THE O.C. VOSS SITE:
REASSESSING WHAT WE KNOW ABOUT THE FORT ANCIENT OCCUPATION OF THE CENTRAL SCIOTO DRAINAGE AND ITS TRIBUTARIES

DISSERTATION

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By

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ABSTRACT

In this dissertation I present newly acquired data concerning the prehistoric occupation of the O.C. Voss site in Franklin County, Ohio, and provide a contemporary analysis of the results of archaeological investigation conducted at the site more than forty years ago by the Ohio Historical Society. Results of the research suggest Fort Ancient occupation of the central Scioto River drainage and its tributaries was not confined to the early period ca. A.D. 1000-1200 nor is a depopulation of the sub-region ca. A.D. 1350 supported.

The Voss site is located on a second terrace above Big Darby Creek in the Battelle-Darby Metro Park. After excavation of the Voss Mound in 1963, the original investigators placed the Voss site within the Late Woodland Cole Complex, a newly defined taxonomic unit. Within a few years of discovery of the village site associated with the mound, other archaeologists began to question the classification of the Voss site as Late Woodland and suggested attributes of the artifact assemblage indicated a Late Prehistoric Fort Ancient affiliation. Because details of the artifact assemblage, feature type, and village organization existed mostly in the gray literature, the Voss site has retained an incipient Late Prehistoric status in the minds of many researchers in the forty-plus years since discovery of the site. The 1966 village excavations uncovered numerous

pit features and two structural patterns in a configuration that suggested a circular settlement. Yet, questions remained concerning the size of the village, its internal structure, subsistence patterns, and timing of occupation.

Recent investigation of the site utilized geophysical survey in the form of magnetic survey as the paramount method of data recovery. Additional data recovery techniques included magnetic anomaly testing through removal of the plowzone, anomaly coring, limited feature excavation, and shovel testing to determine patterns of artifact density within the village site. An analysis of ceramic and lithic attributes on previously and recently excavated materials is presented and discussed in relation to established temporal indicators. Because little information has been compiled on characteristics of mound construction within the Fort Ancient community, a review and analysis of excavated and reasonably well-documented Fort Ancient mounds was undertaken to assess characteristics of the Voss Mound.

The location of the Voss site is unique as it lies at the northern margin of the Fort Ancient Culture area and is located more than 60 km north of any excavated Fort Ancient site within the Scioto River drainage. Despite its location on the northern boundary and within the dissected valleys of the Big Darby Creek, it will be argued that occupation of the site occurred during the Late Prehistoric period by Fort Ancient populations who adhered to a well-established intra-site settlement pattern of a circular village organized around a central, community-oriented plaza. The Voss site does not represent an incipient stage of the Fort Ancient Tradition of the Late Prehistoric period but rather a site utilized by Fort Ancient populations into the early 15th century.

To all those who encouraged me to see it through

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CHAPTER 1

INTRODUCTION

This dissertation addresses the problem of the nature and timing of the occupation of the O.C. Voss Mound and Village site, and utilizes the occupational history of the site and data from other Late Prehistoric sites within the central Ohio Valley to critique past and current thinking concerning the Baum Phase of the Fort Ancient Tradition.

The Fort Ancient Tradition

Fort Ancient sites in the Ohio River Valley had been excavated as early as the 1870s. Archaeologists have excavated Fort Ancient sites along all of the major rivers flowing into the Ohio River from the north in Ohio and eastern Indiana, and from the south in northern and central Kentucky and western West Virginia. In the early 1900s, William C. Mills conducted extensive excavations at a number of Fort Ancient sites throughout southern Ohio, and coined the term “Fort Ancient Culture” (1906: 135) as a classification for pre-Columbian village sites exhibiting well-developed agriculture and underground food storage.

The first comprehensive study of Fort Ancient cultural traits and their geographic extent was conducted by James B. Griffin and detailed in his 1943 *Fort Ancient Aspect*.

Griffin organized sites (components) into Baum, Anderson, Feurt, and Madisonville foci based on similarity of ceramic attributes. Prufer and Shane (1970), adopting the classification system put forth by Willey and Phillips and incorporating newly available radiocarbon dates, organized Fort Ancient components into chronological phases within a Fort Ancient Tradition. Their chronological framework based on newly available radiocarbon dates divided the Fort Ancient Tradition into three periods, Early A.D. 950-1250, Middle A.D. 1250-1450, and Late A.D. 1450-1750 (1970: 257). The Early Fort Ancient period in central and south-central Ohio was represented by the Baldwin Phase in the Hocking Valley, the Baum Phase in the Scioto Valley, and the Brush Creek Phase in Adams County. The Brush Creek and Baldwin Phases according to Prufer and Shane represented less "Mississippified" phases within the Early Fort Ancient period due to the lack of centrally located burial mounds and the low percentage of shell-tempered ceramics. They also suggested that a Voss Phase belonging to the Early Fort Ancient period, being more Late Woodland in its characteristics may yet be defined for central Ohio.

Since Prufer and Shane's initial discussion of Fort Ancient chronology, a plethora of various phases have been suggested for areas within the Fort Ancient territory primarily on the basis of ceramic styles/geography (Figure 1). Graybill (1981) divided Fort Ancient occupations along the Ohio River in West Virginia and eastern Ohio into the Early to Middle Fort Ancient Feurt phase, and a Late Fort Ancient period Clover Phase. Graybill (1981: 161) using data from sites in West Virginia, suggested that site size increased over time while the number of sites decreased. Graybill concluded these changes in settlement patterns reflected amalgamation of Fort Ancient populations and geographic constriction of Fort Ancient territory to areas adjacent to the Ohio River. He argued the effects of a deteriorating climate on more northern populations and the subsequent crop failure resulted in competition over hunting grounds and increased warfare between these groups and Fort Ancient populations.

Essenpreis' (1982) work at the Anderson site better defined the Anderson phase within the upper Little Miami River drainage. In an early paper, Essenpreis (1978) had proposed a settlement hierarchy for Fort Ancient sites similar to Mississippian patterns in the lower Ohio River Valley and the southeast. This model of Fort Ancient settlement pattern was based on an erroneous identification of a Fort Ancient component at Marietta as a political center with a platform mound (Drooker 1997: 72) was later refuted (Graybill 1981; Griffin 1992; Pickard 1996). The sites argued to have shown evidence of a settlement hierarchy were either determined not be contemporaneous with one another or not Fort Ancient. Most researchers conceptualize Fort Ancient communities as politically and economically autonomous, village-based tribal societies largely focused on their immediate drainage-defined sub-regions (Pollack and Henderson 2000; Drooker 1997). Essenpreis' research at the Anderson site provided information on Anderson phase site structure and a detailed analysis of the Anderson site ceramic assemblage. As a result of this research, Essenpreis placed the Anderson phase within the period ca. A.D. 1100-1400, and at least partially contemporaneous with the Baum phase.

Cowan (1986) added the Early, Middle, and Late Fort Ancient phases of Turpin, Schomaker, and Mariemont, respectively, for the southern reaches of the Miami River drainages. Early Turpin phase sites containing shell-tempered pottery, wall-trench style architecture, and scroll-like motifs on ceramics were seen as reflecting interaction with

Angel phase and other Mississippian populations to the west. Middle Fort Ancient Schomaker phase sites were thought to show similarities with sites upstream (Anderson phase) in the presence of circular settlements with deep storage pits, central plazas, and palisades. By comparing the Early/Middle Fort Ancient single-family dwellings with the Late Fort Ancient Mariemont phase multi-family structures, Cowan (1987) proposed a shift in social organization from family groups in small villages to a clan-based village organization. Riggs (1998: 51) contends Cowan's analysis failed to take into account the multicomponent nature of sites like Schomaker and Hine, particularly in discounting the late dates from these sites when establishing a chronology for the lower Miami Valley that was based on impressionistic changes in settlement patterns and ceramic assemblages over time.

Henderson et al. (1992) provided a much needed review and analysis of Fort Ancient sites in Kentucky which had previously been overlooked in models of Fort Ancient culture change. Henderson and Turnbow divided the northeastern Kentucky Fort Ancient sites into four phases; Crogan A.D. 1000-1200, Manion A.D. 1200-1400, Gist A.D. 1400-1550, and Montour A.D. 1550-1750. One Crogan phase site, Thompson located along the Ohio River south of Portsmouth shows Baum phase affinities in its ceramic attributes. An Osborne phase was defined for the Inner Bluegrass region of Kentucky with the Muir site being the most well-known early component (Sharp 1996). Pollack and Henderson (2000) argued that early sites like Muir and the lower component at Thompson show a pattern of several widely spaced households with associated pit features. They argue that Middle Fort Ancient sites tended to be structured, circular villages with central plazas and concentric activity rings, some also having burial mounds on the plaza edge. Pollack and Henderson (2000; 1992) offered a model of Fort Ancient development over time, suggesting that Early Fort Ancient settlements represent the clustering of family units (after Johnson and Earle 1987) into permanent hamlets or villages, while Middle Fort Ancient villages represent larger aggregations of kin groups into larger yet still autonomous communities. They postulated a post-A.D. 1400 "Big Man" social organization formed as a result of multiple smaller villages coalescing into large villages with village leaders assuming a role in extra-regional exchange.

Carskadden and Morton (2000: 158) have defined a Fort Ancient Philo Phase ca. A.D. 1250-1350 and a Late Fort Ancient protohistoric Riker-Wellsburg Phase for the Muskingum Valley. Carskadden and Morton contend Philo Phase ceramic attributes represent styles that can be directly traced to Graybill's Early Fort Ancient Roseberry phase. They also define a Cole Phase in the Muskingum River Valley contemporaneous or nearly so with Fort Ancient Philo Phase occupations dating to the 13th century.

Different researchers have differing opinions on the beginning and ending dates of Fort Ancient occupations in the Ohio Valley, placing the earliest occupations at A.D. 950 and the latest ones at A.D. 1650, yet as Henderson (1992: 1) expressed it, Fort Ancient lifeways may have begun and ended at different times in different places. Calibrated radiocarbon dates have adjusted chronological sequencing of Fort Ancient components within various sub-regions. In the late 1980s, a pan-regional Madisonville Horizon was recognized to characterize the development from distinct sub-regional traditions within specific drainages to a region-wide material culture post-A.D. 1400, geographically confined to areas adjacent to the Ohio River (Drooker 1997).

Current models of the Fort Ancient Tradition are largely reactions to or refinement of these earlier models. Familiarity with the models of Fort Ancient chronology outlined above is necessary for understanding the basis for discussion and for arguments put forth in this dissertation.

The Voss Site

The O.C. Voss site, referred to hence forth as the Voss site, is located on the east side of Big Darby Creek just south of the confluence of the Little and Big Darby Creeks at Georgesville, Ohio. The Voss site and reconstructed mound are located along the Ancient Trail within the Battelle-Darby Metro Park in southwestern Franklin County. In the early 1960s, the U.S. Army Corps of Engineers planned a reservoir that would have flooded the Big and Little Darby Creek valleys behind a dam constructed at Darbydale (Dancey 1986). It was later determined that the dam was unfeasible for engineering reasons. However, believing dam construction was imminent, salvage was deemed necessary and the Ohio Historical Society began an archaeological survey of the area in 1962. In 1963, the Ohio Historical Society, under the direction of Raymond Baby, excavated the Voss Mound. The investigators concluded that the Voss Mound was the first evidence of the ceremonial life of the Cole Indians (Cole Complex) in Ohio. The mound was assigned to the Late Woodland Cole Complex based on the presence of notched projectile points, "Cole Cordmarked" pottery, and a radiocarbon date of A.D. 966 from a charcoal sample recovered from a post hole beneath the mound (Baby et al. 1966). They did note the occurrence of triangular points and shell-tempered pottery indicating contact with Fort Ancient populations to the south.

During the 1963 mound excavation, test pits revealed the presence of a midden and possible house pattern northeast of the mound (Baby, Potter, and Sawyer 1967). In 1966, the Ohio Historical Society's archaeology department, in cooperation with the National Park Service and The Ohio State University, conducted excavations in the proposed village area. The investigators uncovered nineteen refuse pits situated in an arc running between two structures and a plaza area devoid of features. Although radiocarbon dates obtained from the 1960s excavations ranged from the tenth to the sixteenth centuries and had large associated errors, most in excess of 100+ years, Baby et al. (1966) reported a Late Woodland tenth century occupation for the site.

The classification of Voss Mound and Village as Late Woodland Cole Complex has since been questioned by a number of archaeologists (Prufer and Shane 1970; Seeman 1980; Church 1987; Dancey 1992). Fort Ancient affiliation concerning the Voss site has been suggested by a number of archaeologists not only because the artifact assemblage mimics those of Fort Ancient settlements in other areas but because the intrasite settlement pattern does as well in the organization of structures and pit features (Prufer and Shane 1970; Griffin 1978; Seeman 1980; Church 1987; Dancey 1992; Church and Nass 2002). It should be stated that researchers commenting on the results of the 1960s excavations, including the author, have the benefit of hindsight and the many years of archaeological research and analysis since the original excavations were conducted. Nonetheless, the dominance of triangular projectile points, a percentage, albeit small, of shell-tempered pottery, ceramics with incised decorative motifs and strap and lug handles, and a circular village pattern with a plaza and mound indicate Fort Ancient affiliation.

Prufer and Shane (1970) considered the Voss Mound and Village to be an early expression of Fort Ancient in central Ohio. Limestone elbow pipes and a large triangular knife placed in the hand of one of the burials at Voss were argued to be nearly identical to those recovered from the Fort Ancient Blain Village site near Chillicothe, Ohio. Their examination of the ceramic assemblage from Voss led them to conclude that it exhibited "to a very large extent stylistic and morphological characteristics of undoubtedly early Fort Ancient affiliation" (Prufer and Shane 1970: 234). Prufer and Shane went on to say that ceramic attributes in the Voss assemblage were identical to those from both the Scioto Valley Baum sties and the Hocking Valley and Brush Creek localities. Prufer and Shane viewed the Voss site as similar to the Hocking Valley and Brush Creek sites, and as early with more or less modified Woodland traits persisting into Fort Ancient times as a result of local populations being influenced by Mississippian outsiders (Prufer and Shane 1970: 261). Curiously, just subsequent to likening Voss to the Hocking Valley and Brush Creek sites, they note the lack of central plazas and burial mounds at Hocking Valley and Brush Creek sites, both of which were found at the Voss site. Blain Village yielded a wide range of dates very similar to the dates obtained from Voss. As Baby and Potter had done for Voss, Prufer and Shane accepted only the earliest dates for occupation of Blain, ca. A.D. 960, but called the site Late Prehistoric (Church 1987). In response to Prufer and Shane's assertion that Voss was an affiliated Baum phase Fort Ancient occupation, James Griffin (1978: 554) hesitantly voiced a similar inclination in a review titled *The Late Prehistory of the Ohio Valley*, saying that it "is possible the Voss site…should be included in this phase."

Flora Church (1987) included the Voss site in her analysis of the transition from the Late Woodland to the Late Prehistoric period in the central Scioto Valley. Church concluded, that while ceramic attributes such as guilloche decoration, deep pit features, and a structured community plan indicated a Late Prehistoric Fort Ancient character, the small percentage of shell temper, greater percentage of thickened rims, the predominance of convex-based triangular points, and small site size (her determination that Voss represented a small site based on the two structures uncovered), Voss was better characterized as a "Transitional" Late Prehistoric site. Church remained equivocal on the placement of Voss suggesting that there exists a possibility that a Late Woodland component underlies a Late Prehistoric component at the site. In a more recent review of the central Ohio Valley in the Late Prehistoric, Church and Nass (2002) place the Voss site within an A.D. 1000 to 1250 transitional Late Prehistoric period which they have defined as transitional largely based on characteristics of community settlement patterns. Despite classifying the Voss site as transitional, they comment that, "Voss displays a more spatial, structured arrangement of features and dwellings which is more consistent with post-A.D. 1200 sites," (Church and Nass 2002: 21).

Research Questions

Additional archaeological testing was conducted at the Voss site as part of the author's dissertation research. Archaeological field work began in the Fall of 2001 to test the hypothesis that the Voss site exhibits a circular community organization with concentric rings of mortuary, storage/refuse, and residential zones encircling a central plaza. Fieldwork performed at the site to test this hypothesis included magnetic survey with a fluxgate gradiometer, shovel testing, feature excavation, and coring of magnetic anomalies. An analysis of the stylistic attributes of the ceramic and lithic assemblages recovered from the site during the 1960's mound and village excavations, now housed at the Collections Facility of the Ohio Historical Society, was also conducted by the author. Results of the recent archaeological testing are discussed in the context of a previous Late Woodland Cole Complex classification of the site and a proposed Fort Ancient affiliation, particularly within the context of established Baum phase artifact assemblages, community settlement patterns, and chronology. The problem with previous discussions and reporting of the Voss site is that the archaeological evidence of settlement pattern and community organization in terms of types of features and their distribution within the village including house size, site size, and mound construction, along with paleoethnobotanical remains, ceramic and lithic attributes, and absolute dates have not been presented or discussed as a comprehensive whole and in the context of current thinking on Fort Ancient chronology. Consequently, the taxonomic placement of Voss within established Fort Ancient chronologies remains tentative in the minds of many and the underlying uncertainty that it represents an "emergent" or "transitional" experiment has additional consequences for discussions of a Fort Ancient presence in central Ohio. The author recognizes the restraints and shortcomings of attempts at taxonomy. Many issues arise in making taxonomic designations. Classification of any period of prehistory requires drawing lines along a continuum of culture change. Complicating factors for systematic comparison may include time-sensitive traits experiencing lags from one sub-region to another, comparing uncalibrated dates, and conflating artifact assemblages from multicomponent sites as if they were simply single component. Nonetheless, distinctions can be made concerning the Voss site in characteristics of settlement, subsistence, and ceramic and lithic attributes that allow one to place the Voss site within the seven hundred year continuum of the Fort Ancient Tradition. Results of the investigations at the Voss site are discussed in the context of the larger Fort Ancient Tradition, with particular attention given to Baum phase occupations within the Scioto River drainage.

Research questions under investigation are:

- Does the Voss site exhibit a classic Fort Ancient structured settlement characterized by a circular village organized around a central plaza with concentric zones of burials, storage/refuse pits, and house structures?
- Is a Fort Ancient subsistence strategy heavily reliant on a limited number of cultigens including maize and beans indicated in the paleoethnobotanical remains and feature types?
- Do chronological estimates derived from stylistic attributes in the ceramic and lithic assemblages agree with the radiocarbon assays obtained from the site?
- Does the Voss Mound in characteristics of construction and placement within the larger community adhere to patterns of mound construction at Fort Ancient sites?

CHAPTER 2

BAUM PHASE AND AFFILIATED SITES: A DISCUSSION OF THEIR SPATIAL AND TEMPORAL EXENT

The purpose of the following chapter is to illustrate past models and current thinking on the Fort Ancient occupation of the Scioto River drainage, as well as related components in the Hocking Valley, Brush Creek Valley, and northern Kentucky. The sites shown in Figure 2 have been attributed to the Baum phase or affiliated phases, or have yielded limited quantities of Baum ceramics. Models of Fort Ancient chronology put forth by Griffin, Prufer and Shane, Church, and Church and Nass are discussed in detail. Henderson, Pollack, and Turnbow's extensive work in Kentucky is also given particular attention as several sites located in northern Kentucky and bordering Kentucky on the northern bank of the Ohio River show a mixed ceramic assemblage with a portion of the assemblage attributed to Baum series ceramics. Murphy's review of Hocking Valley Fort Ancient sites suggests sites there also exhibit a mixed ceramic assemblage with a portion of the assemblages represented by Baum series ceramics. The intent of the chapter is to illustrate the problematic temporal extent of Baum phase sites by reviewing previous chronological models that evaluated the temporal placement of Baum-affiliated sites using such indicators as percentage of shell-tempered ceramics, and lastly to compare these indicators with published radiocarbon dates.

Origins of Fort Ancient

Although Fort Ancient sites were recognized before the 1940s as different from and, eventually, recognized as subsequent to the "high culture" of the Hopewell, James Griffin was the first to present a comprehensive ceramic analysis and taxonomy of Fort Ancient sites. Using the McKern classification system, Griffin defined on the basis of geographical clustering of stylistic traits in ceramic assemblages, four foci within a Fort Ancient Culture: a Baum Focus and Feurt Focus in the Scioto River drainage, an Anderson Focus in the Miami River drainages, and a Madisonville Focus in southwestern Ohio and in areas adjacent to the Ohio River. Griffin's work included an extensive review of the existing literature and an examination of pottery collections from the well-known Fort Ancient sites of Baum, Anderson, Feurt, and Madisonville along with related components including Gartner, Baldwin, and Brush Creek within the Baum Focus, Taylor, Steele Dam, and Kemp as part of the Anderson Focus, and Sand Ridge, Turpin, Fox Farm, and Buckner as Madisonville components. Also included was a discussion of similar archaeological ceramic assemblages from areas in Indiana, Illinois, and Wisconsin. Temporal distinctions were minimally addressed by Griffin as his work was accomplished prior to radiocarbon dating and was gleaned from relative dating techniques such as the inclusion of European goods at sites producing Madisonville Focus ceramics. Griffin (1966: 308) speculated on the origins of and the relationships between the foci suggesting that the Baum and Anderson foci seemed to result from a fusion of Woodland traits and early diffused Middle Mississippian traits. Moreover, Griffin suggested the Anderson Focus may have resulted from the actual merging of local populations and migrating Mississippian populations. He recognized the presence of Baum Focus ceramics at the Feurt site and speculated that either the Feurt site represented a population closely allied with Baum but more Mississippian-like in its material culture, or that the inhabitants of Baum and related sites had moved down river to the Feurt site acquiring more Mississippian traits.

In their report of the investigations at Blain Village, Prufer and Shane (1970) devoted considerable time to a discussion of Fort Ancient origins, and their model, similar to the ideas put forth by McKenzie (1967), became a construct that many researchers later challenged. Prufer and Shane argued that the Baum Phase resulted from an actual influx or migration of non-local people into the area. The Feurt Phase along the Ohio River in the Portsmouth area and east, as well as the Anderson Phase in southwestern Ohio, were placed within the Middle Fort Ancient period. The Feurt Phase was seen as the successor to the Baum Phase, and the Anderson Phase developing out of the Brush Creek Phase. Prufer and Shane seem to have disregarded the multicomponent nature of many of the sites (Henderson 1992; Riggs 1998) placing them strictly within Early, Middle, or Late periods. Moreover, they did not explicitly address Fort Ancient occupations within Kentucky and West Virginia and how some of the known sites in those areas might fit within their chronological framework. Prufer and Shane (1970) argued that the appearance of Fort Ancient cultural traits in the central Scioto drainage was abrupt and thus could not be explained by gradual diffusion, either by actual exchange of goods or simply an exchange of ideas/styles from distant populations. The

Baum phase was believed to represent the most "Mississippified" of the early Fort Ancient phases, having an intrasite settlement pattern with a centrally located burial mound and plaza. Therefore, Baum phase populations were seen as immigrants to the Scioto Valley from Mississippian populations found farther west with this immigrant population having displaced indigenous populations to the nearby upland hinterlands. Prufer and Shane viewed the Fort Ancient populations in the Hocking and Brush Creek valleys with their more Woodland-like ceramics (i.e. very few shell-tempered sherds and/or numerous thickened rims) and no centrally located burial mounds as representing acculturation of local Late Woodland populations, the acculturation originating from the Scioto Valley Baum populations. Dunnell (1972: 78) made a similar argument for Fort Ancient sites in the mountainous regions of Kentucky. The Woodside phase was argued to represent an upstream expansion (migration) of Fort Ancient populations into the territory of indigenous populations. Similar to Prufer and Shane, Carskadden and Morton (2000) view the onset of Fort Ancient cultural traits in the central Muskingum Valley as representing the movement of populations into the region, replacing indigenous populations. They view Fort Ancient Roseberry/Blennerhassett phase peoples as having moved up the Muskingum Valley reaching Philo II by the mid 13th century absorbing some local populations into their villages. Currently, the more widely held belief is that Fort Ancient is an *in situ* or indigenous development out of local Late Woodland groups, with local groups only having been marginally influenced by Mississippian cultures to the west and south rather than having been replaced by migrating populations. Church (1987: 135) in her analysis of the transition between the Late Woodland and Late Prehistoric in central Ohio concluded that temporally sensitive ceramic traits such as tempering, decorative designs, and rim form suggested continuity over time rather than population intrusion. The majority of expressed opinions since also view Fort Ancient as a local development from local Late Woodland populations; Riggs (1998) in his analysis of ceramic assemblages of the lower Little Miami Valley, and Rafferty (1974) and Pollack and Henderson (2000) working in Kentucky. Griffin seemed to have favored a combination of the two, stating that Fort Ancient appeared to have resulted from both an actual migration of peoples of Mississippian culture from places like Missouri, Illinois, Kentucky, and Tennessee into the southwestern portion of Fort Ancient territory, as well as by a diffusion of traits (Griffin 1966: 257); the possible movement of some societies into the Fort Ancient area of southwestern Ohio, and by cultural exchange with southeastern groups (Griffin 1978: 547). It is entirely possible the pattern and tempo of cultural change was different in different sub-regions within the Fort Ancient Culture area. Some populations may indeed have been displaced or assimilated while others retained their identity in the face of diffusion of new materials, practices, and beliefs. Not surprisingly, Fort Ancient sites in southwestern Ohio show more evidence of interaction with Middle Mississippian populations (Cook 2004). Clearly, recent evidence does not suggest the beginnings of the Fort Ancient Tradition are only found in the central Scioto drainage as Prufer and Shane (1970) implied. Although Early Fort Ancient sites are relatively few, there are well-documented early sites in southwestern Ohio and northern Kentucky. As will be detailed in the following sections, the earliest dates previously reported for Baum Phase sites are suspect in light of recent evidence.

Models of Fort Ancient in the Scioto, Hocking, and Brush Creek Drainages

Discussion of Fort Ancient chronology has suffered from the tendency to assign new phase names too hastily, even when few differences in ceramic attributes or settlement patterns can be identified between sites, i.e. Anderson and Schomaker phases. Chronologies for Late Prehistoric sites located within the Scioto, Hocking, and Brush Creek drainages are no exception. Phase distinctions are copious and the author is not advocating their use. However, the intent is to discuss the chronological models previously put forth to argue we must reassess the nature and timing of Fort Ancient occupation within central and south-central Ohio.

Griffin (1966) included the Baum site located on the south bank of Paint Creek southwest of Chillicothe, the Gartner site located six miles north of Chillicothe on the east bank of the Scioto River, the Baldwin site located northeast of the present-day city of Lancaster on a tributary of the Hocking River, and the Serpent Mound component located in Adams County along Brush Creek, in his definition of the Baum Focus. The Baum Mound was excavated in the late 1880s by the Bureau of Ethnology. The village site, the type site for the focus, saw extensive excavations conducted by Mills (1906) during three field seasons beginning in the summer of 1899. The village was described as being over ten acres in extent (see Griffin 1978) with Mills reporting forty-nine house structures and 234 storage/refuse pits within the 2-acre portion of the site excavated. Mills, as did Griffin later, remarked on the considerable similarity in material culture and village layout between the Baum and Gartner sites. Griffin suggested the Baldwin site, although clearly related, was less similar in that some of the Baldwin ceramics showed considerable similarity to Woodland pottery in the vertically notched lip treatment on rims and some rims exhibiting raised (castellated) sections. Griffin documented the presence of Baum ceramics at the Feurt site and commented on other similarities such as burials around or within houses and circular/oval house structures. By 1978, Griffin had abandoned the use of terms like Focus and Aspect and replaced them with phase and complex, defining a Baum phase, a Baldwin phase, and a Feurt phase for the Scioto and Hocking river drainages with the Voss site and Serpent Mound component in limbo between those phases and the Anderson and Madisonville phases to the west. Despite his use of the term phase, temporal differences were not addressed and Kentucky Fort Ancient sites were almost entirely ignored.

Prufer and Shane (1970), largely using Griffin's original framework but rearranging components and adding the element of time, sought to build a chronology for Fort Ancient sites within the Middle Ohio Valley, giving particular attention to sites having Baum ceramics. Prufer and Shane added the Blain Village site, located on the Scioto River just south of Chillicothe, to the list of Baum-related sites. They, largely due to newly available radiocarbon dates, reconceived of Griffin's framework of foci, constructing a region-wide Fort Ancient Tradition divided into phases within Early A.D. 950-1250, Middle A.D. 1250-1450, and Late A.D. 1450-1750 periods. The Baum, Baldwin, and Brush Creek phases were assigned to the Early Fort Ancient period, A.D. 950-1250. The Baum phase now consisted of Griffin's original components of Baum and Gartner, the newly added Kramer (also spelled *Cramer*) Mound and Village site located six miles north of Chillicothe on the west bank of the Scioto River just across the river from the Gartner site, and Blain Mound and Village. The Baldwin phase of the Hocking Valley in southeastern Ohio consisted of the Baldwin, Graham Village

(McKenzie 1967), and Gabriel sites. A Brush Creek phase was defined for the Serpent Mound component and Prufer and Shane (1970: 257) left open the door for other early Fort Ancient phases, especially in central Ohio, including a possible Voss phase represented by the Voss Mound and Village site located along Big Darby Creek. The Feurt and Anderson phases in southern and southwestern Ohio were seen as later developments of the Middle Fort Ancient period A.D. 1250-1450, the Anderson phase developing out of the Brush Creek component and the Feurt phase developing from the Baum phase. Only one phase, the Madisonville phase, was defined for the Late period post-A.D. 1450.

The chronology for Prufer and Shane's Early Baum, Baldwin, and Brush Creek phases was largely based on radiocarbon dates associated with only the Blain, Graham, and Voss sites as the other affiliated sites had been excavated in the early 1900s and had no dated material. The Blain and Voss sites, however, yielded radiocarbon dates spanning the entire 700-year time frame of Fort Ancient. The two most recent dates from Blain Village were rejected by Prufer and Shane due to root contamination, contending the only acceptable temporal range for the site was A.D. 970-1225. Schambach (1971) questioned Prufer and Shane's assertion that the earliest date from Blain best represented the entire occupational history of the site. In addition to absolute dates, Prufer and Shane based their chronology upon the ratio of shell vs. grit-tempered sherds from the various sites, hypothesizing that sites could be seriated on the basis of percentage of shell-tempered ceramics. Baum affiliated sites were seen as being early in the overall Fort Ancient sequence due to ceramics assemblages dominated by (>80%) grit-tempered ceramics. As Blain, Graham, and Brush Creek exhibited less than 5% shell-tempered sherds, these sites were viewed as representing the earliest occupations. Baldwin, with 10% shell-tempered sherds, was seen as slightly later. Baum and Gartner with 15 to 20% shell-tempered sherds were believed to be the latest in time. Percentage of shell temper has since been used by many to seriate Fort Ancient ceramic assemblages (Turnbow and Henderson 1992; Riggs 1988; Church 1987; Ullman and Pi-Sunyer 1985; Essenpreis 1982).

Flora Church, largely responding to models put forth by Prufer and Shane, sought to better define the Late Woodland and Late Prehistoric occupations in the central Scioto drainage. Church (1987), in her analysis of the Late Woodland/Late Prehistoric transition in central Ohio, added the sites of Howard Baum (Skinner et al. 1981) and Enos Holmes (Baby, Potter, and Sawyer 1968), both located along Paint Creek, to the list of Baum-affiliated sites. The Howard Baum site is located on Paint Creek in Ross County. Investigation of the site was conducted as part of a CRM project resulting in a narrow transect perpendicular to the terrace edge being mechanically stripped. The stripped area revealed approximately ten pit features. Enos Holmes is located along Paint Creek in Highland County, just south of the confluence of Plum Run and Paint Creek. Baby, Potter, and Saurborn (1968), as they had for the Voss site, originally assigned Enos Holmes Mound to the Late Woodland Cole Complex. Church's seriation of sites by temper duplicated Prufer and Shane's seriation (Figure 3). Howard Baum, Voss, Enos Holmes, and Blain exhibited less than 5% shell-tempered ceramics and were therefore considered transitional Late Prehistoric. Baum, Gartner, and Kramer exhibited greater than 15% and were therefore early Late Prehistoric.

Spatial and Temporal Extent of Baum Series Ceramics

Attempts to define diachronic change within the Fort Ancient Tradition have suffered from viewing sites as single component without recognizing or making explicit the likely multicomponent nature of many of the sites (Drooker 1997; Pollack and Henderson 2000). Mixed ceramic assemblages from certain sites may, on the one hand, be evidence of multiple occupations separated in time. Alternatively, it may suggest villages comprised of household units deriving from varied populations at a single point in time.

Contemporaneous with early Baum phase sites in the Scioto drainage and its tributaries, is the Crogan phase in northeastern Kentucky (Henderson et al. 1992). The Crogan phase consisting of the Thompson, Scioto County Home, and Feurt sites shares many similarities in material culture with the Baum phase. However, due to differences in site size and configuration as well as a belief that assigning sites located 60 or more kilometers to the south would dilute the integrity of the concept of the Baum phase, Henderson et al. (1992: 255) assigned Early Fort Ancient sites in northeastern Kentucky to a separate Crogan phase. The Scioto County Home site assignment is based on a very limited number of rim sherds from a single feature (Jeb Bowen, personal communication).

The convention has largely been to assign any Baum Series ceramics recovered from a site to an early component. The Thompson, Feurt, Baldwin, Graham, Gabriel, and McCune sites produced a mixed ceramic assemblage, with a portion of the assemblage being Baum series ceramics (Turnbow and Henderson 1992; Murphy 1989; Griffin 1966). The Thompson site contains a lower component as well as an upper, Late Fort

Ancient component. Turnbow and Henderson (1992: 114) state, however, that "all Baum series ceramics were assigned to the lower component [at Thompson] regardless of whether they were collected from lower or upper component levels." While Prufer and Shane (1970: 257) attributed the Feurt site, a large village site containing three mounds located near Portsmouth, to the Middle Fort Ancient period and descendant of the Baum phase, Graybill (1981) and Henderson et al. (1992) assign the Feurt site to an Early/Middle Fort Ancient period. Griffin (1978: 556) and Henderson et al. (1992: 255) suggested evidence points to the site being multicomponent in nature based on ceramic attributes, triangular point styles including a large percentage of serrated triangular points, as well as deep cultural deposits and large numbers of burials. Henderson et al. suggest that Feurt contains at least two components but attribute the Baum series ceramics to only the early component. However, Mills and Griffin report deep cultural deposits, large numbers of burials, and serrated triangular points from the Baum site as well. Mills' (1917) report of the site does not indicate the context of the Baum series ceramics at Feurt and it is possible that the Feurt series ceramics and the Baum series ceramics co-occurred in features.

Murphy (1975; 1989) contends that the Baldwin, Graham, Gabriel, and McCune sites in the Hocking Valley all have ceramic assemblages containing both Feurt and Baum series ceramics, which Murphy interprets as reflecting multicomponent sites with early and later occupations. Murphy contends that the dominant occupations at Gabriel and McCune are Feurt phase with minor and earlier Baum phase occupations. Graham and Baldwin are seen as Baum phase occupations with minor later Feurt phase occupations. Murphy appears to have based his conclusions of temporal sequence on percentage of shell-tempered ceramics with Feurt ceramics being nearly 100% shell-tempered. Yet, apparently both ceramic types were recovered from one of the three pit features excavated at the Gabriel site (Murphy 1989: 276). He reconciles the mixture of grit, limestone, and shell-tempered sherds in Pit 3 by declaring the pit to be Feurt phase with large amounts of earlier midden mixed in the fill. Murphy later suggests that some of the Baum and Feurt components may have been contemporaneous. Ullman and Pi-Sunyer (1985: 73-74) reported the presence of a limited number of Feurt Incised sherds in the Kramer site ceramic assemblage along with Anderson-like rim strip incising as being evidence for a conclusion that the Baum, Anderson, and Feurt phases were at least partially contemporaneous. While the presence of both Baum series and Feurt series ceramics occurring at sites like Feurt, Baldwin, Graham, Gabriel, McCune, and a limited number at Kramer have been mostly interpreted as representing distinct occupations separated in time, the possibility that these ceramic series are at least partially contemporaneous must be considered. The possibility these ceramic types are contemporaneous within a single site has implications for our understanding of social organization. Fort Ancient communities appear to have been autonomous and self-sufficient but perhaps they were also fluid and open through such mechanisms as intermarriage.

The ceramic assemblage from the Baum site has been the “type” assemblage to which all other similar ceramic assemblages have been compared. Using the Baum site ceramic assemblage as a comparative collection for narrowly defining sites as Early Fort Ancient is possibly misleading if in fact the Baum site is also a multicomponent site. Viewing the entire Baum site ceramic assemblage as a single early occupation potentially obscures trends in ceramic styles for a vast area encompassing the Scioto, Hocking, and Brush Creek drainages, as well as northern Kentucky. Henderson et al. (1992) implicitly make this argument. Baum series ceramics are reported from Killen-Grimes and Wamsley at the confluence of Brush Creek and the Ohio River (Brose 1982; Henderson et al. 1992: 259-262). The Killen ridge area contained a large sheet midden, several burials, a burial mound, 14 storage and cooking features, and five structures. The adjacent Grimes ridge area contained 17 storage and cooking features, and part of a structure. The Wamsley site consists of a circular dense village midden. Henderson et al. assigned the Killen-Grimes and Wamsley sites to the Middle Fort Ancient Manion phase due the presence of Fox Farm series ceramics. They suggest the Baum series ceramics at these Middle Fort Ancient sites indicate that either these sites contain minor earlier components or Baum series ceramics continued in minor quantities into the A.D. 1300s. Given the number of sites producing Baum series ceramics and argued to be Middle Fort Ancient, it is probable that the Baum site represents multiple occupations with at least one occupation occurring during the Middle Fort Ancient period. As Drooker (1997: 69) points out, stratigraphically controlled excavations at multicomponent sites combined with radiocarbon dates from samples in direct association with particular pottery types would go a long way towards fine tuning sub-regional chronologies. This, however, has not occurred with the vast majority of sites producing Baum series ceramics.

Percentage of Shell-Tempered Sherds as a Temporal Indicator

Temper type has traditionally been used to infer temporal relationships between sites. Little critical analysis of change in temper over time within the Fort Ancient

Tradition had been attempted until Riggs' analysis of the lower Little Miami Valley. His analysis utilized ceramic assemblages from well-stratified sites so that temporal trends could be determined not only from radiocarbon dates but from stratigraphic context. Riggs (1998: 316-317) notes that changes in the use of temper over time have been analyzed from the perspective of vessel performance and resistance to fracture and thermal stress (Steponaitis 1984). Riggs conclusions concerning changes in temper in the lower Little Miami Valley suggest that populations did shift their emphasis to shell temper over time but not in a clear-cut manner predicted by functional models if increased vessel strength and resistance to thermal stress were the only factors affecting the transition to shell-temper. Riggs found that grit temper persisted much longer than predicted, indicating other factors than solely functional considerations were at play. Church's (1987) analysis of the central Scioto drainage found that the percentage of shell-tempered ceramics in the central Scioto drainage never approached that seen at emergent Mississippian sites, nor did it approach the percentages found at the earliest Fort Ancient sites in southwestern Ohio or Kentucky. In Turnbow and Henderson's (1992: 302) analysis of five Kentucky Fort Ancient sites, crushed rock as temper predominates in the earliest component, the lower component at the Thompson site. However, over 40% of Baum series sherds recovered from Thompson are shell or mixed shell/grit-tempered, suggesting the addition of shell was more commonly used in the southern regions than at contemporaneous or later sites in the upper Scioto and Hocking River drainages.

Riggs' (1998) analysis of sites in the lower Little Miami Valley suggests that grit-tempered only sherds decline throughout the Late Prehistoric yet only disappear after ca.

A.D. 1500. His analysis shows that populations did indeed shift from primarily grit to primarily shell temper from the late Late Woodland through the Late Prehistoric, but that the shift was not abrupt or wholesale and that grit tempers persisted much longer than predicted (Riggs 1998: 317). In reviewing reported percentages of shell-tempered ceramics from pre-A.D. 1400 sites in the upper drainages of the Miami, Scioto and Hocking rivers, it becomes apparent that percentages of shell-temper at certain sites never reached the levels seen at contemporaneous sites located closer to the Ohio River (Table 1). Essenpreis (1982: 20-21, 197) argued that Anderson shell-tempered ceramics tended to increase over time within the Miami River drainages however, her analysis included ceramics from only two sites, Anderson and Carroll-Oregonia. The ceramic assemblages from the Early/Middle Fort Ancient Great Miami Valley sites of SunWatch, Steele Dam, Wegerzyn, and South Fort each produced less than 5% shell-tempered sherds (Griffin 1966; Harper 2000: 347; Cook 2004, 2006; Kennedy personal communication). SunWatch and South Fort have produced dates in both the early and middle periods. These sites produced very similar dates to the State Line site which in contrast produced 98% shell-tempered ceramics (Vickery et al. 2000: 312). State Line is located farther south in Hamilton County near the Ohio River. Analysis of percentage of shell-tempered ceramics at sites where overlapping structural patterns and pit features, or rebuilding of a palisade suggest a site is multicomponent may prove difficult. Determining which occupations produced what percentage of shell-tempered pottery may prove impossible. Many site reports often do not indicate if shell-tempered ceramics cluster in a particular area of the site or whether these sherds are evenly distributed throughout pit features. One feature contained 12% of the shell-tempered pottery recovered at SunWatch Village

(Cook 2006: 18). The associated median date was A.D. 1359. A meager twelve percent shell-tempered pottery associated with such a late date is noteworthy. We do not know whether certain pit features at Baum contained higher percentages of shell-tempered ceramics and whether these features would produce later dates.

Indeed the problem has already been articulated by a number of researchers including Carr and Hass (1996: 27) writing, "The large number of late dates at Blain and O.C. Voss that fall in the range of later Anderson and Feurt phase Fort Ancient sites which bear high percentages of shell-tempered ceramics must be reconciled with the very low incidence of shell-tempered ceramics at Blain and O.C. Voss." This author is not suggesting that shell-tempered ceramics do not increase in number over time eventually entirely replacing grit-tempered ceramics. The evidence is clear that this change is complete by circa A.D. 1500 (Riggs 1998). However, the pattern of change does not appear to have been uniform over the Fort Ancient culture area. Rather the pace of change appears to have been uneven and slow at a number of sites in the upper reaches of the Miami, Scioto, and Hocking river drainages.

A number of possibilities exist to explain the low percentages of shell-tempered ceramics at certain sites in these areas. One possibility is that these sites are largely early despite the long range of radiocarbon dates, thus arguing the dates are erroneous. A second possibility is that the sites producing some relatively late dates and low percentages of shell-tempered ceramics have later components and percentages are skewed by uneven or limited excavation, and/or undifferentiated temporal contexts. The Graham Village ceramic assemblage contained approximately two percent shell-tempered sherds, n=94. However, McKenzie (1967: 71) reports that over half of the shell-tempered sherds came from only two of the 14 pit features excavated. Cook found that shell-tempered pottery was concentrated near newer houses but was most closely associated with the elite area at SunWatch (Cook 2004: 207). A third possibility is that some populations in the upper reaches of the Scioto, Miami and Hocking River drainages never incorporated the percentages of shell-tempered ceramics either through local manufacture or trade that more southerly Fort Ancient populations did, or did so unevenly, making percentage of shell-tempered ceramics a poor indicator of site chronologies pre-A.D. 1500 in these sub-regions. It is the opinion of this author that the relatively low frequency of shell-tempered ceramics in these upper drainages is likely a combination of the second and third scenarios.

Radiocarbon Dates

Many of the radiocarbon dates reported for sites having Baum Series ceramics were produced by labs that are now defunct such as the lab at Ohio Wesleyan University (lab code OWU), University of Michigan (lab code M), and Dicarb Radioisotope Co. (lab code DIC). The Dicarb lab is argued to have produced dates that tend to be younger than assays produced by other laboratories (Reuther and Gerlach 2005). Moreover, the radiocarbon ages produced by Ohio Wesleyan University, University of Michigan, and Dicarb labs tend to have large estimates of error. Therefore, a number of the dates listed in Figure 4 are not be acceptable due to the 100+ estimates of error and having been processed in the early days of radiocarbon dating. These assertions cast doubt on some of the reported dates, particularly the very early and the very late dates. Certainly these sites were not occupied for the entire seven hundred year sequence. As Maslowski et al.

(1995) caution, many archeological sites are unstratified and multicomponent so that a radiocarbon date provides little information without associated diagnostic artifacts. Radiocarbon assays thought to be overly long for the artifact types represented is not unique to sites within the Scioto River drainage. Cook (2006) suggests that at SunWatch Village, long interpreted as single component but with a radiocarbon sequence spanning a 500-year period, two portions of the radiocarbon sequence, the late 1100s and the late 1300s can be accounted for by analyzing such temporal indicators as architecture/rebuilding and feature form/volume, along with the more commonly used diagnostic artifact attributes.

Recent radiocarbon determinations on non-wood charcoal have yielded some interesting results for sites that previously had no reported radiocarbon ages. As will be shown, some of the dates obtained within the last ten years from several sites containing Baum series ceramics fall within expected ranges while others suggest later occupations/multiple components (Figure 4). The recently submitted samples from Baum phase sites have produced dates consistent with Early and Middle Fort Ancient period occupation.

Carr and Haas (1996) obtained AMS dates from nutshell and food residues on pottery from 17 sites in the Scioto and Muskingum drainages including Howard Baum, Voss, and Blain. Radiocarbon dates for sites discussed in the text are provided in Table 2 and sources for the dates and site information are provided in Table 3. The samples submitted by Carr and Haas yielded dates in the 13th century for Howard Baum, the late 15th/early 16th century for Voss, and the 17th century for Blain. The authors comment that the date for Blain is likely inaccurate, indicated by the $\delta^{13}C$ value being unacceptable for the source material (Carr and Haas 1996:46).

Greenlee (2002) conducted an analysis of the variation in isotopic diet among maize farmers in the Middle Ohio Valley during the Late Woodland and Late Prehistoric periods. The Voss and Enos Holmes sites were viewed as being particularly important for determining chronological placement as they had been argued to date to the Late Woodland period and yet showed similarities to later sites. Radiocarbon determinations were made directly on human bone. An individual buried beneath Voss Mound recovered during the 1963 excavations yielded an intercept date of A.D. 1263 and a one sigma range of A.D. 1215 to 1284 (Greenlee 2002: 559). A thirteenth century date falls considerably later than previous interpretations of the site suggested. Greenlee obtained a radiocarbon age of 930 +/-60 B.P., calibrated to the twelfth century, on human bone from the Enos Holmes Mound. A date in the late 12th century is in line with previous expectations and a previously obtained date.

Hart et al. (2002: 381) obtained AMS dates on *Phaseolus vulgaris* (common bean) and associated maize fragments from Late Prehistoric sites across the northern Eastern Woodlands to establish the timing of the adoption and spread of domesticated beans in the region. Hart et al. contend that beans were a later post-A.D. 1200 addition to the three sisters intercropping of maize, beans, and squash. Hart et al. suggest that many of the sites reporting beans in early contexts have radiocarbon dates that span several centuries, have large standard deviations, or were obtained from features that did not contain the beans. Bean samples were obtained from Blain Village, Baldwin, and Gartner for dating. Bean and maize samples from the Blain site produced two sigma calibrated intercept dates of A.D. 1421 and 1428, Baldwin bean samples produced intercepts of A.D. 1408 and 1428, and the Gartner site bean samples produced intercept dates in the 14^{th} century. All of these dates are much later than previous interpretations of site occupations and none more recent than the late A.D. 1200s (reported calibrations were done by Hart et al. using CALIB 4.3, Stuiver et al. 1998). Radiocarbon dates on bean samples obtained by Hart et al. are provided in Table 4.

Jeb Bowen (2004, 2005) reported several recently obtained AMS dates on deer bone from the Gartner, Baum, and Feurt sites. The deer bone fragments obtained from the Gartner site were said to be excavated in the 1980s from a pit feature containing both grit-tempered and shell-tempered ceramics. The sample from the Baum site, also recovered in the 1980s, was from a midden deposit south of the mound. The Feurt sample is of unknown provenience. Baum and Feurt produced radiocarbon dates in the 14^{th} century while Gartner yielded a date in the late 13^{th}/early 14^{th} century. The date from Gartner obtained by Bowen corresponds well to the dates obtained by Hart et al. on the bean fragments from Gartner.

Radiocarbon dates alone are insufficient to determine the timing of occupation of Fort Ancient sites in the central Scioto and upper Hocking drainages but are, nevertheless, suggestive of later occupational histories than previously entertained (Figure 5). Rather than viewing the Baum site as the type site for comparison of ceramic attributes to determine whether a site should be considered an early manifestation of Fort Ancient, the reverse may be more useful. The Baum site ceramic assemblage should be compared to a series of sites with calibrated dates and associated pottery. In this way we can come to know the occupational history of the Baum site and the temporal extent of

Baum series ceramics. Revisiting changing ceramic styles within Baum series ceramics seems prudent if indeed Baum series ceramics span a three hundred year period as radiocarbon dates suggest they do. The possibility must be entertained that some of the Baum-affiliated sites have middle and/or border-line middle/late components, and specifically the possibility of an occupational history of greater duration (although likely discontinuous) than simply ca. A.D. 1000-1250 for the Baum site.

A larger issue to which these later dates speak is the proposed depopulation of northern Fort Ancient territories for southern environs adjacent to the Ohio River believed to have occurred ca. A.D. 1350. Depopulation ca. A.D. 1350 is not supported by the recently obtained AMS dates from sites in the central Scioto drainage. Clearly the full-blown or classic Madisonville Series ceramics of the Madisonville Horizon beginning A.D. 1450/1500 do not appear to be present at these sites. Therefore, a late period occupation post-A.D. 1500 is not supported by the ceramic evidence or recent radiocarbon evidence. It may be that models of depopulation of the upper Scioto and Hocking drainages must be brought forward in time ca. A.D. 1500 if the later radiocarbon dates stand and can be supported by other lines of evidence. It is interesting to note that the coolest period of the Little Ice Age, argued to have been the stimulus for shifts in Fort Ancient site distribution at the beginning of the Madisonville Horizon, is argued to have begun ca. A.D. 1500 (see Kennedy 2000). The concept of a depopulation of large areas of the Fort Ancient territory is revisited in Chapter 7.

CHAPTER 3

THE DARBY CREEK DRAINAGE AND PAST ARCHAEOLOGICAL INVESTIGATIONS OF THE AREA

The Voss site is located in central Ohio and lies on the northern margins of the Fort Ancient territory located to the south, southwest, and southeast. The site is located along a border of sorts, of an area lying between the tributary valleys of the Great Miami, Scioto, and Muskingum rivers and the Lake Erie watershed, an area for which archaeologists know little about (Redmond 2000).

Environmental Setting

The Darby Creek drainage encompasses parts of Logan, Union, Madison, Franklin, and Pickaway counties. The confluence of Big Darby Creek and the Scioto River is in southern Pickaway County. The Voss site is located on the east bank of Big Darby Creek just south of the confluence of the Little and Big Darby Creeks at Georgesville, Ohio, in Pleasant Township, southwestern Franklin County (Figure 6). The Voss site and reconstructed mound are located on the Nature Trail within the Battelle-Darby Metro Park, southwest of where Harrisburg-Georgesville Road comes to a dead end and park property begins. The reconstructed mound is located immediately adjacent to the mown park trail running along the tree-line of the terrace edge.

The second terrace on which the Voss site is situated was formerly owned and farmed by O.C. (Osmer Charles) Voss. Bob Voss, his grandson, visited the site while the recent excavations were being conducted. He pointed out the location of the old farmstead where a magnolia tree and several established pine trees stand along the trail and adjacent to the creek, just to the west of the paved park maintenance driveway running from the dead end of Harrisburg-Georgesville Road towards the creek. The Voss family farmed the land when the original investigations were conducted by the Ohio Historical Society. When the Voss family acquired the land in the 1950s it was in a somewhat fallow condition which they soon rectified and began farming operations. Available aerial photographs show the site had been under cultivation as far back as 1948. The nearby town of Georgesville was established in 1795, and land located along rivers and creeks tended to be among the first locations settled and put under cultivation.

Glacial Geology and Bedrock

The Darby Creek drainage and the Voss site lie within the Till Plain of the Central Lowland Province. The Till Plain is composed of glacial till and outwash deposited during the Wisconsin Glaciation of the Late Pleistocene Period. As the glaciers melted and the ice receded, sediment-laden melt water was discharged into the valleys. The sand and gravel was deposited as gravelly outwash along the Scioto River and its tributaries in areas now above the present-day floodplain (Franklin County Soil Survey). The smaller silt and clay particles were carried in suspension and laid down in still water.

The bedrock underlying most of western Franklin county and Eastern Madison county consists of dolomitic limestone with Devonian Columbus Limestone on the eastern margins (King 1981; Fenneman 1938). The bedrock is buried by glacial deposits of calcareous till interspersed with lenses of sand and gravel. The depth to bedrock ranges from a meter to over 60 meters, with an average of 15 to 20 m of till over bedrock. Bedrock is exposed in the area at only a few localities, including along both the Big and Little Darby Creeks near West Jefferson and Georgesville.

Physiography

The topography of the area can be described as nearly level to gently undulating glacial till that is only slightly dissected by the major streams of the area (King 1981). Most relief, other than adjacent to the streams, is gentle, between 1 to 4m/km. However, the valley walls of the Little and Big Darby Creeks tend to be steep sided. The topography along the creek valley is characterized by narrow to relatively broad flat valley floors, and broad flat terrace benches with short, rather steep slopes between terrace levels. The uplands are characterized by broad flats with depressions, knolls, and ridges. Elevation generally ranges between 230 m (above mean sea level) along the lowest point of the creek to 320 m on the uplands.

The Voss site is situated on the second terrace above Big Darby Creek. The terrace edge drops to the floodplain below on the western edge of the site (Figure 7). A rise from the relatively broad and flat bench of the second terrace to the third terrace occurs to the east of the site. The slope from the second terrace to the floodplain below is moderately steep with the steepest portion of the slope having an approximate drop in elevation of 5 m over a distance of 50 m, then as one proceeds towards the creek there is a much more gradual and modest change in elevation to the level of the creek.

A United States Corps of Engineers benchmark is located immediately west-southwest of the mound in the tree-line. The following coordinates of the benchmark were supplied to the crew of the Ohio Historical Society during the original investigations of the site: latitude 685.556.281, departure 1.797.747.987, Elevation 843.07.

Soils

The soils in the vicinity of the Voss site formed in calcareous glacial till as a result of the Wisconsin Glaciation. The soils in the vicinity of the site belong to the Eldean-Ockley-Warsaw association, the Medway-Genesee-Sloan association, and the Miamian-Celina association. The Eldean-Ockley-Warsaw association is found on the second terrace where the village site is located, shown in Figure 8. This association is described as deep, nearly level to moderately steep, well drained soils formed in moderately coarse to moderately fine textured glacial outwash, alluvium, or loess (Franklin County Soil Survey 1980). The soils in this association found at the Voss site are Ockley silt loam, covering the majority of the village site, with extensions into Warsaw silty clay loam. Ockley and Warsaw soils have moderate to rapid permeability and are good sources of sand and gravel. Ockley soils formed under a forest consisting mostly of hardwoods such as oak and maple. Warsaw soils formed mainly under grass. The following are descriptions of these soil types as given in the Franklin County Soil Survey:

OcB-Ockley silt loam, 2 to 6 percent slopes

Gently sloping, deep, well-drained soil in areas on low knolls and in long narrow strips on stream terraces and broad outwash plains

Surface layer – brown, friable silt loam, approximately 30 cm thick

Subsoil – approximately 84 cm thick with the upper and middle parts being brown and reddish brown, mottled, friable gravelly sandy clay loam

Substratum – to a depth of approximately 150 cm being a brown, loose gravelly loamy sand with very rapid permeability

-Strongly acid or medium acid reaction in the upper part of the subsoil to neutral in the lower part

-Medium natural fertility and low potential for water impoundment because of the very rapid permeability in the substratum

Typical pedon:

A horizon – Ap 0-18 cm, brown 10YR 4/3 silt loam, medium granular structure, friable, 3 percent coarse fragments, medium acid, abrupt smooth boundary; A2 18-30 cm same with medium subangular blocky structure, slightly acid with abrupt wavy boundary

B horizon – Bt 30-90 cm , brown 7.5 YR 4/4 to 5YR 4/4 clay loam, medium subangular blocky structure, thin very patchy dark brown to dark reddish brown clay films on horizontal and vertical faces of peds, 5 to 12 percent coarse fragments, medium acid to slightly acid in the lower portion, wavy boundary; B3 90-114 cm, dark reddish brown 5YR 3/3 gravelly sandy clay loam, common coarse dark brown mottles, massive, friable, 16 percent coarse fragments, neutral, clear wavy boundary

C horizon – 114-150 cm gravelly loamy sand, single grain, loose, 40 percent coarse fragments, moderately alkaline

<u>WdB-Warsaw silt loam, 2 to 6 percent slopes</u>

Gently sloping, deep, well-drained soil on moderately broad, long areas on stream terraces and outwash plains; shallower over sand and gravel than Ockley soils

Surface layer – very dark grayish brown, friable silt loam approximately 20 cm thick

Subsoil – approximately 20-75 cm with the upper part being dark brown, friable silty clay loam and reddish brown firm clay loam and the lower part being dark brown, firm clay loam and dark reddish brown, friable gravelly clay loam

Substratum – 75 cm to a depth of approximately 150 cm being brown, loose very gravelly sand with very rapid permeability

-Strongly acid to neutral in the upper part of the subsoil to moderately alkaline in the lower part

-Medium natural fertility and low potential for water impoundment because of the very rapidly permeable substratum

Typical pedon:

A horizon – Ap 0-20 cm, brown 10YR 3/2 silt loam, medium granular structure, friable, 2 percent coarse fragments, neutral, abrupt smooth boundary

B horizon – B1 20-33 cm , dark brown 7.5 YR 3/2 silty clay loam, medium subangular blocky structure, friable, thin very dark gray coatings on vertical faces of peds, 2 percent coarse fragments, neutral, clear wavy boundary; Bt 33-60 cm, reddish brown 5YR 4/3 to dark brown 7.5 YR 4/4 clay loam, medium to coarse subangular blocky structure, patchy very dark grayish brown clay films on horizontal and vertical faces of peds, 5 to 10 percent coarse fragments, neutral, clear wavy boundary; B3 60-75 cm dark reddish brown 5 YR 3/3 gravelly clay loam, coarse subangular blocky structure, many fine weathered limestone fragments, 25 percent coarse fragments, mildly alkaline, gradual wavy boundary

C horizon – 75 to150 cm very gravelly sand, loose, 55 percent coarse fragments, moderately alkaline

Ross soils of the Medway-Genesee-Sloan association are located on the floodplain below the village site, and are described as deep, nearly level, well, moderately, or poorly drained soils formed in moderately coarse to moderately fine-textured recent alluvium. Ross soils have a silt loam surface layer and high available water capacity. Ross soils commonly occur on the highest part of the floodplain and are subject to occasional flooding. Most areas of this soil are farmed and this soil has high potential for row crops.

Miamian soils of the Miamian-Celina association are found on the ridge just to the east of the site. Miamian soils are described as deep, gently sloping to very steep, well-drained soils formed in medium textured and moderately fine textured glacial till that occur on higher knolls and on the sides of ridges and valleys. Miamian soils have moderately slow permeability, and have a silt loam, silty clay loam, or clay loam surface layer.

Flora and Fauna

The site is currently located in a fallow field which is periodically mowed to keep out woody growth. Prior to its fallow condition, the terrace was under crop cultivation. The vegetation of the area is designated mesophytic deciduous. Most of western Franklin and eastern Madison County is Mixed Oak forest with areas of Oak-Sugar Maple found along the Big Darby valley and Elm-Ash Swamp forest along the Little Darby Creek valley.

The site is located within the Darby Plains. The term Darby Plains has been in use since the arrival of Europeans to the area but its boundaries have been drawn with varying extents. King (1981: 108) defines the Darby Plains as having the southern limits of the Powell Moraine in southern Union County as its northern boundary, its western boundary the gradual slopes of the eastern limits of the Cable Moraine in extreme eastern Champaign County, it southern boundary the northern limits of the low hummocky London Moraine across central Madison County, and its eastern boundary the weakly defined drainage boundary between the Scioto River and Big Darby Creek in western Franklin County (Figure 9). In 1751, Christopher Gist of the Ohio Company traveled to west-central Ohio. In his journal, Gist described the area as being rich, level land forested with Walnut, Ash, Sugar Maple, and Cherry and interspersed with meadows of wild Rye, blue grass and clover (see King 1981). Wild turkeys, deer, elk, and buffalo were also said to have been abundant in the area. At the time of European settlement, the Darby Plains consisted of open grasslands surrounded by closed forests. According to early historical accounts, prairie and open oak groves were extensive within the Darby Plains just prior to European settlement.

Accounts given by early nineteenth century settlers to west-central Ohio, such as the one Jonathan Alder dictated to his son, tell of large grass prairies in the area. Jonathan Alder, captured in Virginia in 1782 by Indians and taken to the Ohio Country, was the first white settler in the Darby Plains. Alder eventually built a cabin near present-day Plain City. Holder (1883; in King 1981: 113) in describing the central and southern portions of Union County spoke of grass that grew to such a height as it was possible to grab handfuls above the head while on horseback. Accounts of the area from the mid-1800s describe prairie fires occurring nearly every spring or autumn.

The prairies, because of the very flat terrain and slow drainage, remained wet for a considerable part of the year. As more settlers moved into the area, they sought to discourage the wildfires and within a few years, a wet and thick mass of decaying grass accumulated exacerbating the disease of malaria (King 1981). Settlement by Europeans brought a desire to cultivate the land for crops, and consequently, the desire to drain the prairies. The conversion to crop land was so thoroughly carried out by the early 20th century that only small remnants of the original prairies remained. The draining of the wet prairies by the late 1800s had largely removed the native grass species and the vast species of native wildflowers. Prairie remnants in the very near vicinity, north, west and south of Georgesville, were drawn on a 1967 map depicting the Darby Plains in west-central Ohio. The map shows a prairie located on the west side of the creek, across from the Voss site on the upland. Due to the efforts of Jack McDowell, there exists a restored prairie in this location within the Battelle-Darby Metro Park.

The area of the Darby Creek drainage is rich in naturally fertile land and diverse in its plant communities. Occupants of the Voss site would have had access to a variety of woods including oak, hickory, black walnut, ash, elm, honey locust, and basswood. Oak, hickory, and black walnut would have provided ample nuts. Edible fruits included wild berries, wild grapes, and wild plums among others. Grass species of the prairie would have provided many colorful native flowers but also material for thatching roofs, weaving, lining storage pits, and mats. Apart from deer, elk, and wild turkeys, other native species included wolf, black bear, mountain lion, fox, raccoon, bobcat, opossum, mink, and muskrat. The Big Darby Creek would have provided abundant riverine resources such as freshwater mollusks, fish, and waterfowl including geese and ducks, as well as habitat for river otters and beavers and several turtle species. The Big Darby is designated a State and National Scenic River for its diversity of aquatic species.

Previous Archaeological Research Conducted in the Area

Within the larger area of the Darby Creek drainages, two extensive archaeological surveys were conducted. One was previously mentioned, the other was conducted during the summer of 1979 by a crew from the Anthropology Department of Ohio State University. In 1975 and 1976, the Ohio State University Department of Anthropology excavated a mound located on the Darby Dan Farm and conducted a small scale survey of the immediate vicinity (Dancey 1986). The location of mound and grave sites within the Darby Creek drainage were included in Mills' Atlas of 1914.

In the early 1960s, the U.S. Army Corps of Engineers planned a reservoir that would have flooded the Big and Little Darby Creek valleys behind a dam constructed at Darbydale. It was later determined that the dam was unfeasible for engineering reasons. Believing dam construction was imminent, salvage was deemed necessary and the Ohio Historical Society began an archaeological survey of the area in 1962. In 1963, four of the eight recorded burial mounds were salvaged, the Voss Mound being one of the four. The remaining three mounds, Hambleton, McMurray, and Sidner, excavated in 1963 were determined to be Early Woodland Adena mounds (Baby and Potter 1963; Dancey 1986). The other recorded mounds included Galbreath, Cannon, Montoney, and Skunk Hill. The eight mound sites and the six non-mound sites recorded by the Ohio Historical

Society survey are shown in Figure 10. The Voss Village site surrounding the mound was excavated in 1966 by a crew from the Ohio Historical Society directed by Raymond Baby. Both the mound and village excavations will be discussed in detail in the following chapter. Included as part of the 1966 archaeological investigation of Voss Village was the survey of what were described as two small camp sites on the Montoney and Shipley farms (Baby, Potter, and Sawyer 1967). The Montoney site was said to be located approximately 2000 yards north of the Voss site, and the Shipley site located approximately 1 ½ miles south of Voss just behind the proposed Big Darby dam site at Darbydale. The land owner, Max Shipley, recovered ten rim sherds, eleven neck sherds, 114 body sherds, and a portion of the pottery vessel. These ceramics were analyzed by Martha Potter (Otto) and assigned to the Cole Complex. The Montoney site consisted of a low, dark stained ridge (mound) approximately 30 meters in length along the edge of the stream that had been subjected to repeated flooding. The surface survey yielded sherds, lithic debitage, broken stone tools, and considerable quantities of fire-cracked rock. The investigators reported that the ceramic material indicated a Cole Complex camp site they felt was undoubtedly related to the Voss mound and village (Baby et al. 1967: 11).

The survey conducted under the direction of Dr. William Dancey of Ohio State University placed emphasis on the discovery of traces of settlements in an effort to counterbalance what was seen as a burial mound bias (Dancey 1986). Eight mound sites and only six habitation sites had been recorded for the central Darby Creek drainage prior to the survey in 1979. The objective of the systematic survey was to locate and map all surface-exposed cultural items on a variety of land forms to identify artifact clusters, estimate artifact densities, and to more objectively map the extent of archaeological sites (Dancey 1986: 36). The survey resulted in the recording of 42 habitation sites and one mound site in addition to what had previously been recorded (Figure 11). The Archaic period is well-represented in the lithic types recovered during survey. Dancey contends evidence from the burial mounds in the region suggests that mortuary practices characteristic of the Adena appear to have been at least partially contemporaneous with Hopewell mortuary patterns in regions along the Scioto River. Evidence for Middle Woodland Hopewell material culture was lacking, represented by only a few bladelets and one projectile point. Dancey concluded that evidence existed for the settlement context of the Adena burial mounds excavated in previous years and that more settlements of the Late Woodland and Late Prehistoric are present in the region than were previously known.

In 1975 and 1976, the Ohio State University Department of Anthropology under the direction of Dr. William Dancey excavated a large portion of the John W. Galbreath mound previously mapped by the OHS survey and located on the Darby Dan Farm. Investigation during that field season also included a small scale survey of the immediate vicinity (Dancey 1986).

Aument (1990) conducted his Ph.D. research on the mortuary practices of Adena populations in the Big Darby Creek drainage in central Ohio. Adena mound construction by individual communities during the terminal Early Woodland period through the Middle Woodland period in the region is the major focus of the study.

CHAPTER 4

THE OHIO HISTORICAL SOCIETY'S EXCAVATION AND CLASSIFICATION OF THE VOSS SITE

The Classification of the Voss Site as Cole Complex

It will be argued by the author that the Voss Mound and Village site does not represent a Cole Complex settlement. Several reasons exist for drawing such a conclusion. It is recognized by the author that these conclusions are possible because of the 40+ years of archaeological research since the Cole Complex was first conceptualized. The taxonomic unit of Cole Complex as it was originally defined does not represent a cohesive unit in characteristics of material culture, settlement pattern, or temporal placement. Moreover, recent research concerning the Cole Complex has shown that sites assigned to the Cole Complex are better understood within other taxonomic units (Dancey and Seeman 2005). In the case of Voss Mound and Village, the site fits comfortably within the Late Prehistoric Fort Ancient Tradition in characteristics of its artifact assemblage, intrasite settlement pattern, and radiocarbon dates.

Baby and Potter (1965) defined the Cole Complex based on a ceramic analysis from what were at the time thought to be Late Woodland sites in central and western Ohio. Sites included by Baby and Potter in the Cole Complex were the W.S. Cole site in

Delaware County, the Zencor site in Franklin County, the Lichliter site in Montgomery County, and the Voss Mound. The ceramic analysis focused on lip and rim form as well as characteristics of vessel shape. They defined a new pottery type, Cole-Cordmarked, described as grit-tempered and cordmarked with flattened, appliquéd, collared, or cambered rims, and exhibiting angular or rounded shoulders. Baby and Potter (1965: 4) described Cole-Cordmarked pottery as a "post-Hopewellian manifestation of a basic Woodland or Scioto tradition", and being a functional rather than ceremonial ceramic type that persisted into the Late Woodland times. Despite including the Voss site in the Cole Complex, Baby and Potter's own description of the ceramic assemblage from the Voss Mound showed it to be dissimilar in rim form and decoration to the other three sites. Nearly all rims from Voss Mound exhibited thickened rims versus only a handful of rims being thickened from the Zencor and Lichliter sites. The ceramic assemblage from Voss Mound was dissimilar in decoration, with incising of various forms present in the ceramic assemblage from Voss Mound and absent at Zencor, Lichliter, and W.S. Cole. In her Master's thesis, Potter (1966) expanded the list of Cole Complex sites by including sites like Erp located in the upper reaches of the Great Miami River, Highbanks (Orange Works) located along the Olentangy River, and Voss Village. Baby, Potter, and Saurborn (1968) later included the Enos Holmes Mound located on Paint Creek in Ross County in the Cole Complex. Potter (1968) suggested the Cole Complex settlement pattern was one of semi-permanent villages with circular houses and small temporary camp sites for hunting. Cole populations and their non-Fort Ancient lifeways were believed to have persisted into the Late Prehistoric period to become at least partially contemporaneous with Fort Ancient populations to the south (Potter 1968; Seeman 1980; Dancey 1992).

Sites originally classified as Cole Complex have been called an incongruous lumping of ceramic styles and prehistoric occupations in central Ohio falling between the Hopewell ceremonialism of the Middle Woodland and the Fort Ancient settlements of the Late Prehistoric (Dancey and Seeman 2005; Dancey 1992; Shott 1989; Seeman 1980). Dancey and Seeman (2005) argue that sites originally designated as Cole Complex reflect an overly broad range of time and represent distinct and dissimilar ceramic assemblages. They suggest that Cole pottery encompasses two or more types with the original type having no historical significance. They further suggest that as a taxonomic unit, Cole Complex is simply no longer used or used with hesitation because sites originally defined as such fit comfortably elsewhere. Moreover, researchers are unsure of whether the concept applies to a pottery type or an ethnic group (Dancey and Seeman 2005: 135). The Zencor and Lichliter sites have since been classified as early Late Woodland Newtown-like sites on the basis of settlement patterns and artifact assemblages. Seeman (1980: 18) remarked that of the originally defined Cole Complex sites only the W.S. Cole, Ufferman, Fryman, and Green Camp sites appeared to represent a late Late Woodland complex in the northern tributaries that either immediately preceded Fort Ancient or was at least partially contemporaneous with Fort Ancient populations to the south. Voss, Erp, Olen Corporation, and Henderson Road sites were argued to be Fort Ancient in character. Dancey and Seeman (2005) suggest that the W.S. Cole and Ufferman sites might have functioned exclusively as cemeteries and may not have been residential at all.

Barkes (1982) concluded that the original Cole-Cordmarked ceramic type encompassed multiple ceramic types including Newtown, Baum, and Peters ceramics. According to Barkes, the DECCO, Ufferman, and W.S. Cole sites, located along the Olentangy River yielded the most similar pottery assemblages which she designated as Cole-Cordmarked. Barkes refined, or redefined, the pottery type Cole-Cordmarked as being grit-tempered and having rounded shoulders, collared rims (thickened by folding) with exterior cordmarking to the lip, and sometimes exhibiting nodes, lugs, and castellations. She noted, however, that the sites having Cole ceramics also produced radiocarbon dates in the 12^{th} and 13^{th} centuries which suggested at least partial contemporaneous occupation with Fort Ancient populations to the south. Barkes concluded that the DECCO, Ufferman, and W.S. Cole sites were Late Woodland culturally but temporally contemporaneous with the Late Prehistoric Fort Ancient populations. Dancey and Seeman (2005) also concluded that Cole-Cordmarked pottery was manufactured and used largely within the 12^{th} and 13^{th} centuries. Barkes (1982: 20-21) emphasized the similarity between Cole ceramic assemblages and the ones from Baldwin, Graham, Blain, Voss, and Erp, sites considered to represent Fort Ancient ceramic assemblages. However, Barkes concluded that conspicuously and importantly absent from the Cole ceramic assemblages were decorative motifs like punctates, strap handles, and incising, along with some amount of shell-tempered ceramics.

The post-A.D. 900 dispersed communities that persisted into the Late Prehistoric period to become contemporaneous with Fort Ancient populations is the portion of the original concept of Baby and Potter's Cole Complex that has remained in general use in discussions of the archaeology of central Ohio (see Carskadden and Morton 2000).

Despite any reservations archaeologists have with the Cole Complex concept, the term continues in current usage to describe site assemblages that do not fit well-established Late Prehistoric ceramic assemblages and settlement types. Carskadden and Morton (2000) have conducted extensive archaeological investigations in the Muskingum Valley and use the term "Cole phase" to describe sites lacking the characteristics of Middle Fort Ancient Philo Phase occupations in the valley. Again, these sites designated Terminal Late Woodland but dating to the 13th century are dominated by collared and castellated pottery. Carskadden and Morton suggest the ceramics from these sites exhibit collars and castellations but also show sufficient Fort Ancient traits such as incising, punctates, loop handles, and lugs for the Cole phase Muskingum Valley sites to just as easily be viewed as "Emergent Fort Ancient" rather than "Terminal Late Woodland." The Tysinger and Haas sites in the Muskingum River Valley, classified as Terminal Late Woodland Cole Phase sites are described as small loosely structured villages having widely spaced pit features, predominately cooking features, and few clearly documented storage features. Cole Phase sites in the Muskingum Valley also report little evidence of maize which suggests little reliance on maize, however, this could just as likely be a result of differences in preservation due to soil conditions or behavioral patterns. The afore-mentioned traits are at odds with known Middle Fort Ancient settlement/subsistence patterns. However, small and loosely structured village sites with widely spaced pit features is an accurate description of some Early Fort Ancient settlements such as Muir in Kentucky. These Muskingum Valley sites with a blend of Cole and Fort Ancient ceramic attributes may represent Early Fort Ancient settlements within that sub-region or interaction between indigenous populations and migrants as Carskadden and Morton suggest. It will be shown in this dissertation that the Voss site does not represent a small, loosely structured village with widely spaced pit features, but does represent a large, nucleated, and well-structured community.

The significance of sites with similar ceramic attributes but substantially different settlement patterns is important and needs to be resolved if we are to discern synchronic variation in settlement patterns and population diversity from changes in settlement patterns and cultural practices over time. Moreover, the use of terms such as Terminal Late Woodland to describe occupations that date well within the Late Prehistoric period by two hundred years is problematic. Terms such as terminal, emergent, and transitional have implications of time and sequence rather than conveying a difference in lifeways between groups viewed synchronically. If one accepts the corrected radiocarbon dates reported for sites with Cole ceramics dating to the 13th century in eastern Ohio, sites designated as Cole phase fall at the same time or after the dates for the large, nucleated Fort Ancient settlements just as in central Ohio (Seeman 1980; Dancey 1992; Dancey and Seeman 2005).

Clearly, more research is necessary to determine the temporal and socio-cultural relationship between sites having Cole pottery and small, loosely structured settlements and those with Fort Ancient ceramic assemblages and nucleated, well-structured village settlement patterns. If the overlapping radiocarbon dates can be accepted, the cultural portrait of life in central Ohio during the Late Prehistoric period may have been a complex one. The cultural portrait on the margins of the Fort Ancient territory may have been one of interaction and negotiation between groups with significant cultural differences resulting in assimilation for some and abandonment for others.

Excavations Conducted by the Ohio Historical Society

Excavation of the Voss site was conducted by the National Park Service and the Ohio Historical Society as part of a general archaeological salvage project conducted within the limits of a proposed reservoir. The reservoir was to be created by damming the Big Darby Creek to control flooding. The Voss Mound was excavated in 1963 and portions of the surrounding village in 1966. The mound one sees today while walking along the nature trail in Battelle-Darby Metro Park is reconstructed (Figure 12). The soil for reconstruction was brought in from elsewhere and not collected on the second terrace where the village site is located. Mound excavations were conducted under the direction of Raymond Baby of the Ohio Historical Society with Martha Potter and Asa Mays Jr. as supervisors. Village excavations were carried out under the direction of Raymond Baby, with Martha Potter and Barbara Sawyer as supervisors for a field crew of students from the Ohio State University.

OHS Site Grid

In the summer of 1963, a base line oriented to N 29°17’ E was established along the eastern periphery of the mound (Baby, Potter, and Mays 1964). Perpendicular to this base line and at a point which would nearly intersect the center of the mound, an east-west line was established (Figure 13). The intersection of the base line and the line perpendicular to it was designated Stake 0. Stake 0 was arbitrarily assigned an elevation of 100 feet; the actual elevation was later determined to be 842.95 feet. Stake 0 was reported to be 102.65 feet at a bearing of N 85°46’ W from the Corps of Engineers benchmark located just west-southwest of the mound in the tree row. These base lines were used to grid the mound into contiguous five foot squares. Excavation began along the base line at Stake 0 and proceeded from east to west across the mound.

The two original base lines from the mound excavations were used during the 1966 excavation of the village area with the one exception. The intersection designated Stake 0 was designated Stake 70 (Baby, Potter, and Sawyer 1967). As a result of this change, the base line remained parallel with the tree line but was now 170 feet long with stakes placed at 10-foot intervals (Figure 14). A line perpendicular to the base line was laid out at Stake 170, extending 40 feet to the east and 70 feet to the west. A series of 10-foot squares were oriented to these lines. During the summer of 1966 from June to August, the crew excavated over fifty 10-foot square units north of the mound as well as several 5-foot square test units on the south side of the mound. Each square was excavated through the plowzone to a level of .2 to .3 foot (6 to 8 cm) into the undisturbed subsoil.

Mound Excavation

From maps of the excavation, the original mound, shown in Figures 15 and 16, appears to have been roughly 85 feet (26 m) east to west, 65 feet (20 m) north to south, with a maximum height of 4 ½ to 5 feet (1.2 to 1.7 m). Given that the original investigations were conducted in feet and all field notes and reports use feet as a unit of measurement, feature measurements will be given in both feet and meters. The original mound appeared rather long and low in profile. Excavation of the mound began along the north-south base line on the eastern edge of the mound and proceeded to the west. The mound was dug in a series of north-south trenches measuring five feet wide east-to-west, and varying in length depending on the extent of the mound on its northern and southern boundaries within a particular trench. Details of the overall mound profile will be discussed. In addition, the mound contained several distinct features and these will be addressed individually.

The overall mound profile led Baby et al. (1964) to conclude the Voss Mound had been constructed in two phases. An initial primary mound consisting of dark, sandy, alluvial soil covered the mound floor. Several areas of sand and gravel containing relatively higher concentrations of village trash than found in the mound fill were encountered on top of the primary mound. This primary mound was capped by a secondary mantle of yellow-brown loamy subsoil. The following was given as a typical profile from below the floor to the apex (Baby et al. 1964: 3):

> 1 – A yellow, loamy sub-soil
> 2 – A narrow dark band which probably represented a old sod layer and/or accumulation of occupational debris
> 3 – The primary mound composed of a dark, sandy, alluvial soil most probably taken from the nearby lower terrace of Big Darby Creek
> 4 – The secondary mantle of yellow to brown loam not unlike the sub-soil except for the inclusion of organic material
> 5 – The humus layer and plow disturbed zone infringing into the secondary mantle

The profile of the mound, shown in Figure 17, was published in 1966, in *Explorations of the O.C. Voss Mound* by Baby, Potter, and Mays. From profile maps found in the Voss Collection files, the primary mound appears to have been approximately 1 to 1 ½ feet (.3 to .5 m) in height. Randomly placed, thin lenses of sand, gravel, and charcoal were found on top of the primary mound. The investigators noted that the concentration of cultural material was higher beneath these sand and gravel lenses than elsewhere in the mound. What the investigators did not know at the time, as the village site had not yet been discovered, is that these sand and gravel lenses containing village trash likely came from the digging or cleaning out of storage/refuse pit features. Storage turned trash pits were almost always dug well into the sand and gravel layer which invariably appears at approximately 90-110 cm below surface. Baby et al. reported a narrow band of leached soil and several small snail shells found on top of the primary mound and suggested that some time had elapsed between the two stages of construction.

A large pit feature, Feature I, containing six burials was revealed on the eastern periphery of the mound. The pit was elliptical in shape with its long axis oriented approximately grid north-south. The pit measured nine feet (2.7 m) in maximum extent north-south and 6.3 feet (1.9 m) east-west. The burial pit was three feet (1 m) deep. The pit is described as having been dug in two layers of two burials each with an extension made to the north to accommodate the two additional burials. Figure 18 shows four of the burials in Feature I before the fifth and sixth burials were uncovered. Another burial was discovered in a small pit, designated Feature III, adjacent to the pit containing the six burials. The pit containing the single burial was described as bathtub-shaped with nearly vertical walls and a flat bottom, with the long axis of the pit parallel with the north-south base line of the grid. The fill of the burial pits was said to have contained animal bone, charcoal, fire-cracked rock, and several complete and many fragmented human bones. All of the burials experienced a limited amount of disturbance by rodents and this may account for some of the isolated bones and fragments but the report is unclear on this topic. The pattern of burial in Feature I suggested to Baby et al. three interment episodes.

Feature I was dug in two layers with two burials in each layer. In order to accommodate two additional burials, the pit was extended to the north at the level of the top layer of burials. Feature III was dug just north of Feature I and a single burial placed within it.

The following is a brief description of the position of the burials within the two pits, and the associated artifacts. All of the individuals were in a semi-flexed position within the pits. All burials were aligned approximately to grid north-south which parallels the terrace edge. In the extension of the upper layer of Feature I was an adult male, designated Burial 1. Lying in between this individual's left shoulder and the flexed knees was an infant, designated Burial 2. The infant had a drilled elk tooth resting on the cervical vertebrae, likely part of a necklace. These two burials were located in the extension of the original pit. Burials 3 and 4, also males, made up the top layer within the confines of the original pit. A triangular projectile point was found beneath the rib cage of Burial 3. Burials 5 and 6, both males, comprised the lower level of burials, directly beneath Burials 3 and 4. A triangular knife was found just above the left innominate of Burial 5. A polished bone hair pin was found with these burials, the tip of the pin lying over the cervical area of Burial 5 with the drilled end resting over the nasal bones of Burial 6 (Baby et al. 1964: 13). Beneath the lumber vertebrae of Burial 6 was the base of a side-notched projectile point. A shell hoe made from one valve of a freshwater shell was found within the fill of Feature I. The shell had been drilled in two places suggesting to the investigators that it may have been hafted to a forked stick for use as a hoe (Figure 19).

Two short-stemmed elbow pipes made of limestone were found between the skulls of Burials 5 and 6, as was the beak of a young, red-shouldered hawk (Figure 20).

A large triangular knife was found in the hand of Burial 5. Near the wrists and thorax of Burial 6 were found hundreds of small disk-shaped and barrel-shaped beads made from freshwater shells. A total of 51 beads were said to be made from marine shells (*Marginella apicina*). Prufer and Shane (1970: 235) emphasized the similarity of these grave goods to an elbow pipe, a bird beak, and a large triangular knife recovered from burials at Blain Village. Funkhouser and Webb (1928: 87) describe a burial from Clay Mound, a Fort Ancient site in Kentucky, as containing an elbow pipe, a large flint knife, shell beads, and the skull of a hawk. This combination of artifacts may have had special meaning, or indicated a level of achieved status by an individual within the community. Short-stemmed elbow pipes have been recovered from the Fort Ancient sites of Gartner, SunWatch, Baum, Feurt, State Line, Anderson, Taylor, and Orchard (Drooker 1997: 91), as well as from Fox Farm (Griffin 1966, Plate CXIX). Marine shell ornaments do occur at Baum and Gartner as well as at Early and Middle Fort Ancient sites in southwestern Ohio (Drooker 1997: 94).

Burial 7 (Feature III) consisted of a single individual in a pit just to the north of Feature I. Burial 7 was also semi-flexed. A large triangular knife was found in the hand of Burial 7. The only reported evidence of pathologies found outside of the embedded projectiles was osteomylitis evident on the skeleton of the infant. Table 5 gives details of age estimates, position within pit, and associated artifacts. Bone measurements and stature estimates are given in Baby, Potter, and Mays 1966.

The plan view of the mound floor, shown in Figure 21, was published in 1966 in *Explorations of the O.C. Voss Mound* by Baby, Potter, and Mays. A large concentration of stones designated Feature II and described by Baby et al. (1964, 1966) as an "elliptical stone ring" was encountered near the base of the primary mound. Indications that the stones rested on fill within the primary mound can be found in statements to the effect that the mound fill was removed only to the level onto which the stones had been placed and after clearing the stones the remaining mound fill was removed to expose the floor of the mound (Baby et al. 1964: 2). Feature II was a large elliptical or sub-rectangular outline of stones, consisting of pebbles of various sizes as well as large limestone slabs (Figure 22). The outline of stones varied in width from 3 to 19 feet (1 to 6 m) and enclosed an area measuring 45 x 30 feet (13.7 x 9 m). A narrow gap in the stones occurred in the west-southwest portion of the outline. A wider gap in the outline occurs in the northeastern section. The outline of stones was interrupted by three "trough-like depressions" in the northern portion that aligned roughly parallel with the outline of stones (Baby et al 1964). The largest trough-like depression was 22 feet (6.7 m) in length. The two other trough-like depressions were 15 feet (4.6 m) and 11 feet (3.6 m) in length. The depth of one of the trough-like depressions was 0.5 feet (15 cm). In a small bend in the third trough-like depression was a charcoal deposit approximately 2.5 feet (80 cm) in length and appeared to be the only indication of a charred log (Baby et al. 1964: 7). The trough-like depressions did not penetrate the mound floor beneath the stones. Twelve bone awls made from turkey and deer bone, typical of Fort Ancient bone artifact assemblages, were recovered from on top of and beneath the outline of stones.

The mound floor did not appear to the archaeologists to have been a prepared surface but rather the result of a small accumulation of occupational debris. The floor of the mound consisted of a small amount of village trash with areas of charcoal and ash. Baby et al. contend that no hearths were revealed on the mound floor suggesting the charcoal and ash deposited there had another source such as a structure that had burned prior to construction of the stone embankment and primary mound. However, the plan view map of the mound floor shows areas of burned earth and charcoal suggesting that some of the burning took place *in situ*. Feature IV was described as a small burned area, kidney-shaped in plan view and basin-like in profile, and located on the floor of the mound beneath Stake 80. The feature consisted of burned earth and a small amount of fire-cracked rock. Nine small areas of charcoal were found on the floor of the mound interior to the outline of stones. Other features on the mound floor included five small semi-circular depressions, also interior to the outline of stones.

Baby argued the posts on the floor of the mound were evidence of a ceremonial structure largely because of their size. Nine large post molds, most in excess of one foot (30 cm) in diameter and two feet (60 cm) in depth, were found beneath the outline of stones. The combination of the outline of stones, the large and widely-spaced post molds, and the associated burials led the investigators to the conclusion that they had found the remains of a ceremonial structure. Despite the belief the structure was ceremonial in nature, the investigators remarked that the floor of the mound did not appear to be a prepared surface but rather an accumulation of occupational trash mixed with charcoal and ash. Sand and gravel lenses containing a relatively higher concentration of cultural material were said to have been randomly placed on top of the stone ring and on top of the primary mound. The investigators interpreted the sand and gravel concentrations as being debris from the interior of the structure having been swept onto the stone at the time of construction of the mound. Again, it is the belief of the author that these areas of sand and gravel containing village trash are not ceremonial in nature but are the result of the digging or cleaning out of storage/trash pit features in the village.

According to Baby, Potter, and Mays (1964: 15) the chronology for the construction of the mound went as follows: the structure was burned, a ring of stones was then placed over the post holes to commemorate the location, debris was swept onto the stones from the interior of the structure, and a low primary mound was erected over the stone. Sometime after, two burial pits were dug on the eastern edge and the pits and the primary core were covered with the secondary mantle. A charcoal sample from beneath the mound was sent for analysis and returned a date within the 10th century. Given that the outline of stones conformed largely to the pattern of posts on the floor of the mound, it is not unreasonable to assume that the posts of the structure were standing while the stone was piled around its base and time allowed the slumping of some of the stone into the interior, or perhaps this occurred when the structure was dismantled. The trough-like depressions likely represent fallen posts or posts purposely knocked down during the piling of the stone. However, there is little indication that these posts had burnt. Rather, it appears as if the posts were covered soon after falling or being pulled to the ground, and decayed as they lay covered. There is evidence of burning having taken place within the structure on the floor of the mound. The investigators interpreted the sand and gravel concentrations scattered over the stone outline as being debris from the interior of the structure having been swept onto the stone at the time of construction of the mound. One could argue that the sand and gravel concentrations Baby describes represent the digging or cleaning out of village pit features as fill for construction of the mound. Mills (1904) also interpreted the sand and gravel concentrations beneath Gartner

Mound as having come from the pit features in village. The occurrence of these lenses on the outline of stones and occupational debris on the mound floor suggests that construction of the primary mound occurred after the village had been occupied for a period of time. As stated earlier, these sand, gravel, and occupational trash lenses were also found capping the primary mound. This suggests that village trash was again deposited after the primary mound had been in place long enough to experience leaching but before construction of the secondary mantle.

The structure beneath the mound does appear to have functioned in a ritual/ceremonial nature but one closely tied to the activities of the surrounding village. The size of the structure and the irregular spacing of the posts, the numerous features on the floor of the area delineated by the posts, the piling of stones about its base, and the final commemoration of the location with the mound suggests it was no ordinary village structure. However, the artifact assemblage from the mound is varied in content, domestic in nature, and Fort Ancient in character. A total of 3,295 pottery sherds were recovered from the mound, 2,803 reportedly from the mound floor and 492 from the mound fill (Baby et al. 1964: Appendix). These sherds will be discussed in detail in a later chapter providing an analysis of the total ceramic assemblage recovered to date. Attributes typical of Fort Ancient ceramics and present in the ceramic assemblage from Voss Mound include shell-tempered sherds, guilloche incising, punctates, and strap and lug handles. The report of the mound excavation states that 29 projectile points were recovered from mound excavations, 17 of which were notched and 12 were triangular. In an analysis of the collection by the author, only 18 projectile points sufficiently complete to be typed could be located that had catalog numbers associated with the mound. Of these, nine were triangular, seven were notched, and two were stemmed.

Village Excavation

During the mound excavation, what was described as a low rise located 135 feet (41 m) north of the mound along the 60' profile, prompted a 10 x 10 foot test unit excavation. The area was identified as a midden and was returned to during the 1966 field season. Efforts to relocate the midden were successful in the first days of the 1966 dig. Much of the first half of the field season was spent in the area of squares along the 150 to 200 lines from L2 to L12. Numerous features were encountered along with some of the post holes that would make up House I. The later half of the field season saw many more pit features revealed and the post hole pattern of House II. Additional test units were excavated northeast of the mound location with negative results. Smaller 5-foot square test units were dug on the south side of the mound, for which the exact location was unspecified. The smaller test units do not appear to have been more than 40 feet from the southern edge of the mound. These test units also yielded negative results. In all, the investigators uncovered nineteen refuse pits, two complete house patterns, two infant burials, several isolated post molds, and plaza area devoid of features (Baby et al. 1967). The results of the 1966 village excavations are shown in Figure 23 and an overhead view of excavations mid-way through the field season is shown in Figure 24.

Village excavations uncovered an arc of pit features between two house structures. Most of the pit features were circular to oval, large, 2 ½ to 9 ½ feet (.7 to 3 m) in diameter, and deep, averaging 2 ½ to 4 ½ feet (.8 to 1.4 m) below the top of the subsoil. Of the nineteen pit features, seven were straight-sided, six were bell-shaped in profile, four had slightly tapered sides, and two were basin-shaped (Baby et al. 1967: Table 1). Fragments of charred grass lined the bottom of four pit features suggesting they were originally used for storage. Two unusual but nearly identical pit features were revealed adjacent to each other, Features XIII and XIV. These features were described as conjoined pits having two lobes each with the western lobe dug deeper than the eastern lobe. This type of conjoined pit feature was also discovered during recent excavations. Two infant burials were uncovered in separate refuse pits, Feature I and Feature IX. Adult burials within the village were not found during archaeological investigation of the site. However, a skull and other human bones of unknown provenience were recovered from the site by the Voss family in the 1950s (Bob Voss, personal communication). The recovery of human remains from a non-mound context suggests burials did occur somewhere in the village. Radiocarbon dates obtained on charcoal samples in the 1960s from features in the village spanned the 10th to the 16th centuries. Features and associated radiocarbon dates are given in Table 6. A sample of feature profiles was provided in the 1967 report of the village excavations and is reproduced in Figure 25. Feature dimensions are given in Table 7.

Two complete house patterns were revealed during village excavations. Both house patterns were sub-rectangular with rounded corners. The posts of the side walls were described as being arranged roughly in pairs with single posts forming the ends. Large central posts were located in the interiors of both structures. House I consisted of 98 post molds and measured 27 x 21 feet (8 x 6 m). House II consisted of 85 posts and measured 27 x 23 feet (8 x 7 m). Three of the pit features, Features XVII, XIX, and XX, intruded into the post pattern of House II. The investigators concluded these pits had destroyed the site of the posts in the northeast portion of House II indicating continued occupation of the site after abandonment of the house (Baby, Potter, and Sawyer 1967: 4). It is also possible the structure post-dates the pit features. The midden revealed during testing conducted north of the mound in 1963 and reinvestigated in 1966 proved to be associated with the post pattern of House I. The midden, approximated at Sq. 190 L10 to L12 – Sq. 220 L10 to L12, was designated Feature VIII - midden associated with House I (Feature XI). A 2 sigma calibrated date of A.D. 1185-1431 was obtained from charcoal associated with House 1. The midden associated with House I, however, produced a wider and generally later range of dates.

The investigators concluded the post hole pattern of the two structures in the village was similar to charnel houses found beneath Hopewell mounds. The charnel houses beneath Mound 4, Mound 5, and Mound 13 at Mound City in Chillicothe were given as examples of a causal post arrangement and the use of screens to cover the entrances (Baby et al. 1967: 4; Mills 1922). The lack of interior hearths further added to the argument that the structures represented specialized dwellings related to the ceremonial mound and plaza. The ceremonial nature of the two structures in the village cannot be supported based on the associated material. The only material associated with the two structures, the pit features, and midden is habitational debris. The Voss structures are generally smaller than Hopewell sub-mound structures and show no evidence of ritual features such as crematory basins or ceremonial objects. The post holes of the two structures are not particularly regular in size, depth, or, in the case of House II, pattern. The absence of hearths in the interior of the structures is curious.

However, features of such a shallow nature may have been largely destroyed by the plow. Because Voss is located on a terrace bench well above the floodplain, alluvial soils could not aid in preserving cultural features.

There are some indications that the OHS archaeologists suspected at least two occupations of the site. The reports and field notes indicate that some of the features showed evidence of intrusive material in the upper portions. In the Voss Collection files housed at the Ohio Historical Society's Collection Facility, typed notes on the samples submitted to Ohio Wesleyan University's radiocarbon lab stated that samples from the midden in Sq. 190 L12 were divided into upper and lower portions because of a suspicion that there was intrusive material in the top sample. Unfortunately, only a radiocarbon age from the lower portion of the midden (OWU229B) could be located and this date had a large range of error associated with it, +/-215. Two separate charcoal samples from the midden were also sent to the University of Michigan radiocarbon lab. There is no indication of how these samples were chosen but it may have been for the same reason. Features II, IX, XIX, and XX also had two samples submitted for each, and all sets produced one early and one late date. Again, there is no indication of how these samples were chosen or of their vertical provenience within the feature.

A detailed analysis of the ceramic and lithic material will be given in Chapter 6 in combination with the ceramic and lithic materials recovered during recent excavations. A reported 3,943 pottery sherds were recovered during village excavations (Baby et al. 1967: 9). Lithic, bone, and shell artifact counts by feature context from both the mound and village are given in Table 8. The bone tool assemblage is diverse as is typical with many Fort Ancient sites. Bone hairpins and bone awls made from both deer and turkey were recovered from both mound and village contexts. Deer bone beamers used in working hides, bone shuttles, bone fishhooks, and antler projectile points were recovered from pit features in the village. Examples of the bone artifact assemblage are shown in Figure 26. The bone fish hooks could not be photographed as they are on museum display, therefore a photo of the artifacts obtained from the OHS Voss files is provided in inset.

CHAPTER 5

RECENT ARCHAEOLOGICAL INVESTIGATION OF THE VOSS SITE

Field Methods

The research design for further investigation of the Voss site employed a combined strategy of traditional excavation techniques and a remote sensing technique. Field method techniques employed at the Voss site included magnetic survey, anomaly testing by removal of the plowzone, coring, shovel testing to determine artifact density, and feature excavation. The combination of the various techniques provided data on intrasite settlement patterns, community subsistence strategies, and general characteristics of site occupation. The hypothesis that the Voss site represents a typically Fort Ancient settlement pattern of a circular village with concentric rings of activity areas radiating out from a central plaza required further investigation. Many details of site structure, such as the width of the habitation zone and overall site size, were still unknown after the 1966 excavations. Additionally, no paleoethnobotanical remains were collected by the Ohio Historical Society during the 1960's excavations and questions concerning subsistence practices remained unanswered. A combination of remote sensing techniques and the more traditional field methods of feature excavation, coring, and shovel testing made it possible to determine site structure and size, and address lingering questions concerning subsistence practices. The methodology and results will be presented in the current chapter. The analysis of the results will be presented in the following Chapter 6.

Reconnaissance and Site Grid

The initial stages of recent investigation of the Voss site involved reconnaissance of the site and surrounding area. Five aerial photographs of the site taken in 1948, 1985, 1995, and 2000 were obtained from the United States Geological Survey EROS Data Center. The hope was that contrasting patterns in vegetational cover or soil color as seen from above might hint at the nature and extent of prehistoric occupation at the site. The 1948 aerial was taken before excavation of the site. The 1985 aerial was taken after excavation but before reconstruction of the mound. The 1948 and 2000 aerials were taken in the months of September and October, under typically drier conditions when crops are ready to be harvested and vegetation is thick. The 1985 and 1995 aerials were taken in the month of March when precipitation is typically higher and there is little vegetative cover. No contrasting patterns were visible in any of the aerial photographs examined.

Global Positioning Systems equipment and a total station were used to establish a site grid. Upon completion of the initial background research, the site and surrounding area were mapped using Global Positioning Systems equipment. GPS data was collected at the site with the use of a Trimble Pro-XR GPS from the Anthropology Department at Ohio State University. The locations were logged in UTM (Universal Transverse Mercator) coordinates. Establishing a site grid and obtaining topographic data was accomplished with the use of a TOPCON Total Station, an electronic distance-measuring device.

A GPS survey was conducted at the site to obtain accurate locations of the site datums and to provide a map of the park trail surrounding the site. Two locations approximately 50 meters south of the mound in the tree line were arbitrarily chosen for site datums. In order to facilitate conducting the magnetic survey, the site grid was aligned to magnetic north. This meant the 1960's grid could not be used during recent investigations. The terrace edge on the west side of the site made establishing widely-spaced permanent datums aligned to magnetic north difficult. The locations of the datums are marked with orange plastic surveying spikes. The locations of the datums were logged in carrier phase in UTM coordinates and are as follows:

Datum 1	N 4416543.237m E 310083.074m
Datum 2	N 4416554.679m E310082.818m

Datum 1 was given grid coordinates of N5000 E5000 and Datum 2 given grid coordinates of N5012 E5000. Using the above datums to establish a site grid resulted in the benchmark located just west of the mound in the tree line having grid coordinates of N5051.91 E5018.03. An orange surveying spike was placed on the northwest side of the reconstructed mound as an additional locational marker and has grid coordinates of N5060 E5040.

Magnetic Survey

Geophysical survey with a magnetometer was chosen as a noninvasive method of determining the extent, type, and pattern of intact subsurface features at the site, and to assess the potential historic disturbance to the site due to farming and park operations. It was also thought the magnetic survey may indicate the location of previous archaeological excavations conducted at the site. Whether or not a magnetic survey could be used to test if the intrasite settlement pattern conformed to a well-established Fort Ancient settlement pattern of a circular village consisting of concentric rings of activity areas situated around a central plaza, had yet to be determined. This community settlement pattern had been established by other, more traditional investigative methods such as controlled surface survey after plowing and stripping of the plowzone (Hawkins 1996; Sharp and Pollack 1992; Cowan 1986). However, magnetic survey was seen as a desirable alternative to these methods at Voss for a number of important reasons. Foremost, conducting a magnetic survey to discern whether a circular Fort Ancient settlement pattern could be detected using such a method is experimental and would be a contribution to the knowledge of the use of magnetic survey in archaeological investigation of Late Prehistoric sites in the Middle Ohio Valley. Kvamme (2003: 436) contends that recent advances in geophysical survey techniques have made possible the wide-area mapping of settlements to reveal a site's organization and, therefore, made possible inter-site comparisons of form and size. Kvamme argues the greater sensitivity of the instruments, an increase in the acquisition and processing speed, and improved computer memory of the data loggers have all contributed to more detailed and extensive surveys. At the Kincaid site in southern Illinois, magnetic survey led to the discovery of a substantial village site surrounding a degraded and overlooked mound (Clay 2006: 62). Clay argues the magnetic survey demonstrates that the Kincaid large mound center had multiple parts that likely represent temporally independent components.

Magnetic survey was viewed as more desirable to large-scale invasive methods such as stripping of the plowzone or shovel testing. Coverage of a magnetic survey can far exceed coverage provided by stripping of the plowzone. Moreover, the Metro Park had concerns about extensive disturbance to the site and disruption of established land management policies. Systematic surface survey after plowing may have proved useful in mapping artifact distribution and clustering (Dancey 1996) to determine whether a midden ring surrounding a relatively sterile central zone is present. However, the Metro Park maintains the site as a fallow field that is not plowed but only periodically mowed to keep out woody vegetation. Magnetic survey was viewed as a desirable alternative to extensive shovel testing because of the limited effectiveness of shovel testing as a discovery technique (Shott 1985), because of the more thorough coverage provided by a magnetic survey, and the ease at which a single individual can conduct a magnetic survey. The extensive magnetic survey conducted can aid Metro Park management in developing interpretive exhibits for the public, and can be used at a later date for additional, more concentrated investigation of the site using more invasive methods.

Geophysical instruments commonly used in archaeological survey measure the physical properties of electrical resistivity, conductivity, and magnetic susceptibility/thermoremanent magnetization of sediments (Clark 1996). The differing techniques measure different properties of the subsurface sediments. The use of multiple remote sensing techniques can often provide complimentary data (Clay 2001). Electrical resistivity surveys measure the electrical resistance of soils by introducing an electrical current into the subsurface and observing the flow of the current (Heimmer and De Vore 1995). The electrical resistance of soil is dependent upon soil structure, ion content, and moisture content (Weymouth 1986: 318). Electrical resistivity is highly dependent upon the amount and distribution of moisture in the soil. The relationship between soil structure, organic content, moisture content and resulting resistivity, however, is often not a straightforward one. Magnetic survey is a passive geophysical method of archaeological feature detection. Magnetic survey is another method available to measure near-surface properties without destructive testing and is becoming increasingly popular in site investigations. There are several different types of magnetometers but they all measure the same basic property, the strength or amplitude of the Earth's magnetic field (Bevan 1998). Magnetometers detect two kinds of phenomena, magnetic susceptibility and thermoremanence (Clark 1996). Detection of a magnetic anomaly however is a function of the object's magnetic susceptibility and remanent magnetization, as well as unit volume and distance between the feature and the sensor (Heimmer and De Vore 1995: 12).

In measuring magnetic susceptibility, the magnetometer detects relative differences (distortion) in the earth's magnetic field over a defined terrain. The unit of measurement of the magnetic field is the nanotesla, abbreviated nT. The average strength of the Earth's magnetic field in North America and Europe ranges from 40,000 to 60,000 nT (Weymouth 1986; Kvamme 2001). Magnetic susceptibility depends on the distribution of magnetic minerals in the subsurface sediments or surface material (Kvamme 2003). Both prehistoric pit features and historic iron objects will concentrate the earth's magnetic field. Prehistoric pit features and ditches often contain organic-rich topsoil which tends to have a higher magnetic susceptibility relative to the surrounding subsoil, resulting in a positive magnetic feature commonly referred to as a monopole. Iron-containing objects will cause the field to concentrate in those objects thereby causing the field nearby to be reduced (Bevan 1998: 19). A metal object buried or on the surface will appear as an obvious very localized, bipolar anomaly. Iron objects have strong magnetic signatures consisting of paired positive and negative extremes at mid-latitudes, commonly expressed as dipoles (Kvamme 2003: 441). Magnetometers are very sensitive instruments and often produce dummy values when in close proximity to iron objects. Surface metal can obscure prehistoric subsurface features present below it. Magnetic "noise" can result from recent historic activities, geologic conditions, or solar activity (Heimmer and De Vore 1995).

Thermoremanence is the magnetic enhancement of soils resulting from the firing process. The firing process converts weakly magnetic compounds to more strongly magnetic oxides (Clark 1996). Thermoremanent magnetization results when sediments and rocks are heated above a certain temperature known as the Curie point (about 600°C). When sediments and rocks are heated to temperatures above the Curie point, the oxides are demagnetized and upon cooling they are re-magnetized with a permanent magnetization aligned with the earth's magnetic field at the time of firing (Clark 1996: 65). Fired areas such as hearths and kilns can result in remanent magnetization. Fired areas tend to appear as bipolar, localized anomalies. Lightning-induced remanent magnetization occurs as a result of past lighting strikes (Maki 2005). Lightning strikes appear as broader bipolar anomalies in what has been referred to as a starburst pattern.

FM-36 and FM-256 Geoscan fluxgate gradiometers were used to conduct the magnetic survey at the site. This type of magnetometer is configured as a magnetic gradiometer. Whereas magnetometers with single sensors measure the total magnetic field of the Earth, fluxgate gradiometers measure only the vertical component of the field along the instrument's length (Bevan 1998; Clark 1996). The gradiometer measures the difference in the earth's magnetic field between two sensors positioned one on top of the other vertically. The data generated by subtracting the reading at the top sensor from that of the bottom sensor is the vertical gradient of the magnetic field (Kvamme 2001). The vertical magnetic gradient is a result of surface objects or subsurface sediments. Due to the simultaneous readings, the gradiometer provides an automatic correction for changes in the earth's magnetic field that can occur throughout the day (Bevan 1998: 19).

A magnetic survey of the Voss site was conducted during the years of 2001, 2002, and 2006. The magnetic survey provided very informative results concerning the overall community settlement pattern, and lead to the discovery and investigation of a number of prehistoric pit features. The area coverage of the magnetic survey was 140 meters east-west by 160 meters north-south. The initial magnetic survey conducted in 2001 and 2002 consisted of twenty-six 20 x 20 meter blocks. This required asking maintenance workers at Battelle-Darby Metro Park to mow a defined area within the field as it had been in a fallow condition for several years. At the time, mowing a large area of the terrace was not an option due to the time required to complete the survey and the number of repeated mowings necessary to complete the survey. Therefore, to determine the extent of the minimum area for mowing required for the magnetic survey, an estimate of site size was made. This original estimate proved inadequate. In 2006, fortuitously, but after an initial summary report (Brady-Rawlins 2006) was produced for the Metro Park, a decision was made by park management to mow the entire second terrace which they do only on a rotational basis of five or more years. This provided an opportunity to expand the initial survey area beyond the expected extent of the village site, and an opportunity to more fully define the community settlement pattern. The survey was expanded 40 meters to the east, 20 meters to the north, and 20 meters south. The total coverage of the survey was now 140 m x 160 m. The results of the gradiometer survey are shown in Figure 27. The survey consisted of forty-five 20 x 20 meter blocks oriented to magnetic north. The northern most row was designated Z and the southern most row designated G. The western most column was designated 2 and the eastern most column designated 8. The resulting blocks are Z4-Z8, A4-A8, B4-B8, C4-C8, D2-D8, E2-E8, F2-F7, and G2-G6. In order to expand the grid numbering system north, the decision was made to designate the additional row to the north Row Z. The location of the corner stakes were measured with the total station when available and with the use of Fiberglas measuring tapes otherwise. The use of tapes can reduce the accuracy when measuring long distances over uneven ground and can result in problems with edge match between blocks. This occurred between Blocks A8 and B8, and Blocks D3 and D4.

The magnetic data was collected in the same fashion for all blocks with the author as the instrument operator. The grid length was 20 meters for all blocks. The traverse direction was north and the traverse interval was 0.5 meters. The sample interval was set to 8 readings per meter at a resolution of 0.1 nT. Magnetic data was downloaded in the field or the laboratory and processed using Geoplot 3.00. Processing of the magnetic survey data included Zero Mean Traverse, Clip, and Interpolate. Zero Mean Traverse removes striping effects in the traverse direction by setting the background mean of each traverse within a grid to zero (Geoplot Manual). Clipping the data reduces the effect surface iron or lightning strikes have on the overall statistics of the plot. Spikes remain in the data after clipping but at a reduced magnitude. Late Prehistoric pit features tend to result in relatively strong positive readings. Therefore, the data was clipped at +/-15 nT, so as not overly reduce those features which tend to be relatively strong positives such as deep pits or pits containing burnt sediments. The survey data was interpolated to give a smoother appearance to the data and improve the visibility of large-scale patterning. Characteristics of the magnetic anomalies were further analyzed in terms of strength and configuration. The data was exported to Surfer in order to view the data as contours and assess the size and configuration of the anomalies.

The results of the magnetic survey at the Voss site indicate many magnetic anomalies. When anomaly testing was begun in 2002, the northern, eastern, and southern extremes of the magnetic survey had yet to be collected. Nonetheless, it was argued that a circular/oval settlement with a central plaza could be discerned even with only a little over half of the survey blocks collected. Collection of additional survey data in 2006 confirmed and strengthened this conclusion. Some of the magnetic anomalies result from historic disturbances such as extensive groundhog burrowing across the site and plow scars visible in the data running southwest to northeast. Additionally, there appears to be a considerable amount of buried metal, isolated magnetic dipoles (strong positive with a strong negative) scattered across the site. There are three noticeable starburst patterns in the southwest and extreme northwest portions of the magnetic survey which likely are locations of past lightning strikes. A linear feature running from Block G4 to C8 is likely historic in nature. The linear feature is just barely visible on the 1948 aerial and continues northeast eventually meeting Georgesville-Harrisburg Road. The feature may relate to an abandoned farm road. A natural swale and subsequent drainage pattern is visible running from Block Z7 to A8. Nonetheless, the results of anomaly testing suggest that many intact prehistoric features exist on the site and that the anomaly-rich nature of the data reflects the reality of the subsurface, that being an area intensively utilized during prehistoric occupation of the site. Many monopoles (magnetic positives) and weakly-expressed dipoles are present in the data. Anomalies of these types are often are a result of intact subsurface features.

Testing of Magnetic Anomalies

A judgmental sampling strategy was employed in the archaeological testing of magnetic anomalies. Specific anomalies for testing were chosen based the strength of the anomaly, its configuration, the patterning of anomalies in the overall survey, and knowledge of the site gained from previous excavations. The OHS investigations of the Voss site revealed house structures and pit features north of the mound. Excavation units dug east and on the south side of the mound yielded negative results. A judgment was made that testing magnetic anomalies south and east of the mound would produce valuable additional information for use in determining site structure.

Archaeological testing of specific magnetic anomalies was conducted by removal of the plowzone and coring. Four individual anomalies and one series of anomalies were chosen for testing by plowzone removal. Two anomalies located south-southeast of the mound, and two anomalies located northeast of the mound were initially chosen for testing. The four individual anomalies all measured .5 meter or greater in extent and had magnitudes greater than 5 nT. Anomalies with slightly different configurations were chosen for comparison purposes. Viewing the data as contours helped to map the configuration of the individual anomalies and determine the north-south and east-west dimensions and overall shape. One anomaly, in reality a series of anomalies, located east of the mound was hypothesized to be one wall of a possible structure with associated pit features. Individual magnetic signatures within this area varied in magnitude and configuration yet presented a collective pattern of related subsurface features oriented southeast to northwest.

Ground-truthing of magnetic anomalies consisted of removal of the plowzone to expose subsoil or intact feature. Testing of magnetic anomalies began with a 50 x 50 cm test pit placed over a magnetic anomaly. The plowzone, typically 0-28 cm below surface (cmbs), was removed as one level to expose intact feature or undisturbed soil below. If a prehistoric feature was encountered in a particular location after removal of the plowzone, adjacent 50 x 50 cm units were excavated until the boundaries of the feature were exposed. All dirt removed from the plowzone over Anomalies 1-4 was screened. A sampling strategy was employed during removal of the plowzone over Anomaly 5. It consisted of screening one 50 x 50 cm unit for every square meter of plowzone removed.

The gradiometer survey data for individual blocks was processed in much the same manner as for all blocks collectively, i.e. Zero Mean Traverse, Clip, and Interpolate, to determine likely cultural features. Analyzing the data to determine likely prehistoric features is best conducted by using various processing algorithms. However, determining the location of anomalies on the ground surface is best conducted on minimally processed data or data that is closer to raw data. To achieve the smoothing effect, interpolation expands the data by subtracting or adding data points in either the x or y direction. In processing, data points were added in the y direction (between traverses) to compensate for more readings logged in the x direction (along the traverse) than in the y direction. For ground-truthing and relocating anomalies, data that was not interpolated was given consideration. When attempting to located magnetic anomalies on the ground surface, it should be noted that 0 m along the east-west axis in the composite data from Geoplot, in reality corresponds to 0.5 m east on the ground surface. This is because the first traverse of each block occurs on the 0.5 meter mark, not on 0.

The data for individual blocks and corresponding anomalies was processed and presented in the same manner for each. The top map in the figure for each block is a grayscale image of the magnetic data with the location of the anomalies indicated. The lower map shows only those anomalies with magnitudes greater than 3 standard deviations above the background mean (background noise). Measuring the background mean required limiting the statistical processing area to a quiet area (Geoplot Manual 3-28). Admittedly, determination of a quiet area is somewhat subjective as multiple areas with slightly different magnitudes could be chosen. The goal is ensure that the mean in the chosen quiet area is near zero and the distribution follows a normal curve.

Anomaly 1 and Anomaly 2

Archaeological testing of Anomalies 1 and 2 in Blocks E4 and F4, with coordinates N5007 E5068 and N5000 E5068, respectively, proved inconclusive. Anomaly 1 and 2 are located south of the mound. The magnetic survey data for these blocks is shown in Figure 28. Anomaly 1 related to a relatively small monopole with dimensions of approximately 0.5 x 1 meter and a magnitude of 5.6 nT. Anomaly 2 also related to a monopole but was slightly larger, 1 x 1 meter, and had a magnitude of 7.9 nT. Anomaly 1 and 2 did meet the threshold of 3 standard deviations above the background mean. Dark soil with increased rock content was visible at the plowzone-subsoil interface but did not penetrate the subsoil. A considerable amount of lithic debitage manufactured from local pebble chert, was recovered from the plowzone over both anomaly locations. From the equivalent of 1 x 1.5 m of plowzone over Anomaly 1, seventy-one chert artifacts were recovered including 58 flakes, 12 pieces of shatter, and 1 chert perform. From the equivalent of 1 x 2 m of plowzone removed over Anomaly 2, eighty artifacts were recovered including 43 flakes, 32 pieces of shatter, 2 chert tools, 1 groundstone tool, and 2 fragments of fire-cracked rock. The presence of lithic debitage indicates some prehistoric activity in the immediate vicinity. However, the nature or shape of the anomalies could not be defined as they did not penetrate the subsoil.

Anomaly 3

Anomaly 3 in Block A5 (N5083.5 E5082) was originally suspected of being in the area of a corner post of a possible structure. The anomaly was tested by removing the equivalent of one square meter of plowzone over the anomaly. The gradiometer survey data for Block A5 is shown in Figure 29. Anomaly 3 was approximately 0.5 m x 1 m with a maximum reading of 14.7 nT. A thin (<5cm) dark soil layer containing artifacts was visible between the bottom of the plowzone and the sterile subsoil, at approximately 27-30 cmbs. The nature of the deposit could not be easily defined and was very shallow in extent. Due to the extremely droughty conditions in the summer of 2002, expanding the unit at time was viewed as likely being unproductive and better left for a later date when more conducive conditions prevailed. This area shows promise both in the magnetic survey data and in ground-truthing and should be revisited.

Anomaly 4

Anomaly 4 is located north-northeast of the mound and just east of the 1966 excavations. The magnetic survey data for Anomaly 4 in Block A5 is also shown in Figure 29. Anomaly 4 was 1 m x 1.5 m with a magnitude of 11.7 nT. Approximately 2 m x 2 m of plowzone was removed over the area designated Anomaly 4. The configuration of the anomaly when viewed as contour data suggested a circular/oval monopole. It was suspected the discrete and strong magnetic monopole was a prehistoric pit feature. Removal of the plowzone did reveal a storage/trash pit feature measuring 1.5 m in diameter. The feature was designated Feature 1.

Anomaly 5

Anomaly 5, in reality a series of anomalies, in Block B6, was chosen for archaeological testing because it was thought to relate to a series of post molds of a prehistoric structure and associated pit features oriented southeast to northwest. Additionally, the area was chosen for testing because it is located east of the mound and east of the area that produced negative results during the 1966 excavations. The magnetic data for Block B6 is shown in Figure 30. As previously noted, removal of the plowzone during the 2004 field season was conducted with a slightly modified methodology to conserve time without loss of information. Instead of screening the entire plowzone for artifacts, a sampling strategy was employed. For every one square meter of plowzone removed, only ¼ of the square meter was screened. Six magnetic anomalies within the area exposed in Anomaly 5 have magnitudes greater than 3 standard deviations above the background mean of the block. One of these anomalies, a dipole located at N5072.5 E5116, is the result of an open groundhog burrow.

Ground-truthing of Anomaly 5 resulted in five pit features and one large posthole/possible cache pit. Figure 31 shows the area designated Anomaly 5, the photo was taken while removal of the plowzone was ongoing. Figure 32 is a plan map showing the location of Features 2-9 drawn after removal of the plowzone. It was originally thought that a section of the eastern wall of a structure had been exposed as well as adjacent areas/features. Four large features have small, dark, rock-filled stains in their interior. With the exception of one large possible post mold, the other possibilities were merely dark stains and larger cobbles located within large pit features. A large area, approximately 1 m x 2.5 m, of black soil ringed on the west side by fist-sized glacial cobbles was located in the overlapping central portion of Features 4 and 9. The black soil appeared to be a result of burning in situ. The black soil contained a few small and fragmented artifacts but did not contain significant amounts of fire-cracked rock, only glacial gravel along its outer boundary (not burnt). Some discussion should be provided on how the magnetic survey compares to the actual characteristics of the feature uncovered and what it indicates about the nature of the deposit. The magnetic survey showed a weak dipole with a magnitude of +8.8/-8.0 in this location. Given the nature of the pit features (Features 4 and 9) uncovered in this location, one would predict the magnetic signature to be overlapping monopoles. Dipoles are often the result of buried metal. This dipole, however, did not have as strong a magnetic signature as is seen with buried metal and was not oriented with the negative to the north wrapping around the positive to the south as dipoles resulting from metal typically exhibit. The dipole reading was an indication of burnt sediments. The combination of the black soil and dipole reading indicated that a thermal feature had been constructed on the surface of a trash-filled storage pit feature. The location of the fired soil in the magnetic survey is located just south of where it was found on the ground surface. Clark (1996: 65) has indicated the angle of dip of the earth's magnetic field at mid-northern latitudes results in the maximum of a thermoremanently magnetized feature to be displaced to the south. This phenomenon could be an explanation for the displacement although there is also the possibility of the displacement of fired soil within the plowzone affecting the readings. The magnetic signatures of the pit features designated Features 4, 5, and 9 appear to be completely obscured by the magnetic signature of the burnt deposit. Feature 3 had a magnitude less than the threshold of 3 standard deviations above the background mean. Features 2, 6, 7, and 8 had magnitudes of 6.12 nT, 4.25 nT, 13.4 nT, and 6.62 nT, all at or greater than 3 standard deviations above the background mean for the block. The magnetic signature of Feature 7 is partially obscured by the dipole resulting from the open groundhog burrow.

The plowzone was removed and the subsoil exposed in two areas just to the west of the features in Anomaly 5. The area exposed immediately west of Feature 2 revealed only sterile subsoil. The area farther west revealed a prominent plow scar and a dark stain approximately 75 cm in diameter. The dark stain contained a small piece of charcoal but showed a very diffuse boundary in plan view. The area was designated as a possible feature but was not given a feature number and was not investigated further.

Test Cores

Because the testing of Anomaly 1 and 2 located south of the mound proved inconclusive, additional testing in this area was deemed necessary. Three additional anomalies and one quiet area south of the mound in Block F3 were chosen for testing by coring with a 4-inch bucket auger. Test cores were conducted to assess whether the anomalies would test positive for feature fill. The gradiometer survey data for Block F3 is shown in Figure 33. Three of the cores tested with a 4-inch bucket auger tested positive for feature fill. Because glacial gravel is numerous in the subsoil and because the majority of pit features at the site tend to be deeper than one meter, the decision was made to core the anomalies not with an Oakfield soil probe but with a larger 4-inch bucket auger. The disturbance to the feature would be minimal and much information as to the overall site structure and community settlement pattern would be gained from the testing. The three cores testing positive for feature fill were of a magnitude greater than 3 standard deviations above the background mean for the block. The anomalies located south of the mound had magnitudes of approximately 12.8 nT, 9.7 nT, and 8.9nT from west to east. The middle anomaly is a weak dipole. The fourth auger test was conducted in the immediate vicinity of the second core but in a location that did not show a magnetic anomaly. This fourth core tested negative for feature fill and had a soil profile consistent with sterile subsoil underlying the plowzone. The soil profiles of the four cores are shown in Figure 34. Depth of the core and soils encountered for each auger test are given in Table 9.

Feature Excavation

Feature excavation was a direct result of anomaly testing. The first of the features excavated, Feature 1, was sectioned into four equal quads and only one of the quads excavated. The other four features were bisected along a north-south or east-west axis and half of each feature was excavated. In this way, the feature profile could be easily viewed and mapped. Feature fill was excavated in arbitrary 10-centimeter levels. All dirt removed was screen with ¼” mesh. Upon finishing each 10-centimeter level, the feature was photographed and mapped. Flotation samples of 1 to 5 liters as well as charcoal samples were obtained from each 10-centimeter level whenever possible. Identification of the carbonized plant remains and wood species recovered from flotation and charcoal samples, as well as the faunal material recovered from feature excavation, will be discussed in the following chapter in a section on subsistence patterns.

Not all of the features uncovered during ground-truthing were fully exposed or were subsequently excavated. Groundhog disturbance and time constraints prohibited exposing the entire area. All of the features uncovered were, however, given a feature number and were mapped and photographed. Nine intact subsurface features were uncovered during archaeological testing of magnetic anomalies. Five of the features were excavated; Features 1, 3, 4, 9, and 7. Features 2, 5, 6 and 8 were not excavated but were probed with an Oakfield soil core to determine the nature and extent of the features.

Feature 1

Ground-truthing of Anomaly 4 resulted in the discovery of Feature 1, a prehistoric storage/refuse pit roughly 1½ meters in diameter. Only the southeast quad of the feature was excavated. Feature 1 was a deep, cylindrical pit, straight-sided in profile with a rounded bottom. The storage/trash pit was 1.63 m in depth measured from the ground surface (1.33 m from the top of the subsoil) and contained three distinct soil layers. Feature dimensions are given in Table 10. The top layer, approximately 30-90 cm below surface, consisted of a dark, grayish-brown, organic-rich soil. Two rodent burrows were evident in top layer. The middle layer consisted of a dark brown clay loam lightly mottled with the darker soil from the top layer. This layer also contained cobble size gravel and one large limestone slab. The top layer contained more organic material but charcoal pieces were found throughout both the top and middle layers. The bottom layer consisted of a yellowish-brown clay loam containing few artifacts. Artifacts including ceramic sherds, faunal material, and lithic debitage were found throughout the feature. A nail fragment and a .22 shell casing were found within the upper 20 cm of the feature fill where rodent burrowing was documented. A summary of recovered artifacts by feature is given in Table 11.

Feature 3

The mid-point of Feature 3 is located at N5079.4 E5113.5 (Anomaly 5, Block B6). Feature 3 was bisected along its east-west axis and only the southern half excavated. Feature 3 represents a large posthole or possible small cache pit. The feature had straight or slightly sloping sides and a flat bottom, and exhibited a uniform fill without stratigraphy (Figure 35). Both characteristics are consistent with post molds. Feature 3 was 44 cm in diameter at the plowzone-subsoil interface. The darkest soil is in the center (approximately only 20 centimeters in width) becoming more diffuse as you move outward on either side. The overall diameter of the hole suggests the post may have been purposely removed, making the hole larger than it was originally. The feature had a depth of 56 cm below ground surface (28 cm below the top of the subsoil). Feature 3 is similar in size, shape, and depth to some of the post molds found beneath the mound during the 1963 excavations, and to the central posts in the two house structures from the 1966 excavations. A large pottery sherd was uncovered from the feature at 48 cm below surface. The sherd has a wedge-shaped rim strip that is cordmarked to the lip with cordmarking on the body.

Feature 4 and Feature 9

Features 4 and 9 (Anomaly 5, Block B6) correspond to the large burnt area previously described. The black, powdery soil was restricted to the center and was found to be relatively shallow. After the area was carefully troweled at 30 cmbs, the burnt area was still highly visible but the edges of the feature revealed a surprise. The plan view of these features at 30 centimeters below surface showed two overlapping, roughly circular, pit features with the black soil in its center. The decision was made to assign two feature numbers, Feature 9 being on the west and Feature 4 on the east. The features were bisected along the same east-west axis and only the southern halves excavated. The bisecting line began at N5076.5 E5111.5 and ended at N5078 E5114.5, running southwest to northeast. The profile drawing showed fairly consistent fill in the upper layers of both sides of the pit feature leading to the conclusion that Features 4 and 9 should be considered a single feature. The north profile map is shown in Figure 35. The total extent of the feature was 3.4 m in length with a maximum depth of 1.63 m below surface (1.35 m below the top of the subsoil) and a minimum depth of 1.38 m below surface (1.10 m below the top of the subsoil). Some differences were noted in the types of remains recovered from each of the lobes. Feature 9 contained a number of complete deer bones while Feature 4 contained visible burnt seeds. Feature 9 was dug deeper into the sand-gravel strata than was Feature 4. However, Feature 4 had a thin, very dark, soil layer on the bottom of the pit and this layer contained a fragment (< 5 cm) of a burnt grass mat. It is likely that the entire bottom of Feature 4 had this grass lining suggested by the continuous thin and dark soil layer. Features XIII and XIV from the 1966 excavations were described as conjoined pits, one side deeper than the other with the deep end in both features oriented to the west (Baby et. al 1967). As with the above-described pits, the conjoined pit excavated in 2004 shows the west end dug deeper into the sand/gravel layer than the east end.

Feature 7

The center point of Feature 7 is located at N5073 E5117 (Anomaly 5, Block B6). Feature 7 was bisected along a north-south line and the east ½ excavated. The feature is 1.95 m along the bisecting line. The bottom of the pit feature was not encountered until reaching 175 cm below surface (1.50 cm below top of subsoil). Feature 7 is, in the opinion of the author and commented on as such by one of the original investigators, Martha Potter Otto, on a visit to the site in 2005, a complex and unusual pit feature. It appears that the original pit was a cylindrical, rounded bottom, grass-lined storage pit. Between 155-165 cmbs, a burnt grass layer was discovered similar to Feature 4 except that in Feature 7 much more of the fibers had burnt and were preserved (Figure 36). Baby and Potter reported charred vegetable fibers (grass) found lining the bottom of four pits suggesting they were originally used for storage. The grass lining the bottom of Feature 7 had either been purposely tucked into the sand and gravel on the margins or had been inadvertently covered with the slumping of sediments from the sides of the pit. The grass lining appeared to have been weighted down with large cobbles. In between the masses of burnt grass were pockets of reddish burnt soil. The second event in the uselife of the pit feature resulted in the widening of the original pit. Sometime after the original storage pit had been re-filled with refuse, the pit was re-dug in the upper portion resulting in the pit being much wider at the surface than at its base. The re-digging of the original pit resulted in a more basin-shaped pit in the upper layers. The final event affecting this pit feature could be a result of cultural or natural transformation processes. The final event relates to a dark, gravel-filled shaft in the upper layer. The dark shaft is surrounded by a sand and gravel pocket and could be the remains of a posthole or a result of groundhog burrowing.

Shovel Testing to Determine Artifact Density

Shovel testing was used to determine artifact density across the site. A series of test pit units were dug along a transect bisecting the site from north to south to discern changing patterns in artifact concentrations within the main habitation area of the site. The shovel test pits were dug at 10-meter intervals within a 10-meter-wide corridor. The locations of the shovel tests had to be taped with Fiberglas measuring tapes. The fallow field of poison ivy, multiflora rose, briars, and thistle made accurate measuring nearly impossible. Therefore, test units lie within a 10-m swath east to west between approximately N4980 and N5120. The exact grid coordinates of the shovel test pits were later obtained with a total station. The shovel test units to determine artifact density were completed after the initial magnetic survey but before the expansion of the magnetic survey. The north-south extent of the transect was initially thought sufficient, however, additional test pits to the south would have been applicable given the results of the total magnetic survey data. The plowzone was removed and screened as one unit. Each shovel test was excavated to a depth of 5 cm below the plowzone or until sterile subsoil was encountered. Soil was screened onto plastic tarps to avoid affecting future magnetic surveys. Varying artifact densities within the plowzone should provide data relevant to patterns in the use of space and the presence/absence of a central plaza. The results of the shovel testing will be discussed in combination with the results of the magnetic survey data in the following chapter. The shovel test pit coordinates and associated artifact counts by artifact category are given in Table 12.

Summary of artifacts recovered during recent investigations

Recent archaeological investigations at the Voss site yielded approximately 4,200 artifacts recovered during five field seasons. Table 13 provides a total artifact count by artifact category. The largest artifact category is that of faunal material, n=1,916. The majority of the faunal material is highly fragmented. Turtle shell, bivalve shell, and bird bone are well-represented in the faunal material assemblage as is deer bone. Anne Lee conducted an analysis of the faunal material from feature context. The timing of the analysis precluded a more detailed interpretation of the data for the dissertation. A portion of the information provided by Lee is presented in Table 14. A total of 1,550 chert artifacts were recovered during archaeological investigation of the site. Table 15 provides a count of chert artifacts by type. A total of twenty-three projectile points or projectile point fragments were recovered. Removal of the plowzone, shovel tests, and feature excavation yielded 604 ceramic sherds. The majority of sherds were body sherds (n=566) with the remaining being neck (n=10) and rim (n=28) sherds, data provided in Table 16. Of the 604 ceramic sherds, 591 sherds are grit-tempered and 13 are shell-tempered, resulting in only 2.2% shell-tempered sherds.

CHAPTER 6

THE VOSS SITE REDEFINED

An analysis of the data resulting from recent investigation of the Voss site will be presented in the chapter. The data resulting from the magnetic survey, anomaly testing, feature excavation, and shovel testing to determine artifact density is used to address questions concerning community settlement patterns and subsistence patterns. The results of an analysis of the ceramic and lithic assemblages recovered during both recent investigations and the 1960s excavations will also be presented in this chapter.

Community Settlement Pattern

Site Structure

Assessing characteristics of site structure from the grayscale image of the magnetic data presented in the previous chapter provides information on the spatial patterning of likely prehistoric features across the landform. In grayscale images one is mostly assessing the presence or absence of anomalies over the landscape and the arrangement of the anomalies to detect if spatial patterning is indicated in the data. The presence or absence of anomalies can provide useful information such as whether a central plaza is indicated by a relative lack of anomalies. Or the arrangement of anomalies across the landform may indicate whether a linear settlement pattern following a terrace edge is suggested by the data. The original magnetic survey suggested there were relatively few possible intact subsurface features immediately east of the mound. A greater number of anomalies, particularly the large magnetic positives, are visible toward the eastern margins of the survey data. The grayscale map also indicated a higher concentration of anomalies located north/northeast and south of the mound. The extent of the original survey did not capture site boundaries that should ideally be indicated by a sharp decrease in the number of magnetic anomalies. The additional survey blocks collected in 2006 did capture the boundaries of the main habitation area of the site in the east and southeast portions of the survey. The grayscale image does indicate the relative absence of magnetic anomalies and the quiet nature of the data in these areas. No drop-off in anomaly density was indicated in the northern margin of the survey data. The magnetic anomalies do not follow the terrace edge in a linear arrangement but rather extend out into the terrace bench east of the mound.

The community settlement organization at the Voss site becomes clearest when the magnetic survey data is processed to show only those anomalies that meet a threshold of 3 standard deviations above the background mean (Figure 37). I had previously used a threshold equal to the magnitude of excavated storage/refuse pit features as an interpretation technique. While this threshold would be applicable to Voss, it would not be particularly useful across sites as the magnitude of anomalies may vary depending on the site-specific sediments. Therefore, statistical detection was attempted to find a method of assessing site structure with broader applicability. Surface iron and lightning strikes can significantly distort the standard deviation of a composite of data. If the effects of iron objects or lightning strikes are not addressed by processing of the raw data, using standard deviation parameters for feature detection will reflect the historic disturbance rather than the archaeology (Geoplot Manual 3-28). The data was first processed by using Zero Mean Traverse, Clip +15/-15, and Interpolate. To measure the background mean (background noise), the statistical processing area was confined to a quiet area in the data (Geoplot Manual). Admittedly, determination of a quiet area is somewhat subjective as multiple areas with slightly different magnitudes could be chosen. The absolute minimum and maximum plotting parameters were then set to 3 times the standard deviation measured in the quiet area. In this way, we can estimate that data with a magnitude above the threshold of 4.70 nT is very unlikely to be a result of noise (a 0.1% chance that data with a magnitude greater than the threshold is a result of noise). Historic disturbances such as open groundhog burrows, likely buried metal, instrument tilt, and lightning strikes were removed from the graphics plot shown in Figure 37. Using a threshold of 3 standard deviations above the background mean will undoubtedly remove some weakly expressed features from the data set. However, after analyzing the data with varying thresholds, it was found that at 2 standard deviations the plow scars were still very prominent, possibly because the plow was dragged through feature fill. In an attempt to detect only the large pit features and fired areas, a threshold of 3 standard deviations was used. A threshold of 4.70 nT corresponds well to the magnitude of the storage/refuse pit features revealed by removal of the plowzone. Most of the pit features produced maximum readings well above 4.70 nT. Feature 3, the possible post mold or cache pit, had a magnitude less than the threshold, therefore confirming the threshold will leave out smaller or more weakly-expressed features.

The magnetic survey data suggests an oval settlement consisting of a habitation/household ring surrounding a central plaza that is kept largely free of domestic activities associated with individual households. The magnetic survey also suggests that the mound is located at the interface of the central plaza and the surrounding habitation ring at a point closest to the terrace edge. The simplest way to articulate the community settlement pattern is to begin at the mound and move outward. The results of the magnetic survey suggest a concentration of pit features (discrete monopoles) north and south of the mound. The central portion of the survey immediately east of the mound shows relatively fewer possibilities for prehistoric pit features. The magnetic survey results suggest that a limited number of pit features do exist within this central zone as do some weaker or smaller features that do not meet the threshold of 3 standard deviations above the background mean. The area east of this central zone once again shows a concentration of monopoles or possible pit features. The area west of the mound is covered by the trail and tree line and was not surveyed. However, the pattern of anomalies suggests that the concentration of anomalies just north and south of the mound continues west of the mound, wrapping around the backside of the mound. At the present time no more than 20 meters of ground surface exists between the terrace edge and the western side of the mound, leaving only limited habitation space west of the mound. The terrace edge likely experienced some erosion since prehistoric occupation of the site. The eastern-most and southeastern-most margins of the survey area show a pronounced decrease in the number magnetic anomalies. These areas are interpreted as being just outside of the main habitation area of the site. Whether or not the village was palisaded cannot be addressed with the magnetic survey data. An abrupt decrease in the concentration of anomalies is indicated in the eastern and southeastern extremes of the survey and this could be an indication of a barrier to utilizing additional space. Posts used in the construction of stockades may be small and therefore would not be detected in the survey. However, if a trash midden developed along side the palisade during occupation of the site, this feature would presumably be evident in the survey as a more linear positive anomaly. No such feature is evident in the magnetic data.

The southeastern portion of the survey does not show the same concentration of anomalies that is visible in the northern, northeastern, and southern portions. It has been suggested that gaps, areas of decreased feature concentration in the habitation ring, documented at some Fort Ancient sites reflect expected growth in the village that for various reasons is never fulfilled (Henderson 1992). With a similar argument, Carskadden and Morton (2000: 178) suggest that gaps between household clusters are the norm at newly established Fort Ancient villages and that closely spaced houses result from lengthy occupation and multiple rebuilding episodes. Hawkins (1994) documented two large gaps opposite one another in the northwest and southeast portions of the circular village at Horseshoe Johnson.

It should also be noted that multiple occupations of the site cannot be discounted or confirmed with the results of the magnetic survey data alone. Evidence of rebuilding was found during the 1966 excavations. If multiple occupations of the site did occur, it largely did not disrupt the visible pattern of the central communal zone. Given the density of features north and south of the mound, the possibility of an earlier or later more linear settlement paralleling the terrace edge is possible. The pattern that is most evident when the magnetic data is analyzed using statistical detection with 3 standard deviations is that of a community settlement pattern consisting of a circular/oval habitation zone surrounding a central plaza with the mound at the plaza-household interface.

Archaeological testing of anomalies and subsequent feature excavation confirmed intact subsurface features north, east, and south of the mound. Feature 1, a large storage/refuse pit was uncovered north of the mound. Six large storage/refuse pit features, two of which were partially excavated, and a possible post mold/cache pit, also partially excavated, were uncovered east of the mound. Moreover, the unusual conjoined pit feature discovered north of the mound during the 1966 excavations was duplicated east of the mound. Three test cores located south of the mound tested positive for feature fill. The three cores testing positive for feature fill appear to be deep pit features within the southern portion of the habitation ring. The three cores are located along the N5000 grid line between E5040 and E5060. Anomalies 1 and 2 that proved inconclusive after removal of the plowzone are located just to the east of the test cores containing feature fill. Although the nature of the deposit could not be defined for either of these anomalies, considerable quantities of lithic debitage were recovered from the plowzone above these anomalies.

The results of the shovel testing to determine artifact density across the site, shown in Figure 38, in many ways supports the data obtained during the magnetic survey, including the possibility of village expansion/contraction. The grayish-white areas within the transect indicate none to few artifacts with the pink to red areas containing increasingly more artifacts. One immediately notices that the highest concentration of artifacts is located in the northernmost reaches of the transect. The magnetic survey suggests this area is within the elliptical zone of pit features but on its northern most edge. The area of higher artifact concentration could relate to a midden or dumping area on the outer edges of the main living space. The southern portion of the transect does indicate artifact concentrations between N4980 and N5000, but at a lower artifact density than on its extreme northern margin. The southern artifact concentrations are within the southern portion of the proposed habitation ring. Two areas located at approximately N5008 and N5047 show an absence or near absence of artifacts. These areas are within areas of the magnetic survey that show relatively few magnetic anomalies and are within the proposed central plaza. One obvious exception to the pattern is the increase in artifacts indicated between N5020 and N5037. The magnetic survey does suggest the presence of possible intact subsurface features in this area arcing from southwest to northeast. These anomalies could relate to communal activities within the plaza. Alternatively, the presence of possible subsurface features combined with the higher artifact density in this location could reflect expansion of the village due to rebuilding and growth, or a contraction of the village due to fission of the population and/or abandonment of particular sections. One could interpret this area of higher artifact concentration as corresponding to the southern edge of the central plaza at a specific point in time during village occupation. The interpretation of the wider magnetic survey data and the results of the test cores suggests, however, that the household zone during at least one occupation of the site was located farther south between N4970 and N5000.

Figure 39 integrates the data from mound and village excavations in the 1960s, the analysis of the magnetic survey data at 3 standard deviations, feature excavation, test coring, and shovel testing to determine artifact density. The community settlement pattern suggested by the data is an elliptical settlement consisting of a ring of houses interspersed with pit features surrounding a central zone kept largely free of individual household activity and debris. The data does not suggest a pattern of strictly concentric rings of activity with zones of burials, pit features, and houses radiating outward from the central plaza. A concentric community organization has been documented at a number of Fort Ancient sites. The oval residential zone surrounding a plaza with a mound at the interface seen in the Voss magnetic data is very similar to the pattern mapped from a visible surface midden at the Florence site in Kentucky. At the Florence site, Sharp and Pollack (1992: 218) documented a community organization consisting of three concentric rings: a mortuary zone, a residential zone, and a refuse zone. The pattern of community organization at the Florence site is similar to the one at SunWatch Village in the sense that both are organized in a concentric manner. However, the pattern at SunWatch consists of three concentric rings with the refuse zone situated between the mortuary and residential zones. The visible pattern of storage/refuse pit features interspersed between houses as well as in front of the structures, like that seen at Voss, was documented at the Philo II site in the Muskingum Valley, and at the Baum and Gartner sites (Carskadden and Morton 2000; Mills 1906). This pattern could result from a breakdown in the intrasite settlement organization as abandonment and/or rebuilding of houses occurs within the habitation zone. We know from the 1966 village excavations that pit features intruded into the post pattern of House II suggesting that one preceded the other and that rebuilding did occur during the life of the village. What is often attributed to rebuilding of house structures during one occupation may alternatively reflect cycles of village occupation and abandonment related to swidden agricultural practices. House patterns were not clearly discernable in the magnetic data even given the close 0.5 m spacing of the transects. We know from the 1960's excavations that the two house patterns, roughly 8 x 6 m and sub-rectangular, consisted of small 5 to 9-inch in diameter posts. Individual posts of that size are too small to be evident in a survey with 0.5 m transect spacing. The location of village burials at Voss, other than the seven individuals in the mound and the two infants found in refuse pits, is still unknown. However, there has been no evidence uncovered to date for a zone of burials located between the outer edge of the central plaza and the habitation zone. It is quite possible that some of the magnetic anomalies located within the household/pit feature zone are in fact burials. A cemetery area located outside of the village or a more distant location for burials cannot be ruled out. How storage/refuse pits, houses, and burials are organized within the broader circular arrangement varies among Fort Ancient sites. Varying patterns of the mortuary, residential, and storage/refuse zones within individual communities supports the argument that Fort Ancient villages represent interconnected but largely autonomous communities (Graybill 1981; Nass 1988).

Multiple lines of evidence suggest that occupation of the site was not short-lived. These multiple lines of evidence include a wide range of dates obtained in the 1960s excavations, rebuilding and/or reuse of areas evident in the overlapping of house patterns and pit features, a magnetic survey indicating the site was intensively utilized by prehistoric inhabitants, and at least one pit feature having been re-dug outside of its original boundaries for reuse.

Site Size

An analysis of the magnetic data at 3 standard deviations can be used to estimate village size, extent of the central plaza, and width of the habitation zone. Figure 40 provides size estimates for the village, plaza, and household/pit feature zone based on an interpretation of the magnetic survey data at a threshold of 3 standard deviations above the background mean. It is very likely that a much wider area, beyond that surveyed, was utilized for village and household activities. Overall site size estimates are intended to indicate the extent of the main habitation area.

Overall village size is estimated to have been approximately 160 meters north-south by 140 meters east-west in maximum extent. The size of Voss village is estimated to have been 2.2 hectares. The site size for the Florence site (15HR22) in Kentucky, estimated from a dark surface midden, measured 110 meters north-south by 140 m east-west. The maximum site size estimate for Voss is greater. The estimate for site size is a maximum as rebuilding/reoccupation could result in the footprint being larger than it was during any given point in time. Differences in size estimates may also be a result of differing methods of data recovery. Assessing village size from a surface midden in a plowed field may produce a rougher estimate than assessing size from plowzone stripping or from a magnetic survey. A size estimate of approximately 1.2 hectares for the extensively excavated Philo II site south of Zanesville is provided by Carskadden and Morton (2000: 170). Site size for a number of southwestern Ohio Fort Ancient sites is given by Drooker (1997: 93). The sites range in size from 0.5 hectares at Anderson to 4-6 hectares at State Line. Most of the sites included in the comparison are estimated to have been between 1 and 2 hectares. The Schomaker site located along the lower Great

Miami River was estimated to be oval in shape, approximately 130 m by 100 m, and roughly 1.5 hectares in extent (Cowan 1986: 97, 159).

The maximum extent of the plaza at Voss, oval in shape, is estimated to have been 60 to 70 meters. Drooker (2000: 251) provides a comparison of plaza dimensions for a number of Fort Ancient sites in southwestern Ohio. The maximum estimated size of the plaza at Voss is in line with plaza estimates for SunWatch (Heilman et al. 1988). Again, the plaza size and configuration likely changed during village occupation. The plaza dimension estimates for the Madisonville and Anderson sites are between 20 and 40 meters. Schomaker, Hine, and Horseshoe Johnson are in the middle range of plaza dimensions, approximately 40-50 meters in diameter. Most plazas are reported as being oval in configuration. Based on a site map provided by Carskadden and Morton (2000), the central plaza at the Philo II site is also between 40 and 50 meters in diameter.

The residential zone containing households and associated features is estimated to have been a maximum of 40 meters in width. Forty meters may be greater than the width of the residential zone at a single point in time during village use. Expansion or contraction of the village will give the appearance of a wider residential zone when viewed in sum. The residential midden zone at the Florence site (15HR22) was estimated to be approximately 30 meters wide (Sharp and Pollack 1992: 216). Although the residential zone at the Carpenter Farm site in Kentucky is in a linear arrangement, it also was found to be 30 m wide estimated from excavation units within a dark surface midden (Pollack and Hockensmith 1992: 184).

Subsistence Patterns

No attempt was made to recover charred plant remains from the Voss site during the 1960s excavations. The 1960s excavations were conducted before flotation techniques became a routine part of archaeological investigation. Given the nature of the preserved plant remains in the pit features recently dug at the site, botanical remains in the pit features excavated by the OHS crew were likely small and fragmented. No indication was given in the reports of any large masses of burnt cultigens having been discovered as Mills had reported for sites like Baum and Gartner. This left the impression that the village occupants at Voss were not practicing maize agriculture in any substantial way and therefore, were distinct from their Fort Ancient counterparts. One of the research questions of the dissertation is whether or not a subsistence strategy heavily reliant on maize agriculture is indicated by the macrobotanical remains from feature context, the types of features, or stable carbon isotope analysis. Due to the marginality of the Voss site to the larger Fort Ancient territory, differences in subsistence practices and diet could have existed between the Voss population and the populations located farther south. Analysis of flotation samples from feature context was needed to fully address subsistence patterns of the Voss population.

In 2002, an initial flotation sample from Feature 1 SE Quad was sent to Annette Ericksen at Cultural Resource Analysts, Inc. for archaeobotanical analysis. She reported one possible corn kernel fragment and hickory nutshell. In 2004, the flotation sample from Feature 4 South ½ was sent for analysis. Ericksen identified two corn (*Zea mays*) kernels and nine kernel fragments. In 2005 and 2006, the flotation samples from Features 1, 3, 4, 9, and 7 were processed by the author resulting in heavy and light fractions. All of the light fractions were given to Steve Howard and Dr. Kristen Gremillion at Ohio State University for archaeobotanical analysis. The results from the analysis of the light fractions are given in Tables 17, 18, and 19.

The sample is admittedly small but does offer insight into the plant species utilized by the Voss population during occupation of the site. Aside from wood charcoal, the largest category of carbonized botanical remains by count and gram weight is hickory nutshell (n=272, wt.=4.393g). The vast majority of this (n=177) was recovered from a level of 45-65 cmbs in Feature 7. The largest category of identified cultigens by count is corn cupules. The largest category of identified cultigens by gram weight is corn kernels. Corn kernels and/or cupules as well as squash remains were recovered from all of the 3 deep storage/refuse pits. Samples from the conjoined pit feature yielded an interesting result. Only corn kernels were recovered from the grass-lined eastern half (Feature 4) while only cupules were recovered from the western half (Feature 9). The significance of this, if any, is unknown. The differences may relate to how maize was stored, perhaps with only shelled corn stored in the eastern half of the conjoined pit. Two bean fragments were recovered from the charcoal samples from Feature 7, level 45-55 cm below surface. Feature 7 was the only feature documented to contain beans. Feature 7 level 45-55 cmbs also yielded 10 of the 13 fish scales recovered from the light fractions. Other than wood charcoal, only 6 nutshell fragments were recovered from Feature 3. This result is not surprising considering the proposed nature of the feature as a post mold/cache pit. Chenopod, sumac, and erect knotweed were identified in the light fractions from the lower portion of Feature 7. Three little barley seeds were recovered in the samples from Feature 1.

The relatively low frequencies of corn kernels (n=27) and cupules (n=55) cannot be used to infer a reduced reliance upon maize agriculture. Both Prufer and Shane (1970: 249) and Church (1987: 263) have suggested that sites like Baum and Gartner with their storage pit features of stacked corn cobs and bags of shelled corn may be evidence for a relatively later occupation while a low frequency and/or ubiquity of maize in pit features seen at sites like Blain or Baldwin is possibly a reflection of an incipient stage of maize agriculture. Such an assumption is not supported by recent stable carbon isotope data. The amount of recovered maize from a site is often not a good indicator of how much was consumed in the diet of its occupants. Differences in the amount of recovered maize likely have to do with inter-site behavioral differences rather than merely differences in the diets of the populations. Middle Ohio Valley sites often produce much greater quantities of burnt maize fragments than do Upper Ohio Valley sites, yet stable carbon isotope data shows roughly comparable maize consumption (Greenlee 2002: 24). The differences in this case probably relate to differences in storage techniques, below-ground versus above-ground storage. One such possible behavior affecting the preservation of plant materials at sites where space is limited due to intensive occupation may have involved burning rotten or moldy remains in the bottom of a pit to discourage vermin activity and thereby allowing continued use of the pit for refuse.

Stable carbon isotope data suggests similar maize consumption irrespective of the quantity of recovered maize from feature context. Atmospheric carbon dioxide is differentially metabolized by plants during photosynthesis. Maize, a tropical cultigen, metabolizes greater amounts of ^{13}C relative to native plants and its values are less negative. Native cultigens in eastern North America typically range from -35 to -20 $\delta^{13}C$, expressed as delta values in parts per thousand. Human tissue reflects the isotopic composition of the plants that make up the diet. Schurr and Schoeninger (1995) analyzed ten individuals from Baum and 15 individuals from Gartner and, not surprisingly, found that they were isotopically enriched with $\delta^{13}C$ means of -11.97 and -11.14 respectively (isotopically-depleted individuals not included in average). Greenlee's (2002) analysis of stable carbon isotope data on hundreds of human skeletons from Middle Ohio Valley Late Woodland and Late Prehistoric contexts suggests that maize was rapidly and widely adopted around A.D. 900 in the Middle Ohio Valley. By the early Late Prehistoric period, maize contributed significantly to the diet of most individuals in the Middle Ohio Valley as it did to most individuals throughout the Midwest and Southeast (Gremillion 2003). Isolated individuals, particularly in southwestern Ohio but also at Baum, Gartner, and Kramer were found to be isotopically depleted (Greenlee 2002: 188, 353). Individuals within the population showed some variation in the relative amount of corn consumed. Within the Middle Ohio Valley, groups living along the Ohio River (like Killen) tended to be more enriched than along the tributaries. Stable carbon isotope analysis performed on six individuals from the Voss Mound suggests these individuals consumed significant quantities of maize. The six individuals from Voss Mound yielded $\delta^{13}C$ values ranging from -9.80 to 12.81, with a mean of 11.22. Individuals analyzed by Greenlee from Enos Holmes, Baldwin, Kramer, and Feurt proved similarly isotopically-enriched. Mean $\delta^{13}C$ values from Baum and Baldwin, and Gartner and Voss are very similar contrary to the varying quantities of archaeobotanical evidence recovered from each site (Table 20).

The presence of domesticated beans, *Phaseolus vulgaris*, in an archaeobotanical assemblage is argued to be a temporal indicator. Hart et al. (2002: 381) obtained AMS dates on *Phaseolus vulgaris* (common bean) and associated maize fragments from Late Prehistoric sites across the northern Eastern Woodlands to establish the timing of the adoption and spread of domesticated beans in the region. Hart et al. contend beans were a later, post-A.D. 1200, addition to the subsistence base of northern Eastern Woodland populations. Two bean fragments were recovered from Feature 7, level 45-55 cm below surface. The mere presence of domesticated beans in the Voss archaeobotanical assemblage indicates that intercropping of maize, beans, and squash was likely occurring during at least one occupation of the Voss site. Additionally, it was recognized that the presence of domesticated beans had implications beyond what it revealed about subsistence patterns. The presence of domesticated beans from feature context could provide information concerning site chronology, strongly suggesting that at least one occupation occurred post-A.D. 1200. John Hart was approached as to his interest in having one of the bean fragments from the Voss site dated. The resulting date will be discussed in the last section of the chapter.

From the relatively small sample of carbonized remains recovered from the Voss site, one notable difference is indicated between the Voss botanical assemblage and a number of assemblages from other Fort Ancient sites. Wymer (1992) suggests the paleoethnobotanical record in the central Ohio Valley from the Late Woodland to the Late Prehistoric shows a pattern of a decreasing number of species in the crop system. This pattern of an increasing reliance on fewer plant species eventually results in the disappearance of most members of the Eastern Agricultural Complex in Fort Ancient settlements. Wymer suggests this almost total abandonment of native starchy seeds along with the importance of maize in the Fort Ancient diet distinguishes the central Ohio Valley from Mississippian populations to the west. Chenopod and sunflower are the exceptions to this trend (Wagner 1987; Rossen 1992) and continued to be used during the Late Prehistoric period in the Middle Ohio Valley. Chenopod was recovered from such sites as Muir, Fox Farm, and Florence in central Kentucky (Rossen 1988; Rossen 1992; Sharp and Pollack 1992) and from SunWatch Village (Wagner 1983; 1987), and has now been documented at the Voss site. The data on subsistence patterns at the Voss site largely support these earlier conclusions. Maygrass was not recovered in the flotation samples from Voss. The absence of maygrass is in line with its reported absence at Fort Ancient sites (Rossen 1992: 208; Wagner 1987). However, two other members of the Eastern Agricultural Complex rarely recovered from Fort Ancient sites, little barley and erect knotweed, were present in Feature 1 and Feature 7, respectively, at Voss. This may be an indication that the marginality of the Voss site resulted in at least one difference in subsistence behavior. Additionally, nutshell accounts for approximately 70 percent of the carbonized botanical remains by frequency. A proposed decrease in nut collecting for Fort Ancient populations when compared to Late Woodland or Mississippian populations (Rossen 1992: 206) is not supported by the features excavated to date at Voss. Nevertheless, broad conclusions cannot be drawn on the limited evidence as nutshell typically preserves more readily than other plant remains and the overall sample size is small.

The original use of bell-shaped and deep, cylindrical pits is attributed to storage behavior based on their shape, size, and occasional remnants of charred grass linings

(Wagner 1996: 261). Twenty of the twenty three pit features (Features 4 and 9 considered to be one feature) excavated to date at Voss are large and deep pit features dug well into the sand and gravel layer at 90-100 cmbs. It is likely the initial use was intended for food storage. Features VII and XVI being basin-shaped, and Feature 3, the post mold/cache pit, were the exceptions. Mills (1906) describes and draws the storage pits at Baum as always being dug well into the sand and gravel layer. Terrestrial gastropods, occurred throughout the refuse layers of the storage/trash pit features at Voss, indicating the pits were not rapidly filled (Prufer and Shane 1970).

Four of the pit features excavated in 1966 and two of the features excavated recently showed evidence of a bundled grass lining. Mills (1906) describes the storage pits at the Baum site as having been lined with grass or bark with corn cobs placed in rows or shelled in bags, some containing other plant foods such as beans, hickory and walnuts, and pawpaws. The description of grass and bark lined pits with stacked corn cobs is similar to that reported for SunWatch Village. Mills envisioned the following sequence for the cultural transformation in the use of a storage pit feature: pits originally dug for underground storage by spring became trash receptacles after supplies had been depleted during the winter, the old storage pit would be used for trash until filled then new storage pits would be dug for the coming fall harvests and winter use. The use of underground storage pits provides an environment with fewer fluctuations in temperature, light, and humidity than above-ground storage (Wagner 1996). Experimental and ethnographic evidence from Wisconsin suggests that storing plant foods underground during the winter months required the pit be dug into clean soil, that the pit be lined with materials such as bundled grass or bark, that the food be prepared for storage, and that the pit be securely covered (Arzigian 2006). Underground food stores that were not properly prepared suffered from mold growth, insect infestations, and rodent disturbance. The experimental unlined pit resulted in dangerous mycotoxin growth on the corn. Arzigian contends that processing the corn with lime, as is done in Mexico, was found to significantly reduce or eliminate the mycotoxins. Wagner (1996) argues underground storage pits are a way to protect agricultural surplus through concealment during seasonal abandonment of the village. Wagner notes that for the concealment argument to be plausible, concealment must have been directed against outsiders rather than other members of the community since nearly all storage pits within the village are located adjacent to structures. However, concealment is difficult to envision unless concealment was directed towards distant outsiders as nearly all Middle Ohio Valley populations located their storage pit features adjacent to their houses.

The storage/trash pit features excavated at Voss did not contain large quantities of fire-cracked rock. In fact, it was often commented on that the pit features recently excavated contained remarkably little burnt rock relative to the large amounts of glacial gravel. Only a small quantity of the faunal remains recovered from the storage/refuse pits showed evidence of having been in a fire. A mere 10% of the faunal material from feature context was charred, burned, or calcined. In contrast, earth oven pit features and middens containing large quantities of fire-cracked rock are the norm at sites dating to the Late Woodland period (Seeman and Dancey 2000:591). Many more burnt and blackened animal bones in the Late Woodland layers than the overlying Fort Ancient component at the well-stratified sites of Turpin and Sand Ridge suggest that large quantities of meat were cooked in the earth oven features.

Using catchment analysis as a technique for measuring the amount of productive soils surrounding Fort Ancient communities, Nass (1988) found that nucleated Fort Ancient communities in southwestern Ohio had sufficient soil for growing the necessary quantity of cultigens to support its population on a year-round basis. Kennedy (2000) suggests that small Fort Ancient sites are found in areas of low and high soil fertility but that larger sites are found only in areas of high soil fertility. Important requirements for maize agriculture are well or moderately well-drained soils, soils that warm early in the spring, and soils which have a texture suitable for the cultivation with a wooden digging stick or shell/stone hoe (Nass 1988: 328). Well-drained loam soils such as sandy loam, silt loam, and loam occurring on level or nearly level terrain possess these characteristics. Silt loam soil occurs in the A Horizon on the terrace bench where the village site is located at Voss and the underlying sand and gravel substratum results in the soil being well-drained with rapid permeability. Silt loam soils that are moderately well-drained and nearly level, easily tillable and subject to only occasional flooding, and that have a high crop potential, occur on the highest part of the floodplain just below the village site on both banks of the Big Darby Creek.

Analysis of the Voss Ceramic Assemblage

Baum Series Ceramics

Griffin (1943, 1966) was the first to formally define ceramic types within the Fort Ancient Tradition. Griffin viewed the Baum Focus pottery as belonging to "essentially one type, Baum Cord-marked and Baum Incised" (1966:68). Griffin's type was defined as mostly grit-tempered, with a minority of shell-tempered sherds (including rare sherds of mixed grit and shell and also limestone tempering), in smoke-blackened gray or grayish tan to brown colors. Vessels were described as open-mouthed jars with vertical to slightly flaring rims and subconoidal to rounded bases, with the lips of vessels evenly divided between rounded, narrowed and rounded, and flattened. The surface finish of nearly all sherds was cordmarked or exhibited smoothed cordmarking. Lug handles were common just below or contiguous to the lip and lug forms included horizontal and semicircular forms. Some lugs exhibited vertical notches on the lip of the lug. Handles also took the form of rim strip nodes functioning as lugs, as well as parallel-sided or ovoid strap handles (Griffin 1978: 554). Parallel-sided strap handles sometimes having ear-like projections above the handles also occurred in his type. The most common design found in his type was two or three line curvilinear guilloche incising over cordmarking, the lines being medium wide and medium deep or wide and shallow (Griffin 1966: 45-46); the second most common design being a triangular area with oblique hatching. Diagonal or transverse lip-notching while it did occur, appeared on less than 10 % of the rims from the Baum site. Rim strips were sometimes notched on their lower margins, or were incised with oblique lines. Most rims from Baum Focus sites were said to be unthickened. Thickened upper rim strips appeared in the type but were in the minority, accounting for less than one-fourth of the sherds in the Baum site assemblage. Griffin viewed the sherds from the Baldwin site as a "less rich variant of the Baum type" due to the presence of the added rim strip.

Prufer and Shane (1970) utilized Griffin's Baum Cordmarked Incised ceramic type when describing ceramic assemblages from Blain Village just south of Chillicothe. Prufer and Shane divided Griffin's type into two types, Baum Cordmarked Incised var.

Blain, and Baum Shell Tempered var. Blain. Shell-tempered sherds were considered chronologically important. Turnbow and Henderson (1992: 303) argue that Prufer and Shane made no mention of mixed grit and shell tempered sherds even though these sherds were likely present in the Blain assemblage believing Prufer and Shane included the mixed-tempered sherds in with the predominant temper type. Ullman and Pi-Sunyer (1985) analyzed the ceramic assemblage from the Kramer site just north of Chillicothe. Along the lines of Prufer and Shane's creation of site-specific subtypes, Ullman defined three new subtypes of Baum phase ceramics: Baum Cordmarked var. Kramer, Baum Incised var. Kramer, and Baum Shell Tempered var. Kramer. Ullman and Pi-Sunyer utilized Prufer and Shane's two types but further segregated the grit-tempered sherds exhibiting incising into its own type. Turnbow and Henderson use the following Baum phase ceramic types: Baum Cordmarked Incised, Baum Plain, Baum Shell Tempered, and Baum Shell Tempered Plain. Turnbow and Henderson (1992) point out plain surface sherds are often segregated within the assemblage and noted but not fully discussed or formally typed. They defined two new types for these plain sherds, Baum Plain and Baum Shell Tempered Plain.

The following type definitions for Baum series ceramics are compiled from Turnbow and Henderson (1992: 305), Griffin (1966: 44-46 and 342-343), Prufer and Shane (1970: 39-64), and Ullman and Pi-Sunyer (1985). The following type definitions represent a general description of Baum series ceramics and are not site specific. It was felt that redefining types or defining new subtypes for the Voss ceramic assemblage was not warranted. It is the opinion of the author that the Voss assemblage can be comfortably placed within the existing types.

Baum Cordmarked Incised

Temper: Consists of crushed fragments of igneous or metamorphic rock with small amounts of unknown rock. Mixed temper of grit and shell and/or grog occurs but grit accounts for greater than 50 percent of the temper. Temper size is medium fine to coarse and occurs in a wide range, indicating poor sorting of temper.

Color: Dark grays, tans, and browns predominate with a high percentage of smoke discoloration on both exterior and interior surfaces. Paste is gray to black.

Surface Treatment: The majority of sherds show clear cordmarking, with smoothed-over cordmarking also present. Cordmarking extends vertically to the lip. Most rims do not exhibit smoothing of the cordmarking. Interior surfaces are predominately smooth with a matte finish.

Rim profile: Rim profiles include direct and vertical, slightly flaring, and more rarely flared or incurvate.

Rim form: Rim form includes unthickened direct rims, and rim strips applied to the vessel at the lip in the minority. Rim strips are either wedge-shaped in cross-section or of uniform thickness.

Lip Form: Lip shape varies from flattened and rounded, to rounded, to narrowed and rounded.

Thickness: Body sherd thickness and rim thickness ranges from 4 to 10mm. Rim strip thickness ranges from 5 to 12mm.

Appendages: Appendages include horizontal (shelf) or continuous lugs, semicircular lugs, bifurcated lugs, tongue-shaped projections, and strap handles largely of the parallel-sided variety. "Ears" sometimes extend above the lip or above the lug/handle.

Decoration: Decorative techniques include incising and notching. Lip decoration consists of transverse and diagonal notching or incising, and cordmarking. The lip of lugs is sometimes notched. The lower edge of the rim strips are sometimes notched. Decoration on the neck of the vessel consists of incising including curvilinear guilloche, rarely rectilinear, and incised line-filled triangles. Incising is narrow and shallow, moderately wide and shallow, or moderately wide and moderately deep. Punctates occur either with incising or in rows on handles, or at the base of the thickened upper rim band. The band is not commonly incised.

Vessel Form: Jars are the only vessel form. A typical vessel would consist of an elongated body and conoidal or rounded base, a direct to incurvate, unthickened rim with a flattened cordmarked lip, or a straight or slightly flaring rim with a wedge-shaped rim strip and a narrow and rounded lip.

Baum Plain

Temper, Color, Rims, Lip form, Appendages, Decoration, and Vessel Form are identical to *Baum Cordmarked Incised*.

Surface Treatment: Exterior surfaces are either smoothed with a matte finish or well smoothed to burnished. Interior surfaces are predominately smooth.

Baum Shell-Tempered

Color, Rims, Lip form, Appendages, Decoration, Vessel Form and Surface Treatment are identical to *Baum Cordmarked Incised*.

Temper: The predominant temper is crushed mussel shell. A wide range of particle sizes exist within a given sherd. The paste is moderately to densely tempered.

Baum Shell-Tempered Plain

Color, Rims, Lip form, Appendages, Decoration, Vessel Form and Surface Treatment are identical to *Baum Plain*.

Temper: The predominant temper is crushed mussel shell. A wide range of particle sizes exist within a given sherd. The paste is moderately to densely tempered.

The Voss Ceramic Assemblage

In total, archaeological investigations of the Voss site have produced a ceramic assemblage of 7,842 sherds. A total of 604 ceramic sherds were recovered during recent excavations. Baby et al. (1964, 1967) reported a total of 3,295 sherds recovered during mound excavations and 3,943 sherds recovered during village excavations. An analysis of the Voss ceramic assemblage housed at the Ohio Historical Society Collections Facility was conducted during 2006. The total collection was examined to visually assess tempering material. A more complete analysis of the rim and neck sherds was conducted to assess rim form, decoration and appendage type.

Temper

Following Prufer and Shane (1970) and Turnbow and Henderson's (1992: 304) definitions of temper categories, grit-tempered sherds are defined as those sherds tempered with crushed rock, as well as mixed-temper sherds where grit constitutes the majority of temper. The predominant temper particle in the grit-tempered sherds is crushed fragments of igneous rock, particularly granite with rare inclusions of quartz and mica. A small number of sherds appear to be tempered with water-worn silt comprised of very small pebbles and sand. Mixed-temper grit/shell sherds in the Voss ceramic assemblage account for less than one percent of the total recovered sherds. The shell particles in mixed-temper sherds are extremely fine and sparse within the paste. Shell-tempered sherds include those sherds where shell constitutes all or the majority of tempering material. The shell particles in these sherds are large and dense within the paste.

A total of 56 shell-tempered sherds were found in the collection, resulting in a percentage of only 0.8% shell-tempered sherds. Of the 604 sherds recovered during recent excavations, 13 were shell-tempered yielding 2.2% shell-tempered sherds (Table 21). Regardless of which percentage one uses, the frequency of shell-tempered sherds at the Voss site is low. One desired effect of the ceramic analysis was to address the question of whether the shell-tempered sherds clustered in any one area of the site. Shell-tempered sherds were recovered from different feature contexts across the site including from the mound and from 8 pit features within the village. Provenience of shell-tempered sherds is given in Table 22. The results of the ceramic analysis indicate that shell-tempered sherds occur in all sections of the village excavated to date. Shell-tempered sherds were more consistently recovered from the features within Anomaly 5. Shell-tempered sherds were recovered from all three large pit features excavated within this area.

Rim form

Rim sherds from the mound and both village excavations were analyzed collectively. A total of 396 rim sherds could be located in the Voss collections at OHS from mound and village contexts. A total of 28 rim sherds were recovered during recent excavations. This yielded 424 rim sherds and 87 decorated neck sherds available for analysis. A breakdown of rim forms present in the assemblage is presented in Table 23. Mean thickness of the upper rim for each majority rim category is given in Table 24. Table 25 provides the frequency of surface treatment exhibited on rim sherds in the Voss assemblage. Rim profiles are given in Figure 41. Examples of rim sherds from mound and village contexts are shown in Figures 42 and 43. Ninety percent of the rims analyzed are thickened with a wedge-shaped rim strip and exhibit cordmarking or partially smoothed cordmarking to the lip. Ullman and Pi-Sunyer (1985: 30) referred to this style of cordmarking as "dainty Hocking Valley-like." Figure 44 shows a portion of a reconstructed pottery vessel exhibiting a wedge-shaped rim strip cordmarked to the lip recovered from Feature 3. Wedge-shaped rim strips are reported from the early component at Thompson, as well as at Baldwin, Graham, Baum, and Kramer (Griffin 1966; McKenzie 1967; Ullman and Pi-Sunyer 1985; personal inspection). Wedge-shaped rim strips have also been recovered from the Wegerzyn site located along Stillwater Creek near Dayton (Kennedy, personal communication). Some variation exists in the width of the rim strip. The vast majority of rim strips are narrow and thin. A variety of thicker rim strip exhibiting a wider band also exists in the Voss ceramic assemblage but they are rare. The high frequency of thickened rims is unlike the Baum and Gartner ceramic assemblages. The Baldwin ceramic assemblage analyzed by Griffin contained a higher frequency of thickened rims than unthickened. Griffin's (1966) plates of ceramics from the Serpent Mound component show similar rims thickened by the addition of a wide rim strip. Turnbow and Henderson (1992: 126) contend based on a ceramic analysis of Kentucky sites, rim strips predate A.D. 1400, being present in both Early and Middle Fort Ancient contexts in Kentucky. Cowan (1986: 128-129) reports the majority of rims from the Schomaker site are thickened by folding or an added rim strip. Griffin (1966) noted that added rim bands were in the majority in Anderson Focus ceramic assemblages.

Secondary rim types are rolled rims, and unthickened rims with either flat or rounded lips. Although relatively few in number, rolled rims were recovered from the mound and from multiple pit feature contexts. Examples of rolled rims are shown in the lower left corner of Figure 43. Only 6 shell-tempered sherds had intact rims, 4 of them were of the rolled variety and the remaining two are unthickened. These rolled rims are of the Shell-Tempered Plain variety, exhibiting a plain surface treatment. The Baum Series defined types do not address this variety of rim form. Rolled rims are described by Riggs (1998: 134) and do occur in Fort Ancient ceramic assemblages in southwestern Ohio. The shell-tempered rolled rims from Voss are very similar to those reported from the Carroll-Oregonia site which Brose and White (1983: 20) classify as Madisonville plain. Unthickened rims were recovered from both the mound and village context. The majority of these rims are thick (approximately 1 cm in thickness) and heavily cordmarked with a coarse, vertical cordmarking. Two unthickened rims with a knife-edge lip were recovered. Unthickened rims, very much in the minority at Voss, are in the majority at sites like Baum and Gartner (Griffin 1966), and Kramer (Ullman and Pi-Sunyer 1985: 37).

Two rim forms are represented by very few sherds. Seven rims exhibiting a uniformly thick added rim strip exist in the collection. One rim sherd with an added rim strip and prominent castellation, recovered from Feature XX, fits Barkes' definition of the Cole pottery type.

Decoration

Decoration on rim and neck sherds is common in the Voss ceramic assemblage and takes a variety of forms. Incised decoration occurs on approximately 30% of the rim sherds (neck only sherds included) in the Voss assemblage. Table 26 provides a list of decorative motifs exhibited on rim and neck sherds from the Voss assemblage. Figures 45 and 46 show examples of decoration on rim and neck sherds recovered from the mound and village.

The vast majority of decorated sherds exhibit some form of medium-wide incising on the neck of the vessel. Curvilinear guilloche is the most common decorative motif in the Voss assemblage. Curvilinear guilloche consists of three and four-lined designs and occurs over plain and cordmarked surface treatments. The number of lines used in the guilloche motif varies between two, three, and four-lined in Fort Ancient assemblages. Vickery et al. (2000: 312) report the majority from the State Line site as being of the three and four-lined variety while at SunWatch the two-lined variety predominates. The body of the vessels exhibiting curvilinear guilloche is typically cordmarked below the neck, although curvilinear guilloche does occur on vessels with a plain surface treatment. The shell-tempered guilloche neck sherds obtained from the mound, shown in the top row of Figure 45, exhibit vertical cordmarking below the shoulder with a four-lined curvilinear guilloche over a plain surface treatment on the neck of the vessel. This combination of vertical cordmarking on the body and curvilinear guilloche over a plain neck on shell-tempered vessels is similar to what Drooker refers to as Anderson shell-tempered pottery that has come from features dated to the fifteenth century (1997: 79) like the ones recovered from the Schomaker site (Cowan 1986: 117). It is exhibited by sherds from the Sand Ridge component (Oehler 1973: 55). This combination of attributes occurs at the State Line site, a site argued to have its main occupation during the middle period (Vickery et al. 2000: 308). Turnbow and Henderson include this combination of attributes in their Madisonville Cordmarked type representative of the early part of the late period (1992: 364). Two examples of sherds with incising excavated from Feature 7 and shown in Figure 47, display some of the variation in temper, rim form, lip shape, and decoration recovered from within a single feature at Voss. The rim on the left is unthickened and shell-tempered while the rim on the right is grit-tempered, unthickened, and has a knife-edge lip. Figure 48 shows a portion of a pottery vessel recovered from Feature IX exhibiting curvilinear guilloche and incising on the rim strip over a plain surface treatment. Incising on the rim strip in the form of oblique or grouped alternating slashes occurs on seven rim sherds recovered from pit features in the village.

Incising in combination with punctates on the neck of the vessel also occurs as a decorative motif in the Voss assemblage. Punctates are found on the rim strip in a series and are either small and round or ovate. Punctates are also found bordering the incising or occurring within the eye of the guilloche. Punctates bordering a pattern of incised triangles is a motif seen in the rim sherd recovered from Feature 7, shown in Figure 49. A decorative motif of punctates within the eye of the guilloche, shown in the second row of Figure 46, occurs on five sherds recovered from Features I, V, VI, IX, and XII, clustering in the northwestern portion of the village. Punctates within the eye of the guilloche is a decorative motif noted as being present in the Anderson, Steele Dam, and Turpin site assemblages from the Miami River drainages (Griffin 1966: 99, Pl. XXXVIII, Fig. 3 and 110, Pl. LVI, Figs. 4, 6, and 10 and 152, Pl. LXXXIV, Fig. 6). Cowan (1986:

126-128) reports the use of punctates in the eye of the guilloche and as embellishment for line-filled triangles in the Schomaker ceramic assemblage. In Kentucky, the combination of incised lines and punctates is unique to the Middle Fort Ancient Manion phase (Henderson et al. 1992: 265). No sherds decorated with line filled triangles, a common Fort Ancient decorative motif, were recovered from Voss. Turnbow and Henderson (1992: 128) report very little to no curvilinear guilloche from the lower component at Thompson, but do report incising in the form of line-filled triangles. The opposite pattern was found at Voss.

Lugs/Appendages

A number of lug handle varieties are present in the Voss ceramic assemblage (Figure 50). The largest category of lugs is a variety formed by the widening of the rim strip on the upper margin with a corresponding widening on the lower margin. Table 27 provides data on the frequency of decoration exhibited on lugs/appendages. This type of lug is rarely decorated, the only decoration being notching on the upper, lower, or upper and lower margins of the lug. McKenzie's (1967: 70) description of an expanded rim strip at Graham Village in the Hocking Valley is nearly identical to the type of lug seen at Voss formed by the widening of the rim strip above and below. This type of lug appears to be similar to a rim sherd described by Essenpreis (1982: 467) and one shown for the Serpent Mound component (Griffin 1966: Plate XVIII). Horizontal or shelf lugs are present in the assemblage. Several of the horizontal lugs exhibit incising and/or ovate punctates. The two strap handles recovered from Voss are short, thick and of the converging-side variety. This type of strap handle is consistent with the strap handles recovered from the Baum and Gartner sites. Griffin (1966: 342) describes these as "a poor imitation of the Madisonville type…usually squat, thick, and poorly shaped, and most often attached to the lip." One of the strap handles exhibits narrow incising in a chevron pattern with punctates (shown in Figure 42, last in third row). No parallel-sided strap handles or loop handles were recovered from Voss. Cowan reports strap handles from Schomaker are generally thick and triangular in outline, sometimes decorated with incised lines and punctates.

Notably absent from the Voss ceramic assemblage are semicircular lugs which Griffin (1966) considered a hallmark of Baum Focus ceramics. Semicircular lugs being absent in the Voss ceramic assemblage and recorded at all other Baum components listed by Griffin is interesting. Semicircular (semilunar) lugs are also found in the Roseberry phase sites located around the mouth of the Muskingum River (Graybill 1981; Carskadden and Morton 2000). Semicircular lugs are present in the ceramic assemblage from the lower component at Thompson (Turnbow and Henderson 1992). Griffin (1966) reported semicircular lugs being rare in Anderson component ceramic assemblages. It may be determined that semicircular lugs are a particularly time-sensitive trait with a narrow time span of production.

Ceramics Summary

The Voss ceramic assemblage is consistent with Baum Series ceramics as previously defined. The assemblage also shows a number of affinities with Anderson phase ceramics in the rolled rim variety, the incised rim strip, and the shell-tempered guilloche over a plain neck with cordmarking below. No ceramics indicative of a late

Late Woodland period occupation were recovered at Voss. Barkes (1982) and Pollack and Henderson (2000: 198) suggest it is the minor use of shell temper, presence of handles and lugs, and incised designs on the necks of vessels that distinguish early Fort Ancient ceramic assemblages from their Terminal Late Woodland predecessors. Ceramic assemblages from sites dating to the late Late Woodland period exhibit thick, grit tempered, collared, and cordwrapped-stick impressed ceramics (Shott and Jefferies 1992: 54; Niquette and Kerr 1993; Seeman and Dancey 2000: 593). No cordwrapped-stick or cordwrapped dowel impressed rim sherds seen at the late Late Woodland sites of Clark and Parkline, or Prairie Chapel in Coshocton County (Seeman and Dancey 1998; Seeman 1992; Carskadden and Morton 2000) were recovered from Voss. Ceramics from sites Carskadden and Morton (2000: 163) designate Cole phase sites dating to the 12th and 13th centuries in the Muskingum Valley show similarities to the Voss ceramic assemblage including a thickened rim strip, horizontal and “tongue” lugs, incising on the lip, and curvilinear guilloche incising, but again all of these attributes occur in Fort Ancient ceramic assemblages. Collared rims with castellations are a frequent occurrence in ceramic assemblages from the Cole designated sites in the Muskingum Valley. At Voss, however, with the exception of one sherd (last in second row of Figure 49), castellations occur only in the sense that a lug is formed by a slight rise on the upper margin of the rim strip in combination with a widening of the lower margin. The “tongue” lug appears to have been relatively common in the early to middle Late Prehistoric and occurs in the Baum and Gartner assemblages.

Ordering sites by percentage of guilloche decoration on ceramics, Church (1987) suggested that earlier sites exhibited the greatest percentages of sherds decorated with guilloche. Blain, Enos Holmes and Voss showed greater percentages of guilloche design when compared to Baum and Kramer. Gartner and Howard Baum produced nearly identical percentages of guilloche (50%) decoration yet exhibit considerably different percentages of shell-tempered sherds. Ordering sites by percentage of rim form, either thickened or unthickened, produced results inconsistent with the seriations by temper and decoration. Enos Holmes yielded only 21% thickened rims, a percentage consistent with the proposed later Baum, Gartner, and Kramer sites. However, Enos Holmes also exhibited >50% guilloche decoration and less than 5% shell-tempered sherds, two characteristics that would place Enos Holmes among the transitional sites according to Church. Church (1987: 128) concluded that Howard Baum, Voss, Enos Holmes, and Blain were Transitional Late Prehistoric sites with their ceramic assemblages exhibiting <5% shell-temper, >50% guilloche decoration, and large percentage of thickened rims. Baum, Gartner, and Kramer were found to be early Late Prehistoric sites with >15% shell-temper, <50% guilloche decoration, and largely unthickened rims.

Riggs' (1998: 248-261) seriation of ceramic assemblages from stratified sites in the lower Little Miami drainage suggests the opposite chronology for frequency of neck decoration and changes in rim form. Riggs' analysis suggests that components of sites dating to A.D. 900-1100 exhibited 90% unthickened, 6% thickened/collared, 2% rolled, and 2% angled rims. The period A.D. 1100 -1300 showed an increase in thickened (collared, folded, applied) rims but showed expanding and direct (unthickened) rim profiles still dominating the assemblages in frequencies of 58% unthickened rims, 36% thickened rims, and 7% rolled rims. Thickened rims peaked in frequency in the components dating to the period A.D. 1300-1500 (1998: 243-255). Again, in his scenario, thickened rims would show their greatest frequency during the Middle Fort Ancient period, ca A.D. 1200-1500. Riggs found the frequency of decoration on neck sherds to be highest within the same time frame. Decoration on the neck of the vessel increases in the period A.D. 1100-1300 but remains in relatively low frequencies, then peaks in the period A.D. 1300-1500 and drops drastically in the period post A.D. 1500. The frequency of decoration on the neck of the vessel (typical location of guilloche) increases from 8% in the period A.D.900-1100 to a peak of 50% in the period A.D. 1300-1500 and drops back to below 10% post A.D. 1500 (1998: 327). In his scenario, both early and late sites would show relatively little neck decoration when compared to sites dating to the Middle Fort Ancient period. Riggs suggests the increase in neck decoration relates to increasing group size and diversity.

Depending upon whether one uses the ceramic seriation produced by Riggs or the one argued by Turnbow and Henderson, the Voss ceramic assemblage is consistent with an Early or Middle Fort Ancient occupation. The large number of thickened rims is argued to be consistent with the early period Thompson site ceramic assemblage in Kentucky. However, the Voss assemblage lacks other styles found at Thompson such as line-filled triangles and semicircular lugs. Large numbers of thickened rims are also argued to be consistent with middle period, ca. A.D. 1200-1500, ceramic assemblages from well-stratified sites in southwestern Ohio. The considerable number of rim and neck sherds exhibiting guilloche, and incising in combination with punctates is consistent with Middle Fort Ancient ceramic assemblages in both southwestern Ohio and northern Kentucky. With one exception, rim forms, decorative motifs, and appendage types were not found to be exclusive to the mound context that might indicate the mound related to a different occupation than the village. Rolled rims were recovered from both the mound and village. Guilloche decorated sherds were recovered from the mound as well as from the village. One strap handle was recovered from the floor of the mound and another of the same type was recovered from Feature IV in the village. Lugs formed by the widening of the rim strip were recovered from both contexts. Nonetheless, village debris from an earlier occupation would likely have littered the surface, allowing the incorporation of this material into the pit features of a later occupation. Cultural behaviors such as cleaning up and readying the ground for new house and storage pit construction could contribute to the mixing of habitational debris from an earlier occupation. Punctates within the eye of the guilloche was the only decorative motif found to be exclusive to the village, a motif found at Middle Fort Ancient sites in southwestern Ohio suggesting roughly contemporaneous occupation.

No classic Madisonville Horizon ceramics with unthickened rims and elongated, thin strap handles were recovered from the Voss site.

Analysis of the Voss Lithic Assemblage

The Voss lithic assemblage includes numerous lithic tools including triangular projectile points, side and corner-notched projectile points, thumbnail scrapers, triangular knives, leaf-shaped blades, and flake tools including one exquisitely pressure flaked and crafted from local pebble chert. Chert tools were manufactured from locally available materials such as Delaware chert and pebble chert.

Because attributes of the triangular point are argued to be temporally sensitive, a more detailed analysis of triangular projectile points in the Voss artifact assemblage was conducted. Analysis of triangular projectile points to determine temporally sensitive attributes was initially conducted by Graybill (1981). He suggested the base shape of triangular projectile points was a temporal indicator, changing over time. Graybill's seriation showed that convex-based points decreased over time, concave-based points increased over time, and straight-based points increased then decreased over the Late Prehistoric. Flora Church analyzed base shape of triangular points from a handful of Fort Ancient sites in the central Scioto Valley and its tributaries (1988). Church's seriation was conducted as a comparison to the analysis conducted by Graybill on triangular points from Late Prehistoric sites in West Virginia. Church included the sites of Voss, Blain, Gartner, Kramer, and Baum in her analysis of triangular point base shape using Graybill's types. Church concluded that Voss, like Blain, was early in the sequence as convex-based points dominated at the site while concave-based points were rare. Straight-based points accounted for slightly more than one-third of triangular points (1988: 59). For reasons unknown to the author, only 19 triangular points from Voss were used in her analysis. Church placed Baum and Gartner later in the sequence as they had 30-50% concave-based points. However, Graybill's three types do not distinguish between earlier forms of concave-based points that are incurvate on the lateral margins as well as along the basal margin, from concave-based points exhibiting straight or excurvate lateral margins that are prevalent in later contexts.

Railey (1992), using primarily Kentucky Fort Ancient lithic assemblages refined the triangular point typology to include seven types. A recent study attempted to expand on Railey's classification by quantitatively defining types on the basis of metric measurements (Bradbury and Richmond 2004). The present analysis uses the typology developed by Railey (1992). Railey's seriation of triangular point styles in lithic assemblages in many ways concurs with the findings of Graybill for Fort Ancient sites in West Virginia. However, the use of seven types instead of three allows a finer classification of base shape in relation to the orientation of the lateral margins of the triangular point. Parallel-sided points with slightly convex bases can be distinguished from points with convex basal margins and markedly flaring bases. It is believed that the number of specimens used in the analysis is of sufficient size to allow use of the typology as a temporal indicator of prehistoric occupation at the Voss site. The following type designations were used in the analysis of the Voss triangular projectile point assemblage (after Railey 1992: 156-169):

Type 1 Tri-Incurvate

The Type 1 point is small with incurvate sides and concave bases. This point type although more common outside of the Fort Ancient culture area is occasionally present in Early Fort Ancient contexts.

Type 2 Fine Triangular Flared Base

Type 2 points have incurvate sides and/or markedly flaring bases with convex or straight basal margins. An Early-Middle Fort Ancient affiliation for this type was determined, ca. A.D. 1000-1300s for Kentucky site assemblages. Both Early and Middle Fort Ancient sites in Ohio report a majority of Type 2 points.

Type 3 Fine Triangular Coarsely Serrated

Type 3 points are distinguished by coarsely serrated lateral margins. This type is considered to be diagnostic of the Middle Fort Ancient period.

Type 4 Fine Triangular Short Excurvate

Type 4 triangular points are less than 25 mm in length with excurvate lateral margins. Bases are convex, straight, and rarely concave. Most Type 4 triangular points are symmetrical and diagnostic of the Late Fort Ancient period.

Type 5 Fine Triangular Straight-Sided

Type 5 points exhibit straight lateral margins that are nearly parallel to basally expanding. Bases are slightly convex or straight. Type 5 triangular points are recovered from many Early and Middle Fort Ancient sites but become predominate in deposits that post-date A.D. 1400.

Type 6 Fine Triangular Concave Base

Type 6 points have excurvate or straight lateral margins and concave basal margins of narrow to medium basal widths. Type 6 points persist as the latest chipped stone point type in the Middle Ohio Valley and are diagnostic of post-A.D. 1400 deposits.

Type 7 Fine Triangular Thick, Wide Base

Type 7 triangular points are markedly thick with strong diamond-shaped cross-sections. Type 7 points tend to be symmetrical.

Twenty-three projectile points or fragments were recovered during recent investigations. Only eighteen of these were complete enough to be typed into broad categories of triangular points or notched points. Of these 18, all of the points but one are triangular. The remaining projectile point fragment is side-notched. Of the 17 triangular points recovered during recent excavations, 13 were complete enough to be typed using the typology developed by Railey. The mound report indicated that 12 triangular points were recovered during mound excavations. The village report indicated that 31 triangular points were recovered in 1966. Thirty-four triangular projectile points complete enough to be typed using Railey's typology could be located in the Voss collections housed at the OHS Collections Facility. The 34 triangular projectile points found in the OHS collections (Figure 51) and the 13 triangular points recovered from recent excavations (Figure 52) resulted in 47 triangular projectile points used in the analysis. The one Levanna-like point was not considered in the analysis (top row in Figure 51). Triangular projectile points from all contexts that were complete enough to be typed were used in the analysis. Thirty of the 47 triangular points used in the analysis were recovered from feature context, seven from the mound and twenty-three from feature context in the village. Sixteen were recovered from surface and plowzone contexts. One triangular point recovered during the 1960's excavations is of unknown provenience.

Metric attributes for the triangular projectile points used in the analysis are given in Table 28. Included in the table are details on provenience of each specimen. A review of Railey's metrics on basal width of triangular points from Kentucky sites found that Type 2 points on average exhibited greater basal width than Type 5 points. Types 3 and 4 exhibited the smallest average basal width. Type 7 points exhibited the greatest average basal width. The same results were found when analyzing the Voss triangular point assemblage.

The results of the triangular projectile point analysis are consistent with an Early-Middle Fort Ancient occupation at Voss. Figure 53 is a histogram showing the results of the analysis by point type. Type 2, Flared-base triangular points dominate the lithic assemblage (n=33). Railey found Type 2 points to be representative of the Philo Phase and the most common type at Blain Village (Prufer and Shane 1970: 79-81). Railey considers Type 2 points to be generally synonymous with Graybill's convex base triangular (1981: 104-107). The second largest category is Type 5, straight-sided triangular points (n=9). Two, Type 6, concave base triangular points, characteristic of Late Fort Ancient contexts were recovered. One of the concave base triangular points was recovered from feature context, Feature VII. One possible Type 3, serrated-edge triangular point was recovered from beneath the rib cage of Burial 3 in the mound. The location of the point suggests it was related to an injury. Railey considers Type 3 triangular points to be a hallmark of Middle Fort Ancient assemblages. Serrated triangulars occur at the Feurt site near the confluence of the Scioto and Ohio rivers, in large numbers (Mills 1918). Type 3 serrated-edge triangular points are reported as present at Baum (Mills 1906: 85) but very rare in the Gartner lithic assemblage (Griffin 1966: 47-48). At least one serrated point was recovered from a pit feature at the Baldwin site (Griffin 1966: 54). No serrated triangular points were recovered from Blain, Graham, Gabriel, McCune, Thompson, or Scioto County Home. One might suggest that serrated triangular points are possibly geographically restricted. However, their presence at Baum and Gartner suggest they were utilized in the upper Scioto valley. Additionally, one Type 1 point and one Type 7 point were found in the analysis, neither type being particularly time-sensitive.

The side and corner-notched points recovered from the Voss site were categorized according to broad time periods. Time periods represented include Early/Middle Archaic, Late Archaic, Early Woodland, and Late Woodland periods (Table 29). Nineteen corner and side-notched points (Figure 54) and 6 fragments of notched points were recovered during the 1960s excavations. One fragment of a side-notched point was recovered from Feature 3 during recent excavations. The majority of side and corner-notched projectile points were recovered from surface contexts or from the mound floor, either isolated on the mound floor or beneath the concentration of stones. These points were typed to the Early Archaic, Early Woodland, Middle/Late Woodland, and late Late Woodland periods, and may have been scattered on the living surface at the time of construction of the mound. One Archaic and one possible Late Woodland point were recovered from the midden near House I. One Early Woodland point was recovered from Feature I during the 1966 village excavations. It is possible the occupants of the Voss site reused isolated surface finds. A few points show evidence of having been re-worked. Interestingly, the Snag Creek site in Kentucky dating to the late Late Prehistoric yielded numerous side and corner-notched point types (Railey 1992: 149), four of which, the Kanawha Stemmed, Adena Stemmed, Lowe Cluster, and Jack's Reef, were also recovered from the Voss site. McKenzie (1967: 73) reports that stemmed and notched points were used by the occupants of Graham Village. Vickery et al. (2000: 320) report Chesser Notched, Jack's Reef Corner-Notched, and Lowe Flare Base projectile points at the State Line site but do not indicate whether they came from feature context.

Radiocarbon dates and Site Chronology

Previous radiocarbon dates obtained on charcoal from the Voss site suggested occupation spanning the entire Late Prehistoric period. Wood charcoal samples obtained during the 1960s yielded dates within a 700-year span. Of the twenty radiocarbon dates obtained by OHS on wood charcoal samples, sixteen have associated errors of +/-100 years or greater. Recently obtained radiocarbon dates suggest a narrower time span of village occupation.

As part of recent investigations at the Voss site, a number of new radiocarbon dates were obtained. Details of features with associated radiocarbon dates are provided in Table 30. A wood charcoal sample collected from individual pieces of charcoal in level 65-75 cmbs in the east half of Feature 7 was sent to Beta Analytic, Inc. for standard radiometric analysis. The sample produced a conventional radiocarbon age of 980 +/- years B.P. and a 2 sigma calibrated date of A.D. 992-1156. The 2 sigma calibrated date of A.D. 992-1156 is in line with previous expectations of the site chronology. However, two nutshell fragments from two different and recently excavated features were submitted for Accelerator Mass Spectrometry (AMS) analysis. The two nutshell fragments yielded surprisingly late dates. A hickory nutshell fragment recovered from Feature 3 South ½ level 28-38 cm below surface was sent for standard AMS analysis with grant money from the Patricia Essenpreis Grant provided by the Ohio

Archaeological Council (OAC). The nutshell returned a conventional radiocarbon age of 630 +/-40 years B.P., and a 2 sigma calibrated date of A.D. 1285-1401. A hickory nutshell fragment recovered from Feature 4 South ½ level of 78-88 cm below surface was sent for standard AMS analysis with grant money provided by the OAC. The nutshell from Feature 4 returned a conventional radiocarbon age of 520 +/-40 years B.P., and a 2 sigma calibrated date of A.D. 1316-1447.

Two domesticated bean fragments were recovered from Feature 7 East ½ level 45-55 cm below surface. In 2006, John Hart graciously agreed to provide the funds to date one of the bean fragments from the Voss site. The bean fragment was analyzed initially by Kristen Gremillion for identification and then sent to John Hart and David Asch for further analysis. After agreement that the charred material was indeed the cotyledon of *Phaseolus vulgaris*, the sample was submitted to the Illinois State Geological Survey Isotope Geochemistry Radiocarbon Lab for an age determination. The results of the AMS analysis indicate a radiocarbon age of 525 years B.P. +/-30, and a 2 sigma calibrated date of A.D. 1322-1441. The AMS date obtained on the bean sample is in agreement with the two AMS dates obtained on nutshell.

In summary, the radiocarbon dates obtained from recent excavations suggest occupation occurred between ca. A.D. 1100-1440. An initial sample obtained from wood charcoal recovered from Feature 7 yielded a 2 sigma calibrated date in the 11th to 12th centuries. Three AMS dates obtained on nutshell and domesticated bean from three different feature contexts suggest occupation in the 14th century-very early 15th century. A recently obtained AMS date (Greenlee 2002) on human bone from Burial 3 beneath the mound and the associated serrated triangular point suggest an occupation of the circular/oval village and mound ca. A.D. 1200-1300. Several pit features in the village excavated in the 1960s yielded an early date as well as a later date. Feature 7 yielded a 2 sigma calibrated date ca. A.D. 992-1156 but also yielded the bean fragments. Domesticated bean fragments from other Late Prehistoric sites in the Middle Ohio Valley and the northeast have consistently dated to post-A.D. 1200, as did the bean fragment from Voss. Feature 7 did appear to have been re-dug, transforming the original deep cylindrical pit into a basin-shaped pit in the upper layers. However, the ceramic artifact assemblage from Feature 7 did not differ significantly between stratigraphic levels, with shell-tempered sherds as well as decorative motifs combining punctates and incising occurring in both the upper and lower portions. Storage-turned-refuse pit features are not sealed time capsules and mixing of materials within the feature due to cultural and natural processes is likely to have occurred. The "old wood" problem may account for some of the discrepancy between dates. A more complicated interpretation is to suggest there were two occupations separated by a couple of hundred years with the later occupation having mapped on to an older feature. The older features would have been only slight depressions at best given the time elapsed between occupations. It is possible enough time had elapsed to have completely obscured any surface indication of the location of previous pit features.

Recently obtained radiocarbon dates on wood charcoal, nutshell, domesticated bean, and human bone suggest the site is multicomponent. The AMS dates suggest mound construction occurring ca. A.D. 1200s and re-occupation of the site occurring as late as ca. A.D. 1440. The community settlement pattern and attributes of the ceramic and lithic assemblages at Voss are consistent with Early and Middle Fort Ancient sites in southwestern Ohio and northern and central Kentucky. The community settlement pattern indicated in the magnetic survey data and evident from feature excavation is consistent with a circular settlement oriented around a central plaza and mound. Pit features intruding into the post pattern of House I suggest rebuilding did occur at the site. Whether this rebuilding occurred during a single occupation or is indicative of occupations separated in time remains unclear. The Voss ceramic assemblage exhibits a predominance of thickened rims as well as decorative motifs combining punctates and incising. Moreover, a very specific combination of punctates in the eye of the guilloche shows affinities to Middle Fort Ancient sites in southwestern Ohio. The triangular projectile point assemblage from Voss is consistent with Early/Middle Fort Ancient assemblages, exhibiting a predominance of Type 2 triangular points, and Type 5 points showing the second greatest frequency with minor occurrences of Type 6 points. Only one possible Type 3 triangular point, a type considered to be a hallmark of the Middle Fort Ancient period was recovered.

Occupation, even accounting for the possibility of it being multicomponent in nature, appears to have occurred solidly within the Late Prehistoric period and appears to be Fort Ancient in character. No evidence in the form of ceramics gathered to date within the portions of the terrace bench investigated suggests a Late Woodland occupation occurred at the Voss site. The presence of late Late Woodland projectile points indicates use of the area during that period or possibly the reuse of surface finds. The presence of Archaic and Early Woodland projectile points as well suggests the location was used for several thousand years prior to Fort Ancient occupation.

CHAPTER 7

A CRITIQUE OF THE BAUM PHASE

Intrasite Settlement Patterns at Early/Middle Fort Ancient Communities

Because most of the Fort Ancient sites of the central Scioto River drainage and the Hocking Valley were excavated more than thirty years ago and in some cases more than 100 years ago, modern archaeological methods and analysis employing current ideas and models have largely passed them by. Previous models (Prufer and Shane 1970) suggested the earliest Fort Ancient sites represented immigrants who migrated to the central Scioto River valley and eventually spread westward and southward. Current evidence suggests this model is erroneous. The intent of this chapter is to review community settlement patterns and mound construction within the larger Fort Ancient culture area and in the central Scioto River drainage in an effort to reassess intrasite settlement patterns at sites attributed to the Baum phase in light of current models.

Both Drooker (2000: 241, 249) and Pollack and Henderson (2000: 198) suggest there are relatively few Fort Ancient sites with dates falling in the period A.D. 1000-1200. They argue the greatest geographic extent and greatest number of sites occur during the period ca. A.D. 1200-1450. The relatively few well-documented Fort Ancient sites confidently assigned to the early period in Kentucky include Muir (Sharp and

Turnbow 1987) and the lower component at Thompson (Henderson and Pollack 1992) among a few others (Sharp 1984). In southwestern Ohio, the Turpin and South Fort sites are argued to have early components. Pollack and Henderson argue Early Fort Ancient sites in Kentucky are comprised of several widely spaced households and associated activity areas organized in a linear arrangement. They view the lack of well-developed middens at early sites as evidence these settlements were of fairly short duration (Pollack and Henderson 2000: 198). The community settlement pattern evident in these Early Fort Ancient Kentucky sites reflects an organization somewhere between the small and loosely structured settlements of the late Late Woodland period, and the large and nucleated Fort Ancient village. Changing settlement patterns were likely linked, in part, to changing subsistence practices. During the late Late Woodland period a rapid shift in subsistence patterns occurred, evident in the increased importance of maize in the diet at the expense of native Eastern Agricultural Complex species (Wymer 1987; Greenlee 2002). The amount of land required for maize production (Nass 1988), properties of the soil related to soil fertility and ease of tillage (Nass 1988; Kennedy 2000), properties of the soils related to underground food storage, proximity to a water source for watering crops, and population density, all influenced regional settlement patterns as populations became and remained dependent upon maize agriculture. The extent of synchronic variability in community settlement patterns during the Late Prehistoric, ca. A.D. 1100-1400, when maize agriculture was well entrenched, remains unclear. The pattern of widely-spaced houses may indeed be a reflection of garden plot horticulture adjacent to individual houses and closely spaced houses in a circular pattern a reflection of field agriculture adjacent to the village as some have suggested (Nass and Church 2002).

Whether the differing settlement patterns reflect diachronic change or synchronic settlement variability is an important question.

Most Fort Ancient occupations, outside of a few upland sites interpreted as camps, represent village sites consisting of multiple households. The exact timing of the appearance of the circular village oriented around a central plaza with concentric mortuary, refuse, and residential zones is a matter of some debate. A circular village arrangement with the plaza as the focus of community planning appeared during the Emergent Mississippian period ca. A.D. 800-900 in the American Bottom of the Mississippi Valley (Meher and Collins 1995: 36-37). Within the Middle Ohio Valley, the development of the circular village seems to have occurred considerably later. Pollack and Henderson (2000: 200-202) argue only Middle Fort Ancient villages in Kentucky show evidence of a circular organization. The Middle Fort Ancient circular villages documented in Kentucky are larger than the Early Fort Ancient communities, with six to ten houses at early settlements and 20 to 30 houses in the middle period communities. Settlements arranged in linear fashion are argued to have persisted into the middle period in Kentucky. Pollack and Henderson (2000: 202) suggest several possible factors at play for longer periods of occupation seen during the middle period when compared to the preceding period, including population pressure, improved farming techniques, and social mechanisms to help resolve intra-community conflicts. Drooker (2000: 250-251; Drooker and Cowan 2001) argues that villages with circular layouts are known from Early, Middle, and Late Fort Ancient sites in southwestern Ohio. Madisonville, Anderson, Schomaker, Hine, Horseshoe Johnson, and SunWatch Village all show evidence of circular plans with central plazas. However, the picture is complicated by the multicomponent nature of many sites, including Madisonville, SunWatch, Schomaker, and Hine (Drooker 1997; Cook 2006; Cowan 1986). The supposed early sites with circular plans have also produced radiocarbon dates that post-date A.D. 1200. Shifting cultivation practices may have lead to repeated use of many of the sites with periods of occupation separated by fallow intervals of unknown duration. Cycles of occupation and abandonment are evident from overlapping village middens at sites like Florence and Buckner in Kentucky (Pollack and Henderson 2000: 202). Yet, it is difficult to distinguish between a long period of continuous occupation and a cycle of reoccupation especially if reoccupation is based on a soil fertility/fallow cycle of traditional agricultural populations as this may represent only a couple of decades. At the present, circular community layouts seem to be more consistently associated with occupations dating to ca. A.D. 1200/1250-1400/1450.

The well-organized community settlement pattern with concentric mortuary, refuse, and residential zones oriented around a central plaza reflects a level of spatial organization that goes beyond matters related strictly to subsistence or a desire to cluster around a communal central area. Maize agriculture does not require a circular community settlement pattern. The circular arrangement suggests political and social factors played a role in village organization. Monongahela settlements in western Pennsylvania, northern West Virginia, and extreme eastern Ohio have a similar community organization consisting of a ring of houses and associated storage features encircling a central plaza (Hart et al. 2005; Nass and Hart 2000: 134). Petal houses, circular structures with several attached storage features resembling the petals of a flower, are seen at Pennsylvania and West Virginia Monongahela sites post-dating A.D.

1400. Despite a caution that storage facilities varied among individual households within communities and variation existed over time (Hart et al 2005: 356), a pattern of change in food storage practices can be traced in Monongahela sites. Both storage pit features adjacent to houses and storage features attached to houses indicate control of food surplus rested with individual households. The petal houses seen at later Monongahela sites suggest a more centralized control over agricultural surplus by a community leader (Nass and Hart 2000: 147). For Mississippian populations in the American Bottom, smaller storage pits were associated with individual household complexes during the early period while large interior storage pits became common during subsequent phases (Mehrer and Collins 1995: 40). Nass and Yerkes (1995: 77-78) suggest differences in feature storage volume between household zones at SunWatch indicate the presence of a community leader who was involved in amassing food surplus from other households. Cook (2004: 221) suggests that this elite leadership/ritual zone at SunWatch developed over time as interaction grew with Middle Mississippian populations to the west. The presence of storage pit features adjacent to or inside individual structures at Fort Ancient sites during all periods, suggests individual households rather than community leaders largely controlled the fruits of agricultural production. Agricultural surplus may have been relinquished to a village leader or to the larger community during ritual or ceremonial events. The circular village organization may have functioned to fulfill a larger political and social role of integrating unrelated household clusters, i.e. integrating unrelated family units through community-wide ritual.

A circular community layout with an associated burial mound is a common settlement pattern seen at Fort Ancient sites in southern Ohio and northern Kentucky.

Cowan (1986: 139) considered burial mounds to be characteristic of Early Fort Ancient sites in southwestern Ohio. Pollack and Henderson (2000: 200-202) argue Kentucky Fort Ancient villages that are circular in organization often show evidence of mound construction, and suggest mound construction occurred in the latter half of the Middle Fort Ancient period, post-A.D. 1300. The Killen site at the mouth of Brush Creek is a rare example of a linear settlement with an associated mound (Brose 1982). Drooker (1997: 67) points out that radiocarbon dates from Kentucky sites are consistently calibrated and when dates previously reported for mound sites in southwestern Ohio are calibrated, most of the mound sites fall in the period A.D. 1100-1300. Did villages with mounds play a mortuary or ceremonial role in the lives of the occupants of villages lacking mounds? The author is not suggesting mound sites functioned as a political center in a regional settlement hierarchy. Mound function is assumed to be mortuary and/or ritual in nature. Simonelli and Kennedy (2003) argue, although not related to mound construction, that the absence of certain artifact categories and community organization at the Wegerzyn site located along Stillwater Creek indicate occupants of the site may have had a heterarchical relationship with the materially "richer" SunWatch Village site.

Evidence of palisades at some Fort Ancient sites in southwestern Ohio suggests village organization was also related to defense and protection from neighboring groups. Palisades occur at some Fort Ancient sites, primarily at occupations dating after ca. A.D. 1200 in western and southwestern Ohio (Drooker 2000: 249), and after A.D. 1400 in eastern Ohio and northern West Virginia (Graybill 1981). By the mid-14th century in north-central Ohio, Wolf phase/Sandusky Tradition populations form sedentary communities fortified with a combination of ditch, palisade, and earthwork construction (Brose 2000). Investigations of sites in the Scioto River drainage and its tributaries, as well as Philo phase sites in the Muskingum Valley have produced no evidence of stockades. None of the Late Prehistoric sites included in Church's (1987: 222) analysis of the central Scioto drainage showed evidence of ditches, earthen embankments, or palisades. However, many of these sites, including Voss, were not systematically tested for the presence or absence of a palisade. A triangular projectile point found beneath the rib cage of one individual buried beneath the mound and a side-notched point in a lumbar vertebrae of another individual suggest conflict related injuries.

Madisonville Horizon village sites occupied ca. A.D. 1400-1650 exhibit less concern for a rigid community organization. Excavations at the Hardin Village site in Kentucky revealed clusters of houses, associated pit features, and burials in no discernable pattern (Hanson 1966). Late Fort Ancient villages tend to have larger houses, examples being the Buffalo site in West Virginia and Hardin Village. Dunnell (1972) defined a Woodside phase for the mountainous region of Kentucky post A.D. 1400, with sites exhibiting circular organizations, central plazas, and stockades. Drooker (1997; 2000) argues the geographic extent of Fort Ancient sites recedes and number of sites decrease post-A.D. 1450. Graybill (1981; 1984) attributed this to village fusion and geographic constriction of Fort Ancient territory through time. Pollack and Henderson (2000: 213; 1992: 286) suggest late period villages reflect a Big Man social organization of multiple clans within a single community, where village leaders mediate intra-community disputes and negotiate outside alliances. They attribute the post-A.D. 1400 coalescence of self-sufficient smaller villages into large villages, to economic and political factors rather than climatic deterioration or inter-regional warfare. Pollack and Henderson note the lack of evidence for palisades at most Late Fort Ancient sites and paleoethnobotanical evidence that northern populations continued to rely on maize agriculture. Certain areas of the midwest were depopulated or sparsely populated with only pockets of late period occupations after ca. A.D. 1450 (Schroeder 2004: 327). A similar depopulation is argued for the native inhabitants of the middle Cumberland River Valley in Tennessee ca. A.D. 1450 (Moore et al. 2006: 91).

It has been postulated that a constriction of Fort Ancient territory occurred ca. A.D. 1350, attributed to various forces and pressures placed on Fort Ancient populations. Explanations for the depopulation of vast tracts of highly arable land include a climatic cooling event which reduced the number of frost-free days thereby shortening the growing season (Graybill 1981; Kennedy 2000), and a concomitant influx of warring Iroquois groups from the northeast (Graybill 1981). Kennedy concluded that the stimulus for regional settlement distribution pre- and post-A.D. 1400/1450 was an increase in agricultural risk associated with climatic deterioration. Kennedy contends that in order to mitigate climatic risks populations aggregated in areas that offered not only sufficiently fertile soils but also a longer growing season and the greatest opportunity for inter-village exchange, i.e. along the Ohio River proper. Philo phase villages were abandoned in the central Muskingum Valley ca. A.D. 1350. Repopulation of the upper reaches of the Muskingum River occurred during the late 15th and early 16th centuries in the Wellsburg phase (Carskadden and Morton 2000). Iroquois-influenced Eastwall Complex populations occupied northeastern Ohio at this time. It has been argued Whittlesey popuations migrated southward into eastern Ohio due to inter-regional warfare (Graybill

1981; Brose 2000; see Carskadden and Morton 2000). The central Scioto River drainage has long been viewed as a vacant corridor post-A.D. 1300. Cook (2004: 241) contends there is a lack of survey data to conclude that vast tracts of Fort Ancient territory were depopulated after A.D. 1400. Cook suggests recent studies (Harper 2000) show certain sites in southwestern Ohio were occupied after A.D. 1350 but that the duration of these occupations remains unclear. Drooker (2000: 248) provides a map of southwestern Ohio sites likely having occupations that post-date A.D. 1400. She includes components at Taylor, Carroll Oregonia, and South Fort in the upper Little Miami Valley and components at Hine and Schomaker as well as Steel Plant and Campbell Island in the Great Miami Valley.

Reassessing community settlement patterns at Baum phase sites

Reassessing intrasite settlement patterns at sites in the central Scioto and upper Hocking River drainages necessitates a review of previous archaeological investigation conducted at the sites. Investigation of these sites, with the exception of Voss, occurred more than 20 years ago, and most occurred more than 40 years ago. A review of the site descriptions is necessary to reassess village spatial organization in light of current models of Fort Ancient community organization.

The Enos Holmes site is located on a terrace bench along Paint Creek in Highland County. The site was surveyed in 1941 by H. Holmes Ellis (Baby et al 1968). The mound was excavated by the Ohio Historical Society under the direction of Raymond Baby in 1967. Nothing of the presumed surrounding village, with the exception of a single deep pit feature dug into the edge of the mound, is known.

Goslin investigated the Baldwin site, located northeast of Lancaster, Ohio on a tributary of the Hocking River, during the 1920s (Griffin 1966; Murphy 1989). Griffin (1966: 54) described the artifact assemblage obtained by Goslin as a result of surface collecting and excavation of eleven pit features as belonging to the Baum Focus. A few of the features were reported as being deep and stratified. Goslin also excavated five burials, one from an ash pit and the others from individual graves.

The Baum Village site is located on a gravel terrace on the south bank of Paint Creek near the town of Bourneville in Ross County, Ohio. The village site was excavated by William C. Mills beginning in 1899 (Mills 1906: 53). In 1897, Loveberry under the direction of Warren K. Moorehead excavated a small area in the village. The mound was surveyed and mapped by Squier and Davis because of its proximity to the nearby Hopewellian earthwork. The Baum Mound was excavated by Reynolds for the Bureau of Ethnology (Griffin 1966: 36; Thomas 1894; see Mills 1906, he indicates that the excavation and mapping of the mound was conducted by Middleton for the Bureau). The Bureau of Ethnology account of the excavations describes there having been traces of the village around the mound on all sides and particularly to the east. Mills excavated in portions of the village located northeast, east, and southeast of the mound. Mills described the village site as being over ten acres in extent but excavated only a small portion of the site. During three field seasons, Mills (1906: 53) uncovered 49 “tepee” sites, 127 village burials, and 234 pit features. Mills describes village burials as being adjacent to the houses. He describes the average house in the village as being circular, roughly ten feet in diameter, and constructed of small posts. Burials and storage/refuse pits surrounded the house structures. The structures were described as having interior clay-lined hearths that showed evidence of having been repaired many times. He states that out of forty-nine structures uncovered, ten had no associated burials and only a few storage/refuse pits suggesting that these ten houses had not been occupied for any great length of time (Mills 1906: 125). Extensive rebuilding of house structures at the Baum site is indicated by reported overlapping house patterns and burials intruding into house patterns. The one structure reported as not having shown evidence of rebuilding was the largest structure encountered by Mills during investigations located in a portion of the village farthest northeast of the mound. The largest structure at Baum was double the size of the other structures, twenty-one feet long by twelve feet wide and oblong in shape. It was constructed of larger posts ranging from five to nine inches in diameter. A clay-lined hearth, four feet in diameter and six inches deep, was located in the center of the structure. The structure was surrounded by extended and flexed burials on one side and large storage/refuse pits on the other.

Blain Mound and Village, excavated in 1966, is located on the west bank of the Scioto River, just northeast of the confluence of the Scioto River and Paint Creek. The site is located on the floodplain and is confined on three sides by the river and creek. The village was estimated to have encompassed roughly eight acres (Prufer and Shane 1970: 3). The mound was located in the southern portion of the site. The confluence of the Scioto River and Paint Creek is said to form the southern-most boundary of the site. Excavations approximately 100 feet north of the mound revealed 29 pit features, 9 shallow midden deposits, post mold patterns of 3 structures, and one hearth among the refuse pits. Pit features were located to the south of the two house structures, beyond which showed a lack of features in the direction of the mound. The two post structures were oval in shape and approximately 18 x 23 feet. No burials were recovered during excavations although scattered human remains were recovered from the plowzone (Prufer and Shane 1970: 29). Prufer and Shane contend a central plaza at the site was indicated by the spatial pattern of features and areas exhibiting a lack of features.

The Gartner mound and village site is located approximately six miles north of Chillicothe on the east side of the Scioto River. The mound was excavated by Mills in 1902 and the surrounding village in 1903. The village was described as being situated 70 feet above the river on a large terrace spur. Mills described the village site as being between three and four acres in extent, and entirely surrounding the mound (1904: 148-149). However, he draws the mound only 100 feet from the edge of the bank, not in central portion of the terrace spur but on its western edge (Figure 55). Midden development south and southeast of the mound was reported to be from one foot to twenty inches in depth. Mills does not describe the village organization as circular but the choice of location for his excavation units is suggestive of a circular settlement. Excavation units were dug on the northern, southern and eastern margins of the terrace spur while none were dug in the central portion. Mills (1904: 149) appears to have been assessing a visible surface midden because he states that “surface indications are richest” south and southeast of the mound. More than 100 pit features, located adjacent to structures, were excavated during Mills’ investigation of the site. Mills does not describe the structures uncovered at the Gartner site but suggests they were identical to those encountered at the Baum site. Burials occurred in the mound, in storage/trash pits, and in extended graves near the pit features. Only fifteen burials were recovered from the village. Evidence of rebuilding or reoccupation is suggested by Mills’ comments and drawings. A profile drawing of a section of the village shows that the digging of a number of pit features disturbed portions of earlier extended burials. Mills draws the fire pits amongst the storage/trash pit features, however, he does not comment on whether these were also found within the structures. An unusual feature was uncovered south of the mound near the terrace edge. A fired area, over 40 feet in length and 16 feet in width, showed evidence of repeated burning. The soil within the depression was reported to have been burnt to a depth of 14 inches. Based on the charred human remains, charcoal, and ash found in the western portion of the fired area nearest the terrace edge, the feature was considered to have been a crematory. From the thin layer of midden over the crematory, Mills concluded occupation of the site continued after the crematory was no longer in use.

The Graham Village site is located just southeast of Logan, Ohio. The site is situated approximately 300 feet north of the Hocking River (McKenzie 1967). At the time of site investigations, an embankment for the railroad separated the site from the river and prevented flooding. The site may have been subjected to periodic flooding prior to construction of the railroad embankment although McKenzie reported a lack of noticeable flood deposits. Investigations indicated that pit features at the site were concentrated on the southern end of a low rise. Extensive surface collecting was conducted to the south, north, and east of the features with negative results. Fourteen storage/refuse pits were excavated by McKenzie. The features were reported as deep cylindrical, rectangular, and bell-shaped pit features. McKenzie reported the pit features were randomly clustered and believed the associated house patterns had been destroyed by intensive plowing. One of the features contained a pit burial.

The Kramer site is located on the west bank of the Scioto River, six miles north of Chillicothe, and directly west of the Gartner site. The village site is approximately two-hundred meters west of the present channel of the Scioto River (Ullman and Pi-Sunyer 1985). In 1967, a field school from the University of Massachusetts excavated seven 10 x 10 foot units southeast of the mound. Excavations uncovered twenty-five features, 14 of which were deep cylindrical and bell-shaped pits. Five of the pit features were shallow basin-shaped pits. No house patterns were documented at the site. A grid map of the 1967 excavations shows one extended burial located among the pit features. A survey of the site in 1982 produced further evidence of village occupation. From a walk-over of the site in 1982, Ullman and Pi-Sunyer reported evidence of intense habitation debris north, south, and west of the mound for 70-150 feet. Thick vegetation was reported to have hindered investigation of the area located immediately east of the mound. Seeman conducted archaeological investigations at the site in the 1980s. To the author's knowledge no written report exists of the investigations.

The Howard Baum site is located along on a terrace on the southern bank of Paint Creek in Ross County, Ohio. The site was investigated in the 1980s as part of a CRM project (Skinner et al. 1981). Archaeological investigation of the site was confined to a narrow easement perpendicular to the terrace edge approximately 10 meters wide and 45 meter long. The plowzone within the transect was mechanically stripped. Ten pit features, two post holes, and one burned area were uncovered within the transect. No obvious pattern among the features is evident in the plan map of the transect. Skinner et al. indicate that the surface scatter of artifacts was confined to an area running parallel to the terrace edge. The visible surface scatter suggests a more linear arrangement or cluster of pit features rather than a circular settlement. However, investigations of the site were restricted by the scope of the project.

In 1887, F. W. Putnam excavated the Serpent Mound and its immediate surroundings for the Peabody Museum (Putnam 1889; Griffin 1966). Aside from the effigy mound, a conical mound, two small mounds, and a village occupation were revealed at the site. Putnam recognized the stratified deposits and concluded there had been two occupations of the site separated in time. Griffin's (1966: 60) review of the site and artifact assemblage suggested part of the site related to an earlier Adena occupation. Griffin found that the pottery from the conical mound and from the lower level of the village site belonged to an Adena pottery type whereas the pottery from the upper level of the village and one of the small mounds were Fort Ancient Baum ceramics. The village site mapped by Putnam consisted of a cluster of pit features.

In a recent review of the occupation of the central Ohio Valley during the Late Prehistoric, Church and Nass (2002) place numerous sites within a A.D. 1000 to 1200 transitional Late Prehistoric period which they define as transitional largely based on characteristics of settlement patterns. Their model focuses on characteristics of intrasite settlement patterns as criteria for placement within a pre- or post-A.D. 1200/1250 divide. Transitional sites are defined as being settlements of <.5 ha in size with a random distribution of pit features and dwellings. The list of transitional period sites in central and south-central Ohio includes Blain, Voss, Howard Baum, Enos Holmes, and Killen. Church and Nass (2002: 30) suggest that around A.D. 1200 and originating in southwestern Ohio, a new settlement pattern emerged of nucleated, structured communities with central plazas and concentric rings of burials, houses, and storage/trash pits. This pattern was argued to have replaced the earlier pattern of loosely structured household clusters. Sites included by Church and Nass in the post-A.D. 1200/1250 Baum Phase are Baum, Gartner, Kramer, and Serpent Mound. Their point is to tie changes in settlement patterns to changing subsistence practices and social activities. Church and Nass's model of change in settlement patterns over time is in agreement with the model put forth by Henderson et al. (1992) and Pollack and Henderson (2000) for Kentucky Fort Ancient sites. The exception is that a linear settlement pattern is argued to persist throughout the Middle Fort Ancient in Kentucky along with the circular/oval organization of concentric rings of burials, pits and structures surrounding a central plaza and burial mound.

A circular/oval arrangement of houses and pit features surrounding a mound is indicated at the Baum, Gartner, and Kramer sites. However, Church and Nass' contention that sites they define as transitional represent relatively small, more loosely-structured settlements has not been sufficiently demonstrated. A linear settlement pattern for the Howard Baum site is suggested by the surface scatter mapped as part of a CRM project. An intrasite settlement pattern has yet to be determined for Enos Holmes as only the mound was investigated and nothing is known of the associated settlement. The author has argued the settlement pattern at Blain of pit features located on one side of the structures with no features detected beyond the pit features in the direction of the mound suggests a circular settlement with a central plaza as Prufer and Shane previously argued. Despite classifying Voss as transitional, they acknowledged the Voss site as mapped by OHS suggested a structured arrangement of features and structures more consistent with post-A.D. 1200 sites. The circular/oval organization has been further evidenced by results of a magnetic survey and recent feature excavation. The intrasite settlement pattern at the Serpent Mound component, a site they place after A.D. 1200/1250 is largely unknown. Moreover, the classification of so many sites to an early period A.D. 1000-1200 in Ohio and Kentucky runs contrary to most other models of Fort Ancient (Drooker 1997, 2000; Pollack and Henderson 2000).

Table 31 provides characteristics on intrasite settlement patterns of Fort Ancient sites in the central Scioto and upper Hocking River drainages. Baum, Gartner, Kramer, Blain, and Voss appear to have been circular/oval settlements with associated burial mounds. Central plazas are suggested at Blain and Voss. Mills' location of excavation units at the Gartner site suggests it too had a central plaza. Whether the Baum and Gartner sites represent settlements with concentric rings of activity remains a question. Storage/refuse pit features at Blain and Voss are located in front of the structures suggestive of a concentric ring of pit features beyond which is a ring of structures. However, we know from OHS excavations that a limited number of the pit features at Voss are interspersed between the houses and the magnetic survey data suggests this is the case. We do not know where the village burials, other than infant burials in refuse pits, are located at either site. For both Blain and Voss there are reports of human remains being uncovered at the site by land owners or local collectors. There were no burials found near the structures at Blain. The area behind the two structures at the Voss site was not excavated. The magnetic survey data indicates features do exist within, around, and behind the structures at Voss and it is possible some of these are burials. Burials and storage/refuse pits were found on opposite sides of the largest structure at Baum. Mills describes pit features and extended burials as surrounding the smaller structures but does not indicate a particular arrangement or if they had a similar arrangement to the ones surrounding the largest structure. The organization of Baum, Gartner, Kramer, Blain, and Voss appears to have been circular with a central plaza, or "donut-shaped" as it is commonly referred. However, it seems likely that the residential zone adjacent to the plaza at these sites was not as rigidly structured as the spatial organization documented at SunWatch Village.

Considerable variation is seen in house patterns and sizes at Fort Ancient sites in the Scioto River drainage. House patterns are varied at Early-Middle Fort Ancient occupations in southwestern Ohio (Drooker 2000: 251) and include circular and rectangular post construction, semi-subterranean structures, and wall-trench structures. Houses at Voss and Blain are large and of post construction, 6 x 8 m and sub-rectangular and 5 x 7 m and oval, respectively. Only two structures were mapped at each site. The structures at Voss and Blain are similar in size to structures at Florence (Sharp and Pollack 1992), SunWatch Village (Heilman et al. 1988), Schomaker (Cowan 1986), and Killen (Brose 1982). House patterns at Baum and Gartner are smaller with circular layouts similar to what is reported for an early component at Madisonville (Drooker 2000: 25) and similar in size to structures at Muir (Sharp and Turnbow 1987). Mills suggested that at Baum and Gartner house construction indicated long-term use with clay-lined hearths that had been re-plastered many times (Mills 1918: 340). One structure, larger than the others, was recorded at the Baum site. Mills suggested the undisturbed post pattern, surrounding large pit features, and burials indicated no rebuilding had occurred in the immediate area of the large structure. The structure was perhaps a civic structure or residence of a village leader. A similar structure is described for SunWatch Village (Heilman et al. 1988; Nass and Yerkes 1995; Cook 2004) and Horseshoe Johnson (Hawkins 1996).

Mound Construction

The large amount of village debris in the Voss Mound, the placement of the burials in pits so near the edge of the mound, and the low profile of the mound initially led the author to question its classification as a "burial mound". The considerable amount of village debris on the mound floor and in the mound fill suggested a possible village trash heap. The location of burials in pits on the edge of the mound could be interpreted as pit features dug prior to midden accumulation. After a review of the literature, it was discovered that surprisingly few comparisons of Fort Ancient mounds have been compiled. Early analyses of mound building in the Ohio Valley were generalizations of mound building activity, and to convince the general public that the mounds had indeed been constructed by Native Americans rather than a lost race (Thomas 1889). Other analyses of mound building in the Middle and Upper Ohio Valley focused on characteristics of Adena mounds (Dragoo 1963) or provided comparisons of Adena and Hopewell mounds (Webb and Snow 1974). Griffin's *Fort Ancient Aspect* provided brief details of the mounds at the sites included in the publication. Drooker (1997) has provided some comparison of Fort Ancient sites with associated mounds in southwestern Ohio, and has compiled a map of Fort Ancient sites containing mounds.

A review and analysis of excavated Fort Ancient mounds was conducted with the intent of determining characteristics of mound construction, stratigraphic context of burials, and location of the mound within the larger community. The analysis does not critically address the types of associated grave goods, nor does it address demography of the mound population. After conducting a review and analysis of excavated Fort Ancient mounds, it was discovered that the Voss Mound is consistent with Fort Ancient mound construction. Moreover, it was discovered that mound building during the Late Prehistoric period in the central Ohio Valley was fundamentally different from earlier mound building traditions of the Adena and Hopewell.

Mound construction has a long history in the central Ohio Valley. The best-understood and most intensively studied mounds in Middle Ohio Valley date to the Early and Middle Woodland periods. Some early Late Woodland populations constructed stone mounds while others constructed earthen mounds for the burial of their dead (Carskadden and Morton 1996). The late Late Woodland populations in the central Ohio Valley used mounds for mortuary activities. However, these populations utilized existing Hopewell and Adena mounds for burial of their dead (Seeman 1992). Mound construction resurged in the Late Prehistoric period with the construction of low earthen mounds. Earlier Adena and Hopewell mound and earthwork sites show evidence of a distinct separation of ceremonial/ritual space from domestic activity areas (Prufer 1967; Dancey and Pacheco 1997). Middle Woodland domestic sites appear to have been located away from mound and earthwork centers rather than within or adjacent to the earthen monuments. While some may contend there is evidence for not just specialized camps or seasonal use but for village habitation debris adjacent to Hopewellian mound and earthwork centers (Griffin 1996), the evidence for a close association between mortuary activity and domestic activity at Fort Ancient sites is undeniable. The Late Prehistoric period in the central Ohio Valley marks a dramatic change in the community's relationship to the earthen mortuary mound. The earthen mounds of the Late Prehistoric period in the Middle Ohio Valley were closely associated with the village, most often entirely confined by areas of domestic activity. Moreover, village refuse and the soil from ordinary storage/trash pits of the village was used as fill for mound construction.

Twenty-eight documented Early/Middle Fort Ancient sites have associated burial mounds (Drooker 1997: 69). Natural mounds were also utilized by Fort Ancient populations for burial of the dead. Along the southwestern portion of the Taylor Mound and Village site facing the Little Miami River was a gravel knoll from which Moorehead excavated ten burials and from which burials had been unearthed prior to excavation by people quarrying for gravel (Moorehead 1892; Griffin 1966: 101). The Bunnell Kame site, located in the Caesar Creek Valley, a tributary of the Little Miami, was used by Fort Ancient populations for mortuary activity (Brose and White 1983). The sites containing artificial burial mounds have traditionally been viewed as being early Fort Ancient settlements (Prufer and Shane 1970; Cowan 1986). Yet, Pollack and Henderson (2000; 1992) contend that Kentucky Fort Ancient sites containing mounds date to the Middle Fort Ancient Manion phase. Drooker (1997: 66) attempts to reconcile this discrepancy by pointing out that radiocarbon dates are consistently calibrated in Kentucky while the same cannot be said for Ohio sites, and continues by saying it is likely that the construction of burial mounds occurred during the period A.D. 1100-1300 in both sub-regions. Sharp (1996) suggests that Early Fort Ancient Osborne phase sites in central Kentucky show no evidence of village burial and that two isolated stone mounds at the Goodman Clay and Dungun sites may be affiliated with the early Fort Ancient sites in that region. Graybill (1981; 1984) suggested villages with burial mounds were characteristic of Early Fort Ancient sites in West Virginia. However, Carskadden and Morton (2000) report the calibrated dates for one such site, Roseberry Farm, fall around ca. A.D. 1200. A source of confusion relating to the dating of Fort Ancient mound sites may result from the sites being multicomponent. Many of the mounds are not dated directly but dated by association, meaning that many of the dates come from charcoal recovered from village contexts. A number of mounds that have associated direct dates were processed in the early days of radiocarbon dating and have large associated errors. Some of the mounds have no associated dates, not even dates obtained from a village contexts. Moreover, use or reoccupation of the site may have continued long after mound construction ended.

Fort Ancient mounds in the Scioto River drainage

The following is a summary of the Fort Ancient sites in the Scioto River drainage that have associated burial mounds. Descriptions of the mounds and their location in relation to the village, if known, are provided for each site.

<u>Baum Mound</u>

Squier and Davis (1846: 57) described Baum Mound in their *Ancient Monuments of the Mississippi Valley*. They recorded Baum Mound as being a large, square, and truncated mound, 120 feet wide at its base, 15 feet in height, and 50 feet square on top. Mills (1906: 45) described the location of the mound as being "almost in the center of this village, near the edge of the terrace to the west". Mills description of the location of the mound in relation to the village is telling. He describes the mound in two different passages (p. 45, p. 51) as “almost” or “nearly” in the center. It is likely Mills was assessing a surface midden when he indicated more than once that the mound was near the center of the village but not in the center. The Bureau of Ethnology’s excavation of the mound included cross trenches measuring six feet wide at the ends that progressively widened to thirteen feet in the center (Mills 1906: 50; Bureau of Ethnology 1891, Twelfth Annual Report). Two circular structures, roughly 26 feet in diameter, were found in the mound (Figure 56). The structures rested directly atop one another and were separated by layers of sand and a sagging layer of burnt clay. Within the circular structures, the mound fill was stratified with thin bands of fine sand. Both structures are described as having undergone some burning however posts are also described as having decayed in place. On the floor of the lower structure, logs averaging eight inches in diameter radiated from the center to the outer posts. The wall posts of the lower structure, measuring five inches in diameter and set ten inches apart, were five feet in height. The upper structure is described as being more elaborate, having an inner circle of posts and an outer ring of posts separated by a ring of gravel eighteen inches wide.

All but three of the seventeen skeletons recovered from the mound were found on the sand layers. All seventeen burials were found within the area enclosed by the posts. All but one of the burials was extended. Seven of the burials are said to have contained grave goods. Two of the burials were enclosed by red cedar logs placed lengthwise along the body. The investigators believed cremation was indicated from an ash pit containing human remains. The cremation pit measured roughly 4 feet long, 2 feet wide and nearly 2 feet in depth and contained a pottery vessel filled with ash. As numerous other sherds were found in the ashes within the pit, Reynolds concluded that all human ashes were likely placed in ceramic vessels before burial.

The Bureau of Ethnology report of the Baum Mound excavations suggested the upper structure may have extended above the surface of the mound since the posts were discovered so near the surface. However, the ring of posts in both structures was supported by logs laid perpendicular to them against their sides at various points vertically along the walls. The report stated that these posts appeared to be for bracing purposes (Mills 1906: 49). Horizontal braces against the walls suggest that the structure required support to hold back a considerable opposing force, namely the dirt behind it. It is quite possible these structures were crypts, the second built over the first. Many of the posts of the lower structure are reported to have had the charred bark still clinging to the sides which suggests the structure had experienced little exposure to the elements (Thomas 1894: 485). Skeletons No. 15 and 16 were found to have been covered by logs that had largely decayed in place. The burials within the structures did not rest on the floors but were found resting on the horizontal layers of fill. Resting on top of the mound floor were burnt logs radiating out from the center. Directly over these was a layer of decayed and burnt wood averaging ½-inch in thickness. The description suggests the structure had a wooden floor. A gap in the posts approximately 3 feet wide in both the lower and upper structures was noticed in the eastern trench. The gap in the post pattern could relate to a doorway for a standing structure but it also could relate to a tunnel/entryway for a buried structure. Perhaps this gap was only required during construction of the structures as dirt was being heaped around it.

As Griffin noted (1966: 36), the Baum Mound has been interpreted by some as being associated with the adjacent Baum earthworks constructed during the Middle Woodland period. It is not clear if any of the artifacts described by Griffin and clearly of Fort Ancient origin were recovered from the mound. Log-encased burials and cremations are found in Adena and Hopewell mounds (Dragoo 1963; Webb and Snow 1974; Hemmings 1984). Cremations placed adjacent to extended burials have been documented at the Hopewell Mound Group located near Chillicothe (Shetrone 1926; Webb and Snow 1974: 177). The only indication we have that this mound indeed dates to the Late Prehistoric Fort Ancient occupation is the statement in the Bureau of Ethnology report that "numerous fragments of pottery similar in texture, fabrication, and ornamental features to those found in the mound bestrew the plowed ground [of the village]," (Thomas 1894: 488). Griffin (1966: 66) believed, based on artifacts and the absence of any specific Hopewell-Adena features, the Baum Mound was of Fort Ancient affiliation.

Blain Mound

Blain Mound, excavated in 1966, was located on the west bank of the Scioto River. Blain Mound was recorded as being a mere eighteen inches in height when excavated. Prufer and Shane (1970) contend the mound had been reduced by plowing no more than ten inches from its original height. However, given the extreme shallowness of the graves in the mound, from 6 to 16 inches from the surface (Prufer and Shane 1970: 182), it is possible the original height of the mound has been considerably degraded. The mound was elliptical in shape and had an east-west circumference of seventy feet.

Flooding and erosion are said to have prohibited a good estimation of its north-south extent.

The stratigraphy of Blain mound had been somewhat obscured by flood damage around its circumference, as well as damage from the plow at its apex (Prufer and Shane 1970: 153-154). Four trenches were hand-excavated. After completion of the four trenches, the remaining portions of the mound were scraped with mechanical equipment. The mound was said to have been built on a natural rise and thin midden layer. The mound floor was not considered to be a prepared surface. All seven burials were placed on this midden layer. Placed over the midden layer was a distinct layer of yellow sand, and atop that a mottled yellow-brown loam layer. Village debris was found in the mound fill and on the mound floor. The midden layer contained sherds, lithics, and faunal material but apparently not in large quantities.

Positioning of the individuals within the mound was haphazard. Six of the skeletons were extended and one was found in a flexed position. Five of the seven mound burials contained grave goods. Three of the individuals showed evidence of embedded notched and triangular projectile points.

Enos Holmes Mound

The Enos Holmes mound was originally recorded as being a sub-conical mound 4 feet in height and 58 feet in diameter when it was surveyed in 1941 by H. Holmes Ellis (Baby et al. 1968). It was later excavated by Baby and Potter in 1967. Excavation of the mound revealed the actual basal dimension of the mound to have been 80 feet in diameter. The discrepancy between the two measurements was attributed to inaccurate original measurements as a result of crop cover. The mound was situated on a second terrace on a bend of Paint Creek. The site is located on the southern bank of the creek. The report does not state where exactly the mound was on the terrace. However photographs of the mound excavations show Paint Creek just beyond the mound in the background looking north.

Excavation of Enos Holmes Mound was initially conducted in 10-foot square units but this technique was eventually abandoned and the northern portion of the mound was graded with a tractor (Baby et al. 1968). The mound consisted of a primary mound and a secondary mantle. The secondary mantle consisted of yellow clay mixed with lenses of sand and gravel. Around the base of the mound was a midden deposit approximately 5 inches thick. A large storage/refuse pit had been dug into the southwestern skirt of the mound suggesting there was indeed a surrounding village site. The primary mound was composed of dark loam soil and measured 70 feet in diameter and 8 inches in height. The primary mound covered the grave of an infant, and formed the foundation for a circular, wall-trench structure (Figure 57). The circular wall trench pattern measured 31.5 feet in diameter. The structure consisted of 72 single posts ranging from 4 to 8 inches in diameter and placed 12 inches apart. In the southeastern portion of the structure was a divided entryway. The investigators recovered burnt daub, charred logs, and charred grass in the midden on the floor of the structure. These materials indicated to the investigators that the structure was likely of wattle and daub construction with a thatched roof. Cowan (1986) and Cook (2004) argue wall-trench construction seen at Fort Ancient sites in southwestern Ohio is evidence of interaction with Middle

Mississippian populations to the west. Wall-trench construction in the Scioto River drainage, to the author's knowledge, is unique.

Seven burial pits containing a total of 14 burials were excavated in the mound. Four of the seven burial pits were aligned along the southeastern edge of the primary mound. Therefore, most of the burials were located in graves situated away from the structure on the edge of the mound. Twelve of the burials were extended and two were flexed. Five of the burials were intrusive to the mound in the secondary mantle.

A charcoal sample recovered from the floor of the mound yielded a 2 sigma calibrated date of A.D. 1021-1308. Human remains from the mound were submitted for AMS dating by Greenlee (2002). As reported in Chapter 2, the remains yielded an intercept date late in the 12th century.

Feurt Mounds

The Feurt site is located five miles north of the city of Portsmouth, on the east bank of the Scioto River in Scioto County. The mound and village site is situated on a terrace approximately 40 feet above the floodplain. The topographic map of the mound and village site drawn by a surveyor prior to excavation in 1916 by Mills and Shetrone, shows three mounds as being located along the terrace edge overlooking the floodplain (Ohio Archaeological and Historical Society Publications Volume V). Mound No. 1, the lowest of the mounds, was seventy-five feet long, sixty feet wide, and two and three-fourths feet high (Mills 1918: 310). Nonetheless, the small mound contained 107 burials, all but one found in a flexed position. The mound fill contained animal bones and general domestic debris throughout suggesting that the soil had been gathered from the village. Mound No. 2, ninety feet long, forty-five feet wide, and eight feet high, was the highest of the three mounds. This mound was located so near the terrace edge that a portion of the mound along the western edge had eroded. Mound No. 2 contained 137 burials, all flexed. Burials were placed in at least four tiers within the mound as well as a few placed below the baseline. Only four of the 137 burials within Mound No. 2 contained grave goods. Mound No. 3 was ninety feet in length, 112 feet in width, and six feet in height. Mound No. 3, containing 101 burials, some of which showed evidence of reburial in the mound after having been removed from temporary burial elsewhere. At least twelve burials were missing various parts of the skeleton including skulls, and arm and leg bones. At least twenty of the burials in Mound No. 3 contained grave goods. Mills describes finding a small "tepee fireplace" on the floor of Mound No. 3. No burials were found on the floor of the mound. Burials were found within the mound fill including double burials with two bodies placed in very close proximity to one another, sometimes overlapping. Griffin (1966: 70) contends that grave goods were rare and that not one of the burials at the Feurt site included pottery as a grave good. The related Clover site is also reported to have had three raised areas on the site about five feet in height and 200 feet in diameter (Griffin 1966: 244).

Gartner Mound

All but the northern one-third of the Gartner mound was being farmed at the time of excavation in 1903 (Mills 1904). The mound was estimated to have been lowered ten inches as a result of plowing in all but the northern portion. The mound was seven feet six inches in height and seventy-five feet in diameter. Gartner Mound was built in three sections, with three small mounds forming a single final mound (Figure 55). The first section was constructed with the second and third sections overlapping the preceding section. In all, Gartner Mound contained 41 extended and flexed burials. The first section contained cremated human remains placed on a prepared clay platform. Mills suggested cremation had apparently been practiced for a considerable length of time from the accumulation of human bone and ash in some areas being two and one-half feet deep. Section 1 of the mound was said to have covered a house site since below the prepared platform Mills found refuse pits, hearths, and post molds. In the mound fill above the cremated remains were several extended burials. In the second and third sections extended burials were found on the floor of the mound, two to four feet above the floor in the fill, and below the mound floor in pits. Nineteen of the burials did not have accompanying grave goods. Mills reports these burials lacking grave goods occurred in both Sections 2 and 3, and were found both above and below the mound floor.

Kramer Mound

It would appear from the description of the mound and its surrounding surface scatter that Squier and Davis included a description of the Kramer Mound in their 1848 *Ancient Monuments of the Mississippi Valley*. The truncated mound in the following passage may be Kramer Mound:

> *Very nearly in the course of the avenue [of Dunlap Works] are a number of mounds, one of which is fifteen feet high, truncated, and with a base of one hundred feet diameter. The diameter of the level area on top is about fifty feet. These mounds stand on the lowest portion of the second terrace; the ground which they occupy being overflowed at periods of very high water in the river. These are the only monuments known which are reached by overflows. The truncated mound was made a place of refuge during the high water of 1832, by a family with their cattle, horses, etc.,*

numbering in all nearly a hundred. It was among the first opened, in the progress of these investigations, and before the characteristics of this class of works were clearly known. Hence, although a number of skeletons were disinterred, at depths of from two to five feet, together with a few rude instruments, the original deposit of the mound-builders was not reached. The skeletons were unquestionably those of modern Indians. Upon the mound and around it, many fragments of rough pottery are found, and a number of entire vases of rude workmanship were exposed a few years since in ploughing over an adjacent small mound. Many decayed freshwater shells are also found on and around the mound; and, as these when pulverized entered into the composition of the rude pottery of the more recent Indians, it seems highly probable that a sort of manufactory of this ware was established here. (Squier and Davis 1848: 64).

It is interesting to note that the dimensions for this mound are almost identical to the dimensions reported for the Baum Mound. In 1982, the mound is reported to have stood 4 meters high. In 1940, a few locals from the area placed a trench through the western side of the mound and found several extended, bundled, and flexed burials but no reported grave goods (Ullman and Pi-Sunyer 1985: 4; Ohio Historical Society).

Voss Mound

Details of the mound excavation conducted by the Ohio Historical Society in 1963 were presented in Chapter Four. The following account is intended to be a summary. The original mound was roughly 85 feet east to west, 65 feet north to south, with a maximum height of 4 to 5 feet. Baby et al. (1964) concluded the Voss Mound had been constructed in two phases. An initial primary mound consisting of dark, sandy, alluvial soil covered the mound floor. Several areas of sand and gravel containing a relatively higher concentration of village trash than found in the mound fill were encountered on top of the primary mound. This primary mound was capped by a secondary mantle of loamy subsoil. A large pit feature, Feature I, containing six burials was revealed on the eastern periphery of the mound. Another burial was discovered in a small pit, designated Feature III, adjacent to the pit containing the six burials. Four of the seven burials had associated grave goods. Two individuals had been injured by projectile points, one notched and one triangular. A large concentration of stones designated Feature II and described by Baby et al. (1964) as an "elliptical stone ring" was encountered near the base of the primary mound. As occurred on top of the primary mound, sand and gravel containing a relatively higher concentration of village trash occurred within and on top of the concentration of stones. The mound floor did not appear to have been a prepared surface but rather consisted of occupational debris scattered amongst areas of charcoal and ash. Baby et al. contend that no hearths were revealed on the mound floor. However, the plan map of the mound floor shows areas of burned earth and charcoal. Nine large post molds, most in excess of one foot in diameter and two feet in depth, were found beneath the outline of stones. Given that the outline of stones conformed largely to the pattern of posts on the floor of the mound, it is not unreasonable to assume that the posts of the structure were standing while the stone was piled around its base. The combination of trough-like depressions, the outline of stones, and the post molds, suggest a structure was dismantled and soon covered with soil and village trash. The area and the burial pits were then covered with a final capping of loamy soil. Greenlee (2002) obtained an AMS date with an intercept of A.D. 1268 on human remains from a burial beneath Voss Mound.

The Serpent Mound component

It is likely that at least one of the small mounds at the Serpent Mound site is associated with the Fort Ancient occupation of the site. Griffin include this component in his Baum Focus based on an analysis of the pottery recovered by Frederic Putnam of the Harvard Peabody Museum during three seasons of excavation at the site from 1887-1889. Griffin examined 150 body and small rim sherds from the village site, and 350 more from the ash beds, habitation area, and one of the small mounds (Griffin 1966: 62). It is not clear from which of the mounds the ceramics he analyzed were recovered.

A brief account of other Fort Ancient mounds

A brief account is given of the excavated Fort Ancient mounds included in the analysis but located in other sub-regions. Data on these mounds as well as the ones in the Scioto River drainage are summarized in Table 32. The Fox Farm site, Madisonville, and a small mound at Serpent Mound were not included in the analysis. Few details exist on the mound excavations at Fox Farm and the small mound at Serpent Mound.

The Roseberry Farm site located along the Ohio River in West Virginia has an associated burial mound. The village is circular/oval with concentric zones of activity around a central plaza, with the mound at the interface between the plaza and the domestic zone (Graybill 1984). Roseberry Farm Mound was 2 feet in height and 79 feet in diameter. The mound was investigated by excavating two trenches running from the edge to the center of the mound. The mound fill contained Feurt-Clover associated artifacts as did the thin midden beneath the mound. Twenty-five burials were uncovered within the two trenches. Several individuals were interred before and during mound construction but the majority of burials took place after construction as these are described as intrusive bell-shaped pits containing flexed burials. None of the mound burials were infants in contrast to the numerous infant burials found in the village.

Fullerton Field had two low mounds associated with the village. The mounds were located on the eastern side of the village, one near and one on the terrace edge overlooking Tygart Creek (Webb and Funkhouser 1928: 108). The mounds were elliptical in shape and estimated to have been 100 feet in diameter. The mound on the terrace edge was six feet in height, and the mound set back from the terrace edge was four feet in height. The height was questionable as the investigators suggested the builders seemingly had taken advantage of a natural ridge. The written description of the excavations does not make clear which burials came from the mound and which came from the village. The majority of skeletons are reported as flexed and placed on a natural sand layer or dug into the sand layer. Two graves were stone-lined (Griffin 1966: 80; Webb and Funkhouser 1928: 106-119). Only extended burials were reported to have contained grave goods.

The Killen site is located on a terrace overlooking the Ohio River, just west of the mouth of Ohio Brush Creek in Adams County, Ohio. The site was salvaged prior to construction of a power generating station (Brose 1982). The nearby Wamsley Village site was not within the construction corridor but was investigated as part of the investigations in 1977. The Killen Mound was located on a low rise on the western end of the Killen tract. The Killen and Grimes tracts were stripped with a road grader. Stripping of the surface layer within the Killen tract revealed one large sheet midden, several village burials, 14 storage/cooking features, and five structures adjacent to the burial mound in a linear arrangement. As a result of plowing, the mound was only 30 cm in height at the time of excavation and the basal dimension could not be accurately determined. The mound contained 35 burials. Brose suggests mound construction began with the digging of an oval basin approximately 16 x 12 m and 50 cm in depth. The basin was filled with a sandy soil forming a platform 25 to 50 cm in thickness. Burials were then placed on the platform or in pits dug into the clay soils below the platform (Brose 1982: 19). Construction of the subsurface platform had cut into the southwestern edge of a midden. Midden deposits were found to overlay segments of the mound platform along the northwestern margin of the mound. This lead Brose to conclude that midden accumulation occurred both before and after use of the mound platform for burial. Brose defined three zones of mound burials: a clustered central group, a uniformly distributed intermediate group, and a randomly placed peripheral group. Brose reported that most of the central burials were placed on the platform surface while most of the pit burials and burials in the mound fill were located in the two more peripheral zones.

Clay Mound, located in Nicolas County, Kentucky and excavated in 1925, was 60 feet in diameter and five feet in height. The mound floor was described as a prepared platform of hard clay. Below the floor and in the mound fill was village trash. On top of the clay was a layer of ash of varying thickness up to two feet. Above the ashes were limestone rocks concentrated in a rough circle around the outer part of the mound (Webb and Funkhouser 1928: 86). Twelve burials were recovered from the floor and fill. Three burials were said to be deep in the clay. Serrated triangular points were recovered from the mound (Griffin 1966: 183) indicating a Middle Fort Ancient affiliation.

The Cleek-McCabe Mound and Village site is located in Boone County in northern Kentucky. The original description of the site by Webb and Funkhouser described two mounds separated by a village midden. One mound was located close to the terrace edge and creek, the other mound was located directly opposite it at a distance of approximately 200 feet (Rafferty 1974). The mound farthest from the terrace edge was excavated in 1939. The excavated mound was 2 ½ feet in height and 90 feet in diameter. The plan map of the excavations suggests the mound was elliptical in shape. Three structures were found beneath the mound, one circular and two rectangular structures (Figure 57). All were of post construction and were superimposed. The circular structure consisted of 68 post holes and from the map included in Rafferty (1974) appears to have been approximately 30-40 feet in diameter. This structure is very similar in size and shape to the sub-mound structures at Enos Holmes and Baum. Because no patterning of artifacts could be detected in the mound fill, and the superposition of the structures, Rafferty (1974: 149) concluded that construction of the mound strata had not occurred at significantly different times. The mound contained 21 burials. Fourteen of the burials were found near the surface of the mound within or near the plowzone. Five burials were found on or below the midden forming the floor of the mound. Fifteen other features were recorded in the mound including rock pavements and fireplaces. The base of the mound was said to be indistinguishable from the surrounding midden and most of the mound fill was midden material (Rafferty 1974: 124, 140). The mound did appear to have been capped with clay. Rafferty classified the site as an Early Fort Ancient site but the presence of serrated triangular points suggests at least one later occupation of the site.

What is known about the Taylor Mound and Village site, located just south of the mouth of Caesar's Creek where it flows into the Little Miami, is known from excavations conducted in 1891 by Warren K. Moorehead, from Griffin's (1966) review of Moorehead's field notes and the artifact assemblage, and from Essenpreis' review of the excavations (1982). Along the southwestern portion of the site facing the Little Miami River was a gravel knoll from which Moorehead excavated ten burials and from which burials had been unearthed previously (Griffin 1966: 101). Just behind the gravel knoll was an earthen mound (Moorehead 1892: 101). Putting the two descriptions together, one can deduce that the mound was located near the gravel knoll in the southwest portion of the village site. Moorehead's field notes stated that, "Near the center of the village site is a mound 70 by 35 feet and 7 feet high…All about this mound for a distance of 200 yards the village site debris is most numerous," (Griffin 1966: 102). It appears as if the mound was somewhere between the center of the village and the southwestern edge of the site where the gravel knoll was situated. Burial within the mound was apparently highly variable. The mound contained seventy-nine skeletons, some tightly flexed and others extended (Figure 58). Thirteen burials were covered with large stone slabs, as were some of the burials within the gravel knoll and within the village. Bundle burials also occurred in the mound with the long bones of the arms and legs bundled. Double and multiple burials occurred in the southern portion of the mound. In other places within the mound skeletons were said to have been placed one on top of the other resulting three or four layers of graves. Unfortunately, Moorehead provides no description of the mound floor except to say that there were holes or pockets filled with ash and burnt stones extending downward from the base of the mound. Fifteen burials were recovered from the village. Only eighteen of the burials in the mound contained grave goods. Based largely on analysis of the ceramic assemblage from the site, the site is considered to be multicomponent with an Anderson phase component and a possible Madisonville Horizon component (Drooker 1997: 92; Essenpreis 1982).

The Turpin site is located in Hamilton County, Ohio on the second terrace of the southern bank of the Little Miami River. The site contained multiple mounds including two larger mounds, a Late Woodland stone mound (Newtown) and a Late Prehistoric Fort Ancient earthen mound. Griffin (1966: 146-147) provided the first published details of the investigations conducted at the site by Metz in the late 1800s. Metz is reported to have excavated two small mounds as well as a cemetery and a rectangular house. No details of the excavation of the two small mounds were provided. Riggs (1998: 99) believes they may have been located on the northwestern edge of the site closest to the river. The large earthen mound was excavated in 1947 by Oehler of Cincinnati Museum of Natural History. At the time of excavation, the earthen mound measured 6 feet in height and 40 feet in diameter. This mound appears to have been located in the southern portion of the site (Riggs 1998: 100). The plan map of the Turpin mound, shown in Figure 58, has been interpreted as a small mound surrounded by a plaza in which additional burials were placed around the mound "like spokes on a wheel" (Cowan 1986: 141). However, the mound excavated by Oehler was only a portion of the original mound (Drooker 2000: 251). Oehler (1973: 4, 47) reports that soon after mound excavation began it was discovered the original mound was elliptical in shape and much larger. Oehler did not report the larger dimensions. In 1878, Metz recorded the mound as oblong and 10 feet in height, with end portions of the mound having been destroyed by the landowner. Drooker contends the original mound likely covered all of the burials. Oehler (1973: 41) himself suggested the outer burials formed part of a burial mound complex. Oehler describes the floor of the mound as nearly impossible to decipher because the mound had been constructed of clay mixed with village debris. More than 60 skeletons, including infants, were found in just the primary mound. The plan map of the Turpin mound indicates one possible similarity to Voss Mound and Enos Holmes Mound. A primary mound was constructed and sometime later burials were placed near it, with all eventually capped with a secondary fill.

The Hine Mound and Village site is located on a terrace spur on the west bank of an old channel of the Great Miami River (Shetrone 1923). Hine Mound was approximately 7 feet in height and 60 feet in diameter when excavated by Shetrone. Cowan (1986) is dubious of the reported mound at the site, arguing the mound may have been a natural rise. However, Shetrone's description of Hine Mound is consistent with other Fort Ancient mounds. Shetrone describes the mound as having been constructed of soil from the surrounding village. He suggested it was clear that habitation had both preceded and followed construction of the mound. Refuse pits were found below the mound and a grave was intrusive into the mound near the apex. Compared to the large number of burials reported to have been plowed-up by the landowner in the surrounding village, the burial mound contained few individuals, having only five burials. Four burials were extended on the floor of the mound, two near the edges and two near the center. The remaining individual was recovered from the apex and was said to be intrusive. In common with the Voss Mound and Clay Mound, a concentration of stones was found at the base of Hine Mound. Shetrone (1923: 463) reported finding more than

100 limestone slabs ranging from small to medium sized haphazardly placed but approximately in the center of the floor and covering an area of 10 x 12 feet. Intermixed with the stones were small pieces of ash and charcoal.

Mound construction and placement within the Fort Ancient Community

Field reports of fourteen excavated Fort Ancient mounds were reviewed and the data analyzed to determine patterns in mound construction during the Late Prehistoric period in the Middle Ohio Valley. The sample, a total of 14 mounds, is admittedly small. However, it is covers approximately 50% of the documented Fort Ancient mound sites. All known excavated mounds with sufficient detail of the investigations were included in the analysis.

A review of the excavated mounds indicates there was no set template to mound construction for Fort Ancient communities. Figure 59 details the single trait found to be common to all mounds in the sample. All of the mounds in the sample were confined by or immediately adjacent to the domestic space. This characteristic marks a fundamentally different relationship to the earthen monument than the Adena and Hopewell populations had to their earthen monuments where there was a dislocation between domestic sites and burial mounds (Clay 1992: 80; Dancey and Pacheco 1997). Mounds confined by domestic space is consistent with contemporaneous mound construction at Mississippian sites to the south and west (Clay 2006; Cruciotti et al. 2006: 80). Fort Ancient mounds vary considerably in characteristics of construction and stratigraphic context of burials. The variable pattern seen in Fort Ancient mound construction supports the assertion that Fort Ancient communities were largely autonomous and adhered to community-based beliefs and practices and only marginally to wider regional traditions.

Three characteristics found to be nearly universal to the sample were: a location within the village but close to the terrace/site edge, a low profile, and mound fill containing village trash. Table 33 provides a breakdown of the sample by mound height. The greatest number of mounds, 11 of 17 (Feurt and Fullerton Field Mounds counted separately), measured between 4 and 8 feet in height. Five mounds were found to be 3 feet or less in height. The one exception in the sample to having a low profile is the Baum Mound, with a height of 15 feet. Kramer mound, not included in the sample but possibly described by Squier and Davis, was equal in height and shape to Baum. The destructive nature of plowing would have degraded the height of the mounds to a limited extent. Any angular configuration of the sides would likely have been seriously degraded. The low and long profile of the Fort Ancient mounds begs the question of whether activities took place atop the mound. The mounds were centrally located in the sense that they were surrounded by or located immediately adjacent to village activities and would have served as good elevations for ceremonial, ritual, or social events. Moreover, their location near the edge of the terrace overlooking the river or creek valleys is suggestive of a desire to be visible. Many of the mounds contained near surface burials which had been disturbed by plowing; therefore, it is unlikely these mounds had structures located on their summits as building would have disturbed the graves just as the plow had done.

Mississippian cultures to the west and south constructed platform mounds. In characteristics of shape, the Baum Mound and possibly Kramer Mound as described resemble Middle Mississippian platform mounds. It is noteworthy that a portion of a shell-tempered bowl with a duck effigy handle was recovered from the village context during Mills' excavations (Griffin 1966: Plate IV; personal inspection). Duck effigies on bowls are reported from Middle Mississippian sites which contain platform mounds such as ones in Arkansas and Tennessee (Cruciotti 2006: 79; Moore et al. 2006). Baum is the only Fort Ancient mound to the author's knowledge that has been interpreted to have had a structure atop the mound, although the author has given a different possible interpretation of the structures as crypts. As Berle Clay (2006: 49) has suggested, "assigning functional significance to platform construction carries considerable conceptual baggage." Flat-topped mounds are not unique to the Late Prehistoric period in Ohio and occur at the Hopewellian works of Cedar Banks, Ginther, Newark, and Marietta (Pickard 1996).

Village debris was reported in the fill or floor of all of the mounds with the exception of again, Baum, but also of Fullerton Field although the report on this topic is sketchy. The investigators of Baum Mound made no mention of the mound fill having contained village debris. Mound construction in Fort Ancient villages appears to have occurred after the village had been occupied for a period of time. Most burial mounds were constructed over or cut into existing village debris and midden, and therefore were constructed sometime after initial settlement of the site when village trash had sufficient time to accumulate on the surface. Mills described the construction of Gartner Mound as follows:

> *The soil from which the mound was made had evidently been collected from the village site and from the subterranean storehouses as they were dug from time to time as evidenced by thin layers of fine gravel and sand placed over a number of*

the burials which had been procured from the bottom of these pits. But, in every portion of the mound, various implements and ornaments were found intermingled with the soil and gravel. Here also were found animal bone and mussel shells which had evidently been gathered up with the soil from the village, as each successive burial was added to the mound…Beneath the platform were found the remains of the refuse pits, fireplaces, and even the post molds of their little tepees were visible. The pits, also the implements and ornaments taken from them, were similar in every respect to those found in the village surrounding the mound. (Mills 1904: 130-132).

The small "mounds" in the Hohokam communities of the American southwest ca. A.D. 1100-1400 were little more than village trash heaps associated with courtyard groups or clusters of houses (Bayman and Sanchez 1996). Similarly, Fort Ancient mounds contained considerable amounts of village trash either on or below the mound floor, as well as in the mound fill. However, Fort Ancient mounds functioned as more than simply receptacles for village trash. Fort Ancient mounds were mortuary sites, and may have served as an elevation for ritual or political functions given their near central placement within the village. With the location of Fort Ancient mounds on the side of the village closest to the terrace edge, village trash could simply have been (and likely was) heaved over the embankment edge rather than heaped upwards in a central location.

Tables 34 and 35 provide comparisons of the total sample of excavated mounds to those in the central Scioto drainage in characteristics of stratigraphic context and sub-mound architecture. Sub-floor burials occurred in 64% of the total sample and 60% of mounds in the central Scioto drainage, nearly equal. Of the handful of traits noted by Griffin as being present at Gartner but not at Baum, was sub-floor mound burials. Griffin (1966: 65) did note that sub-floor mound burials were also present at the Feurt and Clay components but otherwise had not been reported at mound sites outside of the Baum

Focus. Mound burials at Roseberry Farm Mound are described as being flexed in bell-shaped pits. A limited number of burials are described as having been interred before mound construction (Graybill 1984: 45), meaning they were found below the mound floor. Sub-floor mound burial also occurred in the Cleek-McCabe, Fullerton Field, Enos Holmes, Killen, and Voss mounds. Sub-mound architecture is considered to be sub-mound structures, prepared platforms, or stone concentrations. The frequency of sub-mound architecture was found to be higher in the central Scioto drainage than in the total sample, 80% and 57% respectively. Sub-mound architecture is not unique to the Late Prehistoric period nor is it unique to the Middle Ohio Valley. Sub-mound structures in Adena and Hopewell mounds in the Middle Ohio Valley have been interpreted as houses that had been burnt or ones dismantled during construction of the mounds (Dragoo 1963: 205-207; Webb and Snow 1974: 191) and as ritual/mortuary architecture (Greber 1983; Greber 1996). Sub-mound structures are present at the roughly contemporaneous Spiro-related Harlan and Norman phases in eastern Oklahoma. However, these mounds lack burials, and the sub-mound structures are argued to be charnel houses for housing the dead prior to burial (Kay and Sabo 2006). Perhaps Fort Ancient groups with sub-mound structures were practicing a very old tradition of preparing the body for burial, with the mortuary space and associated graves eventually capped by a mound. A reversed pattern of mound architecture is seen at Middle Mississippian sites. At nearby Mississippian sites in western Kentucky, communities constructed structures atop earthen platforms, with the platforms showing evidence of successive building stages of earthen platforms and structures (Clay 2006).

Figure 60 provides a comparison of Fort Ancient Mound construction by sub-region. Fort Ancient burial mounds within the central Scioto drainage contain relatively few burials, from a low of 7 to a high of 41. Gartner Mound contained the largest number of burials but Gartner Mound in reality is three burial mounds capped by one encompassing mantle. If Gartner Mound is excluded, the number of burials per mound ranges from 7 to 17. The relatively few mound burials suggest individuals in these mounds had a certain status within the community. Pollack and Henderson (2000) view the construction of burial mounds in central and northern Kentucky as evidence of an emerging social inequality within the community. Two Manion phase mounds in the sample, Cleek-McCabe and Clay, also show a pattern of few burials. This pattern of few mound burials lies in contrast to the pattern seen at the mouth of the Scioto River, along the Ohio River in southern Ohio and West Virginia, and in contrast to the pattern seen in the Little Miami Valley. Burial mounds in the latter areas show large numbers of interments. These results suggest individuals had greater access to mound burial at sites located adjacent to the Ohio River. Two other associated patterns appear in the data. As the number of burials in the mound increases, the number of burials with associated grave goods decreases. The mounds with the fewest number of burials have the greatest number of burials with grave goods. This also likely relates to the wider community having access to mound burial. Moreover, mounds with large numbers of burials did not show evidence of sub-mound structures.

A few additional observations were made in the review and analysis of the characteristics of excavated Fort Ancient mounds. Infants were inconsistently interred in mounds. Turpin Mound contained numerous infant burials whereas no infants were interred in the Roseberry Farm Mound. Children and young adults were, however, consistently buried in the Fort Ancient mounds included in the sample. Pottery vessels appear to be strongly associated with the burials of infants, young children, and young adults. For example, three individuals in the Enos Holmes Mound, two children and a young adult, had pottery vessels accompanying them in the grave. Pottery vessels appear to be very rare in the graves of adults buried within the mounds, with the exception of Baum Mound which had pottery vessels filled with ash (cremations).

Marine shell beads and gorgets made of marine shell were included in mound burials at a number of the sites. Marine shell beads were reported to have been associated with mound burials at Blain, Voss, Baum, Gartner, Enos Holmes, and Clay Mound. At Voss, a total of 51 beads said to be made from marine shells (*Marginella apicina*) were included with an older adult male. Pollack et al. (2002) suggest the low number and low diversity of marine shell ornaments reflects infrequent Fort Ancient/Mississippian interaction pre-A.D. 1400. Two short-stemmed elbow pipes made of limestone and a large triangular knife were also found between the skulls of this burial and an adjacent burial, as was the beak of a young, red-shouldered hawk. Prufer and Shane (1970: 235) emphasized the similarity of this burial to grave goods including an elbow pipe, a bird beak, and a large triangular knife encountered at Blain Village. Funkhouser and Webb (1928: 86) describe a burial from Clay Mound as containing an elbow pipe, a large flint knife, shell beads, and the skull of a hawk. Near the left ear of a male burial in the Enos Holmes Mound was the beak of an immature golden eagle. This combination of artifacts may have had special meaning, or indicated a level of achieved status within the community.

The Serpent Mound and Alligator Mound have recently been attributed to the Late Prehistoric period and the Fort Ancient culture. Based on the author's review of Fort Ancient mounds, the construction of the effigy mounds are thoroughly inconsistent with Fort Ancient mounds previously excavated. In the 1990s, re-opening of one of the trenches dug by Putnam in the 1880s at Serpent Mound led to the dating of several small pieces of charcoal obtained from reportedly undisturbed soil at the edge of Putnam's original trench (Glotzhober and Lepper 1994). The charcoal yielded a date of A.D. 1070. Wood charcoal samples obtained in 1999 during trench excavations from the base of Alligator Mound were submitted for AMS dating and yielded dates in the 12th and 13th centuries. Putnam describes the earthwork fill at Serpent Mound in considerable detail. He states it was evident that the whole structure was carefully planned and built of lasting material (Putnam 1889: 875). He details how the clay beneath the embankment had been leveled before construction began and that no black soil (midden or topsoil) was used in the construction of the embankment. Squier and Davis (1848) described the Alligator Mound as consisting of fine clay in its upper portions and large stones at its base. Lepper and Frolking (2003: 149) quote from an 1858 account of investigations of the mound which stated that the interior structure of the mound showed a uniform arrangement of stones at its base. These earlier descriptions of the stratigraphy of Alligator Mound were confirmed by recent trench excavations (Lepper and Frolking 2003). The use of prepared floors by removal of the topsoil and carefully laid stone coverings is similar to Hopewell mound and earthwork construction (see Greber 1996). Lepper and Frolking report finding little evidence of mixing of different textured soils. The surface was prepared by removing the topsoil to the B horizon before construction in both the Serpent and

Alligator Mounds (Lepper and Frolking 2003: 156) which is consistent with a number of Hopewell mounds and earthworks. No human bones or artifacts were recovered during excavation of these effigy mounds. During the investigations (Lepper and Frolking 2003) a trench was extended over four meters into the "alligator" effigy before any charcoal was observed, suggesting a lack of occupational debris in the mound fill. Beyond the fact that the mounds are effigy mounds, the lack of burials, the complete lack of artifacts in the fill or on the floor, and the uniform construction are all inconsistent with excavated Fort Ancient mounds in the sample. The late dates for the Alligator Mound and Serpent Mound cannot be easily reconciled with their uniform and sterile construction. Given there was a Fort Ancient village site located adjacent to the Serpent Mound, material from the Fort Ancient occupation may have become incorporated in the embankment during repairs either prehistorically or historically. Two radiocarbon dates obtained from trench excavations of the earthwork wall at the Hopewellian Hopeton Earthworks, one from the base of the wall, are 800 years more recent than the dates obtained from other trenches (Lynott 2004). Lynott suggests the wall segment was either built many centuries after the other wall segments, or it was modified or repaired at the later time.

Chronology of Baum phase sites

If one uses the tripartite chronological framework that employs somewhat arbitrary divisions at A.D. 1200 and 1400, that have become so commonplace in discussions of Fort Ancient, radiocarbon dates suggest Fort Ancient occupation of central and south-central Ohio occurred during the later part of the early period, throughout the middle period, and into the very beginnings of the late period, ca. A.D. 1100-1500. Boundaries defined by chronological markers rather than by tradition/phase association or cultural content may help to highlight rather than obscure variation in settlement pattern and material culture within a given region at a specific point in time (Seeman and Dancey 2000: 584). Drooker (1997: 68) cautions, however, that comparing sites on the basis of absolute dates rather than horizon marker attributes may also result in confusion because different stylistic attributes often change at different rates. A cultural lag in material or stylistic traits in the northern margins of the Fort Ancient territory is a distinct possibility. What makes changing patterns of behavior in Fort Ancient communities difficult to assess is the multicomponent nature of so many Fort Ancient sites.

A multicomponent nature or long occupational history for a number of sites in the central Scioto drainage is suggested by midden development, overlapping features, material culture, and/or radiocarbon dates. Midden development to varying degrees has been reported at Baum, Gartner, and Voss. Midden development suggests these settlements, especially the Baum and Gartner sites, experienced repeated or lengthy occupation. The construction of Gartner Mound in three overlapping sections suggests a certain time depth to the site. Storage/refuse pits intruding into the post mold patterns of the structures, or pit features disturbing earlier burials suggests multiple occupations of these sites. This pattern contrasts with the one at Blain Village in that at Blain no pits intruded into either of the two house patterns uncovered which led the investigators to conclude that Blain Village was a single settlement of brief duration (Prufer and Shane 1970: 32). However, only a small portion of the potential site was investigated and attributes considered to reflect later developments such as elongated shell-tempered strap handles were recovered from Blain Village (Prufer and Shane 1970: 55).

As was detailed in Chapter 2 and Chapter 6, recently obtained dates from Baldwin, Baum, Blain, Gartner, and Voss suggest occupations post-dating A.D. 1300. A review of the recently obtained dates suggests Fort Ancient occupation of the central Scioto and upper Hocking River drainages continued into the 14^{th} and early 15^{th} centuries. The presence of beans and dates obtained by direct dating of the material at Baldwin, Blain, Gartner, and Voss suggest at least one occupation at these sites occurred during the later half of the middle period. While the later radiocarbon dates may be surprising, they are not inconsistent with settlement pattern data. Blain, Gartner, and Voss can be argued to have had a circular village organization with the mound at the interface of a plaza and residential zone, a pattern strongly associated with Middle Fort Ancient period sites in Kentucky.

There is no evidence to suggest any major occupations of the upper Scioto or upper Hocking drainages post-dating A.D. 1500. No classic Madisonville Horizon ceramics, to the author's knowledge, have been recovered from any of the sites in the central Scioto or upper Hocking River drainages.

The timing of these Fort Ancient occupations in the central Scioto and upper Hocking drainages has implications for understanding population movements during the Late Prehistoric period. These sites do not represent only early or transitional occupations. Evidence evaluated in light of current models of Fort Ancient suggests Fort Ancient populations persisted in the central Scioto and upper Hocking Valley longer than previous models have suggested. Results of this research and recently obtained radiocarbon dates from Baum phase sites are consistent with Graybill's (1981, 1984) assertion of an Anderson/Baum co-tradition ca. A.D. 1100-1450. Moreover, the proposed depopulation of more northerly territory for more southern environs must be brought forward in time to ca. A.D. 1500 for the central Scioto and upper Hocking River drainages.

CHAPTER 8

CONCLUSIONS

A series of research questions concerning prehistoric occupation of the Voss site is presented in the first chapter. The research questions and a summary of the resultant data are provided in this chapter. The broader question addressed in the dissertation is one of classification to determine the nature of the site. The results of the analysis of the community settlement pattern, the artifact and archaeobotanical assemblage, and radiocarbon assays will contribute to our understanding of the Late Prehistoric period in central Ohio. Yet, the classification has larger implications for understanding shifts in regional settlement patterns within the Fort Ancient culture area over time.

Does the Voss site exhibit a typical Fort Ancient structured settlement characterized by a circular village organized around a central plaza with concentric zones of burials, storage/refuse pits, and house structures?

The community settlement pattern at the Voss site was found to be consistent with a Fort Ancient circular/oval village organized around a central plaza ringed by a residential zone. A community organization of strictly concentric zones of burials, storage/refuse pits, and structures is not suggested by results of the investigations to date.

Magnetic survey data and/or feature excavation suggest some pit features are interspersed in front of, between, and behind house patterns. The location of village burials remains unknown but they were not encountered, with the exception of infants in refuse pits, on the edge of the central plaza. Because the magnetic survey does not distinguish a storage pit feature from a burial pit feature, it may be shown through future investigation of the site that some of the probable pit features located within or on the outer portion of the residential zone are indeed burials. Moreover, the possibility exists that the intra-site settlement pattern at any given time during occupation of the site consisted of concentric zones of activity but rebuilding and/or cycles of abandonment/reoccupation resulted in a breakdown in the archaeological visibility of the community organization. Evidence of rebuilding was found during excavation, and a widening or constricting of the central plaza was suggested by the analysis of the magnetic survey data in combination with the data obtained from shovel testing for patterns of artifact density. The magnetic survey data suggests a section of the residential zone in the southeastern portion of the village exhibits a lower frequency of magnetic anomalies (possible features) and may reflect a gap in the residential zone. The Voss Mound is located at the interface of the plaza and residential zone. A circular/oval settlement organized around a central plaza with a burial mound at the interface of the plaza and residential zone is consistent with the community settlement organization found at well-documented Fort Ancient sites in Kentucky and West Virginia. Aside from the circular/oval community organization evident in the magnetic survey and excavation data, an additional occupation organized in a more linear arrangement paralleling the terrace edge cannot be ruled out.

The conception of Voss as a transitional Late Prehistoric site is not supported by the community settlement pattern data. Intrasite settlement pattern data at Blain and Voss and arguably at Baum and Gartner suggest these sites have a circular/oval organization with a mound at the interface of the plaza-residential zone. A re-examination of settlement data and recently obtained radiocarbon dates from sites attributed to the Baum phase suggest the central Scioto River drainage was not the exception to the larger regional settlement pattern. The assertion is being made that the pattern argued for southwestern Ohio and Kentucky of relatively few sites dating strictly to the period A.D. 1000-1200 with numeric and geographic expansion of sites during the period ca. A.D. 1200-1450, also characterizes the central Scioto and upper Hocking River drainages.

Is a Fort Ancient subsistence strategy heavily reliant upon a limited number of cultigens including maize and beans indicated in the paleoethnobotanical remains and feature types?

The archaeobotanical assemblage, feature characteristics, and stable carbon isotope data from the Voss site are consistent with a population reliant upon maize agriculture. While no cob fragments were recovered and the frequency of corn kernels is relatively low, the ubiquity of corn cupules and/or kernels, recovered from four of the four large pit features excavated, indicates consistent use of maize by the site’s occupants. A number of pit features contained a dark lining at the bottom suggestive of having been lined with organic material for the storage of grains. Two of the pit features excavated recently contained preserved portions of a burnt grass lining at the bottom of the pit features. The majority of the pit features excavated at the site were consistently dug well into the sand and gravel substratum underlying the loamy soils. The soil at the depth of the sand and gravel layer has high permeability which is advantageous for underground storage of food. Stable carbon isotope data obtained by Greenlee (2002) on six of the seven mound burials indicates an isotopically-enriched population with individual variation in maize intake.

The presence of maize, beans, and squash in the pit features suggests intercropping of the Three Sisters was in use during at least one occupation of the site. The presence of three members of the Eastern Agricultural Complex, albeit in very low frequencies and low ubiquity, may indicate the Voss population continued to incorporate some native plant species in the diet. The limited use of chenopod, little barley, and erect knotweed could be a reflection of the site's upstream location in the dissected valleys of Big Darby Creek and/or a population that supplemented their diet with more traditional food resources as did contemporaneous Middle and Upper Mississippian populations. However, additional flotation samples from multiple features will be necessary to fully address this question.

Do chronological estimates derived from stylistic attributes of the ceramic and lithic assemblages agree with the radiocarbon assays obtained from the site?

Much had previously been made of the contrast between the wide span of radiocarbon dates, and the low percentage of shell-tempered ceramics and reported uniformity of the ceramic assemblage. Undoubtedly the use of shell temper increases over time in the Middle Ohio Valley during the Late Prehistoric, eventually completely replacing grit tempers ca. A.D. 1500. However, caution must be used in assigning temporal placement to sites solely on the basis of percentage of shell-tempered ceramics. Ceramic data from the Voss site is consistent with data from other sites in the central Scioto, upper Hocking, and upper Miami River drainages which suggests that shell-temper was unevenly and inconsistently adopted in these areas. The pace of change to shell-tempered ceramics was slow for certain upstream populations. Riggs' (1998) analysis indicates grit-tempered ceramics persisted much longer than would be predicted if functional/technological factors alone accounted for the shift to shell temper. Ceramic attributes of the Voss assemblage suggest the increase in decoration associated with Middle Fort Ancient assemblages occurs independent of the shift to shell-tempered ceramics in upstream locations.

While rim form in the Voss ceramic assemblage is unquestionably consistent, considerable variation exists in the combination of attributes on sherds exhibiting decoration and in the form of appendages/handles. The large percentage of thickened rims in combination with the relatively high frequency of decoration suggests a Middle Fort Ancient chronological placement for the Voss ceramic assemblage. The horizontal lug and the convergent-sided strap handle are both present in the assemblage. Thickened rims with lugs formed by the widening of the upper and lower edge of the rim strip shows affinities to the Hocking Valley sites and to the Brush Creek Serpent Mound component. However, shell-tempered sherds with four-lined curvilinear guilloche over a plain neck treatment and cordmarking below the shoulder, as well as the rounded rims, are similar to Anderson and *non-classic* Madisonville ceramics in southwestern Ohio and northern Kentucky. A decorative motif of punctates in the eye of the guilloche suggests contemporaneity with Anderson phase sites in the Miami River valleys. Despite these similarities with sites to the east/south and to the west, two decorative motifs that are possibly chronologically-sensitive, the line-filled triangle and the semicircular lug, do not occur in the Voss ceramic assemblage. The triangular projectile point assemblage is consistent with an Early/Middle Fort Ancient occupation. One possible serrated triangular point, considered a hallmark of the Middle Fort Ancient period, was associated with a burial beneath Voss Mound.

Stylistic attributes of the Voss ceramic assemblage and ceramic cross-dating support the recently obtained AMS dates suggesting recurrent occupation in the 13th through very early 15th centuries. A single standard radiocarbon date obtained on a combined wood charcoal sample suggests a possible occupation in the 12th century. The presence of shell-tempered pottery, sherds with guilloche decoration, and sherds combining incising and punctates in the feature fill associated with the charcoal as well as bean fragments in the overlying fill, make assessing whether there was also an early period occupation of the site problematic. Pre-A.D. 1000 and post A.D. 1500 dates generated during the 1960s by now defunct labs are not supported by the recently obtained dates or stylistic attributes of the ceramic and lithic assemblages.

Does the Voss Mound in characteristics of construction and placement within the larger community adhere to patterns of mound construction at Fort Ancient sites?

The Voss Mound is consistent with excavated and reasonably well-documented Fort Ancient mounds. The low profile and village trash found underlying and within the mound fill are characteristics discovered to be nearly universal to excavated Fort Ancient mounds. The occurrence of sub-floor burials was not unusual, and sub-floor burials were found to occur in other Fort Ancient mounds within the central Scioto River drainage as well as in Kentucky. The placement of burials in peripheral contexts within the mound was found to be not uncommon in Fort Ancient mounds. The more interesting observations relate to the sub-regional diversity seen in construction practices, stratigraphic context of the burials, access to burial within the mound, and pattern of associated grave goods. The stratigraphic context of mound burials varied from a single context to multiple contexts including below the mound floor, on the floor, above in the mound fill, or buried intrusively from the surface. Mounds located in the lower Little Miami Valley and along the Ohio River proper tended to contain many burials and few associated grave goods, and lacked sub-mound architecture. Conversely, the two mounds in the sample located in Kentucky and the mounds in the central Scioto River drainage contained few burials with the majority of burials having associated grave goods, and tended to exhibit sub-mound architecture. Are these sub-regional differences related to synchronic variation in population density and social organization, or are the differences temporal? Perhaps future research can address this question.

Reconstruction

Voss Village holds a significant place in the prehistory of the Middle Ohio Valley during the Late Prehistoric period. The Voss site was a large circular Fort Ancient village on the northern margins of the Fort Ancient territory that was self-sufficient but was not isolated. The presence of ceramic styles found at contemporaneous sites in the

Hocking and Miami Valleys suggest Voss Village was a community very much connected to other Fort Ancient communities, possibly through inter-marriage or trade. Occupation of the Voss site, located on a terrace bench along the Big Darby Creek amongst forests and prairies, was not a fleeting one. Fort Ancient populations appear to have returned to the site more than once over the span of possibly three centuries from ca. A.D. 1100 to 1440, to build their village and practice maize agriculture. They erected a permanent marker in the form of a mound to honor important males in their community and commemorate their final resting place. The later inhabitants of Voss were growing maize, beans, and squash at their creek-side location late in the 1300s when it was assumed populations had abandoned the sub-region for more southern locations.

Future Research

A number of research questions could yet be asked concerning the prehistoric occupation of the Voss site. Future research into the organization of the residential zone should be conducted. The magnetic survey data could be used to determine promising areas for more invasive archaeological investigation. The magnetic survey data would be useful in locating a transect to be stripped across the 30-40 meter-wide storage/refuse-residential zone. Anomalies within the proposed central plaza could be tested by coring or removal of the plowzone to determine if the anomalies relate to a separate occupation, or reflect community-oriented activities within the plaza. The magnetic survey data suggests a sudden decrease in the concentration of anomalies along the village's eastern edge. An excavation trench placed perpendicular to the residential zone and on its outer edge could systematically test for the presence or absence of a palisade. Additional magnetic survey should be conducted to extend the survey into untested areas of the terrace bench. Additional activity areas or additional sites may exist along the terrace edge north or south of the area surveyed during the present study.

The size of the village, the width of the midden ring, and the size of the structures are consistent with medium to large sites in the Fort Ancient core. Occupation at Voss does not appear to have been experimental but rather appears to have been well-developed and substantial. Given this observation, another observation is offered: additional Fort Ancient village sites very likely existed in central Ohio. One such site in Pickaway County is awaiting systematic investigation (Sciulli, personal communication). Magnetic survey combined with limited testing of anomalies is a cost-effective and minimally invasive methodology for site investigation. Baum phase sites where archaeological remains are still relatively intact would benefit from such testing. The absence of any discussion of Baum phase sites in the *Cultures Before Contact* volume, a recent review of the Late Prehistoric period in Ohio and contiguous areas, is indicative of how academic research into the Late Prehistoric occupation of the central Scioto and upper Hocking River drainages has languished during the last couple of decades. Baum phase sites must be brought back into current models concerning Fort Ancient regional settlement patterns and chronology if we are to understand culture change during the Late Prehistoric period in the Middle Ohio Valley and the mechanisms that led to large portions of fertile farmlands being abandoned ca. A.D. 1500.

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APPENDIX A: TABLES

Site	% grit-tempered	% shell-tempered	% mixed shell and grit	Reference
Kramer	69.3	28.2	1.9	Ullman and Pi-Sunyer 1985: 26
Baum	80	20	--	Griffin 1966: 45
Gartner	80	20	--	Griffin 1966: 53
Baldwin	90	<10	--	Griffin 1966: 55
Serpent Mound Component (Brush Creek)	90	<10	--	Griffin 1966: 366, inferred from the description of shell temper as being rare
Blain	96.7	3.3	--	Prufer and Shane 1970
Voss	97.3	2.2	<.5	Brady-Rawlins 2006; recent excavations
Graham	98	2	--	McKenzie 1967: 76
Enos Holmes	99.4	0.6	--	Baby et al. 1968
Howard Baum	100	0	--	Skinner 1981; Church 1987
Anderson	42 (9)	8 (9.5)	50 (81.4)	Griffin 1966: 98 (Essenpreis 1982)
Steele Dam	95	<5	--	Griffin 1966: 110
South Fort	99	1	--	Harper 2000: 347
SunWatch	97.5	2.5	--	Heilman et al. 1988, Vol. 2: 55
Wegerzyn	99.9	.1	--	Kennedy, personal communication

Table 1. Percentages of temper for sites mentioned in text.

Site	Lab code	Material	^{14}C age B.P., +/- 1 std dev	1 σ cal range A.D.	2 σ cal range A.D.; calibration using CALIB 5.0.1 INTCAL04, Stuiver and Reimer 1993
Baum	Beta-168702	Deer bone, AMS	630+/-40	1294-1391	1285-1401
Baldwin	Beta-17822	Maize	630+/-80	1288-1397	1256-1438
	AA-38459	Bean, AMS	542+/-33	1327-1426	1313-1437
	AA-38460	Bean, AMS	420+/-60	1427-1618	1412-1635
Blain	OWU-248	Wood charcoal	1035+/-155	862-1168	757-1260
	OWU-247b	Wood charcoal	970+/-220	871-1271	658-1333
	M-1911	Wood charcoal	760+/-100	1160-1306	1042-1399
	OWU-274a	Corn	405+/-150	1397-1660	1284-1952*
	M-1910	Wood charcoal	490+/-100	1307-1615	1290-1635
	ETH-4501	Nutshell, AMS mixed species	270+/-75	1490-1950*	1448-1952*
	AA-16854	Bean, AMS	510+/-60	1324-1447	1297-1485
	AA-16853	Maize, AMS	420+/-60	1427-1618	1412-1635
Enos Holmes	OWU276	Wood charcoal	815+/-95	1052-1281	1021-1308
	CAMS-22361	Human bone	930+/-60	1034-1158	996-1221
Feurt	Beta-168703	Deer bone, AMS	620+/-40	1297-1393	1288-1405
Gabriel	OWU253	Wood charcoal	425+/-155	1393-1648	1275-1952*
Gartner	Beta-187514		710+/-40	1263-1379	1224-1388
	AA-38461	Bean, AMS	579+/-33	1316-1408	1299-1420
	AA-38462	Bean, AMS	593+/-33	1311-1402	1297-1412
Graham	OWU183	Wood charcoal	770+/-145	1049-1388	989-1434
	OWU184	Wood charcoal	285+/-220	1442-1952*	1331-1956*
Grimes	DIC-852	Wood charcoal	680+/-70	1267-1391	1222-1409
	DIC-855	Wood charcoal	760+/-150	1051-1392	982-1444
Howard Baum	DIC-1928	Wood charcoal	710+/-50	1258-1384	1219-1392
	ETH4244	Wood charcoal	745+/-75	1209-1303	1153-1400
	SMU-1930	Wood charcoal	646+/-41	1287-1389	1279-1398
Killen	DIC-857b	Wood charcoal	780+/-120	1050-1383	1024-1402
	DIC-851	Wood charcoal	750+/-205	1040-1405	867-1529
	DIC-853	Wood charcoal	710+/-205	1047-1431	893-1643
	DIC-856	Wood charcoal	640+/-80	1283-1396	1251-1434
McCune	M1757	Wood charcoal	630+/-100	1284-1403	1206-1454
	I14615	--	720+/-80	1219-1387	1158-1411
Scioto County Home	Beta-23030	--	920+/-30	1044-1158	1028-1184

Continued

Table 2. Radiocarbon ages for sites with Baum Series Ceramics.

Table 2 continued

Thompson	Beta-13368	Wood charcoal	920+/-100	1026-1192	961-1278
	Beta-13367	Wood charcoal	810+/-60	1177-1270	1045-1288
	Beta-11852	Wood charcoal	490+/-50	1402-1450	1311-1608
	Beta-11853	Wood charcoal	400+/-70	1437-1626	1418-1643
	Beta-11851	Wood charcoal	110+/-60	1684-1953*	1669-1954*
	TL	sandstone	750+/-40	-	-
	TL	sandstone	860+/-80	-	-
	TL	sandstone	460+/-40	-	-
Wamsley	DIC-854	Wood charcoal	710+/-105	1216-1394	1150-1431
	DIC-862	Wood charcoal	620+/-80	1293-1398	1262-1439
Voss	M1875	Wood charcoal	1030+/-120	891-1155	769-1229
	OWU-92A	Wood charcoal	970+/-79	1012-1159	937-1222
	M1882	Wood charcoal	880+/-100	1040-1222	977-1290
	M1881	Wood charcoal	830+/-100	1049-1276	1015-1310
	OWU243b	Wood charcoal	815+/-220	997-1394	763-1495
	M1873	Wood charcoal	780+/-110	1052-1382	10271396
	M1870	Wood charcoal	720+/-100	1213-1392	1150-1422
	OWU244	Wood charcoal	675+/-90	1264-1396	1185-1431
	M1872	Wood charcoal	575+/-100	1298-1426	1237-1512
	M1871	Wood charcoal	550+/-100	1299-1441	1264-1522
	M1879	Wood charcoal	540+/-100	1299-1445	1270-1523
	M1877	Wood charcoal	520+/-100	1299-1459	1278-1526
	OWU245	Wood charcoal	517+/-110	1297-1470	1277-1635
	M1883	Wood charcoal	470+/-100	1319-1619	1298-1641
	M1884	Wood charcoal	470+/-150	1310-1632	1238-1686
	M1876	Wood charcoal	450+/-100	1399-1630	1299-1649
	OWU246	Wood charcoal	387+/-158	1398-1668	1291-1952*
	ETH-4500	Hickory, AMS	380+/-80	1446-1631	1410-1664
	CAMS-22362	Human bone, AMS	780+/-60	1207-1283	1152-1302
Recently obtained dates from Voss provided in Chapter 5, Table 30. Sources include Baby 1967; Bowen 2005, Church 1987; Hart et al. 2002; Henderson et al. 1992; Murphy 1989; Otto personal communication; Prufer and Shane 1970; Kentucky, Ohio, and West Virginia Radiocarbon Database, Maslowski et al. 1996 ***** Indicates dates that are suspect due to impingement on the end of the calibration data set					

Site	References
Baum	Mills 1906; Griffin 1966; Church 1987; Bowen 2005
Blain	Prufer and Shane 1970; Church 1987; Carr and Haas 1996; Hart et al. 2002
Enos Holmes	Baby et al. 1968; Church 1987
Feurt	Mills 1917; Murphy 1975, 1989; Henderson et al. 1992; Bowen 2004, 2005
Gabriel	Prufer and Shane 1970; Murphy 1975, 1989
Gartner	Mills 1904; Church 1987; Hart et al. 2002; Bowen 2004, 2005
Graham	McKenzie 1967; Prufer and Shane 1970; Church 1987; Murphy 1975, 1989
Grimes	Brose 1982; Henderson et al. 1992
Howard Baum	Skinner 1982; Church 1987
Killen	Brose 1982; Henderson et al. 1992
Kramer	Ullman and Pi-Sunyer 1985; Church 1987
McCune	Murphy 1975, 1989
Scioto County Home	Bowen, personal communication; Henderson 1992
Thompson	Henderson and Pollack 1992
Wamsley	Brose 1982; Henderson et al. 1992
Voss	Baby and Potter 1965; Baby et al. 1964, 1966, 1967; Church 1987; Carr and Haas 1996; Brady-Rawlins 2006

Table 3. Site References for sites having Baum series ceramics.

Site	Material	Lab code	RCYBP	A.D. cal 2σ (intercepts)
Blennerhasset F23 N1/2	bean	AA-38463	277+/-33	1518 (1643) 1789
Blennerhasset F23 S1/2	bean	AA-38464	301+/-33	1484 (1637) 1658
Blain Village, House 1	bean	AA-16854	510+/-60	1304 (1421) 1478
Blain Village, Pit 4 18-28	maize	AA-16853	420+/-60	1408 (1448) 1637
Baldwin	bean	AA-38459	542+/-33	1321 (1408) 1437
Baldwin	bean	AA-38460	494+/-33	1401 (1428) 1447
Gartner	bean	AA-38461	579+/-33	1301 (1332, 1339, 1398) 1423
Gartner	bean	AA-38462	593+/-33	1298 (1328, 1344, 1394) 1416
SunWatch F1/77	bean	A-0175	652+/-42	1280 (1300, 1373, 1378) 1402
Fox Farm FG09 Tu2	bean	AA-38466	683+/-33	1277 (1295) 1389
Fox Farm FG09 Tu2	maize	AA-38467	592+/-33	1299 (1329, 1344, 1395) 1418

Table 4. Radiocarbon ages for samples of *Phaseolus vulgaris*. Adapted from Hart et al. 2002.

Burial	Sex	Age	Orientation in pit	Associated artifacts
Burial 1	Male	25-30 years	On right side with feet to north and skull towards south, facing east; semi-flexed	None
Burial 2	?	Infant 1 year	Lying on left side facing northwest; semi-flexed; on same level as Burial 1	Elk tooth with two drilled holes found over cervical vertebrae
Burial 3	Male	35-39 years	Adjacent to Burial 3; laid on back with legs flexed; head to the south and facing east	Triangular projectile point found beneath rib cage
Burial 4	Male	25-29 years	Head to south and facing west; semi-flexed	None
Burial 5	Male	30-35 years	Adjacent to Burial 6; head towards south and facing west; semi-flexed	Short-stemmed elbow pipe, hawk beak, and large triangular knife
Burial 6	Male	30-40 years	Head to the south and facing west; semi-flexed	Freshwater and marine shell beads about the neck and wrists, polished bone hair pin, short-stemmed elbow pipe, and side-notched projectile point beneath lumbar vertebrae
Burial 7	Male	25-30 years	Placed on back with knees flexed; head toward the north-northeast and facing west	Large, triangular knife in the right hand

Table 5. Burials from the Voss Mound, Features I and III. Age estimates for individuals provided by Paul Sciulli (personal communication).

Provenience	Lab Code	^{14}C age B.P., +/- 1 std dev	2 σ cal range A.D.; calibration using CALIB 5.0.1 INTCAL04, Stuiver and Reimer 1993
Mound, post hole?	OWU-92A	970+/-79	A.D. 937-1222
Mound burial, AMS on human bone	CAMS-22363	780+/-60	A.D. 1152-1302
Feature II, refuse pit	M-1870	720+/-100	A.D. 1150-1422
Feature II, refuse pit	M-1871	550+/-100	A.D. 1264-1522
Feature III, refuse pit	M-1872	575+/-100	A.D. 1237-1512
Feature IV, refuse pit	M-1873	780+/-110	A.D. 1027-1396
Feature VII, refuse pit	M-1875	1030+/-120	A.D. 769-1229
Feature VIII, midden near House I	M-1876	450+/-100	A.D. 1299-1649
Sq. 190 L12, midden near House I	M-1884	470+/-150	A.D. 1238-1686
Sq. 190 L12, midden near House I	OWU229B	1040+/-215	A.D. 603-1312
Sq. 220 L10, House I	M-1883	470+/-100	A.D. 1298-1641
Feature IX, refuse pit and infant burial	M-1877	520+/-100	A.D. 1278-1526
Feature IX, refuse pit and infant burial	OWU243B	815+/-220	A.D. 763-1495
Feature XI, House I, post hole	OWU244	675+/-90	A.D. 1185-1431
Feature XIV, conjoined pit	M-1879	540+/-100	A.D. 1270-1523
Feature XIX, refuse pit intruding into House II	M-1881	830+/-100	A.D. 1015-1310
Feature XIX, refuse pit intruding into House II	OWU245	517+/-110	A.D. 1277-1635
Feature XX, refuse pit intruding into House II	M-1882	880+/-100	A.D. 977-1290
Feature XX, refuse pit intruding into House II but possibly from floor of House II	OWU246	387+/-158	A.D. 1291-1952*
Feature XXI, refuse pit, AMS on nutshell	ETH-4500	380+/-80	A.D. 1410-1664

Table 6. Radiocarbon dates from charcoal samples obtained from 1963 and 1966 excavations at Voss. CAMS sample is an AMS date on human bone from under the mound, cited in Greenlee 2002. Sources for other dates include the Voss paper files at OHS Collection Facility; Carr and Haas 1996.
* Indicates dates that are suspect due to impingement on the end of the calibration data set.

Shape in Profile	Feature #	Shape in Plan View	Diameter	Depth below Top of Subsoil
Straight-sided, -rounded bottom	Feature VI	Circular	5.8' (1.77 m)	4.7' (1.43 m)
	Feature XIII	Two conjoined, circular pits	9.6' (2.9 m) L 2.5'-4.3' (.75-1.3 m) W	4.2' (1.3 m) max.; 2.5' (.75 m) min.
	Feature XV	Circular	5.0' (1.52 m)	3.9' (1.19 m)
	Feature XX	Circular	5.0' (1.52 m) N-S 5.5' (1.68 m) E-W	4.9' (1.49 m)
- flat bottom	Feature IV	Circular	3.7' (1.13 m) N-S 3.6' (1.08 m) E-W	3.7' (1.13 m)
	Feature XIV	Two conjoined, circular pits	8.0' (2.43) L 2.5-4.6' (.75-1.4 m) W	4.4' (1.36 m) max.; 2.8' (.85 m) min.
	Feature XIX	Circular	2.6' (.79 m)	2.8' (.84 m)
Bell-shaped, -flat bottom	Feature I	Circular	4.7' (1.43 m) N-S 4.0' (1.22 m) E-W	4.4' (1.35 m)
	Feature III	Circular	3.2' (1 m) N-S 3.7' (1.11) E-W	3.4' (1.05 m)
	Feature IX	Circular	3.0' (.91 m) N-S 3.2' (1 m) E-W	2.6' (.79 m)
	Feature X	Oval	5.0' (1.52 m) NE-SW 4.4' (1.84 m) NW-SE	3.9' (1.19 m)
	Feature XVII	Circular	4.0' (1.22 m)	3.2' (1 m)
-rounded bottom	Feature II	Circular	3.9' (1.19 m) N-S 3.8' (1.16 m) E-W	3.2' (.98 m)
Tapered sides, -rounded bottom	Feature V	Oval	3.1' (.94 m) NE-SW 2.5' (.79 m) NW-SE	1.7' (.52 m)
	Feature XII	Circular	4.4' (1.33 m) N-S 5.1' (1.54 m) E-W	4.6' (1.4 m)
	Feature XXI	Circular	4.6' (1.4 m)	2.7' (.82 m)
	Feature XXII	Circular	3.6' (1.1 m)	2.7' (.82 m)
Basin-shaped	Feature VII	Circular	3.9' (1.17 m) N-S 3.6' (1.08 m) E-W	.7' (.2 m)
	Feature XVI	Circular	3.2' (1 m) N-S 3.5' (1.05 m)	Less than 1' (.3 m)

Table 7. Pit features excavated in the village during the 1966 field season by the OHS field crew. Adapted from Baby et al. 1967.

	I	II	III	IV	VI	VII	VIII	IX	XII	XIII	XIV	XV	XVII	XIX	XX	XXI	Mound	PZ
Lithics																		
Triangular points	3	1		1		1	3	2			3		5		1		9	6
Notched points							2				1						7	4
Stemmed points	1						1										2	2
Triangular knives	1					1	3						1				4	7
Flake knives		1					2											2
Leaf-shaped																		1
Scrapers							3			1			1					10
Drills	1																2	
Ground Stone																		
Whetstone	1																	
Hammer-stone	2																	1
Celts																	1	1
Elbow pipe																	2	
Bone& Antler																		
Beamers	3							3				2				5		
Spatulas	1					1												
Hairpins								1									1	
Shuttles	1		1	1					1									
Awls	5											1		1	2	1	12	
Fishhooks		1					1											
Fish gorge		1																
Antler chipper																1		
Antler points	2				1											1		
Worked teeth	1									1								
Shell																		
Worked												1					1	
Shell hoe																	1	
Shell bead																	880	

Table 8. Lithic, bone, and shell artifacts from 1960s mound and village excavations by context. Counts for triangular points, notched points, and stemmed points were determined by the author from analysis of the collections housed at OHS and does not include projectile point fragments. Artifacts from the midden area were included with Feature VIII. Features lacking stated artifacts were not included. Adapted from Baby, Potter, and Sawyer 1967: Table 3.

Grid Coordinates	Feature Fill	Depth of Core	Soil profile	Artifacts
N4999 E5049.5	Yes	80 cmbs	0-27 cmbs 10YR 4/3 silt loam 27-75 cmbs 10YR 3/2 silt loam 75-80 cmbs 10YR 5/4 gravel	Nutshell and charcoal
N4997 E5044	Yes	110 cmbs	0-27 cmbs 10YR 4/3 silt loam 27-90 cmbs 10YR 3/2 silt loam 90-100 cmbs 10YR 4/4 clay loam 100-110 cmbs 10YR 5/4 loamy sand	Charcoal
N4997 E5060	Yes	90 cmbs	0-27 cmbs 10YR 4/3 silt loam 27-65 cmbs 10YR 3/2 silt loam 65-80 cmbs 10YR 4/4 clay loam 80-90 cmbs 10YR 5/4 loamy sand	--
N4999.5 E5050.5/ Control test	No	60 cmbs	0-27 cmbs 10YR 4/3 silt loam 27-38 cmbs 10YR 3/4 silty clay loam 38-60 cmbs 10YR 4/4 clay loam	--

Table 9. Results of test coring of magnetic anomalies in Block F3.

Shape in Profile	Feature	Shape in Plan View	Diameter	Depth below top of Subsoil
Straight-sided rounded bottom	Feature 1	Circular	1.5 m	1.43 m
	Features 4 / 9	Two conjoined circular pits	3.4 m L 80 cm W	Max. 1.35 m Min. 1.10 m
Straight-sided rounded bottom Truncated by basin-shaped pit	Feature 7	Circular	1.95 m	1.5 m
Large post hole or small cache pit	Feature 3	Circular	44 cm at base	28 cm

Table 10. Dimensions of features excavated during the years 2002-2005.

Artifact category	Feature 1	Feature 3	Feature 4	Feature 9	Feature 7
Lithics					
Chert debitage, flake	90	7	37	45	7
Chert debitage, shatter	22	0	14	19	131
Chert tools	6	1	1	7	7
Ceramics					
Body sherds	71	9	71	61	206
Rim and neck sherds	5	1	3	4	19
Faunal Material	424	88	89	255	546
Fire-cracked rock	15	7	14	34	14
Total	**515**	**105**	**176**	**354**	**785**

Table 11. Artifact count by feature context.

Shovel Test Grid Coordinates	Artifact Category					Total count for test unit
	Chert debitage, flake	Chert debitage, shatter	Chert tool	Ceramic sherds	Fire-cracked rock	
N4977.5 E5090, 0-25 cmbs	3	1				4
N4987.6 E5088, 0-25 cmbs	3				1	4
N4997.5 E5086.2, 0-26 cmbs	5	2	1			8
N5007.7 E5084.6, 0-26 cmbs	1					1
N5017.1 E5083.4, 0-30 cmbs	2		1	1		4
N5027.8 E5081.7, 0-27 cmbs	7		2			9
N5037.1 E5081.1, 0-27 cmbs	12			1		13
N5047.9 E5080.3, 0-27 cmbs						0
N5057.2 E5079.8, 0-27 cmbs	3					3
N5067.4 E5079.7, 0-28 cmbs	8	3	1			12
N5077.6 E5079.7, 0-28 cmbs	4	1				5
N5088.9 E5080, 0-25 cmbs	3	2				5
N5099.7 E5079.8, 0-25 cmbs	5	2				7
N5108.4 E5079.4, 0-26 cmbs	7	2		1	1	11
N5118 E5079.5, 0-27 cmbs	18	4	1	1	1	25

Table 12. Artifact counts by artifact category for shovel test units dug to determine artifact density.

	Faunal Material	Chert Artifacts	Ceramic Sherds	Fire-cracked Rock	Groundstone Tools	Historic Artifacts
Count	1916	1550	604	158	1	7

Table 13. Total artifact count by artifact category (recent excavations).

Common Name	F. 1		F.3		F. 4		F. 9		F. 7	
	n	*Modific.*	n	*Modific.*	n	*Modific.*	n	*Modific.*	n	*Modific.*
Bivalve shell	4				1		6		24	
Freshwater Mussel							1		4	
Bony fish	1								2	
Common Musk Turtle							1		7	
Eastern Box Turtle										
hypoplastron							1			
peripheral					1		4		8	
nuchal					1		1		2	
plastron					2				11	1 carnivore damage
coracoid									1	
pleural									19	
Snapping Turtle					2				1	
Turtles										
carapace	5				1	burned	1		1	
pleural	1						1		5	2 burned
hypoplastron									3	
plastron									6	2 burned
peripheral	3	2 burned							3	
nuchal									1	
scapula?									1	
Frog/Toad	261								3	
Eastern Cottontail Rabbit							1		1	
Large Bird										
long bone shaft	11	1 carnivore damage			15	5 burned	46	33 carnivore damage	29	3 carnivore damage 2 burned
frontal									1	
phalanx									1	
flat bone	3								2	
sternum									1	carnivore damage
Canine sp. Canine									1	
Gray fox maxillary tooth							1			

Continued

Table 14 . Faunal material by feature context (recent excavations). Analysis conducted by Anne Lee.

Table 14 continued

Common Raccoon										
maxillary tooth									1	
astragalus									1	
ulna									1	
tooth	1									
Eastern chipmunk					1				1	
Small to Medium Mammal										
metacarpal/ metatarsal							1			
long bone shaft	4	1 polished					1		2	
rib shaft	6								2	
innominate									1	
phalanx									1	
zygomatic	1	burned								
White-tailed deer										
phalanx	4	2 burned 1 carnivore damage			1		10		7	carnivore damage
calcaneous							1			
astragalus					1					
metacarpal /metatarsal	5		1		1		2		3	
long bone shaft							4			
femur	1	carnivore damage					1		1	
patella					1					
innominate							1	hack marks	1	
pubis					1					
vertebrae	1								1	
humerus							1			
scapula			2	1 cutmarks 1 carnivore			2			
radius									1	
ulna									1	

Continued

Table 14 continued

mandible							2			
maxilla	2								2	
skull	1				1				2	
antler (Deer Family)	1						2	1 ring-n-snap	7	1 ring-n-snap
Medium / Medium to Large Mammal										
astragalus							1			
long bone shaft	87	25 burned 2 carnivore damage 1 ring-n-snap	79	77 burned	54	4 calcined 3 burned 1 carnivore damage 1 worked awl	99	7 burned 4 carnivore damage 2 exterior polish,	163	8 burned 18 carnivore damage 1 fine cutmarks
innominate							2		5	
pubis							1	carnivore damage		
vertebrae	2				2		24		46	
humerus									1	
femur									1	
ulna									1	
radius									1	
rib shaft	2		1	carnivore damage			16		68	
flat bone	11	1 burned and cut	2		1		21	4 burned	28	
calcaneous	1				1	carnivore damage			1	
epiphysis	1						1		1	
skull	19	2 burned	2	burned			1		49	
teeth					1				6	
ossified cartilage?									1	
maxilla			3							

Artifact	**Count**
Chert debitage, flake	1267
Chert debitage, shatter	216
Chert tool, biface	9
Chert tool, biface fragment	14
Chert tool, utilized flake	32
Chert tool, preform	8
Chert tool, knife	1
Chert tool, uniface	2
Chert tool, thumbnail scraper	1
Total	**1550**

Table 15. Chert artifacts by type (recent excavations).

Ceramics	**Count**
Sherds, body	566
Sherds, rim	28
Sherds, neck	10
Total	**604**

Table 16. Pottery (recent excavations).

Feature	**Hickory (*Carya sp.*)**		**Walnut Family (*Junglandaceae*)**		**Acorn (*Quercus sp.*)**	
	Count	**Weight**	**Count**	**Weight**	**Count**	**Weight**
F.1, SE Quad	19	.34	9	.05	0	0
F. 3, South ½	0	0	6	.05	0	0
F. 4, South ½	2	.06	10	.06	0	0
F. 9, South ½	1	.11	4	.12	0	0
F. 7, East ½	250	3.88	37	.22	2	.004
Totals	**272**	**4.39**	**66**	**.49**	**2**	**.004**

Table 17. Identified nutshell from Voss (weight in grams).

Feature	**Corn Kernels (*Zea mays*)**	**Corn Cupules**	**Beans (*Phaseolus vulgaris*)**	**Squash (*Cucurbita sp.*)**	**Goosefoot (*Chenopodium*)**	**Little Barley (*Hordeum pusillum*)**	**Erect Knotweed (*Polygonum erectum*)**	**Sumac (*Rhus sp.*)**
F.1, SE Quad	0	5	0	1	0	3	0	0
F. 3, South ½	0	0	0	0	0	0	0	0
F. 4, South ½	19	0	0	0	0	0	0	0
F. 9, South ½	0	22	0	1	0	0	0	0
F. 7, East ½	8	28	2	1	13	0	4	2
Total Count	**27**	**55**	**2**	**3**	**13**	**3**	**4**	**2**

Table 18. Identified seeds by count. Soil samples measured between 3 to 5 liters per 10-cm level for all features.

Feature	**Corn Kernels (*Zea mays*)**	**Corn Cupules**	**Beans (*Phaseolus vulgaris*)**	**Squash (*Cucurbita sp.*)**	**Goosefoot (*Chenopodium*)**	**Little Barley (*Hordeum pusillum*)**	**Erect Knotweed (*Polygonum erectum*)**	**Sumac (*Rhus sp.*)**
F.1, SE Quad	0	.025	0	.001	0	.003	0	0
F. 3, South ½	0	0	0	0	0	0	0	0
F. 4, South ½	.469	0	0	0	0	0	0	0
F. 9, South ½	0	.034	0	.001	0	0	0	0
F. 7, East ½	.107	.147	.095	.001	.005	0	.006	.004
Total Weight	**.576**	**.206**	**.095**	**.003**	**.005**	**.003**	**.006**	**.004**

Table 19. Identified seeds from Voss (weight in grams). Soil samples measured between 3 to 5 liters per 10-cm level for all features.

Sample	$\delta^{13}C$	Standard Error
Baum	-11.90	Not reported
Baum	-11.00	Not reported
Baum	-10.30	Not reported
Baum	-12.50	Not reported
Baum	-10.10	Not reported
Baum	-13.00	Not reported
Baum	-21.00*	Not reported
Baum	-11.70	Not reported
Baum	-11.90	Not reported
Baum	-11.70	Not reported
Baum Mean	**-11.97**	
Baldwin	-12.26	0.13
Baldwin	-12.51	0.10
Baldwin Mean	**-12.39**	
Enos Holmes	-10.79	0.13
Enos Holmes	-10.38	0.11
Enos Holmes	-10.06	0.13
Enos Holmes	-11.21	0.10
Enos Holmes	-11.10	0.07
Enos Holmes	-11.93	0.08
Enos Holmes	-11.03	0.09
Enos Holmes	-10.01	0.16
Enos Holmes Mean	**-10.81**	
Feurt	-13.08	0.02
Feurt	-9.61	0.11
Feurt Mean	**-11.35**	
Feurt (SS)	-12.10	Not reported
Feurt (SS)	-11.10	Not reported
Feurt (SS)	-12.00	Not reported
Feurt (SS)	-9.70	Not reported
Feurt (SS)	-9.90	Not reported
Feurt (SS)	-11.10	Not reported
Feurt (SS)	-11.60	Not reported
Feurt (SS)	-10.60	Not reported
Feurt (SS)	-11.90	Not reported
Feurt (SS)	-11.80	Not reported
Feurt (SS)	-10.30	Not reported
Feurt (SS)	-10.00	Not reported
Feurt (SS)	-9.30	Not reported
Feurt (SS)	-10.70	Not reported
Feurt (SS)	-11.00	Not reported
Feurt (SS)	-11.40	Not reported
Feurt (SS)	-10.40	Not reported

Continued

Table 20. Stable Carbon Isotope Data for sites having Baum Series Ceramics. Adapted from Greenlee 2002. Data from the Baum, Gartner, and Feurt (SS) taken from Schurr and Schoeninger 1995. *indicates isotopically-depleted individuals and were not included in averages.

Table 20 continued

Feurt (SS)	-9.90	Not reported
Feurt (SS)	-9.70	Not reported
Feurt (SS)	-11.90	Not reported
Feurt (SS) Mean	**-10.83**	
Gartner	-11.20	Not reported
Gartner	-9.40	Not reported
Gartner	-10.40	Not reported
Gartner	-10.20	Not reported
Gartner	-10.60	Not reported
Gartner	-11.20	Not reported
Gartner	-11.10	Not reported
Gartner	-10.70	Not reported
Gartner	-12.30	Not reported
Gartner	-10.30	Not reported
Gartner	-11.50	Not reported
Gartner	-12.70	Not reported
Gartner	-13.80	Not reported
Gartner	-10.60	Not reported
Gartner	-20.50*	Not reported
Gartner Mean	**-11.14**	
Killen	-8.08	0.05
Killen	-9.11	0.54
Killen	-9.03	0.16
Killen	-8.01	0.2
Killen	-9.84	0.05
Killen	-10.35	0.26
Killen	-8.83	0.07
Killen	-8.33	0.11
Killen	-8.08	0.13
Killen	-9.50	0.03
Killen	-8.73	0.04
Killen	-10.92	0.08
Killen	-10.33	0.37
Killen	-10.00	0.07
Killen Mean	**-9.26**	
Kramer	-20.34*	0.14
Kramer	-10.10	0.11
Kramer	-12.42	0.03
Kramer Mean	**-11.26**	
Voss Mound	-12.91	0.03
Voss Mound	-11.59	0.03
Voss Mound	-9.80	0.09
Voss Mound	-11.00	0.03
Voss Mound	-10.61	0.13
Voss Mound	-11.42	0.16
Voss Mound Mean	**-11.22**	

OHS Excavations		
	Count	Relative Frequency
Grit	7182	99.2%
Shell	56	.8%
Total	7238	100%
Recent Excavations		
	Count	Relative Frequency
Grit	591	97.8%
Shell	13	2.2%
Total	604	100%

Table 21. Frequency of temper types.

Provenience	Count	Vessel part	Decoration
Feat. 4, 38-48 cmbs	1	Body	
Feat. 4, 78-88 cmbs	1	Body	
Feat. 9, 48-58 cmbs	1	Body	
Feat. 9, 88-98 cmbs	1	Body	
Feat. 7, 25-35 cmbs	1	Body	
Feat. 7, 55-45 cmbs	1	Body	
Feat. 7, 35-45 cmbs	1	Rim	Incising, unthickened rim
Feat. 7, 55-65 cmbs	2	Body	
Feat. 7, 65-75 cmbs	3	Body	
Feat. 7, 135-145 cmbs	1	Body	
Mound floor	3	Rim	Rolled rim
Mound	3	Neck	Incising on smooth neck, cordmarking below
Mound floor	23	Body	
F. V	1	Neck	Curvilinear guilloche with punctates in eye of guilloche
Midden, F. VIII	9	Body	
F. X	1	Body	
F. X	1	Rim	Rolled rim with horizontal lug
F. XIII	1	Rim	Incising and large ovate punctates on horizontal lug
F. XIX	1	Body	
Total	**56**		

Table 22. Context and count of shell-tempered sherds.

Rim Form	**Count**	**Relative Frequency**
Thickened Rims		91%
Wedge-shaped rim strip with narrow and rounded lip	374	
Wedge-shaped rim strip with flat lip	3	
Uniformly thick rim strip with rounded lip	7	
Rolled rim	10	2%
Unthickened Rims		4%
Unthickened rim with flat lip	11	
Unthickened rim with rounded lip	6	
Unthickened rim with knife-edge lip	2	
Indeterminate	11	3%
Total	**424**	100%

Table 23. Rim forms identified in the Voss ceramic assemblage.

Maximum Thickness	Thickened (Wedge-shaped)	Rolled	Unthickened
Mean	**8.77 mm**	**11.01 mm**	**7.92 mm**

Table 24. Mean thickness of upper rim.

	Number	Relative Frequency
Cordmarking or partially-smoothed cordmarking	400	94.3%
Plain	24	5.7%
Total	424	100%

Table 25. Frequency of surface treatment on rim sherds (neck only sherds not included).

	Count
Neck Decoration	
Curvilinear guilloche	88
Incising bordered by punctates	14
Punctates	9
Incising, indeterminate	6
Guilloche with punctates in eye of guilloche	5
Incised triangles with punctates	4
Rectilinear guilloche	2
Rim Decoration	
Incised lip	10
Incising on rim strip-paired (//\\) and triple (///\\\) alternating diagonal lines, and wave	7
Notched on upper and lower edge of rim strip	6
Notched on upper edge of rim strip	5
Pie-crust notching on lip	3
Punctates on rim strip-large, ovate or small circular	3
Notched lower edge of rim strip	2
Appendages	
Lugs formed by the widening of the rim strip above and below	30
Horizontal (shelf) lugs	11
Projecting (tongue) lug	5
Strap handles-short and thick with converging sides	2
Teat lug	1
Bifurcated lug	1
Total Decorated Sherds	**214**

Table 26. Decoration on rim and neck sherds.

Lugs/Appendages	Decorated	Undecorated	Relative Frequency of Decorated
Lug formed by widening of rim strip on upper and lower edge	3	27	10%
Horizontal lug	6	5	45%
Strap handle	1	1	50%
Projecting (tongue) Lug	0	5	0%
Bifurcated Lug	0	1	0%
Teat Lug	0	1	0%

Table 27. Frequency of decoration on lugs/appendages.

Type	Provenience	Max Length	Basal Width	Max Thickness
Levanna-like	3740/352?, F. XIV	--	--	3.6
Type 1	3740/263, F. VIII	**19.7**	**14.8**	**2.9**
Type 2	3740/126, F. I, mound	-	15.6	5.1
	3740/33, beneath stone ring	-	16.1	4.0
	3740/126, F. I, mound	33.5	14.8	4.1
	3740/33, beneath stone ring	38.1	17.7	6.2
	3740/33, beneath stone ring	35.5	24.5	7.0
	3740/314, plowzone	31.9	15.1	3.8
	3740/136, surface	25.3	15.2	4.1
	3740/264, F. VIII	--	17.7	5.6
	3740/136, surface	32.0	16.7	5.1
	3740/220, F. I	--	13.9	3.8
	3740/298, F. XX	37.4	14.0	3.2
	3740/25, bottom primary mound	27.2	17.3	3.7
	3740/294, F. XVII	--	13.6	3.8
	3740/136, surface	--	13.9	6.1
	3740/207, F. IX	33.8	15.2	7.1
	3740/207, F. IX	31.8	15.0	4.6
	3740/294, F. XVII	29.9	15.3	4.9
	3740/320, plowzone	31.1	18.0	9.1
	3740/264, F. VIII	--	16.5	3.3
	3740/250, F. II	38.9	13.6	3.7
	3740/136, surface	38.5	17.9	8.6
	3740/220, F. I	--	20.4	3.8
	3740/295, F. XVII	--	--	5.0
	3740/279, F. XIV	--	12.2	3.2
	3740/294, F. XVII	--	14.4	3.3
	3740/218, F. I	30.8	18.7	4.9
	F. 7 East 1/2 65-75	--	17.5	2.6
	F. 7 East 1/2 75-85	30.3	19.8	5.6
	F. 4/9 out of profile	24.4	18.6	5.3
	N5072.5 E5116.5 ST 0-28 cmbs	22.6	13.2	2.6
	N5076.5 E5115 ST 0-28 cmbs	--	18.7	4.0
	N5077 E5111.5 ST 28-30 cmbs	33.0	16.3	8.1
	N5080 E5110.5 ST 0-28 cmbs	--	15.6	4.1
	MEAN	**31.9**	**16.3**	**4.8**
Type 3	3740/134, burial #3	**24.9**	**13.1**	**3.2**
Type 5	3740/294, F. XVII	--	16.5	3.8
	3740/33, beneath stone ring	28.7	11.4	3.5
	3740/279, F. XIV	29.7	12.4	3.0
	N5074 E5117 ST 0-28 cmbs	--	16.7	8.1
	N5074.5 E5116.5 ST 0-28	33.1	13.5	3.7
	N5077.5 E5114.5 ST 28-30 cmbs	28.9	13.7	4.2
	N5094.5 E5081 ST 0-28 cmbs	--	14.0	4.5
	N5094 E5080.5 ST 28-30 cmbs	--	16.0	5.9
	N5094 E5080.5 ST 28-30 cmbs	--	16.0	3.9
	MEAN	**30.1**	**14.5**	**4.5**
Type 6	3740/262, F. VII	--	**18.1**	5.4
	3740/?	23.2	--	4.1
Type 7	3740/29, mound floor	**28.2**	**23.1**	**4.5**

Table 28. Metric data for typed triangular projectile points, after Railey 1992.

Period	**Type – *after Justice 1987***	**Provenience**
Early/Middle Archaic	Kanawha Stemmed	Surface
(top row in photo)	Indeterminate	Surface
	Indeterminate	F. VIII, Midden
	Indeterminate	Unknown
Late Archaic	Brewerton Eared	Beneath stone ring
	Brewerton Eared	Mound floor
	Lamoka	Beneath stone ring
Early Woodland	Turkey Tail	Beneath stone ring
(second row in photo)	Cresap Stemmed	Surface
	Cresap Stemmed	F. I, village
	Cresap Stemmed	Mound fill
	Adena	Beneath stone ring
	Robbins	Plowzone
	Indeterminate	Mound floor
Late Woodland	Jack's Reef	Mound floor
(bottom row in photo)	Lowe Cluster	Beneath stone ring
	Raccoon Notched	Unknown
	Raccoon Notched ?	Surface
	Raccoon Notched ?	F. VIII, Midden

Table 29. Type and provenience of side and corner-notched projectile points in the Voss lithic assemblage. Six additional notched projectile point fragments recovered during the 1960s could not be assigned to a period.

RCYBP **2 Sigma cal.**	**Lab code**	**Material**	**Provenience**	**Associated Ceramics**
525+/-30 Yrs. B.P. A.D. 1322-1441	ISGS-A0801	*AMS* Bean	Feat. 7-2005, 45-55 cm below ground surface	Large portion of rim, grit-tempered, wedge-shaped rim strip, 3-lined incised triangles bordered on top and bottom by punctates, cordmarked, narrow and rounded lip
980+/-40 Yrs. B.P. A.D. 992-1156	Beta-211383	*Standard* Wood	Feat. 7-2005, 65-75 cm below ground surface	Two grit-tempered neck sherds with punctates and incising that refit with the vessel described above; 3 shell-tempered, cordmarked body sherds
630+/-40 Yrs. B.P. A.D. 1285-1401	Beta-224289	*AMS* Nutshell	Feat. 3-2004, 28-38 cm below ground surface	Unstratified uniform fill, possible post mold; Portion of a grit-tempered, cordmarked vessel with wedge-shaped rim strip from 38-48 cmbs
520+/-40 Yrs. B.P. A.D. 1316-1447	Beta-224290	*AMS* Nutshell	Feat. 4-2004, 78-88 cm below ground surface	Grit-tempered neck sherd with curvilinear guilloche over cordmarking; one shell-tempered cordmarked sherd

Table 30. Recently excavated features with radiocarbon dates.

Site	Village Configuration	Village Organization	Plaza	Mound	House Type	House Size	Village Burials
Baldwin	--	--	--	No	--	--	Yes/ flexed and extended graves; one in ash pit
Baum	Likely circular/oval	Burials and pit features adjacent to houses	Probable	Yes	Circular	3-4 m in dia.	Yes/ 127 extended and flexed; one double burial
Blain	Circular/oval	Pit features located in front of houses	Yes	Yes	Oval	5 x 7 m	(fragmented human remains in plowzone)
Enos Holmes	--	--	--	Yes	--	--	--
Gartner	Likely circular/oval	Burials and pit features adjacent to houses	Probable	Yes	Circular	3-4 m in dia.	Yes/ 15 extended and flexed
Graham	Cluster	Cluster of pit features; no houses uncovered	No	No	--	--	Yes/ 1 in bottom of pit feature; others reported by local collectors
Howard Baum	Linear?	Pit features, no houses uncovered	No?	No	--	--	No/ Excavation limited to narrow transect
Kramer (Cramer)	Likely circular	Burial among pit features, no houses uncovered	Probable	Yes	--	--	Yes/ 1 extended among pit features
Voss	Circular/oval	Pit features located in front and between houses	Yes	Yes	Sub-rectangular	6 x 8 m	No/ Human remains recovered from surface by land owner

Table 31. Intrasite settlement characteristics of Fort Ancient sites in the central Scioto and upper Hocking River drainages.

Excavated mounds	Dimensions	Location in relation to village	Sub-mound structure or architecture	# of burials/ # with grave goods	Stratigraphic context of burials
Baum	Truncated 120' at base 15' in height	Near edge of terrace; near center of village	2 circular struc 26' in dia.; circle of gravel	17/ 7 and pottery with cremations	16 extended, 1 flexed; inside structures
Blain	Elliptical 70' x 50' 18" in height	South side of site near river; near center of village	No	7/ 5	6 extended, 1 flexed
Clay	Circular 60' in dia. 5' in height	Unknown	Clay platform below ring of limestone slabs and layer of ash	15/ 12	Extended, flexed and bundled; most on floor or above; 3 below
Cleek-McCabe	Two Circular; excavated one 90' in dia. 2'6" in height	One mound near creek, the other directly opposite it 200'	One circular two rectangular superimposed; rock pavement	21/ Unknown	14 near surface and 5 on or below floor
Enos Holmes	Circular 80' in dia. 4' in height	Northern edge near the creek	Circular wall-trench on primary mound 31' in dia.	14/ 8	12 extended, 2 flexed; sub-floor and intrusive near surface
Feurt	3 Elliptical 70x60x3'H 90x40x8'H 90x112x6'H	Along western edge of village near terrace edge	No	No. 1-107 No. 2-137 No. 3-101/ Rare	Mostly flexed, 12 bundle; most above, a few sub-floor burials
Fullerton Field	2 mounds; 100' in dia. 4' and 6' H	Eastern side of village near old river bed	No	?/Minority and only with extended	Mostly flexed, on or below surface
Gartner	Tripartite and circular 75' in dia. 7'6" in height	Western side near terrace edge; near center of village	Crematory platform in 1st section	41 (in 3 sections) and cremations/ 21	Extended and flexed on base and in fill, and sub-floor pits
Hine	Circular 60' in dia. 7' in height	Unknown	Small to very large stones near base	5/ 4	1 intrusive near apex, four extended on flr
Killen	Elliptical 80' x 50' 13" in height	Western end of linear settlement near terrace edge	Prepared basin platform of sandy soil	35/ Only with floor burials	On prepared surface and below in pits
Roseberry Farm	Circular 79' in dia. 2' in height	Interface of plaza/ residential zone; near terrace edge	No	25 in two trenches/ Rare	Most flexed in intrusive bell-shaped pits
Taylor (earthen mound)	Elliptical 70 x 35' 7' in height	Southwestern terrace edge; near center of village	No	79/ 18	Flexed,extended, bundle, double, multiple
Turpin (earthen mound)	Elliptical 80+' x 60' (estimate of original) 6'H	Southern portion of site? Small mounds on northwestern edge closer to river?	No	160+/ ? Only 4 of 60 in primary mound	Extended and piled; burials on outer edge heads toward center
Voss	Elliptical 85' x 65' 4-5' in height	Interface of plaza/ residential zone; near terrace edge	Oval structure; ring of stones around base	7/ 4	Flexed in sub-floor pits

Table 32. Sites with excavated mounds. Fox Farm, Madisonville, and a small mound at Serpent Mound not included.

Height of Mounds in Sample		
3' or less in height	4-8' in height	8+' in height
5	11	1

Table 33. Height of mounds in sample. Degradation from plowing is assumed. Feurt Mounds and Fullerton Field Mounds counted separately.

Frequency of mound sites reporting:	Total Sample n=14 (Sites with multiple mounds are considered as 1 unit in the sample)		In Central Scioto Drainage n=5	
	Number of sites	Relative frequency of sites	Number of sites	Relative frequency of sites
Sub-mound architecture	8	57%	4	80%
Sub-floor burials	9	64%	3	60%
Burials in mound fill above floor	10	50%	3	60%

Table 34. Comparison of characteristics of mound construction.

Sub-mound architecture:	Total Sample n=14 (Sites with multiple mounds are considered as 1 unit in the sample)		In Central Scioto Drainage n=5	
	Number of sites	Relative frequency of sites	Number of sites	Relative frequency of sites
Sub-mound structure	4	29%	3	60%
Prepared platform	3	21%	1	20%
Concentration of stones	5	36%	2	40%

Table 35. Comparison of sub-mound architecture.

APPENDIX B: FIGURES

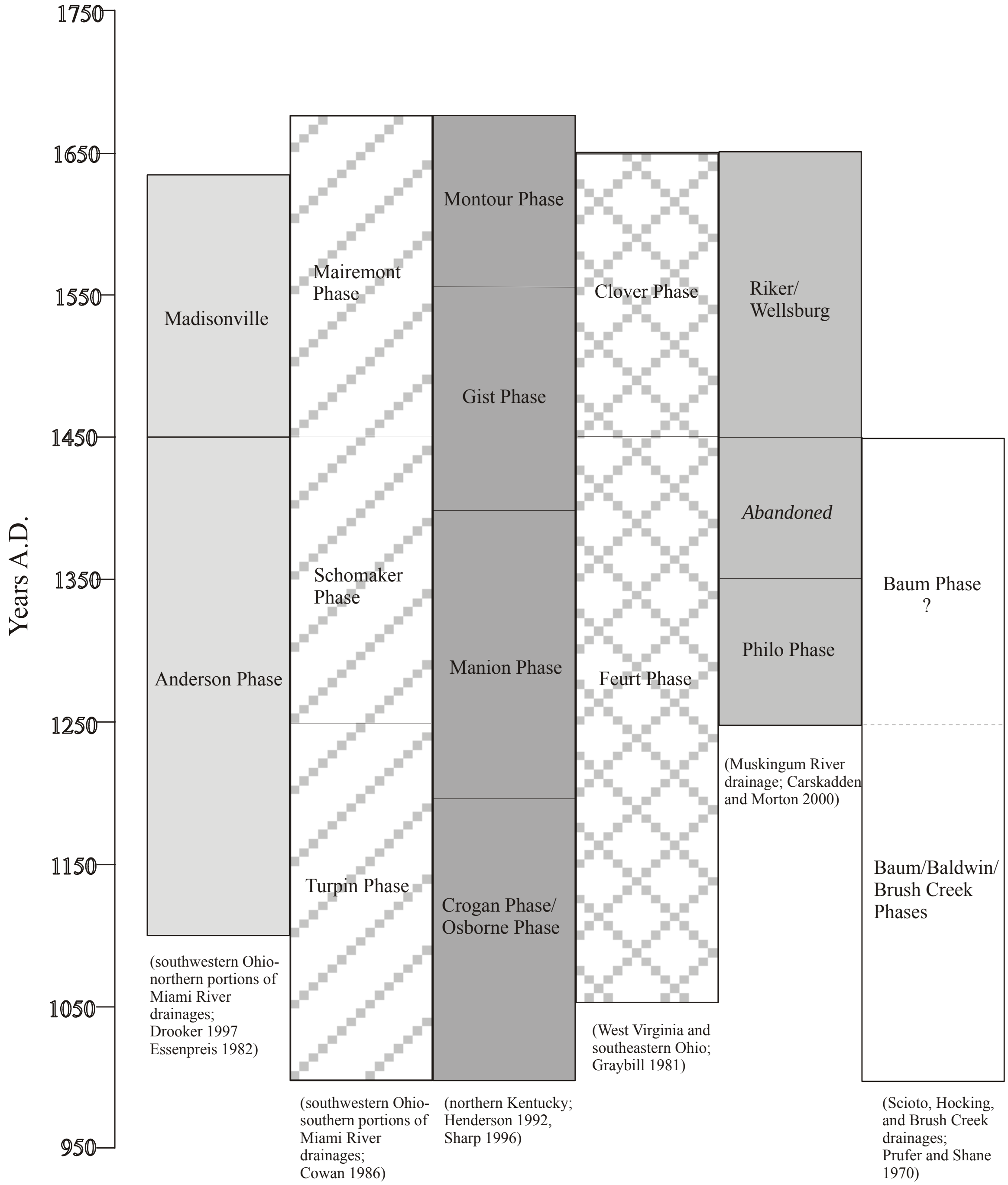


Figure 1. Previously proposed chronologies for Fort Ancient sites in various drainages.

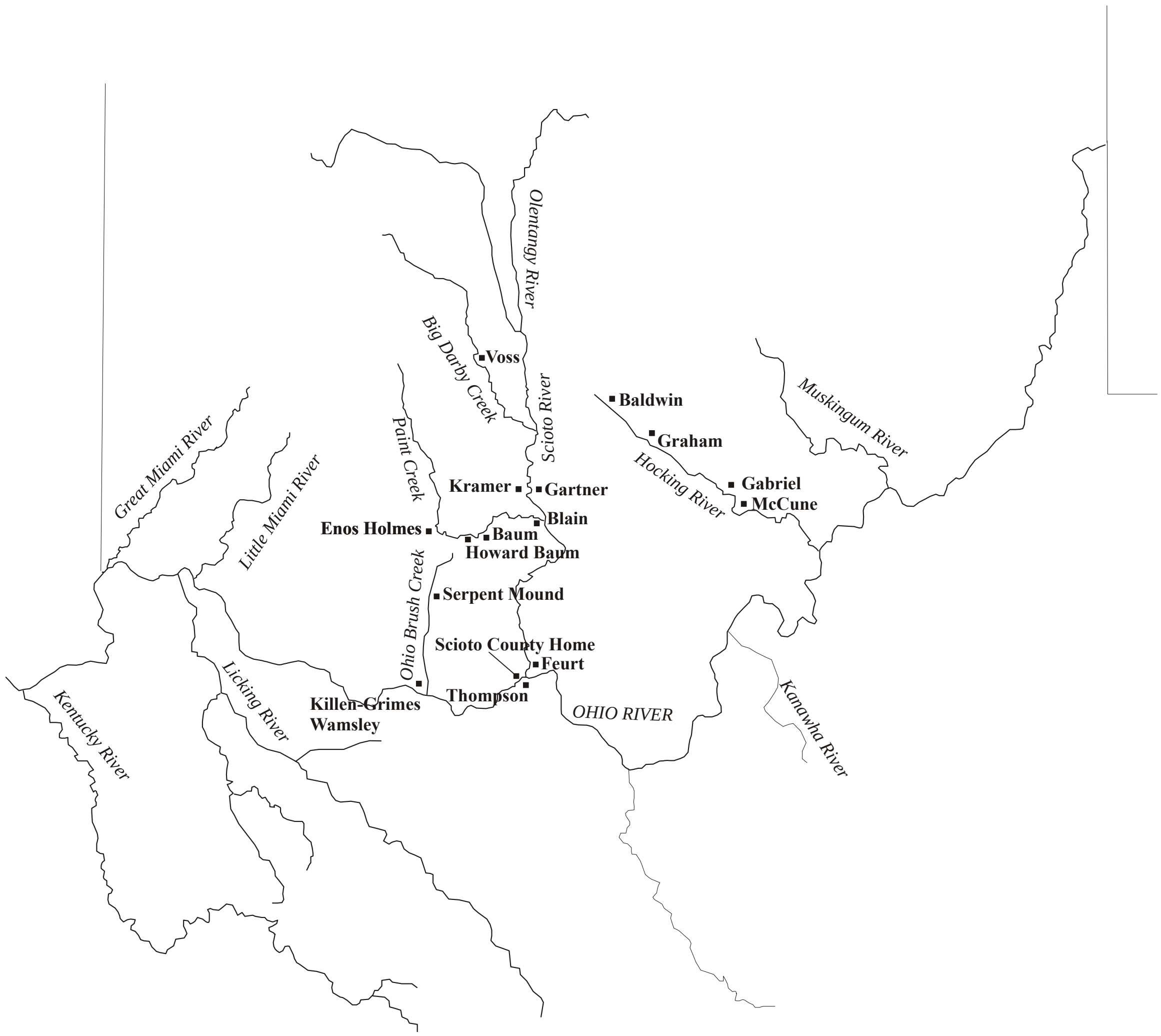


Figure 2. Sites with Baum Series ceramics.

Church's chronology	**Sites**	**Description**
Transitional Late Prehistoric	Howard Baum Voss Enos Holmes Blain	Ceramics <5% shell-temper; >50% decoration being guilloche design; thickened rims; lips flat or round; convex-base triangular points dominate; C-14 dates overlap Late Woodland-Late Prehistoric
Early Late Prehistoric	Baum Gartner Kramer	Ceramics w/ >15% shell-temper; <50% decoration being guilloche design; <25% thickened rims; concave and straight-base triangular points dominate

Figure 3. Chronology of central Ohio sites from Church 1987: 128.

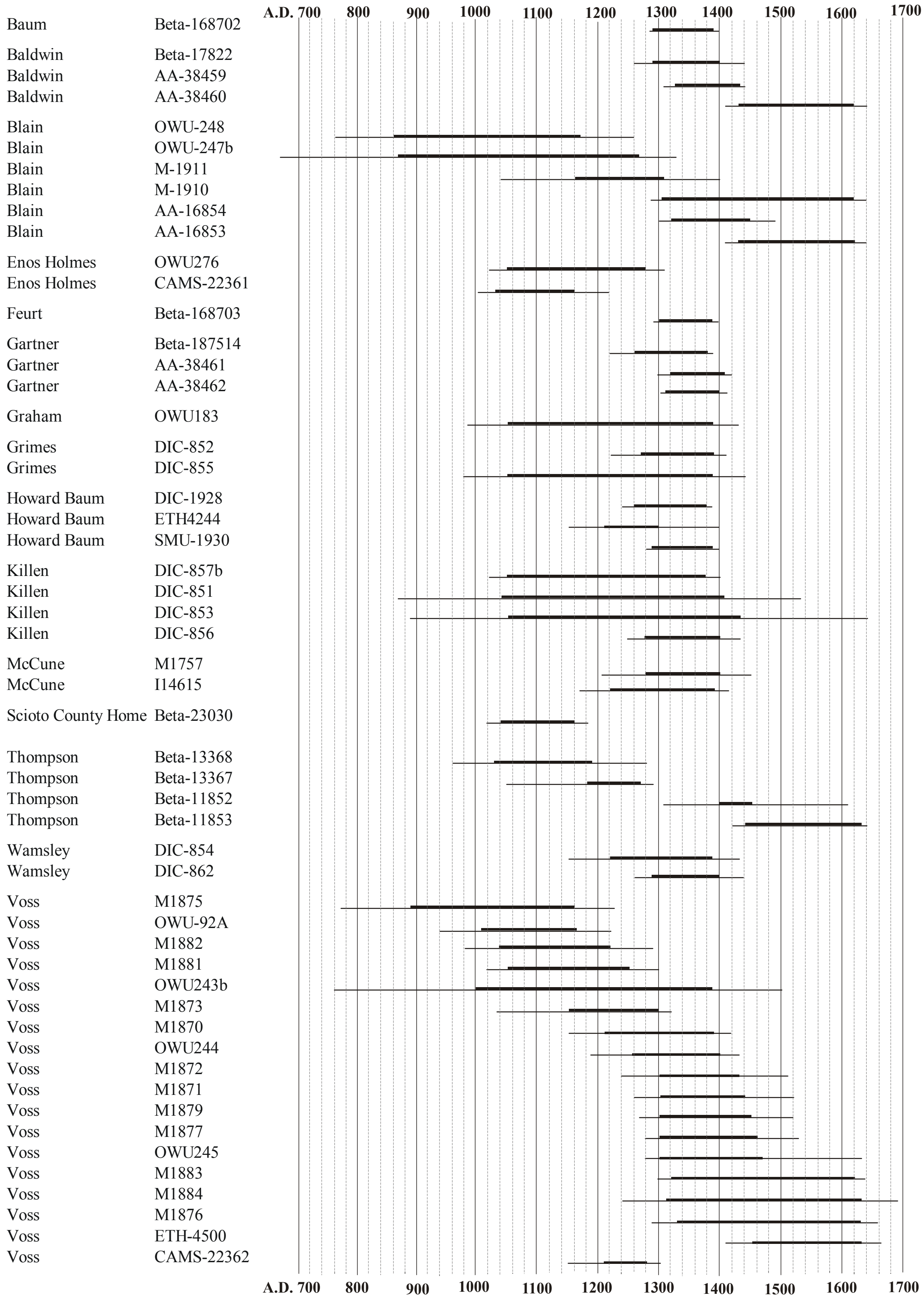


Figure 4. Radiocarbon ages, calibrated using CALIB 5.0 (INTCAL04), Stuvier and Reimer 1993.

EARLY A.D. 1000-1200	MIDDLE A.D. 1200-1400	LATE A.D. 1400-1600
Thompson		Thompson
	Baldwin	Baldwin
Blain	Blain	Blain
Voss	Voss	Voss
	Feurt	
	Baum	
	Gartner	
	Howard Baum	
	Gabriel	
	McCune	
	Wamsley	
	Grimes	
Killen	Killen	
Graham	Graham	
Scioto County Home		
Enos Holmes		

Figure 5. Site chronologies suggested by radiocarbon dates.

Figure 6. Galloway Quadrangle, USGS 7.5 Minute Topographic Map.

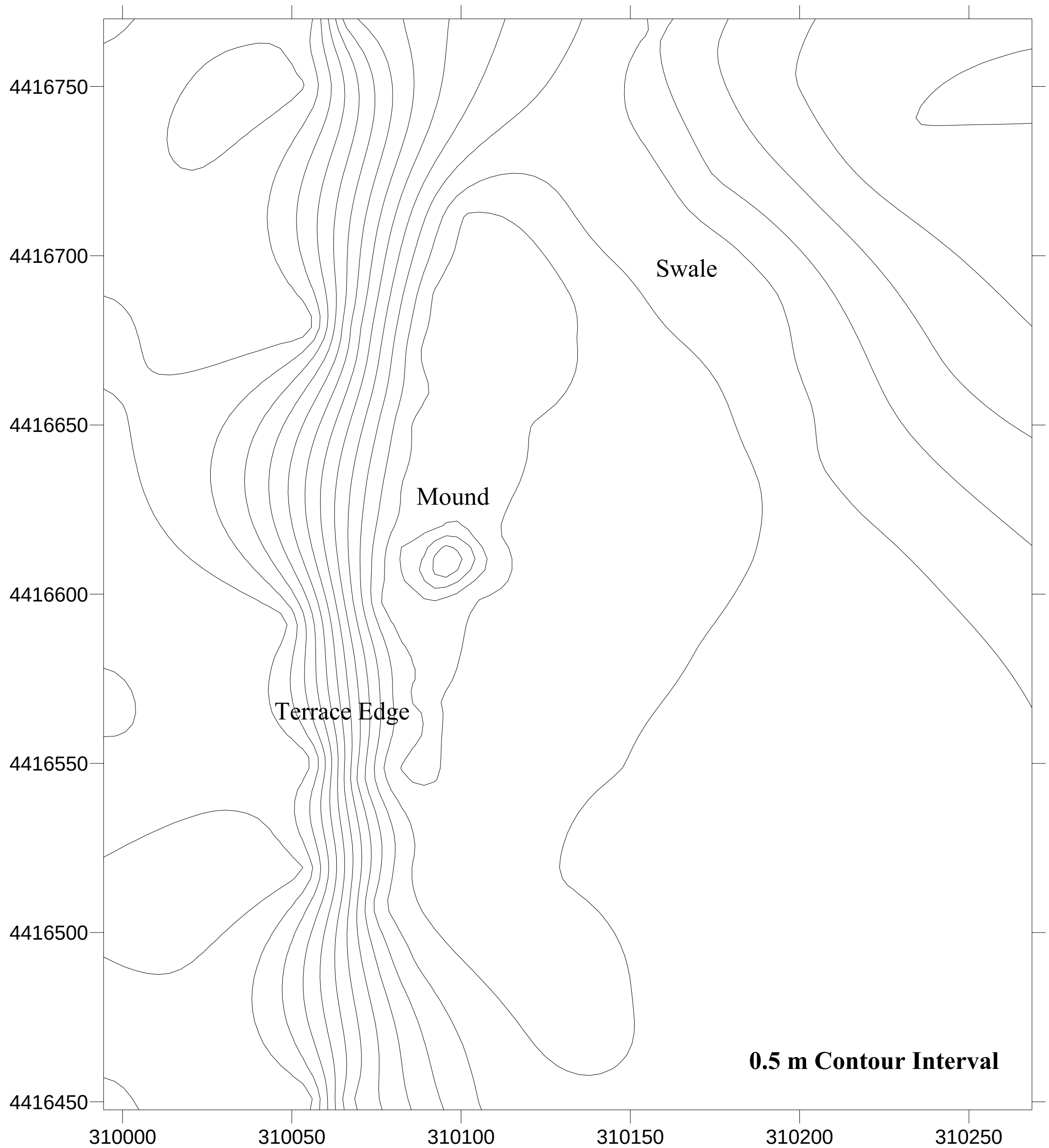


Figure 7. Topography of the Voss Site. UTM Coordinates.

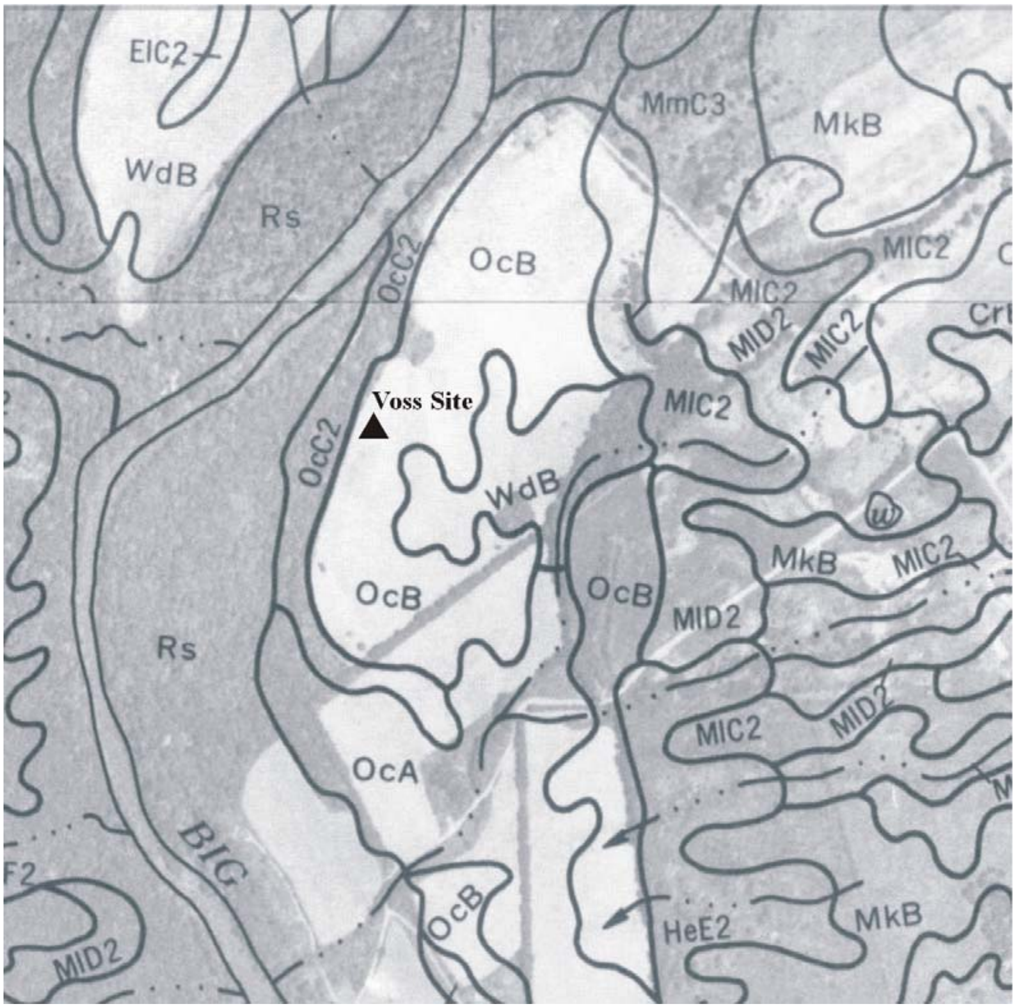


Figure 8. Soils map of the Voss Site. Soil Survey of Franklin County, Ohio, USDA. Sheet Number 49 and Sheet Number 56.

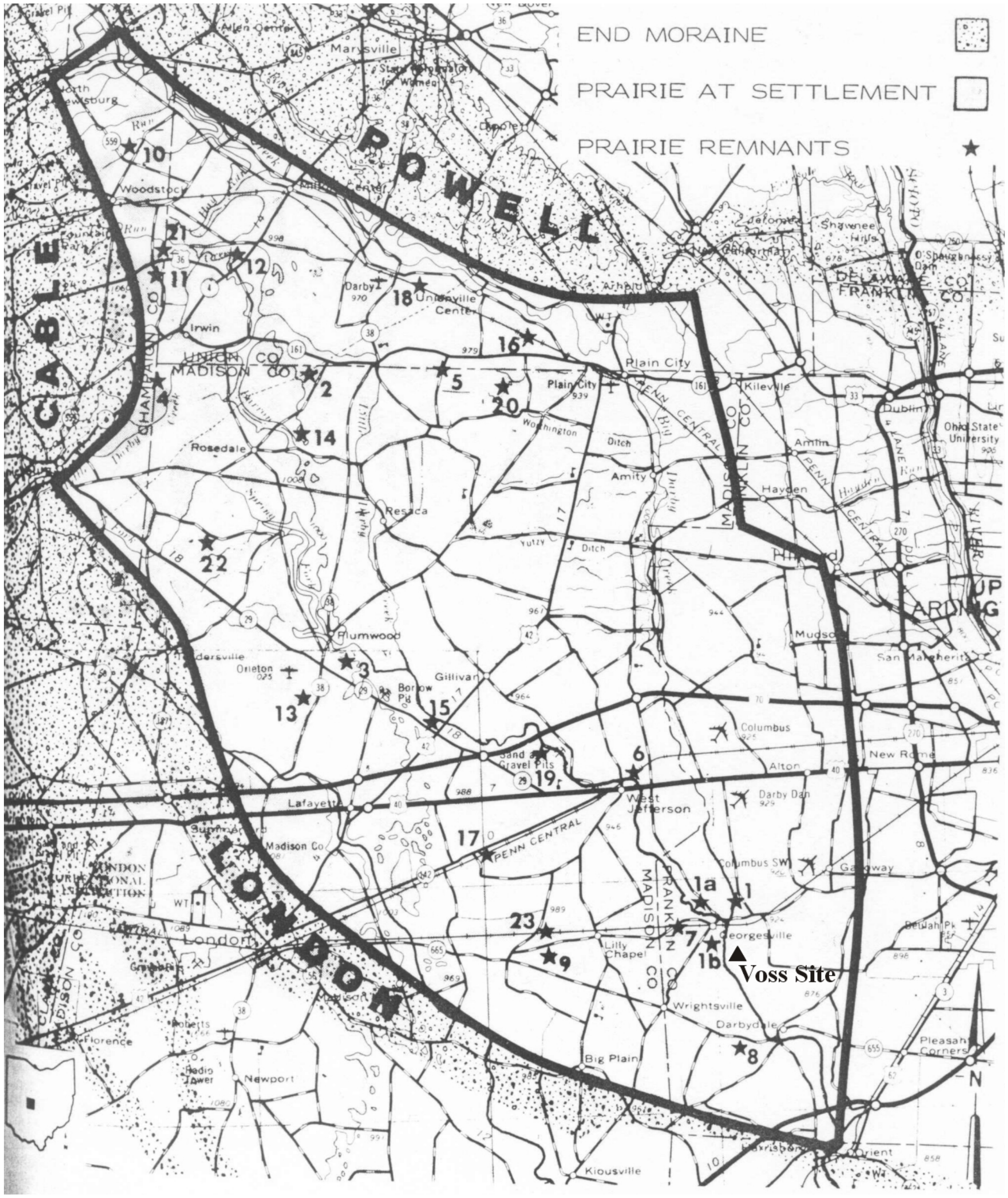
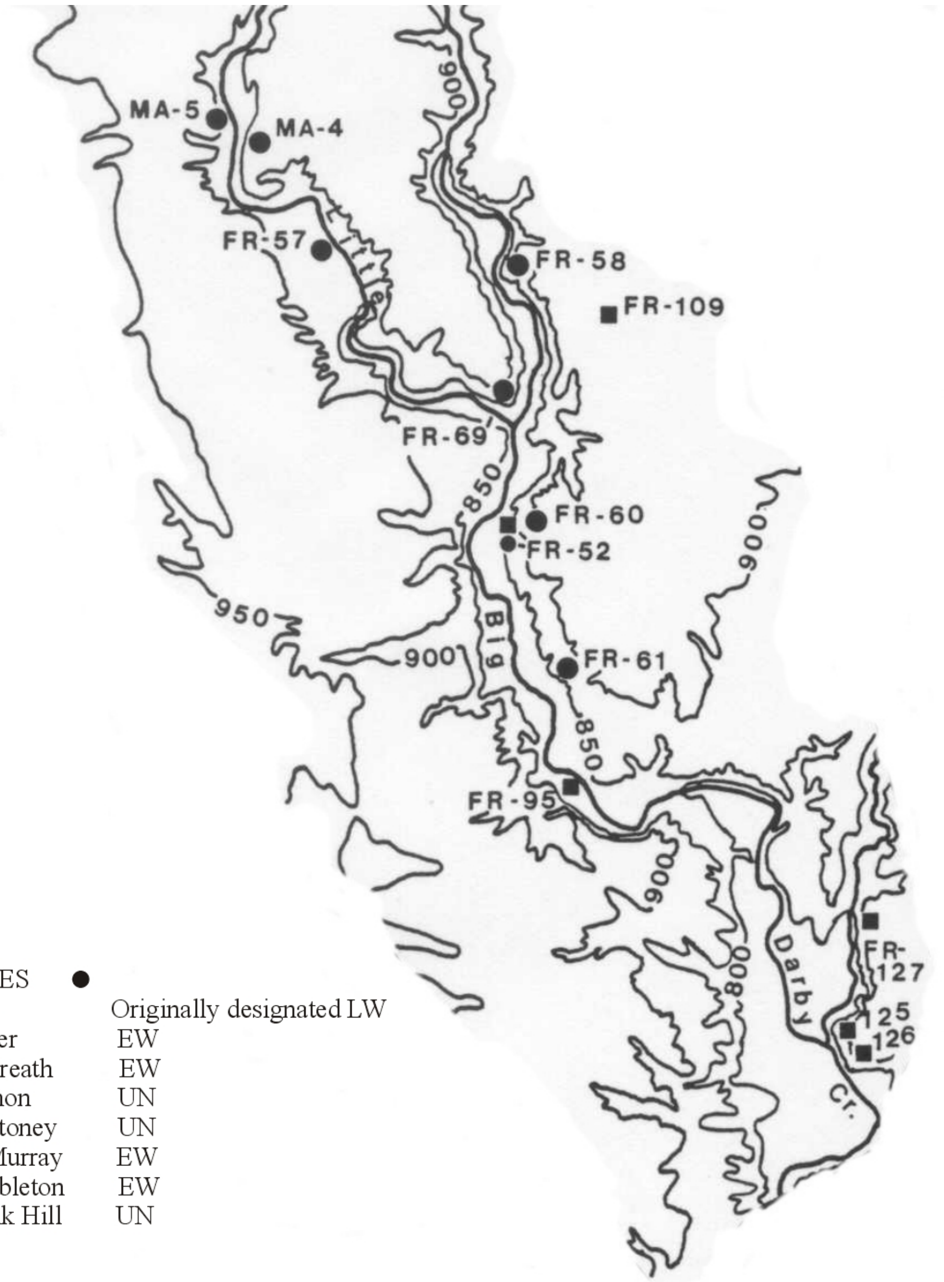


Figure 9. Map of the Darby Plains, in King 1981.



MOUND SITES ●

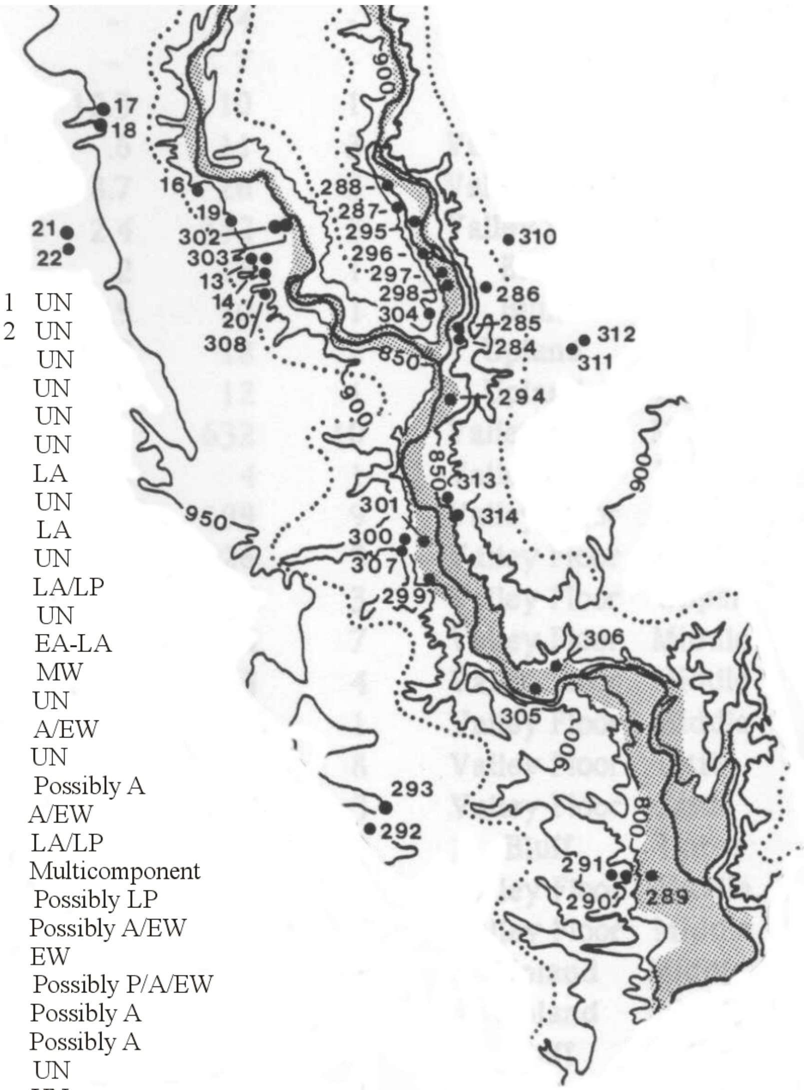
33Fr52	Voss	Originally designated LW
33Fr57	Sidner	EW
33Fr58	Galbreath	EW
33Fr69	Cannon	UN
33Fr60	Montoney	UN
33Fr61	McMurray	EW
33Ma4	Hambleton	EW
33Ma5	Skunk Hill	UN

NON-MOUND SITES ■

33Fr52	Voss	Originally designated LW
33Fr95	Chenewith	UN
33Fr109	Emmelhainz	UN
33Fr125	Timberlake I	LA
33Fr126	Timberlake II	UN
33Fr127	Lennington	EW?

UN (Unkown Affiliation)
A (Archaic)
LA (Late Archaic)
EW (Early Woodland)
MW (Middle Woodland)
LW (Late Woodland)
LP (Late Prehistoric)

Figure 10. Sites mapped by OHS survey. Adapted from Dancey 1986.



33Fr284	Darby Metro-Park Site 1	UN
33Fr285	Darby Metro-Park Site 2	UN
33Fr286	Murnan Site	UN
33Fr287	Cray Site I	UN
33Fr288	Cray Site II	UN
33Fr289	Sheridan Site	UN
33Fr290	Overview I Site	LA
33Fr291	Overview II Site	UN
33Fr292	Gutheil Site II	LA
33Fr293	Gutheil Site I	UN
33Fr294	McDowell Site	LA/LP
33Fr295	Arlene Site	UN
33Fr296	Maggard Site	EA-LA
33Fr297	River Bend Site I	MW
33Fr298	River Bend Site II	UN
33Fr299	McMillin Site	A/EW
33Fr300	Biggart Site II	UN
33Fr301	Biggart Site I	Possibly A
33Fr302	Shipley Site I	A/EW
33Fr303	Shipley Site II	LA/LP
33Fr304	Sundance Site	Multicomponent
33Fr305	Clark Site I	Possibly LP
33Fr306	Clark Site II	Possibly A/EW
33Fr307	Kesrith Site	EW
33Fr308	Knoll Site	Possibly P/A/EW
33Fr310	Oak Tree Site	Possibly A
33Fr311	Schilling Site I	Possibly A
33Fr312	Schilling Site II	UN
33Fr313	Nicobar Site	UN
33Fr314	Lane Site	Possibly A/EW
33Ma13	Thomas Ditch West Site	A
33Ma14	Thomas Ditch East Site	UN
33Ma15	Ball Site	UN
33Ma16	Leela Site	Multicomponent
33Ma17	Kent Ditch North Site	Possibly P/A/EW
33Ma18	Kent Ditch South Site	UN
33Ma19	Kutah Site	A
33Ma20	Shonjir Site	A/EW
33Ma21	Regul Site	A/EW
33Ma22	Duncan Site	UN
33Ma101	Glade Run Site	Multicomponent
33Ma102	Monroe Site	Possibly A/EW/LP
33Ma103	Jefferson Site	Possibly A/EW/LP

UN (Unkown Affiliation)
A (Archaic)
LA (Late Archaic)
EW (Early Woodland)
MW (Middle Woodland)
LP (Late Prehistoric)

Figure 11. Survey of Darby Creek drainage. Adapted from Dancey 1986.

Figure 12. Reconstructed mound with Larry Wickliff, volunteer, in foreground. Photo taken in Winter 2005, looking southwest from northeast of mound.

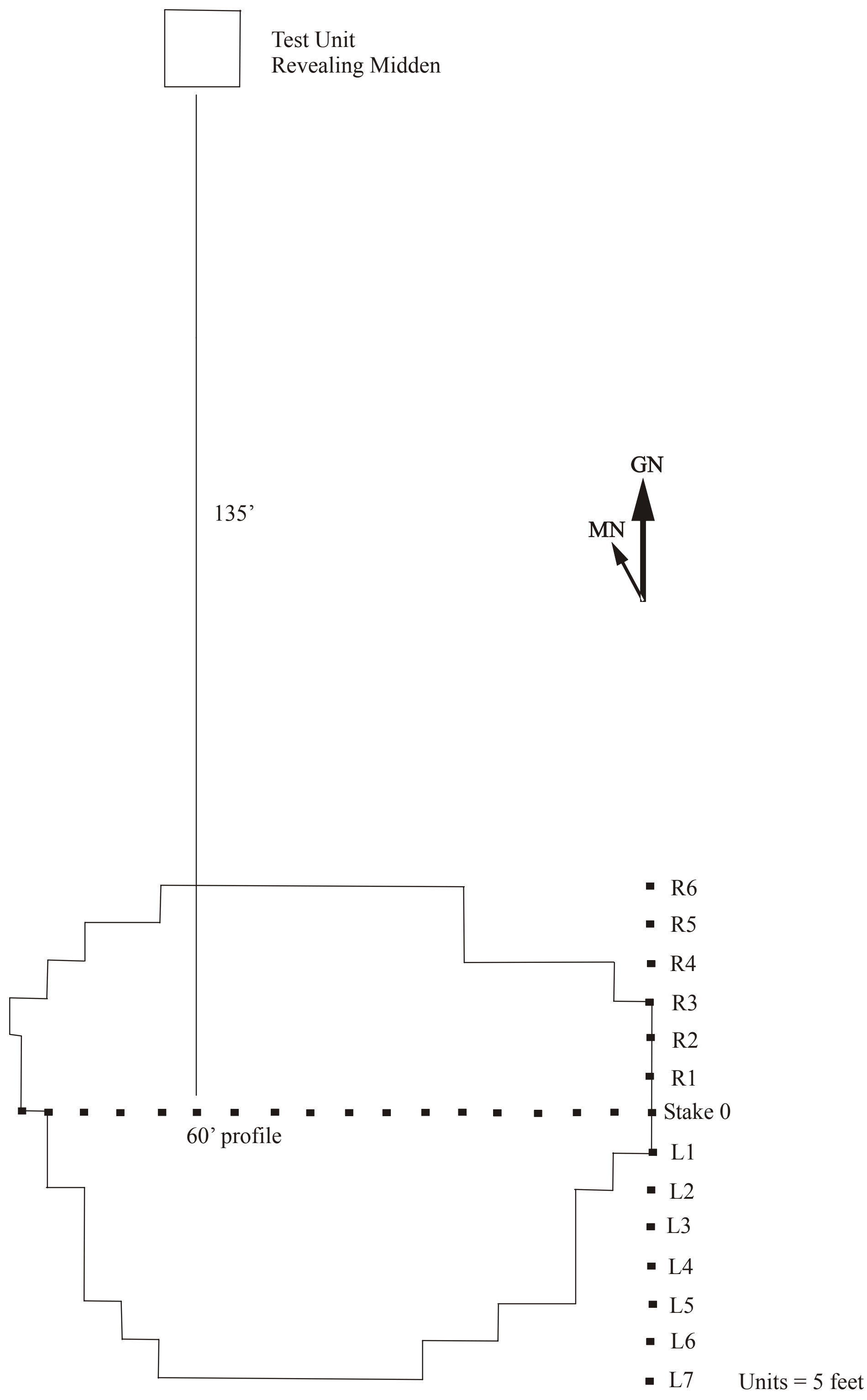


Figure 13. OHS grid for 1963 mound excavations. Adapted from Baby et al. 1964.

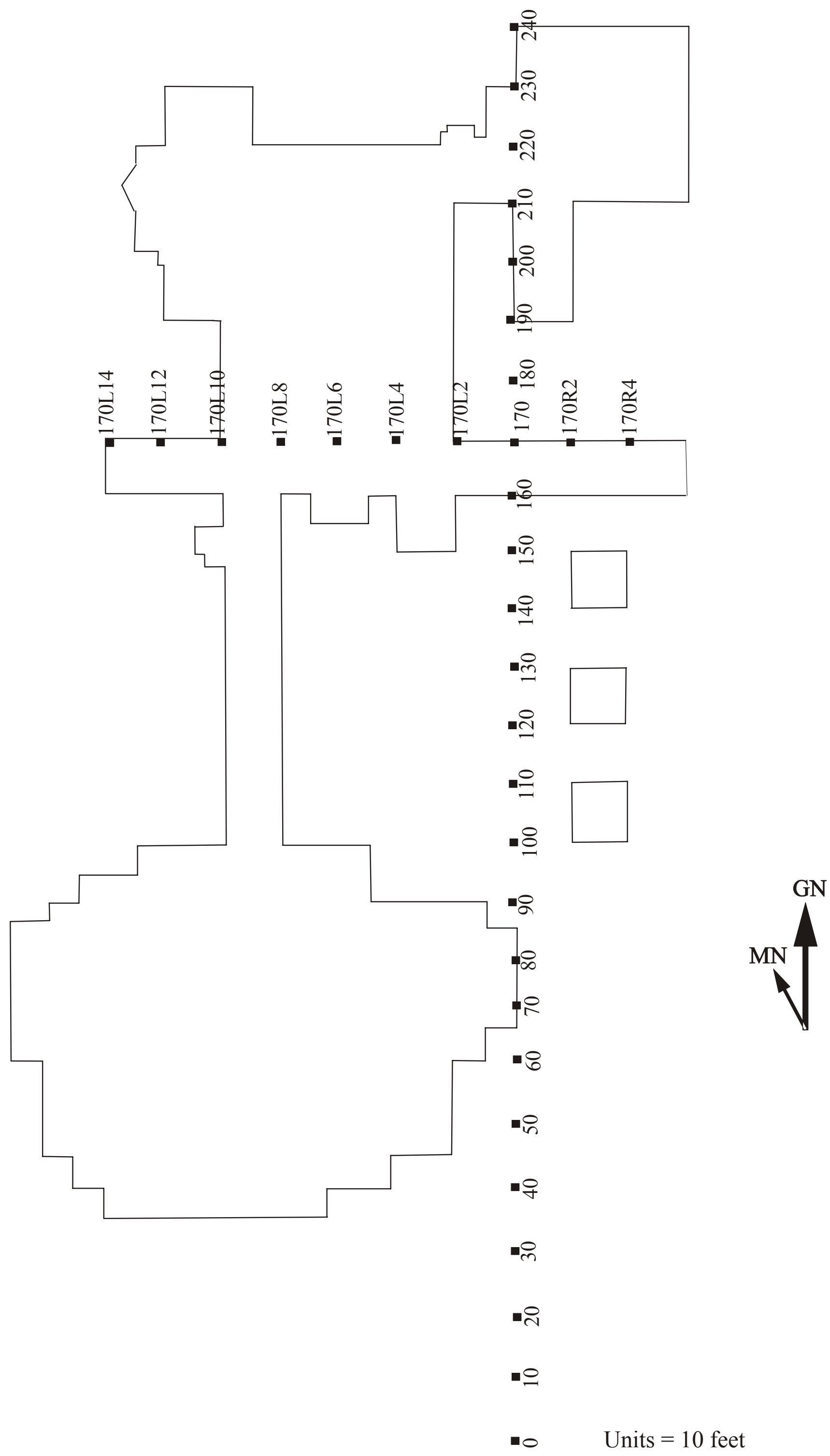


Figure 14. OHS grid used during 1966 village excavations. Adapted from Baby et al. 1967.

Figure 15. Original Voss Mound. Photo taken in 1963, looking west from east of the mound.

Figure 16. Mound profile at 40' profile. Photo taken in July, 1963, looking northwest. Height of mound near apex appears to be between 4 and 5 feet.

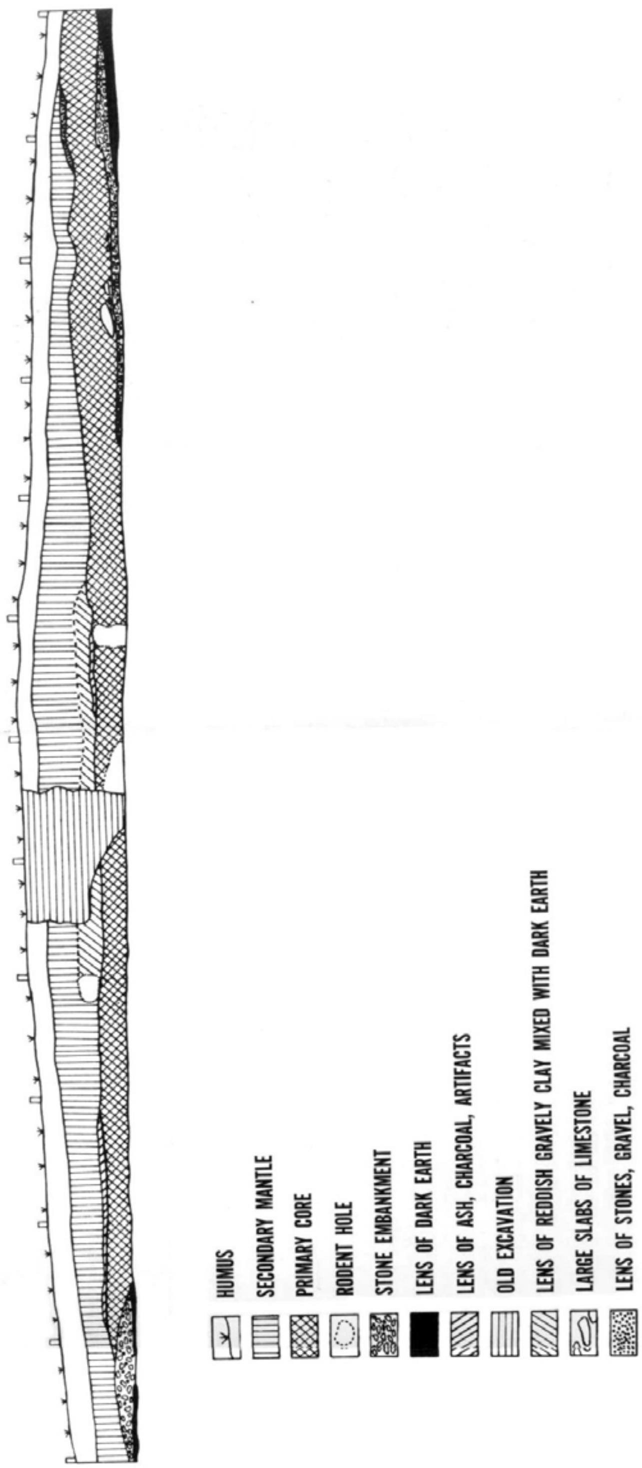


Figure 17. Typical mound profile, in Baby, Potter, and Mays 1966.

Figure 18. Mound burials 1, 2, 3, and 4 in two layers. North is to the right of the page.

Figure 19. Shell hoe recovered from Feature I (burial pit) under the mound.

Figure 20. Mound burials 5 and 6 with two short-stemmed elbow pipes, bone hair pin, and hawk's beak.

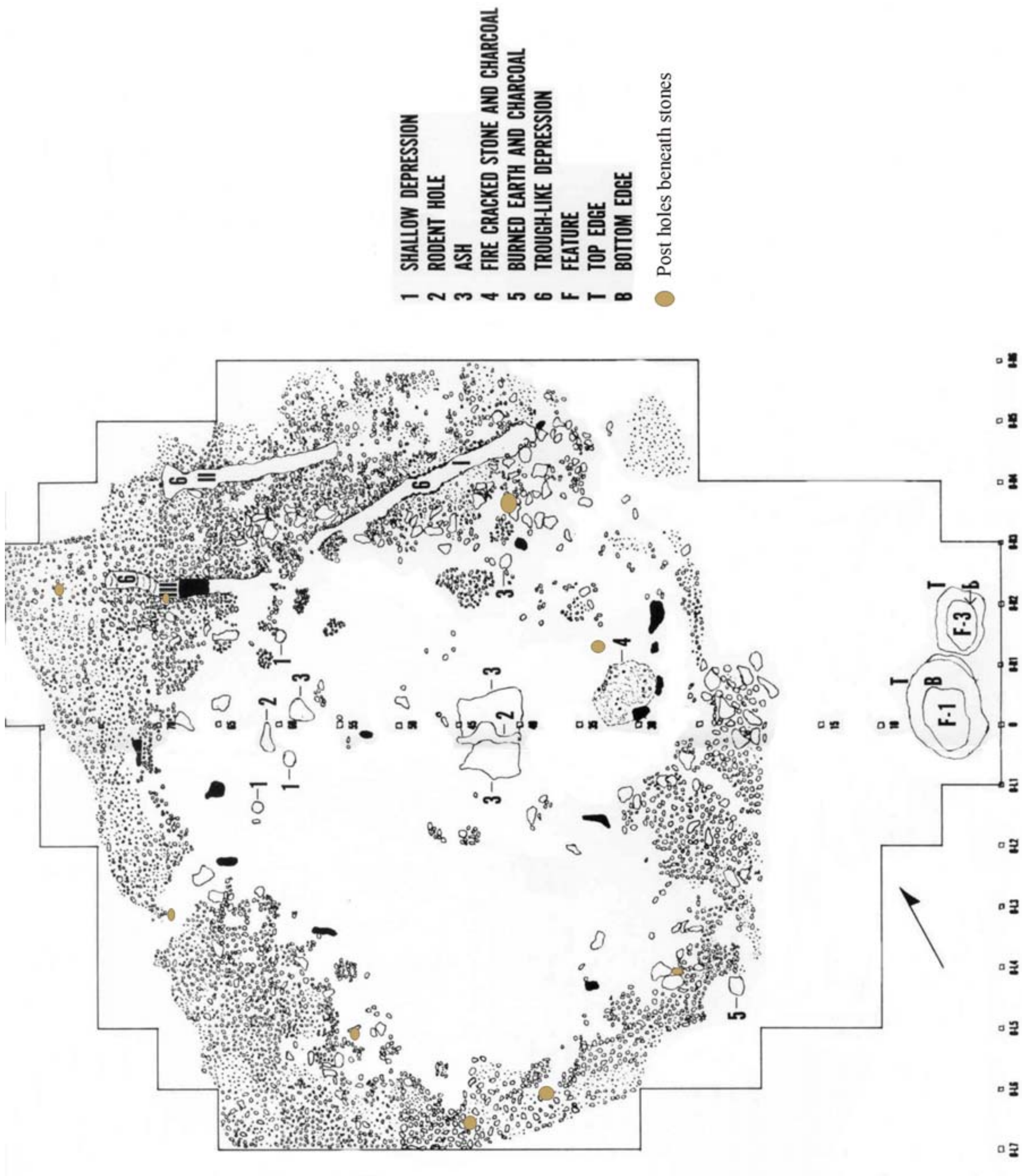


Figure 21. Plan view of mound floor and outline of stones, in Baby, Potter, and Mays 1966. Locations of post holes beneath the stone were added.

Figure 22. Stones near base of primary mound. Photo taken in 1963, looking south.

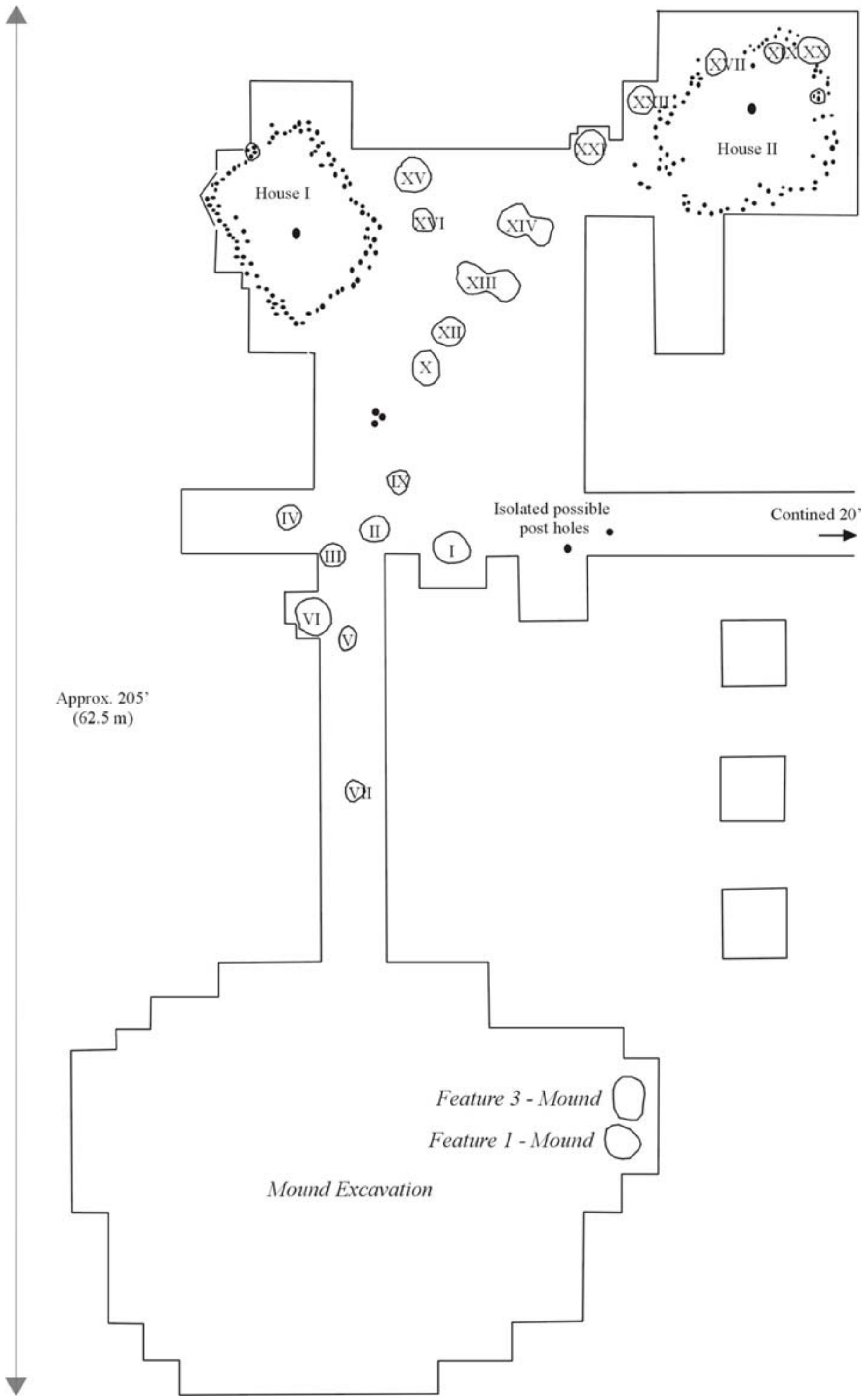


Figure 23. Features from 1966 village excavations. Adapted from Baby, Potter, and Sawyer 1967.

Figure 24. Overhead view of 1966 excavations, looking west. House II and several pit features not yet revealed.

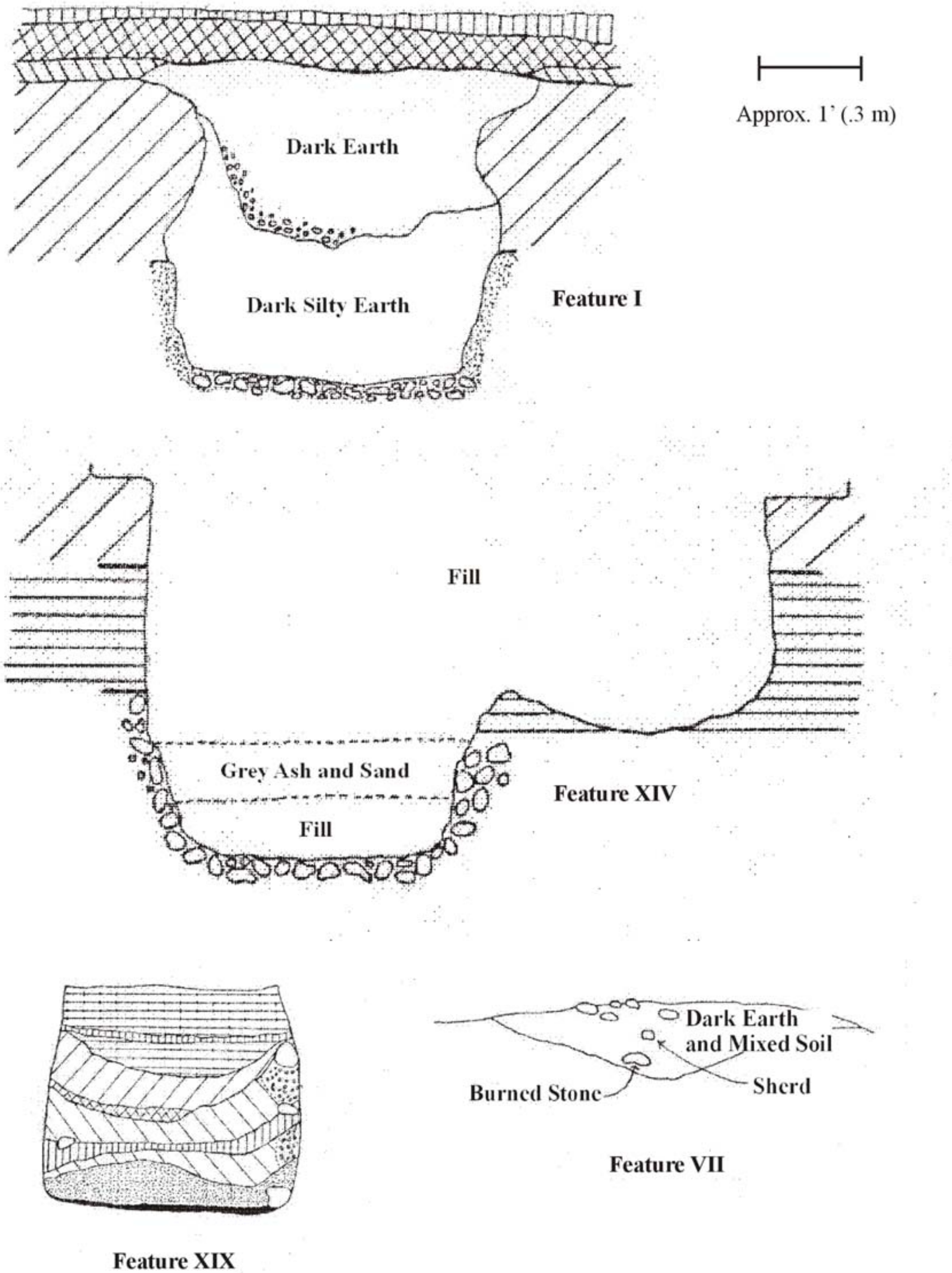


Figure 25. Village features excavated by OHS. Adapted from Baby, Potter, and Sawyer 1967.

Figure 26. Bone artifacts recovered from mound and village excavations. A prior photograph of the bone fishhooks is provided in inset as these objects are on display and were not available for photographing.

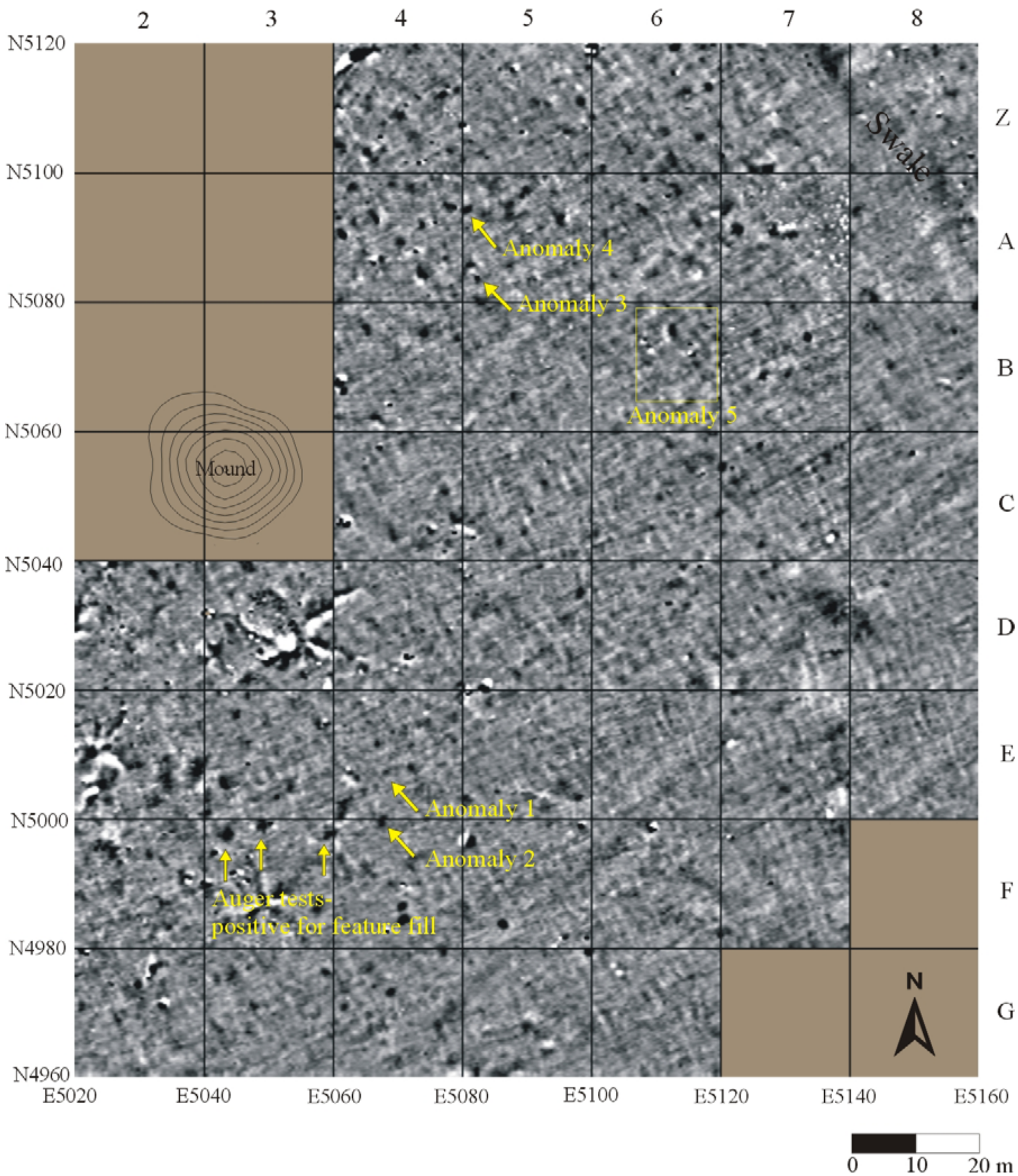


Figure 27. Magnetic survey data showing all blocks and the location of tested anomalies. Processing included Zero Mean Traverse, Clip +/-15 nT, and Interpolate.

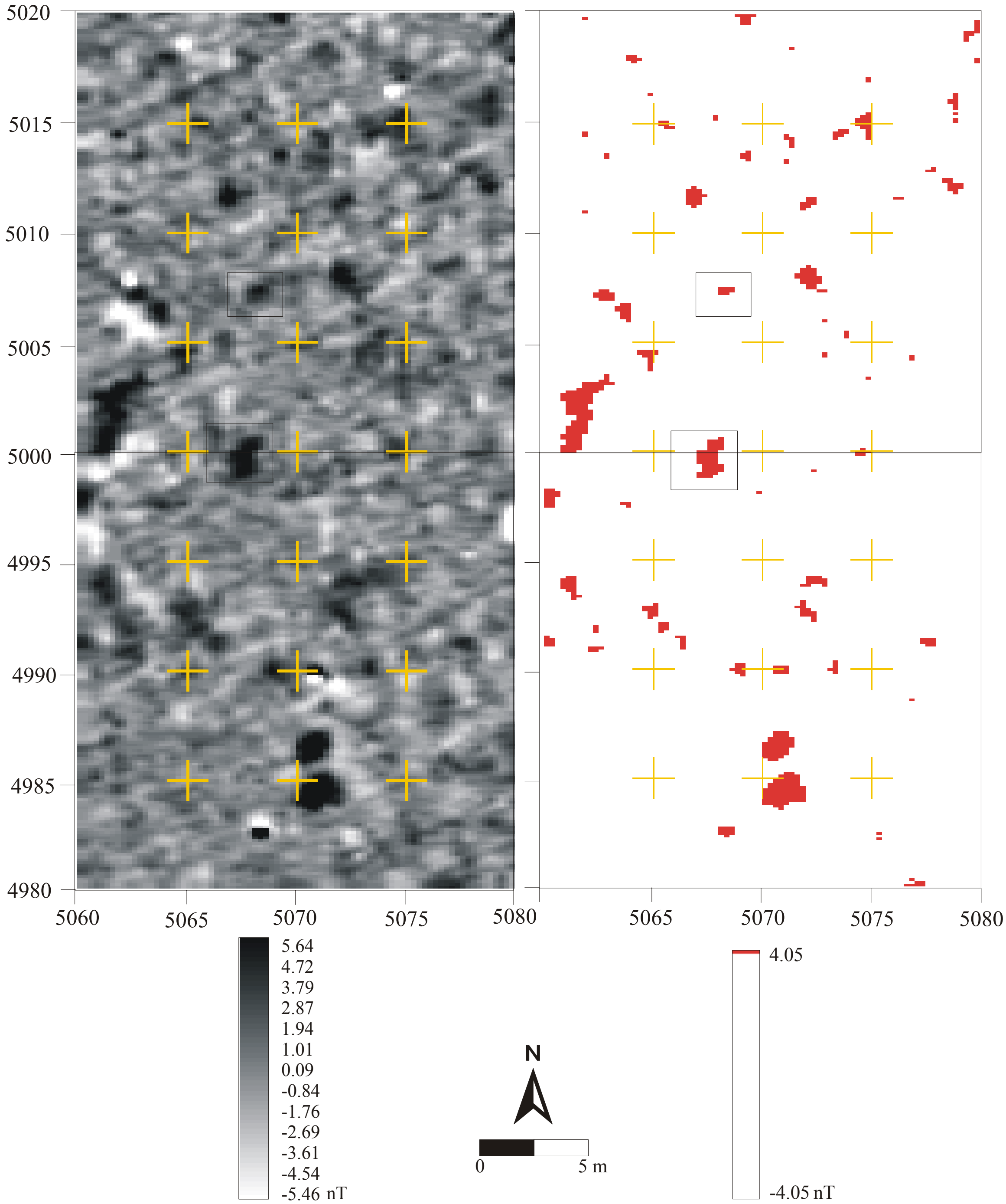


Figure 28. Magnetic data from Blocks E4 and F4 showing Anomaly 1 and Anomaly 2. The graphic on the right shows only those anomalies with readings 3 standard deviations above the background mean of the blocks. Processing included Zero Mean Traverse, Clip +/-15 nT, and Interpolate.

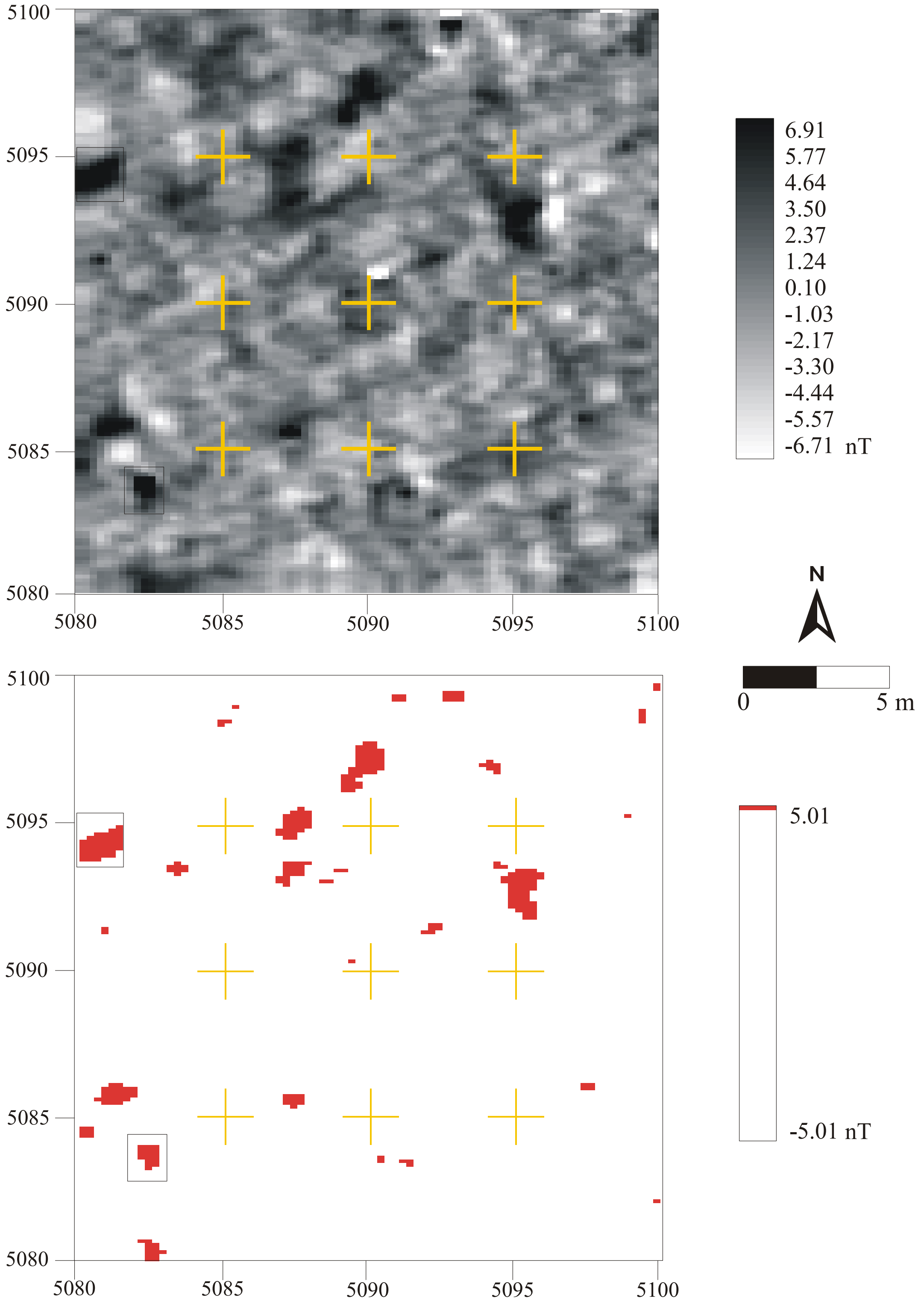


Figure 29. Magnetic data from Block A5 showing Anomaly 3 and Anomaly 4. The bottom graphic shows only those anomalies with readings 3 standard deviations above the background mean of the block. Processing included Zero Mean Traverse, Clip +/-15, and Interpolate.

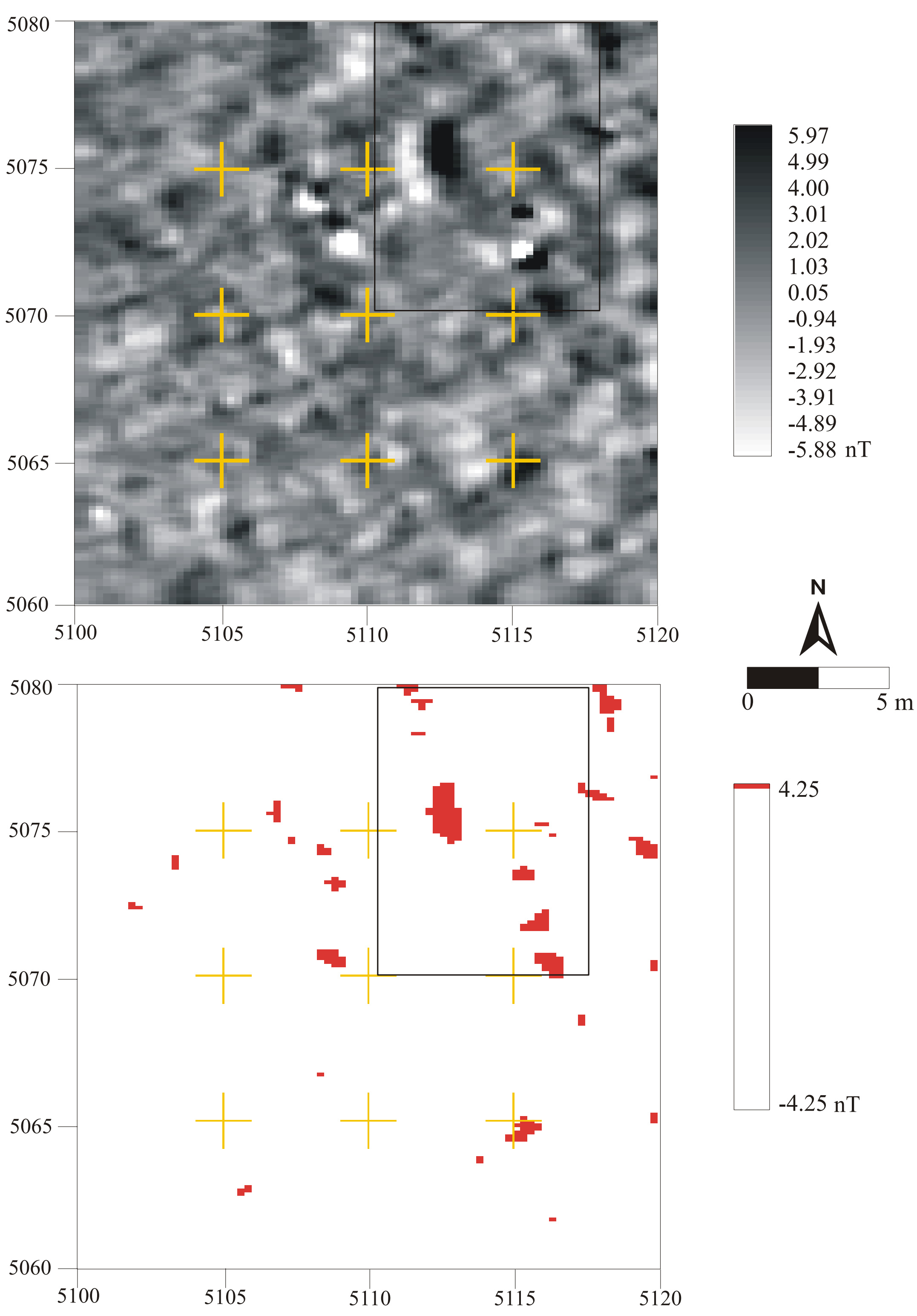


Figure 30. Magnetic data from Block B6 showing Anomaly 5 (a series of anomalies). The bottom graphic shows only those anomalies with readings 3 standard deviations above the background mean of the block. Processing included Zero Mean Traverse, Clip +/-15, and Interpolate.

Figure 31. Anomaly 5 during removal of the plowzone. Feature 7 is in the foreground. Viewpoint is from the southeast looking northwest.

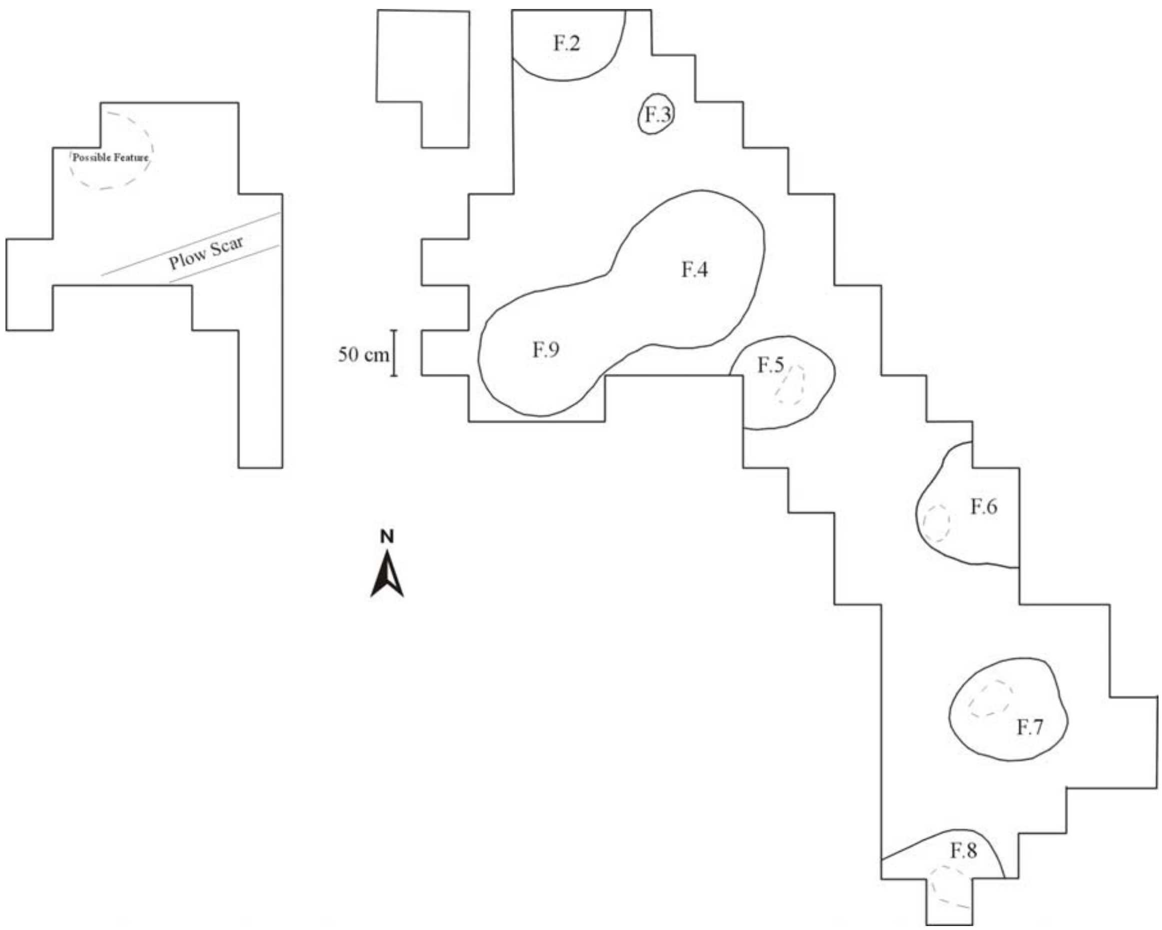


Figure 32. Plan Map of Anomaly 5 after removal of the plowzone (Anomaly 5 in reality is a series of magnetic anomalies).

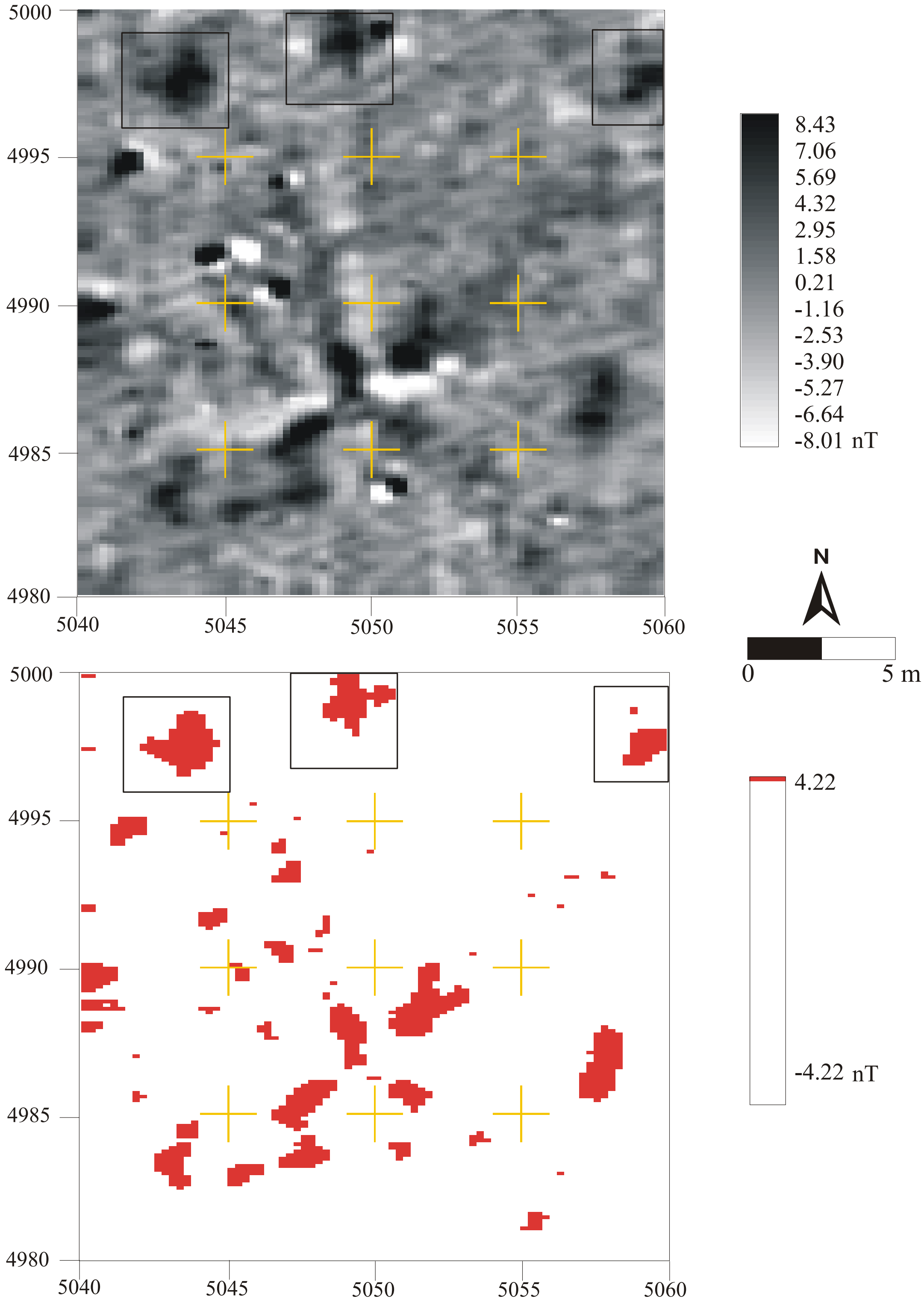
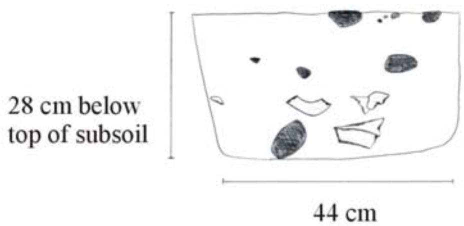


Figure 33. Magnetic data from Block F3 showing location of test cores. The bottom graphic shows only those anomalies with readings 3 standard deviations above the background mean of the block. Processing included Zero Mean Traverse, Clip +/-15, and Interpolate.

Figure 34. Results of the test cores south of the mound. Test cores may have not been located in the center of the feature therefore maximum feature depth is unknown.

Feature 3, North Profile



Feature 9 / 4, North Profile

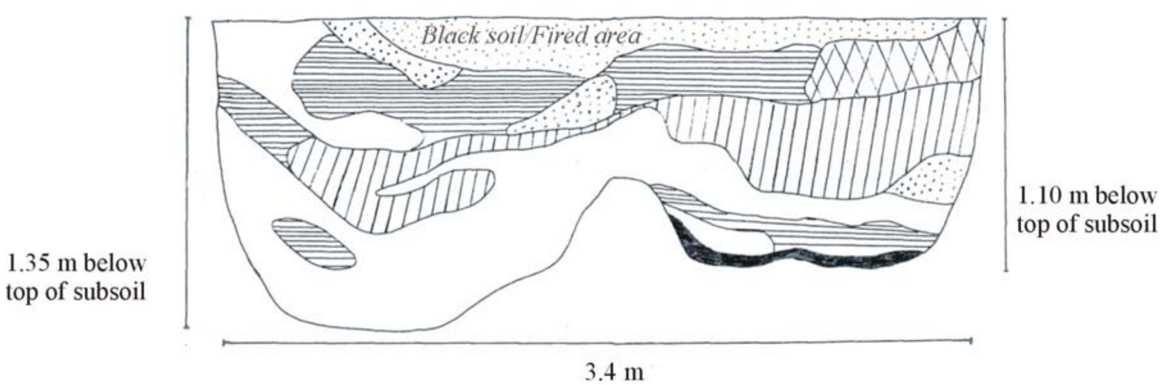


Figure 35. Profile maps of Feature 3 and Feature 9 / 4, the conjoined pit.

Figure 36. Feature 7, west profile showing burnt grass-lining at the bottom of the pit.

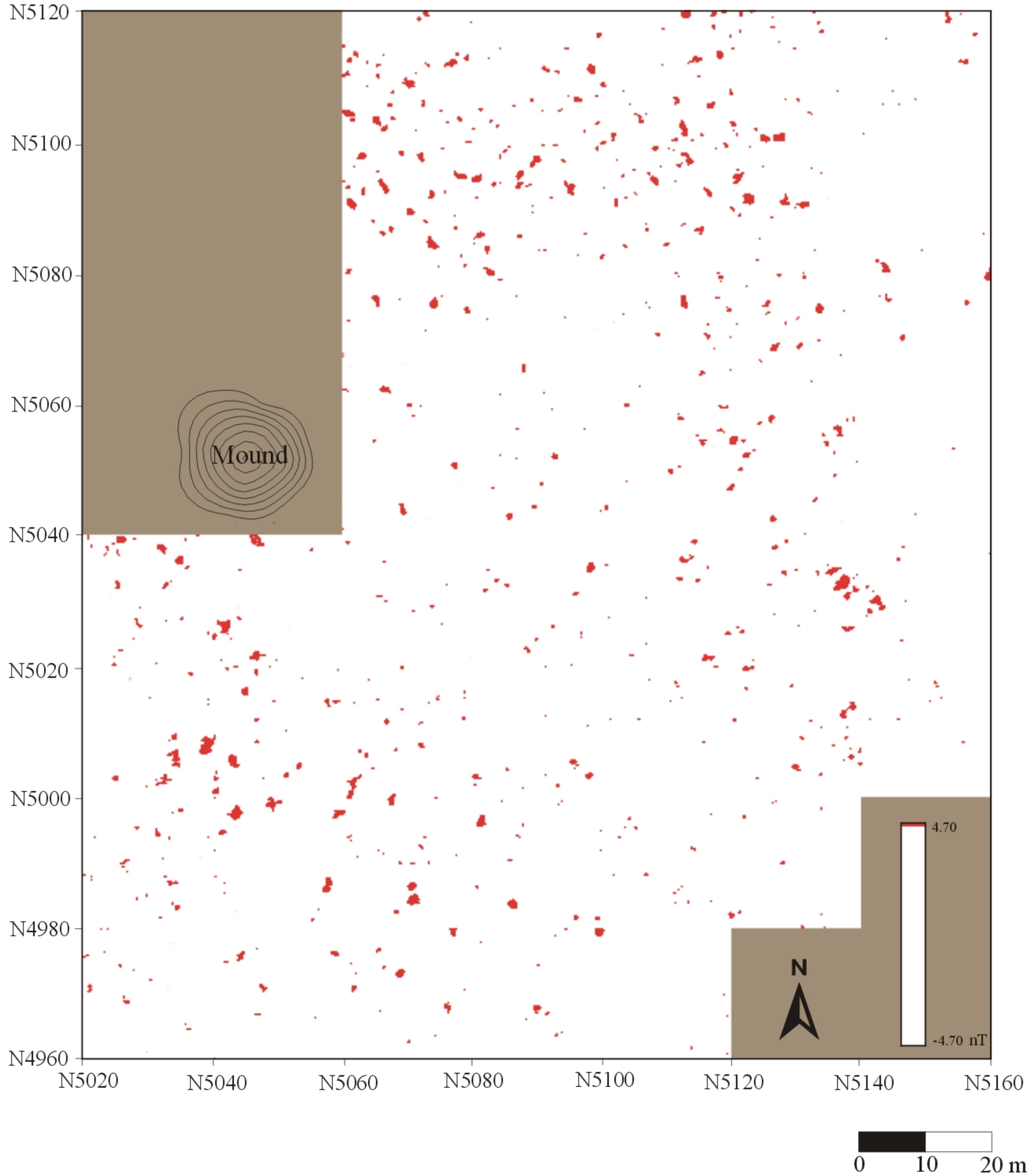


Figure 37. Magnetic anomalies having readings 3 standard deviations above the background mean, with historic disturbances such as likely buried metal, lightning strikes, instrument tilt, and open groundhog burrows removed from the graphics plot. The standard deviation of the background was determined by confining the statistical processing area to a quiet area of the site.

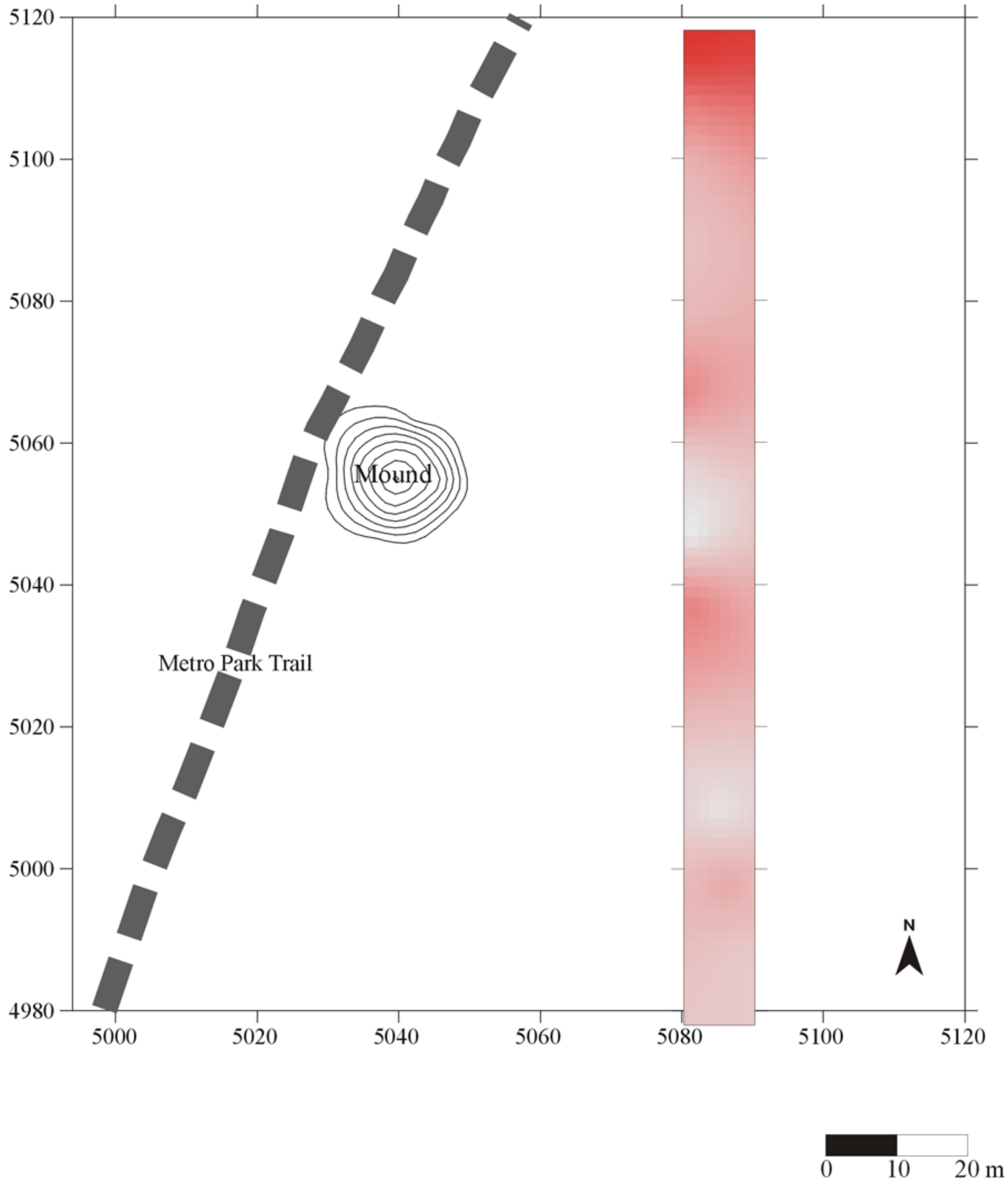


Figure 38. Artifact density shown in red. The shovel test transect consisted of a 10-meter wide corridor with test pits dug every 10 meters. Areas of white indicate few to no artifacts recovered.

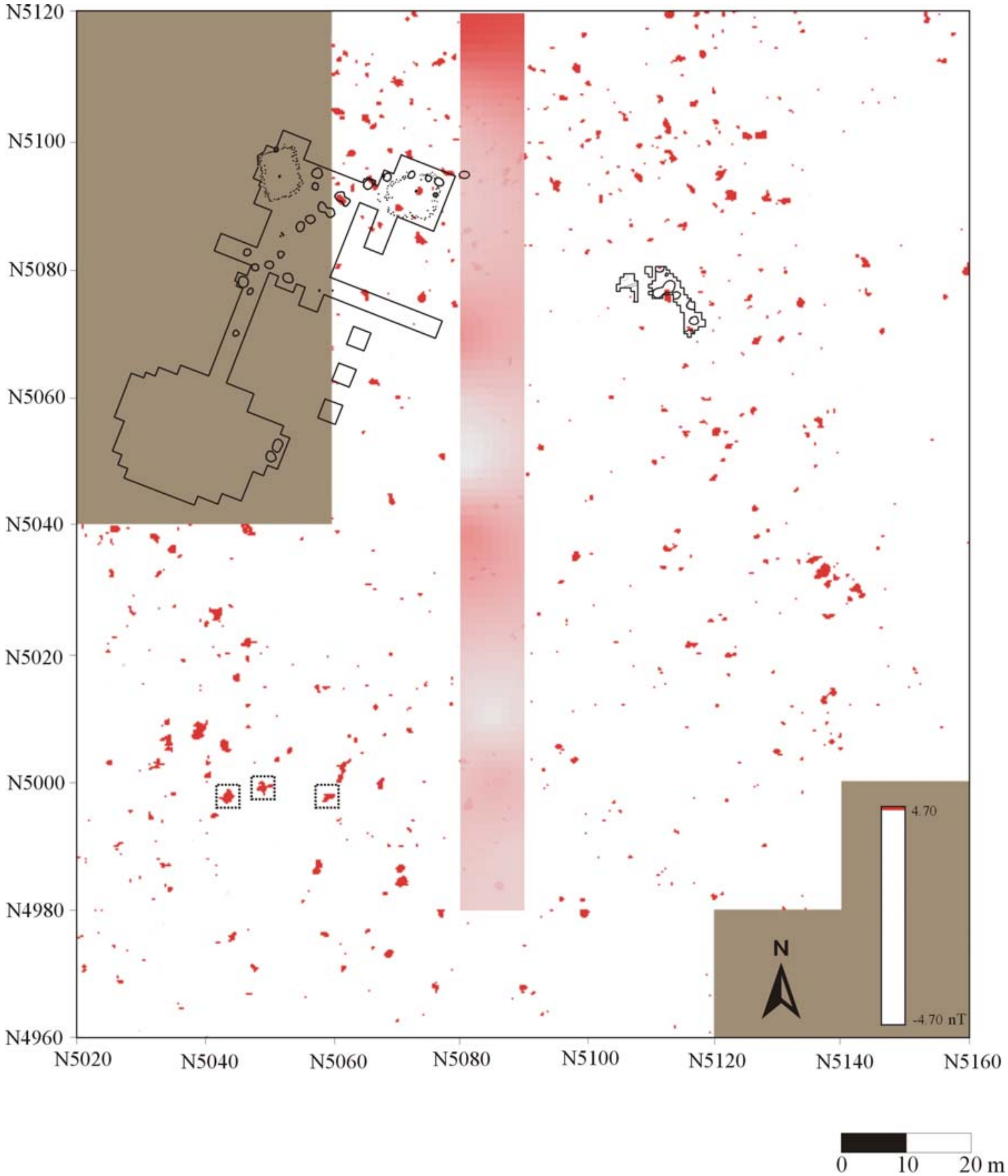


Figure 39. The map combines the results of the 1960's excavations conducted by the Ohio Historical Society with the results of recent investigations. The location of the 1960's excavations is an estimate based on an attempt to reconstruct the previous grid baselines within the recent grid.

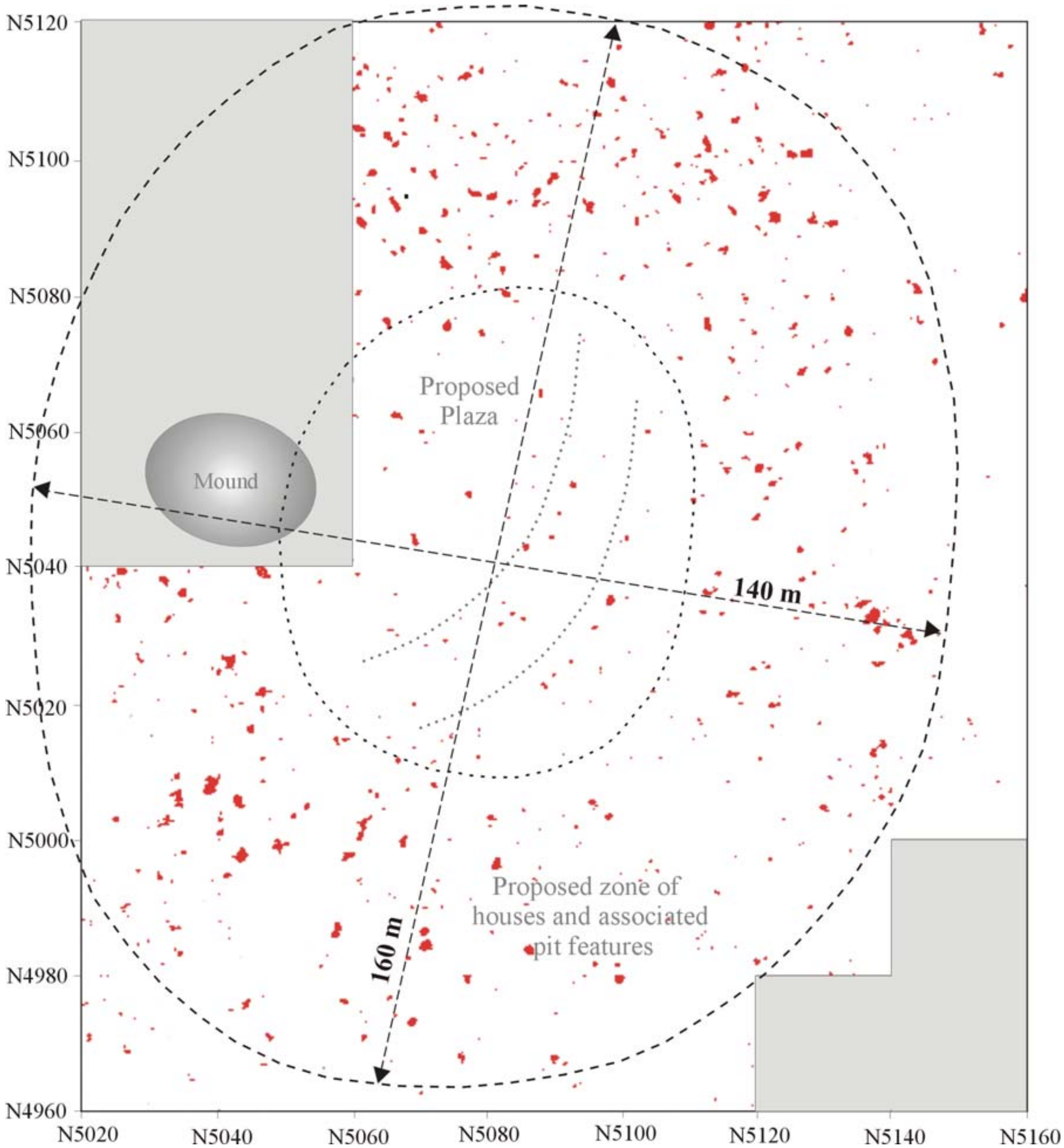


Figure 40. Estimate of overall village size, plaza extent, and width of habitation ring. The plaza is estimated at approximately 60-70 meters in maximum extent. The habitation zone is estimated to be approximately 40 meters in maximum width.

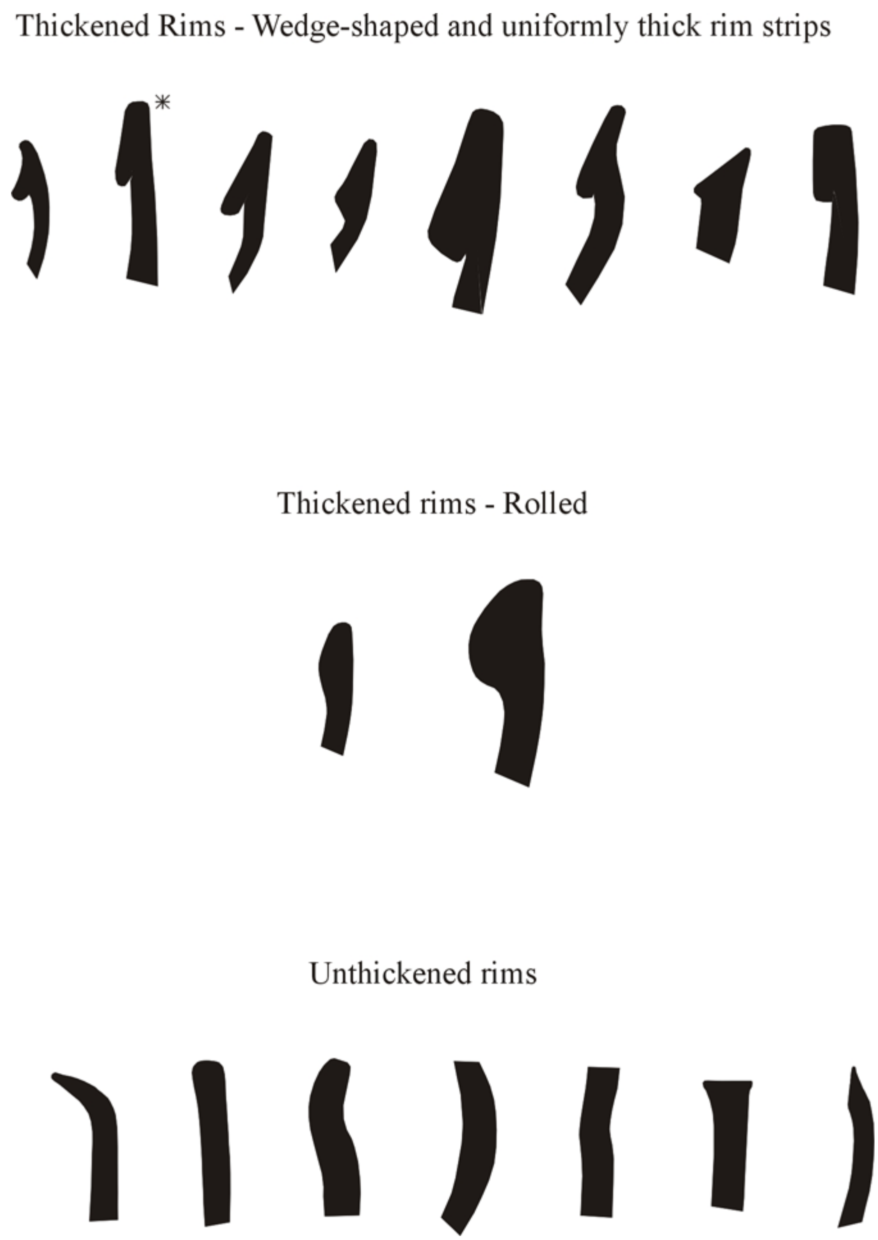


Figure 41. Rim profiles of rim sherds in the Voss ceramic assemblage. The profile with the asterisk is the most common rim type in the assemblage. Profiles of lugs/appendages are not shown.

Figure 42. Examples of rim sherds recovered by the Ohio Historical Society in the 1960s. The wedge-shaped rim strip is shown with vertical notching, and without decoration, and with a lug formed by the widening of the rim strip on the upper and lower margins. Two shell-tempered rolled rims are shown in the second row, far right. One of the strap handles is shown in the third row on the far right. A horizontal lug is shown in the fourth row, far right.

Figure 43. Examples of rim sherds recovered from the 1960s excavations. Two rim sherds exhibiting decoration on the rim strip are shown in the second row, second and third from the left. Two rolled rims are shown in the third row, far left. An unthickened rim sherd is shown in the third row on the far right.

Figure 44. Reconstructed portion of a pottery vessel recovered from Feature 3 exhibiting the wedge-shaped rim strip so common in the Voss ceramic assemblage.

Figure 45. Shell-tempered (top row) and grit-tempered (bottom row) sherds exhibiting curvilinear guilloche recovered during mound excavations.

Figure 46. Decorated sherds recovered from feature context during the 1966 excavations. Middle row shows examples of sherds with punctates in eye of guilloche.

Figure 47. Incised rim sherds from Feature 7, shell-tempered and unthickened (left) and grit-tempered with a knife-edge lip (right).

Figure 48. Portion of a pottery vessel from Feature IX exhibiting curvilinear guilloche and incising on rim strip over a plain exterior.

Figure 49. Pottery recovered from Feature 7 exhibiting incised triangles bordered by punctates with a wedge-shaped rim strip.

Figure 50. Examples of lugs and appendages recovered from the mound and from pit features. One of the strap handles is shown in the lower right corner of Figure 42. Two projecting (tongue) lugs are shown in Figure 42, bottom row. The two sherds on the lower right (not exhibiting lugs) are the only two of their kind in the assemblage. One of these sherds, the one on the far right, exhibits a prominent castellation and fits Barkes' definition of Cole Cordmarked.

Figure 51. Triangular projectile points recovered during the 1960's excavations.

Figure 52. Triangular projectile points recovered during recent excavations. Base of side notched point shown in lower right corner.

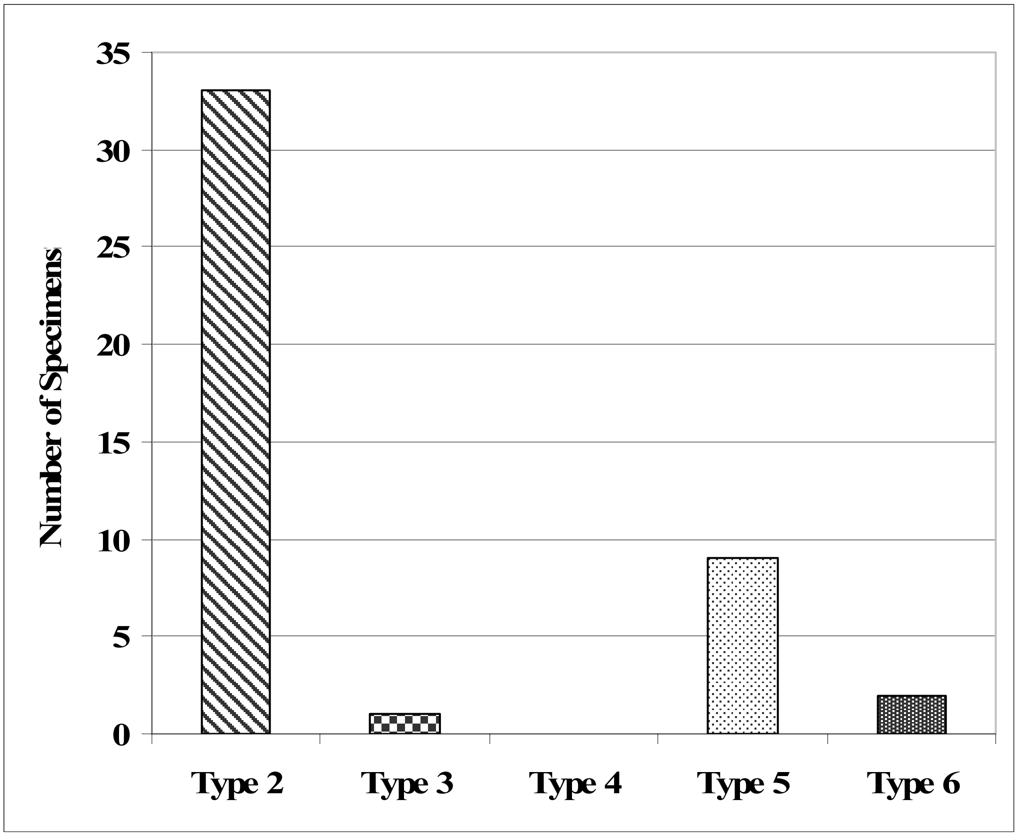


Figure 53. Histogram of triangular projectile point types recovered from the Voss site.

Figure 54. Side and corner-notched points recovered during the 1960's excavations.

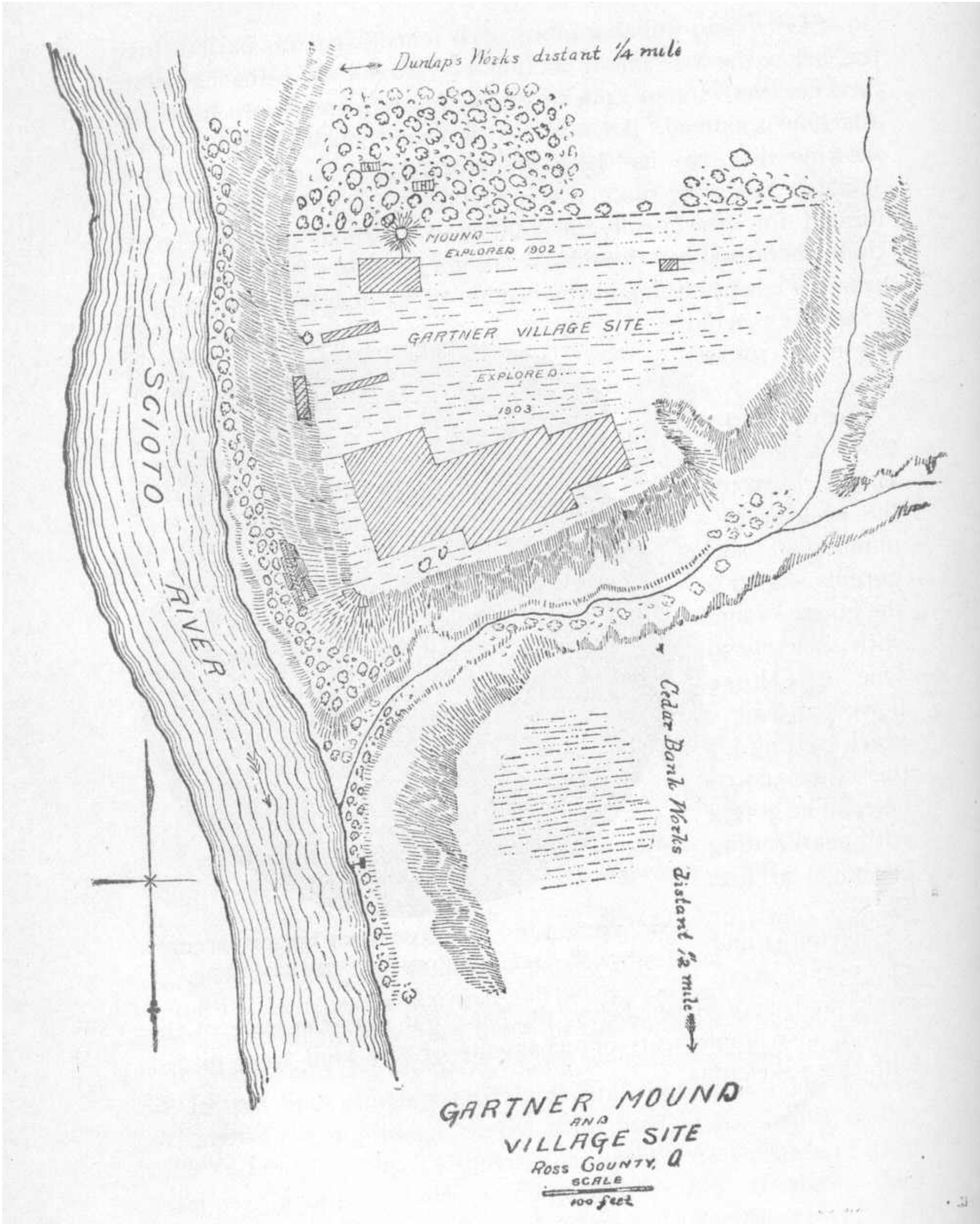
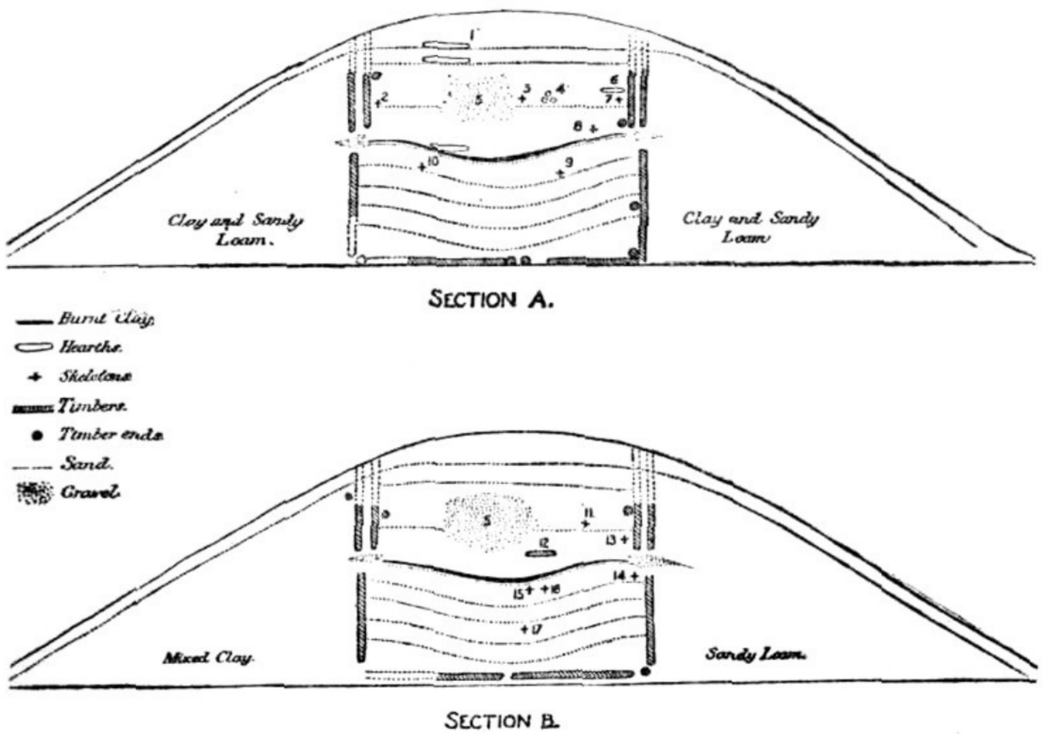


Figure 55. Map of excavations at Gartner Village, taken from Mills 1904.

Baum Mound Profile



Gartner Mound Profile

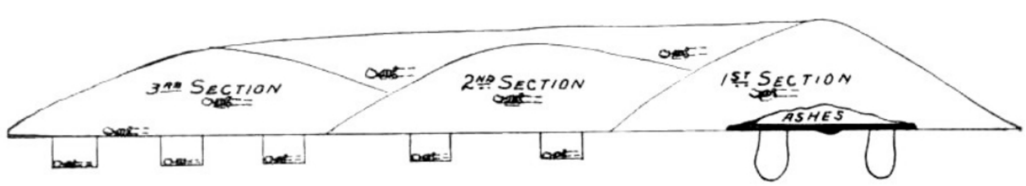


Figure 56. Profiles of Baum Mound and Gartner Mound. The maps are taken from The Ohio Archaeological and Historical Society Publications, Volumes XIII and XV.

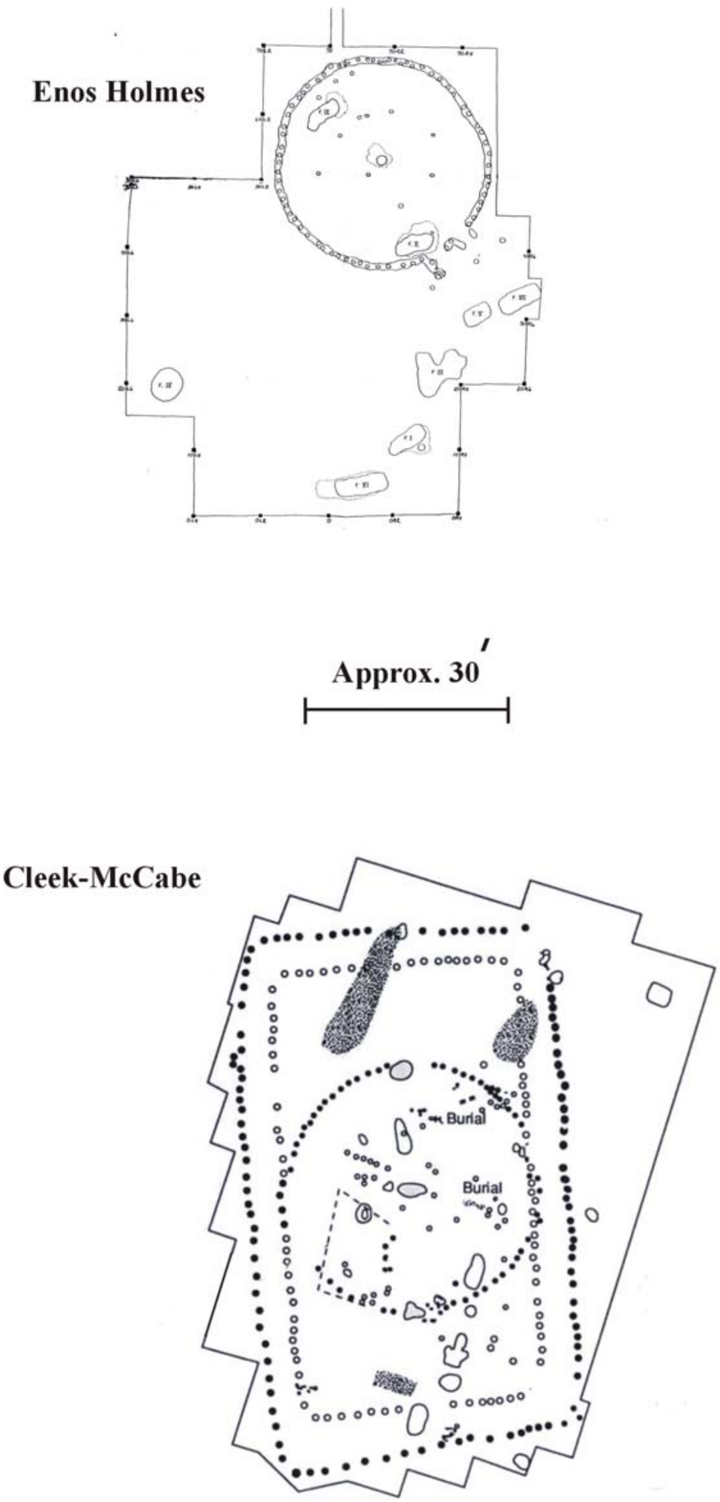
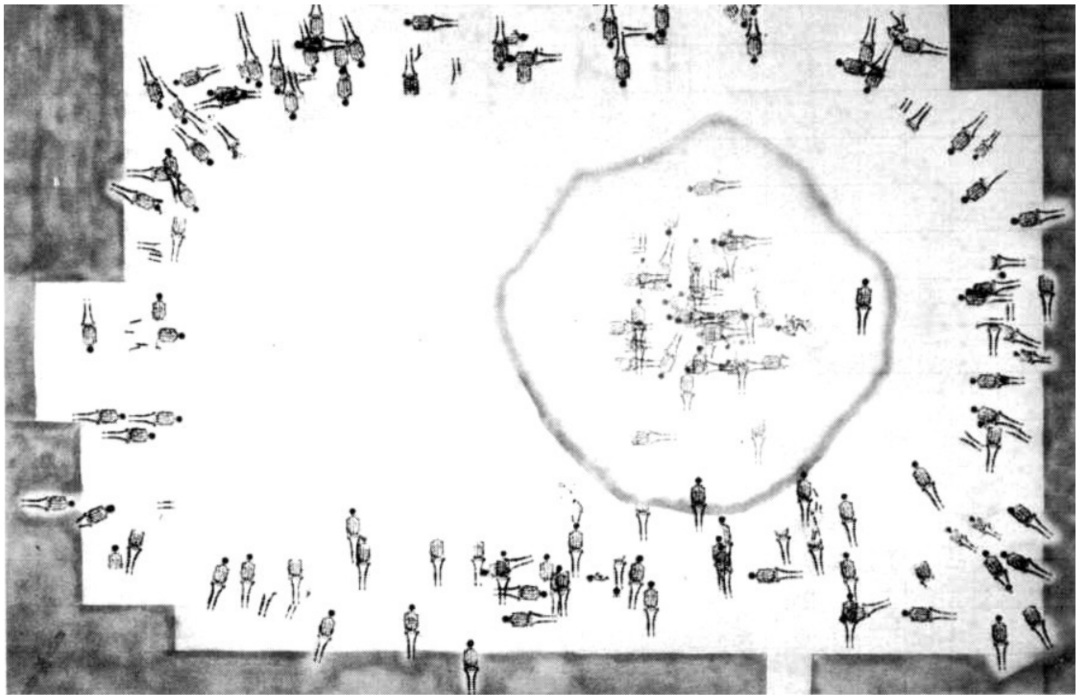


Figure 57. Plan maps of the floor of Enos Holmes and Cleek-McCabe mounds. The Enos Holmes map is taken from Baby et al. 1968. The Cleek-McCabe map is taken from Sharp 1996 (Rafferty 1974).

Turpin Mound



Taylor Mound

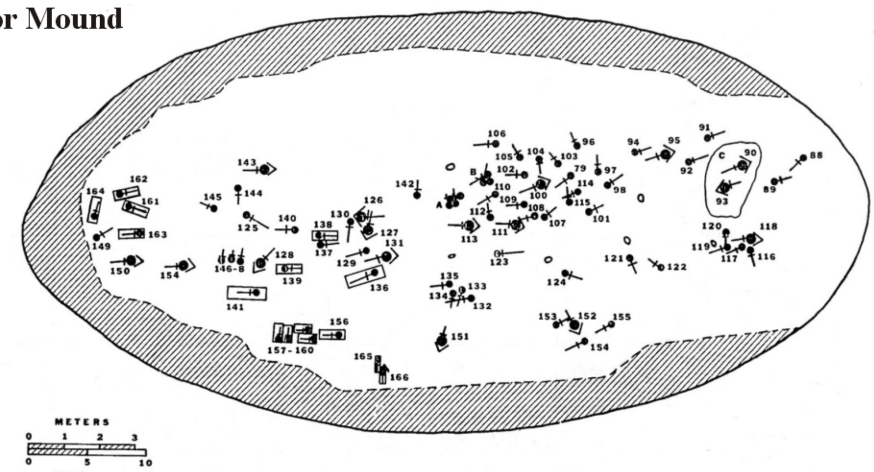


Figure 58. Plan maps of floor of Turpin and Taylor mounds. The Turpin map is taken from Oehler 1973. The map of Taylor Mound is taken from Essenpreis 1982.

Characteristic found to be universal in sample of Excavated Fort Ancient Mounds
Confined by or immediately adjacent to domestic space

Figure 59. Characteristic common to all mounds in the sample.

Schomaker/Anderson/Turpin (**Hine, Taylor, Turpin**)		**Baum** (**Baum, Blain, Enos Holmes, Gartner, Voss**)	
Burials on mound floor or above	No sub-mound structures	Mixed / Sub-floor, floor, and fill burials	Sub-mound structures/architecture common
Fewer burials with grave goods	Many individuals in mound (Hine is the exception)	Burials with grave goods more common than without	Few individuals in mound
Manion (**Clay, Cleek-McCabe, Killen**)		**Feurt-Clover** (**Feurt, Fullerton Field, Roseberry**)	
Mixed / Sub-floor, floor, and fill burials	Sub-mound structures/architecture common	Mixed / Sub-floor, floor, and fill burials	No sub-mound structures/architecture
Burials with grave goods more common than without	Few individuals in mound (Killen is the exception)	Few burials with grave goods	Many individuals in mound

Figure 60. Comparison of mound construction by sub-region.