

# MISSISSIPPIAN PERIOD SETTLEMENT IN THE SOUTHERN PIEDMONT: EVIDENCE FROM THE RUCKER'S BOTTOM SITE, ELBERT COUNTY, GEORGIA

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## Abstract

*Multidisciplinary investigations at a small fourteenth and fifteenth century Mississippian village in north-eastern Georgia are summarized. Changes in village organization, subsistence, and relative population health are evident over the approximately two centuries of occupation. These changes—the appearance of fortifications, a more focused subsistence economy, and a moderate improvement in overall skeletal health—appear linked to a pattern of both increasing political centralization, and increasing intensive use of agriculture in the upper Savannah River area.*

## Introduction

Rucker's Bottom (9EB91) is a large multicomponent prehistoric archaeological site located in the Piedmont of northeastern Georgia, along the upper Savannah River. The site, in the floodpool of the proposed Richard B. Russell reservoir, extends for almost a kilometer along the river terrace, immediately to the north of its confluence with Van Creek, a small tributary (Fig. 1). Extensive excavations along the terrace, conducted from 1980 to 1982, have documented a sequence of prehistoric occupations ranging from the Early Archaic through the Mississippian periods. In this paper we examine in a preliminary fashion the later prehistoric components that were encountered at the site and advance, also in a preliminary manner, a number of ideas about Mississippian period settlement in this part of the Southeast. The Rucker's Bottom material is the subject of an extensive multidisciplinary program of research under the overall direction of the Atlanta Archeological Services Branch of the National Park Service. Previous reports document the discovery of the Rucker's Bottom site (Hutto 1970); initial testing operations (Taylor and Smith 1978:188–189; Gardner and Barse 1980); the 1980, 1981, and 1982 field seasons (Anderson and Schuldenrein 1980, 1983; Anderson, Schuldenrein and Cable 1981); the Early Archaic components on the site (Anderson and Schuldenrein 1983); and ongoing geoarchaeological research (Schuldenrein 1981, 1982; Schuldenrein and

Anderson 1983). Additional papers on the project research are forthcoming, and a final, synthetic excavation report is scheduled for release in late 1984, through the Atlanta Archeological Services Branch of the National Park Service (Anderson and Schuldenrein n.d.).

## Survey and Testing Operations: 1970-1980

The terrace defining the Rucker's Bottom site had been in pasture since the early 1960s, and only nine flakes were found in the area during the initial survey that located the site in 1970 (Hutto 1970:28). Subsequent test excavations, first in 1977 (Taylor and Smith 1978) and then again in 1979 (Gardner and Barse 1980), indicated extensive Mississippian period remains in what is now known to be the central and northern part of the site, some 500 to 800 m. north of the confluence. These tests, totalling five 1 and 2 m. test pits, are now known to have been placed almost exactly in the center of the late prehistoric villages described here. Following this early survey and testing activity, three field seasons were spent at the site under the direction of the present investigators. This work included an intensive testing program across the bottoms in 1980, followed by two seasons of intensive excavation, in 1981 and 1982.

The 1980 testing began with a controlled surface collection to determine site boundaries and surface/plow zone content. A 60,000 m<sup>2</sup> area running for 900 m. along the terrace was disked and intensively collected using a stratified systematic unaligned sampling procedure, with both controlled (dogleash) and general collections taken about each of 583 sample points (cf. Haggett 1966; Goodyear, House, and Ackerly 1979:78–80). The disked area was arbitrarily divided into grid blocks 10 m on a side, with a 4 m diameter circle shot in and collected within each block as a controlled unit (representing a 12.6% sample of the site's surface area). Additionally, all visible artifacts around each circle were collected and tied in to the nearest sample point as a general collection. Twenty 4 × 4 m test units were then opened over the terrace, systematically dispersed at roughly 20 m. intervals, together with two other smaller 2 m test pits. Stratified Early, Middle, and Late Archaic assemblages were found at depths of up to a meter below the surface at the south end of the site. Large quantities of later Woodland and Mississippian period artifacts were found over much of the remainder of the terrace, and

limited transect stripping in these areas—the removal of plow zone from an 850 m<sup>2</sup> area—revealed 170 possible features. Twenty-eight backhoe cuts were opened, to collect geoarchaeological and paleoenvironmental data, and to probe for deeply buried cultural remains. One result of this deep testing was the discovery of Mississippian period ceramics in the swale fill to the south and west of the site, reflecting late prehistoric use of this area.

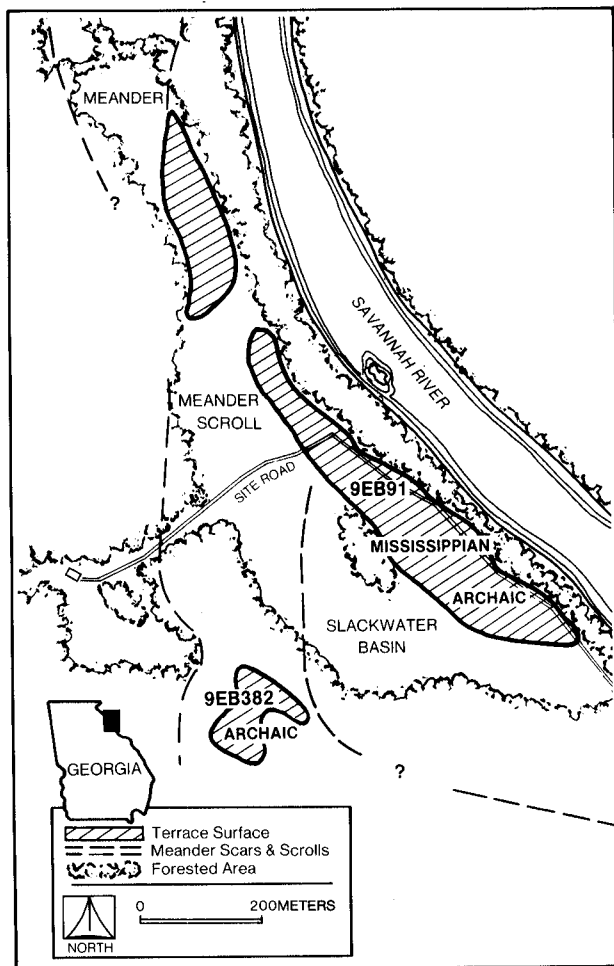


Figure 1. Environmental setting of the Rucker's Bottom site (9EB91) along the upper Savannah River, Elbert County, Georgia.

### The Earlier Components

The 1980 testing results prompted two additional seasons of work at the site, in 1981 and 1982. A 256 m<sup>2</sup> block (16 × 16 m) was opened into the later Archaic and Woodland components at the south end of the terrace, with an adjoining 160 m<sup>2</sup> area opened into the Early Archaic horizon. These blocks produced a tremendous quantity of material, including 254 diagnostic projectile points, 785 tools, and 134,102 pieces of debitage, and fair stratification—from the Early Archaic through the Woodland—is apparent in the levels (Table 1). These data also document increasingly

intensive site use over time: almost a threefold increase in artifact density is apparent from the Early to the Late Archaic levels.

Extensive Woodland components were also found at Rucker's Bottom, mostly in the southern portion of the site, near the confluence of Van Creek. White minor quantities of Stalling's, Kellog/Dunlap (fabric impressed), Swift Creek, and Napier ceramics were recovered, the most extensive Woodland assemblage was characterized by plain, check stamped, and simple stamped ceramics that are reported locally within the Cartersville series (Caldwell 1958, n.d.; Wauchope 1966). Replacement of a plain, check, and simple stamped assemblage with an exclusively plain and simple stamped assemblage is indicated, a pattern in keeping with observations by Wood (1981:29) from the Oconee drainage in the central Piedmont of Georgia. Eight radiocarbon dates for these wares are reported from within the reservoir—six from Rucker's Bottom and two from the Bullard site (Table 2). These dates range from A.D. 370 to A.D. 1180, with all but two in the latter half of this interval. The later dates are associated almost exclusively with plain and simple stamped pottery, suggesting that a continuation of the Cartersville tradition and the presence of a Middle/Late Woodland simple stamped ceramic complex in northeast Georgia appears probable. This would minimally help to explain the relative scarcity of later Woodland period sites in northeast Georgia, by suggesting that they may have been lumped with earlier components. Sites of the later Woodland periods in the region have traditionally been identified by the presence of Swift Creek and Napier ceramics (e.g., Garrow [1975:24]; Sears [1952]; Wauchope [1966]). These wares, while comparatively common in southern and western Georgia, are decidedly uncommon in the Piedmont of eastern Georgia and South Carolina (e.g., Ferguson [1971:67]; Goodyear, House, and Ackerly [1979]; Taylor and Smith [1978]; Wauchope [1966]). Recent work in the Oconee drainage, however, suggests that plain and simple stamped wares may persist in the later Woodland, and be at least partially contemporary with Swift Creek assemblages in that area (Manning 1982; D. Hally, personal communication). Later Woodland ceramic complexes dominated by simple stamped ceramics are also documented from the Appalachian Summit to the north and east of the upper Savannah (Keel 1976:219–226), and in the coastal plain of South Carolina to the southeast (Anderson, Cantley and Novick 1982:302–308). The finish may, therefore, prove to be a useful marker for sites of this period in the general region, once reliable sorting criteria can be developed to differentiate it from earlier and later wares.

The first evidence for structures in the archaeological record at the Rucker's Bottom site occurs during this later Woodland "Cartersville" occupation. Two

Table 1. Incidence of Diagnostic Projectile Points, By Level, in the Archaic Block Units at the Rucker's Bottom Site (9EB91), Elbert County, Georgia.

Artifact Category	Depth in Centimeters								Totals
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	
Clovis	—	—	—	—	1	—	—	—	1
Hardaway	—	—	—	1	—	—	—	—	1
Palmer	1	2	—	12	8	9	—	—	32
Morrow Mountain	—	9	2	6	3	1	—	—	21
Guilford	3	—	—	2	—	—	—	—	5
Savannah River	11	5	2	2	1	—	—	—	21
Otarre/Swannanoa	38	71	17	18	5	—	—	—	149
Yadkin	11	7	—	—	—	—	—	—	18
Woodland Stemmed	1	2	—	—	—	—	—	—	3
Mississippian									
Triangular	2	1	—	—	—	—	—	—	3
Totals	67	97	21	41	18	10	—	—	254
(Number of 1 m. units)	256	256	84	196 <sup>a</sup>	196 <sup>a</sup>	170 <sup>a</sup>	10	10	

<sup>a</sup>160 m<sup>2</sup> opened to approximately 30 cm. below base of plow zone with grader.

Table 2. Radiocarbon Dates From the Rucker's Bottom, Abbeville, and Bullard Site Groups.

Laboratory Number	Age (Years B.P.)	Age <sup>a</sup> (A.D./B.C.Date)	Sample Provenience	Associated Material Remains
DIC-2301	—	—	9EB91,F425/426	Burial 5 (Mississippian) (date rejected-Late)
DIC-2303	500± 70	A.D. 1450	9EB91,M1199,T5 Ditch Base	Semicircular ditch Mississippian pottery
DIC-2305	540± 60	A.D. 1410	9EB91,M1199,T10 Ditch Base	Semicircular ditch Mississippian pottery
DIC-2304	590± 60	A.D. 1360	9EB91,M1199,T5 Ditch Fill	Semicircular ditch Mississippian pottery
UGA-3615 <sup>b</sup>	765±100	A.D. 1185	9EB348, 120S50E,FA	Mississippian pottery pinched rim (date early)
DIC-2296	770± 45	A.D. 1180	9EB91, A30	Plain, simple stamped pottery
DIC-2295	860± 50	A.D. 1090	9EB91, A25	Plain, simple stamped, check stamped pottery
UGA-3616 <sup>b</sup>	860± 55	A.D. 1090	9EB76, 80S30E,F1, 35-40 cm.	Plain, simple stamped pottery
UGA-3613 <sup>b</sup>	1000± 55	A.D. 950	9EB76, 40S30W, 47-52 cm.	Plain, simple stamped pottery
BETA-1961	1010± 80	A.D. 940	9EB91, M2500	Mississippian pottery pinched rim (date rejected-early)
DIC-2297	1050± 85	A.D. 900	9EB91, M211	Plain, simple stamped pottery
DIC-2299	1140±110	A.D. 810	9EB91, M372	Plain, simple stamped pottery
DIC-2298	1580± 50	A.D. 370	9EB91, M372	Plain, simple stamped pottery
DIC-2294	1610± 85	A.D. 340	9EB91, M11	Linear check stamped pottery
BETA-2529 <sup>c</sup>	2000± 80	50 B.C.	38AB91, BLK1, F4	Plain, simple stamped, check stamped pottery
BETA-2531 <sup>c</sup>	2020± 70	70 B.C.	38AB288, BLK 1, F2	No artifacts associated Dunlap, Miss. pottery in overlying plow zone
BETA-2530 <sup>c</sup>	3410± 80	1460 B.C.	38AB288, BLK1, F7	Stallings Punctate pottery
BETA-4307	4400± 70	2450 B.C.	38AB91, EU77	Late Archaic middens (aceramic) small Savannah River/Otarres
UGA-3612 <sup>b</sup>	4500±135	2500 B.C.	9EB76, 30S10W,FB, 54-66 cm.	Late Archaic level Stallings sherds at same general level
BETA-2527 <sup>c</sup>	8080±630	6130 B.C.	38AB91, TP1, F7	Late Archaic midden (date rejected-early)

<sup>a</sup>Dates are uncorrected.

<sup>b</sup>Source: Flint and Suggs 1980

<sup>c</sup>Source: Glander, Barber, and Brockington 1981

possible Woodland structures, each measuring roughly 6 (N/S) × 8 (E/W) m, were found during the excavation of the Archaic components, and it is possible that either a small village or a series of hamlets were present on the site at this time. No domesticates were recovered in the fill of features associated with these apparent structures, suggesting that agriculture may have played a minor role in subsistence concerns.

### The Location of the Mississippian Components

The most extensive occupation of the Rucker's Bottom site was during the Mississippian period. Following the initial transect exposures in 1980, two seasons of stripping, followed by detailed mapping and excavation were conducted at the site. In 1981 an area of almost 4000 m<sup>2</sup> was examined in the central part of the site,

and over 1200 features, one well defined house, and a semicircular ditch line were discovered. In 1982 another 6000 m<sup>2</sup> area was examined, revealing thousands of additional features, a second, rectangular ditch and stockade line, and large numbers of structures and burials (Fig. 2). Using first a bulldozer and then a motor grader, plow zone and modern flood deposits were removed—in some areas up to 70 cm deep—with the features exposed at the base of these deposits flagged, scribed with a trowel, and mapped in place. A total of 587 of these features was excavated, 212 chosen using a simple random sampling procedure, while the remainder were intuitively selected (Table 3). The simple random sampling and excavation procedure helped to demonstrate that most (i.e., over 75%) of the exposed features were of aboriginal origin, rather than trees or other noncultural disturbances. Feature fill was collected on plastic sheeting and then transported in a front end loader to waterscreens set up near the river; all fill was passed through 1/8 inch (3 mm) mesh. Thirty new backhoe trenches, making a total of 58, were opened on the site in 1981 and 1982 in order to examine further and sample the archaeological, geomorphological, and paleoenvironmental deposits. Some of the results of these geoarchaeological investigations have been summarized elsewhere (Schuldenrein 1982; Schuldenrein and Anderson 1983).

The Mississippian assemblage at Rucker's Bottom, with its numerous features, house patterns, burials, and ditch and stockade lines, clearly reflects extended village occupation. Topographically, the area is adjacent to both the main river channel and what was at the time of occupation a swampy, partially filled oxbow or swale (Fig. 1). The terrace itself dominates one of the largest tracts of bottomland along this stretch of the

Savannah, and the location thus offers access to extensive arable land and to a range of both riverine and backswamp resources. Following arguments about Mississippian settlement developed by Murphy and Hudson (1968), Larson (1972), and Smith (1978:480–486), the occurrence of a moderate sized village in this kind of setting should not be altogether unexpected.

Before proceeding with the discussion of the late prehistoric occupations at Rucker's Bottom, it should be noted that site interpretation is partially constrained by the nature of the preservation encountered. Historic plowing has occurred over the entire area, and plow scars intrude the upper parts of many features. Shallow features, including large numbers of posts, some pottery vessels, and most house floors have hence been heavily damaged or lost. In spite of this, however, an impressive feature assemblage has survived and can be used to examine site use and occupational history.

#### Establishing an Internal Chronology

By means of a variety of lines of evidence, the Mississippian occupation at Rucker's Bottom can be dated to between ca. A.D. 1200 and A.D. 1500, and appears to have been more or less continuous. Changes in community organization are evident, and settlement appears to shift from an open, roughly circular arrangement of houses about a central plaza to houses within first a semicircular and then a rectangular ditched and stockaded enclosure. An actual spatial or locational shift in the settlement also occurred over the course of the Mississippian, from the south-central to the northern part of the terrace.

The primary evidence for inferring and dating these changes in community organization comes, in part,

Table 3. Features Excavated at the Rucker's Bottom Site, by Period, Type, and Excavation Area.

Area and Type of Feature "Mississippian"	Period			Totals			
	Stripping	Later Woodland	Early Woodland	Archaic	Unknown	Trees	
Intuitive sample	[317]	[13]	[3]	[—]	[ 9]	[30]	[372]
post	184	—	—	—	—	—	184
pits	85	10	—	—	6	—	101
burial	38	—	—	—	—	—	38
hearth	3	3	3	—	3	—	12
ditch	4	—	—	—	—	—	4
Random Sample	[140]	[ 1]	[1]	[1]	[16]	[53]	[212]
post	77	—	—	—	14	—	77
pits	60	1	—	—	2	—	61
burial	3	—	—	—	—	—	3
hearths	—	—	1	1	—	—	2
"Archaic" Blocks	[ 1]	[42]	[1]	[3]	[10]	[ 9]	[ 66]
post	—	17	—	—	8	—	25
pits	1	25	1	—	2	—	29
burial	—	—	—	—	—	—	—
hearth	—	—	—	3	—	—	3
GRAND TOTALS	458	56	1	4	35	92	650

Table 4. A Comparison of Mississippian Ceramic Finishes at the Rucker's Bottom, Beaverdam Creek, and Rembert Mound Sites, Elbert County, Georgia.

Design Motifs	9EB91 Rucker's Bottom <sup>a</sup>		9EB85 Beaverdam Creek Mound <sup>b</sup>			9EB1 Rembert Mounds <sup>b</sup>	
	Outside Enclosures	Inside Enclosures	Pre-mound Midden	Mound Fill	Village Area	Mound <sup>c</sup>	Village <sup>d</sup>
All complicated stamped	2968 (29.4%)	5846 (33.0%)	703 (12.3%)	524 (18.7%)	401 (6.2%)	136 (46.9%)	196 (45.6%)
All check stamped	852 (8.4%)	652 (3.7%)	553 (9.7%)	194 (6.9%)	529 (8.1%)	3 (1.0%)	8 (1.9%)
All fabric/corncob impressed	272 (2.7%)	717 (4.1%)	105 (1.8%)	125 (4.5%)	179 (2.7%)	2 (0.7%)	7 (1.6%)
Modified rims	55 (0.5%)	196 (1.1%)	14 (0.2%)	18 (0.6%)	14 (0.2%)	18 (6.2%)	24 (5.6%)
Plain	5961 (59.0%)	10,277 (58.1%)	4342 (76.0%)	1941 (69.3%)	5391 (82.8%)	131 (45.2%)	195 (45.3%)
Totals (100.0%)	10,108 (100.0%)	17,688 (100.0%)	5717 (100.0%)	2802 (100.0%)	6514 (100.0%)	290 (100.0%)	430 (100.0%)

<sup>a</sup> All 1980 excavation units, 1981-1982 Features, and Structure 2 fill.

<sup>b</sup> Data derived from Hally's (n.d.) Beaverdam Creek report and his re-analysis of Caldwell's (1953) excavation sample.

<sup>c</sup> Pits 2, 6.

<sup>d</sup> Pits 1, 3-5, 7-9.

from radiocarbon determinations and, primarily, from detailed stylistic and typologically oriented ceramic analyses. Radiocarbon dates from late prehistoric features in the southern portion of the site are earlier than those in the northern area, where three dates place the first, or semicircular ditch at about A.D. 1400-1425 (Table 2). Stronger internal chronological control (until far more dates appear than are available at the present) is provided by ceramic analyses. Every sherd over ½ inch (1.3 cm) recovered on the site (almost 50,000 specimens) has been examined and categorized by paste and surface finish, with all rims and recognizably stamped sherds subjected to additional (attribute) analyses. Overall, the Mississippian ceramic assemblage at Rucker's Bottom is dominated by plain, check stamped, and complicated stamped finishes. Less common, but also present, are sherds characterized by fabric and/or corncob impressions and modified (i.e., pinched, folded, punctated, notched or incised) rims (Table 4). The most common design motifs within the complicated stamped assemblage are nested diamonds, concentric circles, herringbone patterns, and the filfot cross. In passing, it should be noted that although a detailed functional analysis similar to that reported by Hally (1983) from the Beaverdam Creek mound (a single mound and village center some 5 km. downstream from Rucker's Bottom) site has not yet been attempted, the shapes and sizes of intact and reconstructable vessels found at Rucker's Bottom are very similar to those found at the mound site. Jars and bowls dominate the assemblage and, as at the mound, other vessel shapes are a distinct minority.

The site area was divided into a number of analytical units, and the distributions of ceramic, feature, and other artifactual data were examined within and between these areas. First the total area inside as opposed to outside the ditches was examined, and then these two primary strata were subdivided, with structures and high and low density feature areas differentiated. High density areas were in turn subdivided into roughly equal sectors or quadrants delimited in reference to cardinal directions. This was less arbitrary than it might sound, since both the two major analytical units—the areas inside and outside of the ditches—were characterized by low density areas (possible plazas?) surrounded on several or all sides by higher density feature areas (houses?). The analytical units (i.e., site areas), therefore, were chosen to investigate possible variability within and between the two apparent village organizations.

Comparative analysis produced a rough internal chronology for the site and its subareas, which has proved invaluable to resolving changes in the settlement over time. In examining the distribution of plain, complicated stamped, check stamped, corncob impressed, and modified rims, for example, clear differences are evident between the northern and southern areas of the settlement (Table 4). The area outside of the ditch, for example, has a much higher proportional incidence of Mississippian check stamped pottery (8.4%) than the area inside the enclosures, where the finish accounts for only 3.7% of the total. At the Beaverdam Creek mound, where Mississippian occupation appears to have been well established

somewhat earlier than at Rucker's Bottom (radiocarbon dates for the mound range from ca. A.D. 1100 to 1300; Hally n.d.), the proportion of check stamping relative to these other wares is between 6.9 and 9.7% (Table 4). Finally, at the Rembert Mounds, a large multiple mound group 20 km. downstream from Rucker's Bottom on the Savannah, the incidence of check stamping is between 1.0 and 1.9%. Direct comparison of the ceramic assemblages at Rucker's Bottom with those at the Beaverdam and Rembert mounds is possible because Hally's (n.d.) sorting criteria were adopted by the present investigators in the interests of comparability.

A decrease in check stamping over the course of the Mississippian is evident in the Georgia area, particularly along the Savannah where this trend has been documented both at the mouth (DePratter 1979:111), and at the Beaverdam Creek mound (Hally n.d.). Rim modification—particularly the occurrence of folded and pinched, punctated, and notched rim strips—in contrast, increases over time in the region. This phenomenon was originally noted by Kelly (1938:11) and by Caldwell and McCann (1941:41–42) in the Irene mound report, where “transitional” rim forms are illustrated. Wauchope (1966), Reid (1967), South (1976), and others have also noted this trend, which has recently been documented in some detail in the upper Oconee drainage by University of Georgia researchers (Rudolph and Blanton 1981; Smith 1981). In particular, Rudolph and Blanton (1981:16) note that “in the Oconee Valley punctated rims tend to occur in earlier contexts than pinched rims,” while Smith (1981:185–188) notes an increase in pinching and a decrease in punctation over time. Hally (n.d., personal communication) further indicates that collared, fine incised rims tend to be earlier (i.e., his Beaverdam Phase, ca. A.D. 1200–1350) than folded pinched, notched, and punctated rims. All but one of the 46 modified rims reported from the Beaverdam Creek Mound (Table 4) are described as collared rims. At Rucker's Bottom, in contrast, although incised rims are about evenly distributed between the inner and outer village areas, folded pinched, punctated, and notched rims are more common in the inner village, suggesting a later date. In the Russell reservoir, the relative frequency of rim modification increases from between 0.2 and 0.6% at the Beaverdam Creek mound to 0.5% in the outer and 1.1% in the inner (enclosed) village at Rucker's Bottom (Table 4). Some of the decorated or modified rimstrips found in the area to the south of the enclosures at Rucker's Bottom, it should be noted, came from burial pit fill, suggesting a late age for at least some of these interments. The highest incidence of rim treatment, however, occurs at the Rembert Mound group to the south of Rucker's Bottom (Table 4). Hally (n.d.) argues that Rembert is the political center for later Mississippian occupations in the reservoir, just as the Beaverdam mound may be for the earlier Mississippian

populations. From the ceramic evidence, the Rucker's Bottom components appear to overlap with those at both of these other centers.

Design motif distributions also help to document temporal variability within and between these sites (Table 5). The nested diamond motif, for example, is common at Rucker's Bottom, but falls from a total of 63.2% of the identifiable complicated stamped assemblage in the outer area to about 54.3% of the total inside the enclosures. A decrease in the occurrence of this motif, which is traditionally linked with Etowah, has been documented in northwest Georgia (e.g., Caldwell n.d.; Fairbanks 1950; Wauchope 1948, 1966) and along the upper Savannah River at the Beaverdam Creek mound (Hally n.d.; see also Table 5). This decrease over time appears duplicated at Rucker's Bottom and at Rembert (Table 5). The design never disappears completely, however, and (as can be seen from Table 5) is still quite common in later, Lamar (Rembert phase) times. M. Smith (1978, 1981:183–184) has noted that the nested diamond motif continues to dominate later (post-Etowah period) assemblages in the middle Oconee drainage of east-central Georgia. At the Dyar Mound, for example, nested diamonds are reported as the most common motif throughout both the Early and Middle Mississippian Stillhouse and Duvall phases (M. Smith 1978, 1981), which (roughly) correspond to the Etowah/Early Savannah and late Savannah/early Lamar periods in the traditional north Georgia sequence (e.g., Wauchope 1966). What these findings indicate is that (at least in northeast Georgia) the presence of nested diamond designs by themselves should not be taken as clear evidence for Etowah components. Only one other design appears to exhibit some temporal (or at least spatial) variability in its occurrence at Rucker's Bottom. The herringbone motif is considerably less common outside as opposed to inside the enclosures, but concentric circles and fillet crosses—among the most common designs—occur in roughly equal proportions in both areas (Table 5).

In brief, the differential distribution of check stamped pottery, nested diamond motifs and, particularly, modified rims, indicates that the occupation outside the enclosures at Rucker's Bottom is earlier than the one inside. Such an inference is also supported by the size of the design motifs found in the two areas. For over 40 years investigators in the Georgia and South Carolina area have noted that later Mississippian complicated stamped motifs tend to be larger and more carelessly applied than earlier Mississippian assemblages (e.g., Fairbanks 1950:14), and this trend is also evident at Rucker's Bottom. A somewhat higher proportion of sherds with large (> 2 mm) complicated stamped designs—design size measured using width between lands—occurs in the area inside the enclosures than in the area outside (Table 6). Taken together, then, the evidence from the ceramic assemblage at Rucker's

Bottom documents changes in site occupation and use over a span from roughly A.D. 1200 to A.D. 1500. Due to virtually a complete absence of bold incising on the site—fewer than 10 sherds out of over 50,000 could be classified as Lamar Bold Incised—little occupation into the historic era (post-A.D. 1500) is indicated. Such an inference assumes, of course, that our interpretation of bold incising as a predominantly late prehistoric/post-contact finish after ca. A.D. 1450 (e.g., DePratter 1979; Smith 1981:187, 245) is correct.

Given all of these arguments, it is possible to relate the village occupations at Rucker's Bottom to the construction and use of the Beaverdam and Rembert mound sites. The higher incidence of check stamping

and the lower incidence of rim treatment indicate that the primary construction and use of the Beaverdam mound (ca. A.D. 1200–1300) was contemporaneous or slightly earlier than the occupation of the earlier (outside or southern) village at Rucker's Bottom (ca. A.D. 1200–1350). The Rucker's Bottom occupation continues past the latest recognized use of the Beaverdam Mound site, however, into Hally's (n.d.) succeeding Early/Middle Lamar Rembert Phase, and it is in this period (ca. A.D. 1350–1450) that the enclosures appear on the site. The changes in village organization observed at Rucker's Bottom, therefore, may well reflect changes in the political power structure within the region (i.e., the replacement of the Beaverdam center by one at Rembert).

Table 5. A Comparison of Mississippian Complicated Stamp Design Elements at the Rucker's Bottom, Beaverdam Creek, and Rembert Mound Sites, Elbert County, Georgia.

Design Motifs	9EB91 Rucker's Bottom <sup>a</sup>		9EB85 Beaverdam Creek Mound <sup>b</sup>			9EB1 Rembert Mounds <sup>b</sup>	
	Outside Enclosures	Inside Enclosures	Pre-mound Midden	Mound Fill	Village Area	Mound <sup>c</sup>	Village <sup>d</sup>
Nested Triangles	127 (63.2%)	89 (54.3%)	42 (49.4%)	17 (22.7%)	25 (49.0%)	6 (21.4%)	17 (60.7%)
Concentric circles/ figure 8's	37 (18.4%)	36 (22.0%)	26 (30.6%)	30 (40.0%)	20 (39.2%)	5 (17.9%)	4 (14.3%)
Herring bone	14 (7.0%)	34 (20.7%)	8 (9.4%)	19 (25.3%)	1 (2.0%)	— (0.0%)	1 (3.6%)
Filfol cross	23 (11.4%)	5 (3.0%)	9 (10.6%)	9 (12.0%)	5 (9.8%)	17 (60.7%)	6 (21.4%)
Totals (100.0%)	201 (100.0%)	164 (100.0%)	85 (100.0%)	75 (100.0%)	51 (100.0%)	28 (100.0%)	28 (100.0%)

<sup>a</sup>All 1980 excavation units, 1981–1982 Features, and Structure 2 fill.

<sup>b</sup>Data derived from Hally's (n.d.) Beaverdam Creek report and his re-analysis of Caldwell's (1953) excavation sample.

<sup>c</sup>Pits 2, 6.

<sup>d</sup>Pits 1, 3–5, 7–9.

Table 6. A Comparison of the Incidence of Narrow and Wide Complicated Stamp Design Motifs, Inside and Outside the Enclosures at Rucker's Bottom: Chi Square Contingency Table.

	Inside Enclosures	Outside Enclosures	Totals
Stamp width < 2 mm.	1851 (1993.5)	1248 (1105.5)	3099
Stamp width > 2 mm.	962 (819.5)	312 (454.5)	1274
Totals	2813	1560	4373

H<sub>0</sub>: There is no difference in the occurrence of narrow and wide complicated stamped designs in the two village areas at Rucker's Bottom.

$\alpha = 0.05$      $\chi^2 = 98.1$      $df = 1$      $p < 0.001$

( ) = expected frequencies

H<sub>0</sub> is rejected (a significant difference does occur).

### The Organization of the Village Occupations

Turning from matters of chronology, the surviving archaeological record at Rucker's Bottom gives a fair picture of the organization of the successive Mississippian communities. The early Mississippian occupation, to the south of the enclosures, appears to be centered around a comparatively open area that may have served as a plaza (Fig. 2). Around this area are large numbers of features, suggesting the remains of numerous structures. Most of the house patterns in this area of the site are unfortunately either incomplete and/or ambiguously represented. When found reasonably intact, these structures appear to have been roughly circular in shape and from 4 to 8 m in diameter. Burials were found scattered over this area, with several tight clusters evident suggesting planned or cemetery-like behavior. Some of these burials appear to be later in age, however, and may come from the northern village. At least one large public building appears to have been present in the south-central part of this village, facing on the plaza. This structure, some 14 meters in diameter, is very similar in plan to Benjamin Hawkins' (cited in Faulkner 1976:142-143) descriptions of eighteenth century Creek Town houses, or rotundas with their inner and outer rings of support posts, and raised central fires (see also Swanton [1928]). The apparent plaza area, besides having a markedly lower feature density, was typified by several large, rock filled pits that may have functioned as trophy or gaming post supports. No ditch lines are associated with this early village, although there is some suggestion of a stockade line along the northwestern margin; such a fence may have encircled the entire village.

A clear decrease in feature density (except for one large, enigmatic circular structure—possibly another public building—occurs between the early village and the area inside the ditches (Fig. 2). The later village, in the northern part of the site, was initially characterized by a semicircular and then later a rectangular ditch and stockade network. The ditches themselves were from 1 to 2½ m across and from 50 to 120 cm deep. Rows of posts, from probable banked stockade lines, were found (where preserved) from 3 to 6 m inside these ditches. The rectangular enclosure clearly intrudes the semicircular one, and the ceramics in the fill—with a much higher incidence of modified rims—are later in age. A similar pattern, or change from semicircular to rectangular stockades or enclosures, is evident at the Irene site, between the Savannah and Irene (Lamar) occupations (Caldwell and McCann 1941:71-72).

Distinct breaks, or gaps in both ditches were observed, three in the earlier and at least one in the later, that may delimit entranceways. Interestingly, the areas of the ditches nearest the gaps were darker, and (comparatively) loaded with large sherds, shells, bone, and other debris, suggesting a pattern of intentional refuse discard near village entrances. One of the

earlier gaps was, in fact, inferred by the nearby presence of a debris-rich segment of the ditch; subsequent further cleaning exposed the gap.

Both circular and rectangular structures were found within the enclosures, and again a pattern of houses (i.e., high feature density areas) about a plaza (a comparatively open, low feature density area) is evident. Several large, rock filled pits were found (as in the "plaza" in the earlier village) and excavated in this area. These kinds of features, it should be noted, were observed only within the low density areas. Other than several hundred kg. of rocks, these pits (typically) were nearly devoid of sherds, bone, or other artifactual debris. A low artifact density in general characterizes many of the features found in the open areas, suggesting somewhat less surface debris (perhaps due to intentional refuse disposal elsewhere, possibly in the swale, and/or periodic cleaning) during the period of occupation. This pattern is in keeping with historic accounts of Cherokee and Creek village maintenance (e.g., Swanton [1928]).

A large, presumably public circular building occurs in the southern portion of the enclosure and, as in the earlier village, the arrangement of posts is similar to that in historically described Creek Town houses (Fig. 3). Interestingly, this structure occupies the same position as the mound in the semicircular enclosure at the (roughly contemporaneous and similarly sized) Town Creek site in North Carolina. This building may have served a similar function, in the Rucker's community, as mounds at larger sites. Smaller structures in the later village included both square and circular forms, and there is a suggestion that the former may replace the latter over time. At least two of the three squared structures observed within the enclosure are (based on the presence of numerous modified rims in the fill) clearly later in age (ca. A.D. 1400-1500).

One squared structure, in a low area at the north end of the site, had almost 30 cm of undisturbed fill over the floor. The entire area of this structure, which appears to have been rebuilt at least once, was excavated in one meter squares, with all fill from 5 cm above the floor to the floor retained as a separate provenience (Fig. 4). Flotation samples were taken from each floor square, from the central hearth, and from a number of subfloor features, documenting the extensive occurrence of both corn and nut remains over the eastern half of the structure. A large cluster of deer bones, and several large knife-like tools and unifacial scrapers, were also evident in the northern portion of the structure, suggesting an activity area of some kind. The distributions of over 40 categories of artifacts over the floor of this structure have been examined, and provide an analog to the analyses conducted by Hally (1981) with house floor data from the late Mississippian Little Egypt site in northwest Georgia.



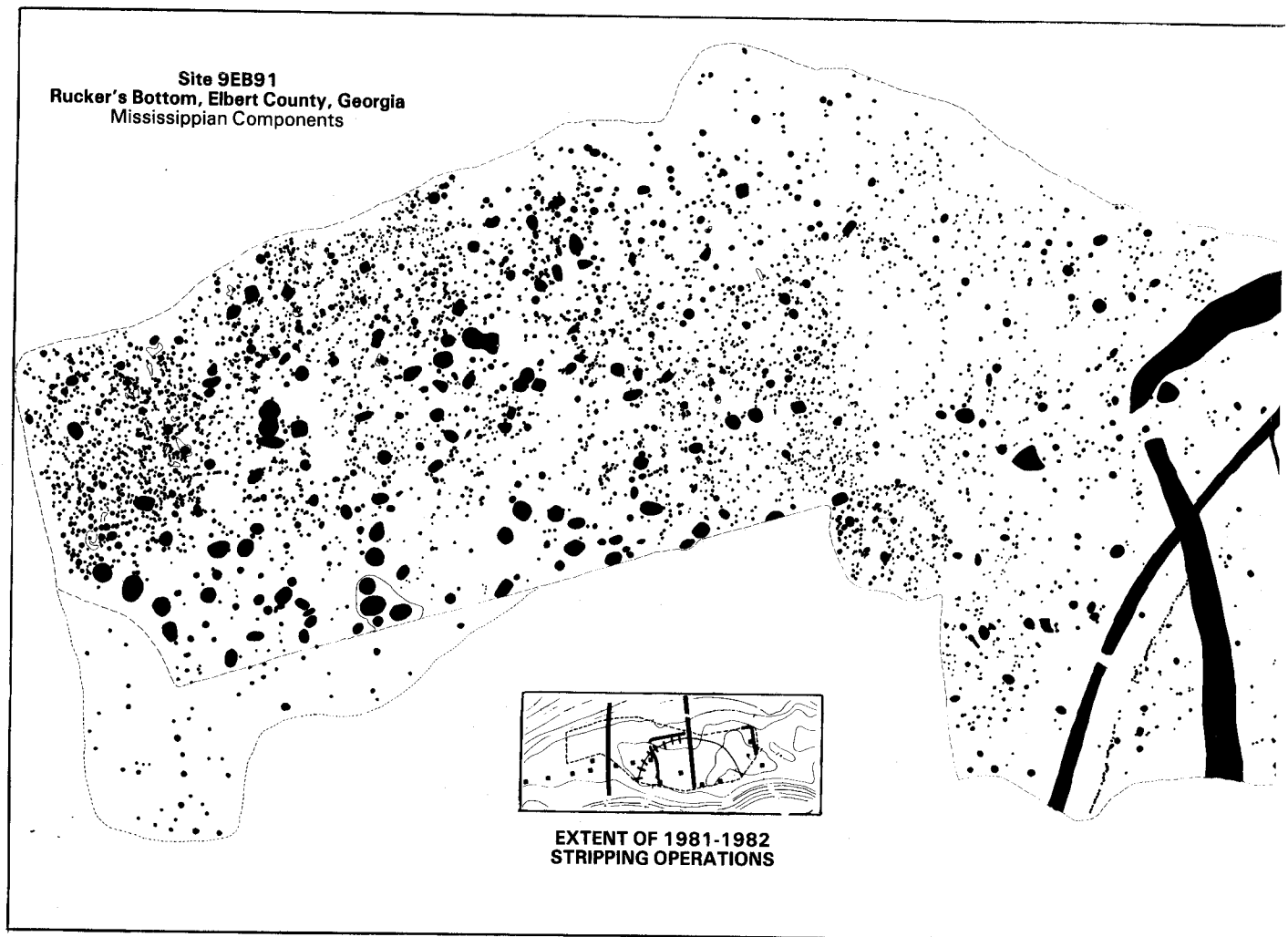


Figure 2. The Mississippian feature assemblage at the Rucker's Bottom site.

Using the extensive surface assemblage collected at the site in 1980, it is also possible to infer activity areas, or site use patterns, outside as well as inside structures at Rucker's Bottom (Figs. 5 and 6). Rock and cracked rock, for example, tend to occur in close proximity to houses, where it may have been employed as hearth stones or as construction (post) supports. Quartz debitage, in contrast, tends to occur in greatest quantity adjacent to or away from structures, suggesting that at least some chipped stone tool manufacture and possibly use was conducted outside of these structures.

### The Skeletal Assemblage

Large numbers of human burials were present at the site, with over 40 positively identified during the fieldwork. Large pits, excluding those filled with rocks in the plazas, typically contained interments. Direct comparison of skeletal remains from inside and outside of the enclosures (and hence, from the earlier and later components), was therefore possible, and formed a major goal of the project research. Early in the field-

work, a decision was made to try to get a fair number of individuals from each area of the site where they occurred, and to concentrate on well preserved remains. Poorly preserved burials, requiring considerable labor to expose and remove (often for little information return) were left, although samples were taken from some of these as well.

Twenty-four largely complete burials were removed, nine from inside and fifteen from outside the enclosures, together with a number of fragmentary remains. This assemblage is currently being examined by Dr. David S. Weaver at Wake Forest University. Aging, sexing, and descriptions of anomalies and pathologies have been prepared for these burials (Weaver *et al.* n.d.), and the sample generally presents a picture of an American Indian population of rather short stature, of gracile physique, and subject to considerable disease stress. Somewhat more females than males are represented, and only about one-third of the population ( $n=8$  individuals) appears to have reached the age of 30 by the time of death (Table 7). The primary epidemiological problems in the Rucker's



Bottom sample are dental diseases and their attendant consequences. The skeletal remains exhibit no evidence for violence or trauma, but instead show "gradual, progressive dental problems that in turn engendered general systemic and skeletal pathologies, including the accumulation of osteophytes, and osteomyelitic bone infections." Overall, the sample documents a population in marginal skeletal health.

Diagnostic artifacts were recovered in the fill of a number of the burial pits, and this, and the general locational data (i.e., inside or outside the Rembert Phase enclosure), permitted the rough dating of 23 burials. Thirteen of these were probably early, Beaverdam Phase, and 10 were probably later, Rembert Phase burials. No major differences in burial patterns are evident between the two assemblages; most adults were found semiflexed, lying on the side. Two infants were, however, found in vessels, and one group of three individuals was found extended, lying on their backs. Grave goods were simple and were found with about half ( $n=7$ ; 53.8%) of the individuals in the earlier sample. Interestingly, grave goods were found in only

one of the ten burials tentatively dated to the later Rembert Phase component, pointing to a possible difference in interment practices, if the samples (admittedly small) are representative. No spectacular grave associations indicative of marked status differentiation were noted on the site, nor was an appreciable age or sex bias evident in the occurrence of grave goods. Adult males, however, tend to have slightly more elaborate grave goods (pots or beads as opposed to bone pins, rattles, or cobble tools) than do adult females.

Some differences in health are suggested between the two Mississippian components. Ranking the relative skeletal health of the individuals in the sample as good, fair, or poor, a definite improvement in overall skeletal health is suggested from the earlier to the later component. The majority of the early population (9 of 13 individuals) can be described as in "fair" skeletal health, while fully half of the later sample ( $n=5$  individuals) were in "good" health, and four-fifths of the remainder (4 of 5) were in "fair" health. The apparent general improvement in skeletal health from the



Figure 3. Large circular structure (possible public building?) in the southern portion of the area inside the enclosures at Rucker's Bottom. Darkened areas indicate excavated features.

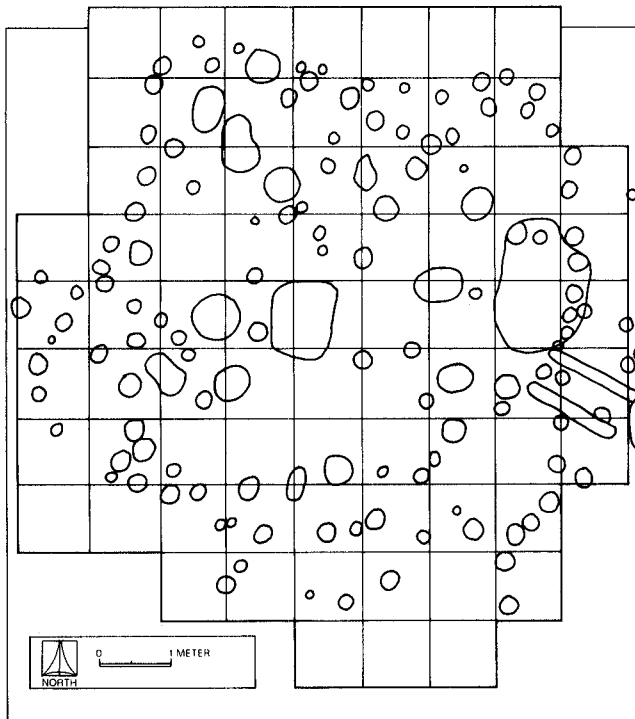


Figure 4. Structure 2, Feature M-1020, at Rucker's Bottom.

Beaverdam to the Rembert Phase, if an accurate reflection of local conditions, probably reflects a reduction in (local) dietary stress. This in turn may be due to the development of somewhat more stable food supplies, possibly through the development of more efficient agricultural methods or more effective redistributive systems. This patterning may also reflect the increasing and finally intensive adoption of agriculture by the local Mississippian groups. Ferguson (1971) and others note that agriculture does not appear to have played a pre-eminent role in South Appalachian Mississippian subsistence; the subsistence data from the earlier (pre-Mississippian "Cartersville") components from Rucker's Bottom suggest that agriculture may not have been of major importance locally until sometime well after the eleventh or twelfth centuries, if then. Alternatively, given the relocation of the dominant center to an area further away (from Beaverdam Creek Mound to the Rembert Mounds), some lessening in political control (and possibly tribute) may have occurred, promoting a more extensive or stable food supply.

### The Subsistence Record

Recovery of subsistence information was a major goal of the Rucker's Bottom project, and these data have been used to examine subsistence preferences over the site occupational history. Over 400 flotation samples were collected and processed and these, and general screen charcoal samples, have been exam-

ined by Josselyn Moore of the University of Michigan (Moore n.d.). Little spatial or temporally-based differences in the occurrence of plant food remains is evident in the Mississippian components at the site. Corn remains are ubiquitous, occurring in dozens of features, and hickory, acorn, and other nut shell fragments are almost as common. Less frequent, but also recovered in several areas, were grape, chenopodium, passionflower, and other seeds. Density values for some plant remains vary considerably over the site, however, particularly those for corn. A clear increase in the overall quantity of carbonized corn is evident between the earlier and the later Mississippian components (even after standardizing figures for feature type and sample volume), supporting the inference (noted above) that, locally, reliance on agriculture may have increased over time.

Zooarchaeological remains, which have been examined by Susan Scott (n.d.) of the Museum of Anthropology at the University of Michigan, exhibit greater differential distribution over the site. Most of the identifiable bone is deer, box turtle, and turkey, although over 50 species have been identified. In terms of yield, two large mammals, deer and bear, provided much of the meat represented by the sample. A wide variety of smaller mammals, birds, turtles, snakes, fish, and, occasionally, river mussels were also collected. The later component exhibits considerably less species diversity than the earlier assemblage, suggesting seasonal (cold weather as opposed to year-round) occupation or, alternatively, greater specialization or focalization of procurement efforts. Cold weather occupations are also suggested by observed changes in house shape; the three squared structures inside the enclosures resemble southeastern "winter houses" as described by Faulkner (1976).

### Geoarchaeology of the Mississippian Component

The terrace at the site is currently a stabilized landform whose morphology was established some 2000 years prior to the Mississippian occupation. A regionally extensive buried soil has been dated to the Late Archaic, and essentially seals the higher energy alluvial deposits that were responsible for the primary landform build-up.

The site emerged as a longitudinally expanding levee in response to complex channel migrations initiated in the early Holocene. Geoarchaeological field and laboratory studies indicate four depositional cycles, disrupted by two intervals of soil formation, that register site developmental history (Anderson and Schuldenrein 1983, n.d.). Each cycle has been correlated with discrete episodes of channel activity as well as with diagnostic archaeological components. The clear articulation of the archaeological components with cyclic alluvial and weathering horizons has produced an archaeo-stratigraphy that appears to hold up

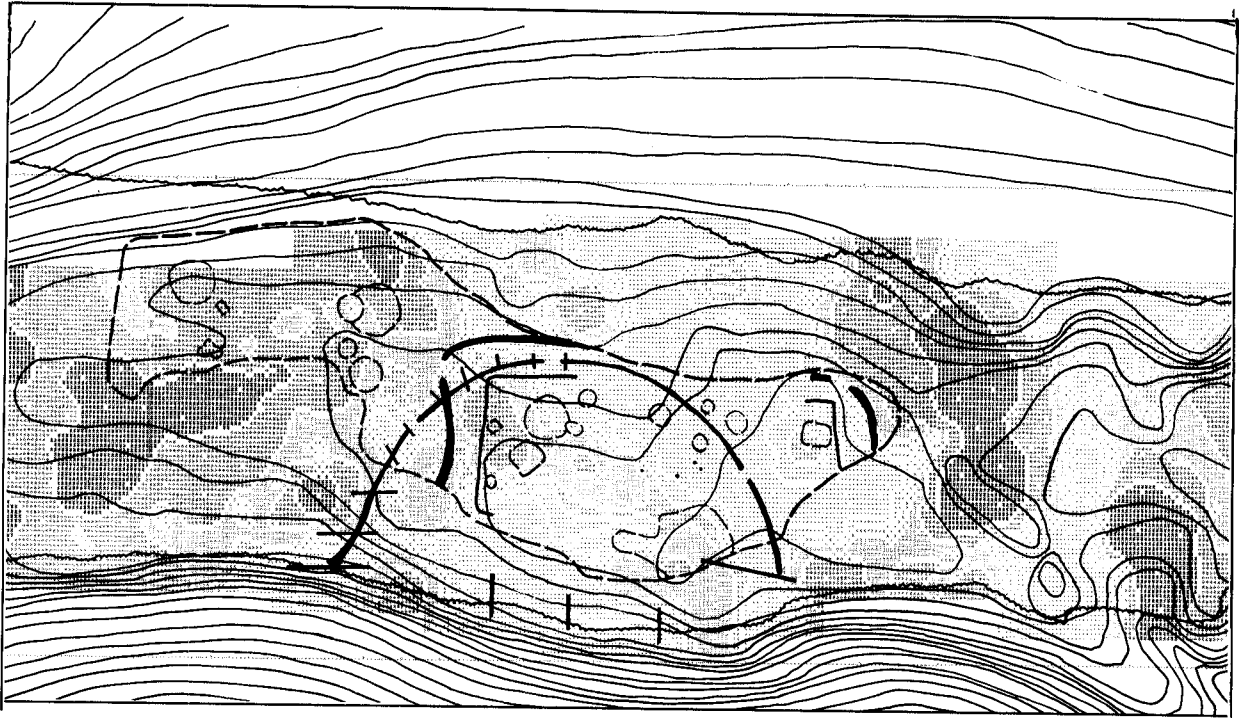


Figure 5. Surface distribution of cracked rock at the Rucker's Bottom site, superimposed over the locations of major Mississippian features.

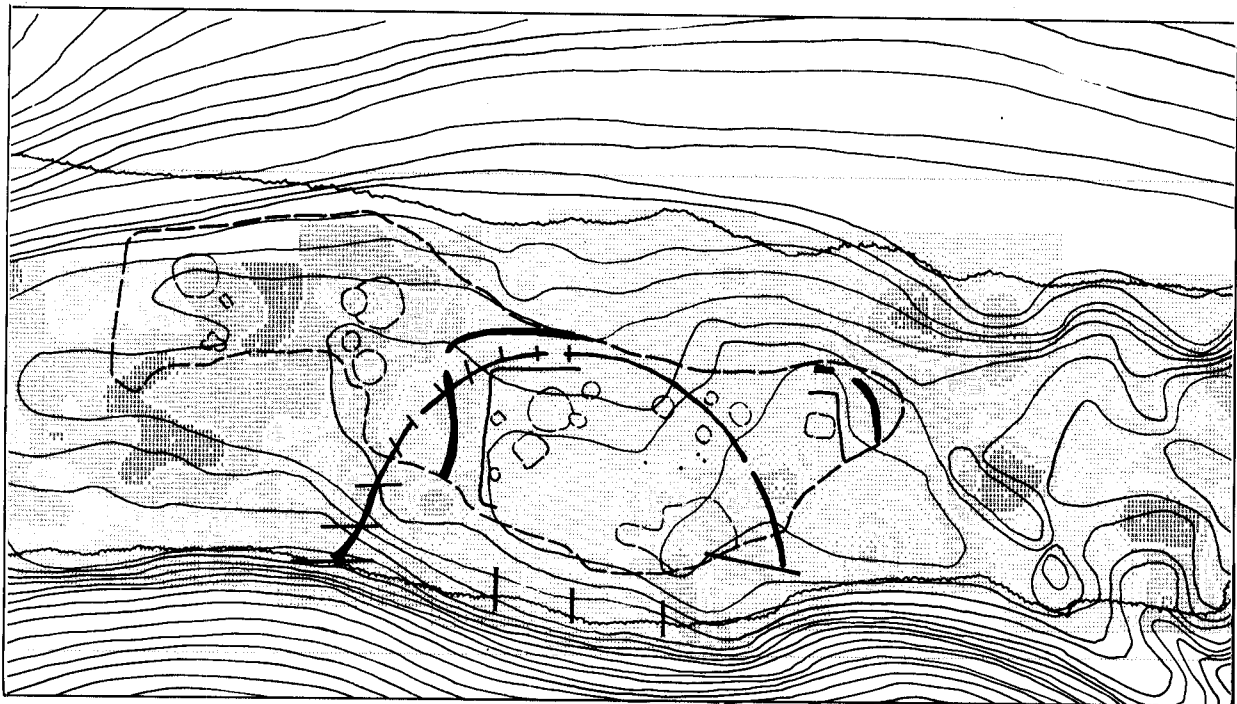


Figure 6. Surface distribution of quartz debitage at the Rucker's Bottom site, superimposed over the locations of major Mississippian features.

Table 7. The Mississippian Burial Assemblage at the Rucker's Bottom Site, 9EB91: Summary Information.

Burial Number	Feature Number	Sex	Estimated Age	Disposition of Remains	Grave Associations	Location Within Site	Period of Interment	Relative Health
1	M1	—	1½	Partially articulated within pottery vessel	Savannah Check Stamped jar	SW sector outer village	Beaverdam	fair
2	M3	—	3–6 months	Inside pottery vessel	Burnished plain bowl	SW sector outer village	Beaverdam (?)	—
3	M13	F	30+	Tightly flexed, lying on left side	Turtle shell	Large structure S sector outer village	Beaverdam (?)	poor
4	M149	M	20–30	Tightly flexed, lying on left side	Plain jar	SW sector outer village	Beaverdam (?)	fair
5	M425/426	F	30	Tightly flexed, lying on left side	Hammerstone, possible "tomb" structure	SW sector outer village	Beaverdam	fair
6	M1201	M	25	Semi-flexed, lying on back	—	SE sector outer village	Beaverdam	fair
7	M1202	F	40–50	Partially extended, lying on left side	—	SE sector outer village	Beaverdam	fair
8	M1331	M	35+	Semi-flexed, lying on right side	—	E sector inner village	Rembert (?)	fair
9	M1318	—	20+	Semi-flexed, lying on right side	—	N sector inner village	Rembert	fair
10	M1314	F	15+	Semi-flexed, lying on back	Carved conch shell ear pins (n=2)	N sector inner village	Rembert	good
11	M1213	M	30+	Tightly flexed, lying on left side	18+ conch, columella beads, 2 bifaces	SW sector outer village	Beaverdam (?)	good
12	M1301	F	35+	Tightly flexed, lying on left side	—	N sector inner village	Rembert	good
13	M1205	—	15	Tightly flexed, lying on left side	—	SE sector outer village	Beaverdam	good
14	M1353	—	15+	Semi-flexed, lying on right side	—	Central Plaza (?) inner village	Rembert (?)	fair
15	M1214	—	20–30	Tightly flexed, lying on left side	—	SW sector outer village	Beaverdam	fair
16	M1215	F	30–40	Partially extended, lying on left side	—	SW sector outer village	Beaverdam	fair
17	M1221	F?	15–18	Semi-flexed, lying on left side (?)	—	SW sector outer village	Beaverdam	fair
18	M2100	M	20+	Semi-flexed, lying on left side (?)	Olivella shell beads, skull fragment, stemmed biface	Central Plaza (?) outer village	Beaverdam	fair
19	M1324	F	25–30	Extended, lying on back	—	N sector inner village	Rembert (?)	good
20	M1324	—	30+	Extended, lying on back	—	N sector inner village	Rembert (?)	poor
21	M1324	—	6–7	Extended, lying on back	—	N sector inner village	Rembert (?)	good
22	M1222	F	20–25	Semi-flexed, lying on right side	—	SW sector outer village	Beaverdam	good
23	M1224	—	30+	Semi-flexed, lying on right side	—	SW sector outer village	Rembert	good
24	M1340	—	30+	Semi-flexed, lying on right side	—	E sector inner village	Rembert (?)	fair

not only for site 9EB91 but across the central portion of the Russell Reservoir (Anderson and Schuldenrein 1983).

The Mississippian deposits are associated with an extensive stratum representing interdigitated flood and midden sediments. This is perhaps the most complex unit at site 9EB91 due to its primary anthropogenic signature, and its extensive and differentiated expression across the site. In addition to incorporating the most intensive human activity at the site, the unit has been mapped the length and width of the ridge and across it from the riverbank well into the swale (Fig. 7). First recognized in 1980, the stratum consists of a 15–30 cm thick and heterogeneous silty-clay sediment matrix that was organic, humified, and moderately

calcareous. The lateral extent and artifact-rich nature of the deposit was consistent with compositions and dispositions of sheet middens at Mississippian sites throughout the Eastern Woodlands and most prominently in the central Mississippi Valley (e.g., Morse and Morse 1983). Most provocative, however, was the continuity of the feature and its unmistakable dip into the concavity (=swale) of the former floodplain. Test-trenching and subsequent granulometric analyses show that this poorly drained setting was a classic backswamp, formerly an abandoned channel featuring massive silts and clays with strong and firm ferromanganese concretions, gleyed colors, and exhumed anaerobic horizons. The component strata were subsequently paired with terrace deposits and

correlations showed that extensive channeling and periodic ponding had characterized the site's microenvironment since the late Pleistocene, essentially the oldest period indexed by the exposed subsurface strata. The Mississippian age clays were initially recognized by an uneven trail of artifacts that graded down-slope from the upper terrace midden to the mid-slope, which still supported permanent site features, and finally into the swale proper. Abundant bone, shell, pottery, and lithic clusters suggested deliberate discard patterns because random configurations would be expected by simply reworking of the pieces by colluvial or low energy alluviation. The erosional surface shown in Figure 7 represents the top of the Mississippian age deposition crosscutting the ridge-swale setting.

Complex land use was thus implicated by an "anthropogenic blanket" that chronicled high-level activity across the site environs. The pervasiveness of the midden signalled the site's potential as a major mississippian settlement early in the first field season, even before complex features were discovered. First, the sheet midden signature registers a composite and enduring cultural presence that is the product of long-term trampling, construction, and clearing activities (Butzer 1982; Cook and Heizer 1965; Van der Merwe and Stein 1972) associated with a protracted sedentary occupation. Second, the natural site setting defines a preferential locus for Mississippian site location. According to B. Smith (1978:488), the location of almost any floodplain Mississippian settlement is dictated by two principal geographic considerations: extensive

tracts of tillable soil, generally situated on sandy levees and terraces, and access to channel-remnant oxbow lakes. Research into Mississippian subsistence settlement systems largely confirms that multiple resource zones were exploited and the larger sites were permanently based on raised and well-drained floodplains that were at once suited for agricultural purposes and in proximity of lush aquatic biomes (see Fowler 1978; Morse and Morse 1983).

The Rucker's Bottom site is strategically set at a major inflection point along the central Savannah where the river swings abruptly from a southerly to easterly flow. It is also here that the river sinuosity increases dramatically, as evidenced by the proliferation of islands and complex anastomosing bars that are aligned with the principal flow axis. Faunal remains including turtle, snakes and backwater fish verify the utilization of the backswamp environment, while the increasing prominence of corn highlights progressive utilization of an agricultural base with time.

If the sheet midden presaged the high level of activity at Rucker's Bottom, the excavations in the 1981 and 1982 field seasons documented the range, pattern, and chronology of highly diversified land use. As noted, across much of the site, on the terrace and graded backslope, the sheet midden is a relatively thin and loosely structured matrix that delimits an extensive occupation, but is not indicative of the particular operations actually performed on the site. More intensive operations are recorded by activity-specific features intrusive into the earlier substrate or often into the

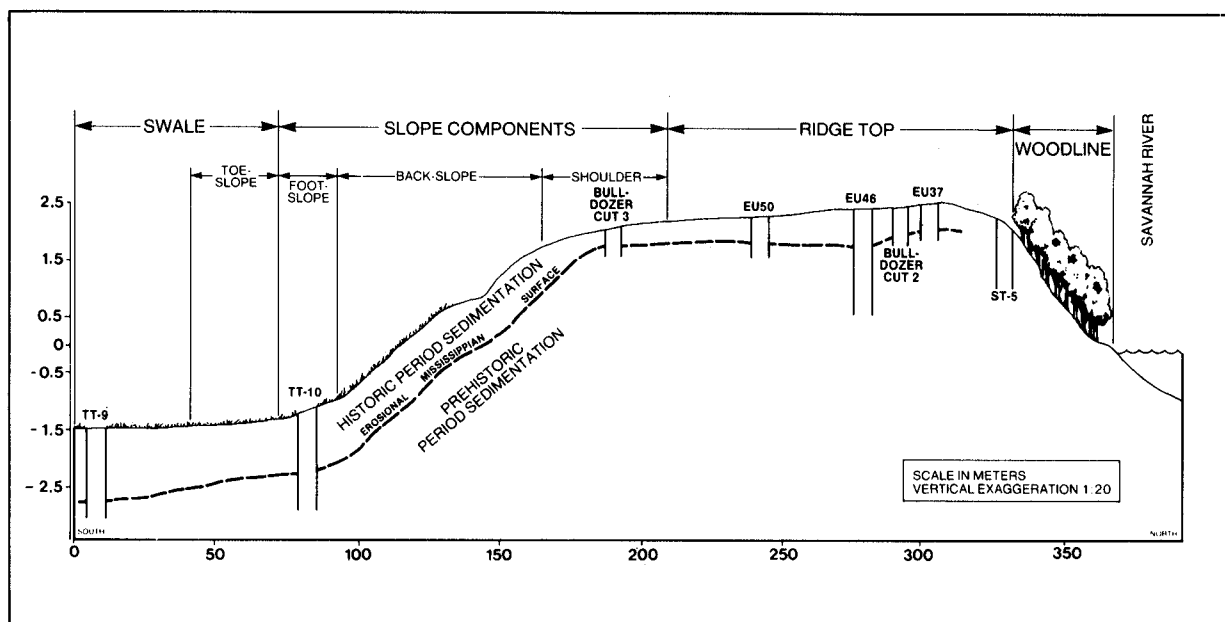


Figure 7. Geoarchaeological cross-section of the Mississippian components at Rucker's Bottom.

sheet midden itself. Recognition of superposition of successive anthropogenic strata provided clear evidence of the multiple occupations now known to have characterized the site.

Once the picture of highly diversified land use became apparent, the geoarchaeological strategy turned to the investigation of processes of site formation. The approach selected involved the localization of specific features and analysis of their contents by chemical testing. Effectively this was the only analytical option for the land use study because the acidic soil environment had degraded all organic materials and preservation was minimal. Geochemical analysis of archaeological sediments, however, remains in an embryonic stage and its potential, for other than highly specific uses, remains largely untested. Schiffer (1983:691), in a recent survey of known methods of "geochemical archaeology," references only six significant studies, noting that "more experimental work remains to be accomplished."

At site 9EB91 two such experimental methods were applied to the examination of the Mississippian feature fills: quantitative trace element analysis and phosphate fractionation. The latter procedure is reported here because it proved to be most diagnostic of feature utilization. The method of phosphate analysis has actually been applied in settlement studies since the 1930s in Europe but it is only recently that sophistication of the methodology has rendered it somewhat reliable (Eidt 1973, 1977; Sjöberg 1976). The basic concept governing the utility of phosphate analysis for reconstructing the nature of ancient land use has been summarized by Eidt (1977:1327) as follows:

... when phosphorous is added to the soil, it accumulates in situ across the broadest spectrum of soil types. Although phosphate levels decline extremely slowly in nature, they deteriorate rapidly during human related activities such as harvesting, livestock grazing, and terrain modification. Since parent materials supply soils with minute amounts of phosphate over geologic rather than short periods of time, natural recycling does not mask human caused alterations.

Accordingly, the cultural or human impact on the land surface will have an identifiable effect and differential activities register singular phosphate "prints." These prints are analyzed by a fractionation method consisting of separation of inorganic settlement phosphate into three separate components, or fractions, by means of non-overlapping extractions. The three fractions are extracted through two separate treatments with sodium compound solutions and by a third treatment with hydrochloric acid. Calculations of the relative loadings of phosphate levels on each fraction provide an index of land use *type*. The abundance of total phosphorous (P) in a particular feature is a measure of land use *intensity*. Total P determinations are routinely performed at archaeological sites with high levels of success (Arrhenius 1931; Cook and Heizer 1965;

Hassan 1978; Goffer et al. 1983). Eidt (1977) suggests that total P value ranges may be diagnostic of activity intensity as follows:

<i>P</i> range (in ppm)	Activities
10-300	hack farming and ranching
300-2000	dwelling, gardening, manufacturing, garbage dumping
>2000	burials, refuse pits, slaughter areas, urban living

At site 9EB91 18 phosphate samples were taken from proveniences of the following feature types (feature numbers in parentheses): (a) house floors (M-1020); (b) postholes (M-2400 series); (c) refuse pits (M-1400); (d) stockade fill (M-1199) (see Fig. 3); (e) general sheet midden (unit 2). Samples were then submitted to the Soils Laboratory, University of Wisconsin-Milwaukee, for phosphate fractionation analysis. The results are shown in Figure 8, a representation of the relative loadings on each fraction on a percentage basis.

Figure 8 plots all 18 samples and total P values as well as nine additional reference land use "prints." The reference "prints" are mean determinations of discrete feature types accumulated by Eidt (personal communication) from a variety of different locales. Attention is drawn particularly to types 8 and 9 that document Mississippian occupations. The reference prints provide a comparative framework for assessing the significance of the Rucker's Bottom features. Examination of the clustering pattern of the site feature samples reveals distinctive sorting delimited graphically by two distributions. The major clustering is keyed to a heavy loading for Fraction I with proportionately lesser weight on Fractions II and III. The cluster encompasses what may be considered a generalized matrix of Mississippian land use patterns. Accordingly, the limits of the distribution are defined by both the residential and planting ridge prints as well as by floors and paths (prints 4, 6) and interestingly by a mixed forest (print 2) possibly representative of the pre-clearance vegetation. Taken together these activities would be expected to incorporate extensive, as opposed to focused or activity specific, features such as, for example, the sheet midden. In fact, three of four sheet midden feature samples fall within the distribution. A series of alternating sterile and house floor (Feature M-1020) strata offers perhaps the most singular distribution. The floor fills cluster tightly in a band loaded at 30 to 35% on Fraction II, shown by Eidt (1977:Fig. 3) to be an index of dating due to its extraction by time transgressive iron and aluminum oxide deposition. This fraction may be indicative of a rapid succession of house floor building episodes.

As Figure 8 shows, a measure of the diagnostic potential of the "extensive occupance" signature lies in



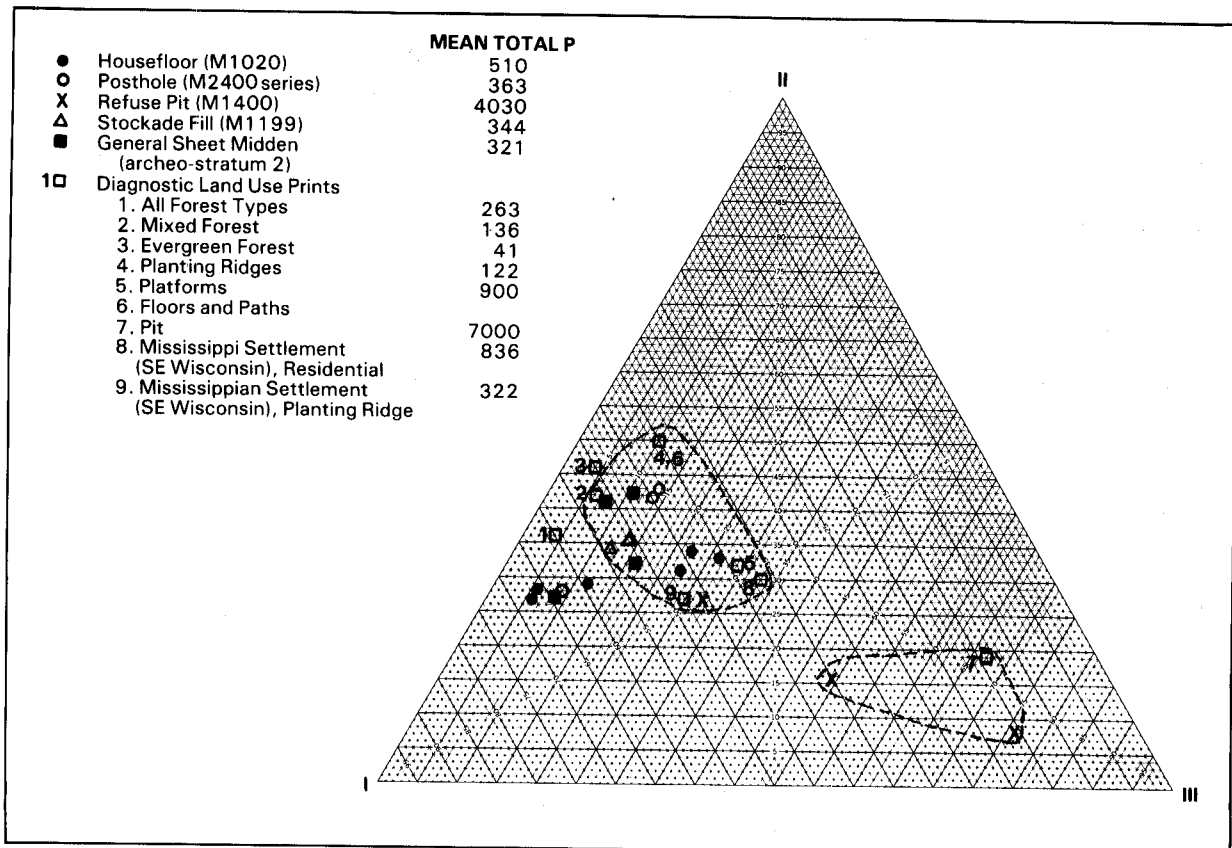


Figure 8. Phosphate prints of Mississippian features at Rucker's Bottom.

the fact that the thin (i.e., 5–10 cm.) strata, alternating with Feature M-1020 floor fills, all fall considerably outside the perimeter of the distribution. Both posthole (M-2400 series) and stockade fills (M-1199) are also tightly focused on Fraction II, at 43 and 35%, respectively. If this fraction could be calibrated to an absolute date it could furnish an optimal chrono-stratigraphic marker. Research along these lines is currently being pursued over the course of the project. In summary, it appears that what may be considered an extensive Mississippian occupation signature consists of phosphate distributions that load from 35 to 55 percent on Fraction I and 25 to 55 percent on Fraction II. While these are very crude indices, we stress that only 15 samples from four feature types were analyzed. The recognition of the potential of the method coupled with additional dates and increased familiarity with feature fill morphologies should enable researchers to streamline sampling strategies and focus efforts on identification of activity patterning across the site.

An indication of the utility of this method for activity identification is furnished by the second print cluster in Figure 8, dramatically offset from the first with a high loading on Fraction III and proportionately minimal loading on Fraction II. Mean total P is 4000 ppm, so that the print is indicative of a very specific type of land use, concentrated trash disposal. The contents of the two samples (M-1400) that sort out with Eid's pit print

(7) were sufficiently degraded so that visual inspection in the field did not in and of itself reveal the full significance of the feature, although subsequent clearance revealed it to be ditch fill. In a feedback sense, then, systematic feature sampling can potentially result in post-hoc identifications of site activity loci. This type of observation is extremely critical for resolving land use problems in humid temperate environments such as the Southeast, where soil acids degrade fills at high rates.

Ongoing geoarchaeological investigation should disclose additional information on changing patterns of site use across the Mississippian surface both at site 9EB91 and in analogous settings. Thus far the phosphate method is best considered a prospecting technique whose principal utility at Rucker's Bottom lies in the recognition of generalized village site areas, in mapping their extent, and in the selective resolution of specific activity loci.

With the refinement of geochemical techniques it will be possible to address such questions as the ancient management of land and reclamation of the site micro-environment. Recent research, for example, suggests that flood management was a major problem in later prehistoric periods and that the building of control embankments was actively pursued in pre-Columbian Peru (Knapp 1982; Ortloff *et al.* 1982). The Mississippians may have utilized analogous management prac-

tices (i.e., floodwater diversion) to maintain the delicate environmental balance required by a mixed agricultural hunting-gathering economy. As B. Smith (1978) argues, in most instances the lush aquatic biomes favored by the Mississippians were in close proximity to the raised floodplain surfaces on which their villages were built. Periodic changes in the hydrologic budget could conceivably have flooded out and destroyed the agricultural tracts, especially at site 9EB91 where surface relief is extremely graded. Flood control is not a problem that has been addressed by archaeologists working in the Mississippian period but it has major implications for understanding the nature of land use by agricultural societies. Mississippian period researchers have been concerned with the problems of tribal warfare and the complex patterns of land use attendant to defense (see Dickson 1981; Gibson 1974; Larson 1972). Future problem areas of inquiry should stress the effects of subsistence related landscape alteration by prehistoric groups whose complex coping strategies may now be identifiable with increasingly sophisticated geoarchaeological methods in application to anthropological problems.

#### Conclusions: The Rucker's Bottom Site in a Larger Perspective

In conclusion, the Mississippian occupation at Rucker's Bottom appears to proceed from an open village characterized by a fairly diffuse subsistence economy and a population subject to a fair degree of dietary stress, to a somewhat more spatially circumscribed community characterized by apparent fortifications, a more focused subsistence economy, and somewhat better overall health. Large public buildings and a pattern of houses ringing central plazas characterize both occupations, and large posts may have dominated both plazas. Burials tend to be dispersed over the village area during the earlier occupation, while in the later period they tend to occur in only one area of the village, or else where found outside of it entirely, in the old village.

Resolving explanations for these changes in the Mississippian occupational history of Rucker's Bottom is a focus for ongoing project research. Locally, increasing intensification of agricultural food production may have led to more dependable food supplies, and rendered a highly diversified subsistence economy less necessary. Increasing political centralization, reflected in an apparent shift in power from the comparatively nearby Beaverdam Creek mound to the more distant Rembert mound group, appears to characterize the local Mississippian, and this may have resulted in more stable food resources (by means of the development of more extensive and/or efficient redistributive networks). Concurrently, these socio-political and organizational developments may have engendered the need for fortifications, to protect local

populations, supplies, and/or land from rival groups (e.g., Larson 1972). By, or shortly after A.D. 1500, however, this experiment in cultural change appears to have ceased, because later (protohistoric) remains are virtually nonexistent in the area of the Richard B. Russell reservoir. This abandonment may reflect a realignment or replacement of organizations, and possibly population movement out of the immediate area. At the time of the DeSoto entrada (ca. 1540), the Savannah River appears to have served as the boundary, or buffer zone between the rival Mississippian chiefdoms of Ocute (on the Oconee River in Georgia) and Cofitachequi (centered on the Wateree River in South Carolina) (DePratter et al. 1983; Hudson et al. 1982). The appearance of fortifications at Rucker's Bottom in the later Mississippian, and the abandonment of the site soon after this, may reflect the development of this no man's land. Later in the historic era portions of the piedmont of Georgia and South Carolina were a buffer between the Cherokee and neighboring groups (cf. Swanton 1922; Milling 1940), and it is possible that the origins of this phenomenon reach back into the prehistoric era, to the late fifteenth or early sixteenth centuries.

#### NOTE ON CURATION

All of the artifacts, analysis notes, photographs, computer decks, and other project records from Commonwealth's Richard B. Russell Reservoir project are currently temporarily curated at Commonwealth's offices in Jackson, Michigan. Upon completion of the reservoir project an appropriate curatorial facility (to be designated by the Archeological Services Branch of the National Park Service) will receive the materials.

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