as indeed it is at the present time. Not only are the landforms dated, but their corresponding environments (vegetation, water salinity, etc.) are as well. For example, a recently built delta has broad and high, well drained natural levees, supporting a willow-hackberry forest with stands of cane, and relatively swift and fresh water (O'Neil 1949: Gagliano and van Beek 1970). Away from the natural levees, or in older deltas, one encounters permanently wet marshes or cypress swamps, with a more brackish-water and a series of lakes and sloughs. If a major channel should be divided into the latter area, as has happened in the Atchafalaya Basin, the swamp-marsh environment is replaced by swift water bordered by rapidly developing natural levees.

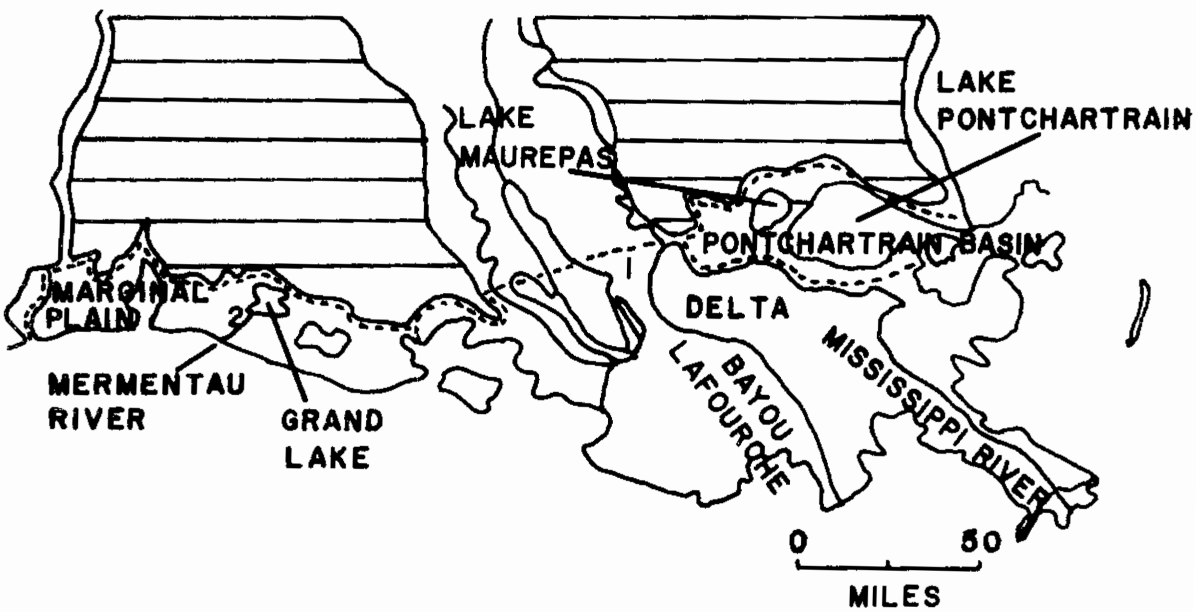


FIGURE I
GEOLOGICAL FEATURES OF SOUTHERN LOUISIANA

PLEISTOCENE UPLANDS
1 BRULY ST. MARTIN SITE
2 PIERRE CLEMENT SITE

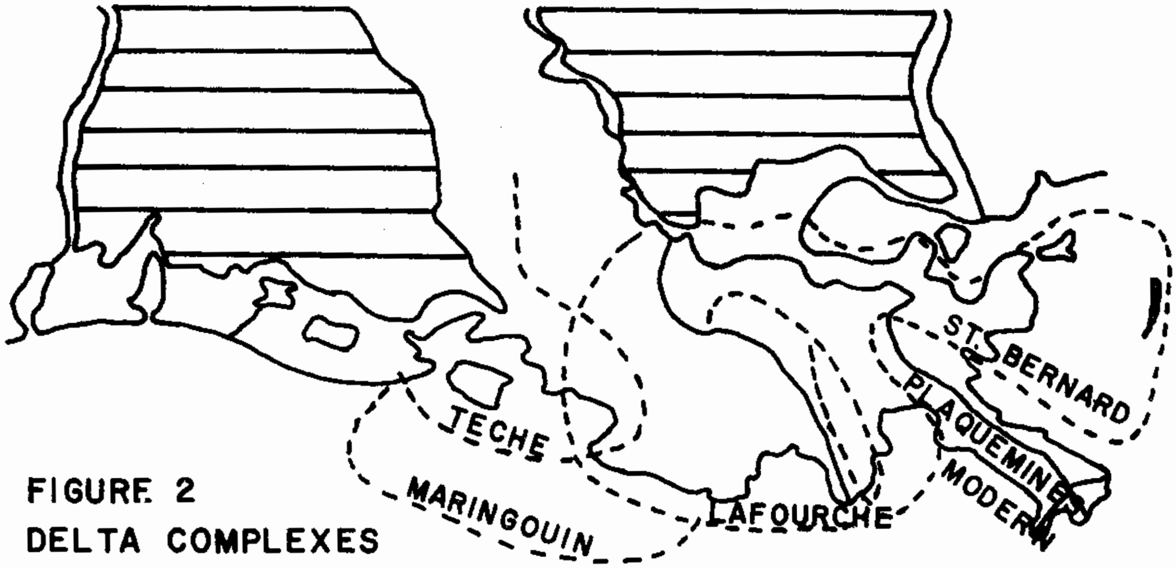


FIGURE 2
DELTA COMPLEXES
REDRAWN FROM FRAZIER 1967, FIG. I

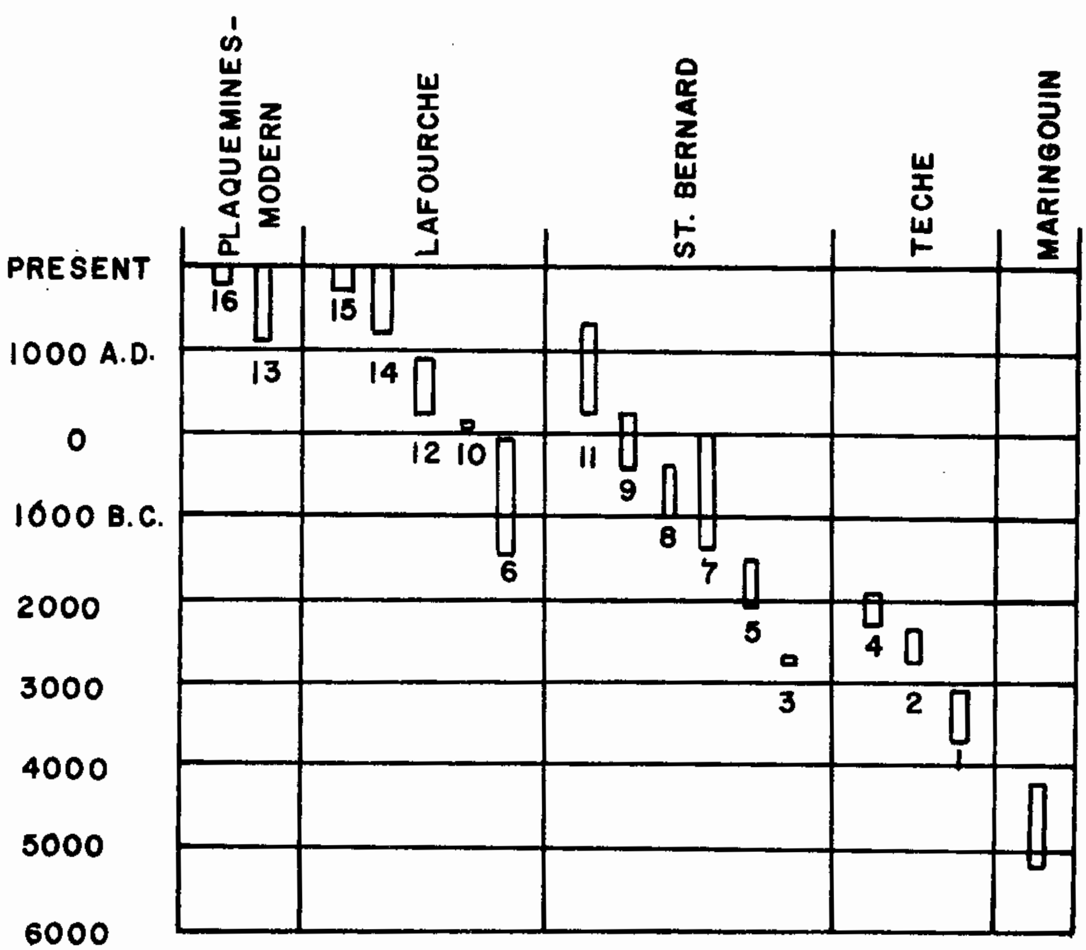


FIGURE 3
DELTA CHRONOLOGY
REDRAWN FROM FRAZIER 1967, FIG. 12

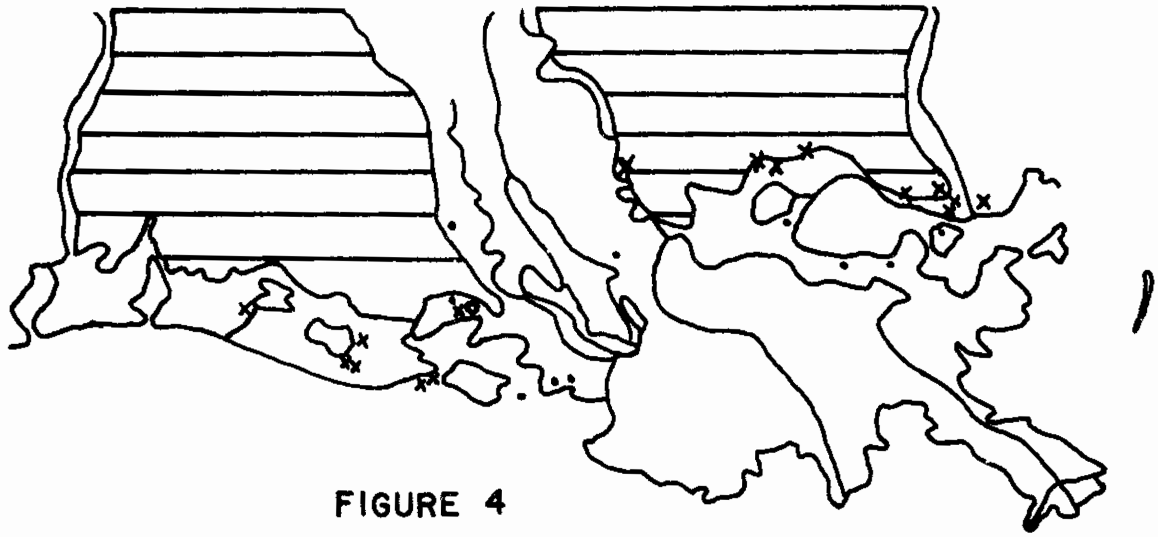

FIGURE 4

PRECERAMIC SITES ON THE LOUISIANA COAST

- • POVERTY POINT SITES
- × ARCHAIC SITES
- ⊙ AVERY ISLAND

FIGURES 4-10 ARE BASED ON MCINTIRE 1958, GAGLIANO 1963, AND SAUCIER 1963.

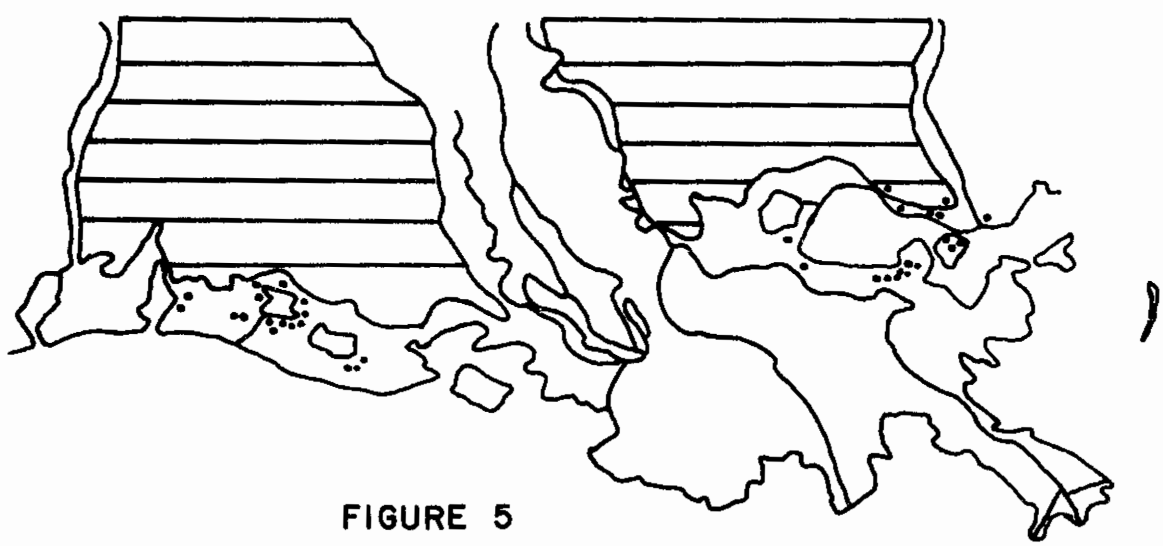

FIGURE 5

TCHEFUNCTE SITES ON THE LOUISIANA COAST

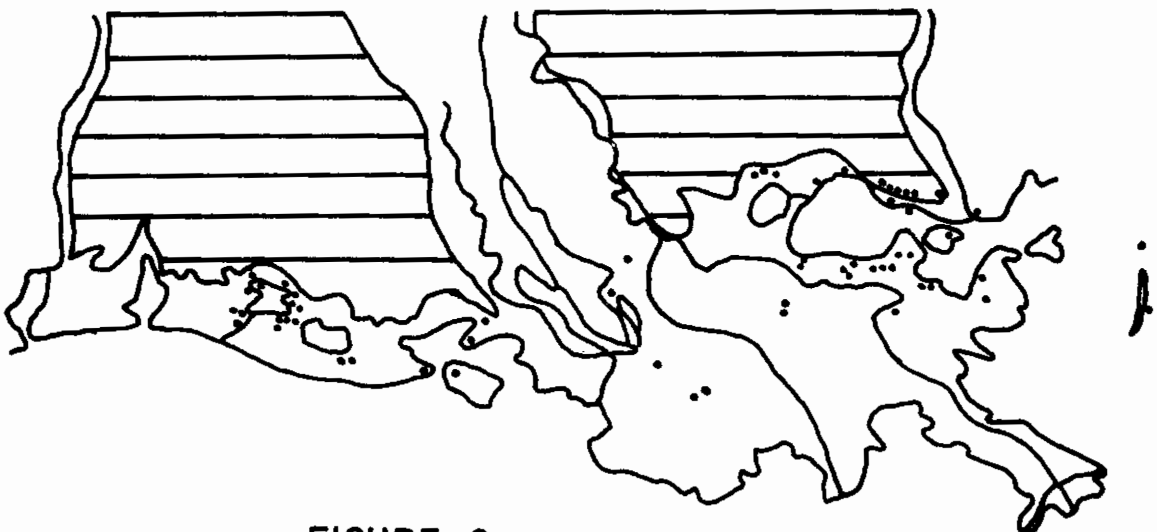

FIGURE 6
MARKSVILLE SITES ON THE LOUISIANA COAST

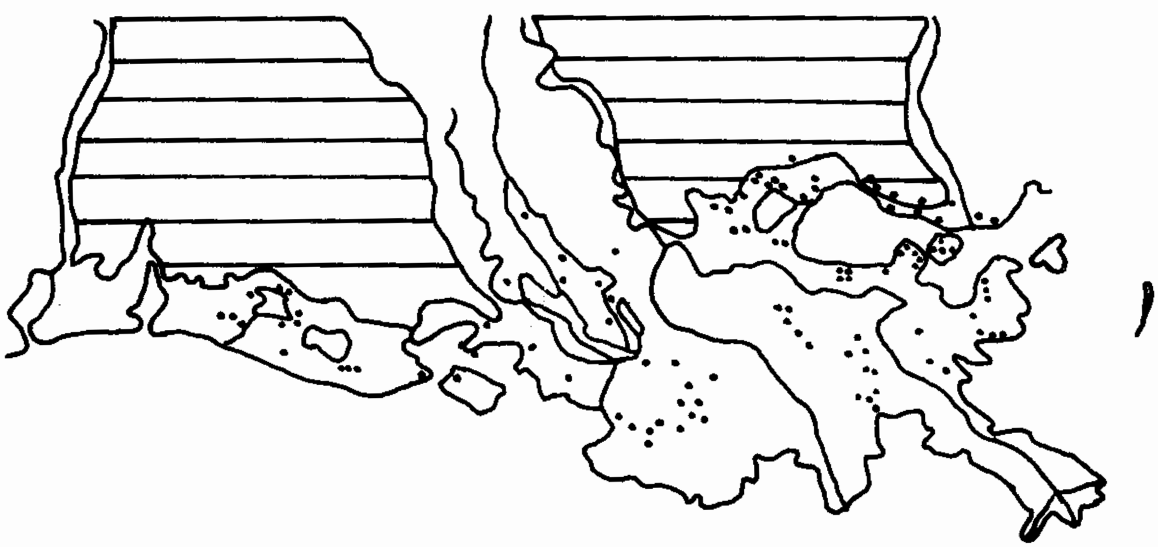

FIGURE 7
TROYVILLE SITES ON THE LOUISIANA COAST

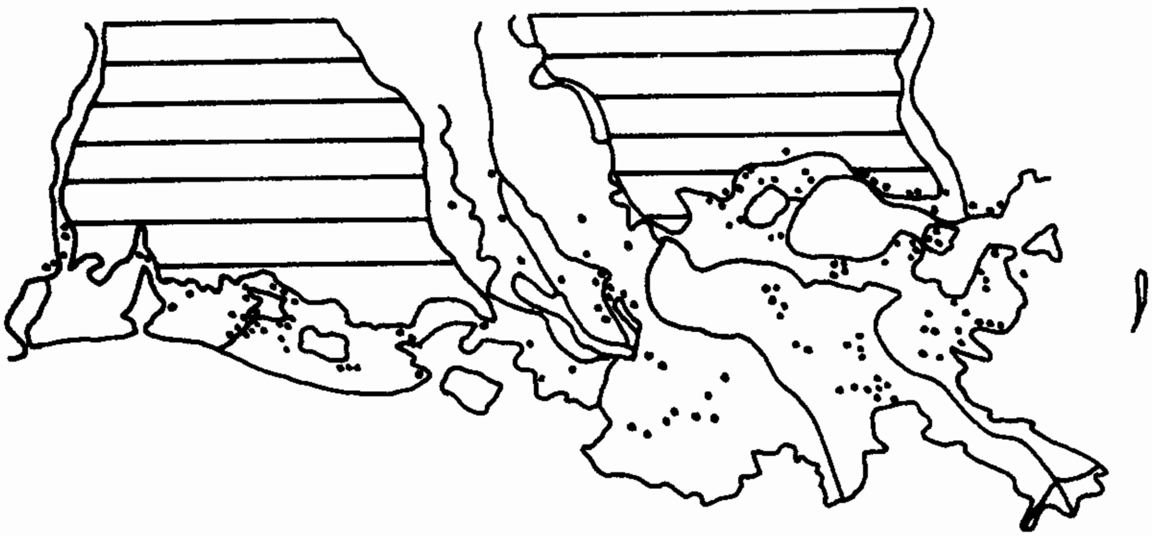

FIGURE 8
COLES CREEK SITES ON THE LOUISIANA COAST

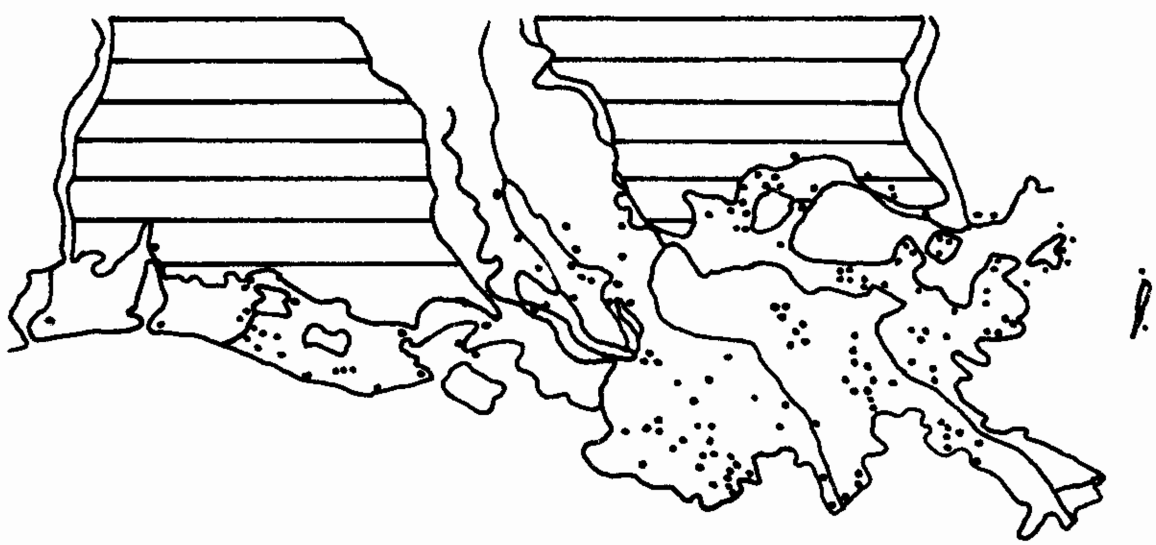

FIGURE 9
PLAQUEMINE SITES ON THE LOUISIANA COAST

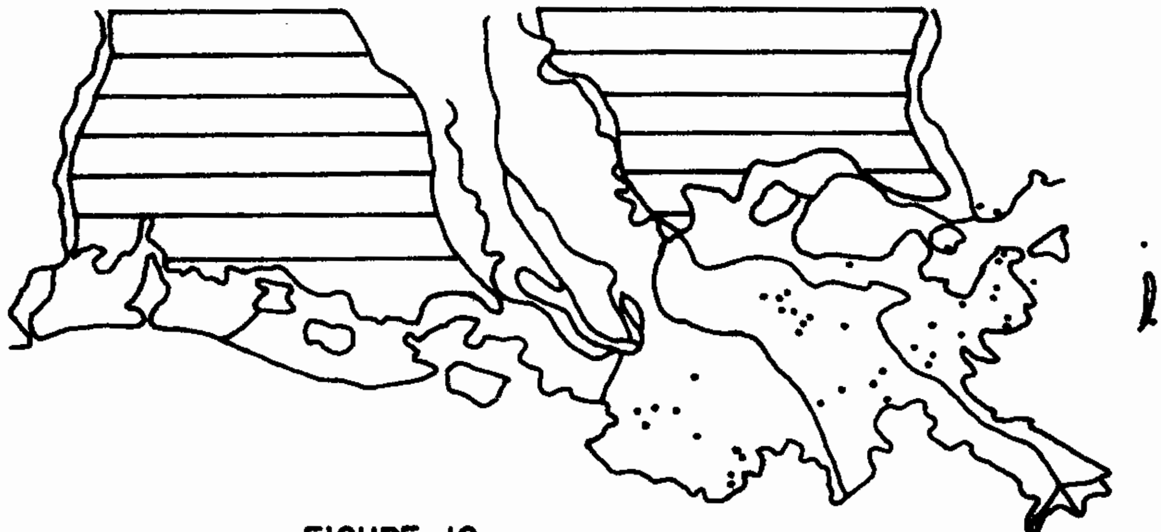

FIGURE 10
MISSISSIPPIAN SITES ON THE LOUISIANA COAST

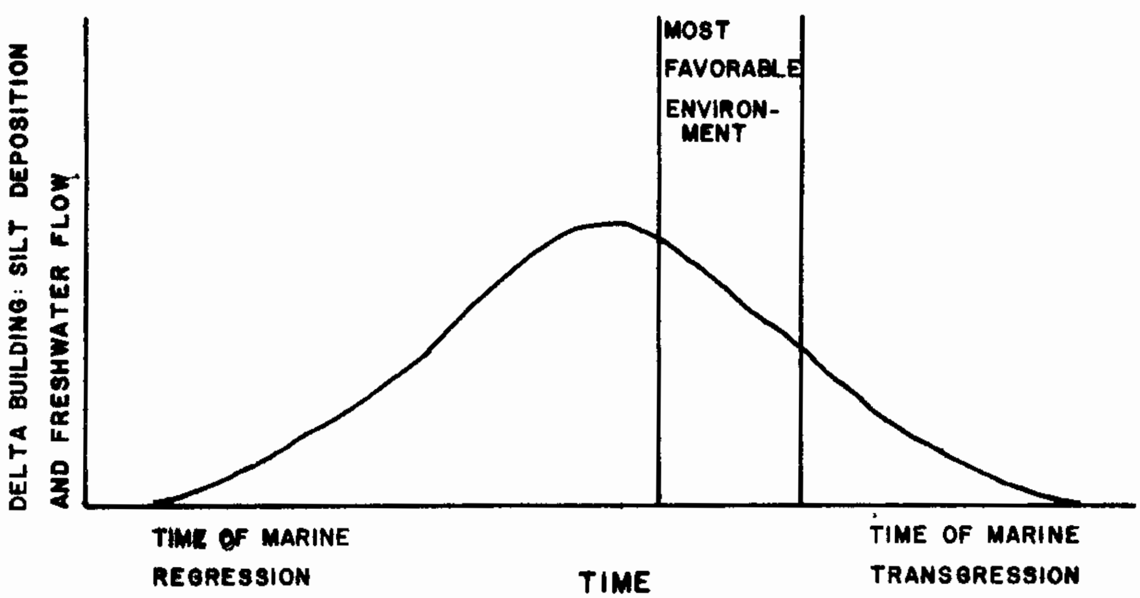


FIGURE 11
DELTA BUILDUP AND DECLINE

In considering the distribution of archaeological sites, it would be well to start with the latest culture, the Plaquemine (ca. A.D. 1300-1750), to minimize the effects of environmental change and burial of sites (Fig. 9). The occupation is spread throughout the coast, with concentrations on several cheniers and delta complexes, as well as around Lakes Maurepas and Pontchartrain. The oldest delta, the Maringouin, was not important for settlement, since it rarely occurs at the surface. The Teche delta complex provides numerous bayous, that are sparsely occupied, while the three most recent deltas are heavily settled. The reader will notice the often linear northwest-southeast dispersion of delta sites, showing concentration along particular channels. However, the two largest channels, Bayou Lafourche and the Mississippi River, support only a few sites, despite their broad natural levees. Much smaller distributaries were favored for settlement. One disadvantage of the larger channels may have been the spring flood--necessary for levee construction--that must inundate the levee in order to build it higher. Since the major channels are long lived, flooding is a chronic problem. Another virtue of the areas remote from major channels is the abundance of sloughs, lakes, and lagoons, that are excellent sources of fish and shellfish. The mixture of brackish and fresh water occurring in these areas is necessary for Rangia clams and oysters, the latter preferring a more saline environment.

Reviewing the archaeological record in chronological order, we must begin with the preceramic sites (Fig. 4), the oldest of which is Avery Island, dating back to 10,000 B.C. (Gagliano 1967; 1970). The environment was then quite different, since the sea level was lower and the present day coast was far inland. Subsistence probably was based on hunting, including extinct Pleistocene animals. In early Recent times (ca. 8000-1000 B.C.), there was a rise of sea level bringing about the inundation of much of the present coast and the creation of beaches and lagoons. The Poverty Point and Archaic cultures probably are of broadly similar age in this region, both dating ca. 2000-500 B.C., with the Archaic sites tending toward the older end of the time span. Saucier (1963: 59) records three Archaic oyster shell middens north of Lake Pontchartrain, and Pierre Clement Level 3 also is an oyster midden. The evidence, scanty though it is, suggests that at this time the local people were still hunting land animals but were beginning a seasonal occupation of the recently built coastlines, relying on oyster for their food. Poverty Point sites, although still marginal to the delta, show a definite progress east and south toward the heart of the coast. The typical delta site locations (natural levees) and economy (Rangia middens with abundant fish and mammals) appear, as do elaborate craft-working and construction of mounds (Gagliano and Saucier 1963; Webb 1968). This is the beginning of the occupation of the fresh and brackish water deltaic environments: an opportunity presented by the stabilization of shore lines and the establishment of a regular regim of river flow and land building.

The Tchefuncte culture, the first with abundant pottery, shows no major changes in site distribution (Fig. 5). Remains are still concentrated to the north (around Lake Pontchartrain) and to the west (around Grand Lake). The Marksville (Fig. 6) and particularly the Troyville (Fig. 7) cultures exhibit a marked increase in delta sites: an extension toward the center of the coast, with the margins still heavily occupied. The lakes and bayous within the present day Atchafalaya Basin begin to be occupied. These trends continue into the Coles Creek (Fig. 8) and Plaquemine (Fig. 9) cultures. The Mississippian culture (Fig. 10) represents a brief occupation of ca. A.D. 1300 along the south and west of the delta, an extension of the Mississippian settlements of the Northwest Coast of Florida.

The preference for locations away from the main channels, which we saw for the Plaquemine culture, is substantiated by the entire archaeological sequence. In addition, we may observe that archaeological sites usually are not contemporary with the delta complex on which they occur, but rather lag several hundred years behind the beginning of land building. This phenomenon had already been noted by Saucier (1963: 75) for sites on the St. Barnard delta in the Pontchartrain Basin. Older deltas may be occupied sporadically even thousands of years after the main channel has shifted elsewhere. These observations suggest adaptation to environmental change on two different scales of magnitude. A developing natural levee was occupied seasonally, as in the lower levels of Bruly St. Martin, but permanent settlement was delayed until the adjacent bayou was no longer flooding. The levee would then be occupied for perhaps 200 or 300 years until subsidence had made the area swampy, whereupon the village would be shifted elsewhere. The process just described occurred over and over on the various bayous of each delta complex, and as the major channels shifted to a new part of the delta, the Indian settlements slowly followed.

In addition to drainage, we must consider another aspect of human adaptation, namely the biological productivity of a delta complex at various stages of its development. The mixture of fresh and salt water allows a particularly rich community to develop. Indeed, such environments are among the most productive natural environments for biomass and energy flow, particularly when only a moderate amount of fresh water is introduced (Odum 1971: 352-362). Therefore, we would expect that the most favorable time for exploiting a delta would be during its declining stage, when the flow of fresh water has decreased enough to permit the beginning of marine transgression and therewith the rich brackish water situation. This preference for occupation of a declining delta may be roughly diagrammed as in Figure 11. Whichever aspect of adaptation we prefer to emphasize, drainage or biological productivity, it is evident that the Louisiana coast is a quite recent phenomenon in the archaeological record. In Poverty Point times, the delta was so poorly developed that only limited areas along its margins were suitable for occupation. Since then, both archaeological and geological evidence indicate that the coast has steadily become more suitable for human settlement.

#

# HOPEWELL ELEMENTS IN THE LOWER VALLEY OF THE LITTLE TENNESSEE RIVER

Jefferson Chapman
University of North Carolina at Chapel Hill*

In a preliminary examination of the material from site 40Mr23 both lithic and ceramic elements of Hopewellian association have been observed. Although the analysis of the site's total assemblage is far from complete, it is important that these previously unrecognized elements in East Tennessee be brought to the attention of those dealing with the Middle Woodland Period in the southeast.

Site 40Mr23 is located on the first terrace of the Little Tennessee River about one mile upstream from Fort Loudoun. The site is within the proposed flood basin of the Tellico Reservoir and was first excavated by the University of Tennessee in May and June of 1969 (Gleeson 1970). Three components are well represented, the earliest being a late Archaic occupation radiocarbon dated at 1170 $\pm$ 140 B.C. (GX-2135). The majority of the material, however, is Woodland, represented by the Candy Creek Complex and Connestee Phase. The third component is Early Mississippian (Hiwassee Island) evidenced primarily by a number of large refuse pits. There also is a small amount of Early Woodland (Watts Bar) and Cherokee material.

Mr. Bennie Keel of the University of North Carolina and Mr. Paul Gleeson at the University of Tennessee suggested that Hopewellian material might be associated with the Connestee Phase on Mr23 as it had been at the Garden Creek Mound number 2. Therefore, Mr23 was chosen as the site for the Webb School of Knoxville Field School in Archaeology in the summer of 1970. The six-week course carried one-half credit and was open to students in grades 10 through 12. The students read Lewis and Kneberg's Tribes That Slumber and C.V. Meighan's Archaeology: An Introduction and paid a tuition to cover transportation, equipment, and my salary. The first summer I had 11 students, many of whom had taken my anthropology course during the school year and were familiar with some of the principles of archaeology.

In the University of Tennessee excavation, the Woodland material had increased towards the northwest end of the excavated area. For this reason we moved downstream and placed four 10- by 10-foot squares further on the terrace and a fifth square much further upstream. The excavation was stratigraphic where possible and by 0.4 foot levels within the strata. All soil from the Woodland zone (0.8-2.0 feet) was sifted through one-half inch mesh. The results were extremely gratifying--first a large lithic and ceramic sample was obtained and secondly, five Flint Ridge blades, two rocker-stamped sherds, and a number of local blades were recovered. The performance of the secondary school students was impressive; their interest and dedication made up for any lack of physical size in digging.

The success of our 1970 season made us return to Mr23 in 1971. Again with 11 students we concentrated entirely on the Woodland zone in a

* Presently at the University of Tennessee, McClung Museum.

20- by 30-foot area. The zone was dug in 0.2 foot cuts by trowel. All soil from each cut was water screened through quarter-inch mesh and then through mosquito netting. Features and postmolds were likewise water screened. Although time consuming, the returns were impressive and, as one might expect, the material to analyze looks overwhelming. The final results of our labors still await analysis of the material, but already it is apparent that considerable amounts of botanical and small bone remains were recovered that would otherwise have been lost. Our goal of a Hopewell sample also was reached and again much of this success was due to the sampling method.

The Hopewell material from these two seasons is manifested in 33 blades or blade fragments of apparent Flint Ridge, Ohio, origin and 15 sherds of the Scioto Tradition-Hopewellian Phase. Of significance, though of local origin, are a number of blades of local flint and considerable amounts of cut and uncut mica.

The Hopewelliam blades are of high quality material exhibiting a considerable color range (Fig. 1). The sides are for the most part parallel and in cross section the blades are prismoidal, having one or two ridges on the dorsal face formed by previous flake scars left during the process of blade manufacture. The longitudinal axis of the complete blade is slightly curved ventrally with a tendency for the curvature to be more pronounced at the distal end. There is a small positive bulb of percussion at the proximal end. Six of the blades and flade fragments show evidence of fire damage. It is difficult to say whether this is intentional or merely a circumstance of their general midden provenience. Thirteen of the blades show use-damage or nibbling on one or both edges and three have been retouched. Of the 27 blade fragments, four are proximal, 11 medial, and 12 distal.

Table 1 compares the distribution of length measurements of complete blades from Mr23, Gordon Creek Mound #2 in North Carolina, the McGraw Site in Ohio, Turner Mounds 1 and 4 in Ohio, and the Snyders Site in Illinois. The classes in millimeters are the same as those used by Oriol. Pi-Sunyer in his comparative work on Hopewell blades (Pi-Sunyer 1965). The small number of complete blades in the Tennessee and North Carolina samples is unfortunate but does show a closer correlation to Ohio blade lengths rather than Illinoisan. A basic division was made in the Tennessee and North Carolina material between Flint Ridge and non-Flint Ridge because it was felt that any comparison made to Ohio or Illinoisian blades should be made in the same or similar lithic material. This would isolate the variable of blade length being determined by the size of available cores, which in the Tennessee material was apparently an important factor. The appearance of 222 prismatic blades of local manufacture (Fig. 3) is certainly significant and may indicate Hopewellian influence, but must be viewed with the same significance as the Flint Ridge material. The non-Flint Ridge blades from Mr23 are significantly shorter and the few core fragments show small and extensively worked samples perhaps indicating the limitations imposed by available material.

Figure 3 is a cumulative graph comparing blade lengths with the sites previously mentioned. Again the Flint Ridge material from Mr23 compares favorably with the Ohio sample and the local blades are significantly shorter.

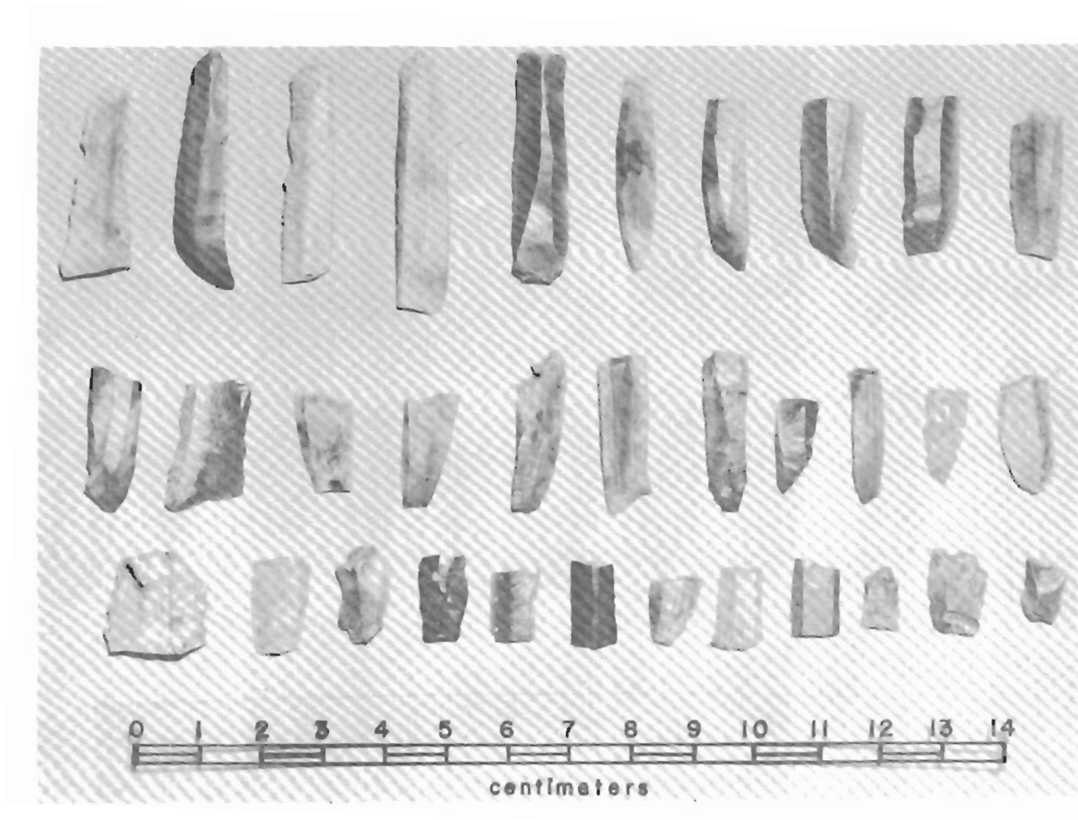


FIGURE 1. Flint Ridge blades and blade fragments.

Table 2 compares the width measurements of blades and blade fragments from Tennessee, North Carolina, Ohio, and Illinois. Here we have a better sample and it is apparent that the Flint Ridge blades from Mr23 and Hw$^{O}$2 are more closely allied with the Ohio samples than the wider Illinoisan type. The local blades are slightly wider but, keeping in mind manufacturing limitations, are closer to the Ohio material than the Illinoisan. This clustering and the significantly greater widths of the Snyders material is well illustrated in the culmulative graph in Figure 4. The mean thickness of the Hopewell blades and blade fragments from Mr23 is 2.0 mm with a range of 0.5 to 4.5 mm--well within the range of the McGraw blades.

The Hopewell blades from Mr23 and Hw$^{O}$2 fit well into the conclusion of Pi-Sunyer that there is ". . .within the Scioto Valley a good deal of homogeneity and there can be no doubt that the Scioto Valley series as a whole is markedly different from the material recovered from the Snyders Site in Illinois" (Pi-Sunyer 1965). That the material from Mr23 and Hw$^{O}$2 shows close relation to the Scioto Valley is evidenced by the blade attri-

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Greg Perino noted after the presentation of this paper that the blades from the Snyders Site manufactured from Flint Ridge material also were shorter and narrower than the other Snyders' blades.

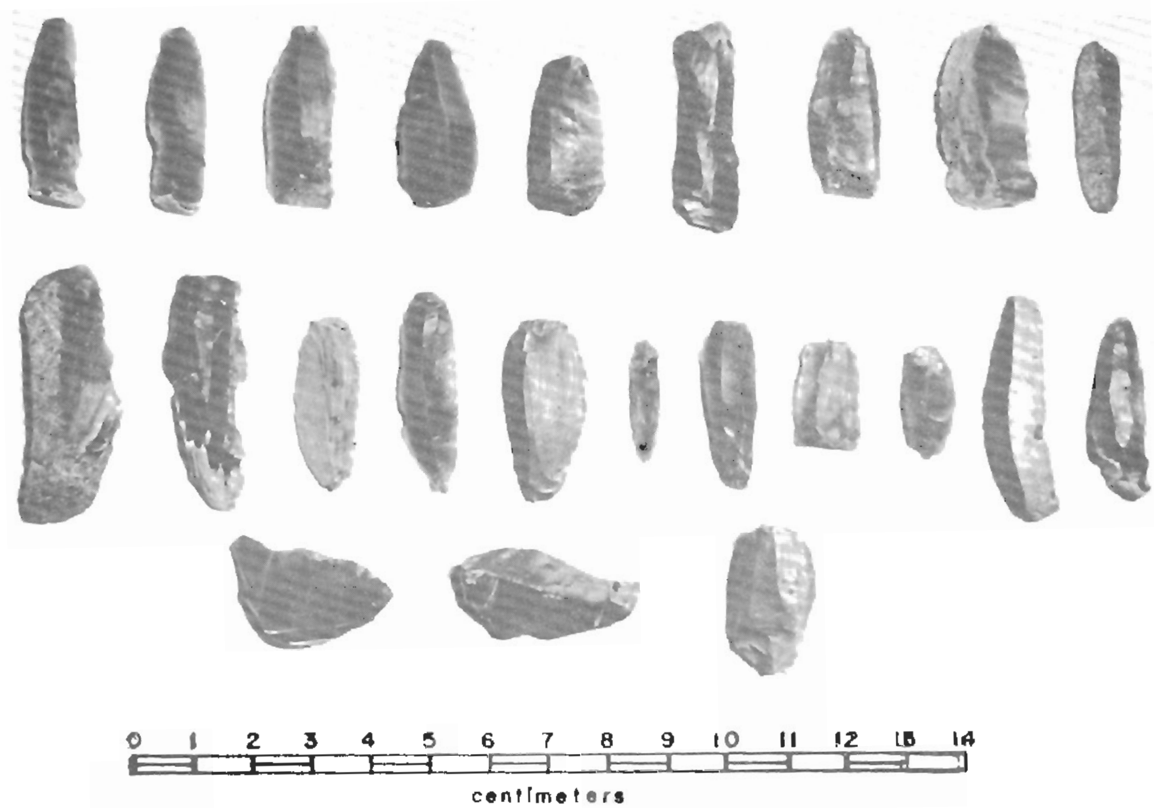


FIGURE 2. (Rows 1 and 2) Prismatic blades of local flints; (Row 3) core fragments.

butes and the Flint Ridge material, and, as will be discussed below, the sherds belonging to the Scioto Tradition-Hopewellian Phase.

Twelve body sherds from Mr 23 conform to the type description of Chillicothe Rocker Stamped, Plain Rocked (Prufer 1965: 29-31). Four of these sherds are illustrated in Figure 5. Seven of the 12 body sherds are grit-tempered, and five show varying amounts of limestone with the grit, one of the latter being predominantly limestone-tempered. Six sherds have an incised line zoning the rocker stamping and six show only a rocker-stamped area. One sherd is apparently from a quadrilobate vessel. The thickness has a range of 3 to 6 mm and a mean of 5 mm; the range is within that defined by Prufer and the Mr23 mean is only 0.9 above that of the type description.

Three rim sherds (Fig. 5) are identified as untyped, Hopewell Rims (Prufer 1965: 31). These are rims with cross-hatched decorations above plain incised lines; no punctate bands were present. Two are grit-tempered and one is tempered with grit and limestone. At least 10 vessels are represented among the total of 15 sherds.

TABLE 1

DISTRIBUTION OF LENGTH MEASUREMENTS OF COMPLETE BLADES

| Classes (mm) | (Flint Ridge) 40Mr23 | $Hw^o2$ | Observed Numbers McGraw | Turner # 1 | Turner # 4 | (Non-Flint Ridge) Snyders | 40Mr23 | $Hw^o2$ |
|---|---|---|---|---|---|---|---|---|
| 10.5-15.0 | | | | | | | 1 | |
| 15.5-20.0 | | | | | | | 6 | 1 |
| 20.5-25.0 | | | 1 | 1 | 1 | | 45 | |
| 25.5-30.0 | | | 10 | 2 | 5 | | 46 | 7 |
| 30.5-35.0 | 2 | 1 | 11 | 4 | 10 | 14 | 23 | 5 |
| 35.5-40.0 | 3 | 1 | 12 | 8 | 18 | 20 | 4 | 6 |
| 40.5-45.0 | | | 10 | 11 | 21 | 43 | 2 | 3 |
| 45.5-50.0 | 1 | 3 | 8 | 8 | 5 | 41 | | 5 |
| 50.5-55.0 | | | 3 | 3 | 4 | 27 | | 4 |
| 55.5-60.0 | | | 4 | 1 | | 27 | 1 | |
| 60.5-65.0 | | 1 | 1 | | | 8 | | |
| 65.5-70.0 | | | | 1 | | 6 | | |
| 70.5-75.0 | | | | 2 | | 4 | | |
| 75.5-80.0 | | | | 2 | | 4 | | |
| Total: | 6 | 6 | 60 | 43 | 64 | 194 | 138 | 31 |
| Mean: | 37 | 45.50 | 39.65 | 45.58 | 39.73 | 48.7 | 26.49 | 38.06 |
| S: | 2.11 | 9.21 | 9.36 | 12.04 | 6.67 | -- | 5.97 | 9.32 |

TABLE 2

DISTRIBUTION OF WIDTH MEASUREMENTS OF BLADES AND BLADE FRAGMENTS

| Classes (mm) | (flint Ridge) 40Mr23 | $Hw^o2$ | Observed Numbers McGraw | Turner # 1 | Turner # 4 | (Non-Flint Ridge) Snyders | 40Mr23 | $Hw^o2$ |
|---|---|---|---|---|---|---|---|---|
| 0.0- 5.0 | 1 | | 2 | | | | 4 | |
| 5.5-10.0 | 29 | 7 | 150 | 19 | 40 | 3 | 121 | 18 |
| 10.5-15.0 | 2 | 12 | 74 | 19 | 22 | 43 | 89 | 34 |
| 15.5-20.0 | 1 | | 5 | 5 | 1 | 86 | 7 | 8 |
| 20.5-25.0 | | | 2 | | 1 | 46 | 1 | |
| 25.5-30.0 | | | | | | 14 | | |
| 30.5-35.0 | | | | | | 2 | | |
| Total: | 33 | 19 | 233 | 43 | 64 | 194 | 222 | 60 |
| Mean: | 8.25 | 10.53 | 9.66 | 11.37 | 10.33 | 18.3 | 10.23 | 11.83 |
| S: | 2.01 | 1.44 | 2.83 | 2.67 | 2.57 | -- | 2.76 | 2.68 |

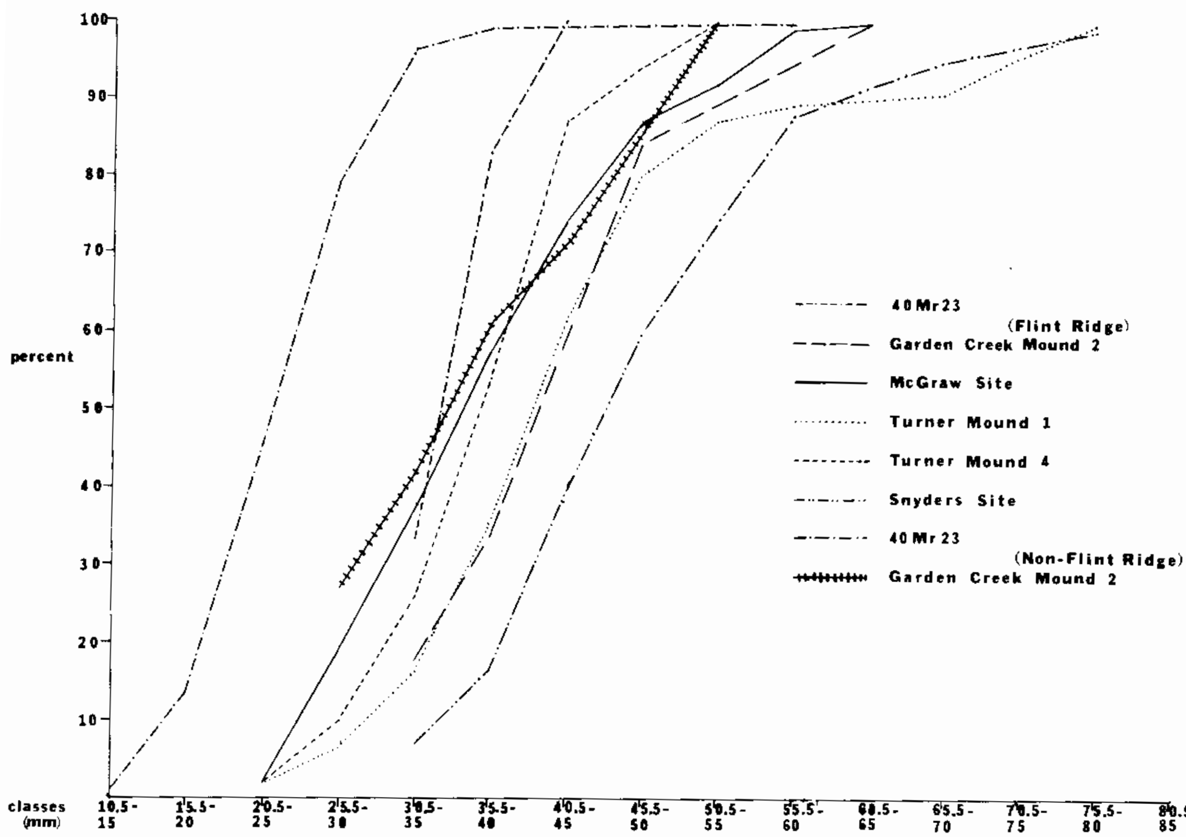


FIGURE 3. Length class distribution of complete blades.

Hw^O^2 also produced a Hopewellian ceramic assemblage in addition to blades. Keel (dissertation in preparation) reports 65 Turner Simple Stamped, 7 Chillicothe Rocker Stamped, Plain Rocked, 22 Chillicothe Rocker Stamped, Dentate Rocked, and three Hopewell Rims. In addition, and lacking at Mr23, 11 fragments of terra cotta figurines were found. Keel (ibid.: 76) notes that some of his sherds classified as Connestee Simple Stamped could have been relegated to the category of Turner Simple Stamped and vice-versa. Such also may be the case at Mr 23. This raises the question of the Ohio "Southeastern Series" and its relationship to the Connestee and Cartersville types.

Mica was fairly commonly distributed throughout the midden. Some samples had cut edges, but most lacked any definite configuration. Similar occurrences of mica, mostly in indefinable shape, are present at the Mandeville Site in Georgia and the McGraw Site.

The context of the Hopewellian elements at Mr 23 is important, especially since their scattered nature and small percentage may have prevented their discovery on other sites of similar composition. There were no apparent concentrations in any area of the excavated squares and mater-

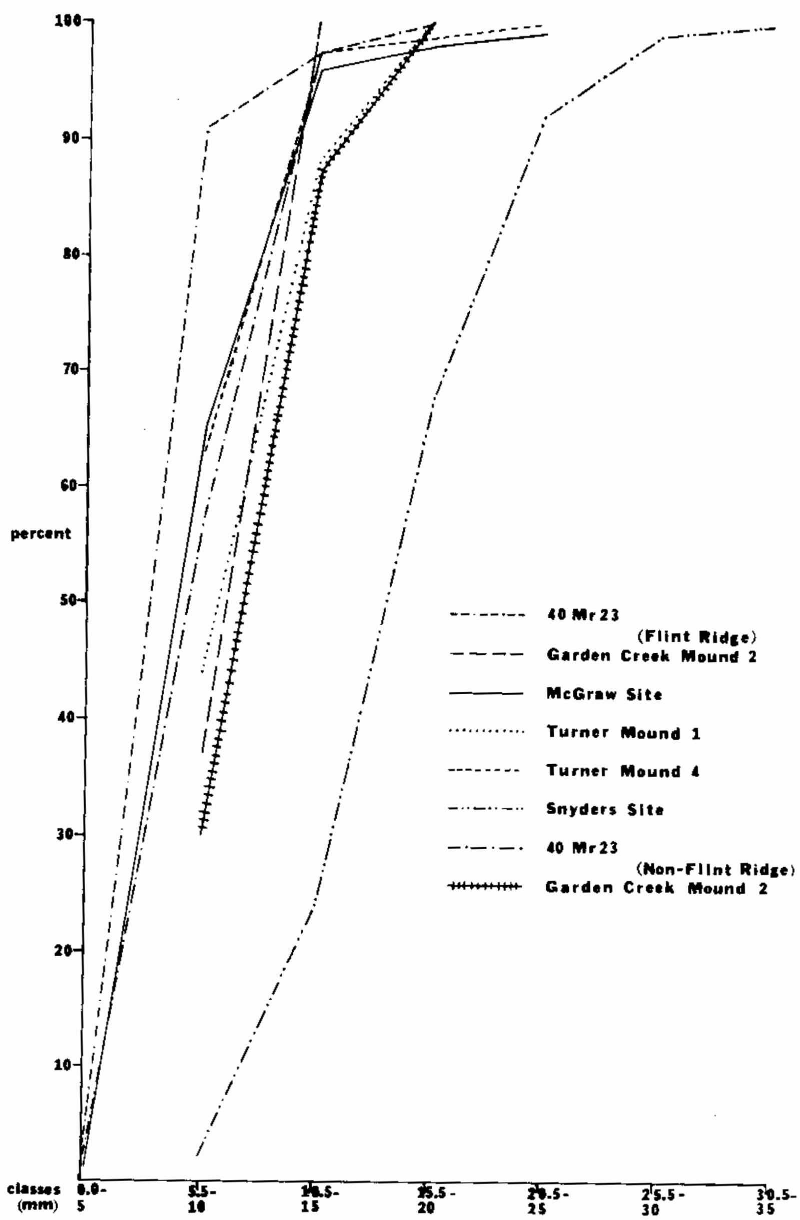


FIGURE 4. Width class distribution of blades and blade fragments.

ial occurred in all levels of the Woodland zone. The greatest percentage, however, was concentrated in the middle 0.4 foot. From our Season I chipped stone sample of 5,615 (which is from dry screening only), 0.1 percent were Flint Ridge blades or blade fragments and only 0.7 percent were local blades. One of the two Chillocothe Rocker Stamped, Plain Rocked, sherds from Season I came from a square with a total count of 1,590. At $Hw^{o}2$, the Hopewell ceramics comprised only 0.3 percent of the over 30,000 sherds. It is apparent, then, that the Hopewell elements are in small percentage and represent exotic elements introduced into a local tradition. This is in agreement with Prufer's conclusion (1965: 130) concerning habitation sites in contrast to burial and ceremonial structures, in that typical Hopewellian traits comprise a very small percentage of the total assemblage.

The local ceramic tradition at Mr 23 into which these Hopewellian traits were introduced is represented by the Candy Creek Complex and the Connestee Phase. These two are apparently contemporary on the site, the sand-tempered ware perhaps indicating some movement of sand-tempered users into the area (Gleeson 1970). The paucity of sand-tempered sherds on other Middle Woodland sites in the Tellico Reservoir would tend to support the uniqueness of this site. Although the ceramic analysis is far from complete, one could take a 10-foot square from our Season I as fairly typical of the ceramic frequencies: 35 percent of the 1,390 sherds were sand-tempered and 60 percent were limestone-tempered; shell and grit composed the other 5 percent.

The sand-tempered ware is almost entirely of the Connestee Phase (Fig. 6). This is represented by a wide simple-stamped, a simple-stamped/brushed, a cord-marked, and a plain ware. The plain neck and rim of the simple-stamped pottery may exagerate the amount of plain ware. Some punctations and incision occur on the necks and tetrapodal bases are present. A small amount of the simple-stamped pottery is tempered with micaceous sand. This also occurs at Hw°2 and makes a lighter sherd in weight, truly unique from the regular sand-tempered ones. Whether these are of local origin or imports needs to be investigated, as does their similarity to micaceous-tempered material from Georgia. Check-stamped ware in the sand-tempered series is certainly less than one percent. In addition to Connestee, a small sample of Swift Creek Complicated Stamped pottery is present (Fig. 6).

Limestone-tempered pottery generally is badly leached. The predominant types here, apparently coeval with the Connestee Phase, are Candy Creek Cord Marked, Bluff Creek Simple Stamped, Wilson Check Stamped, Mulberry Creek Plain, and a small amount of Pickwick Complicated Stamped (Fig. 6).

The chronological placement of the Hopewellian material on Mr23 is fixed by the following dates: 1,365 ± 90 years B.P. or A.D. 585 (GX-2154), obtained by the University of Tennessee from a hearth containing Candy Creek and Connestee pottery, and 1,345 ± 90 years B.P. or A.D. 605 (GX-2487), obtained from a hearth uncovered during Season I. These dates fall in about the middle of the time span of the Connestee Phase (Keel, personal communication), but are late for Hopewell. This raises the question of the range of dates for late Hopewell.

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FIGURE 5. (Row 1) Untyped, Hopewell Rims and (Row 2) Chillicothe Rocker Stamped.

FIGURE 6. (a) Connestee Simple/Stamped/Brushed; (b) Connestee Wide Simple Stamped; (c) shoulder of vessel showing wide simple stamping, punctations, and plain neck; (d) Connestee Cord Marked; (e) Swift Creek Complicated Stamped; (f) Candy Creek Cord Marked; and (g) Mulberry Creek Plain.

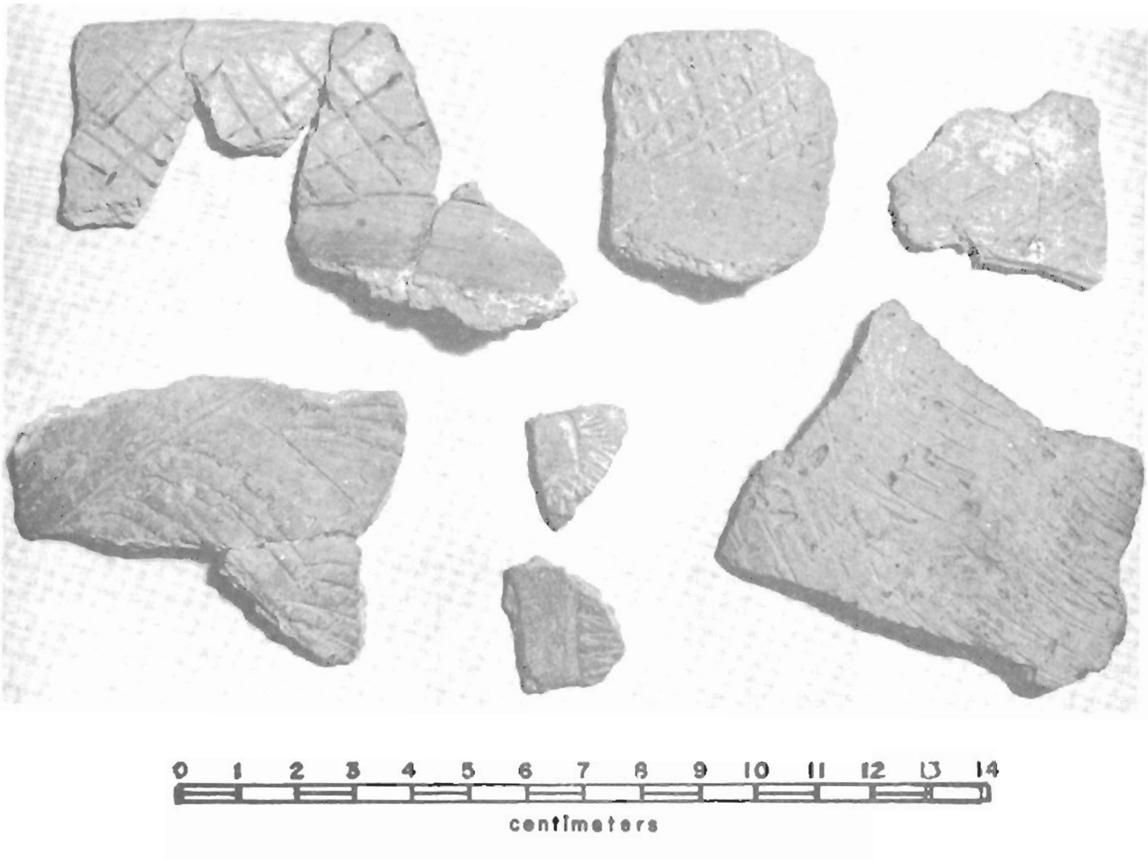


FIGURE 5

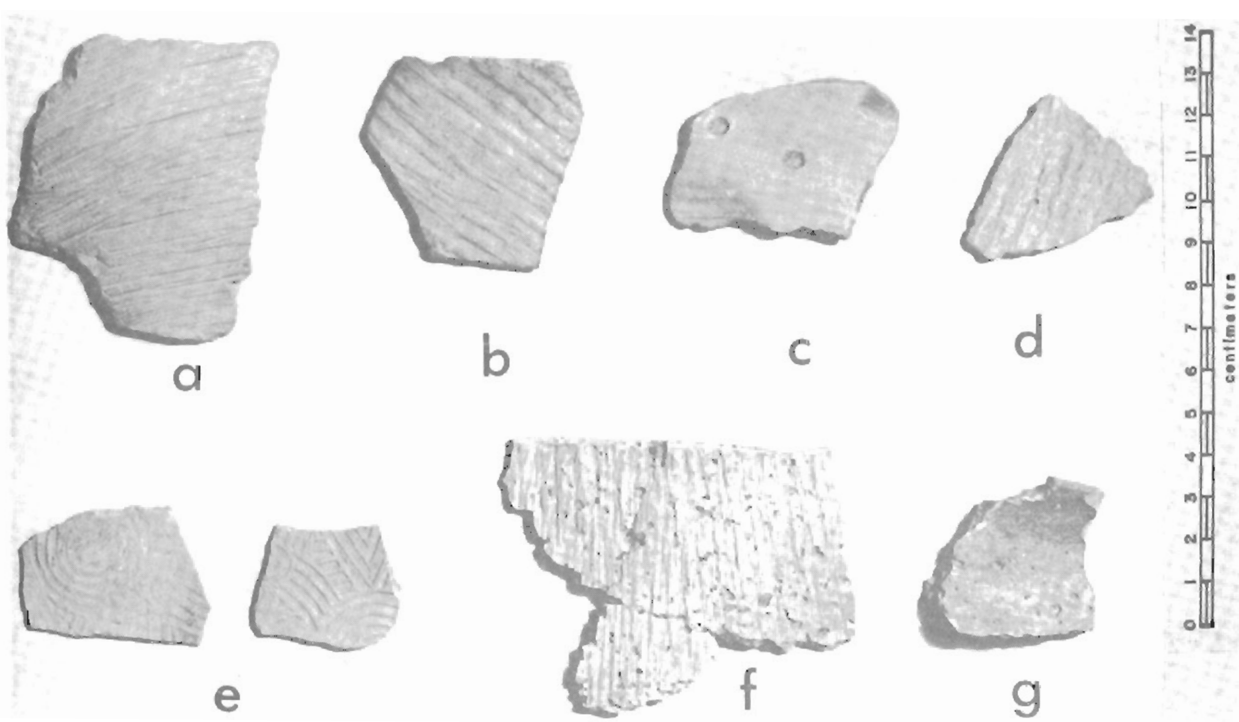


FIGURE 6

Site 40Mr23 must now be added to the roster of sites in the southeast that exhibit Ohio Hopewell elements or influence. Besides the Garden Creek Mound #2 ($Hw^o2$), several other sites in the Appalachian Summit Area have produced evidence of this contact. The Kituhwa Site ($Sw^o2$) and a site near Hendersonville, North Carolina, show Hopewell influence (Keel, personal communication). The Peechtree Site in Cherokee County, North Carolina, produced a "flint flake knife" (Setzler and Jennings 1941: Plate 14, No. 6). A Hopewellian type burial was found by Harrington on Hiwassee Island in Tennessee (Harrington 1922: 116-117, Plate XXXV, Fig. 40). In north Georgia, the Will White Site (Wh29) produced three "micro blades", and the Wilbanks Site (Ck5) produced one core, as did the Long Swamp Site (Ck 1) (Wauchope 1966: 173, Fig. 104). In central Georgia one must add Fu 14, reported in the Atlanta Journal and Constitution Magazine (November 1, 1970), and the Mandeville Site in southwest Georgia (Kellar, Kelly, and McMichael 1962). Further to the south, the Crystal River Complex is quite well known.

In conclusion, it seems that 40Mr23 was participating, as were a number of other sites in the southeast, in the Hopewell Interaction Sphere (Caldwell 1964). Exactly what the nature of the sphere was is not yet known (Struever 1971). Mr23 seems to offer little evidence that the interaction was centered in a religious-mortuary complex as Caldwell preferred, but instead it may be in a sphere that was primarily as economic phenomenon in part involving staple raw material transactions between regional cultures (Winters 1964). It is certainly tempting to see Mr23 and $Hw^o2$ involved as suppliers of mica and Appalachian products in the Hopewellian trade network.

To make further interpretations about Mr23 at this point is premature. Much analysis still needs to be done to fully understand the site. The Hopewell elements certainly raise many questions about the extent of Hopewell influence in the Appalachian Summit Area and the southeast as a whole. The success of water screening of material at this site again points up the importance of this method to the recovery of all available data. Finally, the use of high school students under supervision was most successful and should be considered not only as a potential source of labor, but as an exciting and innovative educational program.

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# THE DEPTFORD PHASE: AN ADAPTATION OF HUNTING-GATHERING BANDS TO THE SOUTHEASTERN COASTAL STRAND*

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The Deptford Phase, an archaeologically-known prehistoric Indian culture, existed along portions of the Gulf and Atlantic coasts of the southeasterm United States from ca. 600 B.C. to as late as A.D. 700 in some localities. With few exceptions--notably Willey (1949), Caldwell (1952; 1958), and Sears (1963)--previous research into the Deptford Phase has centered on the Deptford pottery complex (Caldwell and Waring 1939a; 1939b; Sears and Griffin 1950; Caldwell and McCann 1941; McMichael 1960) and the phase's relative position within the stratigraphic context of other southeastern phases. The Deptford ceramic series is by no means unique, however, and other series similar to the well-known Deptford paddle-malleated ware are found throughout much of the southeast. Prehistorians, having been placed in the position of having almost solely ceramic data with which to work, have incorrectly interpreted the position of Deptford. Wauchope (1966: 48) and Bullen (1961: Fig. 1) have equated the coastal Deptford Phase with the piedmont Cartersville Phase, while Caldwell (1958: 49) has included the Deptford Phase in his southern Appalachian Tradition.

This over-emphasis on ceramic complexes in the interpretation of the Deptford Phase has hindered cultural reconstructions. Consequently, Deptford remains little known, drawing only a paragraph or two in books and articles describing the prehistoric southeast (Willey and Phillips 1958: 119; Willey 1966: 286-287; Ford 1969: 12; Caldwell 1952: 315-316; and Williams 1968).

Cultures, however, consist of elements other than pottery, and it is these criteria that should be employed in ordering and describing cultural units. In this paper, the Deptford Phase and the Coastal Tradition, of which it is a part, are defined on the basis of the following:

- settlement patterning (site locations within the natural environment, see Chang 1968);
- subsistence activities, including specialized adjustments to the natural environment;
- adjustments to the cultural environment, i.e. to other phases;
- archaeologically derived traits, both those directly derived from archaeological excavations (such as community patterning, household patterning, architecture, trade activity, burial complex, and the pottery, lithic, bone, and shell complexes) and those

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* The conclusions presented here were taken from the author's dissertation (Milanich 1971). Research for the project was carried out under a National Science Foundation grant (GS-3105).

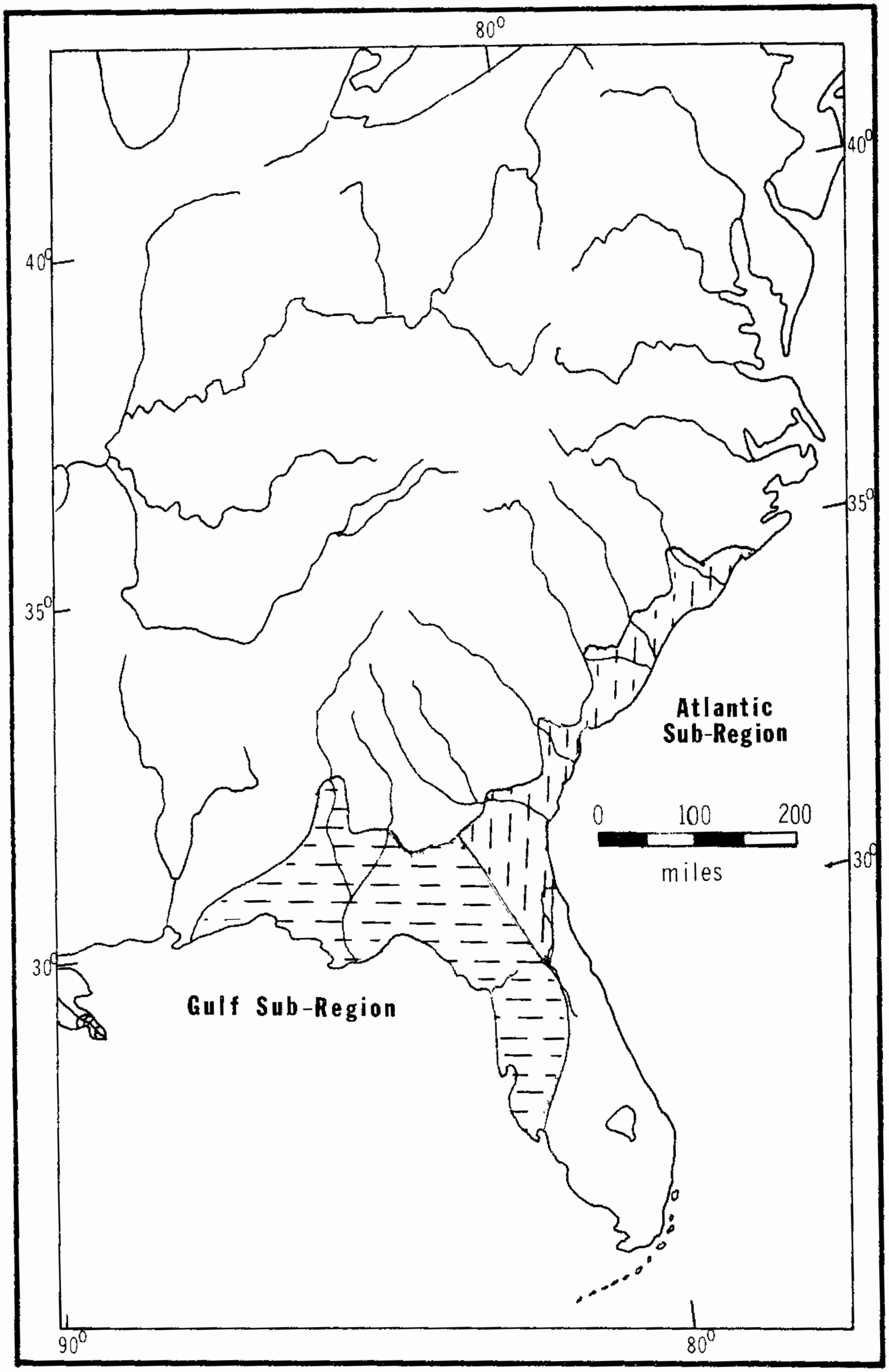


FIGURE 1. Deptford Region.

traits derived through inference (such as social organization, demography, and ceremonials).

The Deptford Phase, stretching southward along the Atlantic coast from Cape Fear, North Carolina, to Jacksonville, Florida, and along the Gulf Coast from the Alabama-Florida line to Charlotte Harbor, Florida (see Fig. 1), is part of a Coastal Tradition, a "distinctive way of life" (Coggin 1949: 17) present along the southeastern coasts from as early as 2000 B.C. Unfortunately, the other phases comprising this tradition also are poorly known, preventing a thorough description of the tradition's development. The Coastal Tradition phases are the Sapelo Phase, associated with the shell-ring sites of Georgia and South Carolina (Waring and Larson 1968; Hemmings 1970); the St. Simons Phase of coastal Georgia (Waring 1968); the Norwood Phase described by Phelps (1965; 1966) for western Florida; the Deptford Phase; and the Wilmington Phase (Caldwell 1952; 1958). The latter phase, now thought to have begun about A.D. 700 (Caldwell 1970), is transitional from the Coastal Tradition into the horticultural, Mississippian-influenced Savannah and Irene Phases on the Georgia coast. Stoltman (1969) has discussed the likelihood of slash and burn horticulture being present in the late Wilmington Phase at non-coastal sites.

On the Gulf coast, the Deptford Phase developed into the horticultural Gulf Tradition, beginning as early as 200 B.C. This separate evolution of the Deptford Phase in the Gulf and Atlantic sub-regions (see Fig. 1) was at least partially the result of different cultural environments, especially the location of the Gulf sub-region as a cultural contact area for the Poverty Point, Tchefuncte, Bayou LaBatre, Adena, and Hopewell Phases and, perhaps, the culture(s) of the Okeechobee Basin Big Circle sites (Allen 1949).

The Southeastern Coastal Tradition subsistence pattern is characterized by exploitation of the coastal strand, including the ocean, beach, live oak forest, lagoon, and marsh biotopes, and of the rivers and river valleys of the coastal plain pine forests (see Fig. 2). Analysis of faunal remains from Sapelo, Norwood, and Deptford Phase sites shows that the same animal species were utilized for food (Phelps 1966; Waring and Larson 1968; Hemmings 1970; Milanich 1971). The Coastal Tradition peoples seem to have occasionally entered the pine forests to collect specialized non-coastal resources, such as nuts, berries, and fresh-water fish, from the rivers and river valleys. As Larson (1969) has pointed out, in his study of late prehistoric subsistence on the southeastern coastal plain, the pine forests themselves contain insufficient resources to support a year-round hunting-gathering population. Thus the pine forests of the coastal plain served as a subsiderary food source as well as a buffer zone between the coastal cultures and those of the piedmont.

The Coastal tradition is differentiated from the contemporary Savannah River Tradition (Fairbanks 1942) and from as undescribed St. Johns Region Tradition. The Savannah River Tradition, composed of the Stallings, Bilbo, and Thom's Creek Phases, was adjusted to utilization of the rivers and forests of the piedmont, Probably seasonal exploitation of the pine forests of the coastal plain was practiced. The St. John's area cultures, including the Archaic, Orange, and St. John's I Phases, occupied the Florida Atlantic coastal strand, especially along the fresh water rivers, primarily the St. Johns. Coastal sites do occur where marshes are present.

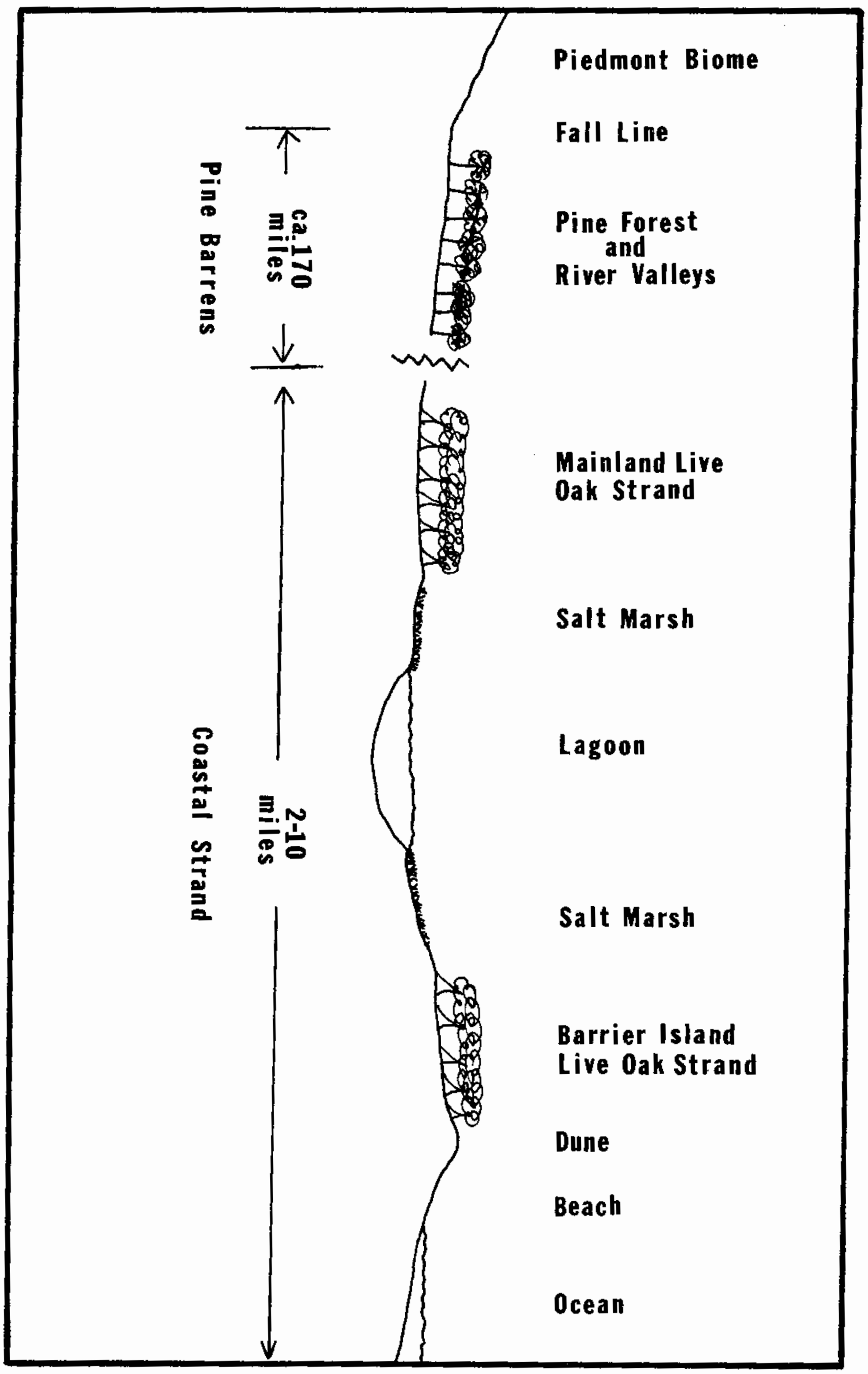


FIGURE 2. Southeastern Coastal Plain Schematic Cross-section.

However, due to a lack of separate barrier islands and silt-carrying streams emptying into the Atlantic, the vast coastal marshes associated with the Coastal Tradition are not present. Site distribution suggests that these St. Johns "tradition" people spent a large portion of the year along the rivers of the Florida central highlands. More research is needed before more detailed comparisons can be made. Table 1 presents radiocarbon dates for the Coastal Tradition and the Savannah River Tradition. References for the dates are presented in Table 2.

TABLE 1. CHRONOLOGY

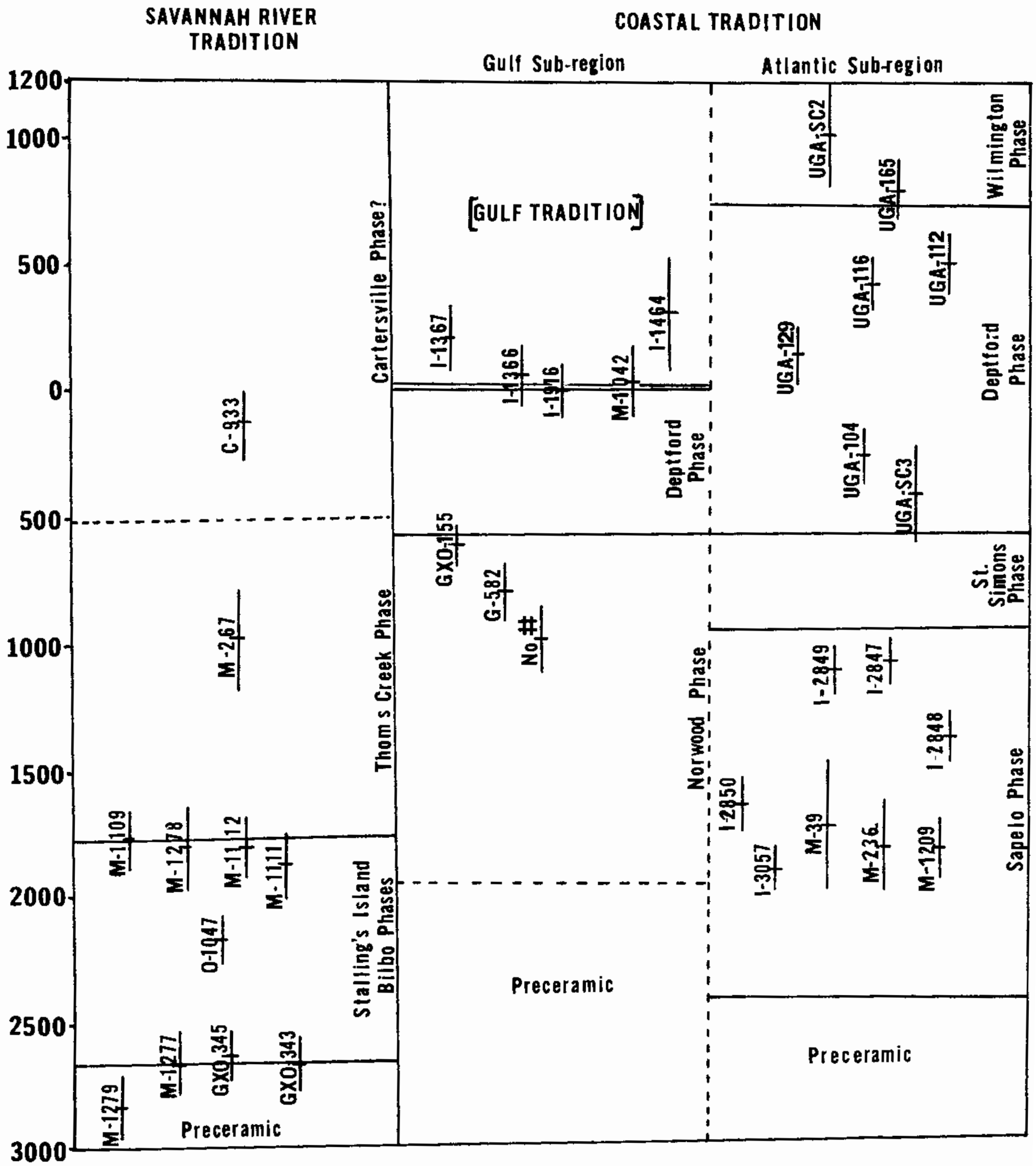

TABLE 2. RADIOCARBON DATA REFERENCE AND PROVENIENCE

| Sample | Date | | Site | Component | Reference |
|---|---|---|---|---|---|
| | | | Savannah River Tradition | | |
| C-933 | 154 B.C. | (140) | 9 Hl 64 | Cartersville | RCA 1958 |
| M-267 | 970 B.C. | (200) | Refuge | Refuge | RCA 1958 |
| M-1278 | 1780 B.C. | (150) | Stallings | Stallings | RC 1965: 135 |
| M-1109 | 1750 B.C. | (125) | Bilbo | Bilbo | RC 1963: 239 |
| M-1111 | 1870 B.C. | (125) | Bilbo | Bilbo | RC 1963: 239-240 |
| M-1112 | 1780 B.C. | (125) | Bilbo | Bilbo | RC 1963: 239-240 |
| O-1047 | 2175 B.C. | (115) | Stallings | Stallings | Bullen 1961: 104 |
| *M-1277 | 2500 B.C. | (150) | Stallings | Stallings | RC 1965: 134 |
| *M-1279 | 2750 B.C | (150) | Stallings | Stallings | RC 1965: 134 |
| GXO-343 | 2500 B.C. | (135) | Rabbit Mound | Stallings | Stoltman 1966:872 |
| GXO-345 | 2515 B.C. | ( 95) | Rabbit Mound | Stallings | Stoltman 1966:872 |
| | | | Coastal Tradition | | |
| **UGA-SC2 | A.D. 905 | (200) | Seaside 2 | Wilmington | Caldwell 1970 |
| **UGA-105 | A.D. 735 | (115) | Seaside 3 | Wilmington | Caldwell 1970 |
| **UGA-116 | A.D. 490 | ( 90) | Wamassee B | Deptford | Caldwell 1970 |
| **UGA-112 | A.D. 520 | (125) | Seaside Md I | Deptford | Caldwell 1970 |
| UGA-129 | A.D. 55 | ( 95) | Table Point | Deptford | This paper |
| ***I-1366 | A.D. 80 | (130) | Crystal River | Deptford | Ford 1969: 29 |
| ***I-1367 | A.D. 200 | (130) | Crystal River | Deptford | Ford 1969: 29 |
| ***I-1916 | 30 B.C. | (100) | Crystal River | Deptford | Ford 1969: 29 |
| ***I-1464 | A.D. 350 | (210) | Crystal River | Deptford | Ford 1969: 29 |
| M-1042 | A.D. 1 | (150) | Mandeville A | Deptford | Kellar et.al. n.d. |
| **UGA-104 | 270 B.C. | (100) | Seaside Md I | Deptford | Caldwell 1970 |
| **UGA-SC3 | 400 B.C. | (220) | Seaside Md I | Deptford | Caldwell 1970 |
| GXO-155 | 625 B.C. | ( 80) | Alligator Lake | Deptford | RC 1965 |
| No # | 1012 B.C. | (120) | Tucker | Norwood | Phelps 1966 |
| I-2850 | 1635 B.C. | (115) | Hilton Head | Sapelo | Calmes 1968 |
| I-2849 | 1170 B.C. | (110) | Hilton Head | Sapelo | Calmes 1968 |
| I-3047 | 1940 B.C. | (110) | Hilton Head | Sapelo | Calmes 1968 |
| I-2848 | 1450 B.C. | (110) | Hilton Head | Sapelo | Calmes 1968 |
| I-2847 | 1160 B.C. | (110) | Hilton Head | Sapelo | Calmes 1968 |
| M-39 | 1750 B.C. | (250) | Sapelo Island | Sapelo | RCA 1958 |
| M-236 | 1820 B.C. | (200) | Dulany | Sapelo | RCA 1958 |
| M-1209 | 1820 B.C. | (130) | Yough Hall | Sapelo | RC 1964: 6-10 |

Number in parentheses is one standard deviation.

* Preceramic component
** St. Catherine's Island
*** Yent Complex

Although the Deptford Phase is quite similar in some ways to the other phases of the Coastal Tradition, differences between the phases do exist and are largely the result of the different intensity of external cultural influences on the phase. Certainly other reasons can be supplied with more research. It is obvious, however, that the Deptford Phase is a period of transition, a change from band hunting and gathering to the more complex societies associated with the later horticultural villages that occur in the Gulf Tradition and the Savannah-Irene sequence.

The following description of Deptford traits relies heavily on the information derived from the excavation of Deptford components at a number of sites, including: Deptford (Caldwell 1952; Caldwell and McCann 1941), two sites on Cumberland Island, Georgia (Milanich 1971), Mandeville (Kellar, Kelly, and McMichael, n.d.; 1962), Sunday Bluff in central Florida (Bullen 1969), and the Tucker (Sears 1963) and Garden Patch (Thompson n.d.) sites in west Florida.

Deptford sites occur in two natural settings. The first is within the live oak forest, either on the offshore barrier islands or on the mainland itself (see Fig. 2). Always these sites are adjacent to the salt marsh and close to the lagoon. The salt marsh starts the coastal food chain. Many species of animals--especially fish, clams, oysters, and shrimp--spawn, grow, and feed there. Other animals utilized by the coastal Deptford populations fed directly or indirectly through the marsh. The marsh, then, was the primary source of food. Smaller Deptford sites are found back from the coast within the river valleys, a distance from the coast of anywhere from a few miles to 40 miles, with Mamdeville being 125 miles inland. Most of these non-coastal sites, however, could be reached in one to three days walking time from the coast.

The river valley sites are within the river valley proper rather than on high ground overlooking the river, suggesting that they were not the type of camp often associated with hunting bands. In the case of both coastal and non-coastal sites, their location is on an ecotone, allowing utilization of multiple biotopes.

Perhaps the best explanation for the two types of site locations is that Deptford bands occasionally traveled inland to gather nuts and berries and, perhaps, to fish. Trade with the piedmont cultures would have been highly likely at this time.

Deptford sites seem to increase in horizontal size through time. Probably this is partially the result of the change in social organization--from camp sites associated with patrilocal bands to small villages occupied by related kin-groups, most likely rudimentary clans.

Excavations and surveys on Cumberland Island, Georgia (Milanich 1971), have yielded the following information on Deptford household and demography: (1) the earlier Deptford camp sites seem to have been composed of five to ten house structures, while the later villages probably contained 10 to 25 structures; (2) houses within the community were spread lineally along the marsh or lagoon rather than being in a curve; (3) both substantial structures with vertical wall posts anchored in shell-filled wall trenches and open chickee-like structures were present; the latter may have been summer sleeping porches or open work areas (a portion of a shell-filled trench also was excavated by Bullen at Sunday Bluff, 1969); (4) the presence of substantial houses suggests central-based nomadism with the site's occupants returning to occupy the same houses year after year (Beardsley et. al., 1956: 138-140); (5) house size indicates nuclear families of five to six persons; and (6) camps and villages were spaced along the coast about every eight to ten miles (based on surface information from Cumberland Island and the Florida Gulf Coast). From this information a very rough population estimate of 4.6 persons per linear coastal mile can be postulated for the Deptford region during the early portion of the phase (i.e., 7.5 structures/camp x 5.5 persons/structure divided by 9 miles). Because the Deptford population was centered on the narrow coast it is more meaningful to speak of population ratio per linear coastal mile that per square miles of the total Deptford region. The total coastline of the Deptford region is ca. 1,185 miles in length, yielding a rough total population estimate of 5,451 persons (i.e., 4.6 persons x 1,185 miles). Admittedly such an estimate is based on scanty evidence; however, even if this figure were doubled the population density of the Deptford hunters and gatherers would still be much less than one per mile. This is the same as the "less than one per square mile" figure given by Steward (1955: 40) based on ethnographic evidence from bands.

The animals caught or hunted by the Deptford people are the same as those that inhabit the coastal and river valley biotopes today. Perhaps the only exception is a species of seal identified from excavations on Cumberland Island and thought to be the West Indian seal, Monacus tropicalis. A complete list of identified food remains from Deptford sites is given in Table 3*.

Net and basketry impressions on Deptford pots suggest that nets and weirs could have been available for fishing. The atlatl also was present as a part of the Deptford tool kits, as evidenced by heavy stemmed, triangular points and bannerstone fragments. The small triangular points that appear later in the phase probably are indicative of bow and arrow useage. A complete list of known Deptford traits is given in Table 4, organized by complexes and activities.

The presence of a Deptford shell and dirt ring on Cumberland Island (Milanich 1971) and burial mounds on St. Catherine's Island, Georgia (Caldwell 1970), tend to confirm the assumption that more complex social forms developed late in the Deptford Phase, by ca. A.D. 500. Such development occurred earlier in the Gulf sub-region where the Deptford Phase was the cultural and population base for the Yent ceremonial complex of the Gulf Tradition (Sears 1962). Mandeville, Crystal River, Garden Patch, and other west Florida sites clearly demonstrate the Deptford-Gulf Tradition continuum. Such forms of ceremonalism as are found late in the Deptford Phase (burial mounds, rings, etc.) are generally thought to have been associated with a higher level of social organization than simple patrilocal bands.

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* Faunal remains from the Cumberland Island sites (Table Point and Stafford North) were identified by Curtiss A. Peterson, Department of Anthropology, University of Florida. Elizabeth Wing, Florida State Museum, identified the Tucker Site material. Dr. Wing's research was supported by the National Science Foundation.

In summary, the Deptford Phase was a unique culture within the Coastal Tradition. Contact with other southeastern phases and, perhaps, response to internal cultural perogatives for change led to the evolution of the hunting and gathering Deptford bands into larger village-type groupings, possibly with rudimentary clans.

The Deptford Phase was a coastal culture and should not be equated with other phases that display a few similar traits, but which occupy very different natural environments and maintain different adjustments to their environments. When the criteria used to define and describe phases is expanded to include the type of traits used in this interpretation, the uniqueness of specific southeastern phases and the relatedness of sequencial phases both become more readily apparent. Such clarity is needed if we are to produce an anthropologically oriented interpretation of southeastern prehistory.

TABLE 3. IDENTIFIED FLORAL AND FAUNAL SPECIES FROM DEPTFORD SITES AND PERCENTAGE OF MINIMUM NUMBER OF INDIVIDUALS FROM CUMBERLAND ISLAND SITES (SHELLFISH NOT INCLUDED)

MAMMALS

Didelphis marsupalis (0.7)
opossum 1,3,6
Geomys cf. cumberlandius (0.7)
pocket gopher 1
Geomys pinetis
pocket gopher 6
Procyon lotor (14.3)
raccoon 1,2,3
Cetacean (1.4)
whale or porpoise 1,2,3
Odocoileus virginianus (27.8)
deer 1,2,3,4,5,6
cf. Monacus tropicalis (1.4)
West Indian seal 1
unidentified bear 4
unidentified elk 4
Lutra canadensis
otter 3
Sylvilagus sp.
rabbit 3
Lynx rufus
bobcat 3
Felis concolor
panther 3

REPTILES

unidentified turthe 5
Deirochelys reticularia (0.7)
chicken turthe 1,3,6
Sternotherus sp. (0.7)
muck turtle 1
Gopherus polyphemus (1.4)
gopher tortoise 1,6
Malaclemys terrapin (15.7)
diamond back terrapin 1,2,3
Cheloniidae (1.4)
sea turtle 1,3,6
Chrysemys sp. (0.7)
slider turtle 1,6
Trionyx ferox (0.7)
soft-shelled turtle 1,6
Terrapene carolina (2.1)
box turtle 1,3
Antistrodon sp.
water moccasin 3
Alligator mississipiensis
alligator 3,6
Kinosteridae
mud turtle 3
Chelydra sp.
snapping turtle 3

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1--Table Point; 2--Stafford North; 3--Garden Patch; 4--Mandeville; 5--Sunday Bluff; 6--Tucker. Number in parentheses represents percentage of individuals of each species based on faunal remains from two Cumberland Island sites (140 total individuals). Mandeville (4) and Sunday Bluff (5) are non-coastal sites; other are coastal. Chart based on Milanich 1971.

REPTILES (continued)

Siren lacertina
mud eel 3

FISH

Carcharhinidae (4.2)
requien shark 1,2
Galeocerdo cuvier (0.7)
tiger shark 1
Sphyrnidae (1.4)
hammerhead shark 1,2
Myliobatidae (2.8)
eagle ray 1
Ariidae (2.1)
sea carfish 1,3
Barge marinus (3.5)
gafftopsail catfish 1,2,3
Arius felis (4.2)
channel catfish 1,2,3,6
Pogonias cromis (2.8)
drum 1,3,6
Sciaenops ocellata (3.5)
channel bass 1,3
Archosargus sp. (2.1)
sheepshead 1,2,3,6
Dasyatidae (0.7)
sting ray 1
Lepisosteus sp.
garfish 3
Unidentified shark 3
Centropomus sp.
snook 3
Lutjanus sp.
snapper 3
Caranx sp.
jack 3,6
Cynoscion sp.
spotted sea trout 3
Chaetodipterus faber
Atlantic spadefish 3
Mugil sp.
mullet 3
Paralichtys sp.
flounder 3
Diodontidae
porcupine fish 3
Opsanus sp.
toadfish 3
Chilomycterus sp.
burrfish 6
Unidentified fish 4,5

BIRDS

Mergus serrator (1.4)
red-breasted merhanser 4,5
Unidentified bird 4,5
Aythya affinis
lesser scaup 3

SHELLFISH*

cf. Elliptio
freshwater mussel 4,5
Vivaparus sp.
snail 5
Crassostrea virginica
oyster 1,2,3,6
Mercenaria mercenaria
clam 3,6
M. campechiensis
clam 1,2
Volsellas demissa
Atlantic ribbed mussel 1,2
Tagelus plebius
stout tagelus 1,2
Busycon contrarium
Lightening whelk 1,2
B. canaliculatum
channel whelk 1,2
B. carica
knobbed whelk 1,2
B. perversum
left-handed whelk 1,2
Littorina irrorata
marsh periwinkle 1,2
Nassorius obsoletus
mud snail 1,2
Polinices duplicatus
shark eye 1,2
Oliva sayana
lettered olive 1,2

PLANTS

hickory nut 4

* At the Table Point and Stafford North sites more than 95 percent of the shellfish was oyster, with the other varieties comprising the remaining amount. At the Tucker Site clams (M. mercenaria) were the majority shellfish species (Sears 1963) while at the Garden Patch Site oysters were most common.

TABLE 4. DEPTFORD PHASE TRAITS

SETTLEMENT PATTERNING ACTIVITY:

Coastal Site Location Complex (Winter through Summer)
- Sites located on ecotones between multiple biotopes
- Sites found near salt water marshes, usually in live oak hammocks in Coastal biome
- Sites spaced about every 10 miles along coast

Inland Site Location Complex (Fall)
- Sites located on ecotones between multiple biotopes
- Sites found in river valleys of Pine Barrens biome

SUBSISTENCE ACTIVITY:

Collecting Complex
- Collecting of shellfish (especially oyster in Atlantic sub-region and clams and oyster in the Gulf sub-region), turtles, cetaceans and seals from beaches (all at coastal sites); mussels, hickory nuts (all at river valley sites)
- Use of specialized shellfish collecting rakes and baskets, canoes, and other specialized equipment (inferential)
- Use of various plant foods (inferred)

Hunting and Fishing Complex
- Hunting deer (much), opossum, rabbit, bobcat, panther, raccoon (much), otter, birds, pocket gopher
- Fishing for sharks, rays, catfish, drum, jack, sheepshead, gar, snook, snapper, sea trout, mullet, flounder, toad fish, porcupine fish, channel bass, other fish
- Use of atlatl
- Use of bow and arrow (late)
- Use of nets, weirs, and snares (inferential)

Food Preparation Complex
- Roasting of shellfish over coals in large fire pits
- Butchering of deer by quartering and using haunches
- Butchering of turtles by cutting through anterior-ventral portion of shell
- Use of spit or similar device in cooking (inferential)
- Cooking in pots

COMMUNITY PATTERNING ACTIVITY

Village Plan Complex
- Camps and villages spread out linearlly along marshes
- Coastal camps occupied by patrilocal bands (inferential)
- Coastal households comprised of separate nuclear families
- Coastal camps comprised of 5 to 10 house structures (inferential)
- Coastal villages occupied by several kin groups (late, inferential)

Village Plan Complex (continued)

- Coastal villages comprised of 15 to 25 house structures (late, inferential)
- River valley camps occupied by one or two nuclear families (inferential)
- Shallow middens
- Midden deposition and accumulation in separate piles ca. 25 feet in diameter
- Possible palisading of villages with posts set in trenches (D) or anchored in shell and dirt embankments (late)
- Central based nomadism with substantial houses at base reoccupied

Architectural Complex

- Wall posts for house structures set in trenches
- Separate posts set in deep end of sloping trenches
- Posts in separate holes
- Use of large posts 1.2 feet or larger in diameter for structure supports
- Use of small posts 0.5 to 0.8 in diameter for wall posts
- Use of midden shell and dirt to anchor posts in holes and trenches
- Oval structures
- Oval, enclosed houses; vertical wall posts set adjacently in wall trenches
- Intra-house partitions; vertical posts set in slot trenches
- Oval (and perhaps circular) open structures used as work areas or outside "sleeping" areas; widely spaced support posts
- Oval open structures adjoining enclosed houses
- Thatched roofs (inferential)

Household Complex

- Nuclear families in separate structures
- Single fire pit for household
- Indoor sleeping areas separated from cooking area
- Sweeping of house floor debris against interior house walls

BURIAL AND CEREMONIAL ACTIVITY:

Yent Complex (late, restricted to Gulf sub-region)

- Burial mounds; continuous-use type
- Initiating burials
- Flexed burials
- Bundle burials
- Extended burials
- Single skull burials
- Grave goods with burials
- Caches of grave goods in burial mounds
- Exotic stone, metal, bone, and shell artifacts and pottery as grave goods, including: copper, shell, and stone double-ended and elongate plummets; stone and shell gorgets; copper panpipes, rectangular plates, and ear spools; silver plated copper ear spools; shell ornaments; cut puma jaws; animal teeth; shell and bone replicas of animal teeth; uniquely shaped and decorated pottery vessels with zoned punctating, cord marking, check stamping, and zoned painting

Non-Yent Burial Complex
- Cremation burials in village
- Caches of killed pottery near cremation burials
- Bundle burials in mounds
- Initiating burials in pentagonal sub-mound pit (late)

Ceremonial Complex
- Platform mounds (late, YC?)
- Shell and dirt rings, 220 feet in diameter (late, possibly ceremonial)

## TECHNOLOGICAL AND ARTISTIC ACTIVITY

Pottery Complex
- Segmental coil and paddle method of manufacture
- Pottery tempered with sand, gritty sand, clay (rare), plant fibers (rare), quartzite granules, and mixtures of these materials
- Long, cylindrical vessels with concoidal or rounded bottoms
- Short cylindrical vessels
- Both long and short cylindrical vessels with tetrapods on flat bottoms
- Rims usually straight or slightly flared
- Scraping of excess clay off of lip with stick or similar tool leaving simple lips or exterior, folded lips (rare)
- Undecorated pottery
- Compacting of coils with wooden paddles
- Check stamping, large and small checks
- Linear check stamping
- Simple stamping
- Cross simple stamping
- Stick impressing in Gulf sub-region
- Cross stick impressing in Gulf sub-region
- Crude complicated stamping (late)
- Geometric stamping
- Stamping done either sloppily or with skill
- Executing of stamps and stamping varies widely
- Brushing or combing
- Cord-wrapped paddle malleating
- Zoned punctating (late, Atlantic sub-region)

Design Complex
- Stamped rectangles
- Stamped squares
- Stamped triangles
- Stamped diamonds
- Stamped diamonds with central dots
- Stamped grooves
- Stamped concentric diamonds
- Stamped curvilinear motifs
- Reed punctations
- Stick punctations
- Incised zones

Trade Complex
- Sherds from St. Johns Tradition and lower Mississippi River Valley and Mobile Bay throughout region
- Sherds similar to Weeden Island types in Atlantic sub-region
- Stone traded from Piedmont and central Florida
- Exotic goods from Adena and Hopewell Phases (YC)
- Deptford goods and marine shells in Ohio-Kentucky region

# THE MELTON SITE (A-169) AN INTENSIVE HARVEST LOCALITY IN NORTH CENTRAL FLORIDA

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The Melton Site was selected as the location of the Field Session of the University of Florida Department of Anthropology during the 1971 spring quarter because we hoped to work with possible modification of the flotation process in adapting that technique to Florida sandy soils. This seemed an ideal place for the experiment because work by John M. Goggin in 1951 had recovered considerable bone and some plant remains. Such remains are generally rare in the warm humid environment of Florida except for shell middens. This inland site without shell promised to have alkaline soil and preservation of organic remains.

Our expectations were amply fulfilled and the excavation produced exceptional amounts of food remains that seem to clearly indicate an intensive harvest economy adapted to the conditions found in the mixed oak-hickory-pine forest of northern Florida. We believe that the results of the analysis of the food remains so far accompalished give a much fuller picture of the subsistence patterns of the early ceramic occupation of north-central Florida than had previously been available. It may go far toward explaining the way of life that prevailed in this region for the period from shortly before the beginning of the present era until the dominance of the Alachua Tradition after about A.D. 600.

The Melton Site is located on the northwest shoulder of a small hill near the southeastern edge of the present city of Gainesville in Alachua County. While the site, like so many others, is at present in permanent pasture, it had been in row crops until 1930 and even had a small tenant house at its northern edge. Northward from the site, the land continues to slope downward to what was probably a dewpond when the water table was somewhat higher. There is another small lake of perhaps two acres about one-half mile northward, but no large bodies of water or wet ground are found nearer than one and one-half miles. At these distances lie Newnan's Lake (to the northeast) and Payne's Prairie to the south.

Until pollen profiles can be obtained, we must rely on the present flora as an indicator of the aboriginal condition. Both live and water oak, along with hickory, longleaf pine, and even cassena are found within sight of the hill today. We strongly suggest that the site may aboriginally have been a hickory grove and that the northwest slope may have been a likely spot for a fairly permanent camp. This might be especially attractive during the cooler months.

About 500 feet southwest is a small sand burial mound (A-5) excavated in part by William H. Sears (1956). Less than a mile to the southwest are two other burial mounds, one excavated during the 1969 Field Session of the University of Florida. There is general agreement in the cultural material of the two excavated mounds with the village site, although we do not at present consider that A-169 was a burial camp. It seems, rather, to have been a seasonally occupied camp of some intensity. While analysis is not complete, we can summarize the cultural position as belonging to the Pre-Cades Pond Phase, at present dated from about 200 B. C. to approximately A.D. 300.

The most prominent features of the site were a large number of large basin-shaped storage pits. In one area the pits were so closely spaced that they resembled a rather large irregular trench. For a brief period we considered that this might represent the wall of a house, but we have now abandoned this idea. The intersection of many pits suggests that the site was annually revisited, new pits being dug into the previous ones. The whole midden zone was literally riddled with the filled burrows of the pocket gopher, Geomys pinetis, and we are at present unable to say whether the occasional bones of this amall animal are to be included in the food bone counts. We hope to answer the problem by flouride analysis.

Pottery was abundant, mostly plain, sandy, and poorly made (it should properly be classified as Indeterminate Sand Tempered Plain). Smaller amounts of St. Johns Plain and Dunn's Creek Red Filmed were found that gives valuable cross-dating information. As most southeastern archaeologists are aware, plain pottery is usually not very informative. In this case we made the repeated observation that this pottery was very poorly made and that the coils were barely consolidated. The thought has occurred to one of the authors that this plain ware may represent the production of people who had learned that segmentally coiled, sand-tempered pottery could indeed be made. What they failed to understand, however, was that paddle malleating was an essential part of the new technique. Un-paddled Deptford pottery is a sorry fabric indeed.

Rather heavy stemmed projectile points, two stone plummets, a few very simple grinding stones, and quite numerous bone tools seem to fit pretty well the Pre-Cades Pond Phase. The simple bone points were evidently parts of compound spears with the smaller size being a spur or barb. This strongly suggests a leister or fish spear, although we will see that this could not have been the sole fishing technique. One fragmentary bone object is part of a flat, elaborately carved bone plaque. The design fragments include a line with a terminal pit, fine parallel line hachures, and lobate elements strongly reminescent of Weeden Island ceramic designs, or perhaps of Adena stone tablets. An Adena affiliation is suggested because we feel that the site dates long before the entrance of the Gulf Complex into Florida.

We used power screens with a one-quarter inch mesh overlying the expanded metal bed of the basket. In order to secure even finer material, massive soil samples from pits were removed to the laboratory and a revised flotation process was developed. This resulted in large aggregates that still largely remain to be sorted. This, along with extremely numerous bone specimens, are now undergoing the process of specific identification. Fish bone seems to be the most numerous and probably represents the most individuals. Mammals are rather common, as are many turtles and snakes. The species list includes the following:

Mammals

Opossum-- Didelphis marsupialis
Marsh rabbit-- Sylvilagus palustris
Grey squirrel-- Sciurus carolinensis
Fox squirrel-- Sciurus niger
Pocket gopher--Geomys pinetis
Rice rat-- Oryzomys palustris
Round-tailed muskrat-- Neofiber alleni
Grey fox-- Urocyon cinereoargenteus
Raccoon-- Procyon lotor
Skunk-- Mephitis mephitis
Otter-- Lutra canadensis
White-tailed deer-- Odocoileus virginianus

Birds

Sand-hill crane-- Grus canadensis
Black-crowned night heron-- Nycticorax nycticorax
American egret-- Casmerodius albus egretta
American coot-- Fulica americana
Turkey-- Meleagris gallopavo

Reptiles and Amphibians

Greater siren-- Siren lacertina
Bullfrog-- Rana catesbiana
Snapping turtle-- Chelydra serpentina
Mud turtles-- Kinosternidae
Box turtles-- Terrapene carolina
Sliders-- Chrysemys sp.
Chicken turtle-- Deirochelys reticularia
Gopher tortoise-- Gopherus polyphemus
Soft-shelled turtle-- Trionyx ferox
Sea turtle-- Chelonidae
Alligator-- Alligator mississipiensis
Mud snake-- Farancia abacura
Coachwhip-- Masticophis flagellum
Indigo snake-- Drymarchon corais
Rat snake-- Elaphe, sp.
Kingsnake-- Lampropeltis getulus
Green water snake-- Natrix cyclopion
Florida water snake-- Natrix sipedon
Cottonmouth moccasin-- Ancisytodon piscivorus
Rattlesnake-- Crotalus, sp.

Fish

Garfish-- Lepisosteus, sp.
Mudfish-- Amia calva
Chain pickerel-- Esox niger
Lake chubsucker-- Erimyzon sucetta
Catfish-- Ictalurus, sp.
Shad-- Dorosoma, sp.
Bluegill-- Lepomis macrochirus
Largemouth bass-- Micropterus salmoides
Speckled perch-- Pomixis nigromaculatus
Warmouth perch-- Chaenobryttus coronarius
Mullet-- Mugil cephalus
Great white shark-- Carcharodon carcharias (teeth only)
Mako shark-- Isurus oxyrinchus (teeth only)
Requiem sharks-- Carcharinus sp. (teeth only)
Tiger shark-- Galeocerdo cuvier (teeth only)

Several things are apparent at this stage of our analysis and strongly point to an intensive harvest economy (Struever 1968). Of the various animals thus far identified, some 24 species might be expected to be found in a Flatwoods/Marsh habitat; those occurring in Longleaf Pine/Turkey Oak habitat include only about nine species, and a similar number seem to represent the inhabitants of the Mesophytic Hardwood Forest. Hydric Hardwoods/River (or lake) environment is of great importance with at least 21 species present. Yet, the site must have been either Longleaf Pine/Turkey Oak or Mesophytic Hardwood in aboriginal times. Thus the primary hunting and fishing seem to have occurred in ecological areas away from the site itself.

The great number of individuals and species of fish present, as well as the range in sizes from 3- or 4-inch individuals to quite respectable size catfish and bass, strongly suggests some total catch technique. The presence of round-tailed muskrat and marsh rabbit point to intensive hunting in a marsh habitat. Payne's Prairie at a distance of one and one-half to two miles would provide open water, marsh, and adjacent high ground indicated by the faunal collection. There almost certainly was no marsh-lake area any nearer to provide the quantities of fish found in the site. The scarcity of Gopher turtle and the relative greater frequency of small marsh turtles points to hunting-collecting in a marsh or wetland situation. This is reinforced by the occurrence in the site of small pockets of the shell of the pond snail of the genus Pomacea.

The deer bone represented some noticeable anomalies. Many of the bones were from obviously aged, arthritic individuals. Most of the bones present are limb bones with some lower jaws. Ribs, crania, and thoracic vertebrae are infrequent. Enough limb elements of deer were found to suggest quartering based on cooperative hunting or some other distributive mode involving houses or living areas in different parts of the site.

In spite of the broad range of fish, mammals, reptiles and amphibians, bird bones are notably infrequent; only one pit contained bird bones in any quantity. Hickory nut shells are extremely abundant and some small number of other seeds await positive identification.

Our tentative conclusion is that the site of A-169 represents a seasonal camp possibly picked for the presence of abundant hickory trees. We postulate that while the women and children gathered nuts in the vicinity of camp, the men ranged to either Payne's Prairie, Newman's Lake, or both where they engaged in a variety of hunting and fishing techniques. Deer were frequently killed, evidently away from the camp. They were butchered at the kill site and only the four quarters and lower jaws brought back to camp. That the lower jaws were saved suggests that either deer tongue was a delicacy or that the dentaries had some industrial use. Other small game of marsh or wetlands habitat was secured in quantity. The presence of round-tailed muskrat and marsh rabbit suggests trapping or snaring, as the large points found at the site would not seem to be effective against such small game. The range in fish size as well as the range in fish species strongly suggests some mass collecting technique. Either netting or fish poisoning is suggested.

The presence of a burial mound close by might suggest that the site was a camp established in connection with the burial ritual activity. At least two other mounds of the same phase are found within a mile of the site. At present, we do not know of another village site of the Pre-Cades Pond Phase within the immediate vicinity of these mounds.

We do not believe that the site selection was dictated by the burial activity. Instead it seems to have been picked for the availability of hickory nuts. Hunting, fishing, and collecting were activities carried on in favorable locations within the larger area. This points to a well developed intensive harvest economy where sites were selected for closeness to the hickory grove, and perhaps for the sheltered nature of the site. Such surplus from this economic enterprise was available for trade as is indicated by the presence of mica, copper, a few exotic rocks, some marine shell, extant shark teeth of at least four genera, sea turtle, and mullet bones. The picture is one of a culture that is approaching sedentism, or at least has a fairly successful central based nomadism.

# THE MISSISSIPPIAN-WOODLAND TRANSITION IN THE MIDDLE SOUTH

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The appearance of Mississippian cultures in the middle south has been almost unanimously explained as a population movement into this area. This movement has been described by Caldwell (1958: 64) as "the spread of people in exactly the same sense that the biologist might refer to the dispersion of a species of plants or animals over a domain not previously occupied." Evidence for this movement has been cited in Kentucky and Tennessee where early Mississippian cultures have been identified in several localities. For example, in the western Tennessee Valley of Kentucky, the Mississippian community at the Jonathan Creek Site, initially described by Webb (1952), has recently been viewed as the earliest Mississippian intrusion into the area (Rolingson and Schwartz 1966: 42; Hanson 1970: 62). The earliest Mississippian occupants of the Jewell Site in the upper Green River drainage of south central Kentucky were believed to have come from the lower Green River Valley to the northeast, possibly displacing earlier Woodland peoples (Hanson 1970: 63). Early Mississippian sites in West Tennessee include Obion which is considered the village of an intrusive culture that remained in the Mississippi drainage because indigenous Woodland cultures retained their hegemony over the western Tennessee Valley (Kneberg 1952: 195). When the western valley in Tennessee was finally settled by Mississippian farmers, they were identified as late comers related to the Gordon complex of the Cumberland Valley in Middle Tennessee, another Late Mississippian culture (Kneberg 1952: 196). Conversely, the eastern Tennessee Valley was apparently successfully penetrated by the Early Mississippian Hiwassee Island people who completely wrested this region from resident Late Woodland groups at an early date (Lewis and Kneberg 1946: 9).

The conclusion that the Mississippian cultures were intrusive into the middle south seems to have been used on two premises. The first was the suggested disparity between the Woodland and Mississippian lifeways. There seemed to be little evidence that the former had developed into the latter anywhere in the middle south. Lewis and Kneberg (1946: 9) believed that the Late Woodland Hamilton people abandoned the upper Tennessee River Valley to the Mississippians so quickly that they did not even have time to acquire any of the invader's culture. In West Tennessee, Woodland and Mississippian traits were seen in a Late Woodland culture called Harmon's Creek, but this was interpreted as the result of acculturation of a Woodland group and not evidence of an emerging Mississippian culture (Kneberg 1952: 195).

The second premise was that the Muskogean-speaking tribes had a Mississippian culture. Mississippian sites have been identified as Chickasaw in Kentucky (Webb 1952) and Creek in East Tennessee (Lewis 1943; Lewis and Kneberg 1946). Since the Creek have a legend that they migrated into the Southeast from the northwest (Swanton 1922), this seemed to provide additional evidence that the Mississippian cultures were intrusive.

It is not the purpose of this paper to defend or refute the hypothesis that Mississippian cultures are intrusive into the middle south or that they can be specifically identified with a particular linguistic or tribal group. The author concurs with Trigger (1968) and Hally (1971) that we should first intensively study communities or towns that made up the larger tribal groups before any serious attempt is made to identify an archaeological culture with the latter polity. Nevertheless, the past emphasis on migration to explain culture change in the Southeast during the Woodland-Mississippian transition appears to have sometimes lulled us into a complacency where we simply see a replacement of one culture with another. We should not lose sight of the fact that the picture is much more complex since there appears to have been reciprocity between intrusive and indigenous cultures with significant culture change in both. This paper will address itself to the evidences for this complexity in the middle south during the Woodland-Mississippian transition.

If the Mississippian culture pattern first emerged in the Mississippi Valley, its earliest penetration of Tennessee presumably would be in the Gulf Coastal Plain physiographic province of West Tennessee (Fenneman 1938). Since the headwaters of such streams as the Obion and Forked Deer are less than 50 miles from the western Tennessee Valley, it is likely that any Mississippian penetration would also have reached this latter area at an early time.

According to Kneberg (1952: 195), the Obion Site on the headwaters of the Obion River in Henry County is one of the earliest Mississippian communities in West Tennessee and could have been the origin for early Mississippian influences in the western Tennessee Valley. Obion appears to have been a large ceremonial center consisting of seven mounds grouped around a plaza. Although the mounds were tested in 1913 and 1940, virtually nothing is known about the village except that both wall-trench and single-post houses were constructed. Kneberg (1952: 195) believed there was an extended occupation with the ceramics changing from a clay-tempered to a shell-tempered ware. An extensive study of this site subsequently demonstrated that both clay- and shell-tempered pottery were used throughout the occupation, with a possible increase in shell-tempered pottery during a late phase (Baldwin 1966: 152-169). In spite of the fact that the culture appeared more homogeneous than previously thought, the occupation was still believed to cover at least 200-300 years, commencing about A.D. 1000 (Baldwin 1966: 395). Charcoal from the midden under the largest substructure mound at this site dated A.D. 1040 ± 110 years (M-1953) and A.D. 990 ± 150 years (M-1955) (Crane and Griffin 1970: 174). Although Obion probably did exert considerable influence in West Tennessee during Mississippian times, it may not necessarily be the earliest Mississippian community in this part of the middle south.

A similar site that could have played an even more critical role in the emerging Mississippian culture in West Tennessee is the Pinson Site on the Forked Deer River in Madison County. Only preliminary test excavations have been conducted on this large multi-component site, so any interpretations may be considered highly speculative. The first excavation in 1961 revealed a burned rectangular wall-trench house in one of the survey areas. The structure was initially identified as a late Middle Woodland house due to sand- and clay-grit-tempered pottery found on the floor (Fischer and McNutt 1962: 11). In addition, the apparent absence of Mississippian ceramic and lithic traits in other surveyed areas led the investigators to conclude that most of the earthworks at Pinson were built by Middle Woodland peoples (Fischer and McNutt 1962: 11). A more extensive excavation in 1963 resulted in a re-evaluation of this interpretation. At least two mounds were identified as Mississippian, and the re-investigation of the wall-trench house suggested a Mississippian structure superimposed on a Woodland village (Morse and Polhemus n.d.: 61). Besides the characteristic wall-trench house, the Mississippian occupation was identified by the presence of clay-tempered pottery which also occurred in significant quantities throughout the occupation at the Obion Site (Morse and Polhemus n.d.: 61). Two dates of A.D. 850 ± 120 years (M-1362B) and A.D. 1130 ± 110 years (M-1362A) with an average of A.D. 990 on charcoal from the burned house appear to validate the Mississippian identification for this structure (Crane and Griffin 1966: 270). Since this is as early as the dates from Obion, it is possible there is a transitional Mississippian culture at Pinson that developed from an indigenous Woodland complex.

Although an Early Mississippian occupation was recognized in the Mississippi drainage of West Tennessee, the Late Mississippian Gray Culture was considered to be the first Mississippian penetration into the western Tennessee Valley (Kneberg 1952: 196). The failure of these people to penetrate this region at an earlier time was attributed to the frequent inundation of the valley which made it more habitable for remnant Archaic and Woodland populations (Lewis and Kneberg 1947: 12). Presumably, these hunting and gathering enclaves acted as a deterrent to the colonization of this area by Early Mississippian farmers pushing in from the Mississippi drainage (Kneberg 1952: 196).

This interpretation of Mississippian development in West Tennessee is in need of re-evaluation. The hypothesis that remnant Archaic peoples lived in the western valley side-by-side with Woodland and Mississippian neighbors is difficult to maintain. Lewis and Kneberg (1959) saw the Early Woodland traits at Archaic sites in the western valley as evidence of contact and acculturation between Late Archaic and Woodland complexes as late as A.D. 500. It seems more logical that these sites represent the transitional period between Archaic and Woodland, sometime between 1500 and 500 B.C. (Faulkner n.d.: 13). The purported absence of extensive Early and Middle Woodland sites probably is due to sampling error; at the end of the Archaic times there was a shift in settlement pattern and many of these Woodland sites are on higher terraces or in the uplands where reservoir salvage was not conducted.

There also is evidence that an Early Mississippian culture was present in the western valley. Although this culture--called Harmon's Creek (Lewis and Kneberg 1947; Kneberg 1952)-- is distinct from Obion, it does share a number of traits with this latter manifestation. These traits include wall-trench houses, usually with open corners, clay-tempered pottery, sherd discs, pottery trowels, triangular projectile points, stone discs, flint spade or hoe, and polished flint adzes or chisels. The most striking differences appear to be in settlement plan and surface treatment of ceramics. Substructure mounds are not found on pure Harmon's

Creek sites and the settlement plan at the type station is a small dispersed hamlet rather than the large nucleated village found at Obion. At least six houses had been built in a north-south axis, two being rebuilt on the sites of earlier structures (Osborn n.d.a: 6-8). Allowing for the shift of one house location as the settlement expanded, the community probably consisted of three houses from 40 to 55 feet apart with pits and work areas around each structure. One possible outdoor activity area may have been shared by two families. The pottery found in these houses is typically Woodland in surface finish; predominant types are Mulberry Creek Cordmarked and Harmon's Creek Cordmarked.

Despite the number of typical Mississippian traits at Harmon's Creek sites, the Woodland pottery has been considered the most significant culture marker. This being the case, Harmon's Creek has been identified as a marginal Woodland culture exhibiting strong influences from neighboring Mississippian cultures such as Obion and Duck River (Kneberg 1952: 195). Since the age of Harmon's Creek is unknown, it seems just as likely that it represents an emergent Mississippian culture developing out of a Late Woodland base at the same time Early Mississippian cultures are appearing in other localities of the middle south.

If Harmon's Creek is the earliest Mississippian phase in the western valley, then late Mississippian phases such as Gray are possibly the result of indigenous development rather than migration from the Duck and Cumberland valleys. Although there are certain traits at the Gray Farm Site that could be considered "late" Mississippian (negative painted bottles and engraved plates), there is some question whether this culture is as late as Kneberg (1952: 197) has suggested. For example, there also are traits that could be considered early in the Mississippian sequence; one of the most pervasive is the clay-tempered pottery that occurs most frequently in the lower levels of the site. It also was noted that some sherds combined what were called "Woodland and Mississippi trait elements", this being interpreted as evidence of "a mixed group of Woodland-Mississippi peoples", or a single group that borrowed cultural elements from the other (Nash n.d.: 3). The other significant feature is a sequence of house types, the earliest being both the circular wall-trench type and the open-corner rectangular wall-trench type (Nash n.d.). The former house type also has been found at the Lick Creek Site in Benton County where it was described as the earliest in a sequence of house types (Osborne n.d.). The round wall-trench house also appears at an early date in other areas. At the Eveland Tract at Dickson Mounds Park in Illinois, a circular wall-trench house was dated at A.D. 930 ± 100 years (Caldwell 1967: 92). In Ohio, a similar structure was found in a Late Woodland Cole complex mound that was dated at A.D. 1135 ± 95 (OWU-276) (Baby and Potter n.d.; Ogden and Hay 1969: 145).

It should be noted, however, that the round wall-trench house type also is found in what appears to be a later Mississippian context and some may have had a very specialized function. At the Kincaid Site in southern Illinois, a round wall-trench pattern was discovered under a truncated mound. The large fireplace in the center of this structure suggested a sweat lodge (Cole et.al.1951: 66). This structure type also occurs at the closely related Angel Site in southwestern Indiana where two were found in different areas of the village. These features also were interpreted as possible sweat lodges or winter "hot houses" (Black 1967: 499-500). There are two radiocarbon dates of A.D. 1420 ± 100 years (M-4) and A.D. 1370 ± 100 years (M-5) for the Angel Site that are acceptable (Crane and Griffin 1964: 7).

The possibility that the Gray Culture is earlier than previously thought not only suggests that Gordon or Duck River people did not move into the western Tennessee Valley from the east, but the movement of traits or even people may have been revearsed; the Duck River and Gordon complexes of the Duck and middle Cumberland valleys may have developed out of Harmon's Creek-Gray. That some time depth is present in the Mississippian occupation of the latter area is suggested by a radiocarbon date of A.D. 1250 ± 95 years (GX-0871) from the Ganier Site in Davidson County (Dowd 1972: 7). Myer (1928) recognized two groups that constitute what we now call the Gordon Culture; one who buried their dead in a flexed position in hexagonal stone slab coffins, and another who used the narrow rectangular stone box grave in which the corpse was placed in an extended position. At the Tinsley Hill Stone Grave Cemetery in western Kentucky, there also was a suggestion that the flexed burials preceded the extended type (Schwartz 1961: 92). There also is a possibility that the stone box grave of Middle Tennessee and Western Kentucky was not introduced by the Mississippian peoples. Stone-lined graves have been found in a Middle Woodland mound in Logan County, Kentucky, on Clear Creek, a tributary of the Green River (Ray n.d.). The only other trait that might be considered early at the Gordon village is a round house reported by Myer (1928). However, since there apparently was no evidence of wall posts in the round pits, the architectural reconstruction is open to question, and it is probable this usually represents a rectangular house in a pit as found on some southeastern Missouri sites. It also is possible that a round house type persisted until Late Mississippian times in some arwas since it has been suggested that no Mississippian phase in the Tennessee-Cumberland region can be distinguished by a single house form (see Rolingson and Schwartz 1966: 41).

In addition to these possibilities of indigineous development of Mississippian cultures in the Nashville Basin physiographic section (Fenneman 1938), there also appears to be at least one instance of culture contact between an indigenous Late Woodland group and intrusive Mississippian peoples in Middle Tennessee. In the upper Elk River Valley of south-central Tennessee, shell-tempered Mississippian pottety was found with Woodland ceramics in a single pit on a habitation site of the Late Woodland Mason Culture (Faulkner, ed. 1968: 43). This culture has been dated at A.D. 770 ± 85 years (GX-0778) and A.D. 890 ± 900 years (GX-0777) (Faulkner 1967: 21-23). If these dates are correct, this is a very early occurrence of Mississippian ceramics in the middle south. This could, of course, suggest another emergent Mississippian culture, but the marginality of this area and the absence of other typical Mississippian traits in the Mason Culture seem to preclude this interpretation. The intrusive Mississippian culture in this area could be represented at the Templeton Site, a large village and ceremonial center on the Elk River in Moore County that probably was occupied over an extended period of time (Butler 1968: 206-209).

Although the appearance of the Mississippian cultures in the eastern Tennessee Valley has been interpreted as simple cultural replacement with little effect on either the indigenous Woodland groups or the intrusive Mississippians, there is some evidence that the cultural transition may also have been more complex in this area. There now appears to have been interaction between these two groups, and even a possible internal development of Mississippian culture in the area.

At the Lea Farm Site on the Clinch River in the Norris Basin, there was a mixture of limestone-tempered and shell-tempered pottery in what otherwise appears to be a typical Early Mississippian context (Griffin 1938: 294-297). The wall-trench house was present, and the majority of the pottery was shell-tempered loop-handled jars and fabric-impressed salt pans. Of the few jar rims studied from this site, 35 percent were limestone-tempered (Griffin 1938: 294-295). Although Lea Farm has not been dated, the Bowman Farm Site on the Powell River, a tributary of the Clinch, has been dated at A.D. 1190 ± 150 years (M-729), and there is evidence from this site that this does not date the earliest Mississippian occupation here (Crane and Griffin 1961: 114). The Lea Farm data suggests a comparable situation to that found at the Cahokia Site, where limestone-tempered types represent 20 to 30 percent of the Mississippian collections before A.D. 1050 (Hall n.d.: 4).

The most conclusive evidence for a Woodland-Mississippian transition in the eastern Tennessee Valley comes from the Martin Farm Site in the Little Tennessee Valley (Salo, ed. 1969). This multicomponent site produced material from two Early Mississippian phases that were designated Emergent Mississippian and Developed Hiwassee Island. The latter was characterized by typical Mississippian traits: shell-tempered pottery including jars with loop handles, Hiwassee Island Red Filmed bowls, and fabric-impressed salt pans; various types of small triangular projectile points; and both wall-trench and single-post dwellings. The Emergent Mississippian phase exhibited what could be a combination of Woodland and Mississippian traits: both limestone- and shell-tempered globular jars with flaring rims and occasional loop handles, Hamilton Triangular projectile points, and wall-trench houses with open corners.

The most significant feature associated with the Emergent Mississippian phase was a shallow ditch about five to nine feet in width and 1.4 feet deep. It was in this feature that the majority of Emergent Mississippian artifacts was recovered. Although the ditch ultimately became a trash receptacle for the occupants of a near-by wall-trench house, its original function is problematical. The most plausible interpretation is that it was associated with a defensive palisade since it would have been an insufficient deterrent by itself. It is noteworthy that a similar feature was found at the Early Mississippian Hampton Farm Site in Rhea County (Walker n.d.). A palisade was located several feet from the ditch. A similar situation may have existed at the Martin Farm Site, but the palisade, if it existed here, must have been at least eight feet from the feature. Trees and other considerations made exploration for such a feature impossible at the time. It also is possible that there was no defensive wall here. A similar shallow (one foot) ditch was discovered on the Late Woodland Mason Site, and there was no evidence of a palisade in the immediate vicinity (Binion 1968).

The ceramics recovered in the ditch at the Martin Farm exhibited both Woodland and Mississippian types. The most common pottery was a limestone-tempered series of cord-marked and plain globular jars with flaring rims and occasional loop handles (67 percent of the total). Approximately 25 percent of the sherds were from shell-tempered plain jars. Minor but significant types in the ditch included Hamilton Cord Marked, Woodstock Complicated Stamped, and a limestone-tempered type with wide trailing on the neck and shoulder that seems to be a decorated variant in the plain and cord-marked series. There was a significant absence of red-filmed sherds and only one sherd from a fabric-marked salt pan (Salo, ed. 1969: Table 13).

The amalgamation of Woodland and Mississippian ceramic traits, the presence of such early types as Woodstock Complicated Stamped, and the absence of red-filmed bowls suggested a date of about A.D. 900 for the Emergent Mississippian phase at this site. Charcoal from the ditch and wall-trench house gave dates of A.D. 325 $\pm$ 180 years (GX-1569) and A.D. 410 $\pm$ 115 years (GX-1571), respectively. Obviously these could not date a Mississippian occupation and the error may be due in part to the small size of the sample (Salo, ed. 1969: 179-181). In spite of these anomalous dates, there is little doubt that these features represent a very early Mississippian component. Although it could represent a remnant Woodland group being strongly influenced by nascent Mississippian neighbors, it has been tentatively concluded that this represents an emerging Early Mississippian (Hiwassee Island) culture in this area.

Although too few sites occupied during the Woodland-Mississipian transition in the middle south have been excavated, the data from the preceding sites suggests that more than simple cultural replacement took place in several localities. Certainly the hypothesis that there was little interaction between Woodland and Mississippian groups cannot be supported. It seems more likely that three things occurred after Woodland-Mississippian contact.

During the initial contact, some Woodland peoples may have relinquished certain desirable portions of the major river valleys. That this contact was peaceful in some instances is suggested by the absence of what could be called heavily fortified sites. We must not exclude the possible defensive ditches at the Martin Farm and the Mason Site and the ditch and palisade at the Hampton Farm, but only the latter could be called a substantial defensive work. It is apparent that not enough work has been done on sites of this period to determine the general presence or absence of defensive works during this time, but one must note that peripheral test trenches at Harmon's Creek did not reveal palisades (Osborne n.d.a). Early Mississippian settlements in the Little Tennessee and Clinch valleys seem to be small and dispersed, and some large Early Mississippian sites such as Hiwassee Island were not palisaded during the earliest part of their existence (Lewis and Kneberg 1946: 38). At present, it seems that at least some of the contact was peaceful and some kind of accomodation had developed. Certainly a symbiotic relationship can be envisioned with a resultant exchange of ideas.

Although dating is tenuous, there appears to have been a rapid appearance of the Mississippian culture in the middle south. This in itself would suggest the Mississippianization of some Late Woodland groups rather than migration to explain all of this culture change. At present, it might be difficult to explain the apparent radical changes in settlement, subsistence, and religion in the Mississippi Period as resulting from internal culture development. However, since we still do not understand what these patterns were like in the Late Woodland and earliest Mississippian cultures of the Tennessee Valley, the possibility of gradual transition rather than sudden break seems just as plausible. Certainly the "dispersed" settlement pattern of the Hamilton Culture (Lewis and Kneberg 1946: 36-37) needs to be re-evaluated in light of recent studies of Late Woodland cultures in other parts of Tennessee (Faulkner, ed. 1968; Faulkner n.d.b). Emergent Mississippian cultures developing from local Woodland manifestations could be represented at Pinson in the Mississippi drainage, at Harmon's Creek in the western Tennessee Valley, and at Martin Farm in the eastern Tennessee Valley. Although traits that are generally considered Mississippian could have dominated in such a transition, some traditional Woodland elements would certainly have persisted in the Emergent Mississippian culture.

The possibility that terminal Woodland groups persisted for several centuries in marginal physiographic sections such as the Cumberland Plateau and Highland Rim after the Mississippian intrusion and development also cannot be discounted. These cultures may have eventually become "Mississippianized" or extinct before European contact. The Mason Culture in the upper Elk Valley could be an example of one of these marginal groups.

There are three conclusions that can be made about Mississippian cultural development in the middle south based on the preceding discussion of the Woodland-Mississippian transition. First, the Mississippian cultures in this region have diverse origins and could be explained by both migration and internal development. There is cultural heterogeneity that results from these diverse origins in addition to an adaptation to local natural areas. This heterogeneity persists in local Late Mississippian cultures until historic times. Second, some of the traditions in the Mississippian culture might be traced back to Woodland antecedents, and, third, considering these diverse origins and the persistence of earlier traditions and even people in certain marginal areas, the identification of the Mississippian culture with a single linguistic or tribal group is certainly questionable.

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# A NEW LOOK AT CAHOKIA CERAMICS

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This paper is based on the Cahokia Ceramic Conference called by Melvin L. Fowler and co-chaired by Robert L. Hall, held from July 19 to 24, 1971 at Collinsville, Illinois. Participants were James Anderson, Charles J. Bareis, Elizabeth Benchley, Glen Freimuth, James B. Griffin, Alan D. Harn, Frederick R. Matson, Patrick J. Munson, Patricia J. O'Brien, James W. Porter, Nelson A. Reed, Robert J. Salzer, and Warren L. Wittry. Since that time various outlines of the results have been presented and/or circulated, including two by Griffin--one at the Cahokia Conference on July 25, and the second (a paper entitled "Recent Decisions on the Sequence at Cahokia") at the Mid-South Archaeological Conference on July 31. The formal position will not be available until published by the chairmen, and the following paper is my personal view of what was said and decided. Criticism already has come from those who have seen the outlines, including a paper by David Baerreis and informal comments by Gregory Perino. Hopefully, there are others who can add their special knowledge to refine the conclusions that have been reached.

Some 700 to 800 years of occupation at Cahokia has so disturbed much of the context, that some questions can only be answered by data from other sites. Added to this confusion, is the recognized multi-ethnic situation, with Late Woodland people acculturating to the successful Mississippian life style over a period of several hundred years, in different ways at different times, both internally and outside of Cahokia. The problems are complex.

Cahokia ceramics were first discussed by Warren K. Moorehead, who found them "southern". Arthur R. Kelly, on the basis of work by Matthew W. Sterling in the Powell Mound group, defined an Old Village and a Bean Pot Phase. This latter name was changed to Trappist by James B. Griffin, who published several papers on the sequence, the most extensive in 1949. Since then, various authors have surveyed the growing amount of evidence, particularly Robert L. Hall, who in 1966 (with ample radiocarbon dates) could begin to give an outline of the sequence placed more or less correctly in time. Work at Cahokia has been truly colaborative, with the University of Illinois, the Illinois State Museum, the Chicago Field Museum, University of Michigan, Gilcrease Foundation, University of Southern Illinois, Washington University, University of Wisconsin-Milwaukee, and Beloit College participating over the years. Since 1940, with major highway salvage work, there has been almost constant activity, some of it hardly equaled since the days of WPA. This past season alone there were four institutions excavating at seven locations at Cahokia with 85 people in the field.

There have been a scattering of publications on all of this work, usually of a short and provisional nature, and not for general distribution, or of papers read but not published. Hopefully, this record will improve. In the meantime, Fowler believed that a conference could formalize many of the ideas that were shared by those working at Cahokia, discuss differences, and hopefully agree on a new terminology. His hopes were largely, and I believe very successfully, met. The fact that the conferees agreed on anything was in itself a situation with miraculous overtones. The first two days and evenings were spent in the presentation of material, the last three in ordering that material. The three traditional phases were divided into eight new phases, from 100 to 250 years in length, based on pottery change and on changing settlement patterns and construction periods as these are presently understood. With a limited amount of stratigraphy, house floors, or sequential filling of borrow pits, and some 50 radiocarbon dates to work with, some of these new phases appear to be firm and well founded. Others are less so, and in two cases, periods were left un-named for lack of good data. It is an important part of our learning process to recognize these major gaps in our knowledge. The phases include Patrick, Transitional, Fairmount, Stirling, Moorehead, Sand Prairie, and Historic. The un-named phase falls between the latter two. Each of these will be discussed briefly.

PATRICK PHASE (A.D. 600-800)

This is the local Late Woodland phase, with conoidal cord-marked jars of Canteen-grit temper, Korando-grog, and Pulcher-limestone temper. Points had expanded stems and included arrow heads. Houses were small, single post construction and built in pits. Hoes were present and believed by some to be gaining at the expense of projectile points with the implication of expanding agriculture. The American Bottoms, the flood plain opposite the confluence of the Mississippi and Missouri Rivers, had 26 Patrick Phase sites according to Harn, not counting those within the confines of Cahokia itself. Much that was to come was based on this foundation. From agriculture and village life, down to details like pipes and chunkey stones, the Patrick people prepared the way for Cahokia, and at the very least, their blood was the predominant line in the building of that center. Evidence is based on Charles Bareis' excavation of Powell Zurkuhlem, Knoebel and Ramey Pit, the Munson-Harn surveys, and Hall's work at Stolle Quarry.

TRANSITION PHASE (A.D. 800-900)

In effect, the conference boldly avoided the problem of Mississippian beginnings, leaving an unnamed 100-year gap between the pure Patrick Phase material, and the apparently sudden appearance of a full blown Mississippian complex. In fact it is known that Late Woodland traditions continued at least another 200 years, and there is a very strong case for continuity in vessel shape and temper. Yet, too little is known of the revolutionary changes that took place during this time to give it a formal name. It will be one of the most interesting and difficult problems of the future. The beginning of a culture by definition will leave the least evidence, and that evidence could very well be under the 15 acres of Monks Mound.

FAIRMOUNT PHASE (A.D. 900-1000)

With the Fairmount Phase, we are into the Mississippian Period in all its complexity. This includes the beginning of construction of Monks Mound, the ceremonialism and political control shown in the sacrifice of over 300 retainers at Mound 72, a trade network that reached to the Caddo, to Yankeetown, and the sources of copper, mica, and marine shell. There is extensive evidence of corn agriculture, with 8-, 10-, and 12-row corn. Hoes are from Mill Creek flint, a quarry area 120 miles to the south. Wall trenches are now used along with the traditional post hole house construction, and, while the post hole continues, every superimposition is be the new technique. Arrow heads are triangular, side notched, tri-notched, multi-notched, or serrated, while Alba points are intrusive from the Caddo area. The notched types had significance as types and were sorted in a status grave.

Merrill Red Filmed continues from the earlier Patrick Phase, but it, together with a number of new types, share a diagnostic shoulder that is new in the midwest. It is not clear if these grog-tempered cord-marked, shouldered jars are ancestral to--or contemporary and influenced by--Mississippian forms. Another local type (Monks Mound Red) with lime-stone temper, continues. To these traditional shapes are added the salt pan with sloping sides, short neck water bottles, blank-faced effigy water bottles, seed jars, and seed bowls. It was felt that while a number of jars were approaching the Powell form, it was not achieved in the Fair-mount Phase. Riveted loop handles were present. This is the phase that Hall has called "pre-old village" or "pre-Ramey" for the supposed absence of that pottery type.

Doubt is cast on the dating by David Baerreis, who has three radiocarbon dates from the Over Focus in South Dakota that average at A.D. 1000 and are related to an incised form derivative of Ramey. Recent radiocarbon dates establish classic Ramey at A.D. 1050, so we are not talking about a great variance, but these dates remind us of the modifi-cations and refinement to come. The hand, hand and eye, and weeping eye were with the other intrusive Mississippian forms, and an engraved bird at Cahokia helps to establish the existence of southeastern ceremonialism by this date.

Yankeetown, Hickory Fine Engraved, Late Coles Creek, and Crockett Curvilinear Incised, are some of the trade material. Evidence on the Fairmount Phase comes from Fowler's excavation of Mound 72, Bareis' work beneath Mound 51, in the Ramey Field, and at the Master Feed and Seed Site, and the coring of Monks Mound by the author.

STIRLING PHASE (A.D. 1050-1150)

The Stirling Phase equates roughly with the first half or early Old Village, according to Hall's sequence. It begins with the appearance of Ramey Incised and ends with the completion of Monks Mound. During this period of high ceremonialism, the round compounds, sun circles, and chunkey yards were built. Powell Plain and Ramey Incised become important, with hooded water bottles gaining effigy faces, and new forms such as the juice press appearing. The earlier wedge or extruded lip gives way to the rolled rim. Cahokia Cord Marked and Tippett Bean Pot appear towards the end of the phase. Harn failed to find Stirling Phase material in the 44 Patrick, Transition, and Faitmount sites identified in the American Bottoms, with the exception of the large mound center at Mitchell. The previously scattered settlement pattern was now concentrated within the five square miles of Cahokia. It was not only farmsteads and hamlets that were abandoned, but six small mound centers appear to have been given up. Excavation will be needed to confirm the results of this surface collection. At the same time, there is evidence of large scale movement up to the central Illinois River Valley, to Aztalan, and down the lower Mississippi to Winterville and Lake George. Extensive trade continues, with Holly, Hickork, Davis, and Crockett being traded in from the Caddo area. Evidence for this phase is based on Griffin's sub-mound 34, Wittry's house 209, 15a, and 15b, Fowler's pottery house, and Porter's and the authors work on the Fourth Terrace of Monks Mound.

MOOREHEAD PHASE (A.D. 1150-1250)

The important social fact that sets this phase apart from what had come before is the cessation of work on the top of Monks Mound. After having concentrated on this massive construction for approximately 250 years, the top of the mound was abandoned in an incomplete state. Part of this change was the construction of a series of nine mound stages on the first terrace of Monks Mound, which, in contrast to the fourth terrace, shows evidence of domestic midden. Another suggestion of religious-political change is the apparent construction of many small mounds after the completion of Monks Mound, and the construction of a defensive palisade with towers. Porter believes that the satelite town of Mitchell was abandoned at this time.

The wall-trench house had grown larger and completely replaced the post hole house. Round refuse pits replaced rectangular ones. Cahokia Cord Marked and Tippett Bean Pot grew in popularity while Powell and Ramey Incised declined. Wells Broad Trailed, a plate form, was a new development. It began with relatively low, narrow decorated rims. Other novelties were a Tazza shape and crucible of poorly fired Cahokia "Crud." Rims shifted upwards, bottle necks became larger, and the juice press increased in length. There was now a press lid decorated with two lugs. Limestone tempering had disappeared. Evidence for the Moorehead Phase is based on Benchley's work on the first terrace of Monks Mound, Bareis' Drinking Fountain House, and Wittry's House 35 and 15A.

SAND PRAIRIE PHASE (A.D. 1250-1500)

The original differentiation between Old Village-Trappist is recognized here by the beginning of the Sand Prairie Phase. Its ending is far less certain, and the fact that it is the longest of the phases, suggest that it is the least known. There obviously was am important change at Cahokia around 1250, which current thinking has attributed to climatic change, based on the work of Brysen. There was a major population loss at Cahokia. Of the 31 radiocarbon dates available to Hall in 1966, only four had a median date after 1290. That this is more than chance is proven by the extensive palisade excavations, which cut many earlier houses but are not themselves cut; the last palisade was built after 1200. There is a break in the regular sequence of Mound 34 at the point where there is a heavy deposition of Cahokia Cord Marked, dated A.D. 1280, and the last known construction stage of Mound 55 was dated A.D. 1370. These stages are measured in cêntimeters rather than the meters of Monks and Powell mounds. Among the mounds built during this phase are the two lobes on the east face of Monks Mound, of unknown purpose. Beneath one of these an inscribed stone tablet was found depicting a masked falcon-dancer. For the survivors of a presumed major collapse, living standards did not fall. Houses reached their greatest size, and the super-imposition of six and seven house patterns on the same location argues for a peaceful continuity.

Powell and Ramey Incised were replaced with Saint Clair Plain and high-rimmed Wells Incised plates. Cahokia Cord Marked was made in deep, wide bowls, with strap handles replacing the earlier loop handles. The necks of water bottles continued to grow. Salt pans now had vertical sides. Cahokia ware of this period was found at the Kincaid and Angel sites, with colonies on the St. Francis in Arkansas. Fortune Noded, Old Town Red, Bell Plain, and negative painted bottles were traded in. Evidence is based on Joseph R. Caldwell's work on Mound 34, Bareis' excavation at the Powell Mound South, Wittry's 15B, and Fowler's East Lobe of Monks Mound.

UNNAMED (A.D. 1500-1700)

No consensus was reached on this period of time because of the small amount of evidence available. Oneota material appeared at a series of sites in the American Bottoms (including Cahokia) but the question of trade versus settlement existed, and it could not be agreed to raise the scanty data to the dignity of a named phase. Evidence thus far is from Pere Marquette, Pittsburgh Lake (Perino), Stolls Quarry (Hall), Grove Borrow Pit, and next to Mound 51, Cahokia. Dating is largely guess work and suggested by the Oneota acculturation in the Middle Illinois Valley, plus trade at Kincaid.

HISTORIC PHASE (A.D. 1700-1750)

A series of intrusive historic burials have been found by Benchley on the first terrace of Monks Mound with trade goods estimated to date around 1730. A pit in the Powell Mound also had historic material. However, to date there has been little success in attempting to relate the various tribes of the Illiniwek to the archaeological site. This includes the Cahokia who were found camping nearby.

#

# SOUTHWESTERN VIRGINIA: A PREHISTORIC CROSSROADS AREA

Howard A. MacCord, Sr.
Virginia State Library

Southwestern Virginia and the surrounding sections of North Carolina, Tennessee, West Virginia, and Kentucky are shown on most archaeological maps as "UNKNOWN." The area involved is the Appalachian Mountain headwaters valleys of the Dan, Roanoke, and James Rivers of the Atlantic Coastal drainage; the New and Big Sandy Rivers (Ohio drainage); the Holston, Clinch, and Powell Rivers (Tennessee drainage), and the Cumberland River. Easily-passed divides link these major river systems, and a diversity of ecological situations can be identified in the area. The Indian cultures thus far identified are likewise diverse, but they share many traits with each other and with some neighboring cultures.

Since the area was vacated by the Indians before European settlement, no historic records exist to tell us the identities of the peoples. Relics found in the course of extensive pot-hunting by many collectors indicate a rich and varied archaeological potential. This picture is confirmed by the limited archaeological studies thus far done in the area. The surveys conducted by Solecki (1949), Ayers (1965), and Holland (1963; 1965) barely touch on the problems.

Several archaeological projects in the past five years are beginning to disclose the complexity of the archaeological background of the area, but a complete picture is far from clear--much remains to be done. What has come out of the work thus far is summarized below.

The Shannon Site (upper Roanoke drainage)-- palisaded village; circular houses; flexed burials; marine shell ornaments common; pottery predominantly Radford types, with lesser amounts of New River and Dan River types.

Brown Johnson Site (New River drainage)--closely related site in Bland County; circular palisade, with external gate-houses; circular houses; plaza in center of village; marine shell ornaments; flexed burials; pottery exclusively of the Radford (limestone-tempered) types.

Crab Orchard Site, Tazewell County (Clinch River drainage)--circular palisaded village with an external gate-house; circular houses; a mixture of flexed, extended, bundle, and "placed" burials; marine shells; pottery predominantly of the Radford type, with lesser amounts of New River (shell-tempered) types.

On the upper James River (and Jackson River), two sites--Lauderdale and Lipes--near Buchanan, yield almost exclusively Dan River pottery types, circular houses, flexed burials, but no palisaded village plan. Hirsh Site on Jackson River in Bath County produced Radford types of pottery plus Albemarle types.

The upper Dan River and its tributary, Smith River, yield circular and square houses, Dan River pottery predominantly, flexed burials, circular palisaded villages, with frequent finds of pottery from more southern sources (Catawba-like, Lamar, etc.). The sites dug thus far are Box Plant, Belmont, Leatherwood, Koehler, and Stockton.

Sites along the middle reaches of New River in Wythe County (Cornett, Martin, and three Reed Creek sites) all yield exclusively sand-tempered pottery (called Wythe Series by Holland, but probably a local manifestation of Dan River wares). Burials are flexed (many on their backs with knees flexed upward), many marine shells, circular, palisaded village plans, and circular houses.

Sites on the Holston and Clinch River (Keywood, Litten, Mays, etc.) have yielded mainly limestone-tempered pottety, with lesser amounts of shell-tempered wares. Community and house patterns not yet defined. Many marine shell ornaments, plus many Southern Cult objects (fenetrated shell gorgets, spuds, etc.). Burials flexed, sometimes with stone slab coverings, and many burials are made in caves.

Stratified cave deposits excavated thus far (Daughterty's, Thompson's, and Hidden Valley) demonstrate a long, in-place development of local cultures with engrafting of borrowed traits. Daugherty's Cave's lowest level yielded a radiocarbon date of 9700 B.P.

A few sites (Litten, Chilhowie High School, and possibly others) have produced European trade goods in small quantities, indicating a probable terminal date of around A.D. 1650.

The identity of the prehistoric inhabitants is unknown at present, but with sufficient archaeological work, we may someday trace the bearers of the culture to a place and a time when they were met and named by Europeans. It is unlikely that they were Cherokees or Shawnees or other named tribal groups. It is possible that they were part of the large and relatively-unknown Eastern Siouan groups, but if this proves true, the lack of historic references to Siouan peoples in the Appalachian area will hinder identification.

Numerous sites (Mounds, villages, caves, quarry-workshops, etc.) await study, and we invite archaeologists to help unravel this prehistoric enigma.

#

# FROM EARTH LODGES TO WATTLE AND DAUB STRUCTURES IN GEORGIA

Arthur R. Kelly
University of Georgia

The 1971 exploration at the Bell Field Mound Site, Carter's Dam, Georgia, represented the sixth season of investigation with nine successive mound occupations partially exposed. The 1971 season to present concentrated on three basal mound occupations with three superimposed earth lodge assemblages. The upper mound structures, five truncated in modern cultivation, give a Dallas continuum closely related to the culture initially described at Hiwassee Island in Tennessee (Lewis and Kneberg 1946), culminating in a mixture of Dallas and a north Georgia variant of Lamar.

Of the three earth lodge occupations, only the two uppermost have been exposed sufficiently to permit precise descriptions. A large central structure with satellite lodges flanking three sides is indicated. True earth lodge basic construction occurs with deeply saucered floors, distinct rim sections with leaner posts sealed in clay slots on platform bases; and a nearly square shape with rounded corners. The roof sod consists of dark gumbo thinning to the median; inner walls exhibit yellow plastic clay daubed over split cane mesh; bark supported the roof and the sanded floor had bark and/or cane mat covering.

Unbroken continuity in successive mound building and an architectural progression from earth lodges to early wattle and daub is reconstructed from archaeological context.

Cultural diagnostics, primarily pottery with scant artifactual content, suggest a pre-Dallas earth lodge manifestation most nearly resembling north Georgia Savannah with some nearby Tennessee provenance. Radiocarbon dates give a time span of four to five centuries of successive cultural development <u>in situ</u>, from 12th to 16th centuries A.D.

#

## SESSION II

### SYMPOSIUM ON FEDERAL AGENCIES AND ARCHAEOLOGY:

### POLICIES, PROBLEMS, AND POSSIBILITIES

The participants of this symposium were:

Rex L. Wilson--National Park Service, Division of Archaeology, Washington, D.C.

George Cattanach--National Park Service, Office of the National Register, Washington, D.C.

David Scott--U.S. Forest Service, Region Eight, Atlanta

Robert D. Beer--U.S. Bureau of Public Roads, Office of Right-of-Way and Environment, Washington, D.C.

Donald E. Lawyer--U.S. Army Corps of Engineers, Environmental Resources Branch, Washington, D.C.

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## THE SPACE-TIME BACKGROUND FOR CHEROKEE PREHISTORY

Harold A. Huscher
University of Georgia

The acceptable evidence points toward a comparatively recent intrusion into the southeast of the Cherokee race, language, and culture; but at present there is no satisfactory synthesis of the protohistoric past, or of the varying conditions of the tribe or tribes contributing to the final resultant we now call Cherokee.

In the past millenium, rectilinear fortifications with spaced bastions were definitely associated with Mississippian culture, in sharp contrast with the circular palisades without bastions of the Iroquoian/ Algonkian Northeast, the Atlantic Coast, and most of the Gulf Coastal area (to the Mississippi), the two systems characterizing sharply bounded mutually exclusive geographical and cultural areas. Intervening were the endless parallel corridors of the Appalachian Mountains running from the northeast to the southwest, providing a broad band of communication between the Cherokees and their northern congeners, the Laurentian Iroquoians, a route invoked in accounting for the core language and for at least some of the ceramic elements. In most other respects of culture, the Cherokees had acculturated to the adjacent regional norms.

The Cherokee position at the south end of these corridors of communication where they are intersected by the headwaters of three major waterways--the Tennessee, the Savannah, and the Chattahoochee Rivers--actually controlling major routes in all directions, indicate probabilities of a cultural interaction area developing toward a regional cultural climax. The cultural gradients should be demonstrable in every direction; to the supposed Laurentide homeland, to the Atlantic seaboard via Virginia and the Savannah River, to the Gulf via the Chattahoochee and Alabama Rivers, to the Cahokia-New Madrid heartland of Mississippian climax, and to the Middle Ohio via the Kentucky Salt Roads.

Seldom are clearcut type areas presented for studying the autochthonous or allochthonous origins of culture and their intergradations, but in the case of the Cherokee it seems entirely possible that the more definite identification of intrusions, hence the more definite bounding of specific areas of cultural origins might now be feasible.

#

# THE EVANS GAP SITE

Max E. White

Western Carolina University

The Evans Gap Site (NC Ja 11) is located in a saddle-like gap at 4,000 feet altitude on Moffitt Mountain, Jackson County, North Carolina. The land is owned by the Mead Corporation, and most of the timber has been harvested, leaving only smaller growth and mountain laurel thickets. Swift-flowing creeks are numerous in the area, and would have supplied prehistoric hunters with a ready source of water for drinking and cooking. Granite can be seen exposed in most of the streams. On the ridges quartzite is fairly abundant, often in rather large boulders and outcroppings. In keeping with the geography of the Appalachians in general, the mountains surrounding this site are steep-sided with rather rounded summits. On many of the slopes, considerable rock cliffs can be seen. Generally speaking, the entire area could be categorized as "rough" country.

The mountains here previously were covered with the usual hardwoods--oak, hickory, etc. In addition, chestnut trees were abundant, as is evidenced by the large number of gigantic chestnut stumps seen everywhere. Many of these forest giants measured several feet in diameter.

As stated before, the site itself is located in a saddle-like area, the land sloping up abruptly on the east and less abruptly on the west. Correspondingly, the land slopes downward rather abruptly to the north, and less abruptly to the south. A short walk downslope to the north brings one to a small creek; a short walk in the opposite direction brings one to a swampy spring from which seeps a small stream. Both of these streams would have been readily available to prehistoric hunters camping at the gap, and perhaps the spring at the time was not so swampy as it is at present. A few quartz chips were found on the surface between the site itself and the spring, perhaps indicating more activity in that direction as opposed to the somewhat steeper slope leading down to the creek on the north side where no chips or artifacts were found.

The Evans Gap Site measures some 80 feet long by 61 feet wide. This is the area of major concentration of artifacts, although a few scattered artifacts were found just outside this area. The soil is dark gray to a depth of five inches. Underneath this is a grayish-yellow subsoil, devoid of artifacts, and underneath this is red clay. Our excavations consisted entirely of salvage operations as the site had been lightly bulldozed. I was informed in the winter of 1970 that employees of the Mead Corporation, in building a new logging road through the gap, found "a cigar box full of arrowheads and a piece of a pot." The site was visited shortly afterwards and a surface collection made. Due to other assignments, the site was not visited again until the following fall. During the fall of 1970 and spring of 1971, the site was completely excavated. The bulldozer had plowed the logging road through the north side of the site and had pushed the tree stumps over the remainder of the site. The ground was littered with quartz chips, mostly of a fairly large size, and fist-sized chunks of quartz were everywhere. The excavations revealed these quartz chips and chunks to be uniform throughout the 5-inch layer of soil at the site. At one point, roughly in the center of the site, we discovered a pile of five large quartz stones--some of them almost too large and heavy for an ordinary man to lift. There was no evidence of a fire there and this was the only feature found on the site.

Steatite chips and stones also were encountered throughout, but these were invariably of a very poor quality steatite. It was, in fact, so rotten that it crumbled to the touch. The better steatite fragments were portions of bowls, cooking stones, and at least one polished atlatl weight. Also found on the site were several pitted steatite stones. The uses of these and the type drill used on them remains a mystery. Several of these stones are pitted on both sides and some of the pits bear marks of a very tiny drill or sharpened instrument (cane or bone?). In any case, these definitely are not nut stones. Later in the spring, a steatite fragment pitted in the exact same manner was found at a workshop site several miles away. In addition to these, two other slightly pitted stones were found, one of granite, the other of sandstone, but these are definitely in a different category. In both cases, the stones had been shaped and bore a slight depression on both sides.

All of the cooking stones and fragments had been polished or smoothed. In the course of our excavations we found what is evidently a sandstone abrader. The atlatl weight fragment had been highly polished. Fourteen of the bowl fragments were smoothed on both sides and one had been smoothed on only one surface. Projectile points were fairly numerous at the site--some 74 points and fragments of points were found in the excavation and on the surface. The majority of these points are analogous to the Stamp Creek and Savannah River types. Both these and other artifacts point to a late Archaic base at the site. These points usually are rather large with a square--usually incurved--base, and almost all were made of quartz. Other types of points found are Late Archaic or Early Woodland. Fragments of several were found, but a surprising number were in perfect condition. A small number of flint projectiles and a few flint chips seem to point to increasing influence from other areas, probably in the later occupations of the site. Aside from this flint, all of the other materials found could be obtained locally, or at the most, only a few miles away.

One other artifact that is of importance in explaining this site is a pestle. The implications of this artifact will be discussed later. Potsherds were almost nonexistent; only 19 were found, some of these being thumb-nail size. Of those found, we can safely ascertain that they belong to the Early Woodland since five are check-stamped, three are cord-marked, five are plain, and one is fabric-marked. All are grit-tempered and are made of a reddish clay.

Twelve artifacts identified as drills were recovered as well as three awls, all made of quartz except one drill that was made of a light gray flint.

By far the best represented artifacts were knives and scrapers. The Evans Gap Site yielded 150 knives and/or fragments of knives, nearly all of quartz. The knives were of all sizes, but a fairly large percentage probably were six or more inches long. The knives were often broken, but a surprising number of the smaller specimens were complete. Complimenting the large number of knives, 26 scrapers were found, again being almost entirely of quartz. Some of the knives had a finely worked base that is analogous to the base on several of the projectile points. The implications of this and other findings and conclusions relevant to the above will be discussed shortly.

The components at this site all point to a Late Archaic-Early Woodland occupation. The perforated steatite cooking stones seem to suggest relationships to the south, as these are found widely in northern Georgia. Otherwise, the steatite industry here seems to be no different than at other sites in the southeast, with the possible exception of the pitted stones, which remain a mystery. The vessel fragments indicate an oval shape, with no decoration on the one or two rims discovered. Several of the cooking stones exhibited hatchure marks around the edges. One steatite object found by the loggers is of doubtful antiquity. This is a steatite bird effigy. I say that it is of doubtful antiquity because we found (also on the surface) a steatite fragment that evidently had been shaped by a metal knife which was inscribed with a person's initials and the date "1937". The bird effigy is unlike anything I have seen, and could have been made with a metal knife in a few minutes.

The projectile points are representative of the Savannah River, Stamp Creek, and Old Quartz phases of the Archaic with a scattering of later types. The stone knives bear close resemblances to the artifacts found at Stamp Creek in North Georgia (J.R. Caldwell, personal communication). Some of the projectile points closely resemble those found at the Doerschuk Site in the North Carolina Piedmont (Coe 1964: 42,44). At least two points were classified as Morrow Mountain, based on material from the Doerschuk Site pictured by Coe (1964: 39). All exhibit pressure flaking and generally are well made.

The check-stamped pottery may be equivalent to the Deptford series in Georgia, as the checks are very small and delicate. The cord-marked and fabric-marked are both early types of pottery in the southeast, as has been determined by Caldwell, Kelly, and others. Both of the above modes of decoration have counterparts in North Georgia (Wauchope 1966:51).

## Conclusions

The question of just what the inhabitants of the Evans Gap Site were doing in a small gap at an elevation of some 4,000 feet can now be answered, at least in part. From the large number of stone knives and skinning tools, it seems rather certain that this was a Late Archaic hunting station. Both deer and bear are found near the site today, but what other large game the Indians may have been seeking must remain unknown, at least for the present. The predominance of large knives and skinning implements seem to indicate large animals. A secondary activity almost certainly carried out at the site was the manufacture of tools. This is indicated by the large number of quartz rocks and chips found on the site. Some, if not all, of the quartz could be obtained nearby. On the mountaintop to the southeast, a secondary site associated with large, white quartz boulders (NC Ja 11b) was found. This site yielded quartz chips and some unfinished scrapers and projectile points. This may have been the source for the white quartz so heavily utilized at the main site. The other quartz must have been brought to the site from some distance away as we found one water-worn red quartz rock that obviously came from further down the slopes.

The few flint chips and artifacts indicate trade relations with peoples probably living in what is now Tennessee. I suggest that this is a later development on the site and does not belong to the Archaic complex. Most of the steatite artifacts are of a superior quality and could have been obtained in the area, but not in the immediate vicinity of the site. Probably the poorer quality, reddish steatite, so abundant in chip form, was obtained nearby.

Gathering may have been carried out at this site when certain foods were in season. I speak specifically about huckleberries, acorns, and chestnuts. The Cherokee living in this area used chestnuts in several dishes, and the prehistoric inhabitants probably did likewise. The use of chestnuts seems to be indicated by the presence of a pestle on the site, although no grinding stone has yet been found.

In summary, the Evans Gap Site seems to have been intensively used during Late Archaic times, primarily as a hunting station with tool manufacturing and gathering being less important activities. Use of the site seems to have tapered off and finally ended in Early Woodland times, as is suggested by the sparse potsherds from that period. There are other gaps in the area, but they remain unexplored archaeologically at this writing. The presence or absence of artifacts there could give us a better idea of prehistoric activities in the area.

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CAPTIONS FOR ILLUSTRATIONS IN FIGURES 1 THROUGH 7:

FIGURE 1. (a) steatite cooking stone, (b) sandstone abrader, and (c) base fragment, steatite bowl.

FIGURE 2. (a) fragment of polished atlatl weight, (b) steatite pendant, and (c) steatite cooking stone.

FIGURE 3. (a) steatite cooking stone, (b-e,h) projectile points, (f) scraper, and (g) scraper/awl.

FIGURE 4. (a-b) drills, (c,i) knives, (d) scraper, (e-h) projectile points.

FIGURE 5. (a-e) quartz knives.

FIGURE 6. (a) quartz knife, (b) slate projectile point, (c) gray flint projectile point, and (d,e) slate knives.

FIGURE 7. (a,d,e,h,i) flint projectile points, (b) quartz projectile point, (c) Morrow Mountain-like point, (f,g) slate knives, (j) flint knife, (k,l) cord-marked pottery, and (m) check-stamped pottery.

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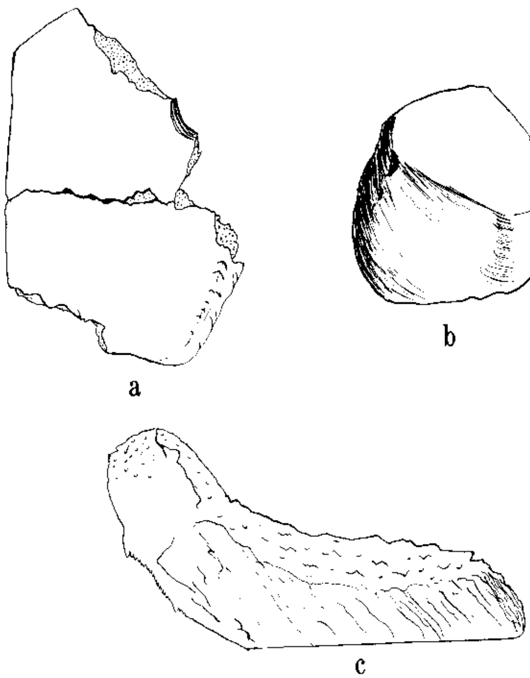


FIGURE 1

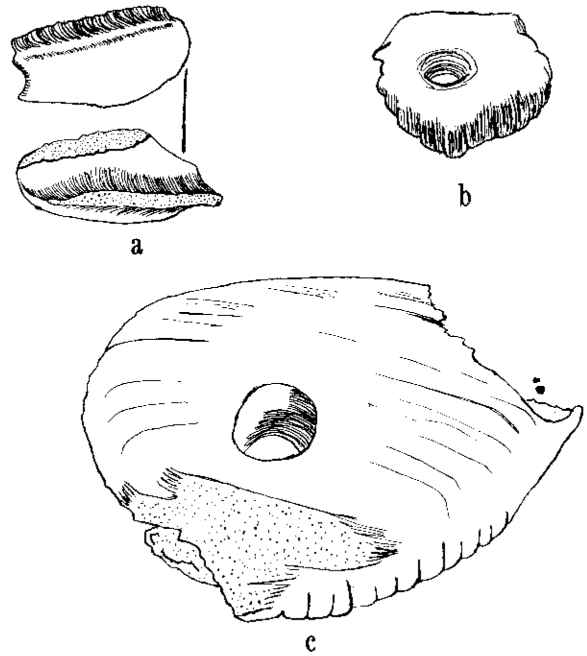


FIGURE 2

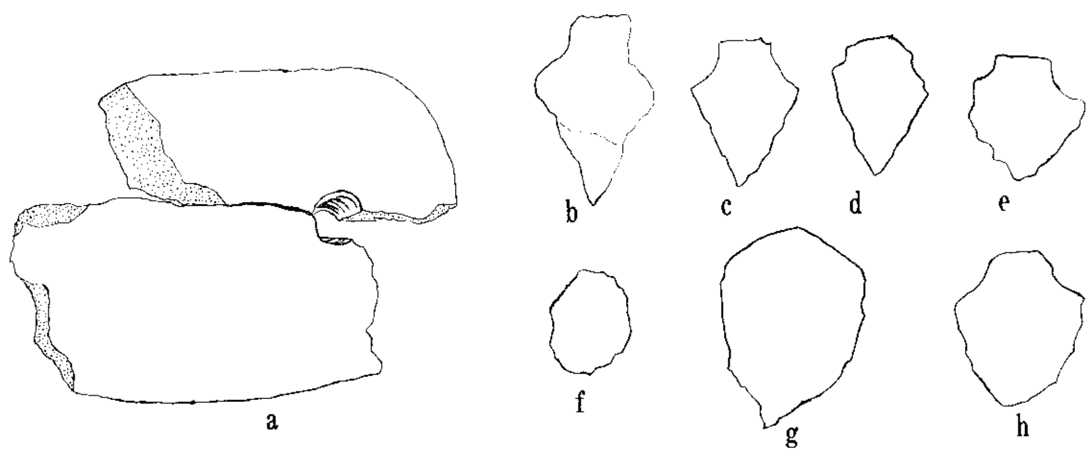


FIGURE 3

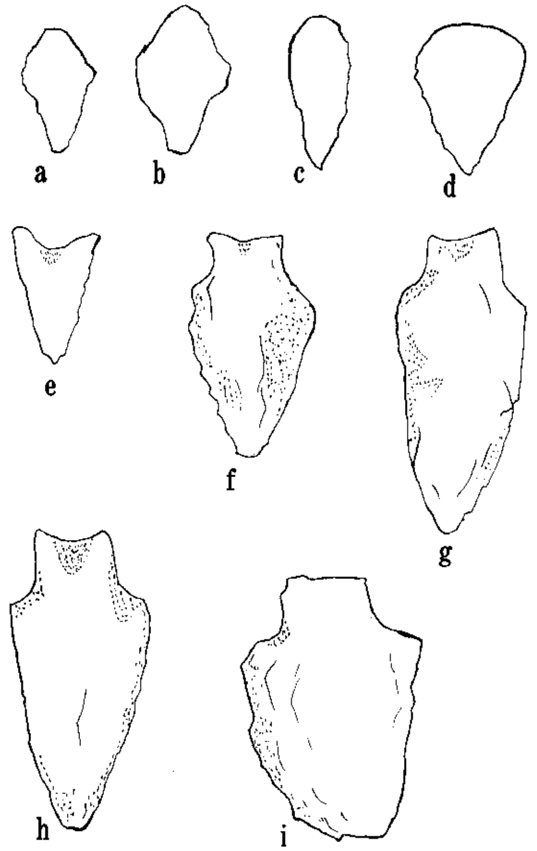


FIGURE 4

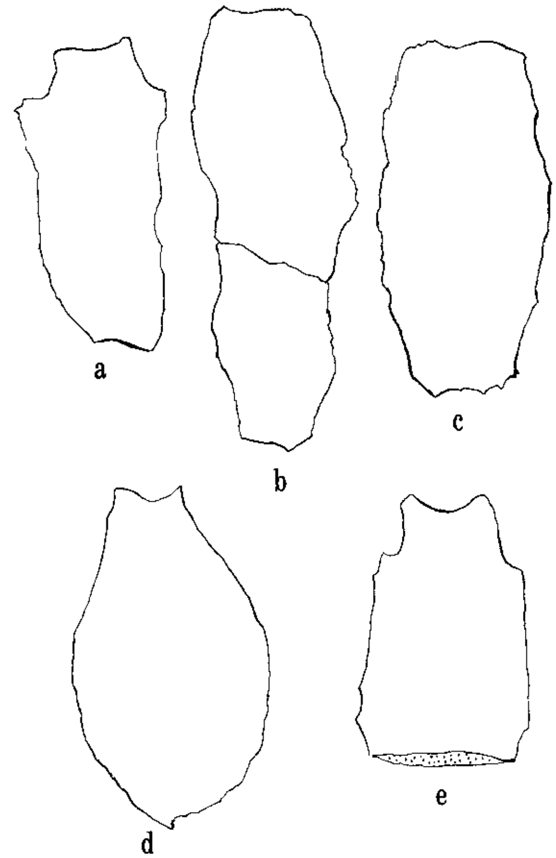


FIGURE 5

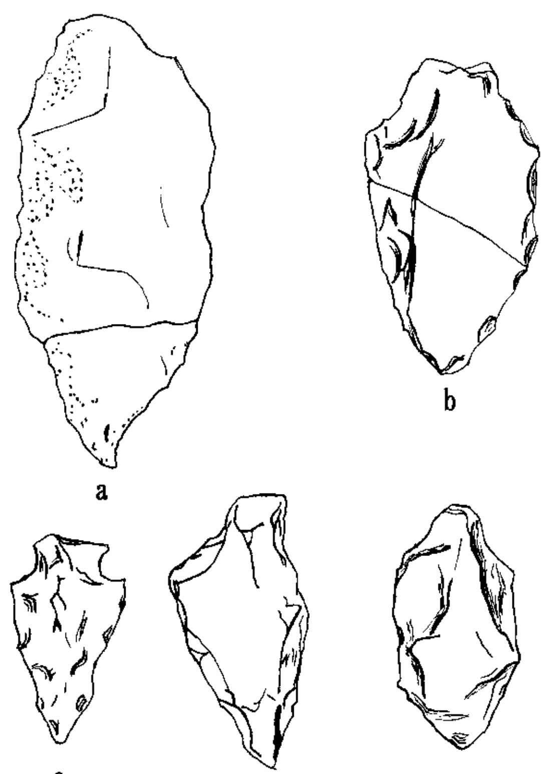


FIGURE 6

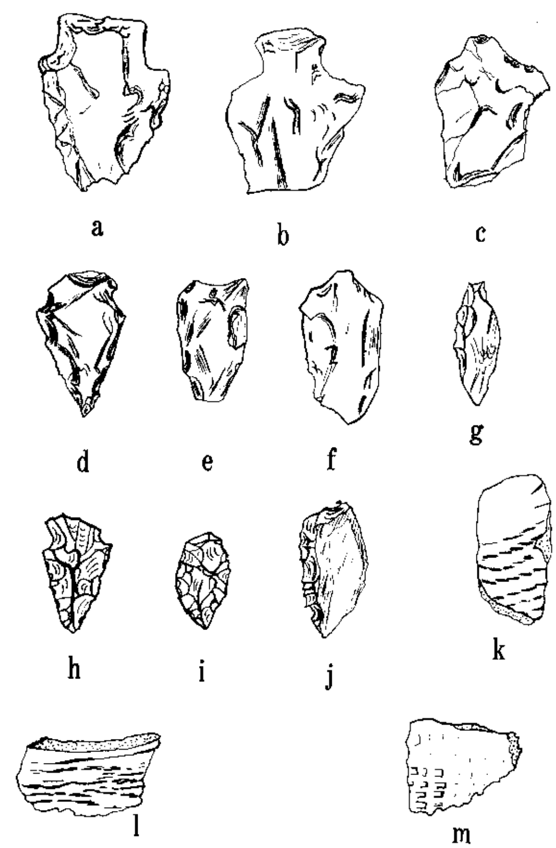


FIGURE 7

## COMMENTS ON HOUSE STRUCTURES FROM LOWER CHEROKEE TOWNS

John D. Combs
University of South Carolina

My comments will be brief, reflecting the University of South Carolina's only recent involvement with the Lower Cherokee Towns. In addition, a very recent discovery, that may shed new light on early historic period Cherokee structures, will be mentioned.

For the most part early historic period Lower Cherokee structures are unknown archaeologically. William E. Edwards (formerly of the University of South Carolina), under the direction of Dr. A.R. Kelly, worked in the village area at Tugalo. These excavations produced no house patterns. A series of disappointing events in 1967 did not allow enough time for Edwards to locate and excavate any structures in the town of Keowee prior to its inundation. Finally, in 1968, under the direction of the author, Don Robertson (formerly of the Institute staff) located and revealed two house patterns from the former Cherokee Town site of Toxaway.

This Cherokee town was located on an 80-acre flood plain of the Keowee River approximately 6 miles upstream from the location of Keowee and the Colonial Fort Prince George. Toxaway appears to be a rather recent town archaeologically, and there are no early references for its existence during the first third of the 18th century. In 1751 the Hunter map shows it containing 30 fighting men. This former site location has been intensively cultivated for years, and its presence was first brought to our attention by recent collector activity that had been undertaken there in 1968. Our investigation consisted of stripping off the backdirt of the amateur excavations and the plow zone from an area about 100 meters square. This revealed those features that were originally dug below the level of the present day plow zone and those that were still left intact after the amateur activity.

Two rectangular postmold patterns were revealed measuring approximately 15 by 30 feet. The pattern was made up of posts measuring from 6 to 8 inches in diameter. Associated Colonial material date clearly from the mid-18th century. The original living surfaces were removed by the farming activity. No indication of the above ground structures remained including such things as daub.

No sketches, diagrams, or drawings of these villages had turned up until July of 1971 in the magazine Arizona Highways. In an article dealing principally with trade beads, a powder horn was illustrated that had attached a sash used as an example of early beaded geometric design. A further inspection of the powder horn revealed that it had engraved on it the Colonial Fort Prince George, plus many of the lower and middle Cherokee Towns. It was an impressive find because of its great accuracy with respect to the diagram of Fort Prince George. This fort was excavated recently by the Institute and the rendering on the powder horn is the first known accurate drawing of the ground plan to be found. Of even more significance, however, is the several small drawings of houses at the various town locations. It is tempting to match up the vertical log members illustrated in the house drawings and the postmold patterns from those revealed at the site of Toxaway.

This powder horn commemorates the campaign of 1760 by the 78th Highland Regiment. It was presented to General Montgomery by the victorious Colonial Grant as a little summary of the campaign. Several years ago this specimen was purchased from the Montgomery Family in England by the present owner. A considerable amount of data can be gleened from the engraving on the powder horn. An arrangement has been made with the owner of the horn that will enable us to further study it and make a series of detailed drawings and photographs.

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## THE OVERHILL CHEROKEE HOT-HOUSE
## THE FUNCTIONAL INTERPRETATION OF A FEATURE

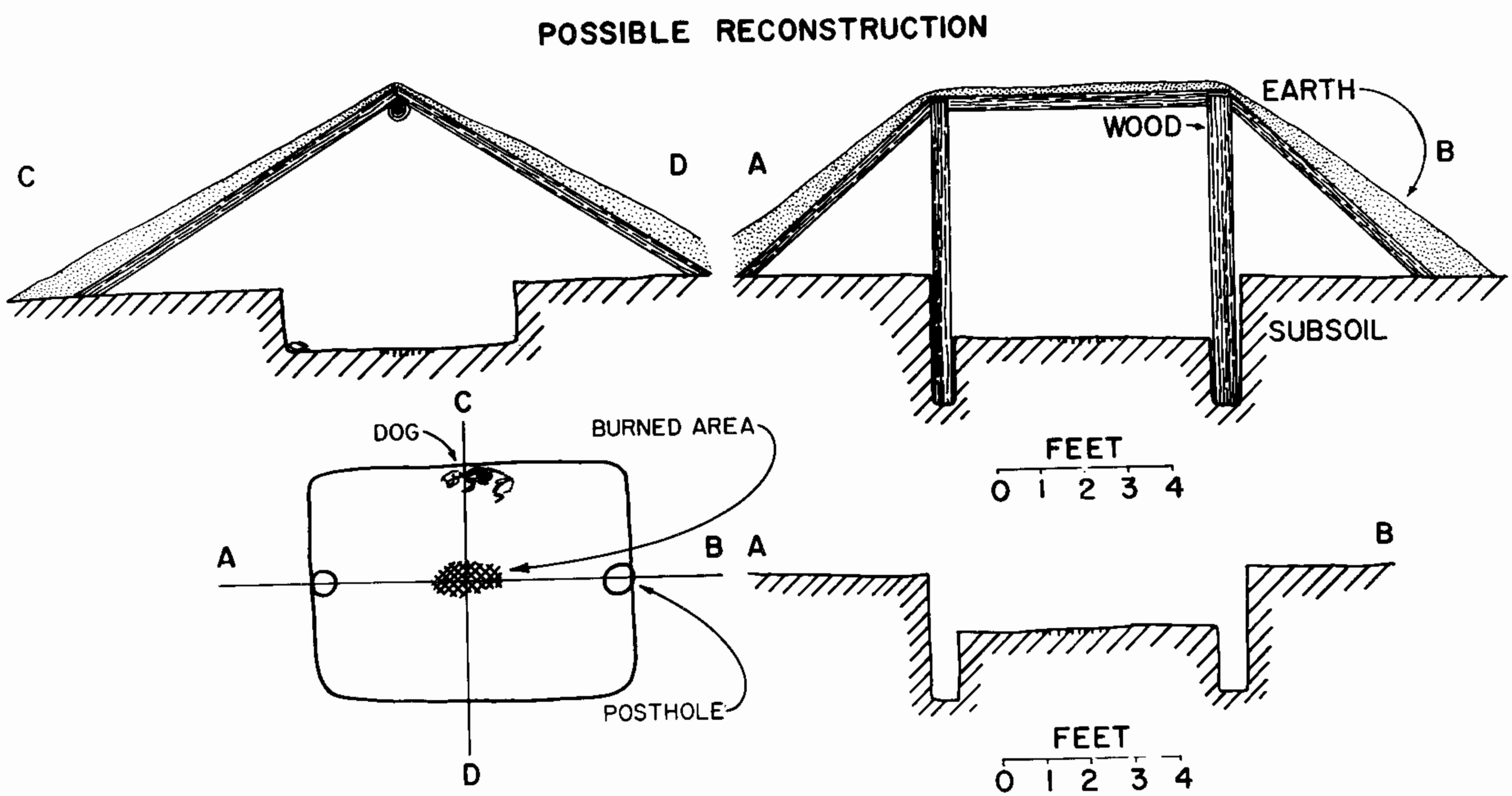
Richard Polhemus

University of South Carolina

Excavation of the 18th century Overhill Cherokee town of Chota, located in Monroe County, Tennessee, has provided us with a number of posthole patterns and a large number of other features. One class of features, characterized by rectangular form, shallow depth, vertical walls, and a posthole in each end is here interpreted as the remains of the traditional Cherokee hot-house. The identification of these features as hot-houses is based on the form of the features, the distribution of the features within the site, the position of the features in relation to structure patterns, and contemporary descriptions.

The feature averages 5 feet in width, 7 feet in length, and 1.5 feet in depth. The postholes average 0.6 foot in diameter and 2.5 feet in depth below the ground level. The floor is level, compacted, and frequently shows a small burned area in the center. The figure showing the floor plan and section of Feature 112 (Fig. 1) also indicates a possible reconstruction of the structure.

The eleven features of this form are distributed throughout the excavated portions of the Chota Site although three are located in area B spaced 30 feet apart in a north-south line, suggesting that each feature was associated with a structure. Excavation to the south and east of the southernmost feature exposed Structure 6. Feature 225, located in area D at the east end of Structure 8, has an orientation perpendicular to the 10- by 30-foot structure. The powder horn described by John Combs illustrates a small structure located at one end of a house similar to Structure 8. Henry Timberlake places the hot-house at one end of the structures he describes, that "rarely exceed sixteen feet in breadth, on account of the roofing, but often extend to sixty or seventy in length, be-




CHOTA (40MR2) FEATURE 112

side the little Hot-House."

Numerous early visitors to the Overhill Cherokee country mention hot-houses in conjunction with dwelling structures. Henry Timberlake, in 1761, observed that "This Hot-House is a little hut joined to the house." Although no one visitor described the hot-house sufficiently to make a reconstruction possible, by combining recurring features in the various historic accounts, one can derive the main features required for such a structure. The size of the hot-house is always described as "small" or "little" in historical accounts, and only by comparison to other structures of given dimensions can a size be determined. Other 18th century descriptions mention that the hot-house was circular in form and earth covered. The suggested reconstruction meets both these requirements.

The following quotation taken from the Moravian Brother Martin Schneider's report of his journey to the Cherokee country in 1784 describes both dwelling and hot-house at the town of Kahite (40MR32) on the Tellico River.

> Their Dwelling Houses are blocked up of narrow Logs about 7 feet high to the Roof, 14 feet long & 10 feet broad, & are well plastered. They have no Windows, the Door is very small, the Chimney fixed on the Outside. Every Family has besides the Dwelling House still a smaller Hothouse. This has but a very small Opening to creep into it, & this is their Abode in cold Weather; after the Fire which is made in the Middle is burnt down, the coals are covered with Ashes. Their Couches of Cane fixed round about are their Sleeping Places, which they scarce ever leave before 9 o'clock in the Morning. Then they make again Fire for the Whole Day & at night they make another. The Old People having but little & the Childrem, till they are 10 Years old, no cloathes at all, they could not hold out in the cold Weather without such Houses (Williams 1928: 260).

The excavation of Kahite (40MR32) on the Starnes farm substantiates the description of horizontal log construction and a large flat-bottomed feature was located in four of the five habitation areas excavated. The use of pits in conjunction with the term hot-house at a much later date is indicated by William J. Cotter in <u>My Autobiography</u> referring to a period about 1838, "In bitter coal weather they slept in large pits called hot-houses." A second late description of a Cherokee dwelling house by Rev. Francis Goulding in 1817 suggests a possible superstructure for the "large pits" referred to by Cotter.

> Some of the dwellings that we saw that day, and many that we saw afterward, belonging to the poorer class, consisted simply of a roof resting on the ground, and made of long pieces of bark, stripped from growing trees, flattened and leaned against a ridgepole. Most of the better houses were made of straight poles or small logs about twelve feet long, notched into each at the corners, so as to lie very close, making a wall about as high as a man's shoulders, and surmounted by a roof of bark, or of split boards.

> These better houses were usually associated with a small patch of cleared ground, an acre, or less, planted with corn and beans (Goulding 1870).

A feature of this type excavated at the Overhill Cherokee town of Tomotley did not have the postholes at each end and in that respect resembles the examples from Kahite. The superstructure of the hot-house may have changed to horizontal log construction as with the dwelling houses.

This class of feature has been found on a number of Overhill Cherokee sites and the placement, distribution, and form suggest a specific use pattern. It is here suggested that this class of features represents the traditional hot-house.

#

# EXPERIMENTS IN SOIL CHEMISTRY

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In an attempt to elicit the maximum amount of information from archaeological investigations, several "para-archaeological" techniques are being introduced into the field of archaeology. This paper is concerned with one of these--the chemical analysis of soils.

In the summer of 1969 at the Lyman Research Center, Miami, Missouri, work began on developing some insight into this technique. The following summer work continued in this vein, based on previous work and on new problems and ideas.

With the assumption in mind that human behavior systems and subsystems delimitable within archaeological time and space will modify the geologic locus of that behavior, the following hypothesis was formed. Chemical soils analysis can detect and differentiate between human and non-human behavioral products.

## BACKGROUND INFORMATION

Significant information derived from the work in 1969 by van der Merwe and Stein was the chemical identification of postmolds and the ability to chemically differentiate them from rodent burrows. This was accomplished by considering each unit or stain as having two components: the stain itself or inside sample, and the immediate surrounding matrix or outside sample. Soil samples were taken along two traverses across the Utz Site (23-Sa-2) in an attempt to establish a base value for the soil as a means of comparison with significant feature values. However, the chemistry of the soil proved highly variable and the idea was discarded. Instead, each unit or feature was considered individually, and the concentrations of chemicals in each of the two components were considered only in relation to each other (van der Merwe and Stein 1969).

Initially samples were subjected to the whole series of tests being used--pH value and concentrations of potassium, calcium, magnesium, phosphate, and the percentage of organic matter. A recognizable and diagnostic pattern gradually began to emerge in three tests: organic matter, phosphate, and magnesium. Potassium, calcium, and pH were discontinued, organic matter was discontinued as being repetitive, and work was concentrated on magnesium and phosphate. At the end of the field season, the work showed a 96 percent accuracy in correlating field diagnoses with chemical diagnoses (van der Merwe and Stein 1969).

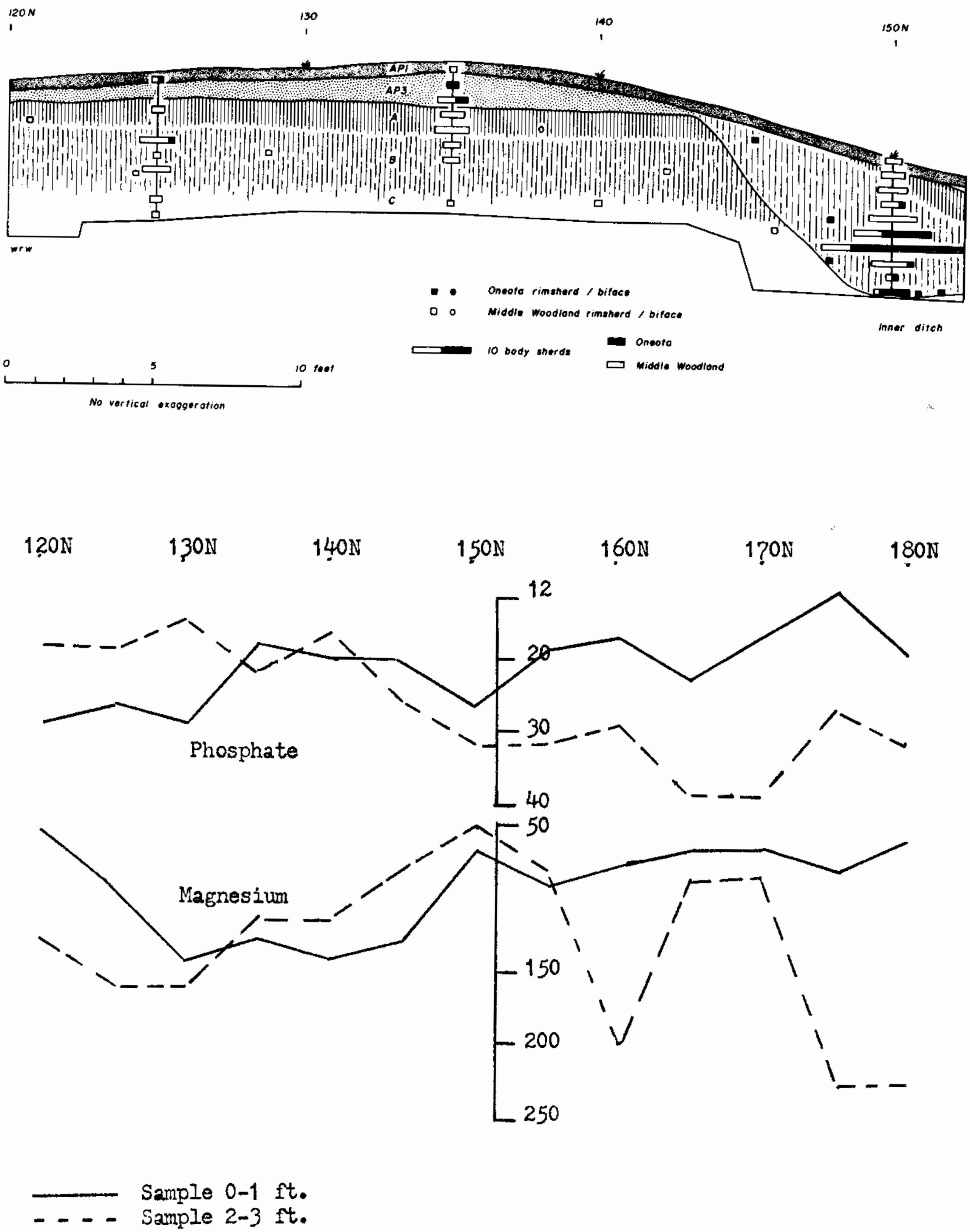
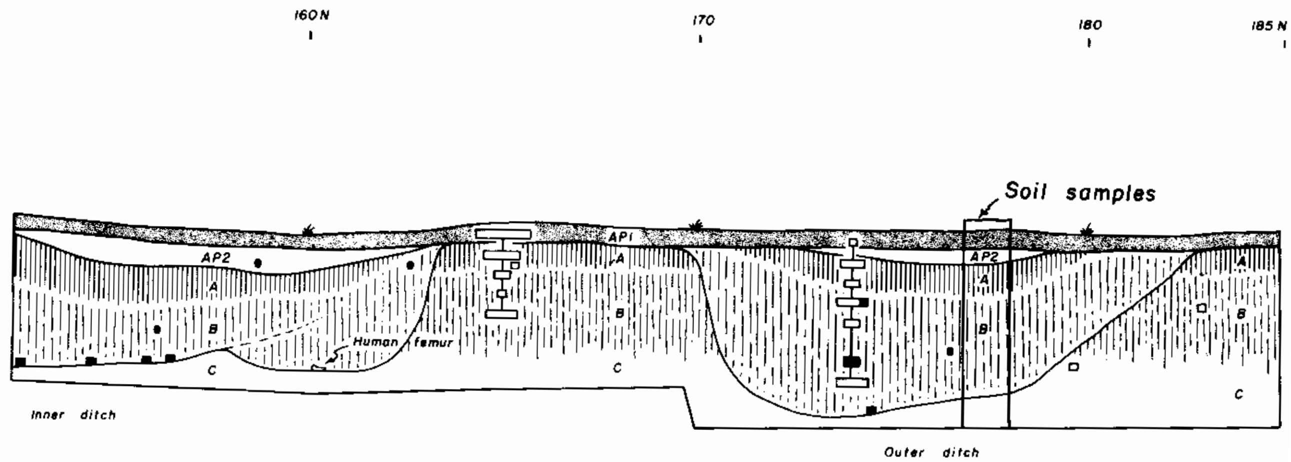
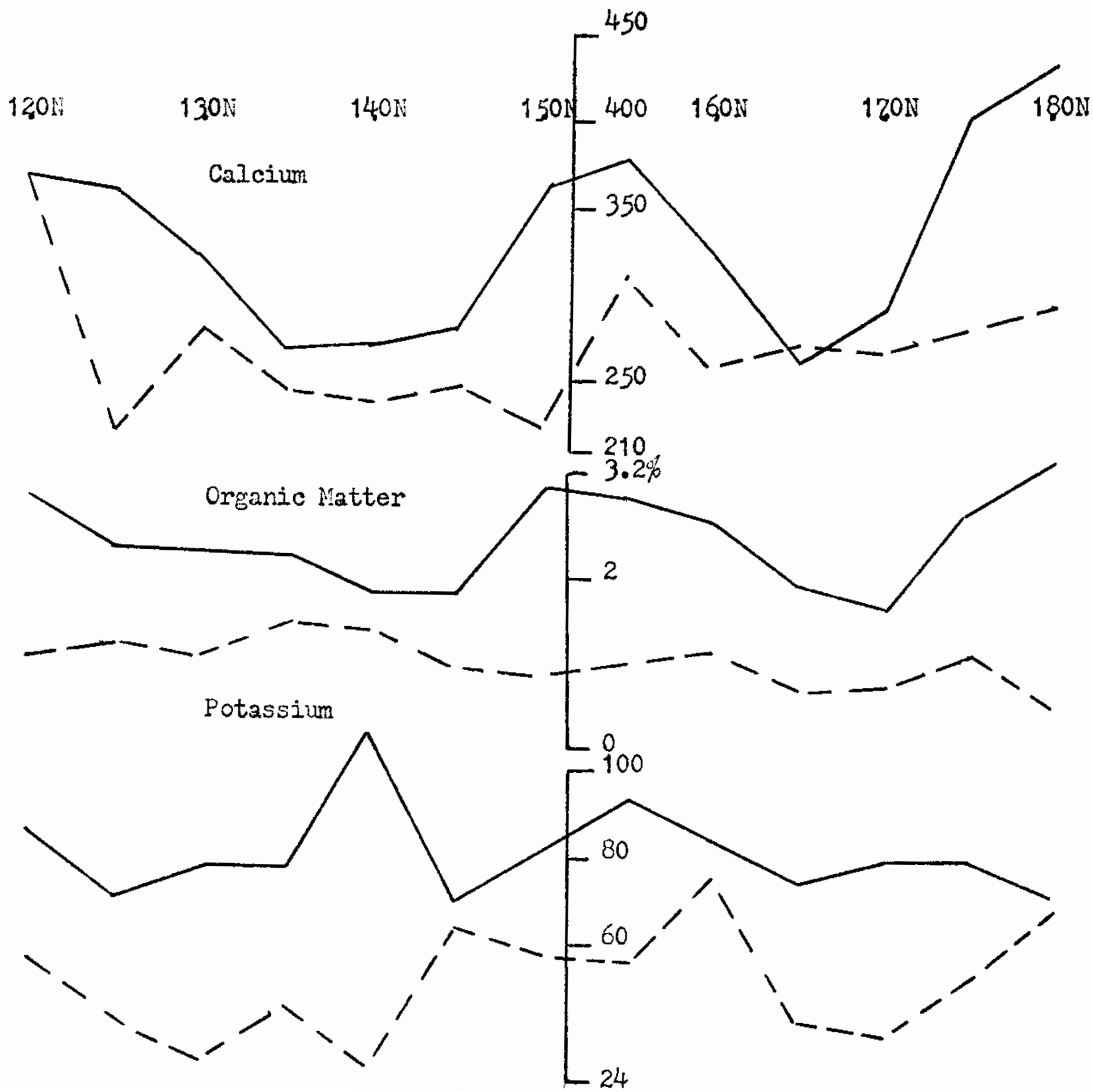



FIGURE 1a. Soil and chemical profile of trench at 23-Sa-104.


160 N
170
180
185 N
Soil samples
AP1
AP2
A
B
C
Human femur
Inner ditch
Outer ditch


120N
130N
140N
150N
160N
170N
180N
450
400
350
250
210
Calcium
3.2%
2
0
Organic Matter
Potassium
100
80
60
24

The formulae developed by van der Merwe and Stein are:

1. Magnesium concentrations were lower in the postmold and higher in the matrix; rodent burrows were the opposite having a higher concentration inside the stain and a lower one outside.
2. Phosphate concentrations were higher in the postmold and lower in the matrix while the revearse is true in rodent burrows.
3. Organic matter percentages were higher in the postmold and lower in the matrix, rodent burrows again being the opposite.

The results of this work were highly tentative as van der Merwe and Stein were quick to point out. The work was on one site and could very easily be a site specific technique. Also, an insufficient number of rodent burrows were tested.

CURRENT RESEARCH: STRATIGRAPHY

Again in 1970 the chemical soils lab was in operation at the University of Missouri Archaeological Field School. One of our goals was to seek more uses of soil chemistry that might be beneficial in the archaeological investigation of a site. The testing of postmolds also was one of the summer goals, but since postmolds were not immediately forthcoming, other experiments were conducted.

The first experiment was an attempt to determine stratigraphy before excavation. A 5- by 70-foot trench was staked off that cross-cut the double ditch encircling the Old Fort (23-Sa-104) located in Van Meter State Park. Samples were taken along this trench with a soil core at 5-foot intervals to a depth of 3 feet. The samples then tested came from the first foot and the third foot unless color differentiation was visable to the eye. In that case, the samples were divided according to humic and loess layers. Applying the six tests previously mentioned, some evidence of disturbance was detected (Fig. 1). Had this analyst been more familiar with soil analysis at the time, it would have been possible to partly predict where some of the greatest changes in stratigraphy occurred. As it turned out, this was one of those retrospective insights that often occur.

Once the trench was opened and the profile visible, stratigraphic differentiations appeared in two areas; the "inner ditch" and "outer ditch" and their various refillings. The "outer ditch" became the subject of another experiment.

The problem was to attempt to chemically determine the microstratigraphy of the "outer ditch". Twenty-two samples were taken in natural levels visible to the eye; several samples were taken in those area consisting of wide bands of natural levels. The area from which these samples were taken was about 1.5 feet in width and 5.2 feet in depth.

Organic matter, calcium, phosphate, magnesium, and potassium tests were run on each sample. The concentration of chemicals in each sample was then marked on a graph at the level from which it was taken and compared to a stratigraphic drawing of the ditch prepared by W. Raymond Wood. Where three or more of the chemical properties peaked either high or low, it was noted and compared to the stratigraphic levels on the map (Fig. 2).

The chemical results showed nine stratigraphic levels, seven of which corresponded with the levels on the profile drawing. These peaks appeared at the following depths:

a. 0.5 feet--labeled AP2 and defined by Wood as unit fill dragged in by an earlier plowing of the area.
b. 1.4 feet--the end of "A" horizon and the beginning of "B" horizon.
c. 2.2 feet--the middle of "B" horizon.
d. 3.0 feet--a change in stratigraphy noted but not labeled by Wood which I have labeled B1
e. 3.5 feet--a change noted but not labeled by Wood, now labeled B2.
f. 3.8 feet--a change noted but not labeled by Wood, now labeled B3.
g. 4.2 feet--the beginning of "C" horizon (lower layer of soil).
h. 4.4 feet--not previously noted which I have labeled C1.
i. 4.7 feet--not previously noted which I have labeled C2.

This experiment points out another use for soil chemistry: establishing microstratigraphy.

It also is interesting to note that several high peaks of phosphate correspond with cultural debris found at these levels, since phosphate has long been thought to be indicative of human activity (Cornwall 1958: 196; Heizer and Cook 1965: 12). When the soil pH is above 7.0 or below 6.0, the phosphorous is generally locked into insoluable compounds and does not leach out of the soil (Heizer and Cook 1965: 13). The pH value of the soil from 23-Sa-104 is from 5.4 to 6.5 so this interpretation is doubtful. Specific pH tests were not run on each of the samples as the pH meter available was not operational. In some cases this phosphate factor could be quite valuable in final interpretations of the excavation.

CURRENT RESEARCH: POSTMOLDS

Another site being excavated at the time was the Fisher-Gabbert Site (23-Sa-1280), a Middle Woodland site with intensive occupation. At this site some postmolds were uncovered providing an opportunity to test the formulae of van der Merwe and Stein on chemical postmold identification. A total of 82 features interpreted as postmolds were uncovered. These were all cross sectioned with descriptions noted of width, depth, and the excavators field diagnoses as postmolds, rodent burrows, or nothing (stain disappeared upon cross sectioning). As described earlier in this paper, two samples were taken from each stain--a sample of the stain itself and a sample from the immediate surrounding matrix.

During the course of excavation and subsequent transfer of samples, portions or all of 27 samples were missing. The remaining 55 samples were first subjected to magnesium tests following the procedure outlined by van der Merwe and Stein. According to the formulae presented earlier, 25 samples tested out as postmolds, 20 as rodent burrows, and 10 "nothings" (in the chemical sense, nothing refers to samples having the same concentration in both inside and outside samples). By following the technique prescribed, phosphate tests would only be run on the group of

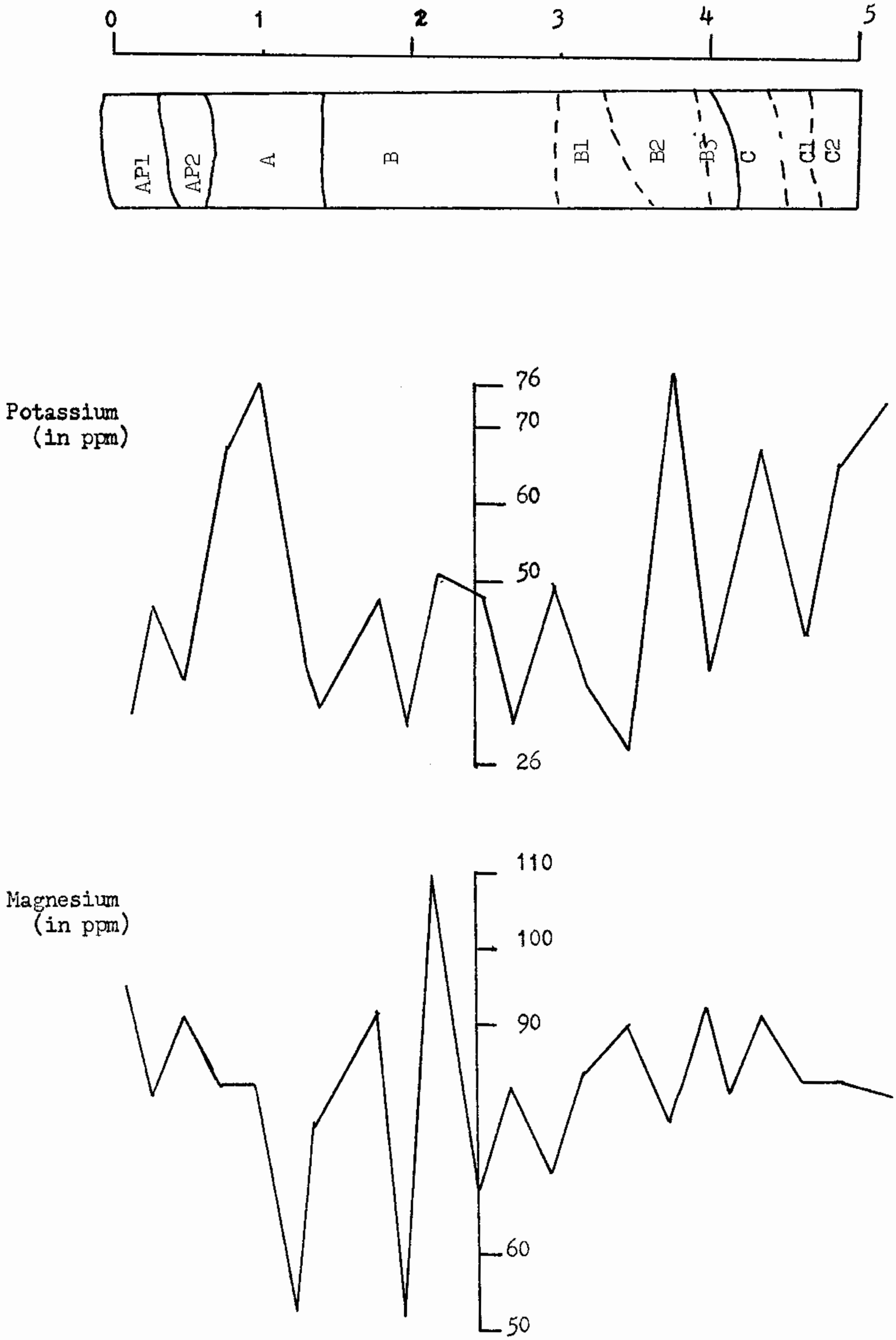



FIGURE 2a. Soil and chemical profiles of the "outer ditch" at 23-Sa-104
(vertical scale in feet)

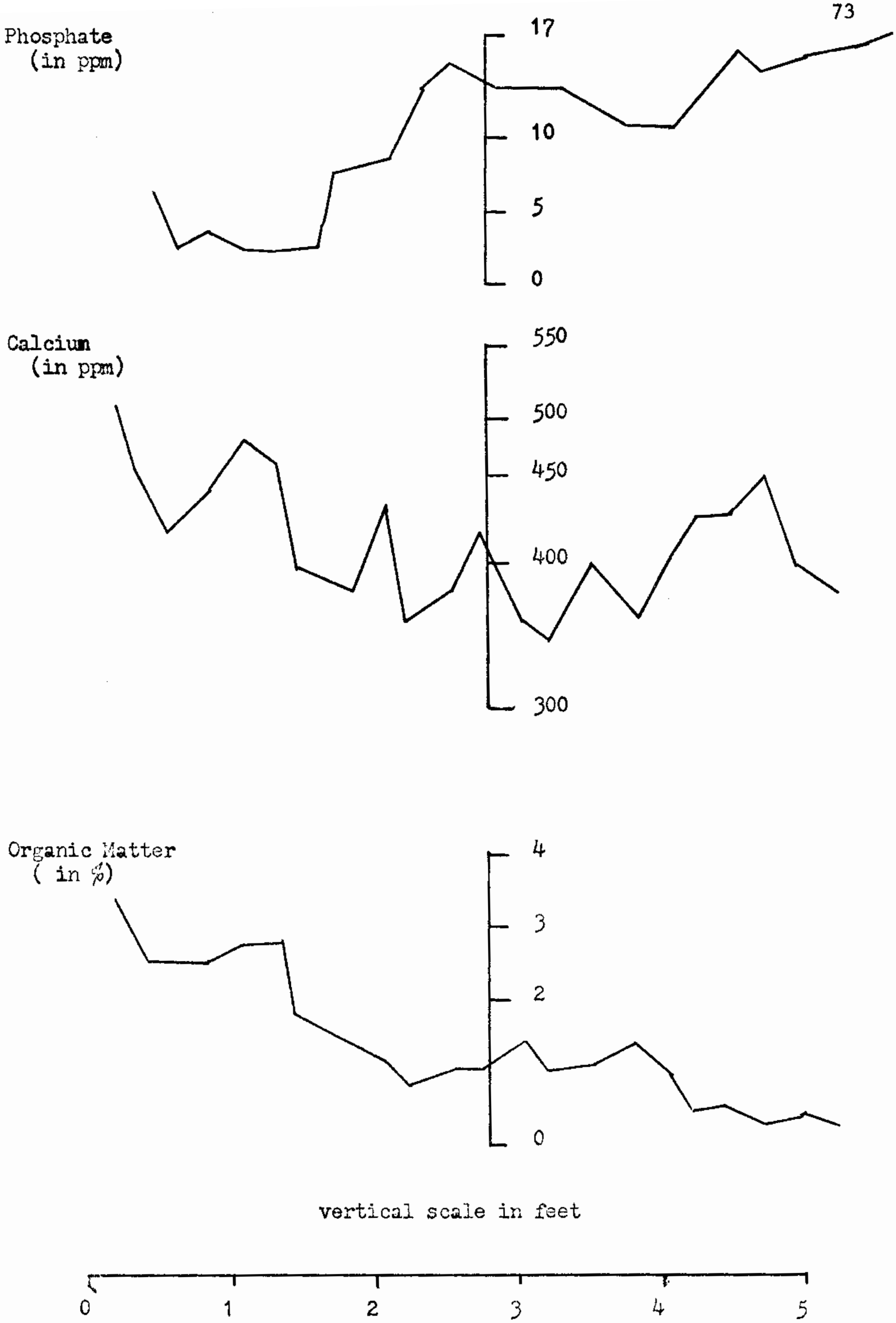



FIGURE 2b. A continuation of the profiles of the "outer ditch" at 23-Sa-104.

25 postmolds. However, for curiosity's sake, tests were run on all 55 samples; the results being 30 chemical postmolds, 17 rodent burrows, and eight "nothings". Combining these figures yielded 16 postmolds that agreed chemically, six rodent burrows that agreed chemically, and no "nothings" that agreed chemically. Field diagnoses available showed 28 stains diagnosed as postmolds, 23 of which were tested, and 15 stains diagnosed as rodent burrows, 13 of which were tested. Comparison of the chemical diagnoses of postmolds with the field diagnoses showed a 30.4 percent agreement. The rodent burrow comparison showed a 15.3 percent agreement (Fig. 3).

With this rather bad percentage, it was decided to run the organic matter tests previously discarded by van der Merwe and Stein. This test was run on samples that had chemically tested out through magnesium or phosphate to be either a postmold or a rodent burrow. Eighteen samples were arbitrarily selected showing fairly equal distribution with 11 magnesium postmolds and 11 phosphate postmolds--six of which agreed--and seven magnesium rodent burrows and six phosphate rodent burrows--two of which agreed.

A second reason for testing the organic matter was an increasing doubt of the applicability of the phosphate test in this particular instance. All of the readings taken of the concentration of phosphate were very high. Several reasons for this have been postulated. (1) The field has been in cultivation (soybeans) for several years. Soybeans are plants that affect the phosphate content of the soil. (2) A phosphate rich fertilizer may have been used on the soil. (3) Since high phosphate is fairly indicative of human or animal activity, and since this was a rich site archaeologically, the high concentrations could be accounted for in this manner. (4) There is also the possibility of the land having been used as pasture for grazing animals.

The results of the organic matter tests were not encouraging. Of the six magnesium and phosphate postmolds, only three were in agreement after the organic matter tests. The percentage was not impressive and led to these conclusions:

1. The formulae presented by van der Merwe and Stein are not valid for the Fisher-Gabbert Site and are most definitely site specific. The same tests have been tried by other researchers in the Binghamton, New York, and Boston areas with the same negative results (van der Merwe, Personal Communication 1970). One reason for the different results on the Fisher-Gabbert Site and the Utz Site could be that the former site had been in cultivation while the latter site has not been cultivated in many years, thus allowing the soil to achieve a natural chemical balance.

2. The lack of agreement between chemical and field diagnoses may be due to other factors than the one just mentioned. The work in 1969 showed a 96 percent agreement in chemical and field diagnoses. The work in 1970 showed a 30.4 percent agreement. The following may have influenced these percentages.

   a. The cross sectioning and taking of samples in 1969 was spread over at least six weeks. The cross sectioning and taking of samples in 1970 was accomplished in one afternoon. The 1970 sample did not appear until the last few days of the summer session and the work was done rapidly by students--many of whom had never seen a post-mold.

b. The weather also was a factor in that the summer of 1969 was quite wet with rain almost every day, while the summer of 1970 was dry with very little rain. The dryness of the ground was one reason for the late appearance of the stains in 1970 and also contributed to the problem of arriving at a conclusion or diagnoses after cross sectioning.

## SUMMARY AND CONCLUSIONS

The aims of this paper were to suggest some uses for soil analysis in archaeology and to describe, explain, and comment on some uses that had been previously presented. Some of these tests brought beneficial results while others did not. This is not to say that they will never work, but that more testing needs to be done.

The collecting of these samples and the theory and methodology behind it has not been discussed in this paper. This will be included in a later paper, along with the results from the samples now being tested.

The procedures now being used come from a phamphlet used in the Agronomy Department at the University of Missouri entitled Soil Testing in Missouri by C.M. Christy. Tests on some of the trace elements might possibly be of further significance. At present we do not have the necessary equipment for these tests. This still remains a possibility to be explored in the future.

In their report on the testing of postmolds at the Utz Site in 1969 Van der Merwe and Stein suggest that further testing be done on their hypotheses. It was for this reason that the stains from the Fisher-Gabbert Site were tested. The results, although negative, are important in that they indicate the limitations on these formulae but do not negate the possibility of more tests showing positive results.

In another vein, the attempt at partially determining stratigraphy of a site and the microstratigraphy of a particular feature proved quite successful at the Old Fort. Using this technique would lend a high degree of predictability to the excavation and might enable the excavator to dig the site in natural rather than arbitrary levels. The chemical breaks in the soil seemed in most instances to correlate with the stratigraphic breaks and also with the layers of cultural debris. Had I been more familiar with what I was doing, the samples taken from the trench could have enabled us to predict some disturbance in the soil deposit and perhaps altered the plan of attack in the excavation of the trench. We might, for example, have been aware of at least a portion of the natural levels and could have excavated accordingly rather than having to go back and correlate all the cultural debris with those levels once the profile was clear in the trench wall.

TABLE 1

RESULTS OF POSTMOLD AND RODENT BURROW TESTS FROM 23-Sa-128

| Sample Number | Field diagnoses | Magnesium | Phosphate | Organic Matter |
|---|---|---|---|---|
| 1 | + | - | o | |
| 2 | + | + | - | + |
| 3 | + | + | - | + |
| 4 | ? | + | + | - |
| 5 | - | + | o | - |
| 6 | + | + | + | - |
| 7 | - | - | - | o |
| 8 | - | o | - | |
| 9 | + | - | o | |
| 11 | o | o | - | |
| 13 | + | o | + | |
| 15 | ? | o | o | |
| 16 | ? | - | - | + |
| 17 | + | + | + | - |
| 19 | + | - | + | |
| 20 | + | + | + | + |
| 23 | o | + | + | + |
| 24 | - | o | + | |
| 27 | + | - | + | + |
| 28 | + | o | o | |
| 29 | + | - | + | |
| 30 | + | + | + | |
| 31 | - | + | + | |
| 33 | + | + | - | - |
| 35 | ? | + | - | - |
| 36 | + | o | - | |
| 37 | + | - | o | |
| 39 | + | - | + | - |
| 40 | + | - | + | + |
| 41 | ? | + | + | + |
| 42 | o | + | + | + |
| 43 | - | - | + | - |
| 44 | - | + | + | |
| 45 | - | + | + | |
| 48 | o | + | + | |
| 49 | o | - | + | |
| 50 | - | + | - | |
| 51 | + | - | + | |
| 57 | o | - | + | |

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KEY: + = positive chemical identification as postmold or field diagnoses as postmold
- = chemical identification or field identification as rodent burrow
o = stain disappeared in field or inside and outside samples with equal readings
? = field diagnosis unavailable
no mark indicated no test on that sample

TABLE 1 (continued)

| Sample Number | Field diagnosis | Magnesium | Phosphate | Organic Matter |
|---|---|---|---|---|
| 58 | + | - | - | |
| 62 | - | + | - | |
| 63 | ? | - | - | |
| 65 | - | - | - | |
| 66 | + | + | + | |
| 68 | + | + | - | |
| 70 | ? | o | + | |
| 71 | + | - | - | |
| 72 | + | - | + | |
| 74 | o | + | - | |
| 75 | - | o | o | |
| 76 | + | + | + | |
| 77 | - | + | o | |
| 78 | + | + | + | |
| 79 | o | o | + | |
| 81 | ? | - | + | |

In the case of a feature such as the "outer ditch" at 23-Sa-104, having a clear picture of the microstratigraphy was most important in trying to predict the sequence of events revolving around its development. The main aim of this excavation was to determine a time period for the construction of this earthwork. The chemical analysis showed a break in the stratigraphy that corresponded with the visible bottom of the ditch. This served as corraborative evidence for the builders being from the Oneota culture since Oneota rim sherds were found at the bottom or on the floor of both the "inner" and "outer" ditches (Wood 1970). The high peaks of phosphate also correlated with the cultural material at the bottom of the ditch as well as other points in subsequent refillings of the ditch, but as previously mentioned this may or may not be significant.

While this technique is relatively new in the field of archaeology in cases of these particular applications, it can be of great value to the archaeologist. Testing of the hypothesis mentioned earlier in the paper will aid the archaeologist in the explanation and prediction of human behavior. To the significata for the differentiation of classes of specimens it will add one more criteria for class inclusion or exclusion. In the question of human and non-human behavior, classes may be initially identified. With this information the researcher will have more data from which he or she may draw observations and predictions for patterned human behavior.

Other tests are in progress. Among these are continued testing on postmolds and rodent burrows, delimiting site boundaries using horizontal strata, and differentiation of pits that may be intersecting. This technique has shown some usefulness in the past and with further testing, this usefulness can be explored more thoroughly thereby providing a contribution of some significance to archaeology.

TRACING THE ORIGINS OF GEORGIA COPPER

ARTIFACTS BY NEUTRON ACTIVATION ANALYSIS

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Neutron activation analysis has been increasingly applied over the past decade in authenticating artifacts and identifying and tracing artifact sources on the basis of presence and amounts of minor and trace elements. Artifacts analyzed include pottery (Kital, Chan, and Sayre 1969; Harbottle 1970); glass (Sayre 1965); obsidian (Gordus, Wright, and Griffin 1968); paintings and murals (Sayre 1968; Ortega and Lee 1970); and such metal objects as coins (Zuber 1966; Das and Zonderhuis 1966), and copper ore and artifacts (Friedman, et al. 1966). The technique is nondestructive and can quantitatively determine many elements with very low detection limits. Neutron activation analysis thus complements other techniques by identifying certain elements not detectable by other methods.

Copper artifacts frequently appear on archaeological sites in the State of Georgia. While questions regarding sources of copper artifact manufacture have been repeatedly posed, little has been done in the way of trace element determination (cf. Hurst and Larson 1958).

The Geochronology Laboratory, University of Georgia, recently analyzed by neutron activation analysis a range of copper specimens received from the Department of Anthropology, University of Georgia (courtesy, Joseph R. Caldwell), the Southeast Archeological Center (courtesy, Richard Faust), the Milwaukee Public Museum (courtesy, Robert Ritzenthaler), and local Georgia rock collectors (Table 1). The purpose of the present study was to investigate the feasibility of determining by neutron activation analysis whether copper artifacts and ores contained sufficient impurities to enable correlation of ores, artifacts, and site distributions.

PROCEDURE

Copper samples weighing $\sim$100 mg. were cleaned in acid and rinsed in distilled water to remove surface contaminants. The samples were placed in polyethylene vials and irradiated for 12 to 24 hours in the Georgia Tech Research Reactor at a flux of $\sim 10^{13}$ neutrons/cm$^2$-sec. The samples were allowed to cool for 7 to 10 days, at which time they were counted using a 55 cm$^3$ (9%) Ge (Li) gamma-ray detector and computer-based multichannel analyzer. Minor and trace elements were identified from the resulting gamma-ray spectra. To avoid uncertainty in flux and absolute efficiency of the Ge(Li) detector, ratios of minor and trace elements to copper were calculated.

TABLE 1

DESCRIPTION OF ARTIFACTS AND ORES ANALYZED

| Specimen Number | Site | Description | Location |
|---|---|---|---|
| 1 | Unlisted | Knife | Milwaukee Co., Wisc. |
| 3 | Unlisted | Gorget | Waupaca Co., Wisc. |
| 4 | Unlisted | Arrowhead | Hancock Co., Mich. |
| 5 | Unlisted | Awl | Grant Co., Wisc. |
| 6 | Unlisted | Projectile Point | Waupaca Co., Wisc. |
| 7 | Unlisted | Spear Point | Fond Du Lac Co., Wisc. |
| 8 | Unlisted | Point | Sheboygan Co., Wisc. |
| 9 | Unlisted | Spear Point | Winnebago Co., Wisc. |
| 10 | Unlisted | Sheet Copper | Milwaukee Co., Wisc. |
| 11 | Unlisted | Float Copper | Fond Du Lac Co., Wisc. |
| 13 | Unlisted | Point | ? (Great Lakes Region) |
| 14 | Osceola Mine | Copper Ore | Osceola 13 Mine, Mich. |
| 15 | Unlisted | Great Lakes Ore | Keweenaw Penn., Mich. |
| 16 | Unlisted | Great Lakes Ore | Keeweenaw Penn., Mich. |
| 17 | Unlisted | Copper Ore | Fannin Co., Ga. |
| 19 | Mandeville | Pan Pipe | Clay Co., Ga. |
| 20 | Mandeville | Pan Pipe | Clay Co., Ga. |
| 21 | Ocmulgee Bottom | Copper Disc | Bibb Co., Ga. |
| 22 | Pharr Site | Ear Spool | Prentiss-Itawamba Co., Miss. |
| 23 | Pharr Site | Pan Pipe | Prentiss-Itawamba Co., Miss. |
| 24 | Unlisted | Copper Ore | Fontana Lake, Tenn. |
| 26 | Mandeville | Ear Spool | Clay Co., Ga. |
| 27 | Mandeville | Sheet Copper | Clay Co., Ga. |
| 28 | Etowah | Sheet Copper | Bartow Co., Ga. |
| 29 | Chauga | Sheet Copper | Oconee Co., S.C. |
| 30 | Mandeville | Pan Pipe | Clay Co., Ga. |
| 31 | Mandeville | Pan Pipe | Clay Co., Ga. |
| 33 | Mandeville | Pan Pipe | Clay Co., Ga. |
| 34 | Etowah | Copper Disc | Bartow Co., Ga. |
| 35 | Etowah | Sheet Copper | Bartow Co., Ga. |
| 36 | Wilbanks | Copper Disc | Cherokee Co., Ga. |
| 37 | Wilbanks | Copper Plate | Cherokee Co., Ga. |
| 39 | Wilbanks | Copper Fragment | Cherokee Co., Ga. |
| 40 | Wilbanks | Sheet Copper | Cherokee Co., Ga. |
| 41 | Chauga | Sheet Copper | Oconee Co., S.C. |

RESULTS

The detection sensitivity levels for the procedure used are presented in Table 2. Also listed in Table 2 is the range in parts per million (ppm) of 13 elements detected.

TABLE 2

ACTIVATION ANALYSIS DETECTION SENSITIVITY LEVELS (PPM)

| Element | Detection Sensitivity (PPM) | Range Detected (PPM) |
|---|---|---|
| Au | 0.0005 | 0.0005 - 8 |
| As | 0.001 | 1.5 - 50,000 |
| Sm | 0.08 | 0.1 - 2,000 |
| Sc | 0.2 | 0.2 - 30 |
| La | 0.2 | 0.2 - 200 |
| Sb | 0.2 | 5.0 - 4,000 |
| Br | 6.0 | 6.0 - 400 |
| Hg | 6.0 | 6.0 - 100 |
| Ag | 10.0 | 10.0 - 5,000 |
| Fe | 10.0 | 10.0 - 60 |
| Co | 0.02 | 0.02 - 0.2 |
| Cr | 4.0 | 6.0 - 9 |
| Zn | 0.5 | 900.0 - 30% |

Figures 1 through 6 graphically present the distribution of concentrations in parts per million of six elements in the samples analyzed (the sample numbers circled in the figures are referenced in Table 1). These six elements displayed the greatest apparent differences in concentrations between the midwestern and southeastern samples analyzed in the present study.

CONCLUSIONS

The number of specimens available for analysis was small; hence the conclusions are at best general and only suggestive.

The present preliminary study suggests sufficient differences in concentrations of minor and trace elements that may, through further investigation, enable distinctions to be drawn between copper artifact and source specimens on local and pan-regional bases. Several potential indicators either singly or in combinations are noted. Major distinctions occur with the elements lanthanum, scandium, and silver. Of these, silver is observed in more samples than any other element detected. Certainly, the oft-quoted but outdated belief that copper artifacts containing silver traces are Lake Region products can be dispelled (for example, Specimen 17, of known Georgia origin).

A proposal to support large-scale neutron activation analysis of copper artifacts in the eastern United States is being developed. Persons wishing to participate are encouraged to communicate with the authors.

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Distribution of concentrations in ppm. of six elements in the samples analyzed

FIGURES 1 through 6

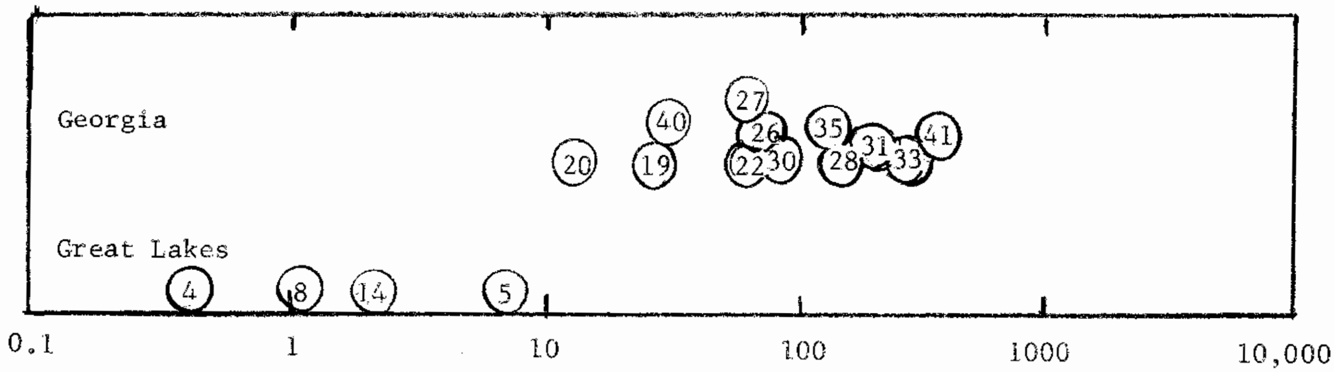


FIGURE 1. Bromine

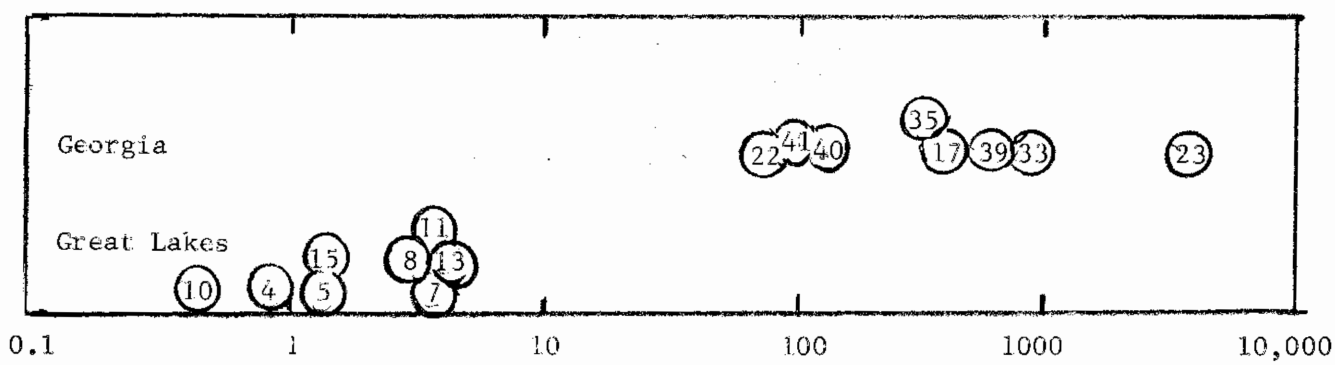


FIGURE 2. Lanthanum

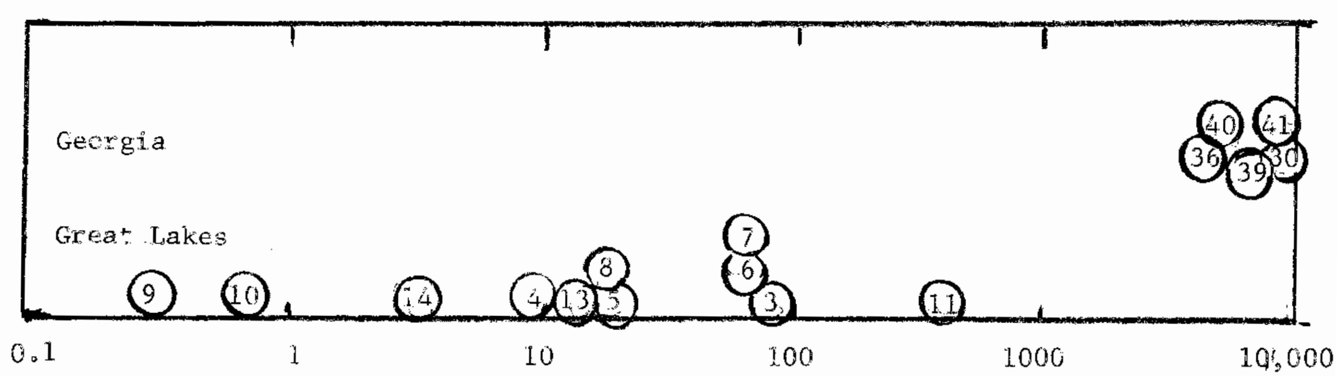


FIGURE 3. Mercury

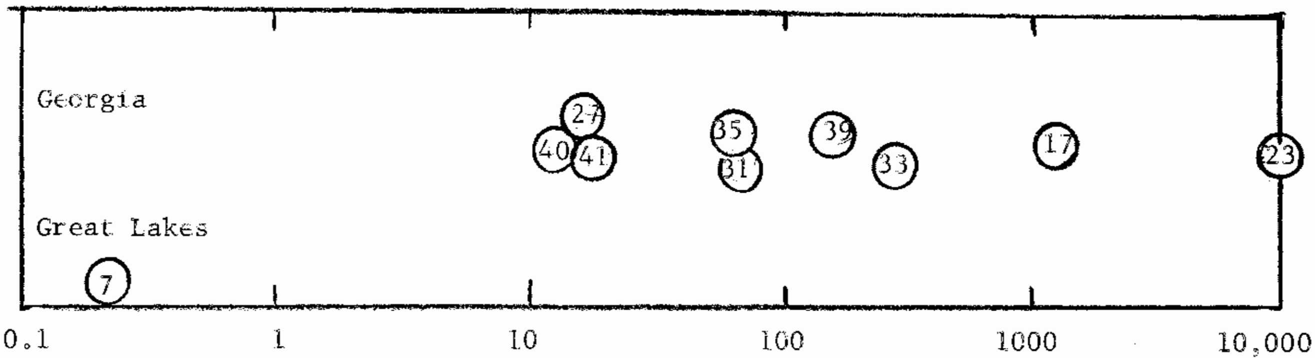


FIGURE 4. Samarium

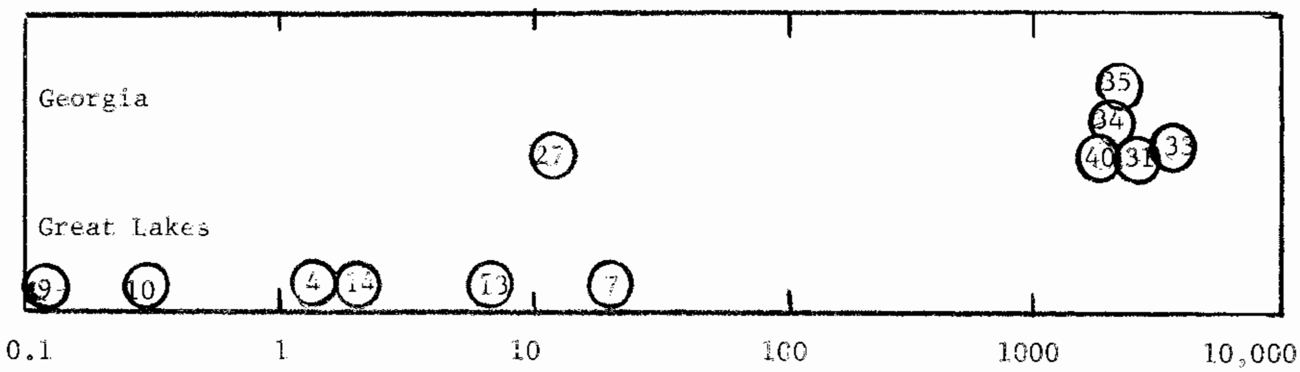


FIGURE 5. Scandium

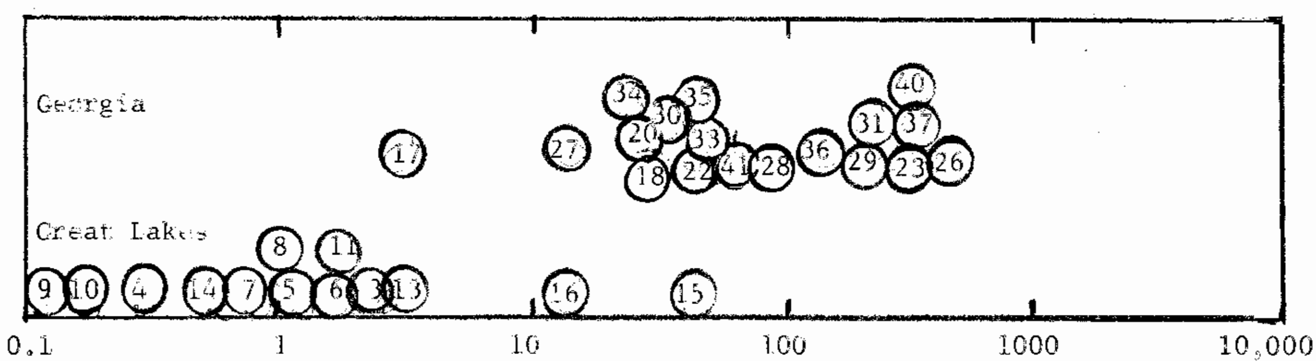


FIGURE 6. Silver

# WELLS CREEK: AN EARLY LITHIC SITE IN STEWART COUNTY, TENNESSEE

Don W. Dragoo
Carnegie Museum

ABSTRACT*

The Wells Creek Site in Stewart County, Tennessee, has been studied by the author and Carnegie Museum staff since 1962. In 1965 extensive excavations were undertaken at the site to determine depth of deposit and presence of features. From this work it was determined that there were no undisturbed features and that the cultural debris rested upon an old eroded land surface that had been subjected to intensive plowing to a depth of 8 inches. All artifacts were found within the plow zone, but there were areas of burned stones indicating the former presence of hearths. No charcoal or other datable materials were found.

Among the many thousands of artifacts recovered from the site, the Clovis points and scrapers are most easily classified, but associated with these typical Early Lithic items were many large, crude chopping and scraping tools. The chopping tools often were bi-facially chipped from large blocks of fine quality chert, but many were worked upon unifacial cores. The scrapers, gravers, spokeshaves, and knives usually were made upon flakes and blades struck from prepared cores. Although some of these crude tools seem to be part of the Clovis Complex, most appear to be much older, as our laboratory analysis indicates a higher degree of weathering and depth of patina.

From the results of our typological studies of these artifacts, it seems apparent that the Paleo-Indian manifestations at this site had a basis of tool forms similar to many of the tools associated with Upper Paleolithic complexes in the Old World. Thus the numbers and kinds of tools found at the Wells Creek Site greatly expand our knowledge of the possible foundation for early New World cultures.

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*The complete version of this report (with illustrations) has been published by the Eastern States Archeological Federation.

# THE EDGEFIELD SCRAPER:

# A TOOL OF INFERRED ANTIQUITY AND USE

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## GENERAL DESCRIPTION

The Edgefield Scraper (Michie 1968) may be described as a large, triangular-shaped hafted scraper with wide, deep side notches. The working edge of the tool is located at an angle of approximately 45 degrees to the medial axis. The edge of the base may be either straight, concave, or convex, but seldom exceeds 3 mm in either direction from being straight. The notches and the basal edge are ground (Figs. 1 and 2).

In appearance, the tool resembles a large, fractured projectile point that has been reworked into a scraper. This, however, is not the case, for the tool is the product of intentional manufacture.

## TECHNIQUE OF MANUFACTURE

The Edgefield Scraper generally was manufactured from a large, thick prismatic flake. The evidence of the flake still exists in some of the specimens. This evidence is the presence of an unmodified ventral surface on the reverse side of the tool, occasionally accompanied with a bulb of percussion. The striking platform or bulbar end is the base of the tool and has since been modified by flaking to reduce its thickness.

This flake or platform was thinned by the removal of large flakes from the dorsal surface and also at the bulbar end of the ventral surface. Secondary flaking was then employed to smooth out irregularities and form the large side notches. When the tool had acquired this near finished form, a series of small flakes were removed from the right edge of the ventral surface, utilizing this unmodified surface as a striking platform. The removal of the flakes produced a bevel on the left edge of the dorsal surface, thus forming its working edge. As a final stage in manufacture, the notches and the basal edge were ground smooth.

## ANALYSIS

The Edgefield Scraper is a specialized form of tool and no doubt was intended for a special task. To understand this tool and its function, in addition to its cultural affiliation, this author has compiled data on 21 specimens (Fig. 3). The two considerations for function that will be presented concern themselves with the primary and secondary edge. The primary edge is the intended bevel on the left edge of the obverse face. The secondary edge is the edge opposite the primary.

The angle of the primary edge is quite steep and varied from 60 to 85 degrees, except for one low angle of 50 degrees. There exists at least two clusterings of angles, and these occur in the mid-60 degree and the high 70 degree range.

The primary edge on all pecimens is shattered. This shattered edge consists of a stepped series of small scars that extend well up the beveled edge. However, all specimens do not display the same consistency in shattering. Several specimens are only step fractured on the small ridges between flake scars, indicating, perhaps, that the tool had recently undergone resharpening and had hardly been utilized. In addition to the mentioned conditions, the primary edge in several specimens has displayed a slight polishing.

The condition of the secondary edge is different from that of the primary. This secondary edge presents at least four variations of condition: serrated, burinated, smooth edge wear, and no evidence of wear or alteration. Of the 21 specimens, 10 present a smooth worn edge, at least two are burinated, and one specimen is serrated. The remaining eight present a sharp edge or have had their edges destroyed during cultivation, thus eliminating evidence. The difference of the two edges suggest separate utilizations. The primary edge with its step fractures and steep bevel is discussed first.

The angle of the working edge of tools and its relationship to an intended task have been observed by Semenov (1964) and Wilmsen (1970). Wilmsen states, "I would suggest that the different angle sizes are related to different functions. More acute bits, in this interpretation, would be associated with the preparation of hides and the steeper bits would be associated with heavy wood and bone working." Wilmsen proceeds to support his inference by observing wear patterns on end scrapers with less acute angles. These tools with low angles generally are polished and a large number of them present parallel striations in the polished areas when viewed under magnification.

"Steeper bits," states Wilmsen (1970: 72), "display a shattered edge that appears to consist of a stepped series of tiny chip scars which extend over the dorsal face and sometimes into the ventral surface as well. This suggests that the tool was drawn with heavy pressure over a tough, unyielding surface somewhat in the fashion of an adze or plane. The high incidence of heavy tips and concavities associated with steep bits supports the inference that these tools were employed in the manufacture of wooden and bone implements." If the inferences made by Wilmsen are correct, then the primary edge of the Edgefield Scraper may have been used in the process of wood and bone implements.

The secondary edge of the tool is not consistent with the edge of the primary. This edge varies considerably, having sharp edges, dulled edges, burins, and serrations. The dulled edges--nearly half of the specimens--exhibit a smooth rounded edge without step fractures. The two specimens containing burins have been struck with multiple blows from the distal end. The blow received on specimen D (Fig. 2) completely removed the secondary edge and has hinged out in the notch. The last variant of the secondary edge is serrated. The serrations exhibit slight wear and appear to be used. This wear indicates that it was drawn across a yielding

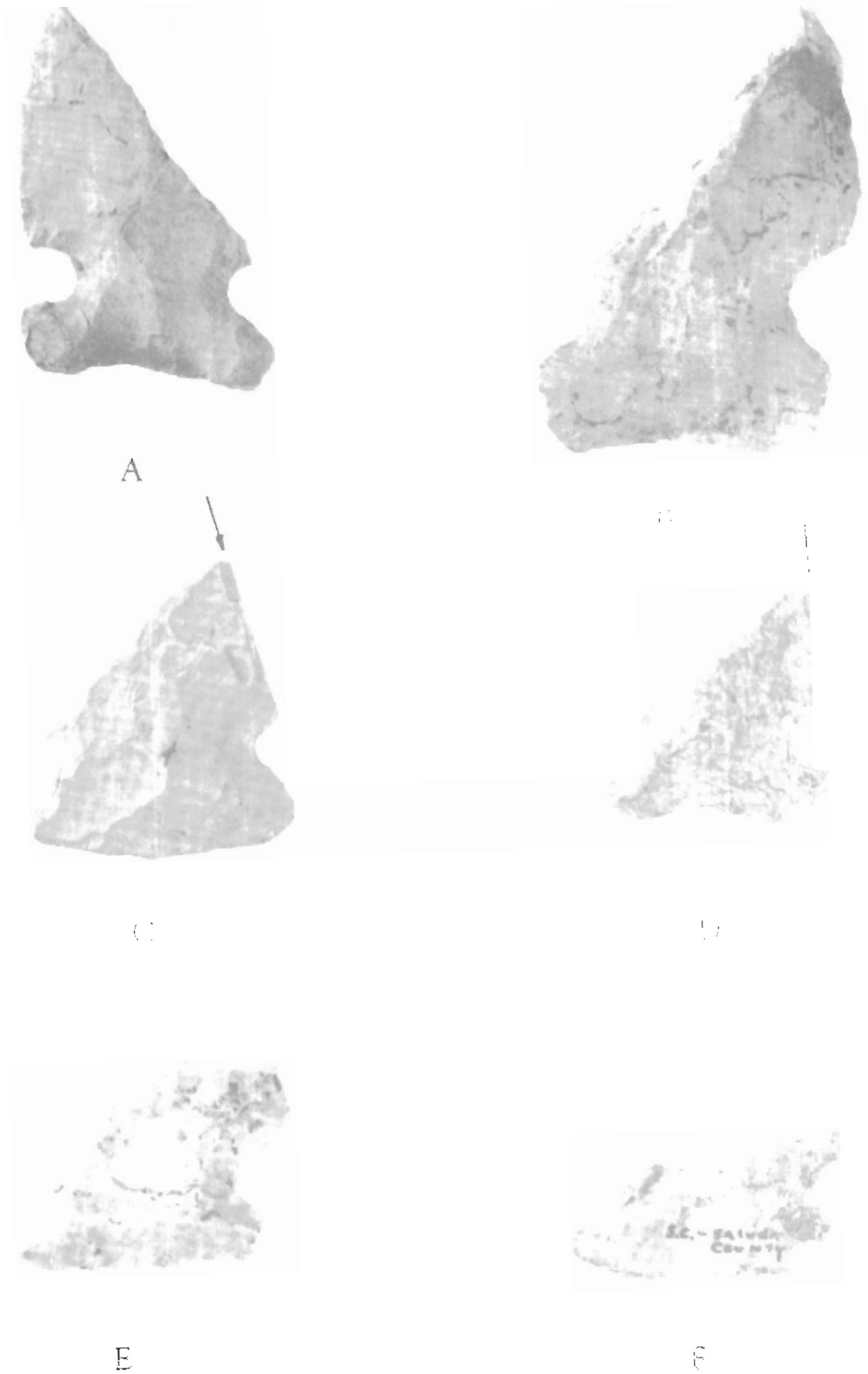


FIGURE 1. EDGEFIELD SCRAPERS, OBVERSE VIEW. NOTE BURINS.
NATURAL SIZE

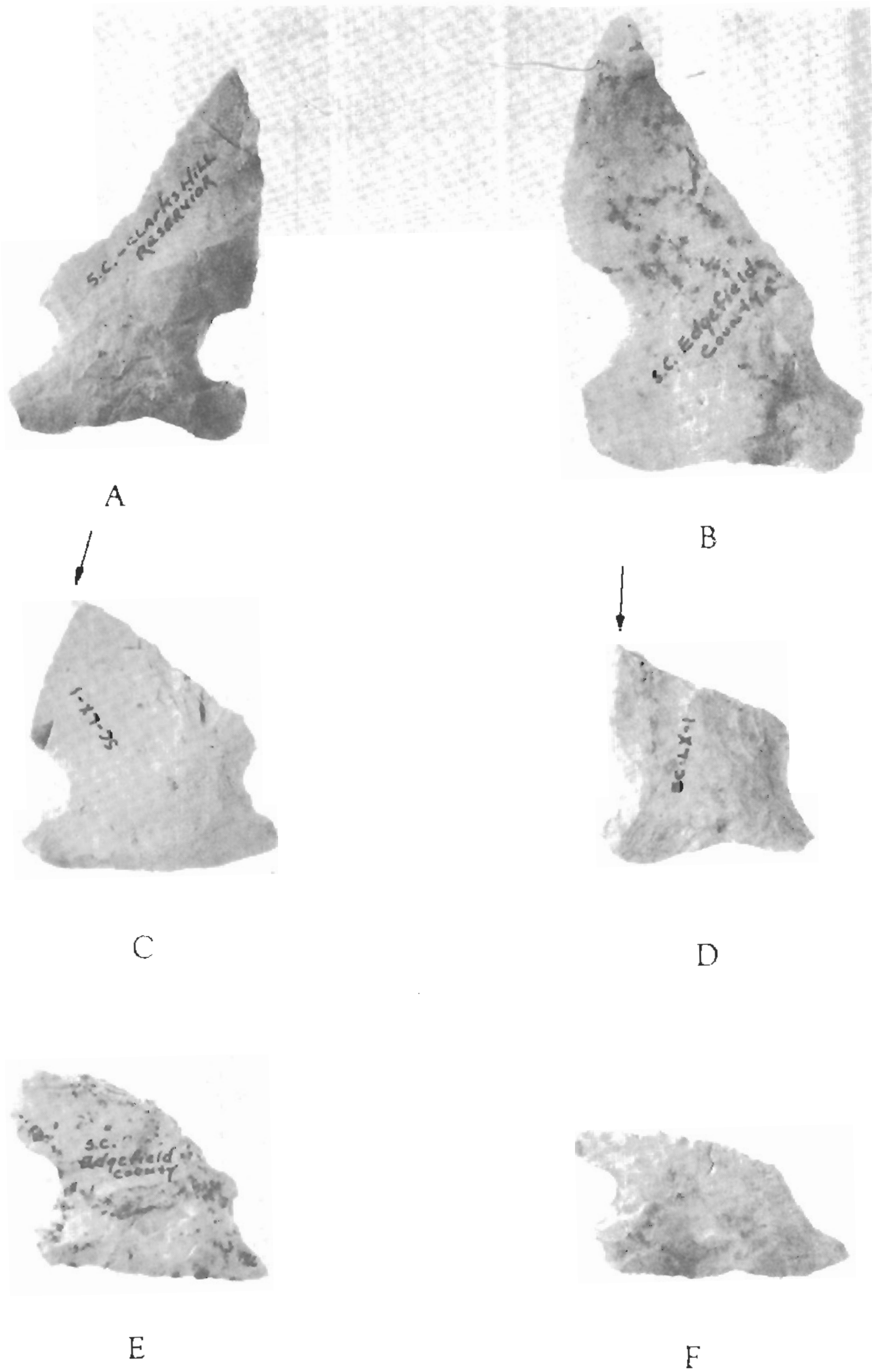


FIGURE 2. EDGEFIELD SCRAPERS, REVERSE VIEW
NATURAL SIZE

| SPECIMEN NO. | LENGTH MILLIMETERS | WIDTH MILLIMETERS | THICKNESS MILLIMETERS | EDGE ANGLE DEGREES | BLADE ANGLE DEGREES | BASE[1] | CONDITION[2] PRIMARY EDGE | CONDITION SECONDARY E'GE |
|---|---|---|---|---|---|---|---|---|
| 1 | 65 | 48 | 11 | 66 | 51 | CC | SF | WORN |
| 2 | 56 | 39 | 10 | 85 | 51 | CC | SF | WORN |
| 3 | 34 | 40 | 12 | 61 | 15 | ST | SF | ? |
| 4 | 45 | 39 | 9 | 60 | 44 | CV | SF | BURINATED |
| 5 | 36 | 35 | 9 | 70 | 36 | CV | ·SF | WORN |
| 6 | 32 | 43 | 9 | 82 | 28 | ST | SF | ? |
| 7 | 41 | 30 | 9 | 78 | 52 | ST | SF | WORN |
| 8 | 36 | 38 | 8 | 76 | 40 | ST | SF | ? |
| 9 | 25 | 43 | 9 | 76 | 12 | ST | SF | ? |
| 10 | 34 | 33 | 10 | 78 | 28 | CC | SF | BURINATED |
| 11 | 25 | 29 | 9 | 78 | 26 | CV | SF | ? |
| 12 | 53 | 33 | 10 | 62 | 63 | CV | SF | WORN |
| 13 | 59 | 50 | 11 | 64 | 47 | CC | SF | WORN |
| 14 | 43 | 44 | 12 | 65 | 26 | CC | SF | ? |
| 15 | 5 | 35 | 9 | 80 | 52 | ST | SF | SERRATED |
| 16 | 50 | 46 | 11 | 50 | 42 | ST | SF | WORN |
| 17 | 48 | 45 | 9 | 71 | 40 | CV | SF | WORN |
| 18 | 53 | 48 | 13 | 65 | 47 | ST | SF | WORN |
| 19 | 55 | 45 | 10 | 63 | 45 | CC | SF | WORN |
| 20 | 40 | 38 | 10 | 66 | 50 | ST | SF | ? |
| 21 | 30 | 44 | 9 | 81 | 12 | ST | SF | ? |
| | | | | | | | | |

1. CC-CONCAVE, CV-CONVEX, ST-STRAIGHT
2. SF-STEP FRACTURES



FIGURE 3. ACCUMULATIVE DATA. NOTE CONSISTENCY OF STEP FRACTURES ON PRIMARY EDGE.

surface. The varied conditions of the secondary edge support many avenues of interpretation. One such avenue that this author finds appealing is bone processing. Given that the primary edge was utilized for shaping and scrapping bone, the secondary edge could be used for grooving and detachment of bone splinters. This is strongly suggested by the occurrence of burins and dulled edges. Semenov (1964) suggests that burins were not used for the longitudinal grooving of bone, but also for transverse grooving to aid snapping or separation. Serrated or saw tooth edges also are suggested by Semenov for the transverse and longitudinal sectioning of bone and for the severing of cartledge, muscle, and tendons.

Tools are not, however, so specialized that they were not used for functions other than an initial intended task. There can exist little doubt that the tool under discussion was used for the alteration of many articles, such as wood and [illegible], as indicated by polishing on the primary edge. But in view of the conditions that exist on the tool and inferences and observations made by others than the author, it would seem reasonable to infer that the Edgefield Scraper had a function oriented towards bone processing.

CULTURAL AFFILIATION AND DISTRIBUTION

The Edgefield Scraper [illegible] assigned to the Early Archaic, for it has a definite association with projectile points of that particular period. To be more specific, the tool is apparently related to the Taylor point (Michie 1966), a type that resembles the Big Sandy point.

The Taylor Site (Michie 1970), the type station for the Taylor point, has yielded a great many points of this type and they are found in the areas that produce the scraper. This tool also is found in Georgia and has been found associated with Taylor points in excavations at the Theriault Site (Brockington 1971) on Brier Creek. Of the three scrapers found at the site, one was from the deepest level. This level also produced the greatest number of Taylor points.

The range of the tool type is much greater than previously suspected and extends down into Florida. Ripley P. Bullen has noted the occurrence and feels that they are related to an Early Archaic side-notched projectile point named the Bolen point (Bullen 1968).

Further evidence of their antiquity and range is reported by Peter B. Cooper (personal communication). Cooper relates that similar tools occur in Iowa and Nebraska and the only difference is the blade angle. The angle of the tool is less oblique than that of the Edgefield Scraper. The tools in Iowa and Nebraska are regarded as early. Several years ago an article appeared in American Antiquity entitles "A Paleo-Indian Bison-Kill in Northwestern Iowa" (Agogino and Frankforter 1960). The Bison kill had embedded in its matrix several side-notched projectile points somewhat resembling the Taylor point. Agogino has named the point Simonsen and describes it as triangular, side-notched, and concave-based. The notches are shallow and exhibit moderate grinding and the base has thinning and moderate grinding. Agogino relates the Simonsen point to sites in the area of the kill and states that a diagnostic side-notched scraper is found at both the Hill and Logan Sites that contrasts strongly with the crude side and end scrapers found at the Simonsen Site. Cooper informs me that the Edgefield Scraper and the tool found at the Logan and Hill Sites are quite similar. The Simonsen Site has been dated at 8430 ± 500 B.P. The Logan Site (Burt County, Nebraska) has been dated in excess of 8,000 B.P. I do not infer that these comparisons reflect a relationship, but the similarity exists and cannot be disregarded.

Another comparison is made with the Albany Scraper (Webb 1946) that occurs in Louisiana. Webb describes the type as side-notched, usually fairly deep, producing an expanded heft, the base of which is typically concave or straight, rarely convex, and a single beveled blade. The Albany Scraper was recently reported at the John Pearce Site (Webb 1971) and was found associated with San Patrice points and varieties of side-notched and corner-notched points.

Some of the examples of relationship have been presented and there appears to be a definite relationship with side-notched projectile points. To nail the relationship down to a specific time would indeed be difficult, but there are speculations as to an age. Side-notched varieties of projectile points are found in the areas of the east and are believed by many students of archaeology to be quite old. The St. Albans Site in West Virginia (Broyles 1970) has produced radiocarbon dates in excess of 9,000 years B.P. on corner-notched points, with side-notched forms yet to be dated (from the lower levels of the site). The Simonsen Site in Iowa with its points has yielded a date of nearly 8,500 years B.P. In North Carolina, Coe (1964) regards the Hardaway Side-Notched as quite old and probably exceeding more than 8,500 years. Bullen (1968) regards the Bolen point of Florida in excess of 8,000 years ago.

If the side-notched varieties of projectile points do indeed exceed 8,000 years and if the Edgefield Scraper is associated with them, then we have a tool that is considerably old, belonging to an Early Archaic period of development. The evidence for inference is there and is growing. Perhaps soon the tool will be more closely associated and the inference dropped.

The distribution of the Edgefield Scraper and varieties of it are much greater than previously suspected. It is found on the coastal plain of the southeast Atlantic states and apparently ranges as far west as Louisiana and perhaps as far north as Iowa and Nebraska.

In summary, the Edgefield Scraper appears to be a tool oriented toward the processing of bone for the manufacture of, perhaps, bone tools. It is consistently associated with projectile points of the Early Archaic or pre-Archaic cultures and is distributed over much of the southeast.

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# THE CULTURAL EXCUSES FOR FIBER-TEMPERED POTTERY

Drexel A. Peterson, Jr.
Memphis State University

This paper attempts to explain the phenomenon of fiber-tempered pottery in the southeast. A certain amount of conjecture is necessary to draw together the various ecological, technological, and cultural reasons for such tempering. I will stand accused not of going beyond the data but around them.

That the vegetal material used to temper early pottery in areas of the southeast was palmetto fiber from one or both of the species of Sabal was formally presented with experimental and botanical supporting evidence last year at the Southeastern Archaeological Conference (Brain and Peterson 1971). Still other important information comes from a paper given by Donald Crusoe (1971). The botanical identification remains secure, and now some of the reasons why palmetto fibers were used for so long need to be explained.

First, however, a summary of the distribution of such tempering in time and especially in space is appropriate, especially since there is new evidence to change the picture of one year ago. Last year, it was my opinion that the fiber-tempered pottery of the Tennessee Valley was different from all the rest, that it was tempered with cut grass as, indeed, the published descriptions had stated (Sears and Griffin 1950). After all, palmetto does not grow wild today anywhere in the Tennessee Valley.

But the archaeological record is not so obliging. This past spring and summer large samples of fiber-tempered ceramics were recovered by crews from Memphis State University from along the Tennessee just below or north of the Pickwick Dam and from along tributaries of the Upper Hatchie just to the west of Pickwick. The forms and decorations of the recovered sample agree well with those reported from the middle reaches of the Tennessee Valley to the south--above Pickwick and Wheeler Dams. They also are palmetto-tempered. One of the original identifiers of the palmetto fibers (Dr. Richard Schultes) could see no major difference between the Tennessee sherds and those studied before from South Carolina, Florida, Georgia, and Mississippi. Nor can I after looking at hundreds from all the areas. Nor are there any alternatives: even yucca, which resembles quite closely the palmetto in fibrous material and availability, also does not occur along the Tennessee today.

With no other likely choices, one is left to conclude that since palmetto occurs archaeologically in pottery from the Tennessee Valley, it must have occurred there when the pottery was made. I cannot conceive of a trade network based on palmetto fronds.

Elsewhere, the picture is the same as before. The current distribution of Sabal palmetto and Sabal minor coincides quite closely with the limits of fiber-tempered pottery along the Atlantic Coast, with both giving out in significant numbers near the present city of Charleston. Additionally, fiber-tempered pottery and palmetto are limited to the coast proper and the Coastal Plain, as well as swampy sections of the major rivers such as the Savannah or the Altamaha. Both the pottery and the raw material occur throughout Florida with the exception of the heart of the Everglades where the palmetto--but not the pottery--occurs. Fiber-tempered pottery, then, is not terribly common, but does occur along the Gulf Coast to Louisiana, as well as up the major river valleys--into central Mississippi and, of course, along the Mississippi River. Palmetto-tempered pottery seems to disappear beyond the Mississippi River even though palmettoes do grow into Texas. The effective limit of occurrence for the pottery in the Mississippi Valley is approximately the mouth of the Arkansas. This break coincides with the present limit for palmetto. But remember that the Tennessee Valley has palmetto-tempered pottery but no present-day palmetto.

The dating of fiber-tempered pottery in the southeast is fairly secure along the coast of Georgia and South Carolina and the Atlantic Coast of Florida. The other areas are less well known chronologically, but there are no reasons to suggest any major differences. The earliest dating of about 2500 B.C. comes from the Savannah valley at Rabbit Mount. The earliest present dates in Florida are about 400 years more recent (Peterson 1967). By about 1000 B.C., other tempering agents have replaced palmetto fibers in these areas. What, if any, time lag there may have been between these two centers and the Tennessee or other more westerly region is unknown.

If the cut-off date of about 1000 B.C. also were accepted for the Tennessee Valley, then the disappearance of palmetto could be postulated there during some slightly cooler climatic episode in the last 3,000 years. If the terminal date for fiber-tempered pottery is later, then available explanations would be condensed. I will not propose here any specific choices for such a correlation, but there is evidence that supports the likelihood of an easy disappearance of palmetto as well as evidence that the change might not have been particularly severe.

Geographically, the southern loop of the Tennessee River intrudes into the present states of Mississippi and Alabama. It is separated from the drainages of the Gulf Coastal rivers by plateau and small mountain extensions of the Appalachians. If you go either up or down river from this southern loop, you go into a cooler and slightly drier climate even less amenable to palmetto. Establishing palmetto in the Tennessee Valley would seem quite difficult given the geographical and climatological isolation of this southern lopp; if, however, it had been established and if it were to disappear again during a cool and/or dry period, it would be difficult to naturally reestablish it with the upland divide to the south and the significantly cooler valley in each river direction to the north. There is no chance of reestablishment by continuous distribution.

In any case, the climatic changes may have been very slight though effective. Only a very minor downward fluctuation in temperature or rainfall may have been enough. Even today, artificially introduced palmetto, especially Sabal palmetto, will grow in Memphis, Savannah, or even Jackson, Tennessee--all of them well beyond the natural range today. They do not, however, appear to have thrived enough to take over the riverine or other swamps in West Tennessee. In other words, an Ice Age would not be necessary, nor would an Altithermal, to change significantly the extent of palmetto occurrence in the southeast.

One thing that the occurrence of palmetto-fiber-tempered pottery in West Tennessee does suggest is that, even on what must have been the margins of occurrence for palmetto where it could not have been as common, say, as in Florida, it was chosen as the preferred tempering agent. There was no substitutions; there were no apparent extensions beyond the limit of palmetto by substituting other fibers or other tempers. There was nothing as early to the north.

All of these things suggest very strongly that palmetto fibers were very positively selected for tempering clay. An interesting corollary, as yet unprovable, is that there were additional subsistence or ecological factors that limited the need for and therefore the occurrence of ceramics to the approximate limit of palmetto occurrence. More intense studies of subsistence will be necessary, however, before one can do any more than suggest that the occurrence of some flora or fauna in much the same distribution as palmetto had a positive effect on the adoption of pottery. Note clearly that shellfish is not such a limiting resource.

Before detailing the reasons for the use of palmetto fibers, a summary of the reasons behind pottery in general is necessary. These reasons have been talked about for many years, and I do not wish to resurrect the argument about the Neolithic in either the Old or the New World. Suffice to say that pottery provides a substantial container, a versatile container; but it also is a fragile container. Therefore, I must invoke the idea of a necessary sedentary pre-adaptation to the use of ceramics. Nomadic wandering bands are not notorious potters, but even semi-sedentary farmers or shellfish collectors are potters in many areas of the world. The point where too much movement is too much and too destructive is not known, but I would think that moving more often than seasonally would be a shattering experience for a potter.

In the southeast, clearly a semi-to-completely sedentary pre-adaptation did exist, and with it comes palmetto-tempered pottery. Such pottery appears first in and throughout a wide area. It also occurs in areas where the pre-adaptation was seasonal or year-round shellfishing. Palmetto-tempered pottery does not occur away from areas where shellfishing was very important. The minute valleys, the Piedmont, and the Appalachians all lack shell middens and fiber-tempered pottery. But if you go only a few miles to the large valleys or to the moderate feeder streams, you find shell middens and fiber-tempered pottery. Of course, such pottey also occurs at sites without shell middens and in small river valleys where shellfishing would be marginal or impossible. The Hatchie tributaries around Ramer, Tennessee, explored by myself and a crew last summer are such an area; but I would suggest seasonality of occupation as one possible solution. The Tennessee River with incredible numbers of shell-midden occupations is at most 20 miles away. Even if this questionable seasonality should evaporate upon closer investigation, the fact will remain that fiber-tempered pottery in almost all areas of its occurrence in the southeast occurs primarily at sites that are shell middens.

Therefore, significant reasons for the utilization of ceramics by shellfish gatherers and preparers may exist. How would pottery, fiber-tempered or otherwise, be useful, even vital, to shellfishermen? Three simple areas come to mind: carrying, storing alive, and cooking. Baskets will fail miserably on the last two. To keep shellfish alive longer, they can be stored in cool water; and a pottery container out of the sun would fill the bill better than anything else before refrigeration. The evaporation through the relatively porus walls would keep the water cooler than anything else, but would keep the water in. Cooking in a basket is possible with heated stones, but it would be so much easier and safer in pots. They would not have set a basket on an open fire, but continuing this line of reasoning gets one dangerously close to the old idea of claycovered baskets leading to the invention of ceramics.

Intensive utilization of shellfish, of course, means localization near the resource; even with pottery to keep them alive, who needs day-old transported shellfish? Living along the streams and rivers will do something else--it put the people where the palmetto was. This brings us to the cultural excuses for palmetto-tempering--or the ecological, technological, and cultural excuses for fiber-tempered pottery.

The availability of palmetto is the first big reason for its use. Palmetto grows along the shores of the streams where the shellfish were being collected. Of course, there are other fibers available along streams as well as other potential tempers such as sand, shell, or even clay to be made into grog. But the palmetto fibers are available in quantity all year long. Probably the others also are, but palmetto has other advantages over the other possible tempering agents.

A temper must be easy to handle, and palmetto fibers are very easy to handle. It is very easy to use in that it requires virtually no preparation or equipment to gather. Sand also would require little work, but crushed shell or grog would create problems.

The palmetto fibers are used stripped out of the leaves of the plants; cut chunks of leaves are uncommon. Even this procedure does not require any tools; palmetto plants always have drying out old leaves (in S. palmetto peeling back from the plant's head, in S. minor as constantly replaced earlier leaf fonds). The fibers can be pulled out of such drying leaves in big handfuls. They do not need to be cut, and they are always available.

Working with the stripped-out fibers leads to another important plus for palmetto. A very primary technical reason for the use of palmetto fibers is the ease with which they can be effectively mixed with clay. The fibers, as gathered, mix easily, completely, and continuously through a wet clay mass. Harder, larger vegetal materials--such as straw, pine needles, or larger cut leaves (even of palmetto)--work very difficultly or, from personal experience, even painfully into clay. Additionally, the overall texture and moistness of the clay is not significantly altered by the addition of palmetto fibers unlike the results with more substantial fibers. Sand and particulate tempers markedly stiffen clay.

As the palmetto fibers mix thoroughly with the clay, they do so in a linear fashion. The long fibers are relatively weak and are easily manipulated while manipulating the entire clas mass, and as long fibers they mix through a large area. Particulate tempers--sand, grog, and shell--are less easy to mix from personal experimentation. They would be easy to mix with dry powder clay, but the drying of clays to a powder seems unlikely in the southeast with primitive technology.

That the fibers mix well into the clay contributes to their effectiveness as tempering agents. Palmetto fibers, in fact, do very well what the aplastic is supposed to do--control or diffuse the stresses caused in drying and firing. On first glance, the fibers look like they would weaken vessel walls by the channels remaining after the firing and charring out process. Any weakening, however, is more than made up for by the following additional technical advantages of palmetto fibers.

First, palmetto fibers are finer than other vegetal aplastics, other than hair, and diffuse more into the clay leaving few weak planes as cut leaves would. There are no large masses of vegetal material such as in straw stalks or pine needles that are potential bombs of combustible, volatile gases.

Second, since the fiber is distributed in linear, often interlocking pathways, it is more adequately distributed. It is not just a particle-by-particle situation. The linearity and interlocking could, more than it would weaken the paste, reinforce it and <u>very importantly</u> channel out any water vapor, $CO_2$, or other gas formed in the firing rather than leave them trapped to crack or explode the vessel wall. Bear in mind that most of the easily obtainable clays in the southeast are highly impure and carbonaceous. Even the very best clays atill are carbonaceous, a situation that could lead to explosive ceramic impurities. The fiber channels, burned or volatilized, become the necessary gaps in the firing contraction to add the tempering backbone as well as the safety valve to let off steam. Exploding, dried sand-tempered experimental briquets suggested this benefit of palmetto-fiber tempering; slightly moist fiber-tempered briquets weathered the firing. A solid particulate temper could not channel off the expansive and explosive byproducts of firing impure clays.

Third, and very closely related to the previous point, is another action of the fiber channels as airways to evenly dry sherds before firing. Fiber-tempered sherds are notable thick, and the differential drying of the exposed surface and the buried core could cause problems. But again, the continuity of the fibers might help even out the drying process, if not by aerating the core, then by taking up moisture or distributing it more evenly to the surface.

Fourth, the burning and charring out of the palmetto fibers and the consequent conduction of heat especially to the core may have helped to even out and make successful a quick, primitive firing. Other particulate tempering agents will not act this way; they are not self-producing heat cobduits.

Fifth, fiber-tempered pottery was not coiled, and it was made thick. Manufacturing studies such as Crusoe or Brain and myself reported on last year to the SEAC show manufacture by two basic methods--complete and irregular mixture of clay and palmetto fiber or the placing of a sheet of fibers between two sheets of wet clay. Additionally, even on the more irregularly mixed sherds the surfaces tend to have been worked smooth and relatively free of fiber. Therefore, the fiber was concentrated by the method of manufacture or surface treatment into the thick centers where drying and firing problems of paste contraction and gaseous expansion would be serious. The earlier mentioned advantages, not disadvantages, of palmetto fiber including ease of mixture, length of channel, and interlocking then would be put to best use in "aerating" the thick cores by the concentration of fibers in manufacturing there. Some would reach the surface by their easy manipulation to act as the outlets. Again, even a concentration of particulate tempers in the core would not result in the safety-valve properties of the palmetto fibers, especially with the potentially explosive impure clays. Other fibers might work similarly to palmetto, but also by their comparative disadvantages add to the expansion and explosion problems.

Sixth, since fiber-tempered pottery was made not by coiling but by patching together slabs of clay, the fibers may have helped to bind the vessel together. If palmetto fibers often times acted as a central backbone between surface clay slabs, they also could, but their easy manipulation and stringy nature, be slightly mixed over the lateral slab junctures to help hold together such seams much better than any other particulate temper.

At the risk of invoking the New Archaeology, I must add the following qualification. All of the advantages of palmetto fibers for use as tempering which involve the steps of manufacture for fiber-tempered pots must not be viewed as either direct causes of non-coil or slab manufacture or direct results of such steps in manufacture. One complements the other in this particular system of pottery manufacture. What is being attempted here is an explanation of why, given the actual archaeological record, palmetto tempering was used.

A couple of more reasons why palmetto tempering might have been adopted will now be apended with the understanding that for various reasons--an unclear archaeological record or lack of experimentation--they are much more hypothetical. The effect of the perosity of pottery in keeping water cool already has been discussed. Hypothetically, the added perosity of fiber-tempered pottery might add to the cooling and therefore the shellfish-preserving effects of pottery in general. This, I hope, will soon be tested. The old idea, again already mentioned, of the beginnings of pottery with clay-covered baskets could conceivably have some validity in explaining fiber-tempered pottery. I will admit, however, that this pottery called "Griffin Impressed" by Waring and, I suppose, others has not been isolated, but it cannot be completely ruled out.

One point remains to be examined. Even if I try to avoid origins or cause-and-effect relationships for the initial experimentations with ceramics and fiber-tempering, I might want to tackle the question of the longevity of its use. Over a time span of at least 1,300 years across most of the southeast where environmental and subsistence conditions warranted, clay was tempered with palmetto fibers. One obvious reason is a distilation of all of the reasons given above: palmetto-fiber tempering is not particularly primitive, marginal, or desparate; in the southeast it was convenient, easy, and successful. Coupled to this is the second reason, which could be called "Cultural Conservatism." The basic idea is certainly not original, and it will not be heard here for the last time. Why change a good thing? Palmetto tempering was working more than adequately, given the clay available and the general technological level of the southeastern Indians three to five millennia ago.

Just as one should be innocent until proven quilty; a technological product would seemingly be good until proven bad. Something would have to replace palmetto fibers that was much better or, if you stretch a point, much more prestigious. Nothing much was around to supply either in 2500 B.C. and possibly not before 1500 or 1000 B.C. There are various possibilities connected with the prestige of Poverty Point, but they were seemingly indifferent to ceramics. There also is the possibility of the introduction of a viable and proven alternative from the northern United States of sand tempering. Of course, indepemdent invention for tempering with sand or any other particulate material cannot be ruled out for the southeast. The early dates for sand-tempered pottery along the South Carolina coast and perhaps even along the Savannah could support such southeastern invention. But not that even if sand-tempered pottery were being made in South Carolina during the middle of the second millennius B.C., it did not catch on like wildfire; the successful, not the primitive, fiber tempering held its ground.

The final conclusion boild down to this: With evidence that tempering with palmetto fibers was a sound rather than a stupid practice, it looks like the old idea of Urdummheit or the "Early Stupidity of Man" will have to give way to "Primary Pottery Efficiency."

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# FIBER-TEMPERED CERAMIC FABRICS AND LATE ARCHAIC CULTURE HISTORICAL PROBLEMS

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Lacunaria pottery or ceramics with porous canals and cavities has a rather curious distribution. There are examples in Japan, the North American Arctic, the Southeastern United States, Colombia, and the Near East, to mention a few expressions of this general ceramic class. But of all the regional expressions only those wares from the southeast and those from Colombia have canals formed by the same kinds of vegetal tempering agents added to the fabric. For this reason, wares from these two localities have been characterized as analogues. Focusing closer, we see that in the period between 3000 to 2500 B.C., pottery with fiber tempering appeared in the Southeastern United States and in Colombia. Whether this pottery represents an independent invention or an introduction of ceramic-making ideas from northern South America (Colombia) where pottery is slightly older but coeval with the southeastern material, is a problem that has puzzled prehistorians for almost a decade. Contrary to Marvin Harris' contention that there is a high frequency of independent technological innovation in the New World, there are relatively few clear-cut and well documented examples of independent innovations. In this light, fiber-tempered pottery is of particular theoretical interest. Today, either of two general orientations--independent innovation or colonization (diffusion)--are held by most New World prehistorians. Both hypotheses have general merit and eminent proponents. Also, the theoretical frameworks appear to be well founded in the supportative data.

In support of the independence hypothesis is the idea that the distance and the numerous barriers between the two fiber-tempered pottery-making centers are insurmountable. Independentists point to the negative evidence along the Atlantic, Caribbean, and Gulf coasts of Central America and Mexico as further "proof" for the independence of the two areas. The few prehistorians of the independence tradition who have worked with ceramics from both areas point out that the "feel" and aesthetic qualities of the two ceramic complexes are so different that they must be independent populations and therefore analogues. On a higher integrative level, independentists feel that no one particular group (Indian) has or had a corner on the brain market (Harris 1968: 173-176, 377-379).

Turning to the colonialistic hypothesis (New World interconnectiveness) we find that supportive data takes the form of typological homology; that is, site design, artifact inventories, motif similarities, and an escalating carbon dating sequence reflecting the hypothetical diffusion of traits from South America to the southeast. Central also to the hemispherical interconnectiveness hypothesis is the proposition that no barrier or distance is too great for man to surmount. Allied with this belief is the idea that the probability of independent but repeated innovation of cultural items by different people is too low to be considered seriously.

It is almost axiomatic that "diffused innovations tend to show greater cross-cultural resemblances in finer detail than independently invented innovations (Harris 1968: 378). Also, it has been repeatedly stated that potters tend to be highly conservative with regard to pottery-making methods. ". . .Meticulous attention to detail and to tried and proven procedures (must be paid if there is to be batch after batch success, for) at a hundred points in the production process error or carelessness can lead to diaster" (Foster 1967: 300-301). Since pottery is the major defining characteristic of the Late Archaic in both Colombia and in the Southeast, and accepting the two above propositions (that diffused innovations have more fine-detail resemblances and that potters pay a good deal of attention to fine detail), and if a number of attributes of the regionally-dispersed types of New World fiber-tempered pottery could be measured at an interval level of measurement (a scale with a zero standard), then one ought to be able to correlate attributes making a probabilistic statement regarding independence or interconnectiveness. That is, one would reject or fail to reject the null hypothesis which for this study was that there is no relationship between the New World fiber-tempered populations. The significance level chosen was $p=.001$. That is, the probability of the relationship occurring by chance and chance alone is one to one thousand.

The first task was to determine exactly what attributes could be observed and measured. A pilot study was conducted which defined 40 attributes (Crusoe 1970). This study revealed that neither a simple observational nor a typological nor a petrographic analysis along would reflect the data sufficiently to test the null hypothesis. Therefore, provision for all three methods (samples) was made in the research design. The following is a short discussion of these samples and findings relevant to the topic at hand.

The general observational sample (n=more than 2,000 sherds) had as its focus a familiarization of the typological differences between the regional fiber-tempered ceramic types. To reach this goal, I examined as many fiber-tempered sherds from the areas as possible. Sample II ($n = 816$) was drawn from Sample I. Its objective was to individually delineate attributes characteristic of each sherd in terms of the 40 possible attributes that were defined by the pilot study. By deleting regional variation attributes that were common to all New World fiber-tempered pottery would be highlighted. Sample III ($n = 172$) was drzwn from Sample II before statistical reduction and deletion, and was studied by petrographic thin-section as well as by sedimentary geological methods. The sample consisted of sherds from Georgia, Florida, South Carolina, Alabama, and Colombia. The focus of this sample was to intensively study the basic attributes of New World fiber-tempered pottery and to correlate the parameters in order to test the null hypothesis. The three samples therefore were drawn from each other, attempting to produce a relatively unbiased sample. To this end, case selection did not depend on whether the sherd was or was not decorated, or whether it was or was not a rim sherd, which is usually the case in normal typological studies. Selection for this sample was based upon the particular stratigraphic and spacial coordinates of the particular sherd. That is, an attempt was made to obtain sherds that were in close association with radiocarbon dates. Efforts also were made to obtain materials from several excavated areas within one site. In cases where no stratified material was available, I attempted to obtain large samples.

Control groups in this study were of three types: (1) fiber-tempered pottery (?) from Japan and chaff-tempered pottery from Iran; (2) crushed stone-tempered sherds from Iran and grit-tempered wares from Florida and South Carolina; and (3) native clays from various localities in Georgia. Control group studies revealed that Japanese ceramics were only slightly comparable to the New World forms, but since the sample was so small (n = 5), no positive statements can be made at present. The Near Eastern material was quite distinct and belongs to a separate classification. The other two groups were used to obtain constants that were further verified by the fiber-tempered studies.

The results obtained from Sample I conform generally, although not completely, to past findings. Due to the scope of this paper, only one hypothesis obtained from the analysis of Sample I will be considered. This hypothesis states that pottery from the Puerto Hormiga Site (Colombia) is vaguely reminiscent of Southeastern fiber-tempered pottery as a whole. In this light, the relationship between both ceramic complexes would best be characterized as negative.

Sample II was limited by the availability of materials that would fit the stringent regulations for inclusion into the sample. My basic criterion for inclusion in this sample was that sherds had to have come from a locality where I had a sample of greater than five sites or else (as with Puerto Hormiga) the site had to be represented by a sample of at least 50 sherds (Puerto Hormiga sample size = 157). Due to these rather stringent criteria, which I thought were necessary to minimize bias due to locally aberrant cases, Sample II consisted of materials from four localities: one in South Carolina, two in Georgia, and the Puerto Hormiga Site. I hasten to report that sherds from other areas were analyzed but were eliminated by the criteria (Central Georgia, Florida--two localities, and Northern Alabama).

In order to arrive at a classification that would reflect the attributes characteristic of all New World fiber-tempered pottery, a hierarchial ordering of the 40 attributes was necessary. I abandoned an effort to design a Guttman scale ordering of the attributes. A Guttman scale is one in which the specific attributes (questions) are ranked such that the most minimal of the attributes is a proper subset of the next larger attribute group. That is, a Guttman scale attempts to place varying degrees of weight upon the various attributes. An arbitrary scale was constructed and the attributes were grouped into categories that reflected the step of the production process when the particular trait would be added to the fabric or when the attribute would result. There were 10 categories into which the 40 attributes were grouped. The resultant classification resembled a stratified nominal scale clustering. That is, each group contained a number of attributes, but only one attribute per group could have been scored per sherd. Next, a reduction in the classification was accomplished by removing the last attribute grouping from each cluster and collapsing identical cluster categories until a lambda of 75 percent was achieved. Lambda is a statistical measure of association that assesses the percent error one would make in a single classification act. Since lambda only assesses the sample on hand and considers all of the attributes, the computed lambda reflects how well the classifier knows the attributes and, in another sense, how well the categories fit the mutually exclusive goal of typology. In most Social Science work a lambda of

25 percent or better is considered to be relatively reflective of the data, but I chose a 75 percent level in an effort to make the classification as accurate as possible for the four regions in the study sample. Therefore, this fourfold typology applies only to the four regions studied, but it can be extended into other areas by enlarging the sample from the particular region. The implication of this fourfold typology is that there are four classes and that regional type names occur in decreasing hierarchial ordering, within the four ware groups. With regard to the fabrication process, let me restate that this whole procedure was conducted in order to delineate the attributes that were reflective of all New World fiber-tempered pottery types. The fabrication process, again, is important because it is where the fine detail exists and it is this detail that would reflect similar or dissimilar populations of pottery-making techniques.

Suffice to say that regional variation is characteristic of attribute groups such as the firing atmosphere, pottery color, surface finish, manufactoring idiosyncrasies, and the texture of the paste. On the other hand, the tempering agent (other than diber), general graininess of the sherd, and the type of fiber (rounded or planar) appear to be attribute groups consistent with all regional ceramoc types. These latter three attribute groups were intensively studied in Sample III to determine whether the two populations of pottery were or were not the result of trans-Caribbean contacts.

Before moving to Sample III, I should like to point out some data that has relevance with regard to the "Law of Limited Possibilities" or the idea that there are only a few ways by which to construct a particular item or perform a specific task. The number of possible ways to arrange (permutations) the 40 attributes studied, taken ten at a time, was determined before reduction to be $3.1 \times 10^{52}$. This figure applies only to the sample clusters scored in terms of the 40 possible traits, and not to the fourfold concise typology that is a fabrication produced in an effort ro describe the numerous individual sherds studied. In terms of the Spalding-Ford question, the individual sherds defined their particular cluster signature (reflecting the emic view). These clusters were then arranged into groupings useful as archaeological constructs (etic groups). This gigantic figure reflects the former, or emic view, in that the particular potter could have chosen any one of the $3.1 \times 10^{52}$ ways to construct his pot. My typological constructs and the subsequent reductions have nothing to do with this figure. One cannot, at present, say anything about the particular limitations imposed upon the potter at particular points in the fabrication process, since we are not able to rank the various attributes in terms of their importance (i.e. Guttman scale). For instance, presently, if a potter puts a handful of grit into the clay matrix, we have no idea of the ways this will limit what can or cannot be added later, what types of finishing steps he will have to conduct, or for that matter, what kinds of decorative techniques he can or cannot use. In terms of the general fabrication process there were only 19 attribute clusters that resulted from the analysis (26.3 percent of which reoccurred in all the localities studied, 10.5 percent in three of the localities, 21.1 percent in two of the localities, and 42.1 percent in only one locality).

If one were to invoke the Law of Limited Possibilities as the explanatory mechanism for similar clusters in different areas, then one must contend with the enormous number of ways that the attributes could be arranged. Many of these arrangements, no doubt, could result in a finished product that would technically, but not culturally, be acceptable and functional. Also, this person would have to account for the five identical clusters (26.3 percent) in North and South America which comprise 92 percent of the sherds in the entire sample. A concomitant theoretical proposition is that the psychic unity of mankind accounts for the similar cultural inventories of various peoples. If this is the case, then the minds of all men must be so directively channeled that no matter what the circumstances, the solution to a particular problem will be identical in minuscule detail regardless of the intervening variables of the particular culture and environment.

Moving to Sample III, five measures were studied petrographically and by sedimentary geological methods. A sixth measure, that of the absolute date of the particular sherd by direct or indirect association with a carbon date, also was involved in the analysis. The method used to obtain each of the first five measures is quite involved and will not be discussed here. These first five measures were the porosity, solid volume, specific gravity, quantity of sand grains, and fiber cast frequency. This descriptive data was translated to IBM processing cards and a regression correlation program (BMD02R) was run on the data by an IBM 360 computer. The solutions to the six problems (one per variable) were computed and at the significance level set at the beginning of the study 29 of the 30 solutions were significant. The one test that was not significant at the .001 level would have been at the .05 level. Rather than lapse into a smoke-screen of statistical jargon, let me state simply that the statistical tests attempted to determine whether the sample could best be described as representing a single population with normal variation from the mean. At the chosen significance level the correlations indicate that the model that best represents the data is a simple linear relationship model.

Not only were the correlations significant. but in two sub-problems the solutions were high enough that prediction of other variables was possible. This does not occur often in Social Science research. In a test sample from one shell ring on the Georgia coast (A. Busch Krick 9 McI 87) I attempted to predict the date of a particular stratigraphic level. The computed result was 120 years "off" from the obtained radiocarbon date and was outside of the counting error estimate by 35 years. This is fairly good considering the discrepancies of dendrochronology and carbon dating, but one should also consider that the predicted date was based upon estimates from other carbon dates.

In short, then, the null hypothesis that there was no relationship between the New World fiber-tempered ceramic-making technologies had to be rejected. Having rejected the null hypothesis, I am left to conclude that there was a single set of ceramic-making ideas that had to have been transported by some direct means from South America to the Southeastern United States.

The data from the samples indicated that: (1) there were a limited number of recipes by which fiber-tempered pottery was made and these recipes are found in both major areas of the New World where fiber-tempered pottery appears at relatively the same time (Colombia ca. 3000-2500 B.C.

and the Southeast ca. 2600-1000 B.C.); (2) ceramic technology evolved dependently as well as independently in each of the two areas--possibly indicative of sporadic contacts between the two areas; and (3) this evolution appears to have resulted in the development of later ceramic complexes in Florida, Georgia, and possibly South Carolina (c.f. Crusoe 1971).

The transference of the pottery-making ideas stands as a major problem since it must be based upon sea-going or land-based vectors. With regard to both of these vectors, we have no data that would soundly support either mechanism.

Turning to the land diffusion hypothesis we find that the lack of data along the coast of Panama and the rest of Central America prohibits closure of the geographical distance barrier. The data available from this area is in no way completely indicative of this type of Late Archaic culture. I have searched the central Caribbean coastal sector of Panama looking for fiber-tempered sites, but to no avail. In the Puerto Hormiga report, Reichel-Dolmatoff (1965) indicated that he favors the land route for dispersal. It may be that these kinds of sites, as he postulates, are located about a days-canoe distance from each other. Further, since the sites are found mainly near the mouths of major river systems, then there are several places on the coast of Panama that are likely candidates. One such area is near the mouth of the Rio Chagres (near the Panama Canal). This is the locality that I searched with negative results. Another problem with the land-based dispersal proposition is that one should find the earlier sites in the western and not the eastern sectors of the Southeast. This apparently is not the case (the earliest dates come from Palmer, Florida, and Rabbit Mount island on the Savannah River). Dating of the Alabama complex (Tennessee River) has not been accomplished, but these materials are the least reminiscent of the North American complexes to the South American complex. Further, complexes nearer the Atlantic coast have ceramics that are equivalent to the South American complex while fiber-tempered pottery in the Mississippi Valley area is scarce. In short, the western border of the Southeast does not provide acceptable evidence to support a land-based dispersal pattern.

Considering the sea-going route as a probable means of introduction for this technological innovation, we find that there are some satisfactory and some unsatisfactory solutions to this problem. The most important of these is the idea that if a sea-going craft were used (assuming that a direct trek across the Atlantic, Caribbean, and Gulf would be most successful in a boat rather than on a log) one could hardly hope to find this craft to support the hypothesis (Bullen's canoe notwithstanding). Instead, we must turn to more indirect and less satisfactory evidence such as the fact that fiber-tempered pottery has been found on offshore Colombian islands that apparently were only accessible by a sea-going craft. The nature of the cultural remains is the second point that could be indicative of such contacts (cf. Ford 1969). The ceramic correlations obtained by my study and the typological homologies of Ford (1969) tie the two complexes together, but the sea-going hypothesis is still only inferential, based upon the positive correlations across the water barrier. In short, I cannot propose a positive vector for the comparable complexes in South and North America, but the sea seems the most probable means of transference.

This data points to a high probability that the two ceramic complexes are related. This does not mean that all ceramic-making ideas in this complex are of South American origin, for some appear to have been innovated in the Southeast. Nor does this mean that other aspects of the Ford hypothesis, in all probability, are valid for more tests of his general theory are necessary. Nor does this mean that there was continuous interaction between the South and the North by fleets of boats. On the contrary, the data indicates that contacts were infrequent at best. Nor does this mean that Southeastern Indians of this time period were less intelligent than those in South America. The data indicates that a good deal of variation upon the basic themes was present. Nor does it mean that New World culture history is the result of a single connected story. But indeed, this study has lent support to a hypothesis that until recently has received little thought (the hemispherical interconnectiveness hypothesis). I feel that in light of the Ford associations and the correlations resulting from my study, New World prehistorians can no longer scoff at the possibility of South American contributions to North American culture history at this early date. This does not mean that New World prehistorians who specialize in Southeastern archaeology must reevaluate every bit of evidence presently on hand--though certainly some of it does need to be rechecked--but instead we should begin to view our data more critically, allowing the Southeast to be exposed in terms of testable hypotheses to comparable extra-area cultural inferences.

TABLE 1

QUANTATIVE DISTRIBUTION OF CLUSTER ATTRIBUTES
BY REGION: ALL SAMPLES

| | CLUSTER SIGNATURE | PUERTO HORMIGA | UPPER GEORGIA COAST | LOWER GEORGIA COAST | SOUTH CAROLINA COAST |
|---|---|---|---|---|---|
| FULL SAMPLE: | 10111 | 3 | 80 | 59 | 25 |
| lambda = 15.0 percent | 10211 | 5 | 2 | 6 | 2 |
| | 10112 | 1 | 0 | 0 | 0 |
| | 10113 | 0 | 4 | 6 | 0 |
| | 10213 | 0 | 0 | 1 | 0 |
| | 13111 | 7 | 15 | 9 | 2 |
| | 13113 | 4 | 2 | 1 | 0 |
| | 13121 | 59 | 129 | 5 | 3 |
| | 13221 | 3 | 9 | 0 | 0 |
| | 10123 | 67 | 187 | 68 | 15 |
| | 11123 | 0 | 13 | 4 | 0 |
| | 10321 | 0 | 1 | 0 | 0 |
| | 10221 | 2 | 0 | 4 | 0 |
| | 10121 | 2 | 0 | 0 | 0 |
| | 10223 | 0 | 1 | 0 | 0 |
| | 10321 | 0 | 2 | 0 | 0 |
| | 11111 | 2 | 4 | 1 | 0 |
| | 25211 | 1 | 0 | 0 | 0 |
| | 25121 | 1 | 0 | 0 | 0 |
| TOTALS | | 157 | 448 | 164 | 47 |

TABLE 1 (continued)

| | CLUSTER SIGNATURE | PUERTO HORMIGA | UPPER GEORGIA COAST | LOWER GEORGIA COAST | SOUTH CAROLINA COAST |
|---|---|---|---|---|---|
| 20 PERCENT REDUCTION: lambda = 10.0 percent | 1011 | 4 | 84 | 65 | 25 |
| | 1021 | 5 | 2 | 7 | 2 |
| | 1311 | 11 | 17 | 10 | 2 |
| | 1312 | 59 | 129 | 5 | 3 |
| | 1322 | 3 | 9 | 0 | 0 |
| | 1012 | 69 | 186 | 68 | 15 |
| | 1032 | 0 | 3 | 0 | 0 |
| | 1022 | 2 | 1 | 4 | 0 |
| | 1111 | 2 | 4 | 1 | 0 |
| | 1112 | 0 | 13 | 4 | 0 |
| | 2521 | 1 | 0 | 0 | 0 |
| | 2512 | 1 | 0 | 0 | 0 |
| TOTALS | | 157 | 448 | 164 | 47 |
| 40 PERCENT REDUCTION: lambda = 33.0 percent | 101 | 73 | 270 | 133 | 40 |
| | 102 | 7 | 3 | 11 | 2 |
| | 131 | 70 | 146 | 15 | 5 |
| | 132 | 3 | 9 | 0 | 0 |
| | 103 | 0 | 3 | 0 | 0 |
| | 111 | 2 | 17 | 5 | 3 |
| | 252 | 1 | 0 | 0 | 0 |
| | 251 | 1 | 0 | 0 | 0 |
| TOTALS | | 157 | 448 | 164 | 47 |
| 60 PERCENT REDUCTION: lambda = 74.0 percent | 10 | 80 | 276 | 144 | 42 |
| | 13 | 73 | 155 | 15 | 5 |
| | 11 | 2 | 17 | 5 | 0 |
| | 25 | 2 | 0 | 0 | 0 |
| TOTALS | | 157 | 448 | 164 | 47 |

TABLE 2

SAMPLE III PARAMETERS

| DESCRIPTIVE PARAMETERS: | VARIABLE NAME | VARIABLE NUMBER | MEAN* | STANDARD DEVIATION* |
|---|---|---|---|---|
| | Porosity | 1 | 215.2254 | 53.18472 |
| | Solid Volume | 2 | 283.6589 | 79.67830 |
| | Specific Gravity | 3 | 9.0173 | 6.01302 |
| *parameter was | Number Sand Grains | 4 | 4.6127 | 5.95770 |
| converted to $\log_2$ | Fiber Casts | 5 | 0.4439 | 0.87286 |
| | Time | 6 | 37.1907 | 9.00143 |

TABLE 2 (continued) ANALYSIS OF VARIANCE

| | | VARIABLE ENTERED | DF | SUM OF SQUARES | MEAN SQUARE | F RATIO |
|---|---|---|---|---|---|---|
| SUBPROBLEM I: Constant = Time | Regression | 5 | 1 | 2304.441 | 2304.441 | 33.877 |
| | Residual | | 171 | 11631.988 | 68.023 | |
| | Regression | 4 | 2 | 3316.55 | 1658.277 | 26.545 |
| | Residual | | 170 | 10619.875 | 68.470 | |
| | Regression | 1 | 3 | 3993.465 | 1331.155 | 22.626 |
| | Residual | | 169 | 9942.963 | 58.834 | |
| | Regression | 2 | 4 | 4214.566 | 1056.642 | 18.208 |
| | Residual | | 168 | 9721.863 | 57.868 | |
| | Regression | 3 | 5 | 4369.797 | 873.959 | 15.256 |
| | Residual | | 167 | 9566.633 | 57.285 | |
| SUBPROBLEM II: Constant = Fiber Casts | Regression | 3 | 1 | 26.671 | 26.671 | 43.697 |
| | Residual | | 171 | 104.373 | 0.610 | |
| | Regression | 6 | 2 | 43.825 | 21.913 | 42.710 |
| | Residual | | 170 | 87.219 | 0.513 | |
| | Regression | 4 | 3 | 50.840 | 16.947 | 35.708 |
| | Residual | | 169 | 80.205 | 0.475 | |
| | Regression | 1 | 4 | 51.533 | 12.883 | 27.221 |
| | Residual | | 168 | 79.511 | 0.473 | |
| | Regression | 2 | 5 | 51.680 | 10.336 | 21.749 |
| | Residual | | 167 | 79.365 | 0.475 | |
| SUBPROBLEM III: Constant = Number Sand Grains | Regression | 3 | 1 | 3083.645 | 3083.645 | 174.526 |
| | Residual | | 171 | 3021.355 | 17.669 | |
| | Regression | 2 | 2 | 3312.053 | 1656.027 | 100.798 |
| | Residual | | 170 | 2792.947 | 16.429 | |
| | Regression | 6 | 3 | 3399.106 | 1133.035 | 73.647 |
| | Residual | | 169 | 2645.894 | 15.656 | |
| | Regression | 5 | 4 | 3663.324 | 915.831 | 63.014 |
| | Residual | | 168 | 2441.676 | 14.534 | |
| | Regression | 1 | 5 | 3679.559 | 735.912 | 50.670 |
| | Residual | | 167 | 2425.441 | 14.524 | |
| SUBPROBLEM IV: Constant = Specific Gravity | Regression | 4 | 1 | 3141.171 | 3141.171 | 174.525 |
| | Residual | | 171 | 3077.720 | 17.998 | |
| | Regression | 5 | 2 | 3305.888 | 1652.944 | 96.464 |
| | Residual | | 170 | 2913.002 | 17.135 | |
| | Regression | 2 | 3 | 3397.694 | 1132.565 | 67.845 |
| | Residual | | 169 | 2821.196 | 16.693 | |
| | Regression | 6 | 4 | 3456.167 | 864.042 | 52.542 |
| | Residual | | 168 | 2762.724 | 16.445 | |
| | Regression | 1 | 5 | 3461.807 | 692.361 | 41.937 |
| | Residual | | 167 | 2757.084 | 16.509 | |

TABLE 2 (continued)

| | | VARIABLE ENTERED | DF | SUM OF SQUARES | MEAN SQUARE | F RATIO |
|---|---|---|---|---|---|---|
| SUBPROBLEM V: | | | | | | |
| Constant = | Regression | 1 | 1 | 58928.125 | 58928.125 | 9.754 |
| Solid Volume | Residual | | 171 | 1033035.875 | 6041.145 | |
| | Regression | 4 | 2 | 93231.875 | 46615.938 | 7.935 |
| | Residual | | 170 | 998732.125 | 5874.895 | |
| | Regression | 3 | 3 | 116897.750 | 38965.914 | 6.754 |
| | Residual | | 169 | 975066.250 | 5769.621 | |
| | Regression | 6 | 4 | 144152.250 | 36038.063 | 6.388 |
| | Residual | | 168 | 947811.750 | 5641.734 | |
| | Regression | 5 | 5 | 145903.375 | 29180.672 | 5.151 |
| | Residual | | 167 | 946060.625 | 5665.031 | |
| SUBPROBLEM VI: | | | | | | |
| Constant = | Regression | 6 | 1 | 31161.750 | 31161.750 | 11.720 |
| Porosity | Residual | | 171 | 455359.938 | 2662.924 | |
| | Regression | 2 | 2 | 61037.375 | 30518.699 | 12.194 |
| | Residual | | 170 | 425484.313 | 2502.849 | |
| | Regression | 5 | 3 | 70281.500 | 23427.164 | 9.512 |
| | Residual | | 169 | 416240.188 | 2462.959 | |
| | Regression | 4 | 4 | 72260.625 | 18065.156 | 7.326 |
| | Residual | | 168 | 414261.063 | 2465.840 | |
| | Regression | 3 | 5 | 73106.250 | 14621.250 | 5.906 |
| | Residual | | 167 | 413415.438 | 2475.542 | |

Tabular significance levels: F ∞ 1 = 10.83

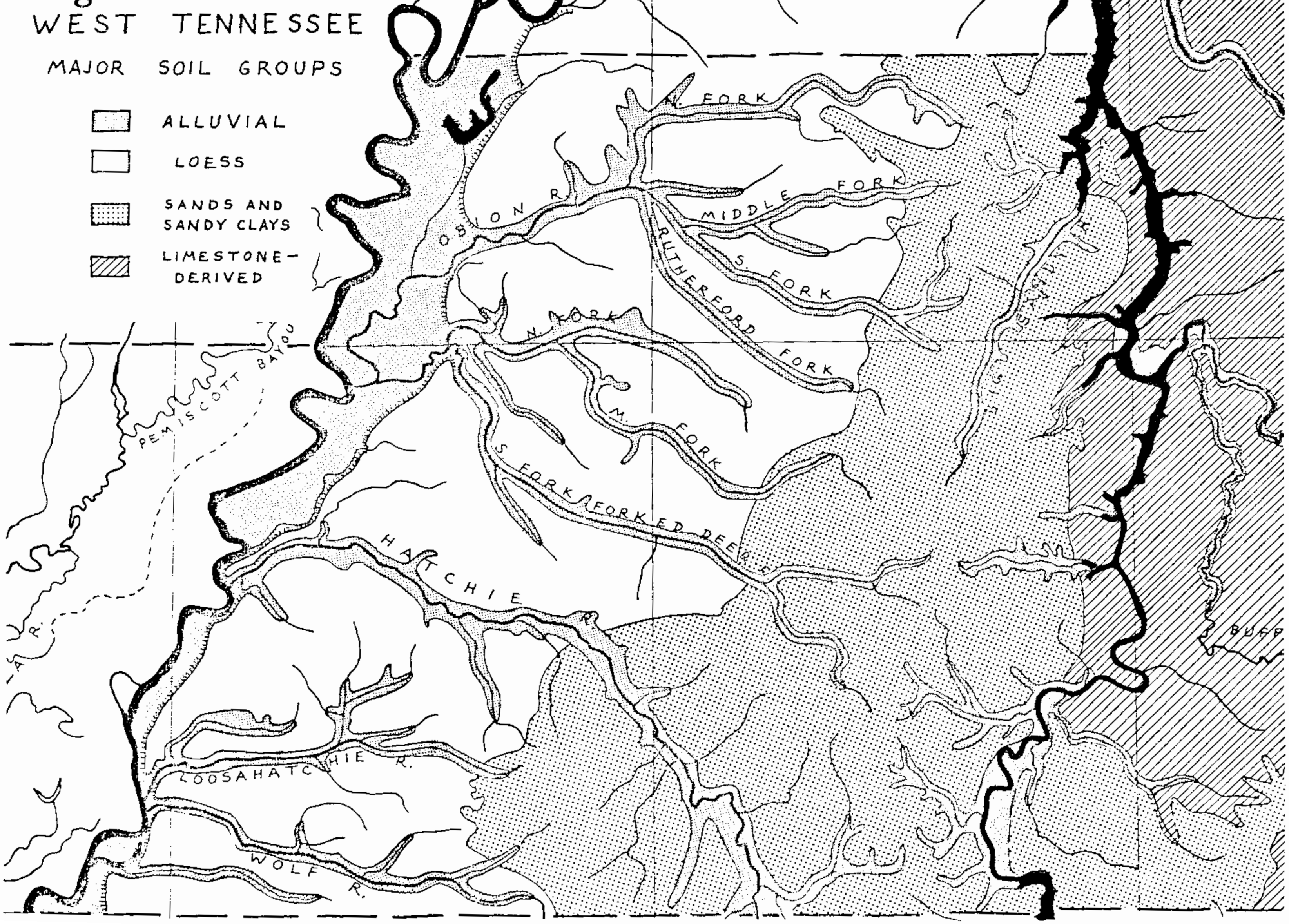
F ∞ 2 = 6.91

F ∞ 3 = 5.42

F ∞ 4 = 4.62

F ∞ 5 = 4.10

Figure 1


WEST TENNESSEE
MAJOR SOIL GROUPS
ALLUVIAL
LOESS
SANDS AND SANDY CLAYS
LIMESTONE-DERIVED
OBION R.
N. FORK
MIDDLE FORK
S. FORK
RUTHERFORD FORK
N. FORK
M. FORK
S. FORK
FORKED DEER
HATCHIE R.
LOOSAHATCHIE R.
WOLF R.
PEMISCOTT BAYOU

# THE LATE ARCHAIC THROUGH EARLY WOODLAND PERIODS IN WEST TENNESSEE

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This paper represents an initial synthesis of some of the data collected over the past four years of survey work in West Tennessee. Unfortunately, the work has of necessity been long on surface collecting and short on test excavations. Primary reliance is placed on distribution analysis, comparison with material from adjacent states, and the highly successful test work at 40 Fy 13 in the Upper Loosahatchie drainage. The distribution analysis has emphasized ecological correlations as well as cultural contacts, thus providing some basic insights into possible factors affecting settlement and subsistence patterns.

## RESOURCES

Climatically, West Tennessee is relatively uniform throughout with regard to temperature and rainfall. With regard to plant resources, however, zones of significant contrasts are present and appear to correlate with major soil zones. From west to east the major soil zones are the swampy sand and gumbo soils of the Mississippi Alluvial Valley, soils developed in the loess sheet adjacent to the Mississippi Valley, the sandy and sandy clay soils of the inner Coastal Plain, and the limestone-derived soils of the Highland Rim and western valley of the Tennessee River (see Fig. 1). Within these zones there are major contrasts between upland and bottomland resources.

Upland forests in the loess zone consist primarily of red oak, black oak, and upland hickory (Flowers 1964). In the sandy soil zone hickory is less common and tends to be replaced by shortleaf pine, blackjack oak, and post oak (Flowers 1964; Proffitt 1963). Upland hickory is uncommon in the limestone soil zone; here there is more complete dominance by a variety of upland oaks, along with basswood, yellow poplar, black gum, and some yellow pine and cedar (Townsend 1953). Walnut is scattered in both the loess and limestone-derived uplands. The upland forest thus provides mast for game, but little in the way of nuts and acorns that would be unpalatable unless leached of tannic acid.

Bottomland forests tend to be dominated by cypress, sweetgum, tupelo gum, yellow poplar, and bottomland oaks such as willow oak, water oak, and swamp white oak. The upper margins of creek bottoms in the limestone-derived soils and in the sandy soils include some shagbark and scalybark hickory, but the area involved is relatively small compared to the total land surface in these soil zones. In the loess soil zone stream gradients and relief of the terrain are much less than in the areas to the east and relatively extensive areas are suitable for these species of hickory and for nockernut hickory, all of which have sweet meat that is edible without processing. In the Mississippi Alluvial Valley minor differences in elevation make a major difference in forest cover. Backswamp areas are dominated by cypress, black gum, and tupelo gum. Slightly higher areas support bottomland oak, sweetgum, hackberry, sycamore, and cottonwood. On the highest areas of the valley floor various lowland oaks, hackberry, sweetgum, sycamore, cottonwood, walnut, and pecan are the most prominent species (Brown 1965).

Most of West Tennessee is devoid of siliceous lithic resources. Camden and Fort Payne (Dover Flint) cherts are available in great quantity in the limestone-derived soil zone and chert gravel is available in the stream beds and alluvial terraces along and near the Tennessee River. High quality tan chert is available in stream beds and banks in the eastern portion of the loess zone and at the base of the bluffs overlooking the Mississippi Valley. Ferruginous siltstone and sandstone are extensively available in the eastern portion of the sandy soils zone and at one known outcrop at the base of the bluffs in northwestern Lauderdale County. Chert gravels also are available from bars in the Mississippi River, consisting primarily of white cherts from Missouri and Illinois. These cherts are rarely found south of Lake County and may not have been available in usable sizes any further south.

The distribution of restricted-area resources thus appears to be somewhat polarized, with major sweet hickory nut and siliceous lithic resources coinciding near the margins of the loess soil zone and major siliceous lithic resources, secondary sweet hickory nut, and major riverine mussel resources in the Tennessee River Valley. Within the Tennessee River Valley it should be noted that extensive flood plain areas are present in the southern quarter of the valley and near the mouth of the Duck River, but otherwise are generally less than a mile wide from bluff to bluff. The sandy soil zone contains sandstone resources usable for grind-stones and siltstone that was pressed into service for celts, axes, hoes, and atlatl weights as well as ornaments. Plant food resources in the forests of the sandy soil zone, however, appear to have been inferior to those of the adjacent zones. Seasonal faunal resources in the form of migratory ducks and geese, and fish trapped in backwaters after spring floods are an additional major resource of the Mississippi Valley and of somewhat lesser extent in the Tennessee Valley.

The survey work done in recent years has included attempts to identify activities carried out at sites in the area and to correlate these activities with ecological zones. Total pickup samples, rather than selection for pottery and worked lithic material in the field, have provided the basic data for this aspect of the work. In general, sites with high ratios of projectile points, cores, waste flakes, and utilized flakes have been considered to represent primarily hunting activities. Those with low ratios of these items and, at least in the loess soils zones, high ratios of ferruginous sandstone and grindstone fragments have been considered to represent mainly plant food gathering activity. Some whole or nearly whole grinding stones often are found on sites mainly characterized as hunting camps; these sites also often have strong representation of the ferruginous siltstone and fire-shattered chert categories.

In Shelby and Fayette Counties, where both detailed soil maps and large numbers of total pickup site collections are available, strong correlations between activities and soil types have been noted. Of 13 sites with primarily gathering activity, ten were on Grenada soil (seven of these where the surface slope is 2 to 5 percent), two on Calloway soil, and one on Memphis soil. Eighteen sites had roughly balanced hunting and gathering activity: six were on Grenada soil, eight on Calloway, and one each on Memphis, Waverly, Henry, and Falaya. The 14 primarily hunting sites were evenly distributed by soil type with all major soil types in the loess zone represented. Grenada and Calloway soils are characterized by a fragipan development at two to three feet below the surface and normally occur in a second bottom context along streams. Memphis and Loring are well-drained upland soils while Weverly, Falaya, and Henry are swamp and first-bottom soils. Preliminary field checks suggest a tendency for relatively pure groves of shagbark and scalybark hickory to form on the lower slopes of slightly elevated areas of Grenada and Calloway soils, but not in other contexts.

EARLY LATE ARCHAIC PERIOD

The early part of the Late Archaic Period primarily is represented by two basic projectile point types, Benton and one that will be referred to here as Bartlett. The Bartlett style is known, thus far, in West Tennessee only from hunting camps along the Mississippi River bluffs and penetrating about 15 miles up the Loosahatchie, Forked Deer, and Obion Rivers. A provisional type now designated as Form 44 is clearly associated with Bartlett. Bartlett points have a wider distribution in the Mississippi Alluvial Valley in southeastern Missouri, northwestern Arkansas, and northern Mississippi. A date of 3280 B.C. ± 125 years was obtained by Connaway and McGahey (1971) on a component at the Denton Site in the upper Yazoo Basin that was characterized by Bartlett points. Small blades on the order of 5 to 7 cm were frequent at Denton, but have not been found in West Tennessee.

Benton points have a complementary distribution with Bartlett and Form 44 points and have a range including virtually all of West Tennessee from the Tennessee Valley westward to within about five miles of the Mississippi River bluff in many places. Three Benton components also are recorded near the mouth of the Loosahatchie River in an area otherwise characterized by Bartlett and Form 44 points. Fifteen lettered varieties of Benton points have been provisionally defined on the basis of variation in form and proportions of blade and hafting elements. Six of these varieties are common enough to permit provisional distribution analysis. In all six cases the distributions appear as loops of varying width extending across the major soil zones from the Tennessee Valley into the eastern half of the loess soil zone. Most Benton components in the sandy soils zone are hunting camps, while those in the loess zone are primarily on balanced hunting and gathering sites. The Benton component in the Tennessee Valley are relatively short of grinding equipment and have lithic material characteristic of hunting activities, but also include shell midden components.

At 40 Fy 13, a Benton hunting and gathering component was found in stratigraphic context between Late Lambert and Early Archaic components on

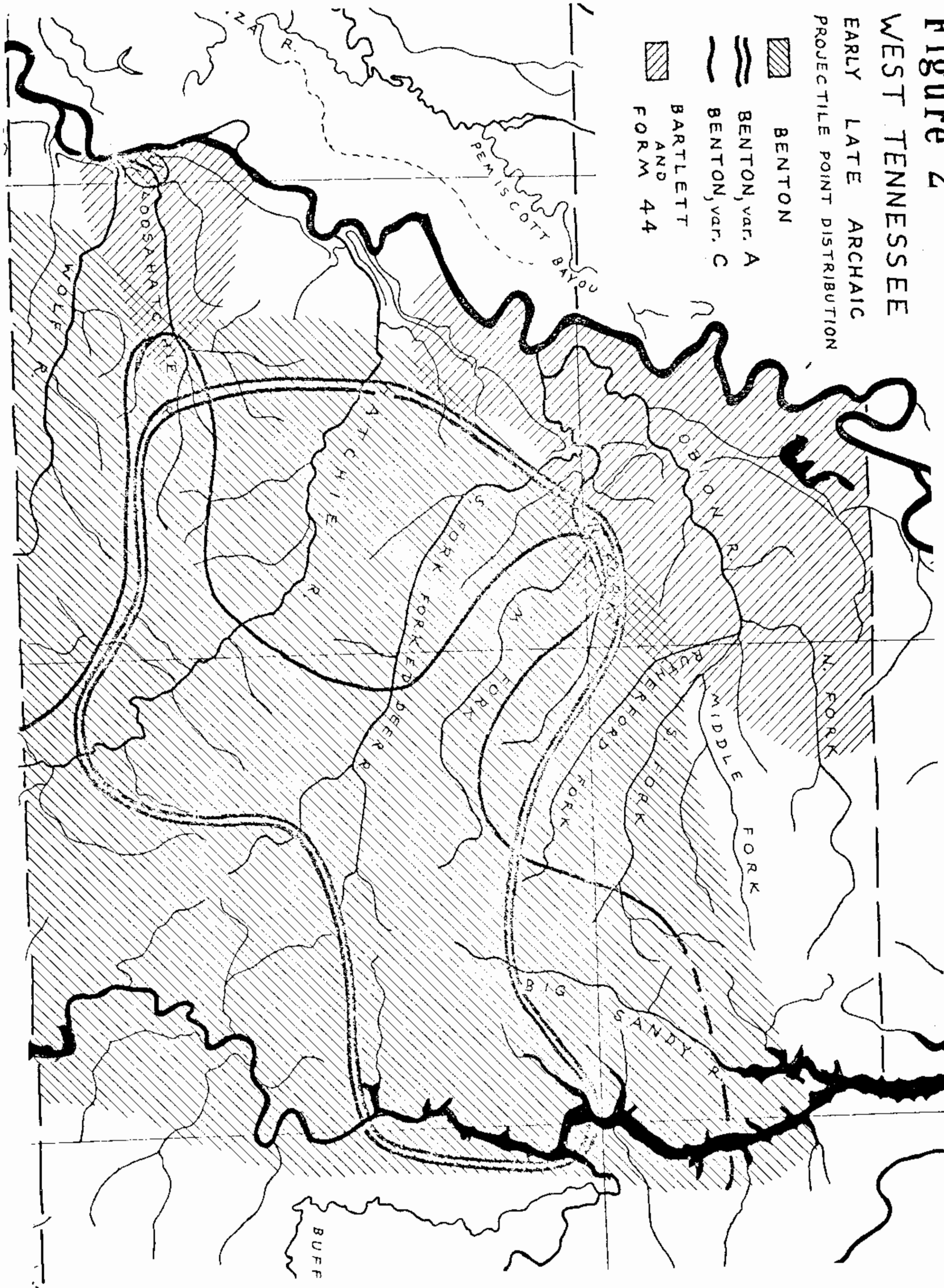


Figure 2
WEST TENNESSEE
EARLY LATE ARCHAIC
PROJECTILE POINT DISTRIBUTION
BENTON
BENTON, var. A
BENTON, var. C
BARTLETT AND FORM 44
PEMISCOTT BAYOU
OBION R.
N. FORK
MIDDLE FORK
RUTHERFORD FORK
S. FORK
M. FORK
S. FORK FORKED DEER R.
HATCHIE R.
LOOSAHATCHIE
WOLF R.
BIG SANDY R.

the site. Of particular interest was the fact that most of the Benton projectile points on the site were made of Fort Payne chert, while most of the waste flakes were of the locally available tan chert. One implication of this situation is the possibility of a seasonal round of movement from the Tennessee River into the loess zone to take advantage of the fall hickory nut harvest from concentrated groves rather than scattered trees. The time span involved for Benton is estimated to extend from about 3500 to 1000 B.C. by the conventional radiocarbon scale, although no dates are yet available.

POVERTY POINT AND LATE LATE ARCHAIC PERIODS

During the time span involved here, roughly about 1000 to 300 B.C., a major change occurred in the cultural orientations in West Tennessee. Point styles characteristic of the Tennessee Valley are restricted almost entirely to the Tennessee River drainage; but they are replaced in the Mississippi drainage by cultures oriented toward the Poverty Point Culture of Louisiana and Mississippi.

The Poverty Point-oriented phases are characterized by Lambert, Delhi, Harris Island, Forn 64, and late varieties of Pontchartrain projectile points and by baked clay objects generally spherical, biconical, or ellipsoidal forms. Microblades are rare and tend to be associated with hunting activities; a hematite plummet fragment and two-hole gorgets are known, but thus far only from the Lambert district in the southwestern corner of the State. Jaketown perforators, refined lapidary work, and earthworks are absent in West Tennessee. The general impression is of an intrusion of cultures that had been and remained, marginal to the mainstream of Poverty Point cultural developments.

Eight phases, including early, middle, and late Lambert phases, have been defined for West Tennessee on the basis of contrasting configurations of projectile point and baked clay object styles. All except the Harris Island Phase are restricted primarily or entirely to the loess soil zone. The Harris Island Phase is considered late, probably contemporary with the Late Lambert Phase, on the basis of projectile point styles and decorative treatment of the baked clay objects. It seems to have developed from an eastward extension of the Holly Grove Phase and is restricted to the sandy soil zone along North Fork Creek east of Jackson, Tennessee. A single carbon date of 450 B.C. ± 96 (I-5782) was obtained from charred nut hulls in the Late Lambert Phase component at 40 Fy 13. This component appears to have been a short-term gathering camp set up to harvest bottomland hickory nuts. Besides the charred hickory nut hulls, the component produced the postmold pattern of a small circular shelter six feet in diameter. The postmolds were approximately 0.2 foot in diameter and 0.4 foot in depth and diametrically paired, suggesting a framework composed of six light poles bowed over to meet at the top of a dome-shaped structure. No prepared floor or hearth was found associated with the postmold pattern.

Pickwick projectile points occur in the Tennessee Valley in West Tennessee from Mississippi to Kentucky, and extend across the divide down North Fork Creek and for a short distance down the South Forked Deer River from Jackson, into the upper valley of the North Fork of the Obion River,

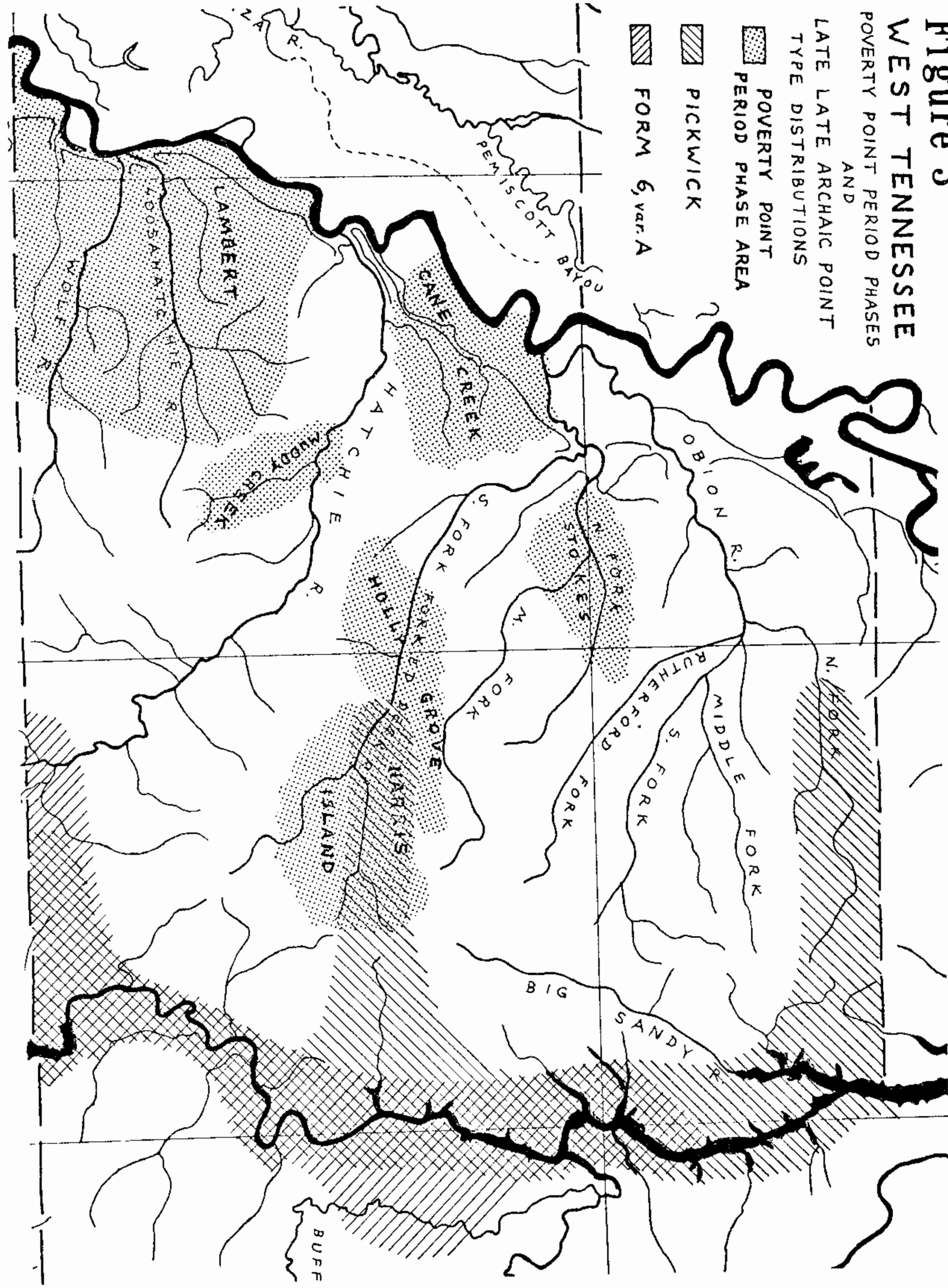


Figure 3
WEST TENNESSEE
POVERTY POINT PERIOD PHASES
AND
LATE LATE ARCHAIC POINT
TYPE DISTRIBUTIONS
POVERTY POINT
PERIOD PHASE AREA
PICKWICK
FORM 6, var. A
PEMISCOTT BAYOU
CANE CREEK
LAMBERT
LOOSAHATCHIE R.
WOLF R.
HATCHIE R.
MUDDY CREEK
OBION R.
N. FORK
STOKES
S. FORK
M. FORK
FORKED DEER R.
HOLLY GROVE
HARRIS
ISLAND
RUTHERFORD FORK
S. FORK
MIDDLE FORK
N. FORK
BIG SANDY R.
BUFF

and along the Mississipi border almost to the Hatchie River. Where site activity can be determined, those involved here are primarily hunting camps with little gathering activity indicated.

Wheeler and related fiber-tempered ceramics occur in the sand and sandy clay soil portion of the Tennessee Valley and along the Mississippi border westward almost to the Hatchie River. The Form 6 projectile points that appear to be associated extend westward into the Hatchie River bottoms and northward into the lower Buffalo River Valley and central Benton County along the Tennessee River. The only Form 6 projectile points outside this area have come from three sites in Shelby County (Sy 27, Sy 98, and Sy 201). Sy 27 and Sy 98 both have Middle Lambert components as the only ones in the time span involved, a situation suggesting contemporaneity of the Wheeler pottery and Form 6 projectile points with the Middle Lambert Phase. Specimens of Pontchartrain, variety Shelby, projectile points, characteristic of the Middle Lambert Phase and a minority style in the Late Lambert, Cane Creek, Muddy Creek, and Holly Grove Phases, also have been found on sites yielding Wheeler ceramics and/or Form 6 projectile points in Hardin and southern McNairy Counties.

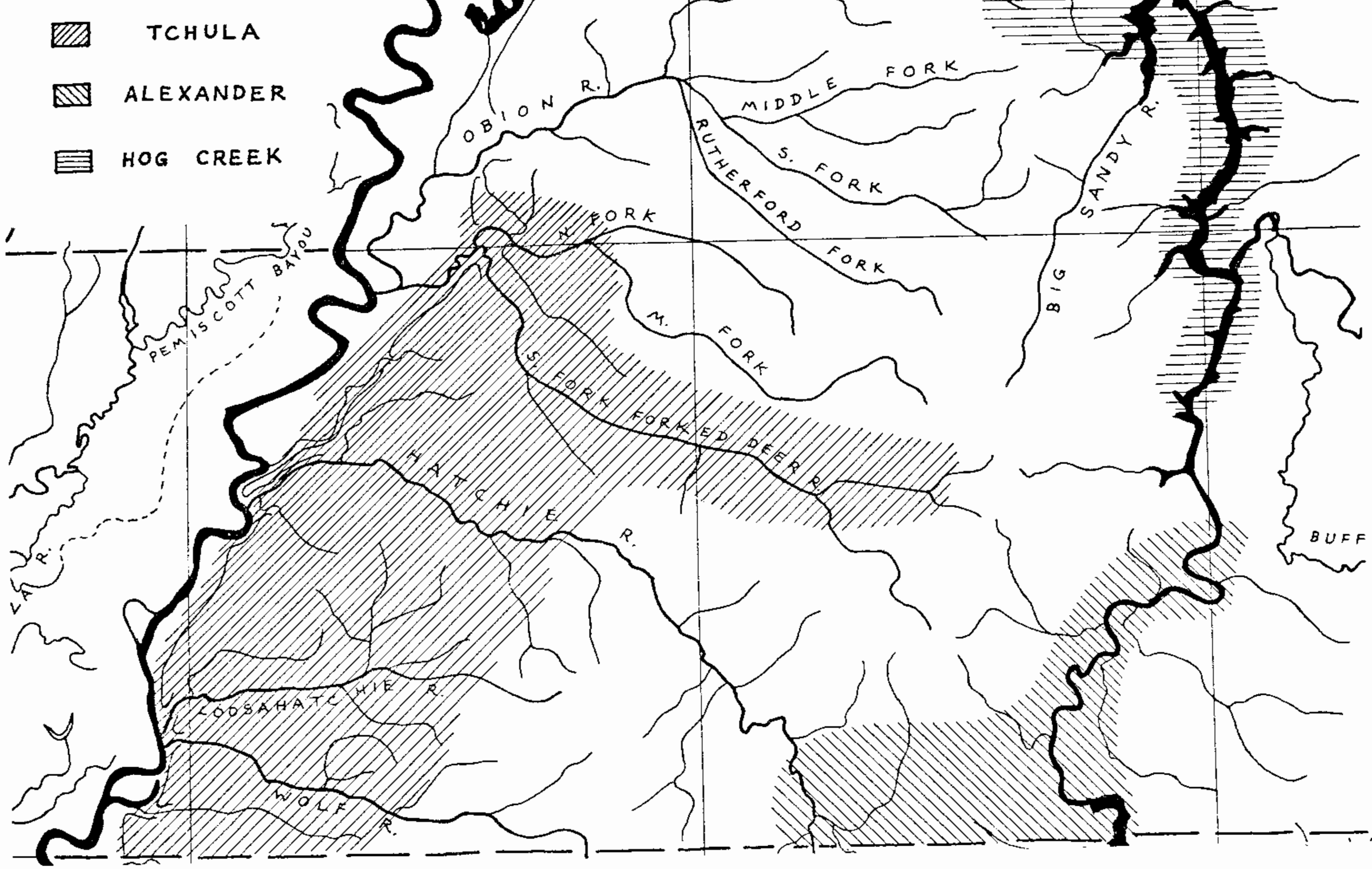
Longer-range contacts are suggested by the presence of Pontchartrain, variety Teoc, points in Hardin and McNairy Counties and the reported presence of locust beads in McNairy County. The locust beads reportedly came from sites with baked clay objects, but the sites yielding Pontchartrain points, thus far, have Wheeler ceramics and no baked clay objects. The Pontchartrain points are made of tan chert typical of the Mississippi Valley sources. The idea that the central part of the Tennessee River Valley may be at least partly involved in the origins of the fiber-tempered ceramics on Poverty Point sites in Mississippi and Louisiana (Ford and Webb 1956: 106; Webb n.d.: 85-95) is thus given added support.

## EARLY WOODLAND PERIOD

The sand-tempered Alexander Series ceramics of the southern third of the Tennessee Valley in West Tennessee seem best summarized as continuing the Wheeler ceramic tradition with slight modification. There are in fact, many specimens that have both fiber and sand tempering in the same sherd. A projectile point type provisionally designated Form 43 appears to be associated with the Alexander Series pottery in the area. Form 43 specimens have been found westward at 40 Sy 63, a site with a Late Lambert component followed by a gap until Early Mississippian, and at 40 Tp 20, a site with a Middle Lambert Phase and a Tchula component. Assuming that the Form 43 points actually do go with the Alexander pottery in this area, I would suggest partial temporal overlap of Alexander with both the terminal portion of Poverty Point-oriented cultures and with the subsequent Tchula material.

Fletcher Jolly's (1971) Alexander material from Little Bear Creek in Tishomingo County, Mississippi, seems closely related to the Tennessee material. The general style of his ceramics is basically the same but includes a much greater use of zoned motifs and combined decorative techniques than is usual farther north. Form 43 is essentially a variant of his (Jolly 1971: Plate VIII and IX) expanding stem Flint Creek points. In his undifferentiated stemmed category, the specimens in his Plate XIII, let-

# Figure 4
WEST TENNESSEE
EARLY WOODLAND PERIOD
CERAMIC COMPLEX DISTRIBUTION



tered a and f could be classified as Harris Island, variety A; h as Form 64; d as Lambert, variety B, a variety known from the Cane Creek Phase; and e as Form 6, variety B.

To the north in the Tennessee Valley, in and beyond northern Decatur County, Form 43 projectile points appear again. They continue downstream to Kentucky and spill over into the headwaters of the North Fork of the Obion River. In this area, however, they seem to be associated with a coarse cord-marked, limestone-tempered ware that I will refer to as Hog Creek Cordmarked for present purposes. The pottery can be summarized as having deep, coarse cord marking with the cord impressions on the order of 2 to 3 mm in diameter and spaced at 1 to 3 mm intervals. Overstamping is normal and at random angles. The paste is soft and slightly contorted with a heavy admixture of crushed limestone. The limestone particles range in diameter from 1 to 5 mm, with most in the upper half of the size range. Thickened and folded rims are known, but no bases. Initially I am inclined to look more toward the later, thinner varieties of Adena cord-marked pottery (Dragoo 1963: 185 and 275) than toward Baumer for its origin, since Baumer Cordmarked as described at the type site (Cole, et. al. 1951: 196-199) appears to be a local decorative treatment closely related to Cormorant Cord Impressed in most cases and is a small minority in the Baumer ceramic complex. In trying to answer the obvious question of "Why not Baumer?", all I can come up with is to suggest that Adena influence arrived earlier and that perhaps Baumer should be looked to as a source of inspiration for Long Branch Fabric Impressed.

Moving westward, most of the sandy soil zone must be disposed of as simply unknown at this time. A few sites with Tchula ceramics occur east of Jackson along North Fork Creek, but appear to represent eastward extension of the main Tchula distribution lying within the loess zone. Most of the Tchula pottery of the area consists of Tchefuncte Plain, with Cormorant Cord Impressed and Twin Lakes Punctated as minority companion types. Crowder Punctated and Withers Fabric Impressed are conspicuous by their rarity. Decorative motifs in Cormorant Cord Impressed consist primarily of bands of diagonal cord impressions set off by Twin Lakes punctation at the rim and lower margin of the band and cross-hatched cord impressions. In general, the Madison County sherds tend to be less sandy and lack the coarse-cord variety of Cormorant Cord Impressed often present in the other collections, but the data are still inadequate for phase definitions. Small stemmed projectile points provisionally classed as Form 2, variety A, appear to be associated with the Tchula ceramics. The Form 2 category in general is similar to Mabin and apparently continues through the Woodland Period and on into Early Mississippian in this past of West Tennessee.

## SUMMARY

The long-term patterns of cultural adaptation and orientation suggest several fundamental changes during the time span involved. Early in the Late Archaic Period, the Mississippi Alluvial Valley and the Tennessee River Valley were focal areas, but in both cases the cultures involved emphasized a transzonal subsistence strategy. This approach is most strongly shown in the Benton settlement pattern, which suggests a seasonal round of movements between the Tennessee Valley and the loess zone adjacent to the Mississippi Alluvial Valley.

Late in the Late Archaic Period, there appears to have been a cultural intrusion from the south into the Mississippi drainage. With this development came a restriction of cultural units to single soil zones, suggesting a functional shift in subsistence strategies. The Tennessee Valley cultural tradition continued, but was now restricted to the Tennessee River drainage. From this time onward these cultures seem to have gone their own way with little influence from the west. Outside contacts instead seem to have been maintained primarily to the south, but appear to have produced little internal change.

Continuation of the Lower Mississippi Valley as the source of dominant influence in most of West Tennessee is exemplified by the Tchula cultures of the loess soil zone and at least part of the sandy soil zone. In the Tennessee Valley, the old order continues in the southern third of the valley, but a new--apparently northern--influence intrudes into the northern third of the valley.

West Tennessee thus appears to have gradually shifted from being the homeland for one of the major centers of cultural development in the Eastern United States to a frontier area where the spheres of influence of other distant centers met and interacted. Involved in this perspective are basic questions of chronology, trade, acculturation, ecological adaptation, and cultural processes that remain to be dealt with in greater detail.

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# PATTERNS AT POVERTY POINT
# EMPIRICAL AND SOCIAL STRUCTURES

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University of Southwestern Louisiana

Poverty Point has been one of the major mysteries in Eastern archaeology over the past two or more decades. The mystery is, however, largely a product of traditional archaeological theory rather than a result of inherent failings of the data. Aspects that were difficult to explain under the traditional historical approach were: (1) the presence and enormity of the semi-octagonal earthworks and associated mounds, (2) the occurrence in large quantities of imported lithic materials brought in presumably from many widely-separated sources, (3) the sheer abundance and variety of artifact classes and types, and (4) the lack of ethnographic or contemporary analogues for several of the artifact classes. Not the least of the troublesome matters was the indicated radiocarbon age for the complex of several centuries before and after 1000 B.C. At that period there were really no closely comparable situations in North America, nor in spite of suggestions to the contrary (Ford 1966, 1969; Webb 1968; Webb, Ford, and Gagliano n.d.) were there any in Mesoamerica. Spaulding (1955) and Willey (1957), reviewing the problem, hinted that the complex might have accumulated incidentially through time with materials possibly deriving from several different cultures and periods of occupation. Although Webb's recent studies (1971; Webb, Ford, and Gagliano n.d.) have indicated the presence of Paleo-Indian and Middle to Late Archaic materials at Poverty Point, Spaulding's and Willey's suggestion only circuits the real issue. The fact remains that there is a complex of unusual implements, facilities, and installations that are found together at Poverty Point and regardless of the nature of its internal networking, an explanatory problem is presented. I hope to demonstrate in this summary exposition that the complex is indeed a valid entity not only in a taxonomic sense but as a representation of a former sociocultural system.

## DATA AND PROCEDURE

The data on which this paper is based consist of the intrasite occurrences or geographic locations of nearly 19,000 artifacts recovered over the past three years from Poverty Point.* The artifacts derive from every sector-ridge segment within the earthworks and from three additional spots without, a total of 34 proveniences.

Analytical procedures involved primarily the use of various inferential statistics such as chi square and linear regression to test hypotheses of difference or no difference in various configurations and to measure the strength of relationship among several variables. Within many artifact

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*I extend my sincere gratitude to Mr. Carl Alexander of Epps, Louisiana, who generously made this material available and to Dr. Clarence Webb who invited me to participate in the study.

classes exhaustive tests were conducted by pairing variables, normally on what would be called the "type" level. Such involved procedures were facilitated by the use of the WANG 700 series programmed calculator employing a standard chi square tape cassette program capable of handling contingencies of up to 84 cells. Other techniques for data manipulation used with some success were the familiar graphic or Fordian seriation and crude visual "cluster" analyses from similarity matrices.

Data structuring precepts include the view of culture as an hierarchy of progressively internetworked systems and the belief that the trajectories and linkages of these systems are aften recorded in the patterning of archaeological materials.

## SPATIAL CONFIGURATIONS AT POVERTY POINT

Complete results of the correlational program cannot be reproduced here (cf. Gibson 1971a, 1971b). I have chosen several of the quantitatively more important classes of information to illustrate their intrasite distributional "behavior". These data will be grouped according to the implicated syntactic pattern.

### Northern-Southern Polarity

While statistical comparisons were made using both sector and sector-ridge aggregates, I was usually able to isolate significant and/or repeated differences among immediately surrounding ridges or sectors. Yet a number of strong, northern-southern partitions emerged; that is to say that when the north and the south sectors were directly compared strong differences were found. The sectors intervening between north and south (northwest, west, and southwest) tended to smooth out these differences so that west sector representation sometimes proved to be similar to the southern half of the semi-octagon and sometimes it was more like the northern half. Comparisons implicating this within-the-site division include:

#### Flake vis-à-vis Blade Industrial Technology

Core types, debitage, raw material selection, and tool classes show negative relationships (correlation coefficients, -.3). Blade elements cluster in southern areas, flake elements in northern ones.

#### Culinary Classes

Contingency analysis indicates that the distributionally similar stone vessel and fiber-tempered pottery configurations differ significantly from untempered ceramics and Poverty Point objects. The former classes occur most abundantly in the northern half, the latter in the southern half.

Gorgets

Significantly more slate gorgets, more decorated gorgets, and more gorget fragments occur in the North sector according to chi square analysis. Morphological categories are however not different.

Anthropomorphic Clay Figurines

Inspection reveals that the majority of these figurines derive from the North and South but only one from the South is not from the Quincy Hale gully (and hense possibly from earlier occupations). The interior ridge of the North sector (N3) has yielded most of the figurines.

Poverty Point Objects

Three distinguishable clusters of Poverty Point objects are revealed by contingency manipulation instead of the more normal condition of simple northern-southern polarity. Cluster 1 consists of the highly correlated melon, bicone, cross-groved, and amorphous types that make up about 60 percent of the total baked clay object representation in the North sector and about 30 percent in the South; cluster 2 made up of spheriods, rectanguloids, decorated cylinders, "others", and perhaps finger squeezed, pillow-shaped, and biscuit forms that bear an inverse relationship to cluster 1 (30 percent in North, 60 percent in South); and finally cluster 3 composed of the cylindrical types (with the exception of the decorated ones) what are dominant in the western sectors (West, Northwest, and Southwest) with proportions reaching almost 70 percent.

Ubiquitous Patterns

Additional sets of data examined on various levels of complexity from attributes to classes fail to show the northern-southern dichotomy. In fact, far more ubiquitous patterns are apparent, patterns that are not only demonstrable through intraclass comparison but are strongly reinforced by significant differences and similarities with other classes. The major groups exhibiting these "nonclustered" distributions are:

Projectile Points

Only projectile point types with frequencies over 30 were used in contingency analysis. Exhaustive mutual comparisons of Gary, Motley, Pontchartrain, Kent, Ellis, Delhi, Carrollton, and Epps demonstrated that only Gary and Motley configurations differed significantly, all other paired sets were similar. No geographic clusters are indicated.

Bifaces

This category of implements probably made up of early system trajectory states of projectile points and other tools reveals rather uniform ("random") intrasite spreads. Contingency analysis failed to show any significant differences among morphological groups (ovates, triangles, broken), among systems states categories and size criteria (bifaces, foliates; large, average, and small), and among selected raw materials.

### Celts-Hoes

Ubiquitous intrasite distributions are statistically indicated for celts and hoes (and probably adzes) by intraclass and interclass testing and by comparison with other class groups such as projectile points (not different) and Poverty Point objects (different).

### Plummets

With regard to morphology, types of suspension ends, raw materials, and crude componential frequencies, plummets have similar, nonclustered intrasite distributional patterns. Only plummet fragments depart significantly from these conditions, North sector has more proximal ends and South sector has more distal fragments.

### Unmodified or Slightly Modified Raw Materials

Although mentioned in connection with the symmetrically distributed materials not all raw materials were uniformly present on all sector-ridges. Cluster analysis has revealed four highly correlated groups of materials (Gibson 1971b). Only two of these--cluster 2 consisting of ochre, brown-red sandstone, gray sandstone, ferriginous sandstone, and chert pebbles and cluster 3 involving quartz crystals and opaline clinkers--can be categorized as uniformly distributed. Another significant cluster (cluster 1), composed of galena, copper, kaolin, and Catahoula sandstone, and often found together in caches, would fit better with the northern-southern categorical clusters.

## Other Patterns

Not all of the artifact groups at Poverty Point fall into the polarized or the ubiquitious patterns. Some groups, especially those with small frequencies, may show other kinds of patterns, but I have been hesitant to use these on statistical grounds. However, at least one additional important configuration is emergent. Even though small frequencies are involved its reoccurrence in more than one artifact category practically rules out the possibility of incidental structuring. This pattern may be briefly characterized as the clustering of certain elements on the interior ring of the semi-octagon, that is on the inside ridge segment of every sector. Plummets exhibiting what has been previously described as a symmetrical pattern with regard to the sectors are the most prominant group illustrating significant restriction to the interior ridges, but some of the raw materials, particularly those of cluster 1, are also exempliary.

# ELUCIDATION OF SITE STRUCTURE

## Empirical Structure

The three kinds of artifactual patterning reveal a latent empirical structure in the geometric layout of Poverty Point. The northern-southern dichotomy is symbolized by an imaginary east-west axis that bisects the earthworks. The large "bird" mound marks one end of the dividing line, the other is represented perhaps by a sunrise position very near but not exactly coincident with the equinoxes (actually about three weeks after and before the vernal and autumnal equinoxes respectively). The northern (upstream) and southern (downstream) halves are concretely represented by statistically clustered artifactual distributions. The apparent assymmetry of the half octagon that has five sectors or compartments of ridges dissolves into a symmetrical figure when the West sector is viewed as part of the east-west axis (cf. Lévi-Strauss 1967: 136-137). Indeed the West sector is the most divergent of all the site sectors in many respects.

Concentricity provides another dimensional structure that is interfaced with the diametric arrangement. The placement of the ridges in a concentric fashion is the prime evidence for this principle. The variability observed within this dimension seems to counteract the northern and southern differences. In other words concentricity is one of the integrating factors in a diametric structure. The clustering of certain artifacts on the interior ring (the violation of polarity) furnishes corroborating support for this proposition. The interior ring is set off from the other rings as the rings themselves are set off from the "central grounds" and the surrounding countryside.

## Social Structure

So far the interpretation strongly resembles Lévi-Strauss' structural model of dual organizations with its latent triadism (Lévi-Strauss 1967). In fact, Lévi-Strauss was so impressed by the superficial resemblances of Poverty Point to his ideal model based on the Bororo, Winnebago, and Timbira tribes that he analagously reasoned the underlying empirical frameworks to be similar. I have arrived at a similar conclusion by working up from the archaeological patterning. The argument between the two approaches is gratifying.

Traditionally only temporal or historical factors would have been held accountable for the observable differences in artifact geography at Poverty Point. Variability along this dimension may indeed have affected some (or all) distributions and may be a major factor particularly in the West sector where an earlier span of occupation is indicated (Webb 1971; Gibson 1971b). However, there are several reasons to believe that residential characteristics have departed the primary structure to the archaeological data. The differences among site sectors on the type or class level are predominately quantitative rather than qualitative, the differences on the attribute or combination of attributes level are essentially qualitative. Furthermore, the major part of the differences on any level are restricted to certain tool categories that are sex-specific, i.e., male or female. Were historical changes largely responsible for the patterning in the archaeological data then there should have been no necessary alignment with masculine and feminine equipment categories.

A pattern of matrilocal residence is indicated by the nonrandom distributions of women's equipment such as stone vessels, pottery, Poverty Point objects, gorgets, and human figurines, and by the random distributions of men's objects--projectile points, bifaces, celts-hoes, plummets, and certain raw materials. Such a condition would have established the continuity in feminine microtraditions because married women would remain with their immediate group of kith and kin. Microtraditions started and passed down through the familiar kinship structure and constantly reinforced by parental and social group sanctions would have ultimately led to the statistical clusters observed in the northern and southern halves of Poverty Point.

A corrollary depending from the proposition of matrilocality is that men's equipment should show randomized patterns. Such a condition would have come about because men would have actually been moving from the location of their conjugal group to their wives' group. This would have disrupted any chance for clustered configurations by continually shifting the post-marital residence of men and geographically separating the microtraditions develcped through lines of male affines.

The clusters in the data conform to the empirical site structure particularly to the division created by the east-west axis. The polarization in female-specific tool classes into northern and southern halves instead of into some other configuration (such as sector clusters or sector-ridge clusters or combinations of both) is the predictable pattern that should occur if the empirical site axis had been a social structural partition dividing the community into exogamous moieties with matrilocal post-marital residency requirements. In the general absence of significant clustering of sociotechnic tools by intrasite provenience it may be further indicated that the major part of the variability observed between northern (upstream) and southern (downstream) moieties was due to these kinship structural peculatities and to the various reciprocal services and generalized exchanges between the two segments. Time has played a negligible role in producing these differences. Only when heavy and not entirely warrented emphasis is placed on the very limited sondage and gully data (Ford and Webb 1956) is it possible to see that the social structural system underwent sweeping changes, perhaps a complete reorientation, during the period that Poverty Point was occupied. But this is a problem for future clarification.

The other emergent pattern involving the interior ridge specificity of plummets and certain raw materials is evidence for an association or sodality that transected kinship divisions and which probably created the strong integrating bond between what could be considered as two almost autonomous social groups conjoined simply through geographic proximity. It is apparently a man's club or fraternity and centered perhaps pragmatically on the hunting-fowling system. Such an organization could have smoothed out potential situations of conflict such as might arise in dual systems. It is tempting to draw on ethnographic analogues to build on this description, such things as bachelor's quarters, ritual activities, male versus female ownership rights are common in structurally (not historically) similar contemporary tribes. However, that is beyond the scope of this simple resume.

## CONCLUSIONS

Only the surface of an extremely complex structure is beginning to emerge. Additional analyses and deductive models presented elsewhere (Gibson 1971b) have indicated a basic egalitarian context and certain patterns of generalized exchange dealing especially with war materials. But basically these are structures that are readily excised from grouped data with the crude statistical program used here. We still need to know why the ridges are compartmentalized into five sectors. What is indicated by the six ridges, why not four or eight? Are individual earthwork segments the residences of clans, lineages, extended families, or some other kind of social group? In spite of the intensified work (cf. Broyles and Webb 1971) there are even more questions to answer about Poverty Point now than ever before. Some of the solutions are before us waiting to be arranged into forms that are as meaningful to us as they were to the community they recall.

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