USE-WEAR, PROJECTILE POINT MORPHOLOGY, AND ACTIVITY AREAS AT THE HAWTHORN SITE (7NC-E-46), NEW CASTLE COUNTY, DELAWARE: CHRONOLOGICAL IMPLICATIONS

David C. Bachman and Jay F. Custer
Center for Archaeological Research
Department of Anthropology
University of Delaware

INTRODUCTION

The purpose of this paper is to briefly describe the morphological variation within a series of projectile points that were recovered from the Hawthorn site (7NC-E-46), a single component, short duration Late Archaic site in the northern Delaware High Coastal Plain (Custer and Bachman 1983). The assemblage from the Hawthorn site is especially interesting because it contains a variety of projectile point forms that generally are not thought to have been used contemporaneously. The research reported herein was a part of data recovery excavations funded by the Delaware Department of Transportation and carried out by the University of Delaware Center for Archaeological Research. It should be noted that this paper represents a summary of the analysis carried out with the Hawthorn site data. Further supporting data are available in the complete site report (Custer and Bachman 1983) which is available from Kevin Cunningham, Delaware Department of Transportation. We also thank Kevin Cunningham and Dan Griffith for their support of our research at the Hawthorn site.

In a recent report on a regional survey in the Pennsylvania Piedmont, Snethkamp et al. (1983) have suggested that traditional interpretations of Late Archaic archaeological data have systematically ignored the varieties of projectile point types that are found together at a single point in time. By beginning from a series of assumptions, or "axioms" which have been lumped together as the "Coe Axiom" (Brennan 1967), most archaeologists working in the Middle Atlantic first assume that single projectile points will be found at single locations at single points in time. Limited co-occurrence of diagnostics is seen as possible in light of applications of seriations (Kinsey 1972:177, Fig. 54); however, single styles at single points in time characterize most chronological schemes (Coe 1964:121). If data from sites, in the form of "anomalous" associations of the "diagnostic" types, contradict these assumptions, the context of

the site is dismissed as mixed, or the assemblage is seen as the result of curation of "heirlooms" by prehistoric groups. In this manner, the point sequences and chronologies remain inviolate and pass every "test" of their validity.

Nonetheless, recent studies of a number of sites and collections (Snethkamp et al.; Stewart 1981; Custer 1982, 1983; Moeller 1982) have suggested that the traditional chronologies require some revisions, specifically with regard to the multiple occurrence of diagnostic types. More importantly, the implicit linking of projectile point "traditions" (Piedmont, Laurentian, etc.) to distinct social units has been questioned (Michlovic 1976).

In this paper we will follow a different approach in analyzing the Late Archaic archaeological record as manifest at a single site. First, we will consider the depositional context of the Hawthorn site to see if there is any empirical reason in light of the soil depositional data and artifact distribution data (other than projectile point styles) to indicate that the site is mixed. Then, we will consider the morphological variety of the projectile points found at the site. Finally, we will consider explanations for the assemblage variability. No a priori assumptions, such as the Coe Axiom, will be utilized.

SITE CONTEXT

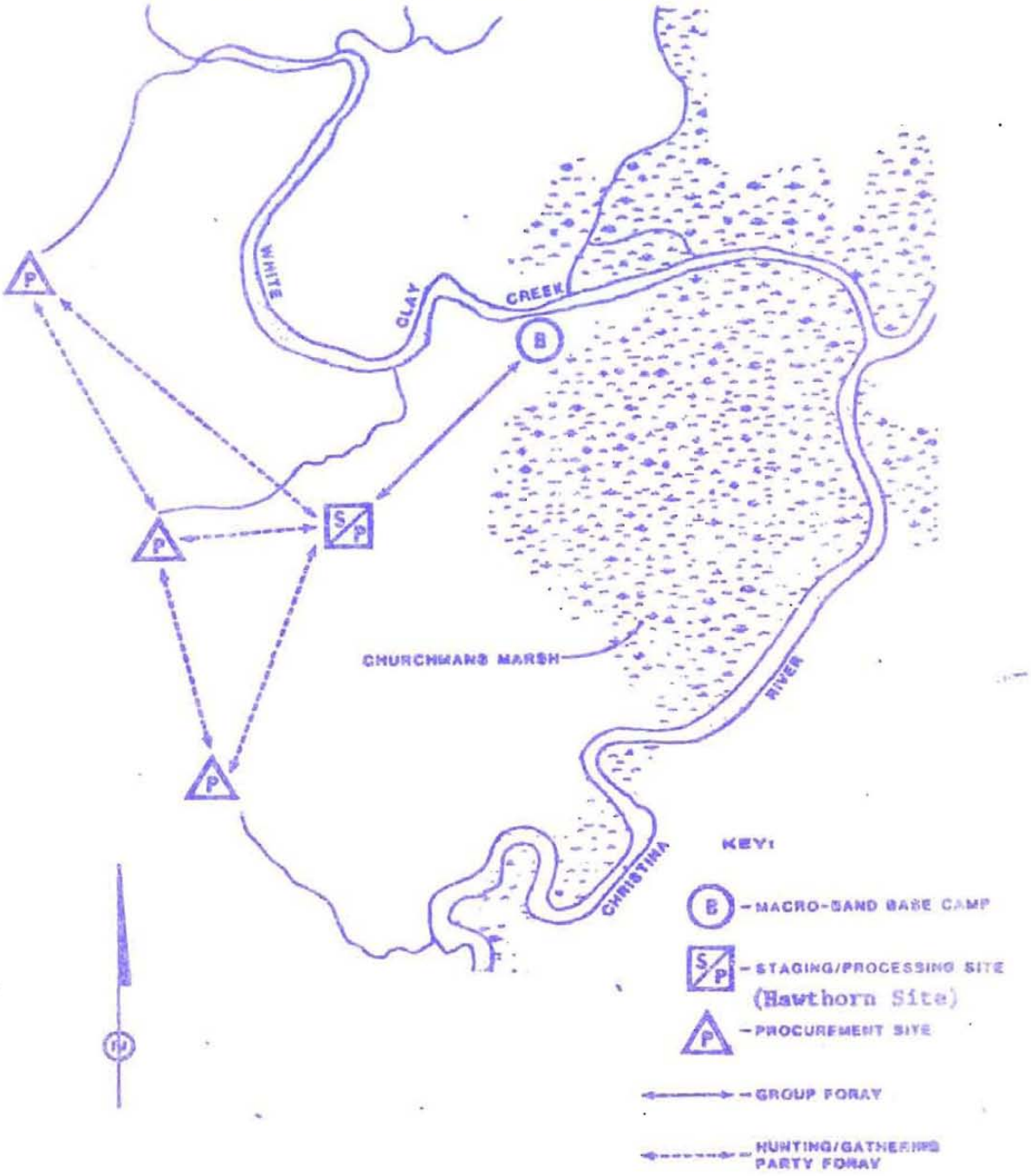
The Hawthorn site is located in the Delaware High Coastal Plain approximately five kilometers south of the Fall Line. It is also within five kilometers of Churchmans Marsh, a large estuarine marsh complex that is the focus of intensive prehistoric settlement (Custer 1982). On a more detailed level, the Hawthorn site is located adjacent to a small springhead that feeds an unnamed tributary of the White Clay Creek (Figure 1).

The Hawthorn site was discovered during Phase II testing of an 18th-19th century farmstead when prehistoric artifacts were discovered in a buried soil horizon that showed some pedological development. A small pit feature was also encountered during the test excavations and was interpreted as an indication that a portion of the site may have contained in situ deposits.

Phase III data recovery excavations consisted of 55 five-foot squares and focused on the area containing the in situ feature. A buried B-horizon containing numerous prehistoric artifacts was discovered. It was overlain by an old plowzone that was primarily composed of recent slopewash and 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

FIGURE 1

LOCAL SETTLEMENT MODEL



soil and then the slope wash and top parts of the B-horizon were disturbed by historic plowing activities. Finally, sometime in the late 19th century, most of the site was covered by sterile sand fill and a macadam driveway. Figure 2 shows the general profile of the site.

In sum, the buried B-horizon represents an old landscape that was buried rather quickly by slopewash during the post-3000 BC time period. Later additional slopewash buried the site even deeper such that a portion of the site approximately 10 - 20 cm thick was protected from later plow disturbance. Artificial burial by driveway construction further protected the site from later historic erosion and mixing. Pedological development, including formation of clay skins and some incipient blocky structure, clearly indicates that the soil profile below the plow zone, including the artifact bearing layers, had not been disturbed for 4000 to 5000 years. Clearly, there are no empirical data from the analysis of the depositional context of the artifacts to suggest that any mixing of the site.

Nonetheless, the burial of the site by colluvium may have allowed some displacement of artifacts and mixing of associations. In order to see if this kind of mixing took place, a variety of analyses were undertaken. First, if colluvial deposition had displaced artifacts, it should not be possible to discern activity areas within the site. Figure 3 shows three clear-cut activity areas that were delineated from the analysis of the distribution of various classes of artifacts and features. Area I is characterized by a small pit feature that appears to have been associated with the processing of nuts and seeds, a discarded axe which showed striations indicative of reuse as a plant processing tool, concentrations of fire-cracked rock, concentrations of charred hickory nut hulls, and concentrations of charred Chenopodium and Amaranth seeds. All sections of the site were subjected to analysis for the presence of these ecofacts; therefore, their presence in this area of the site is not a result of analytical bias or re-deposition.

Area II was characterized by a variety of projectile points, cutting and scraping tools that had been broken in use and discarded, and some debitage (Figures 4 and 5). Small debitage from resharpening of tools was also especially abundant in the flotation samples from this section of the site. Area III was characterized by the presence of an oval ring of stones that is similar to features identified as tent-rings by Fitzhugh (1972). This area also was free of artifacts within the tent ring structure, but did have some associated accumulations of flakes and discarded and rejected tools adjacent to the structure.

In general, three clearly defined activity areas were present at the site. One was associated with processing of plant foods, another seems to be a butchering and animal resource processing area, and the third seems to be a temporary residential area with associated tool kit refurbishing activities. We suggest here that a site that had been subject to

FIGURE 2

GENERAL PROFILE

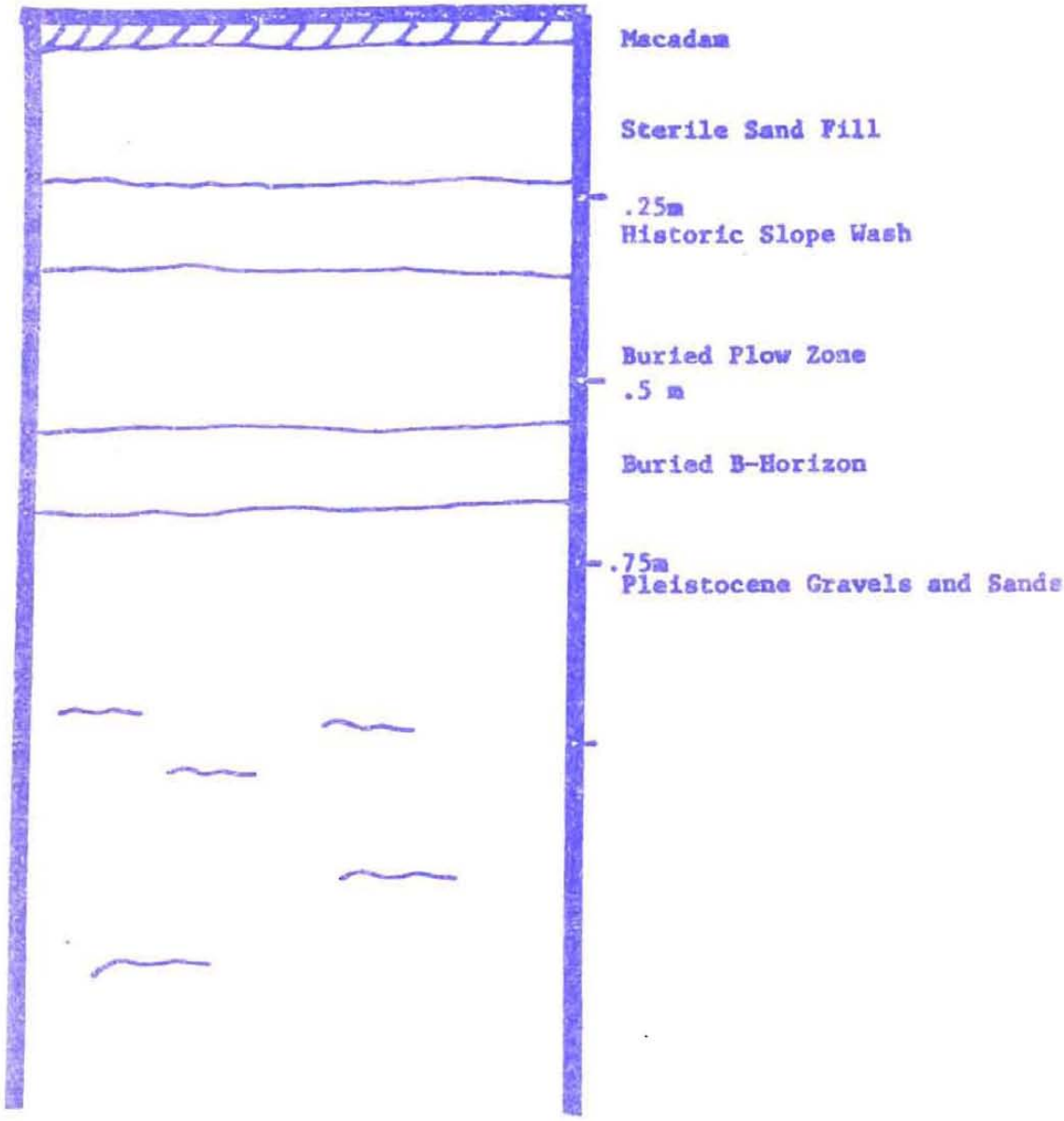


FIGURE 3

ACTIVITY AREAS

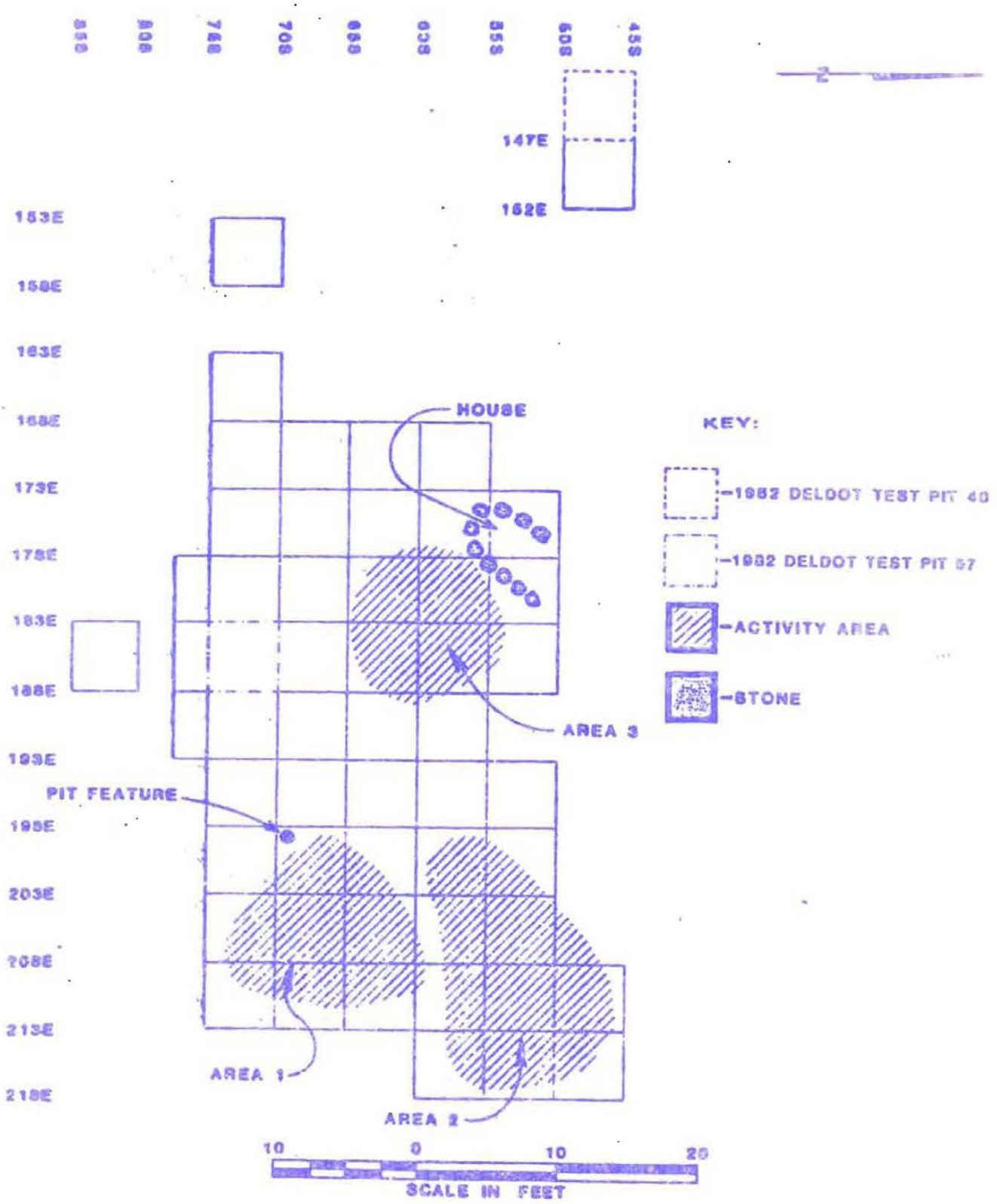


FIGURE 4

DISTRIBUTION of BIFACES and FLAKE TOOLS

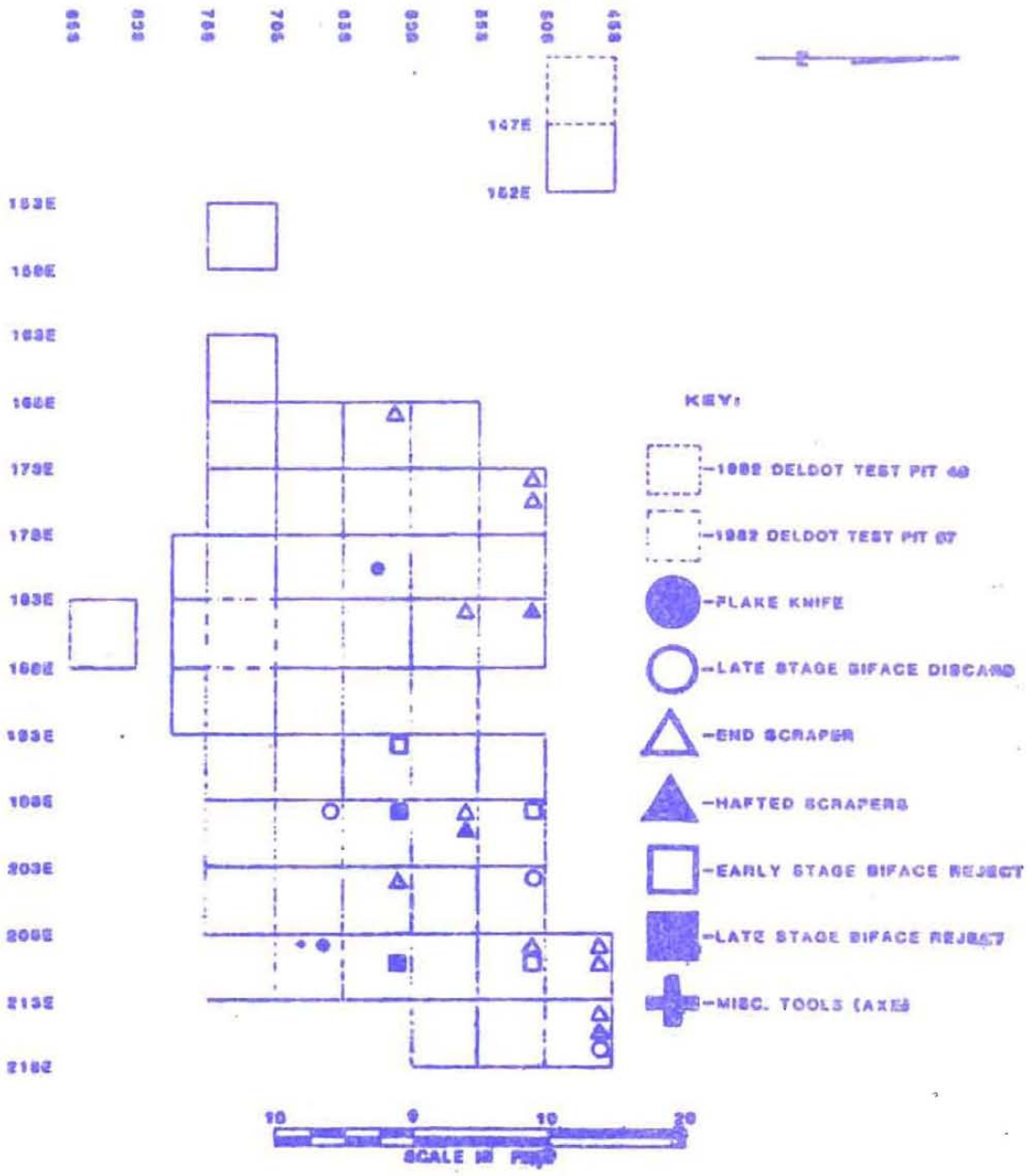
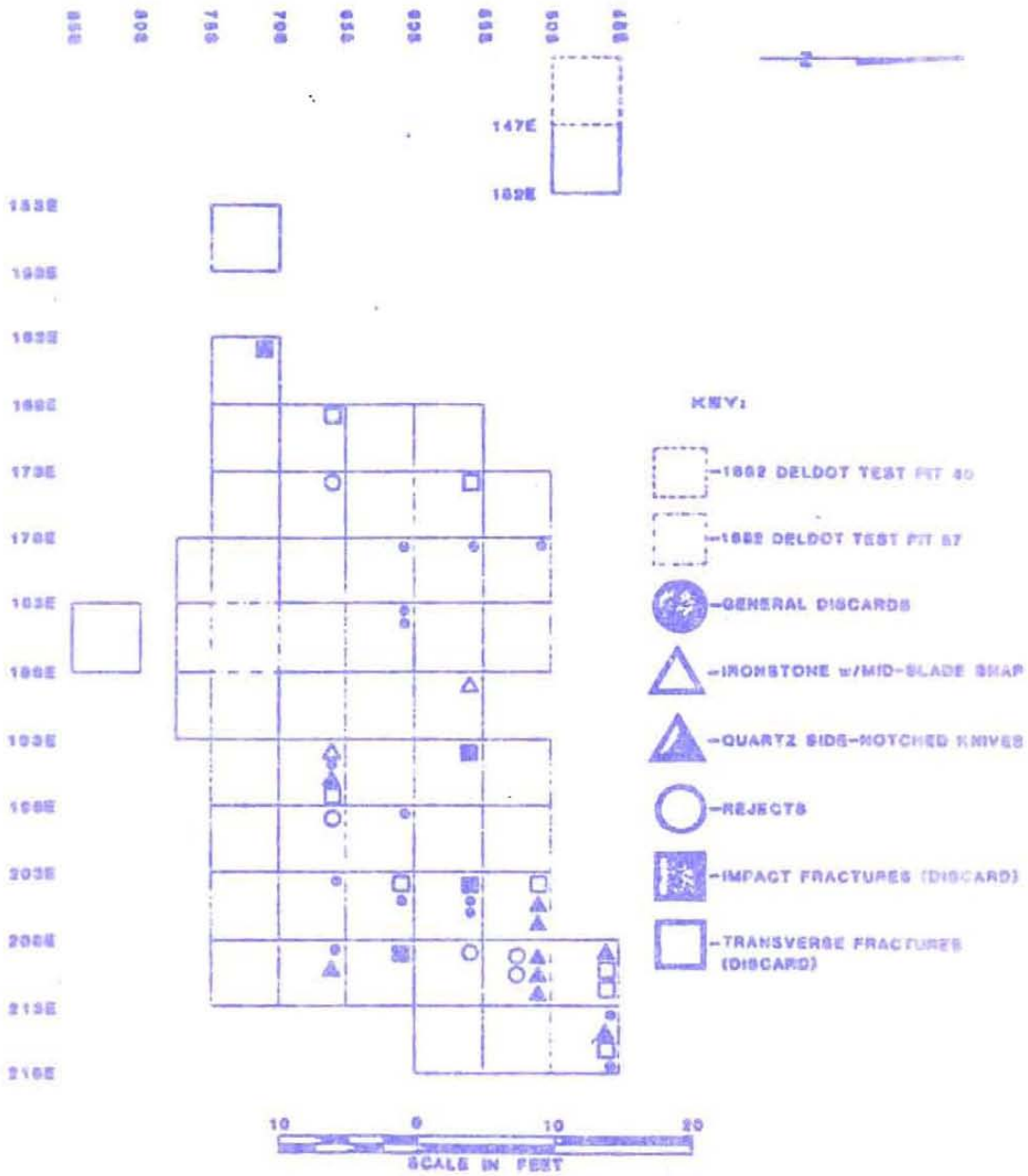


FIGURE 5

DISTRIBUTION of POINTS of VARIED FUNCTIONS



artifact redeposition associated with colluvial activity 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.

Another line of evidence in the artifact distributions that indicates little redeposition of the artifacts is the fact that many of the broken tools and bifaces could be refitted. Figure 6 shows the distribution of these refitted artifacts. The fact that the refitted artifacts link together the separate activity areas indicates that all three activity areas represent the same occupations of the site. Also, the discrete nature of the artifact associations within the activity areas also argues against multiple occupations of the site. Thus, the data on artifact distributions indicate that the assemblage of artifacts 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 to not destroy artifacts associations and features. Other sites with similar colluvial depositional histories are known from the Middle Atlantic (Carr 1975).

PROJECTILE POINT ASSEMBLAGE

Within this discrete single-event occupation of the Hawthorn site a variety of projectile point types were recovered. Figure 7 shows the four major types encountered: a generalized side notched form usually manufactured of quartz, a long narrow blade, contracting stem variety usually manufactured from ironstone, a small narrow blade stemmed variety usually made from chert or jasper, and a broad blade broadspear-like form. We would suggest that we could place different specimens of each of these morphological forms in most of the point types illustrated by Evans (1984) in her recent synposis of Late Archaic projectile point types recognized in the Middle Atlantic.

A few sherds of Wolfe Neck ceramics were also found at the Hawthorn site and on the basis of the variety of projectile points forms, especially the broadspear varieties, and the Early Woodland ceramics we would suggest a date of ca. 1200 BC - 500 BC. Processing of radiocarbon dates from the site is still in progress. Thus the variety of projectile point forms described above all co-occurred within a single cultural group sometime at the very end of the Late Archaic period and the very beginning of the Early Woodland period.

FIGURE 6

HORIZONTAL DISTRIBUTION OF REFITTED ARTIFACTS

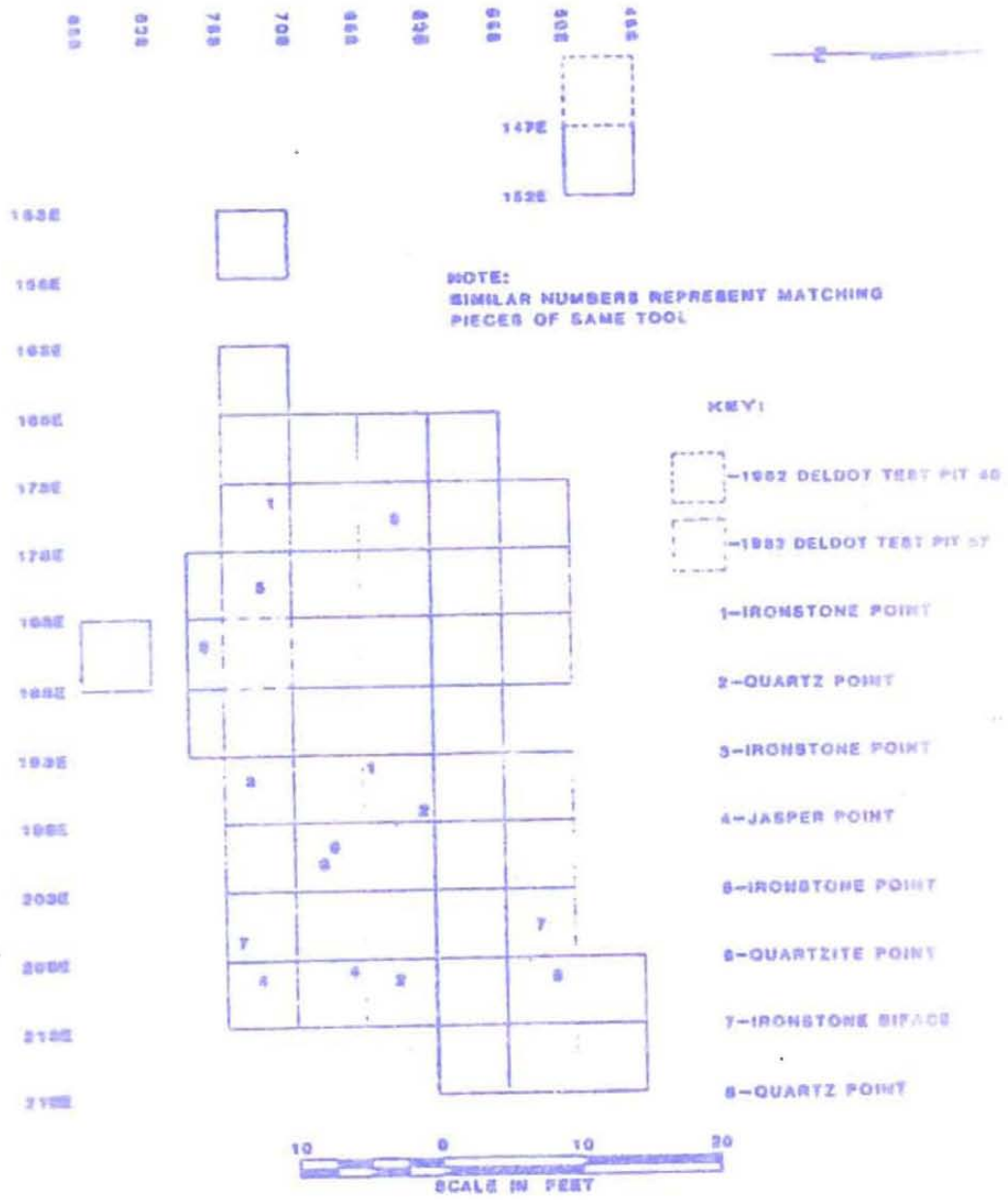
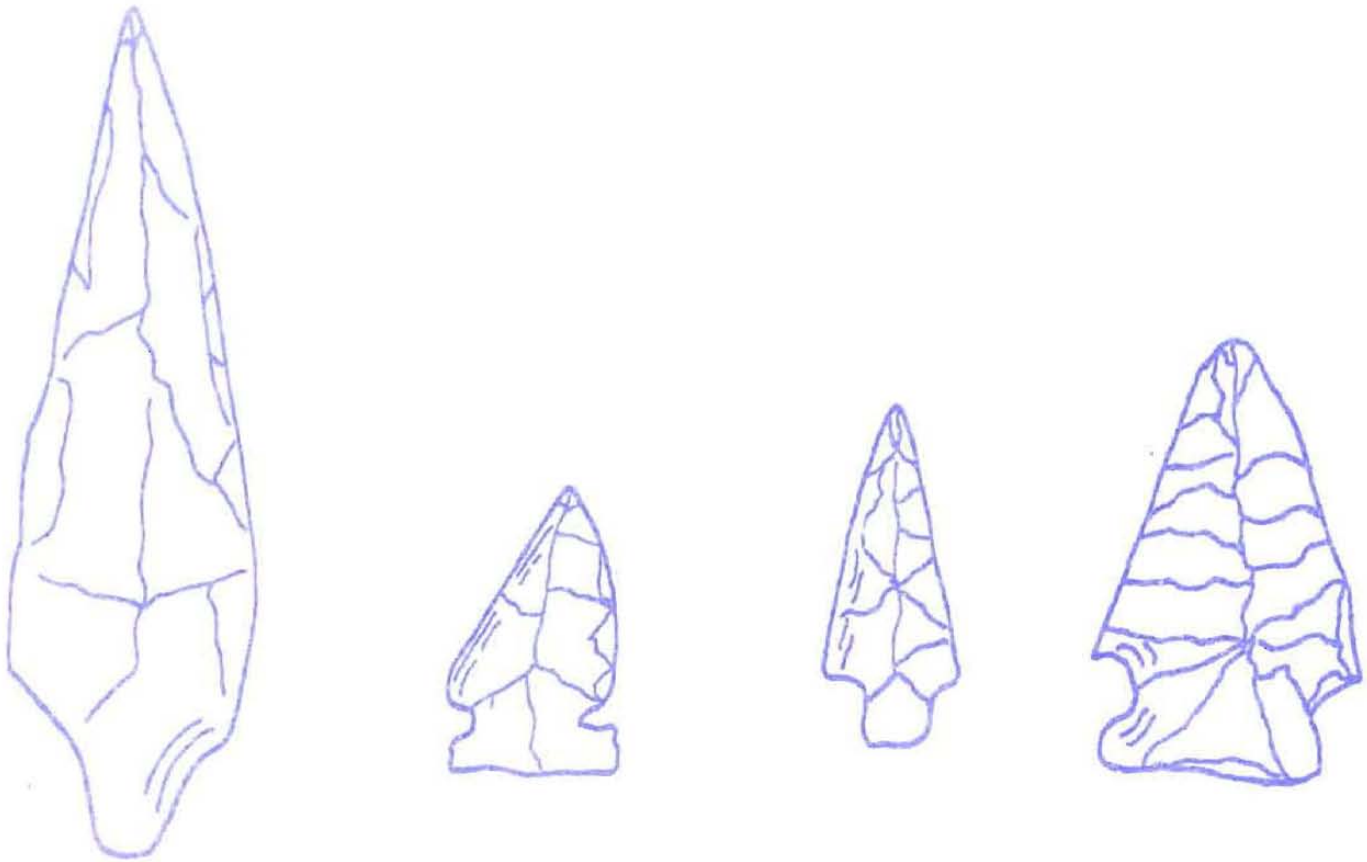


FIGURE 7

BASIC POINT MORPHOLOGIES



Large Stemmed Side-Notched Small Stemmed Broadspear

DISCUSSION

The variety of morphological forms encountered in the single occupation at the Hawthorn site would seem to confound any of the standard explanations of changing projectile point morphology that focus on changes in mental templates through time. However, analysis of wear patterns, through both macroscopic and microscopic analysis, provides an alternative explanation. The quartz side-notched points recovered from the Hawthorn site all shared the following attributes which can be related to their possible function: asymmetrical blade shape, moderate rounding and crushing of edges, striations along the lateral edges that run perpendicular to lateral edges, and rounding of flake ridges perpendicular to the lateral edges. In various experimental studies (Ahler 1971; Keely 1980; Odell 1980; Odell and Odell-Vereecken 1980; Semenov 1964) these attributes have been linked to cutting or sawing motions, perhaps associated with butchering. Asymmetrical blade shape is indicative of repeated resharpening activities. Most of these tools are found concentrated within Activity Area II (Figure 5).

The large, narrow-blade stemmed points of ironstone show a different wear pattern. These tools are characterized by a high incidence (~30%) of transverse medial fractures, and heavy rounding, polishing, and crushing of edges. The experimental use wear studies noted above have linked these wear patterns with heavy cutting and prying activities which would be associated with the initial stages of butchering. These tools are also found in Activity Area II; however they are slightly spatially discrete from the side-notched points (Figure 5).

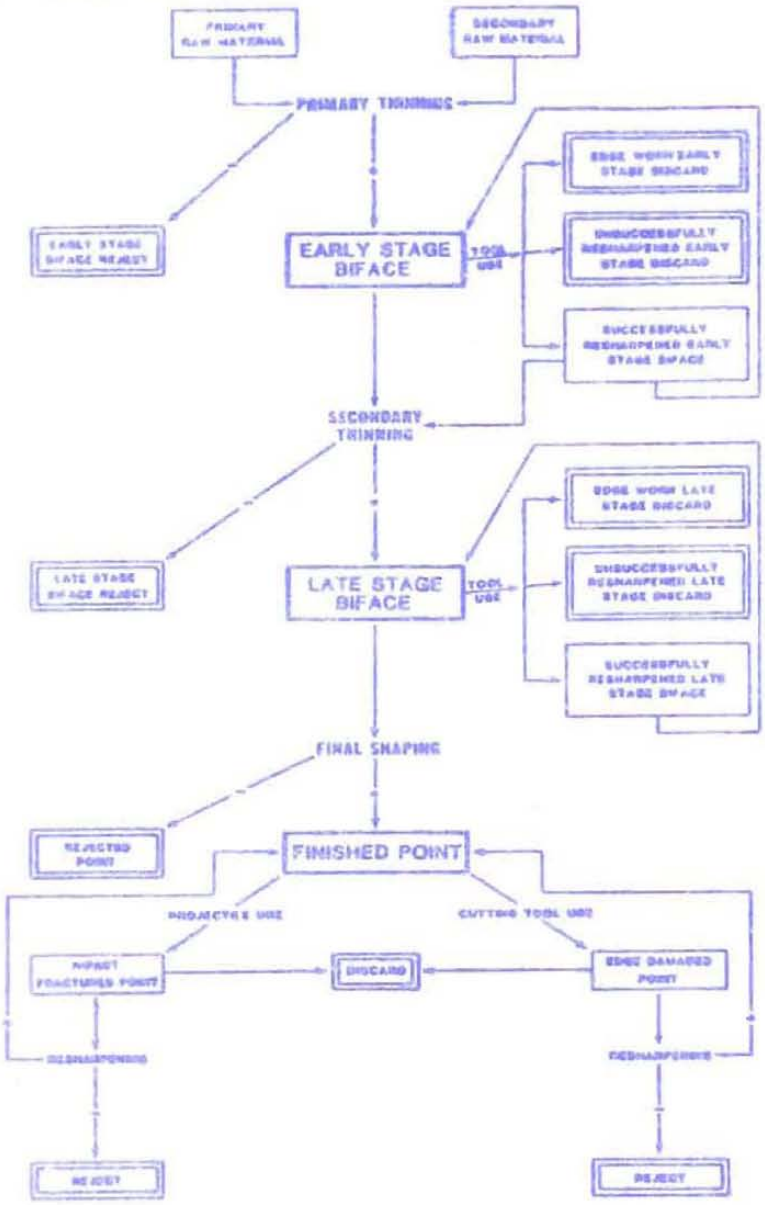
The small, narrow-blade stemmed points showed different forms of wear and were primarily characterized by impact fractures and some polishing on their distal edges. These types of wear are linked with use as projectile points (Ahler 1971). Interestingly, the small stemmed points were found in the few areas associated with tool kit refurbishing in Area III (Figures 4 and 5). The few broadspear-like specimens analyzed showed no consistent wear attributes and may be best characterized as generalized cutting/processing tools.

The fact that these different morphological forms are associated with varied wear patterns and functions suggests that several of the co-occurring "types," which have been thought to be different diagnostic styles, are really different functional tools, not varied mental templates of the same functional tool types. All of these varied projectile point types could easily be manufactured from the same basic biface and their varied forms may only be the result of different production, use and maintenance trajectories (see Figure 8).

The variety of morphology is especially apparent with regards to stemmed points. The numerous Late Archaic stemmed forms noted as different diagnostic types including Bare Island, Lackawaxen, Lamoka, Piscataway, Vernon, Halifax, Holmes, and

FIGURE 8

TOOL PRODUCTION, USE, and MAINTENANCE ACTIVITIES



Clagett probably have little if any chronological meaning as they are now defined. The same situation probably holds true for the numerous notched varieties including Otter Creek, Brewerton varieties, Vosburg, and Normanskill. It especially humorous to consider the fact that the two major "Late Archaic traditions" (Laurentian and Piedmont) may really represent different functional tool categories.

If one believes the arguments presented here, and we certainly do not expect everyone to embrace these arguments, what is left for us to use as chronological markers in the Middle Atlantic region for the Late Archaic and Early Woodland time periods? The available excavated data and morphological descriptions (eg. - Kinsey 1972:423-430) would indicate that the broadspears are a fairly reliable horizon marker for the period between 2500 and 1200 B.C. Furthermore, it may indeed be possible that <u>combinations</u> of some varieties of stemmed and notched points may be isolated at limited points in time. However, these combinations of morphological forms will not be identified using the current research techniques.

The alternative is to first utilize the data from pedological analyses of depositional contexts, refitted artifact distributions, and other artifact and feature distributions to establish the sites where there are no <u>empirical data</u> to suggest that artifact assemblages are mixed or disturbed. Then, the entire range of morphological variability can be described statistically, or at least depicted as illustrations. If radiocarbon dates are available, so much the better. As such a series of descriptions of variability are generated, it should be possible to begin to isolate morphological forms with chronological meaning.

These "types", or combinations of types, would have no cultural implications in their initial definition and analysis. They would simply be chronological markers that would function in a similar manner to index fossils in geology. This is not to say that these morphological varieties would not later be seen to have some kind of cultural meaning. Also, we do not mean that the analysis of projectile points should end here. We are only suggesting that these systems of typologies can be used initially for the purpose of solving chronological problems. In this type of analyses the empirical data from the sites would come first and sets of assumptions like the "Cos Axiom" would not be considered. If these kinds of research methods could be adopted on a large scale, it is possible that we could escape the problems of chronology that currently hamper anthropological archaeological research in Middle Atlantic archaeology of the Late Archaic and Early Woodland periods and move to more interesting issues.

REFERENCES CITED

Ahler, S. A.
1971 Projectile point form and function at Rogers Shelter, Missouri. Missouri Archaeological Society Research Series No. 8. Columbia.

Brennan, L. R.
1967 The Taconic Tradition and the Coe Axiom. Bulletin of the New York State Archaeological Association 14:12-25.

Carr, K. W.
1975 The Fifty site: a Flint Run Paleo-Indian complex processing station. M.A. Thesis, Catholic University of America, Washington, DC.

Coe, J. L.
1964 Formative cultures of the Carolina Piedmont. Transactions of the American Philosophical Society N.S. 54(5). Philadelphia.

Custer, J. F.
1982 An introduction to the archaeology of the Churchmans Marsh vicinity. Bulletin of the Archaeological Society of Delaware 13:1-41.

1983 Delaware prehistoric archaeology: an ecological approach. University of Delaware Press, Newark.

Custer, J. F. and D. C. Bachman
1983 Phase II data recovery excavations of the prehistoric components from the Hawthorn site (7NC-E-46), New Churchmans Road, Christiana, New Castle County Delaware. Delaware Department of Transportation Archaeology Series No. 27. Dover.

Evans, J.
1984 Late Archaic projectile points in the Middle Atlantic: what's in a name. Paper presented at the 1984 Middle Atlantic Archaeological Conference, Rehoboth Beach Delaware.

Fitzhugh, W. W.
1972 Environmental archaeology and cultural systems in Hamilton Inlet, Labrador. Smithsonian Contributions to Anthropology No. 16. Washington.

Keely, L. H.
1980 Experimental determination of stone tool uses: a microwear analysis. University of Chicago Press, Chicago.

Kinsey, W. F.

1972 Archaeology in the Upper Delaware Valley. Pennsylvania Historical and Museum Commission Anthropological Series No. 2. Harrisburg.

Michlovic, M.
1976 Social interaction and point types in the Eastern United States. Pennsylvania Archaeologist 46(1-2):1[illegible]-16.

Moeller, R.
1982 Recent excavations at the Templeton site. Paper presented at the 1982 Eastern States Archaeological Federation nmeetings, Norfolk, Virginia.

Odell, G. H.
1980 Toward a more behavioral approach to archaeological lithic concentrations. American Antiquity 45:404-43[illegible]

Odell, G. H. and F. Odell-Vereecken
1980 Verifying the reliability of lithic use wear assessments by blind tests: the low power approach. Journal of Field Archaeology 7:87-120.

Semenov, S. A.
1964 Prehistoric technology. Barnes and Noble, New York.

Snethkamp, P. E., C. A. Ebright, and J. B. Serena
1982 The Blue Marsh Lake project: archaeological studies of the Late Archaic in the Pennsylvania Piedmont. National Part Service, Philadelphia.

Stewart, R. M.
1981 Shady Brook site (28ME20). New Jersey Department of Transportation, Trenton.