THE GREENE MOUND ARCHAEOLOGICAL PROJECT: INVESTIGATIONS OF OFF-MOUND ACTIVITY AT A KENTUCKY ADENA SITE

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ABSTRACT

The Greene Mound (15Mm8), the only extant member of the Wright Mound complex investigated by Webb in the 1930s, has been the subject of recent study by members of the University of Kentucky Anthropological Research Facility. Initial efforts in 1985 focused on mapping the mound and surrounding area and excavating shovel probes to collect information about the nature and extent of off-mound activities. Excavation of test units in the circum-mound area in 1986 provided a larger, more representative artifact sample and an indication of the site's stratigraphy and depositional history. This paper discusses the results of the University of Kentucky Greene Mound Project and the implications of these findings for future Adena research.

INTRODUCTION

For more than 100 years, Adena research efforts have focused on excavating the numerous earthen mounds scattered throughout the Ohio Valley and analyzing the burials and exotic artifacts which they contain. Because of this past emphasis on investigating mortuary behavior, very little is currently known about Adena settlement and subsistence practices or technology. During the past 20 years, however, increasing emphasis has been placed on identifying and investigating Adena off-mound activity areas (Clay 1985). To date, most of these attempts have met with relatively little success.

Archaeological investigations conducted over the past 50 years in the vicinity of the Wright Mounds (15Mm6 and 15Mm7), located near Mt. Sterling in Montgomery County, Kentucky, indicate that this area has a high potential for contributing new information about Adena off-mound activities. This paper discusses the results of the previous Wright Mound investigations and the findings of recent University of Kentucky fieldwork conducted at the nearby Greene Mound (15Mm8). Suggestions for future efforts designed to locate Adena off-mound features and activity areas are presented.

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ADENA RESEARCH IN CENTRAL KENTUCKY

Adena sites, with their large burial mounds, elaborate earthworks, and exotic artifacts, have intrigued archaeologists since the early nineteenth century (Rafinesque 1824; Squier and Davis 1848). The first scientific investigation of an Adena site occurred in 1901, when William C. Mills excavated the Adena Mound at Chillicothe, Ohio (Mills 1902). Since those early days, archaeologists have identified an Adena core area that includes parts of Kentucky, Ohio, Indiana, and West Virginia (Dragoo 1963; Swartz 1971; Webb and Baby 1957; Webb and Snow 1945).

The major research goal during this period was identifying cultural traits, such as mound and tomb construction techniques and artifact attributes, that eventually led to the development of regionally distinct cultural complexes. Since these early studies largely concentrated on burial mounds and ceremonial structures, trait lists generally reflect the mortuary component of Adena culture.

Much of what is known about Adena in central Kentucky stems from mound excavations conducted by William S. Webb and William D. Funkhouser during the Depression era of the 1930s. Most of these projects were conducted as part of federal relief programs designed to put the unemployed back to work. For the first time, the funding and labor was available to conduct large-scale survey and excavation projects using standardized field and laboratory techniques (Milner and Smith 1986). Central Kentucky Adena sites investigated by Webb using federal relief funds and labor include the Ricketts Site (Funkhouser and Webb 1935; Webb and Funkhouser 1940), the Mt. Horeb Earthworks (Webb 1941a), the Drake Mound (Webb 1941a), and the Morgan Stone Mound (Webb 1941b).

One of the largest and longest running of the federally sponsored archaeological projects in central Kentucky involved the excavation of the Wright Mounds, located approximately 4 km west of Mt. Sterling. These investigations, initiated in 1937 under the direction of William S. Webb, used a Works Progress Administration (WPA) crew to completely excavate two mounds (15Mm6 and 15Mm7) located on the Elizabeth Wright farm (Figure 1). Excavation yielded numerous Adena tombs and burials, as well as associated exotic artifacts (Webb 1940). The third member of the mound group (15Mm8), a conical earthen structure located approximately 60 m southeast of the large Wright Mound (15Mm6), was located on the Greene family farm. As a consequence of the Greene Mound being owned by a different family, it was not excavated by Webb and it remains largely intact today.

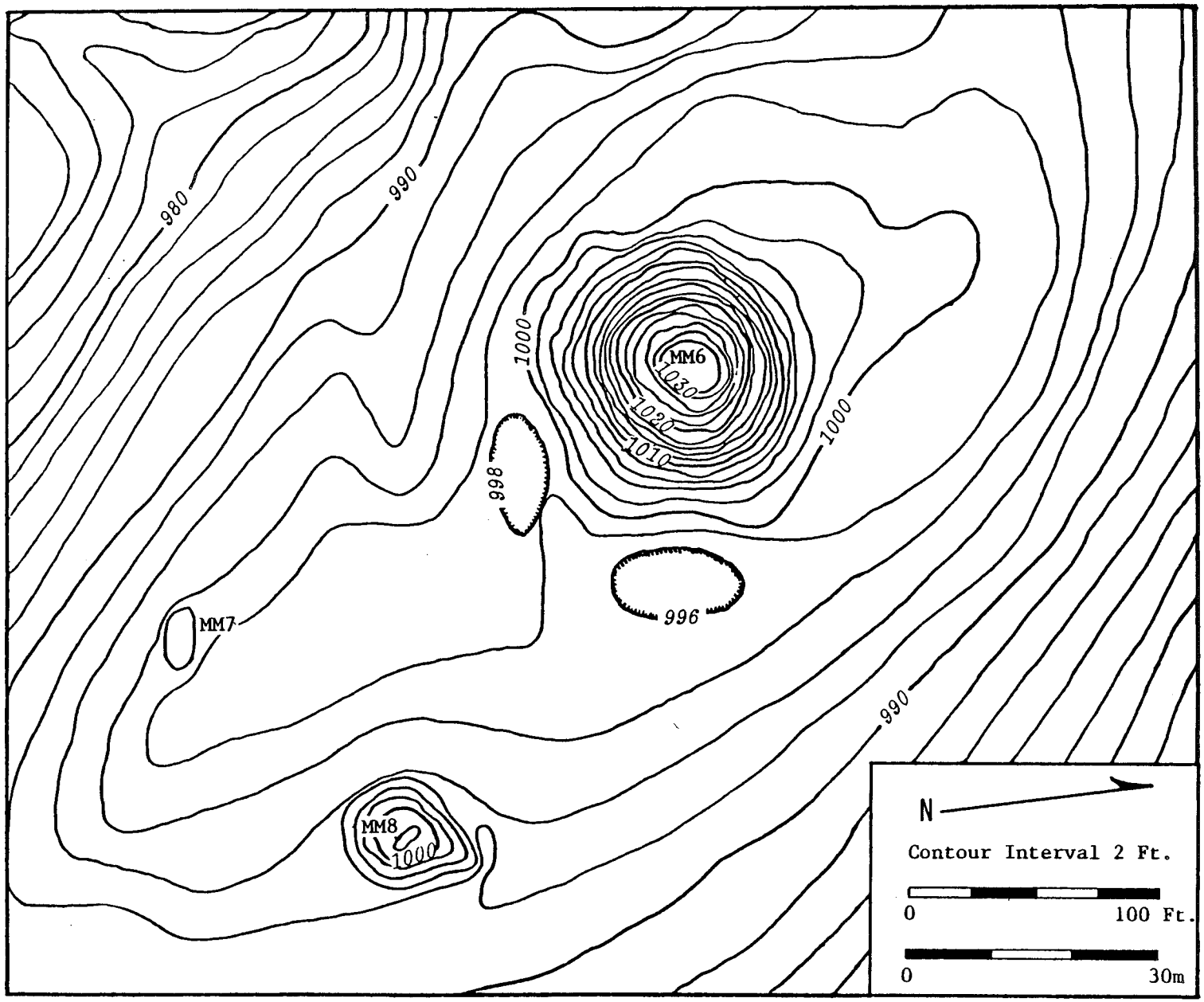

Figure 1. Location of the three mounds comprising the Wright-Greene Mound Complex (adapted from Webb 1940:Figure 1).

WRIGHT MOUND INVESTIGATIONS

Excavation of the large Wright Mound, under the direct supervision of John L. Buckner, extended from October 1937 until April 1939. Webb (1940:7) selected the site for excavation because it was located in a region known for its concentration of mounds and because these particular mounds were considered likely candidates to produce materials representative of the Adena complex. Webb (1940:8) believed that an "ancient village" once occupied the ridge on which the mounds were built, but that its remains had been destroyed by mound building and erosion.

Webb's field investigations focused on the largest of the three mounds (15Mm6). The mound, approximately 10 m high and 60 m in diameter, was excavated from north to south in a series of 1.5 m (5 feet) cuts. Excavation revealed that the mound was built in four construction stages, each containing a number of log tombs and associated burials, accompanied by items made from exotic materials such as copper and mica (Webb 1940).

Excavation of the primary mound exposed a humus or midden layer representing the original premound ground surface. Materials recovered from the submound midden included chert flakes, charcoal, pottery, several tools, and a disturbed burial. Soil and artifacts from the primary mound closely resembled that from the pre-mound humus layer, prompting Webb (1940:48) to conclude that the pre-mound midden was the source of the primary mound fill.

Removal of the submound midden layer disclosed numerous postholes in the underlying clay (Figure 2). Many postholes were aligned, indicating the shapes of several premound structures. The postholes often occurred in pairs, a characteristic now recognized as a common Adena construction trait (Webb and Snow 1945:53-55). Webb (1940:49) identified parts of at least six circular or curved posthole alignments and one rectangular pattern. Estimated diameters of the circular alignments ranged from 11 to 35 m; the lengths of the arcs ranged from 9 to 23 m (Webb 1940:50-52). These dimensions suggest that these structures were substantially larger than most Woodland period domestic structures.

Individual posts averaging 25 cm in diameter extended 46 cm below the submound surface. Postholes within each pair were spaced 18 cm apart, while the pairs were spaced from 1.1 to 1.5 m apart (Webb 1940:52). The distance between pairs of posts suggests that they were not part of a standard domestic structure. Some posts were set vertically, but others were "inclined outward from the center of the pattern" (Webb 1940:52).

The shape and size of the alignments indicated to Webb (1940:50-51) that they may have been parts of circular palisades inside of which smaller structures were built. Unfortunately, he was unable to define smaller alignments within the larger ones. If the patterns were complete circles, they would have extended well beyond the edge of the Wright Mound.

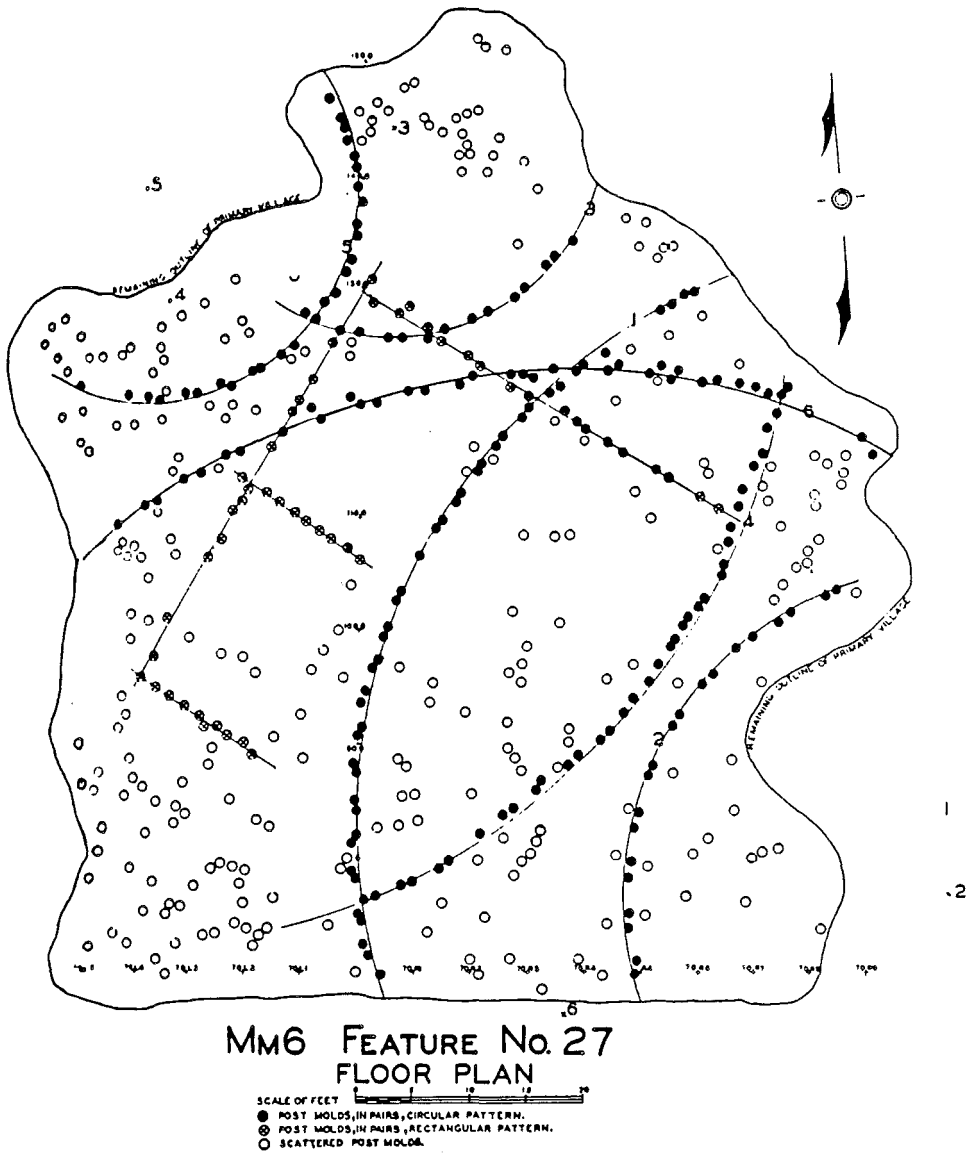

Figure 2. Posthole alignments found in clay hardpan below 15Mm6 (from Webb 1940:Figure 33).

Wood charcoal collected during the WPA excavation and subsequently submitted for radiocarbon dating in the early 1970s yielded determinations of A.D. 210+/-140 and A.D. 50+/-50 (uncorrected). Charcoal producing the earlier date came from charred logs covering the primary mound. The later date was obtained from charcoal collected from Feature 19, a log tomb associated with the secondary mound (Crane and Griffin 1972:160, cited in Turnbow 1981:58).

In 1984, members of the University of Kentucky Anthropological Research Facility designed a multi-disciplinary research project that built on the results of Adena research conducted by Webb and his co-workers. These investigations, supported by a Federal Survey and Planning grant from the Kentucky Heritage Council, are focusing on the re-analysis of existing museum collections and records, coupled with new fieldwork (Jefferies et al. 1985). With the exception of the research conducted by R. Berle Clay (1980, 1983, 1984a, 1984b, 1985, 1986), relatively little is known about the non-mortuary and off-mound aspects of Adena culture. In view of this bias in the archaeological data base, fieldwork being carried out as part of the University of Kentucky's project has concentrated on identifying off-mound Adena activity areas.

The presence of midden and postholes below the Wright Mound, and the apparent extension of posthole alignments beyond the mound's periphery, increases this site's potential for providing information about Adena off-mound activities. Webb (1940:52) suggested that since the midden edge and the ends of the posthole alignments coincided with the periphery of the primary mound, the surrounding midden was used in mound construction, destroying any additional evidence of the "village". If, as Webb reported, the postholes extended well into the soil beneath the mound, then portions of the alignments, or perhaps other kinds of features, may still be preserved in less disturbed parts of the site. Webb's floor plan drawing shows that several posthole alignments could extend a considerable distance to the east in the general direction of the Greene Mound (Figure 2). Since the area surrounding the Greene Mound has not been disturbed by recent activities, other than plowing, evidence of alignments may still be preserved below the shallow plowzone. In view of the results of past archaeological investigations at the Wright Mounds, and the potential of the Greene Mound area to produce new information about Adena off-mound activities, University of Kentucky archaeologists selected this location to pursue their research.

GREENE MOUND INVESTIGATIONS

The Greene Mound is a conical earthen structure measuring approximately 18 m in diameter and 2.5 m high. Investigation of the Greene Mound by University of Kentucky archaeologists started in the summer of 1985 using students from its archaeological field school. The mound was carefully mapped, with elevation readings taken at 1 to 2 m intervals within a 50 x 50 m area surrounding the mound. These data were then used to produce a standard topographic map (Figure 3) and a computer-generated three-dimensional contour map (Figure 4) using the Surface II plotting program (Sampson 1978). The three-dimensional plot not only showed the relief and outline of the mound, but provided an accurate representation of its actual shape.

Following the completion of mapping, a series of systematically-placed shovel probes was excavated around the mound to locate intact midden deposits, features, and artifact concentrations (Figure 5). Shovel probe transects were spaced 5 m apart near the mound; probes were excavated every 5 m along these transects. Transect and probe intervals north and east of the mound were increased to 10 m.

Examination of shovel probe profiles and fill did not reveal any obvious midden or features, but numerous artifacts, consisting of biface fragments, debitage, and sandstone, were recovered. Most of the artifacts occurred in probes placed between the Greene Mound and the former site of the large Wright Mound. Probes placed north, east, and south of the mound had lower artifact densities.

Unfortunately, shovel probes produced no diagnostic flaked stone or ceramic materials, so artifacts could not be assigned a specific temporal or cultural affiliation. Many of the diagnostic artifacts found in the Wright Mound fill are attributed to the Early Woodland Adena occupation(s) that must have been in the immediate vicinity of the mound. Others clearly date to the Archaic period (Webb 1940:Figure 38). The mixed age and cultural affiliation of the mound fill artifacts suggests that both Archaic and Woodland groups inhabited this ridgetop location. Even though earlier materials occur, the Early Woodland midden and posthole patterns below the large Wright Mound, combined with the artifacts collected from recent shovel probes, made further investigation of Adena off-mound activities near the Greene Mound warranted.

Additional investigations were conducted at the Greene Mound by the University of Kentucky during the fall of 1986. This work, funded by a state grant from the Kentucky Heritage Council, involved the hand excavation of six 1 x 2 m test units. Four units were excavated along a north-south line located west of the mound (Figure 3). Shovel probes placed in this part of the site in 1985 indicated that the highest artifact densities occurred here. Two additional units were excavated north and east of the mound. Test unit locations were selected to provide information about the site's depositional history, to obtain data on feature and artifact distributions, and to investigate the nature of Early Woodland activities that occurred around the mound. Each of the six units were excavated in 10 cm thick arbitrary levels. Maximum depth of the units ranged from 25 to 40 cm.

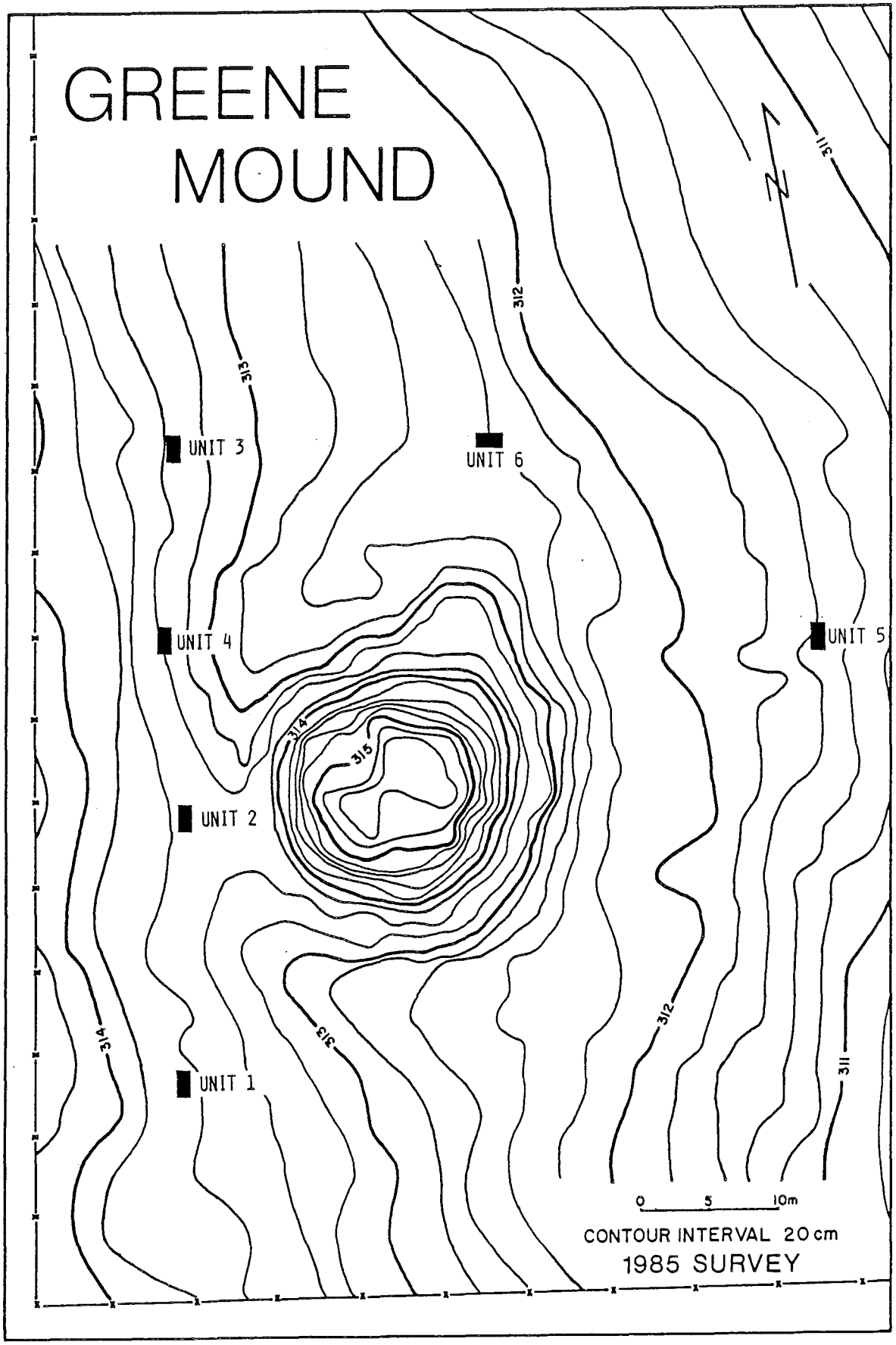

Figure 3. Topographic map of the Greene Mound showing test units.

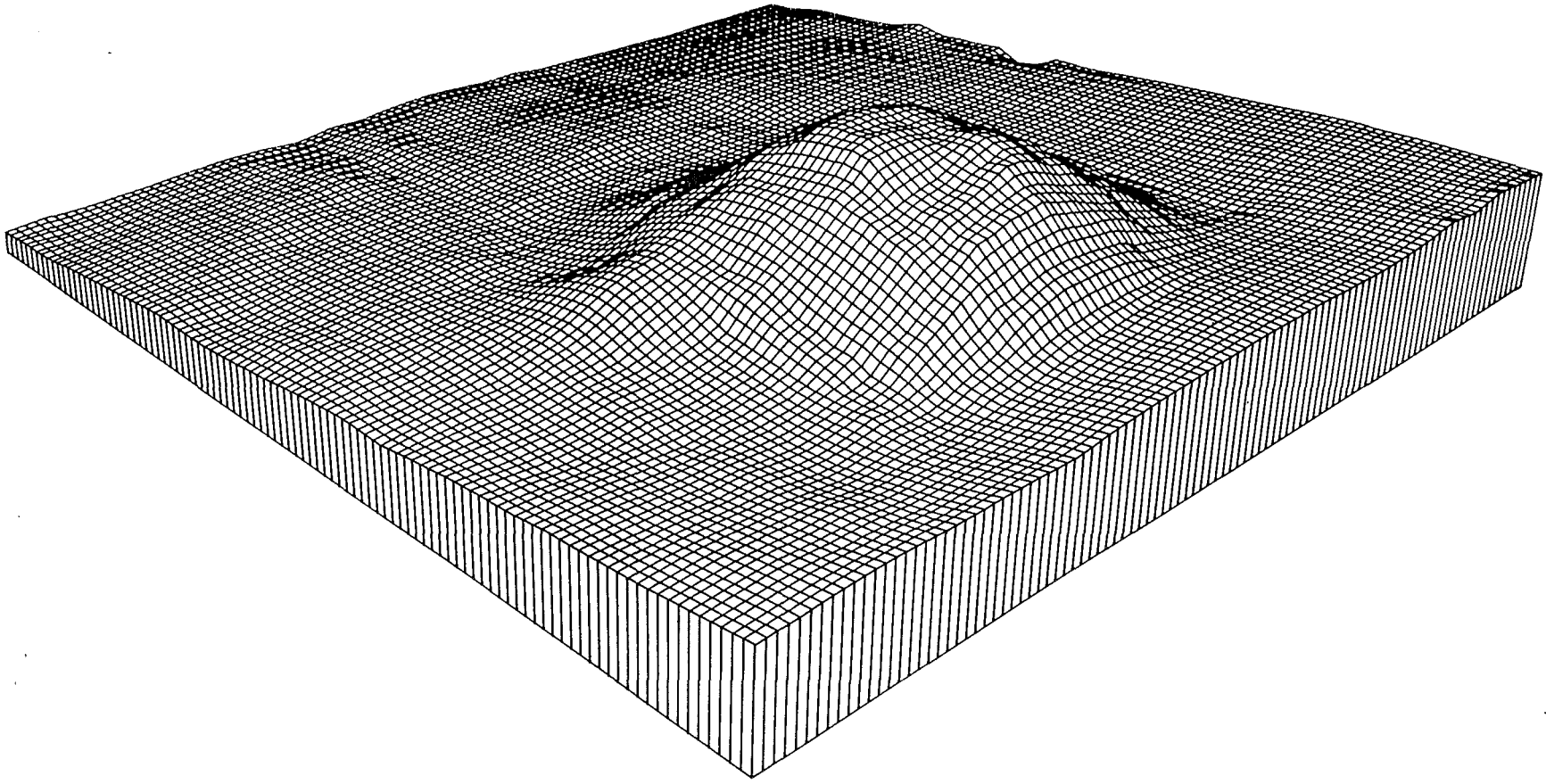

Figure 4. Three-dimensional contour map: southeast view of the Greene Mound.

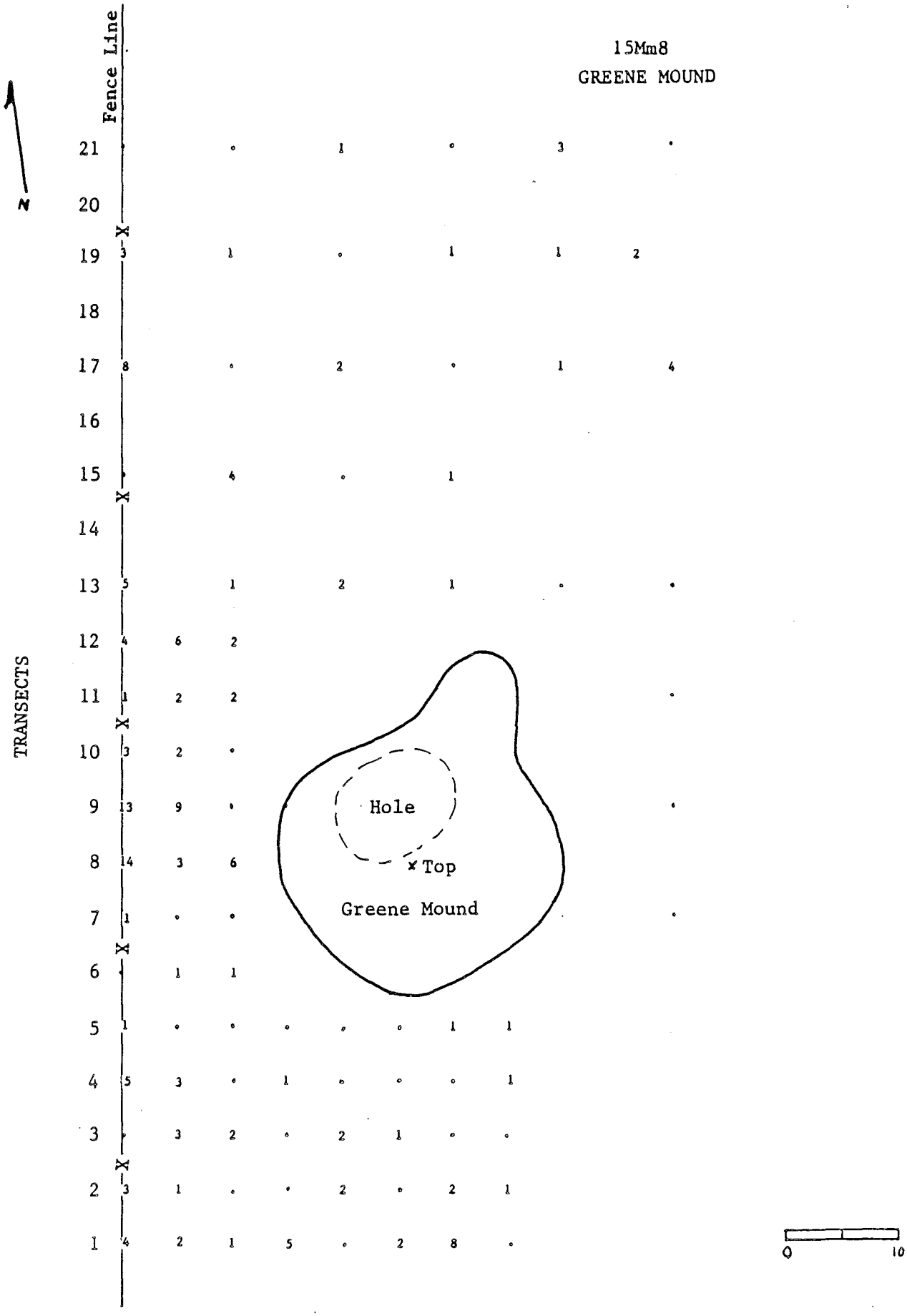

Figure 5. Location of shovel probes showing number of flaked stone artifacts from each probe.

Examination of test unit profiles revealed varied stratigraphy across the site (Figure 6). The portion of the site west of the mound, near Test Unit 2, contained the deepest and most complex stratigraphy. A 20 cm deep plowzone (dark brown silty clay loam) comprised the upper soil zone. A 15 to 20 cm thick transition zone located between the plowzone and the B-horizon soil may represent a lightly stained midden deposit. Artifact densities in the transition zone closely conformed to those of the plowzone. This zone may also be attributable to eroded soil that was carried downslope and re-deposited around the up-hill side of the mound. The B-horizon soil in Test Unit 2 was encountered at approximately 40 cm below surface. Excavation of Test Units 3 and 6, located northwest and north of the mound, respectively, revealed generally similar soil profiles.

Test Units 1 and 4, located west of the mound, and Test Unit 5, situated to the east, exhibited truncated profiles containing a very thin transition zone between the plowzone and the B-horizon soil. The B-horizon was encountered less than 20 cm below surface in Test Unit 4. The reasons for the stratigraphic differences between these three units and the three units discussed above are currently unclear. The truncated profiles may be attributable to aboriginal borrowing activities associated with mound construction, or with modern agricultural practices that caused deflation of the soil profile.

Although no postholes, features, or artifact concentrations were identified in any of the test units, a variety of artifacts including flaked stone, ground stone, and ceramic materials were recovered. Flaked stone items, consisting of various types of chert debitage, biface fragments, and an Adena Stemmed projectile point, comprised the largest artifact category.

In excess of 1,300 pieces of debitage were recovered from the six test units (Table 1). Although the very small size of most flakes precluded the reliable identification of specific chert types, a qualitative assessment indicates that approximately 75% of the debitage is Boyle chert. This chert type, which originates in the Devonian period Boyle dolomite formation, does not outcrop in the immediate vicinity of the Greene Mound. The closest known outcrops are exposed along Slate Creek, some 12 km east of the site (Weir and McDowell 1976). Boyle chert is highly variable in color, occurring as gray, white, blue, pink, red, tan, or any combination of these colors (Boisvert et al. 1979b:70). The remainder of the debitage is comprised of Paoli chert and several unidentified chert types.

Debitage was assigned to five categories (Table 2) commonly associated with the various stages of the biface production trajectory (Jefferies 1982). Angular fragments, associated with the early stage of biface production, are small chunks of chert lacking flake characteristics such as a striking platform or a bulb of percussion. Percussion 1 flakes have a prominent bulb of percussion, the striking platform is generally perpendicular to the bulb of percussion, and cortex is present on the outer surface. Percussion 2 flakes resemble Percussion 1 flakes, but have no cortex. Bifacial thinning flakes generally have flake scars on the exterior surface, a diffuse bulb of

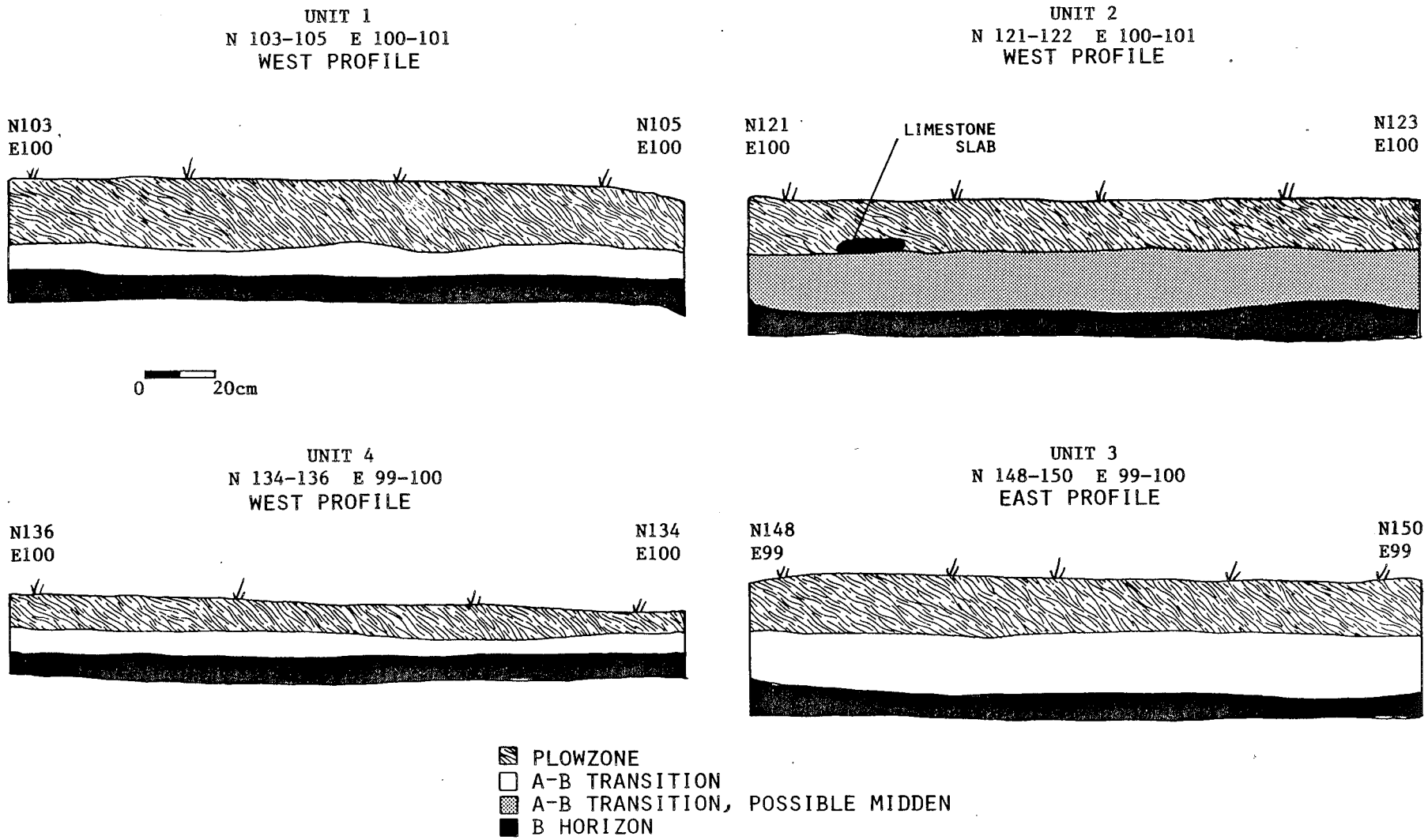

Figure 6. Greene Mound excavation unit profiles.

Table 1. Greene Mound Artifact Distribution.

Test Unit	Volume(m)	Ceramics				Flaked Stone				Other Rock			
		n	wt.(g)	sherds/m³[a]	sherds/m³[b]	n	wt.(g)	flakes/m³[a]	flakes/m³[b]	n	wt.(g)	rocks/m³[a]	rocks/m³[b]
1	.50	9	3.9	18.0	7.8	78	93.2	156.0	186.4	402	343.6	804.0	687.2
2	.80	3	1.0	3.8	1.3	222	147.7	277.5	184.6	910	1020.3	1137.5	1275.4
3	.70	12	7.9	17.1	11.3	731	515.7	1044.3	736.7	950	1132.1	1357.1	1617.3
4	.55	8	2.3	14.5	4.2	108	95.7	196.4	174.0	266	397.8	483.6	723.3
5	.50	3	3.1	6.0	6.2	159	75.9	318.0	151.8	706	320.3	1412.0	640.6
6	.70	8	3.2	11.4	4.6	50	93.6	71.4	133.7	302	497.7	431.4	711.0

a = density by count
b = density by weight

Table 2. Greene Mound Debitage.

Test Unit	Angular Fragment		Percussion 1		Percussion 2		Bifacial Thinning		Shatter		Total	
	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.
1	3	6.4	4	24.7	7	13.1	4	2.0	60	47.0	78	93.2
2	17	16.0	5	21.0	29	21.4	17	12.0	154	77.3	222	147.7
3	46	64.8	32	57.5	71	92.5	74	67.9	508	233.0	731	515.7
4	3	4.2	4	8.7	13	22.4	13	17.2	75	43.2	108	95.7
5	5	8.8	1	0.7	12	20.7	9	8.7	132	37.0	159	75.9
6	6	25.9	5	18.2	4	3.7	5	16.7	30	29.1	50	93.6
TOTAL	80	126.1	51	130.8	136	173.8	122	124.5	959	466.6	1348	1021.8

percussion, and the striking platform forms an acute angle with the bulb of percussion. Thinning flakes are generally associated with intermediate and late stages of biface production. Shatter, broken flakes lacking a bulb of percussion or a striking platform, is generally associated with the final stage of flaked stone tool production and the maintenance of finished tools.

The distribution of debitage among the various categories indicates that all stages of chert reduction occurred at the site. The predominance of thinning flakes and shatter, accounting for more than 80% of the debitage, combined with the small size of all flakes (mean = .75 g), suggests that most flaked stone tool manufacturing activities were associated with the later stages of tool production and maintenance. The character of the Greene Mound debitage is at least partially attributable to the distance from the Boyle chert source area (greater than 12 km). Most early stage reduction activities were probably conducted at the source area to facilitate transport of the raw materials.

Calculation of the density of debitage per cubic meter of excavated soil by both count and weight (grams) clearly indicates that Test Unit 3, with more than 1,000 flakes per cubic meter, contained the highest density (Table 1). Test Unit 3 was located between the Greene Mound and the former location of the large Wright Mound. Densities were much lower in the remaining five test units, ranging from 71 to 318 flakes per cubic meter. Unfortunately, the Greene Mound debitage cannot be assigned a specific cultural affiliation because of the presence of both Archaic and Woodland components at the site.

Other flaked stone artifacts recovered during the 1986 field season consist of two biface fragments, a modified flake and two projectile points (Table 3). Both biface fragments are made of Boyle chert and appear to be parts of blanks or preforms (Figure 7a). The modified flake, also of Boyle chert, is unifacially flaked along one lateral margin and is apparently part of a scraper or a denticulate. A basal portion of a small side notched projectile point was found in Test Unit 5. Cultural affiliation cannot be accurately determined, but it is probably attributable to one of the site's Archaic components.

The only flaked stone artifact from the 1986 testing that can be attributed to the Adena occupation with some degree of certainty is a contracting stemmed projectile point (Figure 7b). The specimen came from plowzone deposits removed from Test Unit 6 (Level 2), located 10 m north of the mound. Points having similar hafting characteristics are commonly found on Adena sites in the Ohio Valley (Dragoo 1963; Webb and Snow 1945). A recent evaluation of flaked stone artifacts from the large Wright Mound identified 37 specimens resembling the Greene Mound point (also see Webb 1940:Figure 38q-r). Dragoo (1963:113) reports that this point type is less distinctive of Adena than ovate-base stemmed variants, and cautions that similar points were manufactured by some Ohio Valley Late Archaic groups.

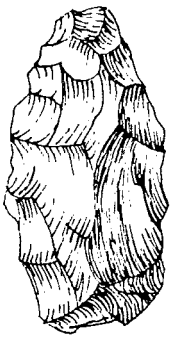

Figure 7. Greene Mound bifaces.

acid. For the present analysis, however, this material is considered to be siltstone.

One siltstone tempered sherd has a cordmarked exterior, one is plain, and the remainder are too eroded to determine surface treatment. Sherd thickness ranges from 4.8 to 6.9 mm, with a mean of 5.7 mm.

The remainder of the ceramic collection consists of three sand tempered sherds, one limestone tempered sherd, and 14 sherds for which temper type could not be identified. Surface treatment could not be determined for any of these specimens.

In his analysis of the Wright Mound pottery, Haag (1940:81) described a number of sherds resembling the siltstone tempered ceramics from the Greene Mound area. He noted that they "invariably showed some leaching, and the middle of a sherd showed some remnants of this leached material, which was angular and light colored, but would not give a carbonate reaction" (Haag 1940:81). Although Haag noted only 18 sherds in the Wright Mound collection having these attributes, the friableness of the siltstone tempered sherds, combined with the WPA excavation techniques, undoubtedly worked against their recovery from the mound fill. The presence of similar pottery in the Wright Mound fill suggests that the Greene Mound material is at least contemporary with the construction of the Wright Mound, if not predating it.

In their recent discussion of pottery from the Calloway Site (15Mt8), Niquette and Boedy (1986:74-76) delineated the geographic range of siltstone tempered ceramics in Kentucky. Their survey of the literature revealed that this pottery occurs in small quantities at scattered open sites and rockshelters in eastern Kentucky, including the Tough Tree Shelter (15McY292) in McCreary County (Knudsen et al. 1985), the Carroll Shelter (15Cr57) in Carter County (Ison and Ison 1985) and the Bentley Site (15Gp15) in Greenup County (Henderson and Pollack 1985). Siltstone tempered pottery is more common in West Virginia, however, where it is generally classified as Armstrong ceramics (Niquette and Boedy 1986:78).

Niquette and Boedy's examination of pottery from the C and O Mounds (Haag 1942) identified a considerable number of Johnson Plain siltstone tempered sherds. In an earlier study of this material, Purrington (1972) noted that the siltstone tempered sherds were either plain, cordmarked, cord-wrapped dowel-impressed, or incised (cited in Niquette and Boedy 1986:76).

Siltstone tempered sherds from the Calloway Site, located in Martin County, Kentucky, were used to define a variant of Adena Plain pottery known as Adena Plain, var. Inez (Niquette et al. 1987). Inez Plain is almost identical to Johnson Plain siltstone tempered pottery from the C and O Mounds, except in rim form. Based on a careful evaluation of extant chronometric data and temporally diagnostic artifacts from Calloway and other sites, it appears that Inez Plain pottery dates to between ca. 250 B.C. and A.D. 200 (Niquette et al. 1987).

Paste and temper characteristics of the Greene Mound ceramics are similar to those of Inez Plain (Charles M. Niquette, personal

communication 1987). The mean thickness of the Greene Mound sample (5.7 mm) matches that of Inez Plain body sherds from the Calloway Site sample, but thickness measurements could be taken on only three Greene Mound specimens. Unfortunately, because of the small size and poor state of preservation of the Greene Mound ceramic collection, few other comparisons can be made at this time. If the Greene Mound siltstone tempered pottery is temporally related to Inez Plain pottery from the Calloway Site, then the Greene Mound material would appear to be attributable to an early Middle Woodland occupation. Radiocarbon dates from the Wright Mound (A.D. 50+/-50 and A.D. 210+/-140) closely conform to the time range proposal for Inez Plain pottery.

SUMMARY AND CONCLUSIONS

Until recently, most Adena research in Kentucky has concentrated on excavating burial mounds and analyzing the associated mortuary features and artifacts. Ongoing investigations by the University of Kentucky in the vicinity of the Greene Mound have attempted to determine the character of off-mound activities of the groups responsible for mound construction. Initial efforts toward this goal have met with rather limited success, but this is not surprising, since only 12 m^2 of a very large and complex site have been examined.

The 1986 field season yielded a considerable amount of information about site stratigraphy, providing insights into activities which disturbed normal soil formation processes. The report of erosion of more than 1.2 m (4 feet) of soil from around the Wright Mound since its construction (Haag 1974) does not appear to have occurred in the Greene Mound area. Soil loss attributed by Haag to erosion may actually reflect borrowing activities associated with mound construction.

Excavation of test units produced numerous artifacts, some of which may be attributable to an Adena occupation. The stemmed projectile point is probably Adena, but similar types were manufactured by Kentucky Late Archaic groups. Perhaps the best indication of Adena activity is the siltstone tempered pottery. The small, eroded sherds appear to resemble material found in both the Wright and C and O mounds, and at the Calloway Site.

While this evidence supports the presence of Adena off-mound activities, it is at best circumstantial. Larger areas of the site need to be opened to locate features containing well-preserved materials in good cultural context. Evidence of truncated soil profiles near the mound suggests that some of the soil used in its construction came from nearby, possibly destroying indications of previous activities. Future excavation efforts will focus on areas further from the mound that are less likely to have been impacted by mound construction.

ACKNOWLEDGEMENTS

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