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Maize agriculture played a significant role in Mississippian communities, particularly the larger mound centers. But the shift to field production of corn began prior to the construction of mound centers (Scarry 1986; Wymer 1993). There has even been speculation that the shift in population aggregation and ceremonial regimes may have been linked to a dramatically increased use of maize (Wymer 1993). Excavations beneath Mound D at the Macon Plateau site (9BI1) at Ocmulgee National Monument revealed topographic features that were identified as “rows” beneath the mound. These “rows,” which resembled prepared furrows, were interpreted as evidence of maize fields (Kelly 1935, 1938). The Ocmulgee “cornfield” was the first feature of its kind to be discovered in the eastern United States (Riley 1994). Numerous other cases have subsequently been identified as fields based on their similarities to the Mound D feature, at sites from Wisconsin, Ohio, Illinois, and elsewhere (Fowler 1992; Gallagher 1992; Gallagher et al. 1985; Riley and Freimuth 1979; Riley 1994).

This project attempted to test the “maize field,” using sediments, pollen, and phytoliths. Have previous excavations accurately interpreted the undulating soil pattern beneath Mound D as an agricultural field? Do the soils suggest that the Mound D fill was placed on top of an agricultural field? Neither pollen nor phytolith analyses have been widely employed in the southeastern United States. These analytical methods are frequently used elsewhere for such purposes as environmental reconstruction and confirming the agricultural activities. Are pollen grains and phytoliths preserved and do they represent a specific cultigen such as maize?
PROJECT SETTING

Lying along the Fall Line, the Macon Plateau area consists of Piedmont uplands, enclosed by the Ocmulgee River and Walnut Creek. The Macon Plateau site (9BI1) is the largest Mississippian mound site in the state of Georgia (Hally and Williams 1994), containing eight platform mounds, including Mound D, the focus of this study (Figure 1). The Macon Plateau site was initially recorded as covering 1,050 by 660 m or approximately 70 hectares. This site has also yielded evidence of Paleoindian through historic Creek period occupations.

Figure 1. The Macon Plateau site (9BI1), showing Mound D (from Hally and Williams 1994:Fig. 8.1, courtesy of the University of Georgia Press).
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The earliest recorded description of the site of Ocmulgee was written in 1739 by a ranger who accompanied General James Oglethorpe (Walker 1994). This report briefly described their party’s campsite, which was “...where there are three Mounts raised by the Indians over three of their Great Kings who were killed in the Wars” (Rangers Report 1916:219). In the Treaty of 1805, the Creek Indians relinquished most of their lands east of the Ocmulgee River, but held out a 15 square mile tract within which the Macon Plateau and Lamar mounds are located (Walker 1994), indicating the significance of the sites to the Native Americans. Creek legend states that on the Macon Plateau was located “...the first town or settlement, when they sat down (as they termed it) or established themselves, after their emigration from the west, beyond the Mississippi, their original native county” (Bartram 1928:68). William Bartram described the sites in 1791, stating

On the east banks of the Oakmulge, this trading road runs nearly two miles through ancient Indian fields...called the oakmulge fields...On the heights on these low grounds are yet visible monuments, or traces, of an ancient town, such as artificial mounts or terraces, squares and banks, encircling considerable areas...(Bartram 1928:68).

In the early 1920s, General Walter A. Harris, a Macon attorney, began a campaign to preserve the archaeological sites on the Macon Plateau (Marsh 1985). Harris contacted the Bureau of American Ethnology and the Smithsonian Institution in search of support, and with the help of the Society for Georgia Archaeology, he was ultimately successful. Legislative efforts to establish the area as a National Monument included House resolutions and Presidential proclamations spanning nearly seven years (Southerlin et al. 1995:27). In 1936, Ocmulgee was established as a National Monument by Franklin D. Roosevelt (Hally 1994). The Lamar Mound site was added to the Monument in 1941 by Presidential Proclamation No. 2493-55 Stat. 1654 (Southerlin et al. 1995:27).

The national monument was not nominated to the National Register of Historic Places (NRHP) until 1973, when it was nominated by Norman D. Ritchie and Bernard Berg (NRHP Inventory Nomination Form) as a historic district that included all sites recorded within the Monuments boundaries. In 1978, the Ocmulgee National Monument was placed upon the NRHP as a historic district with boundaries encompassing approximately 683
acres. The NRHP nomination form states:

This mound is located 1,800 northeast of the Mound A, near the visitor center, and is associated with the Earthlodge (#8). At the time of the excavations it measured 150’ to the side and was 8’ high. Extensive excavations through the mound to original ground surface revealed one of the finest preserved pre-historic farm plots yet found in the world. Only minimal backfill was done so the mound does not have its original appearance at this time. This mound is considered a prime archeological site.

The Ocmulgee Mississippian mound center did not become the focus of extensive excavations until the Civil Works Administration (CWA) funded the first project in December 1933 (Walker 1994). Excavations continued until the early 1940s at the various mounds within the National Monument boundaries (Walker 1994). These projects were overseen by the National Park Service and were funded by the Civil Works Administration, the Works Progress Administration, the Federal Emergency Relief Administration, and the Civilian Conservation Corps.

A.R. Kelly began excavations at Mound D at the Macon Plateau site (9B11) in 1933. When excavation of Mound D began, it was oval in shape (the original shape may have been modified by nearly a century of plowing along the mound borders) and measured 67 by 46 m at its base and 2 m in height (Nelson et al. 1974). The mound was oriented north-south and only the southern half was excavated (Nelson et al. 1974), from 1933 through 1935. It was complex, having the remains of three structures in the mound fill (Riley 1994).

The field features were recognized early in the excavation and were designated as “Structural Layer 7” (Riley 1994:97). Mound D was dubbed the “cornfield mound” when, during excavation, a burned corncob was recovered from the mound fill (Kelly 1935). After further excavation, an undulating surface was discovered beneath the mound. This feature was described by one of the primary investigators, James Alfred Ford, as “garden beds, cultivation rows, or hills” (Walker 1994:19). Thomas J. Riley states that these ridges and furrows were “sealed” by Mound D (Riley 1994), thus ensuring their preservation. A compilation of the field notes by Nelson, Prokopetz, and Swindell (1974) from Florida State University describes the features: 1) “regular ridges
and furrows aligned in a northwest-southeast direction,” 2) the
ridges ranged from 30 to 50 cm apart, 3) the ridges were
approximately 13 cm high, and 4) there were paths running
perpendicular to the rows.

Despite multiple observations of this “cornfield,” no research
has ever been conducted to either confirm or deny the accuracy of
such a label. Thomas J. Riley writes “the question of whether the
feature that constituted Structural Layer 7 at Mound D represented
agricultural fields was never satisfactorily addressed in Kelly’s
work, and other writers, most notably Nelson, Prokopetz, and
Swindell (1974), have considered the point moot” (Riley 1994:99).

RIDGED FIELDS

The Ocmulgee Mound D “cornfield” was the first
archaeological discovery of subsurface agricultural fields in eastern
North America (Riley 1994). Since the discovery of the buried
cornfield at Ocmulgee, numerous other such features have been
discovered (Figure 2). Features such as the ridged-fields at the
Lunsford Pulcher and Texas sites (Fowler 1992), near Cahokia,
Illinois, and the ridges and furrows identified at the Valley View
and Sand Lake sites in Wisconsin (Gallagher and Sasso 1986) have
all been categorized as agricultural features based on their
similarities to the Ocmulgee field (Riley 1994). A similar field
pattern has been observed at the Cerén site in Central America
(Sheets 1992). Palynology has only recently been used to confirm
the agricultural nature of one of these features (Gallagher et al.
1985). Aerial photography has resulted in vague indicators of
ground patterns but currently these indicators have not been widely
verified (Riley 1994).

The morphology of these ridged field features are remarkably
similar despite their geographical setting. At the Sand Lake site in
Wisconsin, the furrows ran parallel to each other and had small
mounds formed every 75 cm (Gallagher and Arzigian 1994). Avebury (1869) describes Native American agricultural fields in the
northeastern United States as being comprised of low parallel
ridges averaging 15 cm apart. The Cerén site fields are comprised
of parallel furrows approximately 1 m apart with plants every 75
cm. The Cerén field also had perpendicular ridges intersecting the
furrows. Sheets (1994) speculates that these ridges may have
designed to limit erosion and increase water absorption.
Gallagher and Sasso (1986), excavators of the Sand Lake site, have suggested that burning preceded the construction of ridges, which occurred both before and during planting (Gallagher and Sasso 1986). Riley believes that the construction of ridges fulfilled several goals, including “aeration, manipulation of ground temperature and fertilization through the addition of ash and midden on the fields” (Riley 1994:101). Riley goes on to say that the fields of Wisconsin and Ocmulgee are “significant as signs of what has to be a complex of agricultural techniques shared by Mississippian societies separated from one another in space by as much as 1500 km and in time by as much as 500 years” (p.101).

PROJECT FRAMEWORK AND INITIAL PROCEDURES

The first step was to map the remaining portion of Mound D in an attempt to ascertain which portions might be the result of the original construction rather than of restoration following the 1930s
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excavations. The next step was to sample soils from beneath the mound and from modern cornfields. Once soil samples were obtained, a particle size analysis was conducted. Evaluation of the soil particle sizes served to distinguish between possible construction events and indicated the degree of spatial integrity that could be expected for pollen and phytoliths. The samples were then tested for sediment chemistry and stable isotope levels. These analyses provide insight into the degree of sediment modification due to human activity and potential for pollen and phytolith preservation. After these steps the sediments were then processed for pollen and phytoliths.

MAPPING MOUND D

Prior to the excavations of the 1930s (Kelly 1935), Mound D was oval in shape and measured 67 by 42 m with a height of 2 m. Since those early excavations, no further investigation of the mound has taken place nor have its current spatial dimensions been recorded in detail. In order to identify the intact areas of the mound and pinpoint the locations from which the soil cores would be extracted, a detailed transit map was compiled. A datum was established on top of the mound, at its southeastern corner. Transit readings were taken at judgementally determined intervals from both interior and exterior points around the mound. Figure 3 depicts Mound D, as it stands today, the trench adjacent to the northeast edge of the mound, the nearby Council House, and the locations of the two soil cores. The mound has an average height of 1 m above the present ground surface. It is currently comprised of two half-moon shaped berms, with the interior apparently removed. Kelly’s field notes state that the entire southern half of the mound was removed during excavations and that the fill was used to reconstruct the mound’s original form following the of excavations (Kelly 1935, 1938). Based on the hollow center, apparently not all of the mound fill was returned to its place of origin.

SOIL SAMPLES

Two soil cores were removed from the Mound D fill using a hand auger with a 2” diameter bucket. The integrity of the stratigraphy was maintained as the soil was removed. Core #1 was recovered from the northern end, approximately 30 cm from the
Figure 3. Transit map of Mound D, 9BI1 (plan view).
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exterior edge of the mound (Figure 3). This core was excavated to a depth of 178 cm below ground surface (cmbs) and was terminated after several auger buckets yielded red clay, which was considered to be subsoil beneath the mound. Core #2 was recovered from the southern part of Mound D to determine the degree of fill disturbance. As with Core #1, this core was terminated when two buckets of red clay were obtained, at a depth of 278 cm.

An additional soil core was collected from a modern corn field. This core was intended to serve as a control sample for pollen levels in maize fields. It was collected from a field in which corn and sorghum are cultivated in rotation. Located in Oconee County, in an upland setting, the soils in this modern field were very similar in acidity to those found at Ocmulgee National Monument. This core was excavated to a depth of 40 cm using the same methods.

SOIL DESCRIPTION

Visual variations between soil colors are generally slight, so a Munsell classification can often be helpful in delineating soil differences. Stratigraphic divisions in the cores were made using Munsell color designations. A 100 gram sample of each discernible soil stratum was then separated from the core material.

Several distinct soil changes can be noted in the Core #1 profile (Figure 4). These soil changes may reflect construction sequences, corresponding with Kelly's (1935) estimate of three separate construction events for Mound D. The base of the mound appears to lie between depths of 145 and 164 cmbs. At 145 cmbs, the soil reflects a dramatic distinction between the mound fill and the original surface soil. The 145-165 cmbs soil stratum is comprised of light brown sand with moderate mica content. At 165 cmbs, the soil undergoes another dramatic change from brown sand to red clay subsoil. The light brown micaceous soil directly overlaying the red clay subsoil is the stratum suspected of having been the cornfield.

In Core #2, a distinct delineation can also be observed between the mound fill and the original ground surface, between 225 and 235 cmbs (Figure 4). Interestingly, the soils between 145 and 165 cmbs in Core #2 exhibit a soil change that may be similar to that from Core #1. In Core #2, this soil change is expressed in a dark grayish brown lens measuring approximately 20 cm in depth. This lens divides approximately 100 cm of dark yellowish brown soil.
Soils in Core #2 were less compact than those in Core #1, with little stratigraphic integrity. Core #2 was removed from the part of the mound excavated by Kelly in 1938. On the completion of the excavation, this section of Mound D was reconstructed (Kelly 1938). The sediments reflect disturbance probably due to this reconstruction. Unfortunately, the extent of the impact on the possible field level from the excavation and reconstruction could not be ascertained. Due to the high probability of contamination, only selected analyses were conducted on Core #2.
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SEDIMENT PARTICLES

Particle-size analysis measures the size distribution of sand, silt, and clay. Grain size depends on source rock, weathering, selective sorting during transportation, etc. (Lewis and McConchie 1994). Of particular interest to this project was the degree of water retention or permeability. Grain size and degree of sorting can indicate how much downward percolation was possible. For example, larger grains allow for more space between grains, facilitating leaching, and this will directly affect the downward migration of pollen and phytoliths.

The percentage of clay in Core #1 varies, although as would be expected, the stratum designated as subsoil has the highest percentage of clay (22.7%). The upper strata (0-18 and 18-41 cm) have the highest percentages of silt with 11.9% and 8.4%, respectively, and the lowest percentages of sand (72.8%, 72.2%, and 74.5%, respectively). Sand increases notably in the stratum directly above the field level (130-145 cm, 77.8% sand), reaching a maximum in the field level (80.2% sand), and dropping dramatically in the subsoil (165-170 cm, 68.7% sand) (Figure 5).

Figure 5. Proportion of sand in Core #1, by level.
Reid

In Core #2, percentages of sand, silt, and clay are extremely variable—not surprising given the disturbed soil. However, as with Core #1 sediments, the stratum designated as subsoil (235-255 cm) exhibits the highest percentage of clay (15.2%).

Three samples were processed from the modern field. These samples were taken from 0-25 cmbs, 25-30 cmbs, and below 30 cmbs (subsoil). Particle size distributions for the modern field soils are variable. In the sample from the 0-25 cmbs level, 0.0 and 1.0 phi size particles dominate. The 25-30 cmbs soils contain higher percentages of 1.0 and 2.0 phi size particles. The subsoil level (>30 cmbs) grades down gradually from 0.0 phi size particles to 4.0 phi.

The particle size analysis highlights several distinctive characteristics of the possible field level. In Core #1 the percentage of sand in this level is the highest while the percentage of silt is the lowest. The sand particles are dominated by those classified as fine and very fine (3.0 phi, 6.2%; 4.0 phi, 2.9%), while the percentage of coarse sand is low (2.0%). While not conclusive, these values suggest that the original ground surface beneath Mound D was comprised of primarily eolian sands. Conversely, the mound fill contains higher percentages of coarse sand, indicating that perhaps the source of the fill was influenced by fluvial processes (such as soils from a floodplain).

While pollen conceivably could have migrated downward into the field level, it is unlikely that it would have been able to flow freely from the upper levels of the mound. The middle levels, with their high percentage of silt and clay, would have blocked the downward migration of microfossils the size of Zea mays pollen. Thus the soil stratum at the base of the mound should be relatively free of extraneous material from the mound fill.

The Core #2 sediments exhibit severe disturbance but do not reflect the reverse stratigraphy that might be expected in the simple backfilling of an excavation. As details on the reconstruction of the excavated portion of Mound D are sparse, the source of the fill material cannot be ascertained.

The modern field soil samples contain significantly higher percentages of clay in the uppermost and subsoil levels than the soils from Mound D. The percentage of clay in the modern field soils and the relatively large particle size may be significant factors in the downward migration and subsequent preservation of botanical microfossils.
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SOIL CHEMISTRY

Twenty 100 ml soil samples from the Mound D cores (one from each stratum) were submitted to Chemex Labs in Sparks, Nevada. These samples were subjected to an ICP-AES Multi-Element Analysis (Triple Acid Total Digestion). Each sample was exposed to a mixture of hydrofluoric, perchloric, and nitric acids, which dissolve all but the major oxides and base metals.

Kemp et al. (1976) have divided the elements commonly found in soils into five categories. These categories are: 1) the main elements found in most soils—Si, Al, K, Na, and Mg; 2) carbonate elements, approximately 15% of the sediment—Ca, M, and CO3-C; 3) nutrient elements, approximately 10% of soils—C, N, and P; 4) mobile elements, which react with changes in soil conditions such as oxidation-reduction, approximately 5%—Mn, Fe, and S; and 5) trace elements, 0.1%—Hg, Cd, Pb, An, Cu, Cr, Ni, Ag, V, and others. This analysis measured most of these elements.

These elements can reflect human activity, such as agriculture, and indicate a soil’s potential for microfossil preservation. Of importance for this study is the total amount of phosphorous. High levels of phosphorus, a nutrient element, are assumed to reflect either domestic waste or human and animal excrement (Walker 1992). The main phosphates will accumulate in areas of human habitation, since phosphorus is a major component of the human diet and is also produced by the digestive tract (Waggaman 1969). Soil phosphate levels can reflect the intensity or duration of the occupation of a site (Woods 1975). While phosphate deposited on the ground surface, such as in modern agricultural activities, is converted to iron, aluminum, and calcium, phosphates in the subsurface soils are highly insoluble (Wild 1950). Once in the subsurface, phosphates bond to soil particles and in this form the accumulated phosphate remains stable through time.

Significantly low levels of phosphorus are often encountered in cultivated A horizons (Sandor 1992). Phosphorous fractionation studies have shown that phosphorous directly available to plants is lost in cultivated fields, particularly fields that are not fertilized (Sandor et al. 1986). As there is no direct evidence that the Ocmulgee fields were fertilized by any means other than run-off and plant decay, it would be expected that phosphorous levels in the field level beneath Mound D would be significantly lower than in the mound fill. Nitrogen is a structural component in all
Reid

organisms and is bound in organic matter. Nitrogen is a component of organic material and can be indicative of anthropogenic activity.

The potential agricultural field yielded the highest levels of several elements, including Ba, Ca, Fe, and K, and the lowest amount of phosphorous. The Core #2 sediments reflect an extreme degree of elemental diversity, as would be expected in sediments lacking stratigraphic integrity.

Selected element levels in the Core #1 samples are illustrated in Figure 6. The levels of the major elements, particularly potassium and magnesium, are well within the normal range for organic soils or plant materials (Kemp et al. 1976) and are the highest for the presumed field level (0.9% and 0.2%, respectively). Mobile elements, which react in a reducing environment, are well represented by manganese and iron, both of which have their highest levels in the field stratum.

Phosphates deposited on the ground surface, perhaps during fertilization of an agricultural plot, are converted to iron, aluminum, and calcium. The soil at the base of Core #1 (below 145 cmbs) exhibits high levels of aluminum (3.5%) and the highest levels recorded of both calcium and iron (0.4% and 1.6%, respectively). Phosphates that remain in the subsurface soils become insoluble. With the Core #1 sediments, the levels of phosphorus are at their lowest in the presumed agricultural layer, although they increase significantly in the subsoil below the field level. This result is consistent with a cultivated field surface.

To determine if a relationship exists between clay and silt and these chemical elements, a bivariate regression analysis was conducted. The independent variable was the percentage of silt and clay. The dependent variables were the values for each element. The R-squared values are aluminum 0.32, calcium 0.02, iron 0.08, potassium 0.03, magnesium 0.01, manganese 0.14, and phosphorus 0.05. While a loose relationship between the clay/silt content of the sediments and the amount of aluminum may exist, these calculations confirm that overall the elemental values are not related to sediment particle size.

The modern field has comparatively high levels of all elements except calcium. The possible field level in Core #1 contains very low levels of phosphorous, common in cultivated A horizon soils, but the phosphorous value in the modern field is extremely high (800 ppm). The modern field is regularly treated with supplements, particularly nitrogen and phosphorous (Albert Hale, property
Figure 6. Core #1 soil chemistry (selected elements) by depth.
Reid owner, personal communication). The low levels of calcium are directly related to the high levels of phosphorous—the soil amendments have not yet been fully converted.

Soil pH, a measure of baseness or acidity, is also of interest in determining microfossil preservation. Acidic conditions enhance pollen preservation, despite the detrimental effects on faunal and macrobotanical remains (Shackley 1975). The pH values for the soils that comprise the Mound D fill are moderately acidic (measuring 3-4), as are the soils beneath the mound. The modern field soils are also acidic, with a pH of 4. These soil conditions should aid in the preservation of fossil pollen grains or phytoliths.

**STABLE ISOTOPE ANALYSIS**

Stable isotope analysis uses mass spectrometry to identify chemical elements. These elements may have different isotopes, which contain nuclei with the same number of protons but a different number of neutrons. Variation in the number of neutrons results in differing masses and, consequently, differing behaviors. Elemental isotopes can be either stable or unstable. All stable isotopes can have both light and heavy expressions. The two most commonly measured stable isotopes are nitrogen and carbon. As the actual isotopic ratio is difficult to calculate, stable isotope measurements focus on variation between a sample’s isotopic ratio and a standard based on a Cretaceous marine fossil found in the Pee Dee formation in South Carolina, *Belemnitella americana* (belemnite), which has an extremely high $^{13}C/^{12}C$ ratio.

It is the ratio of these light to heavy isotopes (e.g., $^{13}C/^{12}C$ or $^{15}N/^{14}N$) that can be used as a “biological tracer” (van der Merwe 1982) for the presence or exploitation of C4 and C3 plants. Unlike other cultigens and most other grasses, which are C3 plants, corn is a C4 plant. C4 plants use a photosynthetic pathway that fractionates carbon differently from the pathway utilized by C3 plants. The Hatch-Slack pathway used by C4 plants converts carbon dioxide into a compound with four carbon atoms while the Calvin-Benson pathway used by the C3 plants produces a three carbon atom compound (Calvin and Benson 1948). The difference in carbon fractionation results in signature $^{13}C/^{12}C$ ratios in the materials that have incorporated the plant tissues, such as skeletal material and soils. Typically, C3 plants will have carbon isotopic ratios of -32 to
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-20 parts per thousand (o/oo). The ratio range for C4 plants is between -17 and -9 o/oo. This difference in the ratio is used to establish the degree to which C4 plants were present in the sample.

Samples from the Core #1 sediments were submitted for stable isotope analysis to the Stable Isotope Research Laboratory, at the Institute of Ecology, University of Georgia. The samples were taken from the subsoil level (165-175 cm), the possible field level (145-165 cm), and from the level directly above the field level (130-145 cm). A sample from the modern corn field was also submitted for analysis. The goals for this analysis were to determine if a C4 plant signature could be observed and, if so, if it was sufficiently strong to indicate the cultivation of corn.

Each of the soil samples submitted for stable isotope analysis were processed twice. The resultant values are shown graphically in Figure 7. For the modern field δ13C values of -21.60 and -21.63 were obtained. Nitrogen values for the modern field also fall at the edge of those values considered within the C4 plant range, at 7.00 and 7.06. The total carbon values were 2.22 and 2.05. The total nitrogen values were 0.17 and 0.16.

![Soil Stable Isotopes](image)

**Figure 7.** Results of stable isotope analysis.
The possible field level beneath Mound D yielded δ13C values of -23.04 and -22.91 with total carbon values of 0.34 and 0.37 (indicating very little organic material in the soil). Nitrogen levels in the 145-165 cmbs sample were 0.02 and 0.02, with δ15N values of 6.04 and 6.07. The subsoil beneath the possible field yielded δ13C values of -21.13 and -21.83, with total carbon values of 0.26 and 0.22. The subsoil level yielded total nitrogen values of 0.02 and 0.02, with δ15N levels of 7.7 and 7.63.

The Core #2 soils are sufficiently disturbed to confirm their status as backfill from the early excavations of the mound and to prove them unacceptable indicators of the pristine soils beneath the mound fill. The soil stratum beneath the mound fill is enriched by organic residues that could indeed be related to agricultural activity. Also, the soil pH is within a range that would allow for the preservation of pollen and other botanical microfossils.

The stable isotopes for the modern field fall at the extreme end of the values considered to reflect the cultivation of C3 plants, but not within the range determined for C4 plants (Fig. 7). Despite the fact that this modern field is planted in corn and might be expected to reflect higher δ13C values, both the δ13C and δ15N values are consistent with modern rotation cultivation (Tom Maddox, Institute of Ecology, University of Georgia, personal communication 1998).

The stable isotopes for the Mound D subsoil (165-170 cmbs) are also at the extreme end for C3 plants. The field level soils fall more squarely into the range of carbon and nitrogen values for C3 plants. Overall, the stable isotope values suggest C3 plants, such as grasses, in the soils beneath Mound D and in the modern field. No overt evidence of C4 plants, such as corn, is present in the Mound D soils. However, the stable isotopes do not present conclusive evidence of corn being cultivated in the modern field, despite the fact that it is. Based on the stable isotope data, the possibility that corn was grown in the soils beneath Mound D cannot be ruled out.

**Pollen**

Pollen grains represent the sexual generation of a flowering plant. Formed in the male portion of the plant and carrying the male genetic material, they are released into the female portion of the flower through a variety of means (Faegri and Iversen 1975; Pearsall 1989). Pollen is dispersed by four mechanisms: wind, insects and other animals, water; and self-pollination.
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Corn or maize pollen (Zea mays) is circular in shape, monoporate, and has a relatively smooth, non-textured exine. Corn pollen grains also have an extremely distinctive annulus surrounding the single pore. While pollen grains can range from 5 to 200 microns in size, with some exceptions (Faegri and Iversen 1989), Zea mays pollen grains are commonly between 75 and 200 microns (Faegri and Iversen 1989; Gish 1994) and are more identifiable by virtue of their large size.

Individual grains of pollen can be extremely resistant to decomposition and will preserve for long periods of time in a variety of sedimentary contexts. Preserved or fossilized pollen can be retrieved, isolated, and identified to genus (and often to species) by observing both the structure and texturing of the individual grains. The longer a grain of pollen lies in the soil, the more it is susceptible to bacteria and other agents of degradation. Consequently, the actual number of grains declines with greater depth (Dimbleby 1985). Bioturbation can also act to move pollen grains both up and down within a soil profile (Walch et al. 1970). In these cases, the prevalence of the pollen types is the guide to which grains are older. A larger percentage of the younger pollen will remain in the upper levels of the soil profile, while the largest percentage of the older pollen will remain at the base of the profile. This pattern of pollen distribution and degradation has been verified at numerous historic and prehistoric archaeological sites (see Dimbleby 1985; Kelso 1993, 1994; Pearsall 1989). The downward migration of pollen has been shown to average 10 cm in 300 years (Dimbleby 1985). This downward movement is not solely determined by pollen grain size, but regardless of size, the oldest pollen grains will tend to be be deeper in a soil profile.

Pollen analysis has been used in a variety of archaeological settings, wet and dry, with great success. It has been used to help identify habitation sites, sites deliberately buried, such as old surfaces under earthen mounds; and agricultural features, such as buried field surfaces (Pearsall 1989, summarizing Dimbleby 1985 and Bryant and Holloway 1983). Andersen (1986) also discusses the use of palynology in evaluating soils that have not been disturbed by plowing, citing pastures, woodlands and sites buried beneath archaeological earthworks or dunes.

The processing of the Ocmulgee soil samples for pollen extraction followed procedures detailed in Faegri and Iversen (1989) as modified by Shane (1992). Once all crystalline and other
extraneous material was removed, slides were prepared using silicone oil as a lubricant to allow the particles to float free. Each slide was comprehensively examined under a microscope at a magnification level of 400x, in 1 mm transects. Once identified at 400x magnification, pollen grains were examined at 1000x magnification to record surface texturing. An attempt was made to identify all cultigen pollen (goosefoot, holly, squash/pumpkin, etc.), although the primary focus was the identification of maize pollen.

Two slides were prepared from the sediments at a depth of 102-130 cmbs. This level contained very little pollen and what was present was extremely degraded. Pine was identified, as were several grains of grass pollen. Two slides were examined from a depth of 130-145 cmbs. Pine pollen was again identified, but all pollen from this level was extremely degraded. Two slides were examined for the level directly beneath the “cornfield,” and pollen was present but highly degraded. Pollen in this sample represents both tree (pine) and grass species.

Twenty slides were examined from the base of the mound (145-165 cmbs level). Pollen preservation was poor with grain density averaging only 3 grains per slide. Pollen grains were identified from *Pinus* (pine) and a variety of unidentifiable grasses. Grass pollen was relatively ubiquitous, with a minimum of 40 individual grains being identified in the twenty slides. These preserved pollen grains maintained their characteristic circular shape and, on most grains, the single pore was clearly visible. The grass pollen grains ranged in size from 20 to 80 microns. These pollen grains also closely resemble grains of *Zea mays* pollen, except that they are significantly smaller than the average size range for corn pollen. Only the definitively identifiable pollen grains were recorded.

Three slides from the modern cornfield soils were examined. Pollen from *Pinus* (pine) and various grasses were identified, as were several *Zea mays* grains.

All factors leading up to processing of the Mound D sediments indicated that pollen preservation could be expected. However, the extremely low density and the severely degraded pollen grains indicate that, despite all expectations, pollen preservation in the Mound D soils is very poor. Sample size is not a factor, since the sample sizes for Mound D and the modern field are equivalent.

Grass pollen could indicate that the area had been cleared of trees to such a degree that grasses and weeds were allowed to
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proliferate. While the clearing of trees is often associated with prehistoric agriculture, no further evidence of cultigens was identified. No corn pollen was identified in the Mound D sediments; however, it was present in the sample taken from the modern field. These soils have a high clay content and have been continually supplemented by chemical fertilizers, which probably diminished preservation, as shown by the low pollen grain density. However, corn pollen is present despite these negative factors. Finally, the pollen grains in the Mound D 145-165 cmbs level are not likely to be due to the translocation of pollen through the soil strata, as insufficient numbers of pollen and spores are present in the upper levels.

PHYTOLITHS

Phytoliths are mineral deposits that form in and between plant cells (Rovner 1983). Many plants absorb chemical elements in solution from groundwater, which are then deposited in specific places in the plant (Rovner 1986). Virtually any plant structure can serve as a repository of silica deposition. Phytoliths tend to be liberated and deposited through decay-in-place mechanisms (Dimbleby 1978). Deposition normally occurs through surface or shallow subsurface decomposition of plant tissue; thus phytoliths are incorporated directly into soils. Phytolith production is high in many families of both monocots (which include grasses) and dicots (Piperno 1988; Franceschi and Horner 1980). Mulholland and Rapp (1992) list several families that are well known as consistent accumulators of identifiable silica bodies, including Poaceae or Gramineae (grass), Cyperaceae (sedge), Ulmaceae (elm), Leguminosae (bean), Cucurbitaceae (squash). Piperno (1985) has also identified silica in many tropical plant families.

The analysis of phytoliths is a relatively recent addition to archaeobotanical research in the United States (Carbone 1977; Pearsall 1978; Piperno 1984a, b; Robinson 1983). Studies of opaline plant microfossils from excavations have enhanced knowledge of sites where preservation of plant macroremains is poor, and have added support to interpretations based on other plant remains (Piperno 1988; Pearsall 1989). Phytoliths have enormous untapped potential in many areas, including ecological and paleoenvironmental reconstruction (Piperno 1983; Rovner 1983, 1988), as well as paleodietary studies (e.g. Pearsall 1989;
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A major current interest among prehistorians is the utility of phytoliths in demonstrating the presence of domesticated plants in the archaeological record, particularly where macrobotanical remains are rare. Phytoliths tend to be sensitive to the earliest small-scale introduction of agriculture. Studies include the identification of such cultigens as maize (Pearsall 1978; Piperno 1984a), rice (Fijiwara et al. 1985), and various Old World cereals (Helbaek 1961; Rosen 1987), as well as the identification of field surfaces (Pearsall and Trimble 1984) and prehistoric irrigation systems (Rosen 1987).

Under favorable normal conditions phytoliths can survive for long periods of time (Rovner 1988). They have even been found in Paleocene sedimentary rocks 60 million years old (Jones 1964). Their usefulness as a paleoecological tool depends in part on their stability in soil environments. Rovner (1986; see also Piperno 1988) sums up the case for phytolith stability by stating that “vertical movement cannot be ignored, but it is a non-issue warranting no special attention. It is certainly no invalidation of phytolith analysis in archaeology.” Phytolith preservation will vary according to the chemical and physical nature of the environment, as well as the particular taxon that has left silicified remains (Piperno 1988). Some of the factors that influence the rate of solid silica dissolution are: iron and aluminum absorbed into the silica surfaces, protecting them from dissolution; phytolith surface area, as the greater the surface area, the more rapid the dissolution; and the presence of occluded carbon, which also retards dissolution of the phytoliths (Piperno 1988). As discussed above, the levels of aluminum and iron in the Macon Plateau field stratum are high, indicating good conditions for the preservation of phytoliths.

Phytoliths are also susceptible to dissolution under strongly alkaline conditions (Iler 1979). Soil pH values of 9 and above tend to accelerate dissolution. Strongly alkaline sediments, such as shell middens, therefore would not be expected to contain many identifiable phytoliths. The pH values obtained for the field stratum are advantageous for phytolith preservation.

Phytoliths often have distinctive shapes, including spherical, circular, conical or hat-shaped, saddle, dumbbell, and cross (Pearsall and Dinan 1992). The kinds of surface ornamentation include: spinulose (regular, evenly distributed pattern of small projections or spinules), nodular (unevenly distributed small
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prominences), rugulose (rugged or rough surface where the presence of spinules or nodules is not clearly evident), smooth (no exterior pattern), irregularly angled or folded, verrucose and tuberculate (denote wart-like projections), stippled, armed (short surficial spines), and nonarmed (Pearsall and Dinan 1992).

Zea mays, one of the most researched plants due to its significance as one of the earliest domesticates, has phytoliths that are often classified as crosses or dumbbells. Cross-shaped phytoliths consist of three or four lobes, each imprinted with several indentations, attached to a central body (Mulholland and Rapp 1992). Dumbbell shapes resemble the dumbbells used in weight-lifting.

As more work on phytolith classifications was done, a consensus emerged that phytoliths within subfamilies were highly redundant and could not be used to identify genera and species, particularly of grasses. This issue is currently being debated by phytolith analysts, including Piperno, Pearsall, and Rovner. Pearsall (1982) and Piperno (1984a) have suggested size parameters for distinguishing Zea mays phytoliths from those of other grasses (family Gramineae). Their method of measurement is based on the short axis width of the cross body phytoliths and the frequency of larger width cross bodies. They suggest Zea mays phytoliths are significantly larger than other non-domesticated grasses and that grass phytoliths can be identified below the family level (Piperno 1988; Pearsall 1978; 1982).

These criteria were tested by Russ and Rovner (1989), using both teosinte and a number of different varieties of maize. The phytoliths from these control plants were compared with those from wild grasses. Russ and Rovner concluded that phytolith size distinctions are genetic rather than environmentally determined, and that the parameters suggested by Pearsall and Piperno have some validity; however, they continue to advocate caution (Rovner 1997, personal communication). Even Piperno (1988) advises that corn, even when present, may not be distinguishable from wild grasses, because of decay of wild cross-body phytoliths resulting in a skewed species ratio, contributions by related species with smaller cross bodies or lower percentages of mirror image structures, and skewing due to husk, tassel, or ear decay.

Separation of phytoliths from sediments involves clay removal and heavy liquid separation. If carbonates are present, acids may be necessary to release phytoliths from the sediment matrix. The
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method of extraction used for this project was that designed by Rovner and summarized by Owens (1997).

Following processing, sample slides were prepared. Examination of each slide was conducted in 1 mm linear transects with a magnification level of 400x. As the primary goal of this study was to identify maize remains, only panicoid grass phytoliths were recorded. As each phytolith was observed, it was assigned to one of Pearsall's variants (1989:318-319).

Careful examination of samples from selected strata of Core #1 resulted in the identification of four of Pearsall's panicoid variants. Soil samples from the "corn field" level contained thick shanked crosses, long shanked dumbbells, short shanked dumbbells, and spiny shanked dumbbells. Figure 8 is an example of a phytolith from the possible field level. No panicoid grass phytoliths were identified from other strata in Core #1, including the subsoil layer beneath the mound fill.

Figure 8. Saddle-shaped phytolith from Core #1.

An attempt was made to use Piperno and Pearsall's procedures for identifying corn phytoliths to species. Measurements were taken of all cross bodies and dumbbells. Cross bodies ranged from 2.0 to 2.4 microns in width and 7.0 to 7.2 microns in length. Dumbbell phytoliths ranged from 7.2 to 12.0 microns in width and 7.2 to 14.4 microns in length. Unfortunately, the number of cross body phytoliths was not an adequate sample. The frequency ratio of cross bodies to dumbbells was 1:3. Saddle shaped phytoliths were by far the most ubiquitous, with a ratio of 4:1 to cross bodies and
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dumbbells. Flat towers, rectangular, and elongated phytoliths were also identified but were not quantified.

The panicoid grass phytoliths in Core #1 confirm the presence of panicoid grasses at Mound D, but only in the 145-165 cmbs strata. Corn is a panicoid grass and, as such, could possibly have been the bearer of the phytoliths at the base of the mound. However, the crossbodied and dumbbell shaped phytoliths are also associated with non-corn grasses. In addition, the ubiquity of saddle-shaped phytoliths, which are generally associated with chloridoid rather than panicoid grasses, suggests that there is a higher likelihood that wild grasses were growing here prior to the construction of Mound D.

SUMMARY AND CONCLUSIONS

This study provides data on the sedimentology of the Ocmulgee “cornfield” mound (Mound D). The specific scope of the study was to evaluate the idea the mound was built on a cornfield.

Chemical analysis indicated that the soils located beneath the mound fill could have been used in agricultural activities and that the soil elements were favorable for the preservation of botanical microfossils. The particle size analysis provided data on sediment texture and highlighted a significant rise in the percentage of sand in the soils beneath the Mound D fill. The particle size analysis suggests that downward percolation was insufficient to have significantly contaminated the microfossils beneath the mound fill.

Pollen was present in the soils located beneath Mound D (145-165 cmbs), albeit in small amounts. However, the pollen grains identified represent only pine trees and unidentifiable grasses. The grass pollen does resemble Zea mays pollen grains in physical characteristics, but differs significantly in grain size. The soils from below the mound fill contain variants of both chloridoid and panicoid grass phytoliths, but the size of the possible panicoid variants did not meet expectations for corn.

Table 1 presents a comparison of the analytical results obtained from the modern day cornfield and the Mound D soils, specifically those A. R. Kelly called the cornfield. The modern field soils contain a significantly larger percentage of clay than do those recovered from beneath the mound fill. Soil chemistry corresponds more closely. This is particularly true when comparing the elemental values between the other levels of the Core #1 soils and
Table 1. Comparison Of Analytical Results Obtained From Modern Corn Field and Mound D (145-165 cmbs) Soils.

<table>
<thead>
<tr>
<th>Sample</th>
<th>% Sand</th>
<th>Selected Chemistry Results</th>
<th>Stable Isotopes</th>
<th>Potential for Microbotanical Preservation</th>
<th>Zea mays pollen present</th>
<th>Zea mays phytoliths present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modern Field</td>
<td>0-25 cmbs 62.42% 25-30 cmbs 74.72%</td>
<td>0-25 cmbs Al 5.8% Ca 0.12 Fe 1.83 K 0.71 Mg 0.12 Ni 14 P 800</td>
<td>0-25 cmbs $\delta^{13}$C -21.6 and -21.63 $\delta^{15}$N 7.00 and 7.06</td>
<td>moderate</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Mound D, Core #1</td>
<td>145-165 cmbs 80.23%</td>
<td>145-165 cmbs Al 3.54% Ca 0.43 Fe 1.65 K 0.93 Mg 0.25 Ni 11 P 250</td>
<td>145-165 cmbs $\delta^{13}$C -23.04 and -22.91 $\delta^{15}$N 6.04 and 6.07</td>
<td>moderate</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

*continuously supplemented
the modern field soils. Stable isotope analysis did not provide conclusive data for the cultivation of C4 plants, such as corn, in the modern field soils. The mound soils reflect stable isotope values at the extreme end of the range expected for the growth of C3 plants, again providing inconclusive data regarding the growth of corn. Both corn pollen and phytoliths were identified in the modern corn field soils. Neither were identified in the mound soils.

While not entirely conclusive, the evaluation of soils from a modern corn field provides a framework for the identification of prehistoric agricultural fields. The values for the modern field can be used to advance expectations for hypothesized prehistoric agricultural fields. Such criteria would include morphological features consistent with organized planting (e.g. rows/furrows, mounds); high sand content; high values of aluminum, calcium, iron, potassium, magnesium, and nickel, and low values of phosphorus; δ13C values above -22 for C4 plants only and below -22 for C3 plants; and cultigen pollen and phytoliths (under conditions amenable to preservation).

The soils beneath Mound D, Kelly’s “cornfield,” meet several of these criteria for an agricultural field. Morphologically, they are similar to other fields for which agricultural production has been confirmed, such as the fields identified at the Cerén site. The percent of sand size particles peaks in the possible field level. The chemical signature of the Mound D field level resembles that of the modern field soils, with certain variations due to fertilization in the modern field. The stable isotope values for carbon in the Mound D field level sediments are very similar to those obtained from the modern field sediments. This combination of factors supports the hypothesis that Mound D was constructed on top of a field.

All factors described above are consistent with the in situ preservation of pollen and phytoliths in the Mound D field sediments. However, no preserved corn pollen or phytoliths were identified. The botanical microfossils identified were from trees and non-cultigen grasses. Corn pollen in the modern field suggests that the size of sample taken from beneath Mound D was sufficient to encounter pollen if it were present. No other cultigen pollen was identified. Thus the species grown in the Mound D field have not been determined. It cannot be concluded that the field was a cornfield, nor can its identity as a cornfield be ruled out. While the species grown beneath Ocmulgee Mound D cannot be determined, the rows and furrows noted by A.R. Kelly may have been an
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agricultural field.

In addition to exploring the viability of the "cornfield" theory, this study has provided comparative data for future identification of prehistoric fields (particularly corn fields), based on a modern day equivalent. It has also highlighted the value of both pollen and phytolith research, when preservation of other microbotanicals is poor. Although more work is needed in identification procedures for phytoliths, this is a useful tool in ethnobotanical research.

While intuitive interpretations of visible ground surface features is a first step, this research has sought to provide further scientific tests for such interpretations. It is hoped that researchers will more fully employ the wide variety of soil analyses available to explore and examine ideas about past lifeways.

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The Vining Phase in central Georgia is an old idea (Kelly 1938) that has new life as a result of more recent excavations in the Oconee National Forest. It was defined as a simple-stamped ceramic complex, an idea that was rejected at the time. Recent excavations suggest that sites with simple stamped pottery and small triangular points located on ridgetops in central Georgia belong to Vining (Elliott and Wynn 1991); it appears to be a Late Woodland-Early Mississippian transitional phase. Four Vining phase sites, Guthrie, Passport, Fant-Davis and Elliott, were excavated between 1988 and 1996. Here we summarize what is known about the Vining phase thus far, describe the results of these modern excavations, and discuss future research directions. This paper is based on the Summary Report (Meyers et al. 1997).

ENVIRONMENT

The four sites discussed here are located in the Piedmont, in the western portion of Putnam County, on the Washington Plateau (Wharton 1989). Putnam County is near the geographical center of the state and along the southern border of the Piedmont Plateau.
Vining

is drained by two major streams, the Oconee and the Little River. Soils in the project area belong to the Davidson Association (USDA 1965), found on broad ridgetops and small, severely eroded areas. Much of the lower Piedmont of Georgia, particularly in the Oconee National Forest, has these broad ridges of Davidson soils, and most are heavily eroded.

VINING PHASE ARCHAEOLOGICAL HISTORY

The Vining ceramic complex was first defined by A.R. Kelly in 1938. Based on his excavations in Putnam county at the Vining site near Rock Eagle, as well as at other sites located in the area, Kelly identified a simple stamped ceramic type. This type was not accepted at the time; rather, it was subsumed into the Mossy Oak complex (Fairbanks 1952). Mossy Oak is considered an antecedent to Swift Creek complicated stamped and as such dates to the Middle Woodland period. However, despite analysis and re-analysis (Stoutamire et. al. 1977), the chronology of the Mossy Oak complex and variations in simple stamped ceramics have not been definitively established.

This part of central Georgia was not intensively investigated again until the late 1970s during the Wallace Reservoir project (DePratter 1976). At that time 3,000 sites were identified in the area; of these, 151 contained simple stamped ceramics. It is not possible to determine which, if any, of these sites belong to the Vining phase without reanalyzing the data; however, it is probable that not all of the sites date to Early and/or Middle Woodland, as originally presumed. Of these 151 sites, 115 also contained Mississippian period ceramics; of these, 19 had small triangular points, and 17 contained podal supports. In addition, 16 sites contained major simple stamped components, and 6 of these sites also contained small triangular points (Elliott and Wynn 1991).

In 1988 in the upper Piedmont in the Richard B. Russell Reservoir, plain and simple stamped pottery with small triangular points was noted by David Anderson (1988) and termed “Late Cartersville.” Eight radiocarbon dates range from A.D. 810-1180, securing the plain and simple stamped pottery in the Late Woodland to Early Mississippian. Excavations at the Shinholser Mound near Milledgeville, in the southern Oconee Province (Williams 1990) recovered an abundance of simple stamped pottery with small triangular points from pre-mound Savannah phase levels. Simple
stamped sherds associated with a small triangular point were found in the premound layer at Scull Shoals, on the Oconee River north of Greensboro. Simple stamped ceramics assigned to the Santee Period in South Carolina date to AD 810-1340. Anderson (1985, 1989) has argued for a Late Woodland period in this area marked by plain, simple stamped, and brushed ceramics.

Surveys of the Oconee National Forest conducted from 1988-1990 (Elliott and Wynn 1991) revealed potential Vining phase sites. Of 4,500 acres surveyed, nine sites with simple stamped pottery were located. Characteristics of these sites include locations in upland areas, an average of 1.4 km from a permanent water source, and size of 1-2 acres. The sites are clustered near the corner of Jasper, Jones and Putnam counties and in the Vining Farm area, near Rock Eagle, Putnam County. Ceramic artifacts from these nine sites include 653 sherds, of which 66% were simple stamped and 32% were plain. In addition, very small percentages of incised, simple stamped with incised, check stamped, rectilinear complicated stamped, Napier and Lamar sherds were also recovered. Curvilinear design elements and podal supports were absent from the sample. Lithic artifacts included small triangular points from several sites (Elliott and Wynn 1991).

The most extensive excavations are those by Worth and Duke (1991) and Worth (1996). Hogcrawl Creek (9DY15) is on the modern floodplain of the Middle Flint River, at the mouth of Hogcrawl Creek. This site was tested in 1988 and results indicated that a midden deposit extended over 70 m along the length of the levee, at a depth of 60 cm. No pits or other features were identified. Diagnostic artifacts included plain, simple stamped, and incised sherds, and small triangular projectile points. According to Worth and Duke, "it is clear that these triangulars occur in direct association with the plain, simple stamped and incised ceramic complex" (1991:32). The authors noted the similarity of the collection to the Averett phase, on the Chattahoochee River south of the Fall Line, and to the Vining phase. Overall, Hogcrawl is closer to Vining than to Averett, due to the incised decoration overstamping; however, the site appears to be a combination of ceramics from both sides of the Flint River. It is neither purely Vining nor purely Averett.

In 1996, Worth reported on excavations at Raccoon Ridge, a large multicomponent site in the inter-riverine Piedmont uplands west of the Oconee River. Simple stamped ceramics and small triangular projectile points were found across the entire site, making
Vining

Raccoon Ridge one of the northernmost large Vining sites in the Oconee area, and the only one close to mound centers. Most importantly, Worth found the remains of a small residential Vining structure. Although no Vining pottery was found in any of the structure’s postholes, Vining sherds were the only sherds other than Lamar recovered in the plowzone above the structure. Radiocarbon and OCR dates were obtained for the structure, and indicate AD 950-1150 as the period of occupation. Worth suggests that Raccoon Ridge was a village with a comparatively large population, and it was possibly a sociopolitical boundary for this area (Worth 1996).

In 1988 Dea Mozingo studied subsistence data from Vining and Lamar features at the Raccoon Ridge site. Mozingo found a small quantity of maize in one Vining feature, compared to a substantial quantity from the Lamar features. The Vining storage pits were small and shallow compared to the Lamar pits. Mozingo suggests that the small size and low number of Vining pits, coupled with the small quantity of maize recovered from them, is a result of a heavy reliance on wild taxa.

During 1990-1993, cultural resource surveys in the Oconee National Forest isolated seven additional potential Vining sites in Putnam and Jasper counties. On the basis of these Oconee National Forest surveys, as well as extensive Phase II testing on four sites in the survey area, Elliott and Wynn (1991) proposed a revival of Kelly’s 1938 Vining Simple Stamped ceramic type, dating to the transitional Late Woodland/Early Mississippian period.

VINING CHARACTERISTICS

Vining’s area of concentration is the central Georgia Piedmont’s Oconee and Ocmulgee River drainages (Elliott and Wynn 1991). It is likely not limited to this area, however, and may occur as far northeast as Camden, Mattassee Lake, and Tyger Village in South Carolina, Rucker’s Bottom at Lake Russell, and west to the Flint River (Elliott, personal communication 1995). Simple stamped pottery alone does not indicate a Vining site. Cane Island (9PM209) has simple stamped ceramics that date to the Woodland period (Wood 1981). Vining sites have simple stamped and plain pottery with small Mississippian triangular points. Sites are large, dense, and located on ridgetops near springs but distant from permanent water sources.
Vining pottery is primarily simple stamped, often overstamped (stamping over the original decoration with a different orientation). Alternately, the decoration could be a simple stamping with cords wrapped first horizontally around a paddle, then crossed over to hold the other in place (Williams, personal communication 1990). Stamped lines include narrow and wide-band with overlapping sub-types. Distances between grooves range from 2 mm—5 mm (Wynn, Bruce, and Certain 1990). Most of the vessel surface is decorated, excluding the bases. Rims are nearly straight to slightly everted and not specifically decorated, though some rims show notching on the vessel lip. A few vessels have a single, broad incised line below the rim. Podal supports are generally not present. Small (0.5-1.5 cm) Mississippian triangular points are found on 20-30% of the Vining sites (Elliott and Wynn 1991).

Based on these artifacts and the dates from Raccoon Ridge, Vining is a Late Woodland/Early Mississippian transitional phase, perhaps contemporaneous with Late Napier, Woodstock, and Etowah. Elliott and Wynn (1991) have suggested a probable range of AD 800-1200, and possibly AD 950-1150 for Vining.

Settlement patterns, subsistence strategies, and mortuary behavior are largely unknown. No mounds are associated with Vining sites. Though likely influenced by the Etowah chiefdom in northwestern Georgia, Vining sites do not appear to have been under the political control of Etowah. Etowah outposts in the Vining area do exist and include Cold Springs and Bull Tongue Island (Wood 1981). Sites such as these likely acted as controls of floodplains and shoals, leaving other areas such as ridgetops available for Vining settlements. If Vining is separate from the Etowah chiefdom, it is unclear what happened to it. The simple stamped pottery disappears from the archaeological record during the Savannah phase.

FOREST SERVICE VINING EXCAVATIONS

The Forest Service undertook excavation of four previously identified Vining sites. These four sites include the Guthrie site, 9PM1043, tested in 1988 by the Georgia Mountains Archaeological Society; the Passport site, 9PM830, investigated by Passport in Time in 1990; the Fant-Davis site, 9PM847, investigated by Passport in Time in 1991; and the Elliott site, 9PM755, investigated by Passport in Time in 1995 and 1996.
GUTHRIE SITE (9PM1043)

Guthrie was discovered after a logging episode in northern Putnam County in the spring of 1988. It was reported to Jack Wynn, Chattahoochee-Oconee Forest Archaeologist, by Forest Service Wildlife Technician William Guthrie, for whom it was named. The site is located on a broad, nearly level ridge, extending southeast toward a tributary of Glady Creek about 200 m from the site. There may have been a spring in a slight drainage about 100 m southwest of the site, there is no permanent water now.

The Forest Service archaeologist conducted a surface survey, finding simple stamped and plain ceramics, and the site was assumed to date to the Woodland period. Its upland setting, unusual for Woodland sites, was noted. It is approximately 120 m by 85 m in size, covering the entire ridgetop.

Following these surface collections, the site was shovel-tested at several spots. One shovel test recovered several sherds on the southeast side of the ridge, of which one was simple-stamped. A third surface collection produced more sherds, and quartz and chert flakes. Following shovel testing, two 1x1 m, two 2x2 m and two 2x4 m test units were placed on the ridgetop. Units were placed in a high density area previously determined by the multiple surface collections and limited shovel testing. Of the 2x2 m units, a total of 99 sherds was recovered from the upper 10 cm. Of these, 8 were simple stamped. Other ceramic types included plain and indeterminate. Punctated and folded rim decorations were evident on some sherds. One chert triangular point, three bifaces, three unifacial tools, sixteen quartz flakes, and one chert flake were also recovered. Artifact frequencies decreased after 10 cm. No features were located in either unit. The two 2x4 m units produced 64 sherds. Of these, 7 were simple stamped, 2 were rectilinear stamped, 7 were indeterminate and 26 were plain, including one rim sherd. In addition, two bifaces, two chert flakes, eleven quartz flakes and a broken cobble with worked facets were also recovered. Artifact frequencies also decreased here after 10 cm.

Further excavation occurred 17 months after the initial test unit excavations. At that time, the site was revisited by Forest Service archaeologists and Georgia Mountain Archaeology Society (GMAS) volunteers. Recent plowing uncovered two small clusters of sherds in the middle of the ridge. A surface survey of the broad area of the ridgetop recovered a small Mississippian triangular
point. Two 1x1 m units were excavated at this time. Feature 1, a pit, was located in one of the units. It contained a large number of sherds, apparently from multiple vessels that appeared to have been broken prior to deposition. The pit was small, and measured approximately 13 cm wide, 25 cm long, and 20 cm deep. The second test unit contained sherds and quartz flakes, but no features.

The Guthrie site has been heavily damaged through the years, making temporal and cultural identification difficult. The lack of multiple discernible features added to this difficulty. However, the excavations did recover diagnostic elements of Vining, that is, simple stamped pottery, small Mississippian triangular points, and location on a broad level ridge more than 100 m from water. The one feature suggests that others may be present. Large sherds were recovered from possibly multiple vessels, which appear to have been broken before deposition. The feature and artifacts suggest a semi-permanent campsite. The Guthrie site should be reexamined and more extensively excavated.

PASSPORT SITE (9PM830)

The Passport site is located in Putnam County in the central Piedmont. It was identified during a cultural resource survey conducted by Steve Webb and Beth Gantt in 1989 (Webb 1990). The site encompassed a surface and plowzone scatter 260 m long and 40 m wide. Artifacts from the initial survey included simple stamped sand-tempered sherds and lithic materials. It was identified by Webb and Gantt as a Late Woodland semi-permanent camp or farmstead, and further testing was recommended. The site is 1 ha, located on a broad ridgetop, near two intermittent streams, but more than one km from a permanent stream.

The site was chosen for the first PIT project in Georgia. PIT is run by the National Forest Service and allows the public to participate in archaeological excavations in national forests across the country. A 25-m interval grid was cut across the northern half of the site. Thirty-one 50-cm test units were dug at the grid intersections. Preliminary artifact counts showed high density areas in the center and northeastern sections, and a possible third high density area located between the north and center areas. These determined the placement of larger test units.

In the central high density area five contiguous 2x2 m test units were excavated (TU 101, 102, 103, 104, and 105). Four
Vining

features were located, one in TU 101, and three in TU 102. A second locus was examined with two units in the northeastern portion, located 25 m apart. A 1x1 m unit was placed between the north and central units.

A total area of 18 sq. m was opened in the central locus. Test units contained between 200 and 400 artifacts. No features were found in this area. One 2x2-m unit was placed nearby, and over 150 artifacts were recovered, including four small Mississippian triangular points.

Five features were found, all probably post molds detected just below the plow zone. When plotted they indicate a possible house structure. If circular, such a house would have a diameter of 5.5 m, and a floor area of about 95 sq. m. The projected center of the arc was unable to be investigated further because it was disturbed by a large pine tree. Overall, this area contained a large quantity of pottery and other artifacts and indicates an activity area.

Over 3,100 artifacts were recovered at Passport. Of the 2,892 sherds, 57% were plain, 30% were simple stamped, and 13% were simple overstamped. Lithics included seven small Mississippian triangular projectile points, scrapers, and unifacial blades.

Passport, though not as thoroughly excavated as the Fant-Davis and Elliott sites (see below) due to time and labor constraints, appears to be a single component Vining site. It has many simple stamped sherds and triangular projectile points. This site has one of the highest sherd counts of any Vining site excavated thus far; over 2,800 sherds and almost 200 lithic artifacts were recovered. Five postmolds suggest a possible round or oval structure, but without more data, this can only be conjecture. Given the findings by Worth (1996) at nearby Raccoon Ridge though, it seems likely. The site appears to be a single-component household or small village. No information was gained on Vining subsistence or broad settlement patterns.

Compared to the Guthrie site, Passport appears to be a much smaller settlement and possibly was not even occupied year-round, but zooarchaeological and botanical evidence is lacking.

FANT-DAVIS SITE (9PM847)

The Fant-Davis site was discovered by seasonal archaeological contractors David Fant and Dave Davis during a cultural resources survey (Fant and Davis 1989). It is located on a broad ridgetop in
northern Putnam County, near the original Vining site, and measures 91x137 m. The ridge is drained by two ephemeral streams. The survey by Fant and Davis included shovel testing and surface collection of a fire break on the northwest side of the site. Artifacts included 33 plain sherds, 26 indeterminate sherds, 11 simple stamped sherds, one indeterminate stamped sherd, and one incised sherd. In addition, one quartz Madison point, chert and quartz secondary flakes, and quartzite chunk/shatter were also recovered.

This site was the location of the 1991 Passport in Time project. A 10-m grid was laid out across the site and a backhoe was used to dig a series of trenches through the plow zone. Trench location was based on 1989 artifact information. Eighteen trenches were excavated. All units were approximately 10 m long and 2-3 m wide, with the exception of the first unit, which was 20 m long. Units were shovel skimmed for excavation, in three or four 2.5 x 2 m quadrants. Two additional units were located near original units after backhoe operations had ceased.

Ten cultural features were uncovered at this site (Table 1). In particular, Excavation Unit 15 contained two pits, three postmolds, and two small rock clusters. The depths and shapes among the postmolds differ, suggesting different functions. Features 4 and 7 may represent structural posts, while Feature 1 may represent the base of a shallow post. The nearby rock clusters did not show any evidence of firing or cultural modification.

Table 1. Features Uncovered at the Fant-Davis Site (9PM847).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Type</th>
<th>Diameter</th>
<th>Depth</th>
<th>Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pit</td>
<td>25 cm</td>
<td>10 cm</td>
<td>2 small daub fragments</td>
</tr>
<tr>
<td>2</td>
<td>pit</td>
<td>—</td>
<td>—</td>
<td>burned roots, possible daub</td>
</tr>
<tr>
<td>4</td>
<td>postmold</td>
<td>18 cm</td>
<td>51 cm</td>
<td>one sherd, quartz chunks</td>
</tr>
<tr>
<td>5</td>
<td>rock cluster</td>
<td>—</td>
<td>—</td>
<td>no artifacts associated</td>
</tr>
<tr>
<td>6</td>
<td>rock cluster</td>
<td>—</td>
<td>—</td>
<td>no artifacts associated</td>
</tr>
<tr>
<td>7</td>
<td>postmold</td>
<td>12 cm</td>
<td>33 cm</td>
<td>none</td>
</tr>
<tr>
<td>8</td>
<td>postmold</td>
<td>18 cm</td>
<td>30 cm</td>
<td>charcoal chunks</td>
</tr>
<tr>
<td>9</td>
<td>postmold</td>
<td>12 cm</td>
<td>29 cm</td>
<td>none</td>
</tr>
<tr>
<td>11</td>
<td>possible hearth</td>
<td>—</td>
<td>—</td>
<td>daub fragments, sherds, flakes</td>
</tr>
<tr>
<td>17</td>
<td>dark stain</td>
<td>—</td>
<td>—</td>
<td>daub fragments</td>
</tr>
</tbody>
</table>
Although no features were located in other units, XU 21 merits discussion. During excavation, proton magnetometer readings were taken of several portions of the site. In the north central portion of the site, near XU-13, a subsurface anomaly was detected which measured 80 cm long and 40 cm wide. A 3x3 m unit, labeled XU21, was opened here. Level 1 contained approximately 1,085 sherds, of which 20% were simple stamped and 80% were plain. In addition, nine daub fragments, 65 flakes, and six points or point fragments were recovered as well. Artifact counts decreased in Level 2; 262 sherds and two points were recovered from this level. Level 3 contained 261 sherds, including 17 pieces of a single pot, and three points. The majority of sherds recovered from this unit were small and weathered. The high frequency of sherds may have been the result of post depositional erosion. This unit may have also been the location of a trash pit, indicated by the subsurface anomaly. In addition, it is worth noting that a small, triangular Mississippian point was recovered in association with a simple stamped sherd from XU 7.

Approximately 2,300 sherds were recovered during this excavation. Of these, 950 were plain and 131 were simple stamped (Figure 1). One check stamped sherd was recovered. Seventeen sherds from the northern portion of the site were cross-mended and appear to be fragments of a single pot. Five rims were identified: three plain, one decorated, and one rolled. Other ceramic artifacts include fired clay and daub fragments. Lithic artifacts include quartz and chert bifaces, quartz and chert flakes, one quartz Mississippian point and one Archaic point.

The trench excavation technique allowed for the first time a view of possible Vining settlement patterns, albeit in a small area. The remains suggest a small farmstead or possibly multiple households. Three postmolds, Features 1, 4 and 7, uncovered in XU-15 suggests a structure. Another postmold, Feature 17, in XU-14 suggests an additional structure. Both XU-14 and XU-15 are located in the north/northwestern portion of the site. In addition, some daub and fired clay fragments were recovered from the south and southwestern portions of the site, suggesting that more structures may have existed there, and subsequent traces of them have eroded away. Excavation trenches located in the center and especially north center of the site produced large amounts of sherds, including seventeen pieces of a single pot.
Figure 1. Vining sherds from the Font-Davis site.
It appears that multiple households were arranged along a north/south axis. Artifacts from other excavation units, occurring in low quantities, are likely the result of erosion from the center trash pile. One check-stamped sherd and one rolled rim suggest some interaction with other groups outside the immediate region.

These results are quite preliminary. Understanding of Vining settlement patterns requires full-scale excavations of a site like Fant-Davis. The site is potentially eligible for the National Register of Historic Places, but additional excavations are needed.

**ELLIOTT SITE (9PM755): 1995 EXCAVATIONS**

The Elliott site is in southwestern Putnam County. Dan Elliott first recorded it during a routine contract survey of Putnam County for the Forest Service (Elliott 1989). Site 9PM755 was actually just beyond the bounds of the survey; Elliott noted a possible midden apparent from a road cut, and simple stamped pottery. The Georgia Mountain Archaeology Society conducted initial testing in 1994, with shovel tests and surface collecting, and found simple stamped pottery with small, triangular projectile points.

Excavations were initiated to ask if a more precise chronology could be obtained, and if more could be learned about subsistence, settlement patterns, material culture, and archaeological remains. A grid was established for shovel tests and 1x1 m test units; shovel tests were excavated at five-m intervals. Test units were laid out in a checkerboard on the north end of the site. Seventy-four shovel tests and nine 1x1 m units were excavated in 1995. Of the seventy-five shovel tests, almost all (96%) were positive. Of the 774 artifacts recovered, 93% (721) were ceramic and 7% (53) were chipped stone. Shovel tests allowed site boundaries to be defined and revealed a possible midden in the northwestern portion of the tested area, based on the heavy concentration of artifacts.

Units N319/E279, N318/E275, N314/E279 and N315/E274, in the northwestern section of the site, contained artifacts but no features. The midden was discernible from the surface to an approximate depth of 20 cmbs. One diagnostic lithic, a small triangular chert projectile point, was found in Test Unit N314/E279, close to the center of the midden. A hammerstone was found in Test Unit N315/E274.

Units N311/E274, N309/E275, N306/E276 and N306/E274 were located in the north central site area. No features were present.
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in these units, although charcoal and numerous large pieces of fired clay, or daub, were present in all cultural levels in these units. One bifacial tool was located in N309/E275 and one small projectile point was located in Level 2 of N311/E274.

The southernmost portion of the site was located in N301/E275. No features were located in this unit, although a small triangular reddish chert projectile point was recovered here. No architectural remains were encountered in any of the test units, and no pits or other features were identified.

A total of 3,036 sherds were recovered from seventy-five shovel test and nine test units (Figure 2). Of these, 774 were from shovel tests and 2,262 were from units. In the shovel tests, 71% were plain, 25% were simple stamped, and 4% were simple overstamped. In test units, 40% were plain, 43% were simple stamped, and 17% were simple overstamped. All sherds were grit-tempered, with moderate to abundant large particles and smooth interiors. Because little variation was observed in temper, ceramic artifacts were characterized by surface treatment. The most common surface decoration was a stamped pattern, consisting of parallel to crossing overstamped lines, lightly applied. Rims were either stamped in the same pattern, or were plain. One exception was a sherd with an incised line below a folded rim. Sherds from the test units were generally heavily worn, perhaps from plowing, root action, or the lightly executed surface design. Two undecorated ceramic beads were found in separate test units. These beads were oval, perforated, and both measured 1.5 cm in length.

Lithic artifacts included projectile points, bifacial tools, flakes, and unidentified debris. There were four small chert triangular projectile points. These ranged from 1.5-2.25 cm in length. Three were recovered from units and in levels with plain and simple stamped sherds. A chert Savannah River point came from a shovel test. Other lithics included two bifacial tools (one chert and one quartz), one chert core, and flakes and unidentified debris.

ELLIOTT SITE (9PM755): 1996 EXCAVATIONS

Following the 1995 excavations the Principal Investigator felt that further testing of the Elliott site was warranted. In the 1995 season no features were recorded in the northern quadrant of the site, so the southern half was selected for investigation, to look for features. Recently published data from Raccoon Ridge (discussed
Figure 2. Vining sherds from 1995 excavations at the Elliott site.
earlier) were used as a model for possible structural remains. Goals addressed during the 1996 season included: defining the physical boundaries of the unexcavated part of the site, more clearly defining the Vining phase, and generating new information about Vining settlement patterns and subsistence.

Sixty-four shovel tests were excavated on the south side to determine site boundaries and delineate areas of occupation for further investigation. Six 1x2 m test units, three 2x2 m test units, and with the assistance of a bulldozer, one large block measuring roughly 11x13 m were also excavated (Figure 3). The southern site boundaries were defined. Although the midden continued into the southern half of the site, no features were uncovered.

Ceramics were classified primarily by surface decoration, as only two types of temper, sand and grit, were observed. In shovel tests, 77% of sherds were plain and 23% were simple stamped. In test units, 76% were plain and 23% were simple stamped. Four surface treatments were recorded: plain, simple stamped (Figure 4), complicated stamped, and incised. Several plain and simple stamped sherds exhibited incising, but were categorized as plain. Most sherds had been heavily damaged by plowing, erosion, and weathering, making identification difficult.

The 1996 excavations recovered 671 lithic artifacts. Of these, 22 were projectile points, of which 15 were temporally diagnostic. Points varied in size, shape, material, and completeness. Much of this information was incomplete because the points were broken, making identification of seven projectile points impossible, and identification of the remaining fifteen points tenuous.

Three points are Late Woodland, and nine are Mississippian. Six of these are small triangular points with straight to slightly convex sides and straight to slightly convex/concave bases. Two, both red chert, have one face that is the fracture plane of a flake (bifacial retouching has altered the edges of one). Four points are crystal quartz; two are bifacially worked and two have a fracture plane as one face. Points of this style date to the entire Mississippian period, the earliest dates of which correspond to Vining. Two thin bifacially worked points are tentatively assigned to the Mississippian. One black chert point has straight sides and base. A second crystal quartz point has straight sides and a straight to slightly concave base. A final point is tentatively assigned to the Mississippian based on its shape and size. This quartz point is quite small, nearly triangular, with a concave base and convex sides.

50
Figure 3. Passport in Time volunteers and teachers at the Elliott site, 1996.
Figure 4. Vining sherds from 1996 excavations at the Elliott site.
Vining

It is notable that such a wide range of Woodland and Mississippian points would be found in association with one pottery type assemblage, i.e. simple stamped and plain. Based on the date ranges for the Woodland and Mississippian projectile points, the site has an occupational span of A.D. 300-1600. The earlier Middle Woodland points may represent cultural hold-overs or later adoption of this style in middle Georgia.

The Elliott site contained simple stamped pottery in direct association with small triangular chert projectile points, and appears to be a single-component Vining site. It is located on a ridge top at some distance from water. This site certainly contains a midden; however, no structural features were found. The Elliott site was probably quite small and may be the remains of a single homestead; however, the size and depth of the midden suggests that if it was a homestead site of one or two structures, these structures had been occupied for quite some time. Kowalewski and Williams' (1989) reanalysis of the Carroll site, approximately 30 miles away, suggests that long-term homestead occupation was not uncommon in this area. Although Carroll dates to the Mississippian period, Kowalewski and Williams suggest that it had been occupied for multiple generations. Perhaps this long-term occupation of small sites in the Mississippian period has a precedent in the Late Woodland. It is possible that at some sites this occupation would not have ceased, that is, occupation would have continued uninterrupted into the beginning of the Mississippian period. Such an occurrence should be recognizable in material culture, supporting the idea that Vining was a transitional phase.

The Elliott site was likely occupied into the Early Mississippian and it appears to have been abandoned before intensive Mississippian occupation in the Oconee River Valley. The site's inhabitants may have been pressured to leave their location and relocate within the local chiefdom boundaries. These pressures may have been both internal, such as from the chiefly hierarchy, or external, perhaps for defense. Indeed, the site may be located in what Anderson (1994) terms a buffer zone, a contested area between chiefdoms on the Oconee River and the Ocmulgee River. Whatever the reason, the site was abandoned by the end of the Early Mississippian period, and not reoccupied until historic times.

The Elliott site is another example of the variation exhibited at Vining sites. Although most of the sites excavated thus far are small, they appear to vary in size and number of structures. The site
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is also an example of variability in length of occupation. Perhaps sites like Guthrie, Passport, and Fant-Davis were not occupied for long periods of time, whereas the Elliott site gives an indication that some Vining sites were occupied for extended time periods, possibly into the beginning of the Mississippian period.

CONCLUSIONS

The Vining Phase, as first proposed during the 1930s by Kelly, has never been used by archaeologists in Georgia; the recent excavations discussed in this paper demonstrate that it is present in central Georgia. It is recognized by simple stamped pottery and small Mississippian triangular points. Vining sites tend to be located on ridgetops. They are small, consisting of a few structures at most, located some distance from a permanent water source.

The Guthrie site is heavily damaged and lacks discernible features, but has the remains of a semi-permanent occupation. Guthrie needs to be more fully investigated.

The Passport site has the highest sherd densities of all four sites reported here. A possible structural feature was recovered. It may represent a single-component household, possibly part of a larger settlement. This site is not large, and may not have even been occupied year-round.

Fant-Davis appears to include an occupation of three small households with their associated trash disposal area. The trench excavation technique used at Fant-Davis was ideal for recovering these patterns, and could prove useful at future Vining sites.

Finally, the Elliott site has a midden but lacks structural remains. It is not a large occupational area, but it may have been a homestead whose features have eroded away. The size and depth of the midden indicate that it was occupied for a long period of time. The Elliott site is similar to Carroll, a long-term Mississippian occupation, perhaps suggesting that upland settlement in the Georgia Piedmont began in the Late Woodland and carried over into Early Mississippian times. This site was abandoned after Vining, possibly due to pressures from expanding chiefdoms. The Elliott site suggests variability in size and structure of Vining sites.

These four sites further define Kelly’s original Vining phase. The settlements are small, likely households or a community of households, with little evidence of hierarchical organization. Intensive corn agriculture was not practiced, although some
horticulture was probably practiced. Vining populations had some interaction with other groups, as evidenced by the variety of ceramics. Variation in settlement patterns during the Vining phase exists. Some sites appear to be single households, while others are larger, with more of a community evident.

Much research remains to be done. Little is known about subsistence patterns, since few intact deposits of zooarchaeological or botanical remains have been recovered. Although Vining subsistence is probably similar to a Late Woodland type, more specific information could shed light on the transition from horticulture to full-scale agriculture, or the lack of such a transition in some areas during the Mississippian. Although this preliminary work suggests that Vining was transitional between Late Woodland and Mississippian, the remote, ridgetop locations suggest limited interaction with surrounding Mississippian cultures. More radiocarbon dates are needed. It should be noted that some techniques appear more suited for Vining sites, namely trench excavation.

ACKNOWLEDGEMENTS

The Chattahoochee-Oconee National Forest provided the resources for these sites to be excavated, many as part of Passport in Time programs. In particular, the work of dozens of PIT volunteers who excavated these sites is gratefully acknowledged. The authors wish to thank Dan Elliott for his assistance, suggestions, and encouragement. Richard M. Stone, Sr., provided assistance during the excavation of all four sites. Rebecca E. Bruce aided in the excavation of the Guthrie, Fant-Davis and Passport sites. Steve Kowalewski and Dean Wood assisted in the Guthrie site excavations. Jill Harrell and Steve Lotti are thanked for their assistance at the Elliott site. Finally, John Worth gave significant amounts of time, and shared his Vining data on multiple occasions. We thank Tina Mulka for her drafting.

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FROM THE PHOTOGRAPHIC ARCHIVES: 
THE WPA IN GEORGIA

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University of Georgia

James M. Page
University of Georgia

This set of photographs is the first in a projected series of three offerings, each with a distinct theme. The first, presented here, focuses on the Works Progress Administration (WPA) period in Georgia. The second part will have pictures from what was known as the "Reservoir" period and the third will display archaeological work not related to either theme, including some later work. The photographs are archived at the Laboratory of Archaeology, Department of Anthropology, University of Georgia. We hope that you will enjoy seeing past projects, friends, colleagues, and yourselves.

THE WPA IN GEORGIA

With a wave of the hand a signature was inked—a signature that would drastically change the knowledge Georgia has about its past. The year was 1933 and of course the signature was that of Franklin D. Roosevelt, who created the Works Progress Administration. Under the umbrella of the WPA several civilian corps projects began. One of these was the Civil Works Administration. "Ocmulgee was one of 11 archaeological projects approved for Civil Works Administration (CWA) funding" (Walker 1994: 17). Work began on December 20, 1933 at Ocmulgee with then 33-year old Dr. A. R. Kelly as director. Before this time archaeological work of this magnitude had only rarely been conducted, and it is not likely to be repeated. For those of us who did not work on such a massive project it might help to envision the excavations at Tanis in "Raiders of the Lost Ark." This project and
the later WPA excavations in Chatham County were a significant undertaking.

When one looks back twenty-five years, from Prosperity to Depression, it is sometimes hard to remember what archaeological research under the Works Progress Administration was like. The main thing to recall is that although WPA was interested in archaeology, it was more concerned with giving employment to a great many people, and that whenever those two aims clashed it was archaeology that suffered (Wauchope 1966:vii).

Robert Wauchope wrote these words in the first paragraph of his Archaeological Survey of Northern Georgia preface. These are sobering reminisces of someone who worked in the WPA system. Granted, there were problems with this large-scale excavation using mostly unskilled workers (unskilled in the ways of archaeology that is), but the WPA did fulfill it primary directive—that of providing much needed jobs. At the same time the WPA carried out a lot of archaeology. Surely there were many problems with the work, but with all archaeology there are problems that have to be conquered.

For more information on the context of these photographs and the excavations in Georgia conducted under the auspice of the WPA, consult David Hally’s (1994) volume Ocmulgee Archaeology: 1936-1986, Mark Williams’ (1992) Stubbs Mound in Central Georgia Prehistory, and Chester DePratter’s (1991) WPA Archaeological Excavations in Chatham County, Georgia: 1937-1942. The photos from the Laboratory of Archaeology archives published here are copies made over the years from older prints or the original negatives. The original negatives are curated in Tallahassee at the Southeast Archaeological Center, National Park Service.
Figure 1. The view of the Ocmulgee excavations. Courtesy Southeast Archeological Center, National Park Service.
Figure 2. A morning meeting of WPA workers with excavation leaders at Ocmealge. Courtesy Southeast Archeological Center, National Park Service.
Figure 3. One of many trenches at Ocmulgee. Courtesy Southeast Archeological Center, National Park Service.
Figure 4. The scale of the trenching at Ocmulgee. Courtesy Southeast Archeological Center, National Park Service.
Figure 5. A night lesson in archaeology for the team leaders of the Ocmulgee excavations led by A. R. Kelly. Courtesy Southeast Archeological Center, National Park Service.
Figure 6. The extent of the excavations at Brown's Mound (9BI5). Courtesy Southeast Archeological Center, National Park Service.
Figure 7. Brown's Mound before excavations. Courtesy Southeast Archeological Center, National Park Service.
Figure 8. A cleared view of the Lamar Mound (9BI2). Courtesy Southeast Archeological Center, National Park Service.
Figure 9. Structure three post hole pattern at Stubbs Mound (9BI12). Courtesy Southeast Archeological Center, National Park Service.
Figure 10. Aerial photo of the Lamar Mound. Courtesy Southeast Archeological Center, National Park Service.
Figure 11. Excavation with burial three in the center at Stubbs Mound. Also pictured in figure 16. Courtesy Southeast Archeological Center, National Park Service.
Figure 12. Outlining a structure at Ocmulgee Courtesy Southeast Archeological Center, National Park Service.
Figure 13. A trench at the Deptford Site (9CH2). Courtesy Southeast Archeological Center, National Park Service.
Figure 14. Trenches at the Oemler Site (9CH8). Courtesy Southeast Archeological Center, National Park Service.
Figure 15. A trench/test pit at the Deptford Site (9CH2). Courtesy Southeast Archeological Center, National Park Service.
Figure 16 (opposite). Burial three at Stubbs Mound (9BI12). Pictured from left to right are: Han-Yi Feng, Walter W. Taylor, Jr., Charles Wagley, Joseph Birdsell, either J. Lawrence Angel or Gordon R. Willey, and A. R. Kelly. In the summer of 1936 these six graduate students participated in a school field program in archaeology under Kelly. Han-Yi Feng had a doctorate from the University of Pennsylvania, Walter W. Taylor, Jr. was a graduate student at Yale University, Charles Wagley was a graduate student at Columbia University, Joseph Birdsell was a graduate student at Harvard University, J. Lawrence Angel had a bachelors degree from Harvard University, and Gordon R. Willey had a Masters degree from the University of Arizona. Courtesy Southeast Archeological Center, National Park Service.
Figure 17. The shear size of the excavations at Ocmulgee
Courtesy Southeast Archeological Center, National Park
Service.
Figure 18. A trench and a trowel at Ocmulgee Courtesy Southeast Archeological Center, National Park Service.
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Dawn Reid

VINING PHASE EXCAVATIONS ON THE CHATTAHOOCHEE-OCONEE NATIONAL FOREST

Maureen Meters, Jack Wynn, Ramie Gougeon, Betsy Shirk

FROM THE PHOTOGRAPHIC ARCHIVES: THE WPA IN GEORGIA

Amanda McDaniel, James M. Page