The functional dimensions of earth oven cooking: An analysis of an accidently burned maize roast at the C. W. Cooper site in West-central Illinois

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Despite the prevalence of earth ovens, a subclass of pit features used for cooking, there is little consensus regarding how these cooking features were used or about the foodstuffs that were prepared in them. To provide a more detailed understanding of earth oven cooking in the archaeological record, we analyze the archaeobotanical contents, stratigraphy, and morphology of a cooking pit recently excavated at C. W. Cooper, an early Mississippian (A.D. 1150–1200) site in west-central Illinois in order to contribute to research on late Prehistoric foodways. Filled with nearly 100 ears of maize, this earth oven presents the opportunity to document the process of undertaking a maize roast. The volume of maize and its presence within a dense concentration of cooking, processing, and storage facilities allows us to consider the communal nature of outdoor earth oven cooking in the 12th century Central Illinois Valley and the socioeconomic dimensions of commensal politics more broadly during the Precolumbian era.

Keywords: Mississippian, earth oven, maize, pit features, cooking techniques, Midwestern archaeology

Introduction

Pits are common archaeological features that were once used to store and process foodstuffs in the ancient American Midwest and Midsouth. Archaeological analyses of pit features have contributed substantially to understandings of late prehistoric foodways in the North American Midcontinent (Binford *et al.* 1970; Fortier 1983; Harris 1996; Holt 1996; Kelly *et al.* 1987; Koldehoff and Galloy 2006; Stahl 1985). For example DeBoer's (1988) famous study of the Mississippian pit features revealed that subterranean storage features could have been used to conceal agricultural surpluses from central administrators seeking to extract tribute payments. Moreover, Bardolph's (2014) recent analysis of early Mississippian (A.D. 1100–1150) pit features in the southern Central Illinois River Valley demonstrated that local groups maintained traditional Woodland era conventions of food storage and preparation while adopting an array of other Mississippian practices and forms of material culture. This paper contributes to archaeological research on pit features and foodways through an investigation of the functional dimensions of earth ovens, a subclass of pit features used for cooking. Earth ovens are generally identified based on the presence of oxidized soils, burned fill zones, and concentrations of fire cracked rocks. Despite their prevalence in the archaeological record in the eastern United States, there is little scholarly consensus regarding how these cooking features were used or the kinds of foodstuffs that were prepared in them. To highlight both the antiquity and ubiquity of this form of cooking we draw on abundant ethnographic, ethnohistoric, and archaeological evidence of earth oven cooking in other areas of the New World.

We add to this body of literature on earth ovens through an analysis and discussion of the contents and structure of a cooking pit recently excavated at the early Mississippian C. W. Cooper site (A.D. 1150–1200), a small bluff top village in west-central Illinois (FIG. 1). Specifically, we consider the archaeobotanical assemblage recovered from inside this pit, in addition to evaluating the pit's stratigraphy and morphology. Filled to the brim with nearly 100 ears of maize, this earth oven feature allows us to document the process of undertaking a maize roast. The volume of maize and the location of this feature within a dense concentration of cooking, processing, and storage facilities also enables a consideration of

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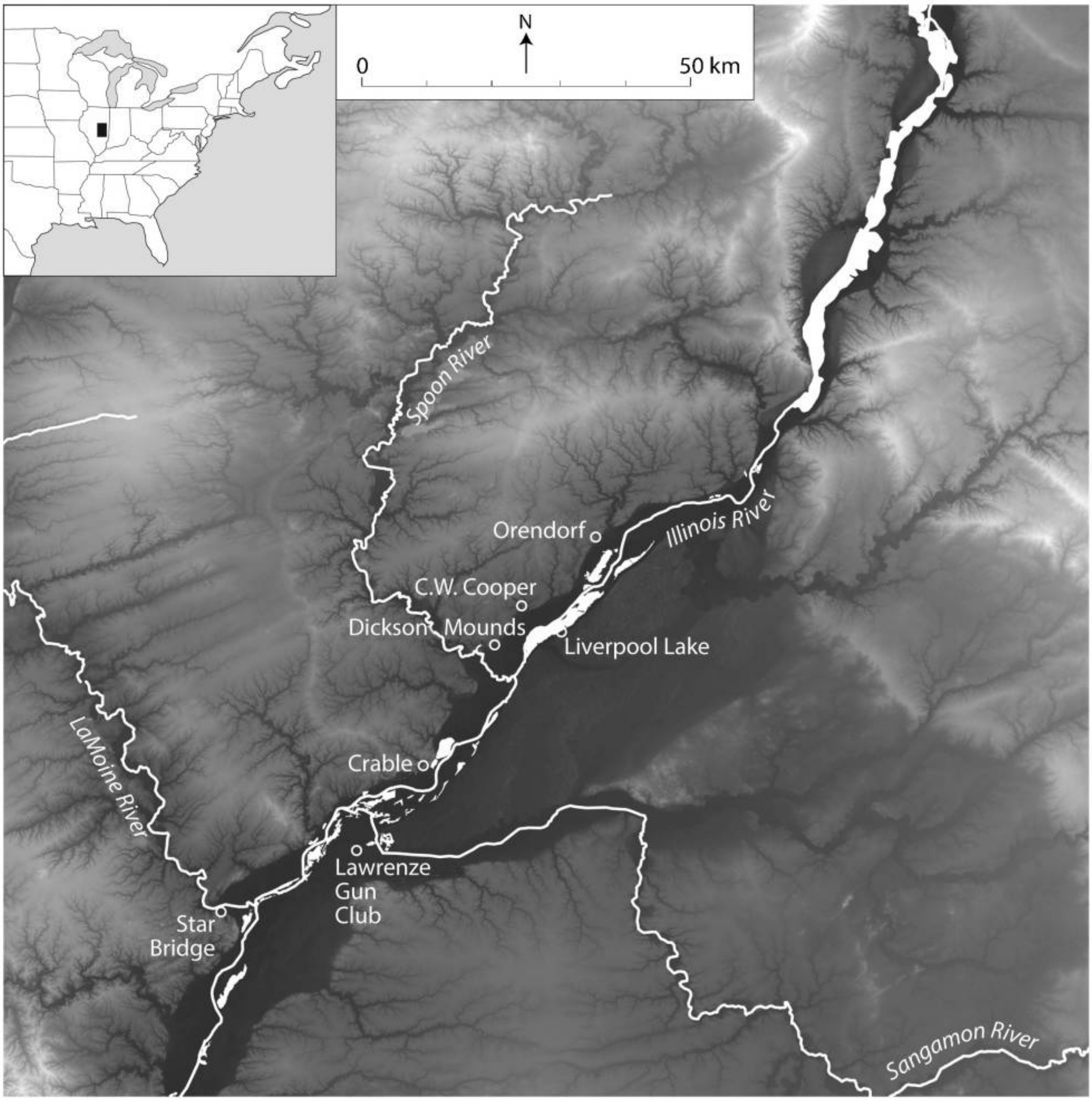

Figure 1 Select sites from the Central Illinois River Valley.

the communal nature of outdoor earth oven cooking in the Central Illinois Valley during the 12th century.

The Antiquity and Use of Earth Oven Features in the New World

The earliest evidence of earth ovens in the New World dates between 8500–8000 B.C. and can be found in Alaska, the Pacific Northwest, and the Great Plains (Thoms 2008, 2009). In addition to these early cases, Thoms (2008, 2009) has documented abundant cases of earth oven/hot rock cooking throughout the western United States, combining ethnographic and archaeological evidence to achieve a fair amount of resolution, thus allowing for the identification of these features on archaeological sites (Fish *et al.* 1985). Earth ovens have also been documented in the archaeological and ethnographic records of Mesoamerica (Dering 1999; Leach and Sobolik 2010; Salazar *et al.* 2012) and South America (Van Den Bel 2010). Unfortunately, while there is abundant archaeological evidence of earth oven use in the eastern United States, ethnographic evidence of this type of cooking technology is generally lacking from the eastern United States.

Most ethnographic evidence of earth oven cooking in the New World highlights the cooking of meat and plant products high in fiber and carbohydrates. The majority of documented plant species include root and tuber plants, or those high in toxicity, such as *Camassia*, *Allium*, and *Agave* (Fish *et al.* 1985; Leach and Sobolik 2010; Wandsnider 1997). By cooking these plants in the earth oven, they "render foods more nutritious and digestible" (Thoms 2009: 573). Moreover, the general size of the cooking feature is often correlated with the amount of food being prepared, thus their size can be used to infer the scale of the event for which the food is meant (Salazar *et al.* 2012; Thoms 2008, 2009).

Recent ethnobotanical and ethnographic research in the Maya lowlands by Salazar *et al.* (2012) documents the roasting of whole maize ears in traditional Maya earth ovens. The context of this particular maize roast was a first fruits feast celebrating the initial maize harvest of the season (Salazar *et al.* 2012: 291). The earth oven was dug to a depth of about 60 cm, the deepest of all the ovens documented in the study, which is not surprising given the communal nature of the event. A fire was built inside the pit, and once the fire died out, the cooks covered the coals with leaves, on top of which were placed the maize ears. The maize ears were slightly wet to retain moisture during the cooking process. More leaves were then laid atop the row(s) of maize, following by an earthen cap, after which the oven was left unattended overnight, or for several days, depending on the level of heat (Salazar *et al.* 2012: 291).

Ethnographic and ethnoarchaeological accounts closer to the study area provide more specific insight into how ancient people of the Midsouth would have used earth ovens (Black and Creel 1997; Hough 1926; Peacock 2008; Teit 1900; Thoms 2008). Our survey of this literature highlights two main methods of heating: indirect, placing heated rocks on the ground surface or in a shallow pit for slow cooking, and direct, building a fire inside a pit. The indirect method was practiced by the Chopunnish (Nez Perce) in the Pacific Northwest:

> *[T]he Indians prepared a large fire of dried wood, on which was thrown a number of smooth stones from the river. As soon as the fire went down and the stones were heated they were laid next to each other in a level position and covered with a quantity of branches of pine, on which were placed bear flesh, the boughs and the flesh alternated for several courses, leaving a thick layer of pine on the top. On this heap was then placed a small quantity of water, and the whole covered with earth to the depth of 4 inches. After remaining in this state about three hours the meat was taken off (Elliot Coues 1893 [in Hough 1926: 36]).*

There are also ethnographically documented examples of indirect cooking techniques in which a fire is built over the floor of a rock-lined pit. Foodstuffs were then laid overtop the stones once the fire burned down to coals (Hough 1926: 37).

An example of the direct method comes from an observation of a group of California Indians. In 1877 Stephen Powers (in Hough 1926: 37) wrote that "…under stress of hunger [the Tlelding] ate soaproot (*Chlorogalum pomeridianum*), the poisonous properties of which they extracted by baking it in large quantities in the ground, covering it over with green leaves and building a fire over it, which was allowed to burn many hours, when the root is said to be sweet and palatable." Wandsnider's (1997) ethnographic cross-cultural study of pit cooking technology found that the use of these two methods largely depended on the types of food being cooked. Fires were often built inside pits for the purpose of high temperature cooking. Alternatively, heated rocks covered with layers of vegetation were often used to prepare foods requiring a moist cooking environment. However, sometimes the two methods were used in conjunction for a long duration and high temperature cooking.

Several scholars have attempted to archaeologically differentiate between these direct and indirect cooking techniques (Binford *et al.* 1970; Fortier 1983: 120–124; Koldehoff 2002; Stahl 1985). Research by Binford *et al.* (1970) at the Hatchery West site in Clinton County, Illinois has provided one of the earliest and most detailed investigations of Late Woodland (A.D. 500–1000) and Mississippian (A.D. 1000–1400) earth ovens. Two subclasses of earth ovens, deep and shallow, were identified at the site. Deep earth ovens averaged 65 cm in depth and were flat-bottomed pits with oxidized floors and side walls. Shallow earth ovens averaged 43 cm in depth and were generally basin-shaped in profile; these pits differed from deep earth ovens in that they lacked in situ evidence of soil oxidation but instead possessed traces of redeposited, oxidized soils and other heat-altered materials mixed into different fill layers. Binford and colleagues (1970) interpreted the deep earth ovens to be indirect cooking facilities and the shallow earth ovens to be direct cooking facilities. Recent experimental research, however, indicates that these functional assignments may be incorrect; Koldehoff (2002) observed experimentally that cooking fires placed directly on pit floors resulted in a pattern of oxidized subsoil that penetrated several centimeters along their basal walls. Moreover, this pattern of oxidation only occurred after a pit was exposed to a high temperature fire for several hours (Koldehoff 2002: 190). Thus, the presence of oxidized soils in the deep earth ovens at Hatchery West indicates they were probably direct cooking facilities. It is also likely that the shallow earth ovens lacking oxidized soils were used for either indirect cooking or short-term direct cooking activities.

The excavation of a number of deep earth oven pits with straight walls and flat bases at the Late Woodland Mund site (A.D. 500–650) in the American Bottom region of western Illinois has provided additional detailed information on the identification of earth ovens (Fortier 1983: 120–124). These features were morphologically similar to the deep earth ovens at Hatchery West but lacked similar evidence for soil oxidation along their bases. A number of earth ovens from the Mund site also each contained a discrete stratum of burned limestone near the base. In several cases, this burned limestone layer was found to lie directly beneath a black greasy layer, which has been interpreted as decomposed thatch or matting (Fortier 1983). Considering the presence of burned limestone and the absence of oxidation, Fortier argued that these represented indirect cooking facilities (Fortier 1983: 124).

It is interesting that the vast majority of the earth ovens excavated at Late Woodland sites, such as Range and Woodland Hill (A.D. 500–800) and terminal Late Woodland (A.D. 800–1050) sites in the American Bottom region, lacked oxidized soils altogether. It appears that the act of placing heated rocks and foodstuffs into a relatively deep pit may have been the predominant cooking technique during the Woodland occupation of this region. As we discuss below, this trend does not appear to have been the case for the Central Illinois River Valley, located approximately 170 km north of the American Bottom.

The C. W. Cooper Site Earth Oven

It is clear from the above discussion that there is significant variation among features identified as earth ovens at archaeological sites located in Illinois and in North America. At present it is difficult to interpret this variability in functional terms, especially considering that most of the known earth ovens in archaeological contexts represent disposal (not cooking) in their final context. The recent excavation of a pit feature containing the remains of an accidently-burned maize roast at the C. W. Cooper site in Fulton County, Illinois provides the opportunity to better understand the functional dimensions of these ancient cooking facilities.

The C. W. Cooper site is located on the western bluffcrest of the Illinois River Valley (FIG. 1). Previous excavations at the site in 1982 and 1983 by the Upper Mississippi Valley Archaeological Research Fund uncovered portions of a small Mississippian village dating to the latter half of 12th century A.D., as well as a later Oneota village dating to the early 14th century. Surface artifact distributions cover an estimated 3 ha although the densest concentration of subsurface features at the site is restricted to a 3000–4000 sq m area that begins at the edge of the bluff and extends northwards. Further excavations funded by the National Science Foundation were conducted at the site between 2011 and 2013. These excavations encompassed 204 sq m of the site, uncovering portions of seven early Mississippian period (A.D. 1150–1200) buildings and 47 pit features.

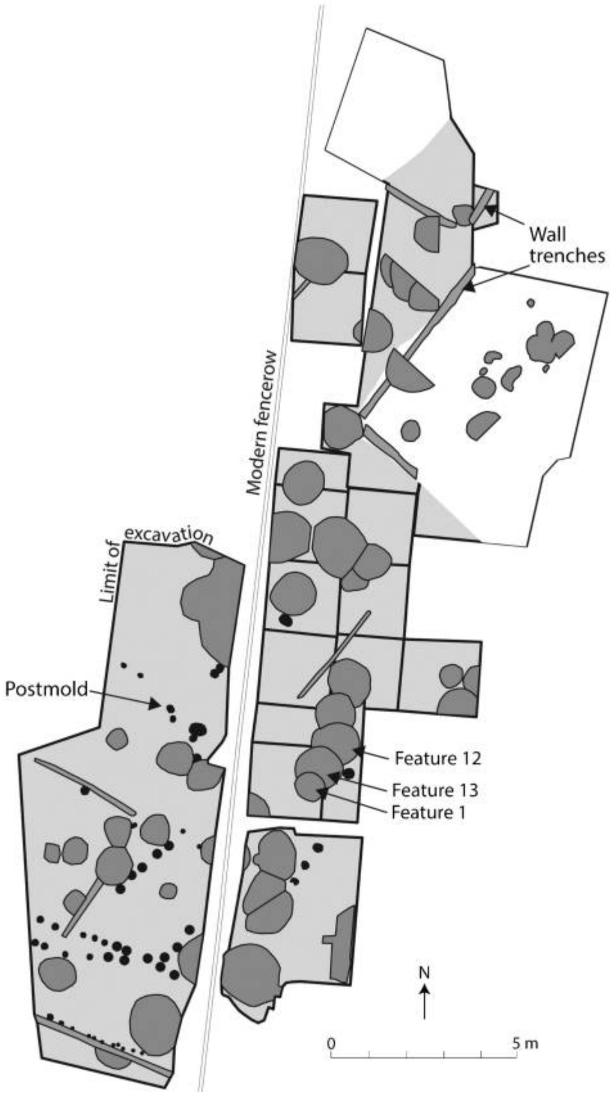

Figure 2 Map of the University of California, Santa Barbara excavations at the C. W. Cooper site.

A complex of five superimposed pit features, including the earth oven in question (Feature 13), was found along the southern edge of these excavations (FIG. 2). Feature 13 was located roughly in the middle of this pit complex and dates to the Mississippian period of the site. It was superimposed by one pit (Feature 12) that was superimposed by another (Feature 1). This earth oven had a circular opening that was 120 cm in diameter. It extended 52 cm in depth with out-curving walls toward the top and a flat base. This feature was excavated by natural stratigraphic layers which allowed for a detailed reconstruction of its use and abandonment.

The base of the Feature 13 pit consisted of a layer of orangeish-red oxidized clay that extended several centimeters into the surrounding subsoil (FIGS. 3, 4). This zone of oxidation also extended up the lower sides of the pit. Above this oxidized stratum was a thin layer of charred fibrous plant material, resembling wild grass, which appears to have lined the base

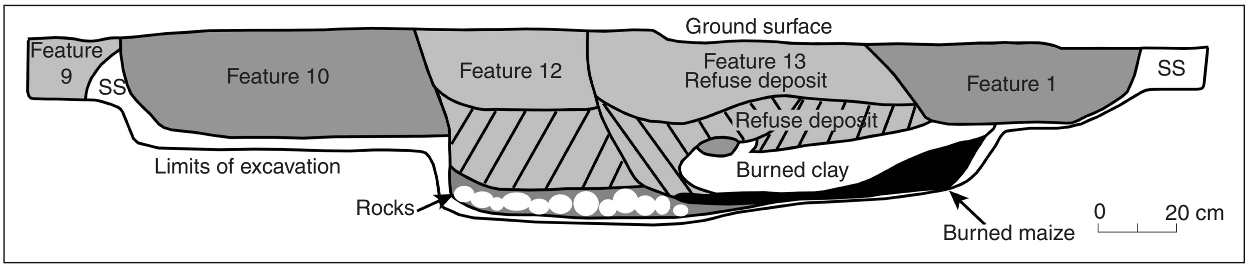

Figure 3 Profile map of the Feature 13 earth oven at the C. W. Cooper site.

Figure 4 The oxidized clay layer overlying the burned maize in Feature 13, C. W. Cooper site.

of the pit to facilitate cooking (FIG. 5). Atop this fibrous plant material was a dense layer of charred maize. This layer was removed in its entirety and processed as several flotation samples totaling 107 L. Multiple, intact charred cobs with kernels still attached were present in this layer, as were thousands of maize kernels, cupules, and smaller cob fragments

Figure 5 Fibrous plant material at the base of the Feature 13 earth oven, C. W. Cooper site.

(FIG. 6). Unfortunately, these whole ears of maize (complete with cobs and attached kernels) did not remain intact during removal. Typically, these maize ears would have been removed from the pit once fully cooked; thus, the sheer abundance of burned maize in this oxidized pit feature indicates that the pit was abandoned during or after the cooking process and was never cleaned out.

Our reconstruction of the cooking methods, based on the pit's stratigraphy and contents, indicates that the maize was covered with a layer of clay upon which a fire was built—as evidenced by wood charcoal overlaying the clay. In its final form, this layer of clay was burned until it had hardened, suggesting that it had been intentionally laid in uniform thickness over the maize as a protective buffer from the fire. The near incineration of the maize appears to have been the result of the intensity or duration of the fire built above this clay layer. This fire was evidently too hot or left unattended for too long, resulting in the burning of the maize until it became an inedible mass. More than 300 carbonized wild grass and weedy seeds were identified above the clay layer, and their abundance above the maize layer strongly suggests that they were intentionally laid on top of the clay layer, perhaps as kindling for the fire. After it was discovered that the maize had burned beyond edibility, the feature was capped with refuse and abandoned.

The plant data

A total of 11 flotation samples (107 L of soil) were taken from Feature 13 representing the entirety of the feature fill (with the exception of the fibrous plant

Figure 6 Burned maize at the bottom of the Feature 13 earth oven, C. W. Cooper site.

layer below the maize ears) (TABLE 1). Samples were floated using a Model A Flote-Tech machine during the summer of 2011; light and heavy fractions were bagged separately and shipped to the University of California, Santa Barbara (UCSB) Integrative Subsistence Laboratory (ISL) for identification and analysis. Although the materials from the light and heavy fractions were processed and sorted separately, data from the two fractions were combined for analysis. According to standard practice, the light fractions were weighed and then sifted through 2.0 mm, 1.4 mm, and 0.7 mm standard geological sieves. Carbonized plant remains from both fractions were sorted in entirety down to the 2.0 mm sieve size with the aid of a stereoscopic microscope 10–4x. Residue less than 2.0 mm in size was scanned for seeds, which were removed and counted; in addition, taxa encountered in the 1.4 mm sieve that were not identified from the 2.0 mm sieve were also removed, counted, and weighed. Maize cupules and acorn nutshells were also collected from the 1.4 mm sieve as these materials tend to fragment into smaller pieces and can be underrepresented in the 2.0 mm sieve.

Botanical materials were identified with reference to the macrobotanical comparative collection at the UCSB ISL, various seed identification manuals (Martin and Barkley 1961; Delorit 1970), and the USDA pictorial website (2011). All plant specimens were identified to the lowest possible taxonomic level (TABLE 2), although taxonomic identification was not always possible as some plant specimens lacked diagnostic features altogether or were too highly fragmented. As a result, these specimens were classified as "unidentified" or "unidentified seed." In other cases, probable identifications were made; for example, if a specimen closely resembled a maize cupule, but a clear taxonomic distinction was not possible (e.g., the specimen was highly fragmented), then the specimen was identified as a probable maize cupule and recorded as "cf. maize cupule." Once the plant specimens were sorted and identified, we recorded counts, weights (g), portion of plant (e.g., maize kernels versus cupules), and provenience information. Generally, most of the seeds identified in the samples were too small to weigh, and thus only counts were recorded. Hickory nutshell and maize remains were both counted and weighed. Seven of the 11 flotation samples produced exceptionally large quantities of plant remains, yielding sample weights in excess of 1000 g (with two exceeding 3000 g). In order to deal with these large samples in a timely manner, we recorded the total weight for each of the 11 samples and then subsampled them using a riffle splitter. After the samples were split, the subsamples chosen for analysis were also weighed. We used this weight information to extrapolate figures for plant weight, wood weight, and taxa counts/weights from the subsample to the total sample. By dividing the total sample weight by the subsample weight, we arrived at a figure that defined the proportional relationship between the sample and its respective subsample. This figure was used as a multiplier for the actual counts/weights recorded from the subsample to determine the proportionally equivalent counts/weights for the total sample.

In total, 52,966 maize fragments weighing 760 grams were identified in this feature (this does not include the possible "cf." identifications); more than 44,000 of these fragments were kernels, with the remainder consisting of cupules and cob fragments (TABLE 2). Measurements were taken on complete maize kernels and cupules as part of a related project (Gracer *et al.* 2013) and reveal that maize kernels from Feature 13 are wide and crescent shaped (FIG. 7). Cob fragments from the 1983–1984 excavations at C. W. Cooper reveal the presence of 8-, 10- and 12-row maize varieties. These cobs, graciously provided by Dr. Lawrence Conrad, derive from screened and hand-excavated contexts and were analyzed by VanDerwarker in the UCSB ISL. Angle measurements from the Feature 13 maize cupules confirm the presence of 8-, 10-, and 12-row cobs, in addition to cupules from the occasional 14-row cob; the majority of cupules measured, however, come from 10- and 12-row cobs, suggesting that the maize in this feature may represent the Midwestern Twelve Row variety

Table 1 Inventory of flotation samples taken from Feature 13 at C. W. Cooper.

Catalog #	Sample volume	Total sample weight* (g)	Plant weight (g)	Wood weight (g)
6	26	3161.76*	345.66	9.50
10	10	208.62	1.80	0.85
18	13	485.55	5.36	2.83
19	6	180.79	3.50	0.69
23	10	1711.43*	2.01	0.63
24	6	1038.82*	2.15	0.55
25	11	3052.51*	17.27	1.46
28	4	2545.00*	46.93	3.76
29	1	324.60	2.95	0.27
30	13	1481.15*	167.76	6.68
31	7	1130.20*	201.19	2.33

*denotes that a subsample was taken.

common to the broader Illinois region (Fritz 1992). Based on average kernel counts from 10- and 12-row cobs of North American heirloom varieties (from the UCSB ISL comparative collection), we estimate that these kernels come from approximately 95 ears of maize. If we assume a consumption rate of three ears of maize per person, then this maize roast could have fed about 31–32 people. Some of the cupules, however, may derive from 8-row cobs, which would translate into more ears of maize represented by the kernels. Regardless of row number, it is clear that this maize roast was meant to feed a large group of people, on the order of several households.

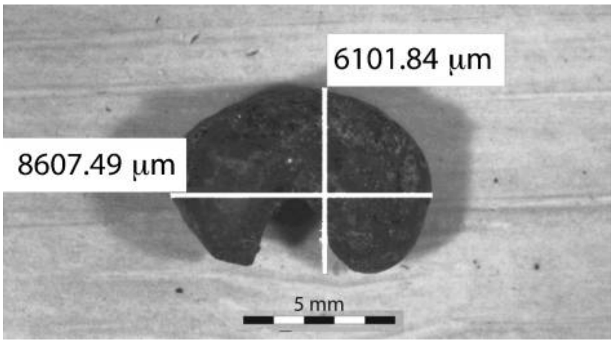

Figure 7 Maize kernel image from the Feature 13 earth oven, C. W. Cooper site.

While the maize represents 97% by count (99% by weight) of the plant materials recovered from the Feature 13, the remaining taxa identified nevertheless bear mentioning (TABLE 2). A fair amount of nutshell fragments was also encountered, dominated by hickory (*Carya* spp.), which was found scattered

Table 2 Inventory of plants identified in Feature 13 at C. W. Cooper (cf.=probable but uncertain identification).

Common name	Taxonomic name	Counts	Weights (g)
MAIZE			
Maize cob fragment	*Zea mays*	68	24.79
Maize cob fragment cf.	*Zea mays* cf.	30	0.14
Maize cupule	*Zea mays*	8826	32.52
Maize cupule cf.	*Zea mays* cf.	6	0.01
Maize kernel	*Zea mays*	44,074	702.42
Maize kernel cf.	*Zea mays* cf.	9	0.09
Total maize (cf. not included)		52,968	759.73
NUTS			
Acorn	*Quercus* spp.	28	0.13
Acorn meat	*Quercus* spp.	2	0.08
Acorn cf.	*Quercus* spp. cf.	14	0.1
Hazelnut cf.	*Corylus* sp.	1	
Hickory	*Carya* spp.	318	3.49
Hickory cf.	*Carya* spp.	4	0.08
Black walnut	*Juglans nigra*	1	0.05
Total nuts		368	3.93
WEEDY SPECIES			
Amaranth	*Amaranthus* spp.	6	
Bedstraw cf.	*Galium* spp.	4	
Bulrush	*Scirpus* spp.	19	
Bulrush cf.	*Scirpus* spp. cf.	11	
Carpetweed	*Mollugo* spp.	1	
Cheno/am	*Chenopodium/Amaranthus*	1	
Chenopod	*Chenopodium* spp.	310	
Goosegrass	*Eleusine indica*	2	
Grass family	Poaceae	173	
Knotweed/smartweed	*Polygonum* spp.	9	
Knotweed/smartweed cf.	*Polygonum* spp. cf.	4	
Maygrass	*Phalaris caroliniana*	1	
Purslane	*Portulaca* spp.	51	
Sedge family cf.	Cyperaceae	4	
Spurge family cf.	Euphorbiaceae	1	
Tick clover	*Desmodium* spp.	7	
Total weedy species		604	
FRUITS			
Maypop cf.	*Passiflora incarnata* cf.	4	
Nightshade	*Solanum* spp.	2	
Total fruits		6	
MISCELLANEOUS			
Bean cf.	*Phaseolus* sp. cf.	4	
Bearsfoot	*Polymnia uvedalia*	1	
Squash/gourd rind	*Cucurbita/Lagenaria*	4	
Sunflower	*Helianthus annuus*	4	
Sunflower cf.	*Helianthus annuus* cf.	1	
Total miscellaneous		14	
UNIDENTIFIABLE		588	2.19
UNIDENTIFIABLE SEED		25	
Total plants		54,618	766.09

throughout all the zones of the pit feature. Given that nutshell was generally used secondarily as a fuel source, it is not surprising that it was identified in the upper layers of the pit. The same reasoning can be applied to the presence of grass seeds and weedy seeds (which include bedstraw [*Galium* spp.], chenopod [*Chenopodium* spp.], bulrush [*Scirpus* spp.], purslane [*Portulaca* spp.], smartweed/knotweed [*Polygonum* spp.], tick clover [*Desmodium* spp.], and unidentified members of the grass family [Poaceae]), as these species were likely used as kindling for the fire set atop this earth oven. The presence of these species in the lower levels of the feature is best explained as intrusive; the intrusion of small seeds and nutshell fragments into the maize layers of the earth oven likely originated in a small area of the pit where the burnt clay layer did not entirely cover the feature.

Discussion and Conclusions

A close consideration of the morphology, stratigraphy, and archaeobotanical contents of Feature 13 at the C. W. Cooper site has provided important insight into one method in which earth ovens were used to cook food in the late prehistoric Midwest. In this case a clay layer placed directly over a large number of maize ears which served to shield the maize from direct contact with a fire built above it. This particular cooking event represents a direct method insofar as a fire was built inside (but at the top of) the pit, but could also be considered indirect in that a thick clay layer buffered the maize from direct contact with the fire. It is clear that the method of cooking used in this feature differs from techniques used in the majority of the ethnographic examples, in which the cooks built the fire (or placed hot rocks) at the base of the earth oven (Hough 1926: 37; Salazar *et al.* 2012; Thoms 2008, 2009; Wandsnider 1997). Indeed, the Maya account of their maize roast, which is the case most analogous to the C. W. Cooper earth oven, documents the use of hot coals at the bottom of the pit (Salazar *et al.* 2012); despite this singular difference, the layering of vegetation, maize, and earth was identical in both cases. Given that no coals or hot rocks were placed below the maize layer in the C. W. Cooper earth oven, the oxidized base of this pit is testament to the high intensity and long duration of the fire built atop it. Pits with oxidized soils have also been identified at other late prehistoric era sites in the Central Illinois River Valley. Esarey (2000) reported the presence of a number of Late Woodland pits exhibiting oxidized bases at the Liverpool Lake site in Mason County Illinois. Moreover, Bardolph (2014) recently documented a number of heavily oxidized pits at the early Mississippian Lamb site (A.D. 1100–1150) in Schuyler County, Illinois. Because most of these earth ovens were cleaned out and later refilled with refuse, it is unknown if they were used in exactly the same way as the C. W. Cooper site feature. The presence of heavily oxidized soils in these features, however, indicates their likely use in direct cooking activities.

One of the most important insights gleaned from the analysis of the C. W. Cooper earth oven is the large amount of food (ca. 95 maize ears) it was used to cook. The scale of this maize roast reinforces previous assertions that such features were used in the preparation of communal meals, possibly feasts. Indeed, expansive excavations conducted at the Late Woodland Range site in the American Bottom region revealed that earth ovens were often located in areas shared by multiple households, an arrangement that led Kelly (1990) to interpret them as communal cooking facilities. Based on the data presented here, the nature and scale of the cooking that took place in Feature 13 indicate that earth ovens at the C. W. Cooper site were also used for the communal preparation of foodstuffs. Whether or not the maize roast that occurred in Feature 13 was conducted as part of a first fruits celebration, as documented in the Maya case, is unclear. Ethnohistorical studies from the southeastern United States provide ample evidence of annual events marking the first maize harvest, known regionally as the Busk or Green Corn Ceremony (Hudson 1976). While it is tempting to interpret the C. W. Cooper earth oven as part of an annual harvest feast, it is simply not possible to achieve this level of specificity. We can say that the C. W. Cooper maize roast was meant to involve a large gathering of people, perhaps the entire community that was residing that the site. This is an important point as the late 12th century was an era when the regional population was beginning to establish larger and more nucleated settlements. Feasting events such as the one represented in the Feature 13 earth oven deposit may have been instrumental in integrating these expanded communities.

This investigation of earth oven functionality is part of a broader, ongoing effort to understand diachronic changes in foodways in the late Prehistoric Central Illinois River Valley. Our recent analysis of changing plant subsistence during the Late Woodland–Mississippian transition revealed a significant increase in maize production and consumption during the early Mississippian period, the latter period represented by the C. W. Cooper plant assemblage (excluding the Feature 13 maize remains) (VanDerwarker *et al.* 2013). It is interesting that the earth oven feature at C. W. Cooper represents the persistence of a Late Woodland cooking technique traditionally embedded within a context of communalism but that simultaneously incorporates a relatively new dietary element—in this case, maize. While maize was certainly present in Late Woodland diets of the Illinois Valley, it did not become a significant staple food in the region until the early Mississippian period (VanDerwarker *et al.* 2013). While we may never know the reason this large outdoor roasting event failed, the fact that it did fail provided us the opportunity to see how earth ovens were constructed, used, and the types of foods prepared within in the Central Illinois Valley and perhaps the broader Midwestern United States.

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