ANALYSIS OF A CORN SAMPLE FROM THE OWL CREEK MOUND, 22CS502, CHICKASAW COUNTY, MISSISSIPPI

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ANALYSIS OF A CORN SAMPLE FROM THE OWL CREEK MOUND, 22CS502, CHICKASAW COUNTY, MISSISSIPPI

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ABSTRACT

This study reports on the examination of a sample of primarily corn remains from a single feature excavated in 1992 from the Owl Creek Mound, 22CS502. The mound, originally discovered during the survey for the Natchez Trace Parkway, is situated in northeast Mississippi. Radiocarbon dates from the mound excavation range from about A.D. 1050 to 1150, with the corn sample probably dating from the latter half of this range.

The materials examined appear to represent a Northern Flint corn with 8 rows of kernels. Unfortunately, the sample size is very small and the preserved cob fragments all appear to be tips of cobs. Consequently, further toward the butt the row count may have increased to 10 and the cupule width was likely larger than identified on the available sample.

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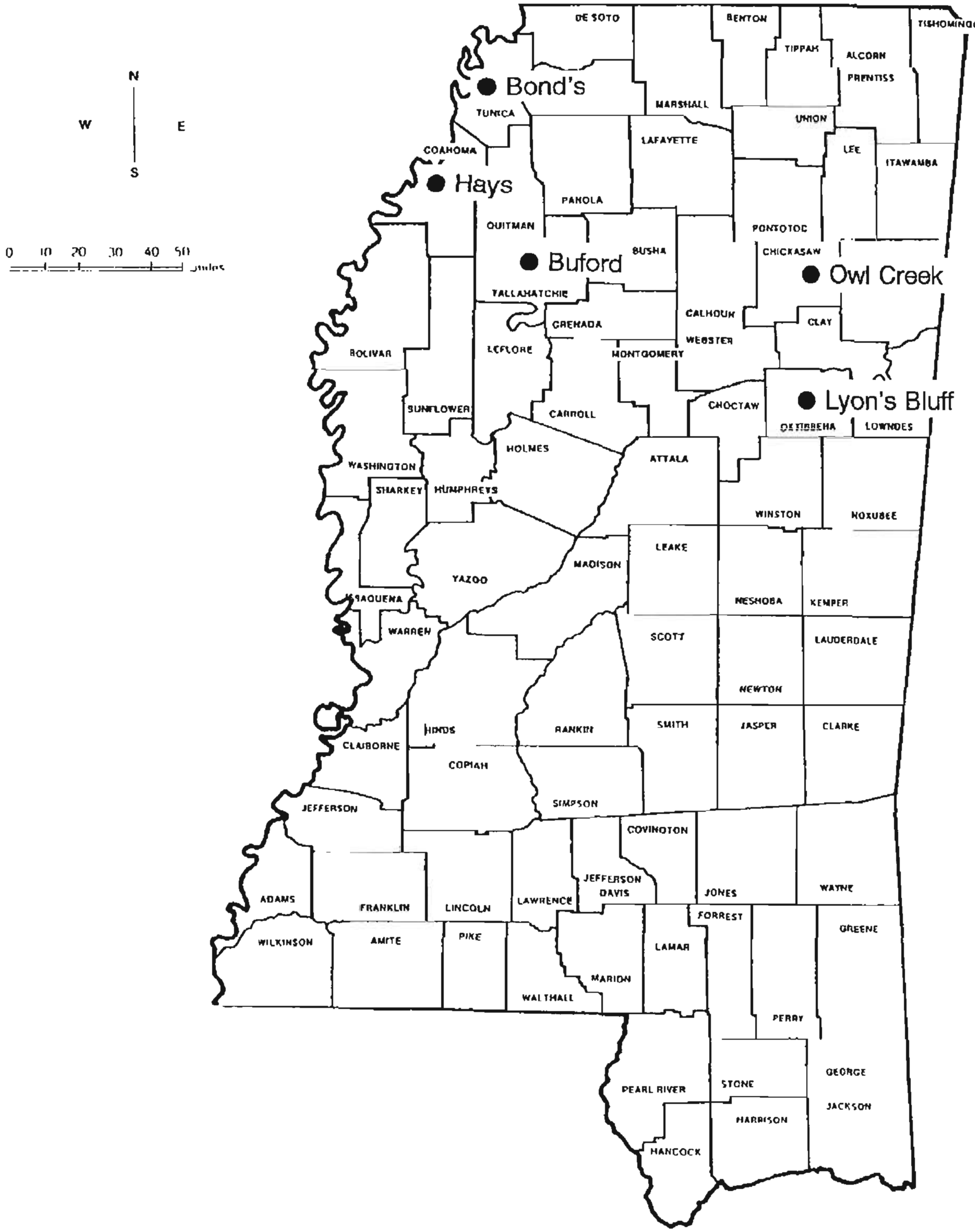

Figure 1. Location of Owl Creek and other sites discussed in this study.

Belt developed from Upper Cretaceous chalks and the portion adjacent to the Tombigbee River is primarily composed of ferruginous red sandy hills of the Eutaw Formation. The Pontotoc Hills form a belt about 5 miles in width between the Flatwoods to the west and the Black Prairie Belt to the east. This belt is composed primarily of Ripley sands and clays, some chalk. The hills rise gently 50 to 60 feet above the valleys on the western side but are steeper to the east where the valleys are narrower. The Flatwoods, a gently undulating to slightly wooded plain, has developed on the calcareous and micaceous Porters Creek clay.

The climate is warm and humid, influenced by the subtropical latitude, the high land mass to the north, and the warm waters of the Gulf of Mexico to the south. Temperatures today range from an average of about 46° F in the winter to an average of about 81°F in the summer. As might be expected for the southern subtropics, the relative humidity for the region is high during both the winter and summer. Rainfall averages about 50 inches, with about 23 inches occurring in the April through September growing season. The average growing season is about 226 days.

While it is very difficult in many cases to project current environmental conditions back to even the Mississippian Period, both the soils and climate of the Owl Creek area are significant features when considering the success of aboriginal cultivation. Trawick Ward (1965:42-43) offers a brief synopsis of various soils and their effect on prehistoric cultivation, noting that most Mississippian sites are found associated with silt loams (as opposed to either clay or sand soils) because the tilth of these soils is easily maintained and they are relatively fertile. An even greater limiting factor is rainfall. Corn requires at least 20 inches of rainfall, which must be well distributed throughout the growing season (Wann 1977:183). Although the Owl Creek area may be expected to produce a good corn yield, it holds the potential for greatly reduced yields and even crop failure.[2]

Braun (1950) classifies the region as an Oak-Pine Forest, although she observes that there is considerable diversity on a local level (Braun 1950:271-272). For example, the Black Prairies was originally characterized by treeless areas occupied by prairie vegetation. Oaks were found on the higher reddish soils which "dot the prairie surface like islands" (Braun 1950:277) and the stream bottoms were dominated by dense hardwood forests. In contrast, the Flatwoods tended to be dominated by loblolly pines and post oaks. Wenger (1968) discusses the silvics of a pine-hardwood forest and notes that pine is usually eliminated within 300 years of the beginning of the successional process, although the trend toward hardwood climax is slower on light sandy soils than on clay soils. Further, a pine forest may be artificially maintained. Regardless, it seems likely that there would be considerable diversity in species readily available to the Mississippian people.

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[2] The driest year recorded was 1952 when only 31 inches of rain fell, greatly reducing corn and other agricultural yields.

METHODS

There are a range of significant biases which potentially affect the collection and interpretation of ethnobotanical collections (see, for example, Figure 4.1 in Popper 1988). It is important to remind the reader that what is discarded, what is preserved, and what is identified all affects our interpretation of ethnobotanical samples. In this case the subject of this study is so limited (one feature) that extensive discussions are probably not warranted. Certainly the nature of the sample, the size of the collection, and the condition of the material all affect the ability of this study to offer substantive analyses.[3]

After the sample was separated from its soil matrix using the flotation process previously described it was examined under low magnification (7x to 30x). Wood charcoal was identified, where possible, to the genus level, using comparative samples, Panshin and de Zeeuw (1970), and Koehler (1917). Wood charcoal samples were broken in half to expose a fresh transverse surface.

Carbonized plant foods and food remains were not broken but were identified on the basis of gross morphological features. The corn was analyzed using the format designed by Ford (1973:188-197). The first observation was the general morphology of each charred cob fragment. If it appeared mature, the cob was recorded as regular (R); cob with the skinny or irregular appearance of a tiller cob or nubbin was recorded as N. Other subjective observations included the shape of the cob in cross-section (circular or oval) and the portion of the cob represented. As Ford notes, the presence of glumes on a cob may alter the apparent shape; where this seemed to be a factor, the cob was arbitrarily recorded as circular (C). The portion of the cob represented was estimated by comparing the carbonized sample to a modern cob and coding it as tip (T), middle (M), or butt (B). The length of the cob fragment was measured (there were no instances of intact cobs and all, in fact, are highly fragmented). The three cupule attributes include assessment of the degree of pairing between cupule rows, the number of cupules in 10 mm of cob length, and cupule width. Cupules were regarded as paired (+) if there was only a narrow groove between the rows, as strongly paired (S) if the grooves are wide, and as weakly paired (-) if the corners of the cupules overlapped.

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[3] Perhaps the issue of greatest concern, however, is whether the ethnobotanical remains identified from this feature, situated on top of a ceremonial mound in an area exhibiting little or no domestic occupation, can be accepted as representing the plant foods commonly present in Mississippian society at the time?

RESULTS AND COMPARISONS

The sample yielded only two small fragments of identifiable wood charcoal and in both cases the wood was identified as *Pinus* spp. No species identification was possible given the very small size of the material. The remainder of the collection consisted of highly fragmented and pulverized corn cob, largely carbonized cupules. The collection did contain four small intact cob fragments, discussed below in Table 1. This table follows Ford's (1973) standard so as to provide a thoroughly documented comparative collection for future researchers. Each of the four samples represented 8-row corn and while none were identified as tiller ears, all of the preserved material originated from the tip of the cob. No mid-shaft portions were identified, although the preserved cupules, ranging in width from 6.7 to 8.6 mm, suggest that other portions of the cob were originally present.

Table 1.
Owl Creek Cob Fragments

	Cob					Cupule		
Specimen No.	Type	Row Number	Cross Section	Length (mm)	Area Measured	Pair	Number 10 mm	Width (cm)
1	R	8	Q	8	T	+	3	5.9
2	R	8	C	9	T	+	3	5.4
3	R	8	C	4	T	W	?	5.2
4	R	8	Q	7	T	+	3	5.6

Key: Q = quadrangular; C = circular; T = tip; + = paired; W = weakly paired; R = regular cob

Cupule rows were most commonly strongly paired. The sample size precluded identification of poor or incomplete cross-pollination, or irregularly aligned kernels. The available sample indicated that there were usually three cupules in 10 mm of cob length (extrapolated for all the samples) and that cupule width was about 5 to nearly 6 mm, although (as previously mentioned) this range is restricted by the identification of only cob tip fragments.

All of the identified fragments clearly indicated that the kernels were removed before the cob was burned. Examination of the associated fragments produced no kernels fragments or charred kernels. The failure to identify kernels precludes examinations for denting. Denting is caused by the extension of the starchy endosperm to the apex of the kernel, which is otherwise encased in corneous material. As the grain dries, the corneous part remains unchanged, but the starchy endosperm shrinks and the top of the kernel is drawn downward, forming the characteristic denting in the end of the grain (Burtt-Davy 1914:278; Weatherwax 1954:199).

It is likely that there were three races of corn in aboriginal eastern North America, exclusive of the pop and sweet corns: Northern Flints (also known as Eastern Complex corn), Southeastern Dents, and Southeastern Flints. Northern Flints, found centered in the Northeast, were characterized by ears possessing 8 to 10 rows of crescent-shaped kernels (that is, kernels wider than high), short plants that were highly tillered, and ears that were frequently enlarged at the base (see Brown and Anderson 1947; Carter and Anderson 1945; Jones 1949, 1968; Brown and Goodman 1977). Cobs were large, and grooves separated the cupules. Southern Dents, found primarily in the Southeast, were noted for plant height and rarely produced nubbin ears. Rows ranged in number from 8 to 26, and the kernels were well dented; the cob frequently had an enlarged base. The race of corn was widely grown in the Southeast during the Colonial period (Brown and Goodman 1977:77; Kalm 1974). The last major race, Southeastern Flint, had short cobs, ears of 12 to 14 rows, and an ear that was slightly compressed at the base and gently tapered to the tip. Brown and Goodman note that this race is limited to the historic period, with earlier prehistoric materials more closely resembling the Northern Flints.

It appears, based on an admittedly small sample (biased by the preservation of only tip sections) that the Owl Creek corn is an example of the Eastern Complex corn of which the Northern Flints were an extreme form. The cobs have 8 rows of kernels. Several of the cobs had the characteristic quadrangular cross-section.

The presence of Eastern Complex corn at Owl Creek, which dates from the eleventh century A.D. was to be expected. Ford (1973:190-191) notes that these traits became more prominent through time, with a very high degree of Easternization (absent in the examined sample) indicative of the Contact period.

Cutler and Blake (1977), exploring the corn from Cahokia sites, reference four well examined corn collections from Mississippi: Lyon's Bluff (22OK1), Buford (Tallahatchee County), Hays (22CO612), and Bond's (22TU530) (see Figure 1 and Table 2). In each case the mean number of rows exceeds that found at Owl Creek, although the range in cupule width is well within that observed in the current sample. It seems likely that the differences between Owl Creek and the other samples obtained from Mississippi sites is one of sample biases. Cob tips tend to have a reduced number of rows and reduced size of cupules. A sample which included mid-sections and butt-ends would likely have exhibited a greater range in row numbers. Regardless, both the Lyon's Bluff, Buford, and Hays sites reveal that 8-row corn is present in the samples, if only in small numbers.

Table 2.
Mississippi Corn Samples

Site	Date	# of Cobs	Mean Row #	Median Cupule Width in mm.	Row Numbers % Total Cobs 8	10	12	14	18+
Lyon's Bluff	A.D. 1200-1500	78	10.8	6.1	10	46	39	4	1
Buford	A.D. 1200-1500	2	9.0	8.1	50	50			
Hays	A.D. 1000-1200	14	11.6	6.4	7	29	50	7	7
Bond's	A.D. 800 - 900	7	12.0	6.4		29	43	28	

Data from Cutler and Blake (1977:Table 10).

Perhaps as interesting as the corn itself is the context of this sample at Owl Creek. Somewhat similar cob pits have been identified by Binford (1967) as smudge pits for hide smoking and by Munson (1969) as smudge pits for pottery reduction. Binford's pits were slightly oval, measuring about 1.0 by 0.9 foot in diameter and 1.1 foot in depth, and contained corncobs, bark, twigs, and other plant remains. He further noted that the "charred twigs are generally curled around in the bottom of the pit with the cobs nested in the center" (Binford 1967:3-4). Fifteen pits were found at a small Mississippian farmstead with no obvious spatial clustering.

Binford and Munson assembled a long list of sites where this type of feature has been found, including Toothsome, Sandy Tip, Lloyd, Cahokia, Kincaid, Boulder, Larson, and Cedar Row sites in Illinois; the Bayou Goula site in Louisiana; the Williams, Etowah, and Stallings sites in Georgia; the George C. Davis site in Texas; the Fort Walton J-5 site in Florida; the Deasonvile and Fatherland sites in Mississippi; a series of 10 Hiwassee Island and Noris Basin sites in Tennessee; and the Jonathan Creek site in Kentucky. To this list may be added the Angel Mounds in Indiana; a series of Tombigbee sites in Alabama; the Wachesaw Landing site in South Carolina; the Moccasin Bluff site in Michigan; and most recently, the Town Creek mound in North Carolina (Trinkley 1985).

The Town Creek sample provides a significant data source for the study of this feature type. Of the 76 pits examined at Town Creek, the orifice ranged from circular to slightly oval. The mean diameter was 1.0, with a range of 0.7 to 1.9 feet, and the mean depth was 0.5 , with a range of 0.2 to 1.0 foot. Unlike Binford's Toothsome site, however, the upper 1.0 foot of the soil at Town Creek was plowzone; thus mean depth of the Town Creek examples may have been as much as 1.5 foot, with a ***possible*** range of 1.2 to 2.0 feet.

These pits contained corn cobs, often with corn stalk, cane, or wood charcoal. A few contained kernels of corn, either loose or on cobs. Where field note information was available, the wood charcoal, frequently in the form of twigs, was situated under the cobs, suggesting that the pits were dug, filled with small twigs, bark, cane, or cornstalk, and topped off with cobs broken into two- to three-inch segments. Burning was under oxygen-starved conditions, so that both the kindling and the cobs completely carbonized with the production of only a small quantity of ash. There is no indication that any of the pits had been cleaned out or reused.

Although Binford suggests that the pits were used in smoke tanning of hides, there is little ethnographic evidence for this practice, at least in the Carolinas. And while Munson suggests that the pits were used to smudge the interiors of pots, smudged pottery is not found in the Pee Dee or Irene wares. Consequently, neither explanation is entirely satisfactory for a large portion of the smudge pits identified at Mississippian sites (see Trinkley 1985 for additional information). At Town Creek, however, the pits have a non-random distribution focused around the cleared plaza area in front of the mound. These features appear to be strongly correlated with the site in its sacred rather than its secular context, which suggests that the pits have a ceremonial, rather than domestic, function. A number of accounts have indicated that corn was burned during the Green Corn Ceremony or Busk of the Cherokee and Creek (Swanton 1928:583-584, 604-606; Witthoft 1949:32, 42, 54).

While the pit at Owl Creek is decidedly shallower than those encountered elsewhere, other aspects of its form, as well as its location on the mound summit, suggest an affinity to the corncob pits examined at Town Creek and other Mississippian sites across the region. As further investigations are conducted at the site, especially in the mound and plaza area, further evidence of this practice should be sought.

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