THE ORGANIZATION OF CORE TECHNOLOGY

edited by JAY K. JOHNSON and CAROL A. MORROW

Westview Special Studies in Archaeological Research

The Organization of Core Technology

edited by
Jay K. Johnson
and Carol A. Morrow

Westview Press / Boulder and London

3

Core Technology at the Hawthorn Site, New Castle County, Delaware: A Late Archaic Hunting Camp

Jay F. Custer

The purpose of this paper is to describe the role of core technologies at the Hawthorn Site, a Late Archaic hunting camp in northern Delaware. Although bifacial tool technologies played an important role in the lithic industries at the site (Custer and Bachman 1986), core technologies, based on local cobbles, are also present in some abundance. This paper will consider the spatial organizations and functions of these technologies.

SITE DESCRIPTION

The Hawthorn site is located in the Delaware High Coastal Plain approximately five kilometers south of the Fall Line within five kilometers of Churchmans Marsh, a large estuarine marsh complex that is the focus of intensive prehistoric settlement (Custer 1982). A small springhead is located adjacent to the site. The Hawthorn site was discovered during Phase II testing of an 18th-19th century historic farmstead when prehistoric artifacts and features were recovered from a buried soil horizon that showed some pedogenic development. Phase III data recovery excavations consisted of 55 five-foot squares and focused on the area containing the in situ artifacts and feature (Custer and Bachman 1983). The buried artifact-bearing horizon was overlain by an old plowzone which contained both prehistoric and historic artifacts. Pedological analysis of the plowzone and underlying B-horizon

(Custer and Bachman 1983:Appendix I) indicated that the B-horizon had been intact as an old land surface approximately 4000 - 5000 years ago and had not been subject to erosion or disturbance since that date. More recent (post-17th century) slopewash had buried this soil and then the slope wash and top parts of the B-horizon were disturbed by historic plowing activities. Finally, sometime in the early 20th century, most of the site was covered by sterile sand fill and a macadam driveway.

Because the site was buried by colluvium, there may have been some displacement of artifacts and mixing of associations. A variety of analyses were undertaken to see if this kind of mixing took place. First, if colluvial deposition had significantly displaced artifacts, it should not be possible to discern activity areas within the site. Figure 3.1 shows three clear-cut activity areas that were delineated from the analysis of the distribution of various classes of artifacts and features (Custer and Bachman 1983:88-112). Area I includes a small pit feature that is associated with the processing of nuts and seeds, a discarded plano-convex axe which showed surface striations indicative of reuse as a plant processing tool, concentrations of fire-cracked rock, concentrations of charred hickory nuts, and concentrations of charred Chenopodium and Amaranth seeds. A radiocarbon date of 2250 B.C. ± 75 (UGa5378) was obtained from the feature. Area II contained a variety of projectile points, cutting and scraping tools that had been broken in use and discarded, cores, and some debitage. Small debitage from resharpening of tools was also especially abundant in the flotation samples from this section of the site. Area III contained an oval ring of stones that is similar to features identified as tent-rings (Fitzhugh 1972). This area was also free of artifacts within the tent ring structure, but did have associated accumulations of flakes and discarded and rejected tools adjacent to the structure.

In sum, three clearly defined activity areas were present at the site. One was associated with processing of plant foods, another was a butchering and animal resource processing area,

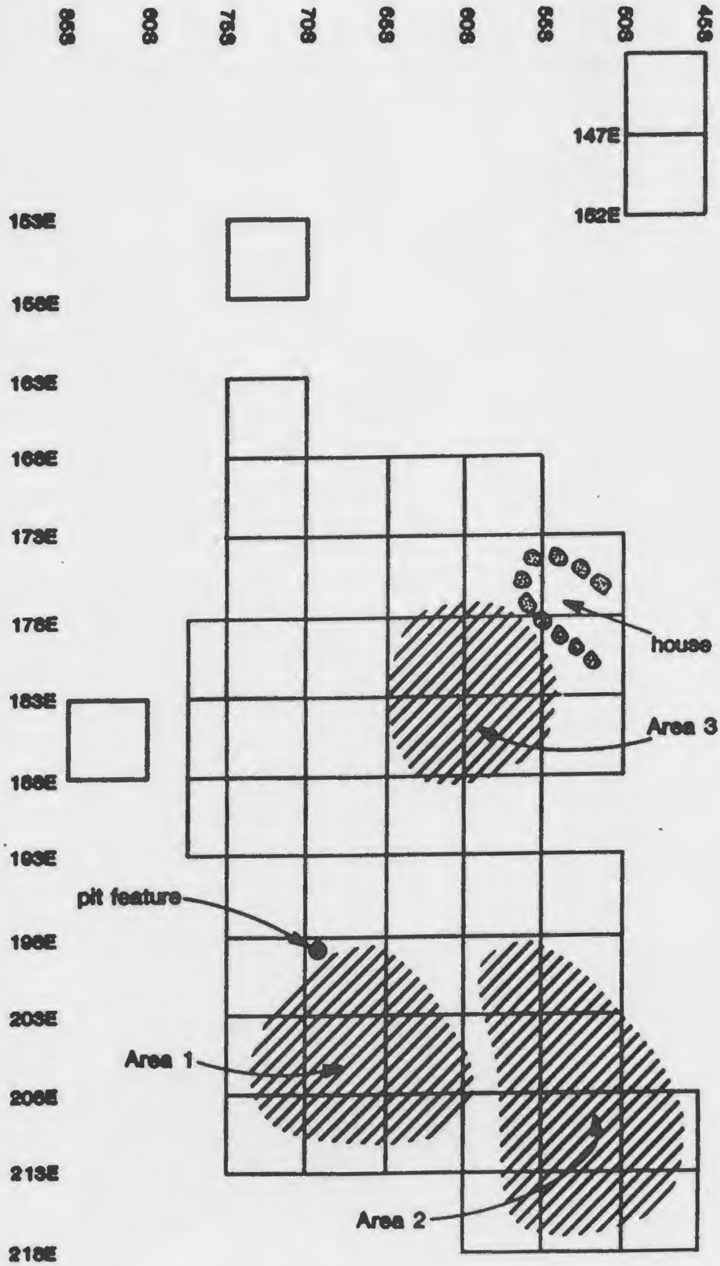

Figure 3.1. Activity areas.

and a third was a temporary residential area with associated tool kit refurbishing activities. Had the site been subject to artifact redeposition associated with colluvial activity it would not be likely to show such clear-cut activity areas. Therefore, the artifact distributions do not indicate any mixing. In fact, the presence of concentrations of charred hickory nut hulls and seed remains in pits and in general excavation levels indicates very little redeposition of even very small artifacts and ecofacts at the site within the buried soil horizon. The discrete nature of the artifact associations within the activity areas also argues against multiple occupations of the site. Artifact distributions indicate that the assemblage from the Hawthorn site represents a single, short-term occupation of the site. The burial of the site was quick enough to preserve activity areas, but was of sufficiently low energy not to destroy artifact associations and features.

Based on its artifact assemblage and features, the Hawthorn site is considered to be a temporary camp from which hunting and gathering forays were made (Custer and Bachman 1986). Several large base camp sites of the same time period are located within 2 km of the Hawthorn site and it is suggested here that the group using the Hawthorn site originally came from one of these base camps (Custer 1982, 1984:99-101). Numerous small, comparably dated, procurement sites, which might also be associated with the Hawthorn site, are also known from within 35 km of the site (Custer, Catts, and Bachman 1982; Custer 1984:104-105).

CORE ASSEMBLAGE DESCRIPTION

A total of 41 cores were recovered from the Hawthorn site and all cores could be placed into two basic categories. Blocky cores, which have a width-thickness ratio of less than 2.00, are present along with tabular cores, which have width-thickness ratios of greater than 2.00. Figure 3.2 shows examples of these two types of cores. Table 3.1 shows the distribution of core

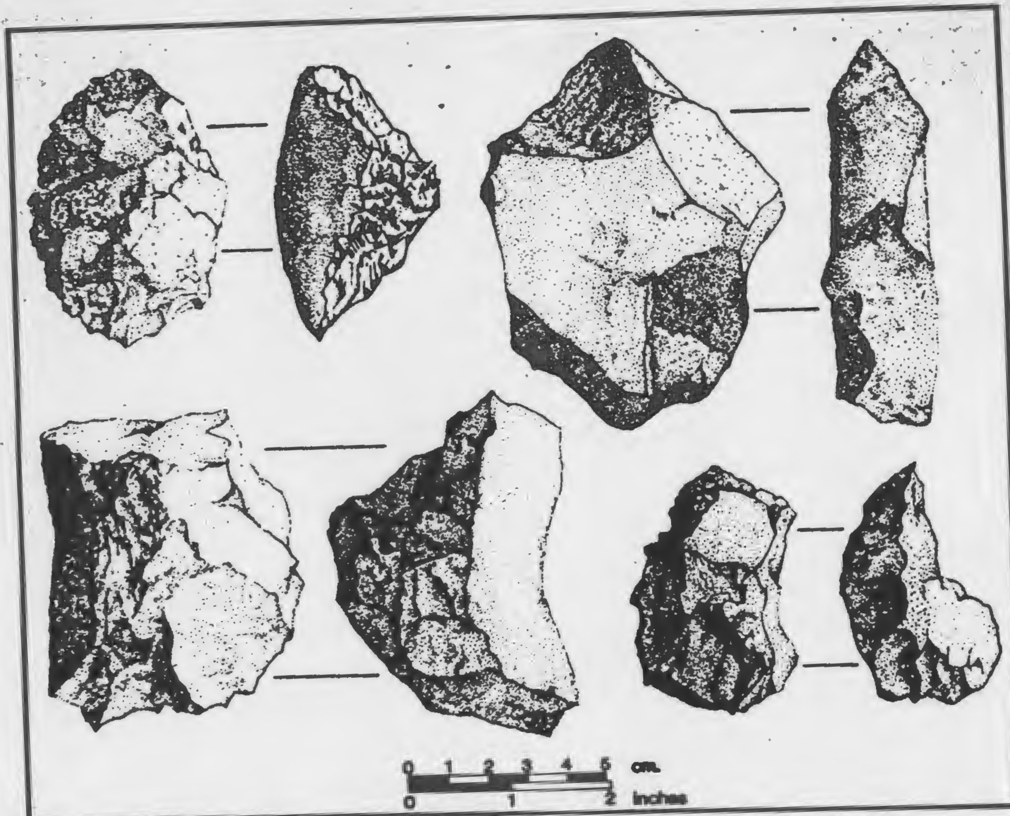

Figure 3.2. Typical cores.

Table 3.1
Core types and raw materials

Raw Material	Core Types		
	Blocky	Tabular	Total
Quartz	17(4)	15(9)	32(13)
Quartzite	3(2)	0	3(2)
Cryptocrystalline	3(3)	3(2)	6(5)
Total	23(9)	18(11)	41(20)

Note: Number in parentheses indicates number of cores with cortex

types among the various raw materials and the presence and absence of cortex on the cores. Half of the cores show remnant cortex and these cores were probably manufactured from secondary cobble deposits which are abundant in the immediate site area. The entire assemblage of cores is fairly evenly divided between the blocky and tabular core types. Also, there is no apparent correlation between core type and raw material. Quartz is the most frequently used material for core production as is the case for the remainder of the site's lithic assemblage (Custer and Bachman 1983:68-74).

Table 3.2 shows the relationship between core type and blank type. The tabular cores were made primarily from large thick flakes, although some were made from flat cobbles. Flakes were usually removed from a single face of the core, although in some cases flakes were removed from both faces of the core. Even though some of these bifacial cores are small (less than 3 cm in the intermediate dimension), the width-thickness ratios are never larger than 3.00 distinguishing them from the few rejected bifaces from the site. Thus, the tabular cores are produced by repeated removal of flakes from cobbles, or large flakes, with little or no platform preparation or specialized shaping of the core.

Blocky cores are primarily manufactured from cobbles and show signs of more platform preparation than tabular cores. In many cases, the blocky cores were manufactured by splitting a

Table 3.2
Core types and blank types

Core Type	Blank Type		
	Flake	Split Cobble	Cobble
Tabular	12	2	1
Blocky	3	12	8

cobble in half using bipolar percussion. Flakes were then removed from one face using either the interior surfaces or the outer cortical surfaces as striking platforms. A plano-convex cross-section results (Figure 3.2) and the margins of the remnant blocky cores recovered from 7NC-E-46 show signs of trimming and grinding associated with platform preparation.

SPATIAL DISTRIBUTION OF CORES

Distribution Among Activity Areas

A total of 28 cores were recovered from the undisturbed soils of the site area and of these 23 were clearly associated with one of the three activity areas shown in Figure 3.1. Table 3.3 shows the distribution of core types among the three activity areas.

Both blocky and tabular cores were found in the plant processing and butchering activity areas. A difference-of-proportion test (Parsons 1974) was used to compare the distribution of core types between activity areas because there were too few data for a chi-square test. When percentages of both core types were compared between the two activity areas, the test statistics were equal to 1.63 ($.25>p>.10$) indicating no significant difference in core types between the two activity areas. Therefore, the core types may be combined to give a clearer picture of core distribution at the Hawthorn site (Table 3.4).

It is interesting to note that cores are not common in the area of the tent structure. Tool kit refurbishing activities are associated with the tent structure area (Custer and Bachman 1983:97-100, 111-112) and a number of discarded special function bifaces manufactured from non-local ironstone (Custer and Bachman 1986:5758) were also found in this activity area. It has been suggested that assessment of the curated portion of the tool kits took place adjacent to the structure and that damaged tools were rejected there. The relative absence of cores in this

Table 3.3
Distribution of core types among activity areas

Activity Area	Core Types		
	Blocky	Tabular	Total
Butchering	8	2	10
Plant Processing	5	6	11
House Structure	0	2	2
No Associated Activity Area	2	3	5
Total	15	13	28

Table 3.4
Distribution of tools and cores among activity areas

Activity Areas	Cores	Bifaces	Projectile Points/Knives	Flake Tools
Butchering	10	5	22	8
Plant Processing	11	0	6	1
House	2	0	11	2

area, and their more frequent discard in butchering and plant processing areas, indicate that cores were not part of the curated portion of the stone tool assemblage.

Distribution Within Butchering Activity Area

An earlier study (Custer and Bachman 1986) considered the distribution of artifacts within the butchering area (Figure 3.1) and provides a context within which to consider the distribution of cores in this part of the site. The butchering area was chosen for analysis because abundant debitage was present in one portion of the activity area and not in another (Custer and Bachman 1983:101, 103-104), and because tools of differing functions, and cores, were scattered among the debitage (Custer and Bachman 1983:94-95). These patterns, apparent from the initial analysis, were interesting and warranted further study.

The minimum provenience unit excavated at the site was a 1-foot square and these counts were used as the basic analytical unit for the study of core distributions in the butchering area. Artifact counts and grid coordinates of the 1-foot squares were entered into an IBM-XT computer using the Ashton-Tate dBASE III software. The dBASE III system was then used to create a series of mapping files which were fed into the Golden Software PC Mapping Package. This package smoothed the data, computed moving averages, and plotted three-dimensional maps of artifact density distributions. The artifact density plots were then combined with one another, and with plots of different functional tool classes, for analysis. Functional tool classes were taken from data in the original report (Bachman and Custer 1983:74-87, Appendix III).

Figure 3.3 shows the distribution of total flakes in the butchering area and Figure 3.4 shows the distribution of biface and flake tools of various functions. It can be seen that there are low numbers of both flakes and tools in the southeastern corner of the butchering area. The southwestern corner also has few flakes, but does

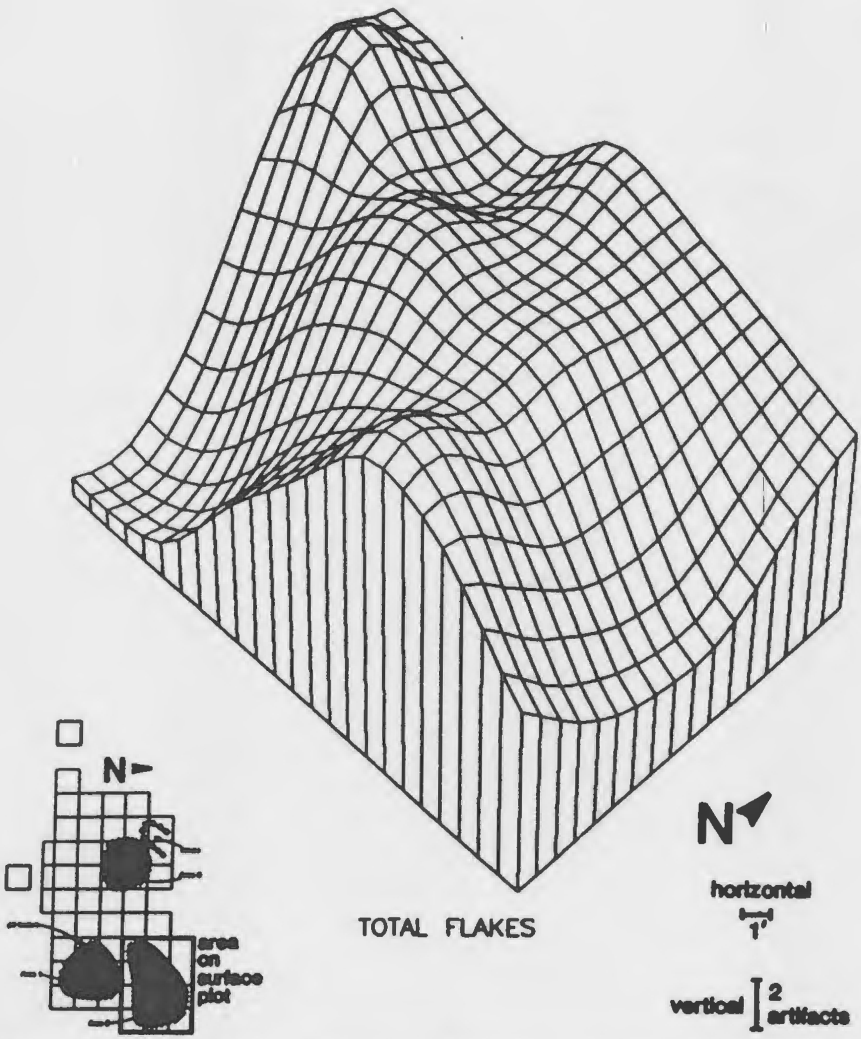

Figure 3.3. Total flakes distribution - butchering area.

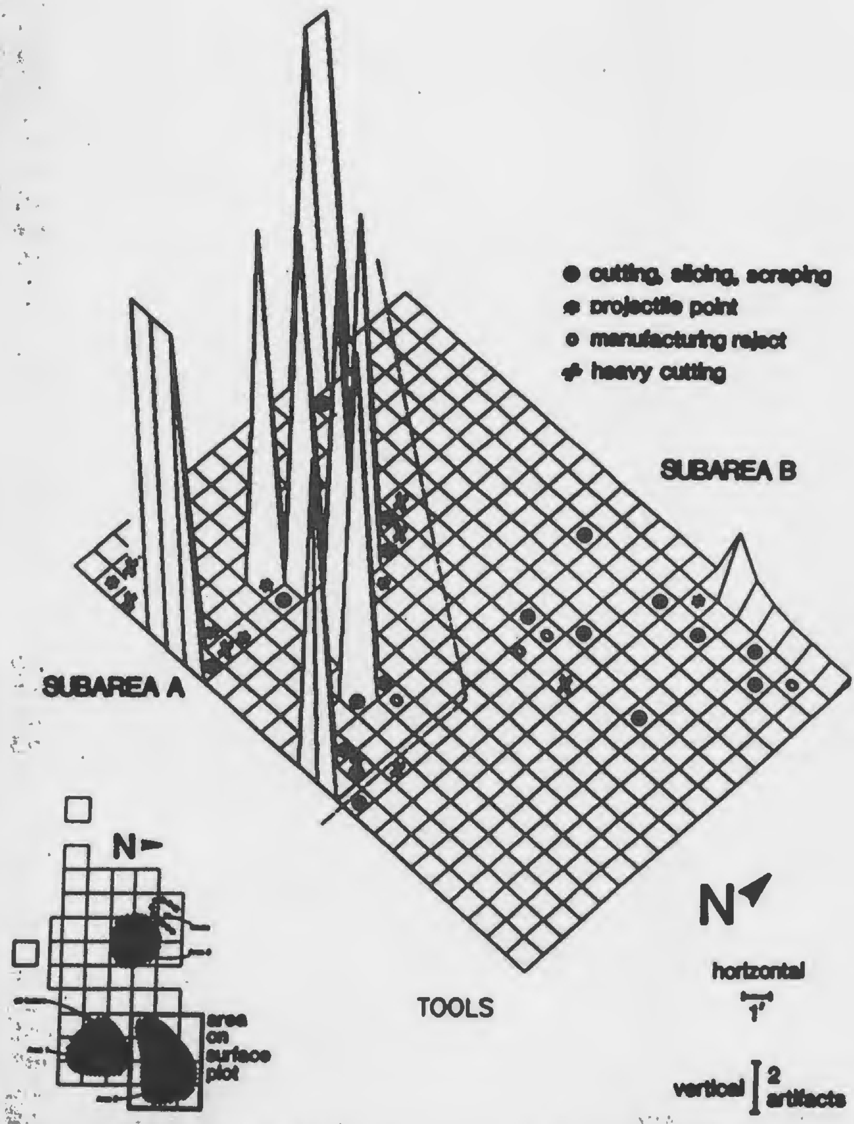

Figure 3.4. Tool distribution - butchering area.

contain numerous tools. In general, the tools are clustered in tight concentrations in the southwestern corner of the block. In the northeastern area there is a diffuse scatter of tools with a small cluster along the northern edge of the block. For purposes of analysis, the butchering area was divided into two sub-areas based on the types of tool distributions (Figure 3.4). Sub-area A is characterized by tight and discrete tool clusters while Sub-area B is characterized by a more diffuse scatter. There are no significant differences among the types of tools found in each area (Custer and Bachman 1986:4750). Overall, cutting, slicing, and scraping tools predominated in both sub-areas supporting the initial identification of this portion of the site as a butchering locale.

Comparison of Figures 3.3 and 3.4 shows that the dividing line between the two sub-areas is characterized by the highest concentrations of flakes. Indeed, the majority of the clustered tool distributions co-occur with dense flake concentrations. The distribution of flakes with and without cortex was also considered because the presence/absence of cortex can show different reduction activities among cobble-based core industries. For example, high proportions of flakes with cortex indicate either early stage biface reduction or the production of both blocky and tabular cores (Custer et al. 1981). Given the very low frequency of early stage bifaces at the site (Custer and Bachman 1983:62-71), the presence of cortex on flakes must be associated with core and flake production (for further supporting data see Table 3.4 and Custer and Bachman 1983:70-74). The distribution of flakes with cortex is similar to that of total flakes with a few gentle peaks along the dividing line between the two sub-areas and a concentration in the southeastern corner of the block (Figure 3.5). On the other hand, flakes with no cortex show a series of discrete concentrations throughout Sub-area A (Figure 3.6). The different distributions in Figures 3.5 and 3.6 suggest that limited cobble core preparation took place in the southeast and central sections of the butchering area producing a diffuse scatter of flakes with

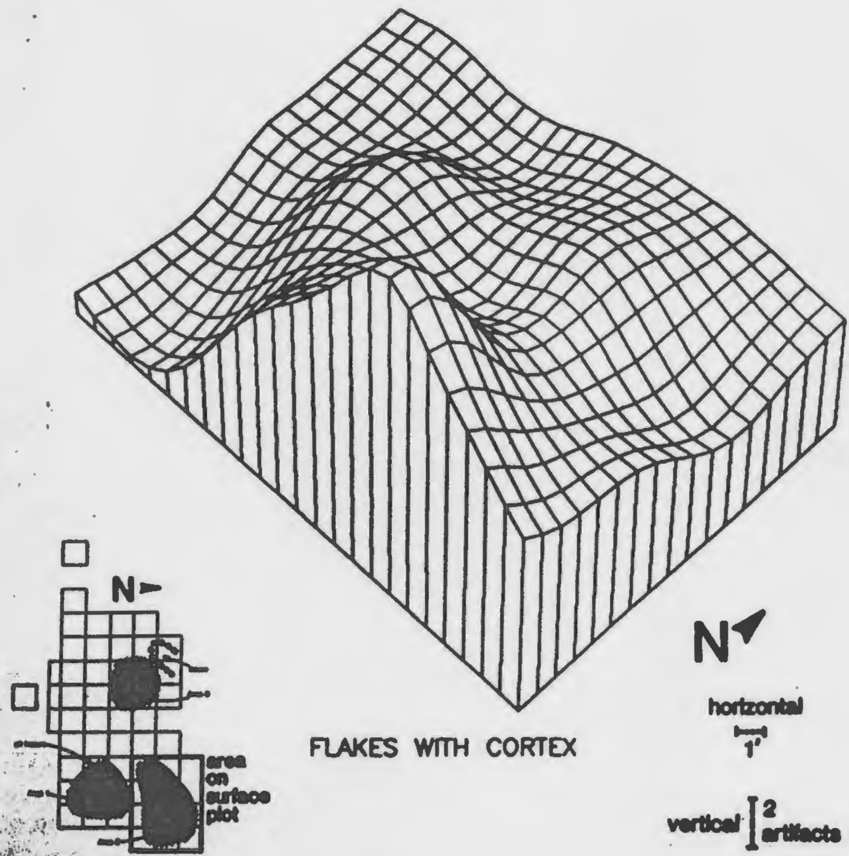

Figure 3.5. Flakes with cortex distribution - butchering area.

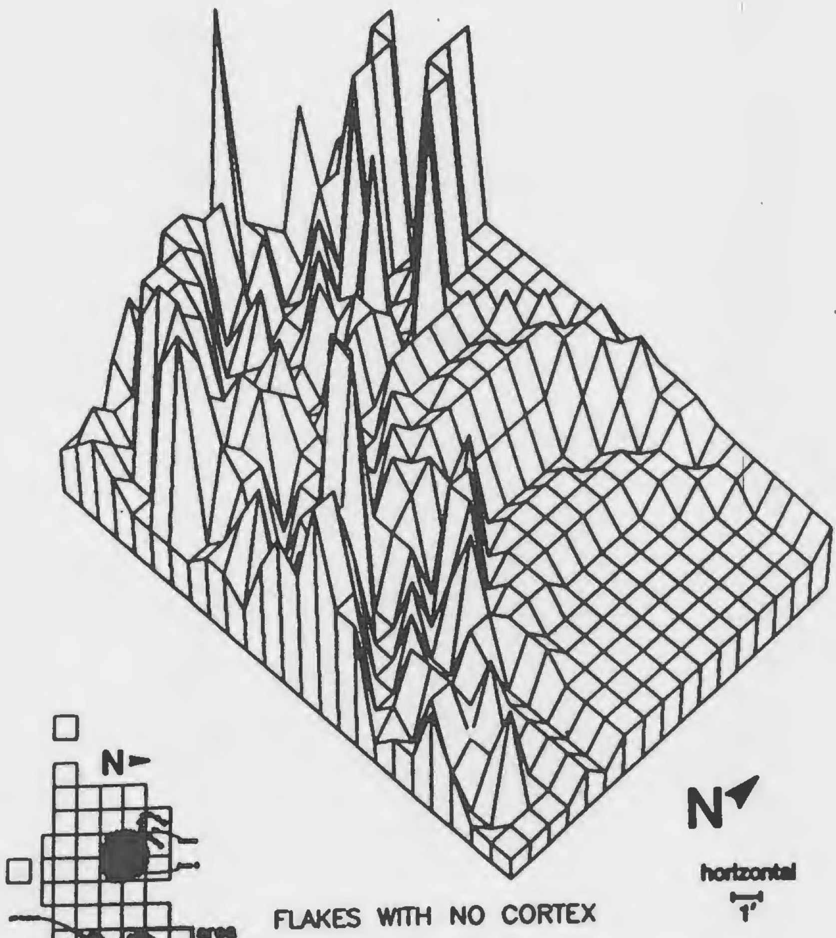

Figure 3.6. Flakes with no cortex distribution - butchering area.

cortex. On the other hand a series of discrete reductions of cores without cortex, and resharpening and reduction events, took place throughout Sub-area A producing the sharp peaks noted in Figure 3.6.

A total of seven cores were recovered from the two 5-foot squares in the southwest corner of Sub-area A compared with 3 total cores from the remaining 8 squares of the butchering area. This concentration of cores in Sub-area A would support the argument that cores were initially shaped from cobbles in the southeast corner of Sub-area B and then were reduced in Sub-area A. All of the cores from the butchering area are quartz and could still produce usable flakes when they were discarded. Furthermore, the quartz flake tools lack cortex although 50% of the cores retained cortex on one end. These observations indicate that quartz cobbles were prepared for use as cores by removing the cortex on one end. Then, flakes were struck from the non-cortex end of the core in an adjacent portion of the butchering area. When sufficient flakes had been produced, the cores were discarded and not curated, even though they could still produce usable flakes.

Figure 3.7 shows the distribution of total artifact classes and activities based on analysis of additional artifact types and raw materials within the butchering area (Custer and Bachman 1986:4757). It can be seen that core preparation and reduction took place adjacent to the butchering area and that flakes from the cores were probably used as expedient tools in the butchering process. Later, the cores were discarded as a group 10-15 feet away from the actual butchering area.

DISCUSSION

The data from the Hawthorn site indicate that cores were part of a locally manufactured expedient technology associated with both butchering and plant food processing. The data supporting this assertion include: 1) most of the cores were probably manufactured from local cobbles and still show remnant cortex; 2) cores

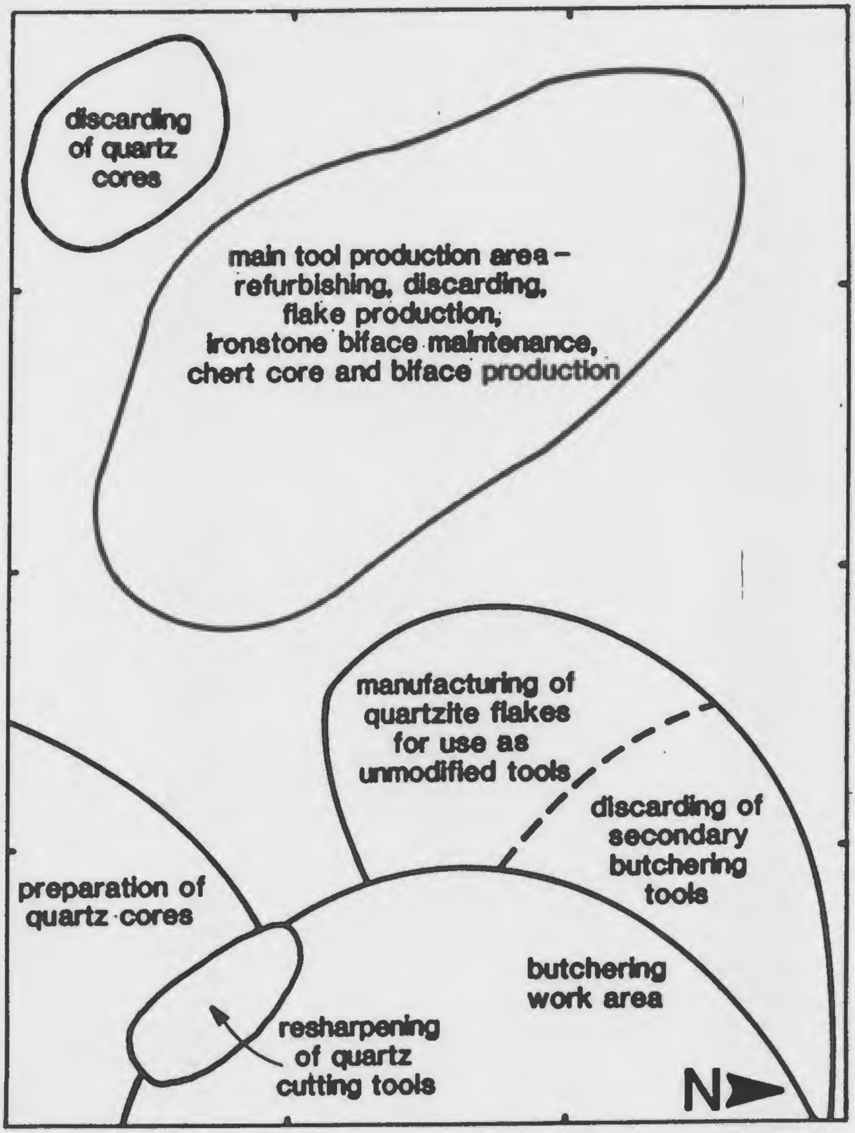

Figure 3.7. Summary artifact distribution - butchering area.

are not discarded with other portions of the curated technologies in the house structure area; 3) cores are produced and reduced within and adjacent to the butchering area; and 4) cores are dumped in a single location even though they could still produce numerous useful flakes. It can also be noted that the cores from the Hawthorn site show no sign of being used as tools themselves and there seems to be no distinction between the types of cores associated with the different activity areas. Thus, the cores do not seem to be manufactured or used for any specific activity.

The role of the core technologies as unspecialized sources of flakes within an expedient technology is understandable in light of the placement of the Hawthorn site within the regional settlement system and the distribution of local lithic resources. As was noted earlier, the Hawthorn site is located less than 2 km from numerous comparably dated large base camp sites (Custer 1982; 1984) and is thought to represent a temporary camp from which hunting and gathering forays to procurement sites, examples of which have been identified in the archaeological record (Custer, Catts, and Bachman 1982), were based. Even though a tent structure is present at the Hawthorn site, it is still thought to represent a relatively transient occupation given the fact that it lacks the pit houses, platform hearths, and deep storage pits characteristic of Late Archaic base camps (Custer 1984:93-107) in the local area. Furthermore, the tool inventory at the Hawthorn site is much more limited than that seen at other base camp sites (Custer and Bachman 1983:113-119). A more limited range of activities is inferred and these activities seem to have been primarily butchering, processing of animal products, and processing of plant food resources. A limited range of tools would have been needed at the Hawthorn site and none of the tools needed had to be very specialized. In fact, unmodified flakes seem to have fulfilled almost all of the unifacial tool needs. Consequently, unprepared, amorphous cores were the simplest source of tools.

The Fall Line setting of the Hawthorn site, and presumably related base camps, is especially rich in cobble lithic resources. In fact, Pleistocene geomorphological processes created a giant alluvial fan in the Delaware Fall Line Zone (Jordan 1964; Custer 1984:23-24) and cobble utilization characterizes lithic industries of all time periods in this region (Custer 1982) to the extent that specialized cobble reduction sites have been identified (Custer et al. 1981). It is hypothesized here that groups utilizing the Hawthorn site were familiar with the ubiquitous nature of the region's cobble lithic resources. They arrived at the Hawthorn site with a curated assemblage of biface tools made from local and non-local materials (Custer and Bachman 1986:58) which served specialized functional needs. However, they anticipated the use of local quartz cobbles for their core and unspecialized flake tool needs. Once these needs had been satisfied, the cores were discarded because more cobbles would be available at the next local site.

To summarize, expedient use of relatively amorphous cores at the Hawthorn site is linked to the rich nature of the local lithic resources and limited needs for unspecialized flake tools. A decreased availability of lithic resources and needs for more specialized tools would probably produce different types of core industries.