DISCUSSION AND CONCLUSIONS

This final section of the report will discuss some of the implications of the interpretations of archaeological data recovered from the Snapp Site. A summary of the data from the site is presented along with discussions of projectile point chronologies, regional ceramic technology and chronology, community settlement patterns, regional settlement patterns, and subsistence systems. Future research directions are noted in relation to individual topics as appropriate.

Site Summary

While excavations at the Snapp Site were in progress, it was common for barge and container ship traffic on the adjacent Chesapeake and Delaware Canal (Plate 3), and car and truck traffic on the nearby St. Georges Bridge (Plate 1), to intrude upon the ambience of the Snapp Site and completely divorce it from its prehistoric setting. However, on a quiet day, and with a little imagination, it was possible to envision the site on its wooded knoll overlooking the marshes of St. Georges Creek 3,000 years ago. A bird flying above the oaks, poplars, and hickories, and looking at the site from the south might have seen a series of three small huts clustered together near the river shore (Figure 94). People may have been working around a large hearth using hot stones to boil water and render oil from fish captured in adjacent St. Georges Creek. A sweatlodge may have been present near the houses for ritual use. This small community was probably the largest number of people to ever inhabit the site during its 10,000 years of use.

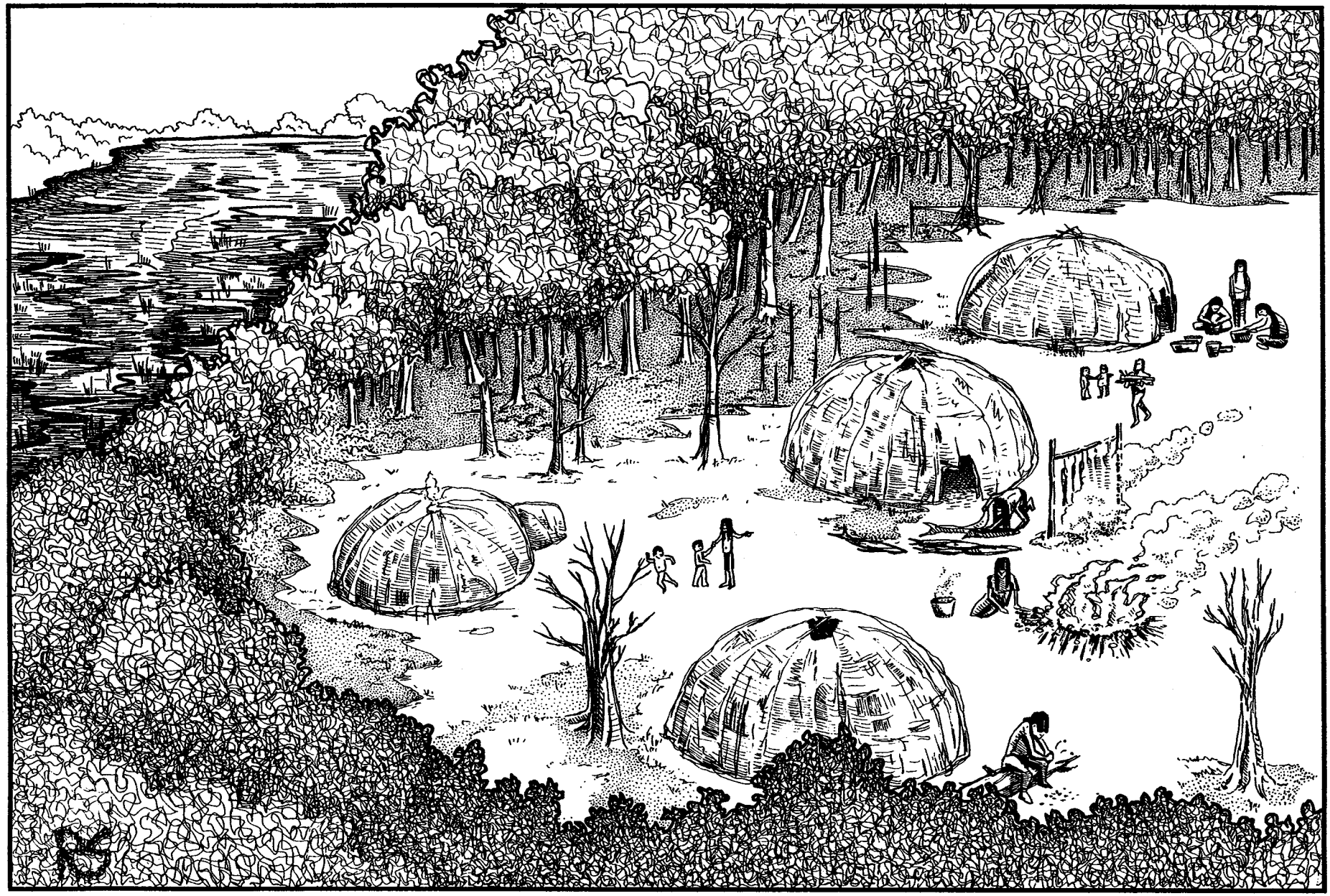
The variety of projectile points and ceramics spanning the period between 8,000 B.C. and A.D. 1500 recovered from the site testify to its intermittent and repeated reoccupation. Prior to ca. 1000 B.C., the occupations were rather ephemeral and the only signs of their presence are projectile points and waste flakes from the manufacture of stone tools. By 3000 B.C., perhaps as late as 1200 B.C., some groups of prehistoric people began to spend more time at the Snapp Site and they built houses like those shown in Figure 94. These houses had interior fireplaces, an excavated "basement"-like depression almost as large as the house itself, and a "sub-basement" storage pit. These filled-in pits are the main signs of the prehistoric houses that remain after centuries of erosion and historical plowing. Storage pits and large outdoor fireplaces that may have been communal resource processing areas were also probably present and still visible in the archaeological record.

All of the houses are relatively small and would have been the homes of individual nuclear families. In one area of the site it is possible that several of the these houses were occupied at once (Figure 94). However, in all other areas, the houses seem to indicate individual family occupations of the site. At any given time in the past, there was probably only one household living at the site. Lithic and ceramic debris were found in some of the pits inside the houses indicating that the pits in the houses were used as refuse receptacles after they were no longer used as storage pits. The occupations probably lasted less than one year, and the presence of interior fireplaces in some of the houses suggests that the occupation spanned the cold-weather months. There seems to be little change in the way the site was used, and the households who used it, from approximately 1200 B.C. to A.D. 1500.

Ceramic remains found at the site include some of the earliest forms of ceramics made in Delaware. These early ceramics were copies of soapstone bowls used by earlier cultures and were often tempered with pieces of soapstone that may have been derived from earlier bowls. The early ceramics from the Snapp Site are especially interesting because they show signs of experimentation with various tempers and manufacturing techniques.

FIGURE 94

Artist's Reconstruction of the Site



Lithic technologies at the site included core and biface reduction which relied heavily on cobbles and pebbles that are present right at the site. In fact, the presence of the cobbles and pebbles may have been an important factor in prehistoric peoples' decisions to settle at the site. Projectile points found at the site are sometimes made from materials not readily available in the immediate vicinity of the site, such as argillite and rhyolite. These artifacts may have been brought to the site as part of the tool kit transported by prehistoric groups, used, broken, discarded, and replaced new tools manufactured at the site from local cobbles and pebbles.

In sum, numerous prehistoric groups lived at the Snapp Site over a long period of time. The site was probably first used only sporadically, but through time, the occupations became more substantial. The populations using the site were never large at any point in the history of its use.

Projectile Point Chronologies

The presence of dated feature clusters at the Snapp Site allowed the identification of an assemblage of projectile points that dates to the time period between 1200 and 700 B.C. (Figure 64, Plate 39). Although it would be preferable to have an assemblage of points from an individual household cluster or feature cluster area, the assemblage depicted in Figure 64 and Plate 39 does provide a view of the variability of projectile point types used at a single site during the final portion of the Clyde Farm Complex (ca. 1200 - 700 B.C.).

It is useful to compare the projectile point assemblage illustrated in Figure 64 and Plate 39 with other comparably dated assemblages from the surrounding region. Table 54 shows the presence and absence of a series of different projectile point types at various Middle Atlantic archaeological sites. The sites are arranged from youngest to oldest in Table 54, and they date from time periods comparable

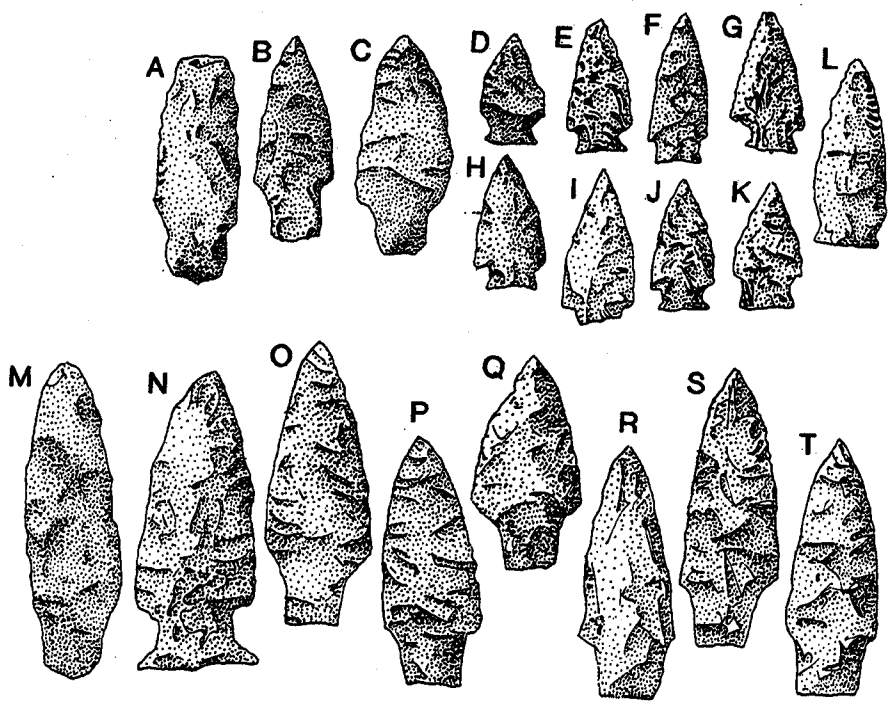
TABLE 54

Occurrence of Projectile Point Types at Various Middle Atlantic Sites

Site	Date	Projectile Point Types							
		Type B Stem	Type D Stem	Type E Stem	Type I Stem	Fishtail	Small Side Notched	Large Side Notched	Hellgramite
Rosenkrans (Fig. 95)	600 B.C.	x	x	x	---	x	x	x	---
Faucett-Orient Component (Fig. 96)	810 B.C.	---	---	---	---	x	---	---	---
Snapp	**1200-700 B.C.**	x	x	x	—	x	x	x	—
Williamson	1300-800 B.C.	x	x	x	x	x	x	x	x
Clyde Farm (Fig. 97)	1000 B.C.	x	x	---	x	x	x	---	---
Piney Island Upper Component	2000-2200 B.C.	x	x	x	x	---	---	---	---
Hawthorn (Fig. 98)	2250 B.C.	x	x	x	x	---	x	x	---
Piney Island Middle Component	2200-2800 B.C.	x	x	x	x	---	---	---	---
Faucett-Lackawaxen Component (Fig. 99)	3400 B.C.	---	x	x	x	---	x	---	---
Piney Island Lower Component	3700-500 B.C.	---	x	x	x	---	---	---	---

FIGURE 95

Projectile Points--Rosenkrans Site



PROVENIENCE
Burial #1 - N, O, P, Q, R, S, T
Burial #9 - D, E, F, G, H, I, J, K, L
Burial #10 - A, B, C, M

STEMMED POINT TYPES (Figure 65, Plates 48-51)
Type B - T
Type D - A, C, M, O-S
Type E - B
Type I - D-L

1 inch
2 cm

Note: Raw material types not noted in original site report

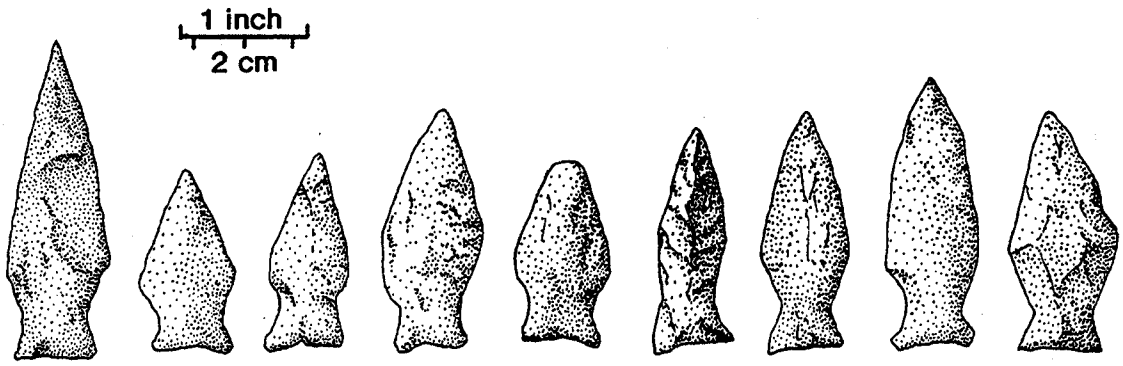
to, and before, the Clyde Farm Complex occupation of the Snapp Site. Generally, these sites span the Late Archaic and Early Woodland chronological periods as commonly defined (Kinsey 1972) and their assemblages show that a variety of projectile points were made and used during this time period.

The four stemmed point types (Types B, D, E, and I) are those used earlier in this report to categorize the stemmed points found at the Snapp Site (Figure 65). Plates 48 - 51 show additional examples of these point types from the Mitchell Farm Site (7NC-A-2) in northern Delaware (Custer and DeSantis 1985). The points shown in Plates 48 - 51 were found as part of a surface collection at Mitchell Farm and were chosen for illustration here based on their morphological similarities to type collection specimens for these four stemmed point varieties in southeastern Pennsylvania maintained at the State Museum of Pennsylvania.

Figures 95 - 100 show sample assemblages from some of the sites listed in Table 54 and a perusal of these figures shows many common forms among the assemblages. The assemblage from the Rosenkrans Site (Figure 95) in the Upper Delaware Valley of New Jersey (Kraft 1976) is derived from a series of cremation burial features that contained other artifacts associated with the Middlesex Adena Complex of the Northeast. The Orient component assemblage illustrated from the Faucett Site (Figure 96) in the Upper Delaware Valley of Pennsylvania (Kinsey 1975:44-48) consists solely of fishtail points and does not represent the full variability of projectile points that were present in that component. The Williamson Site assemblage from the Middle Delaware Valley of New Jersey (Hummer 1991) shows the greatest variability of any of the

FIGURE 96

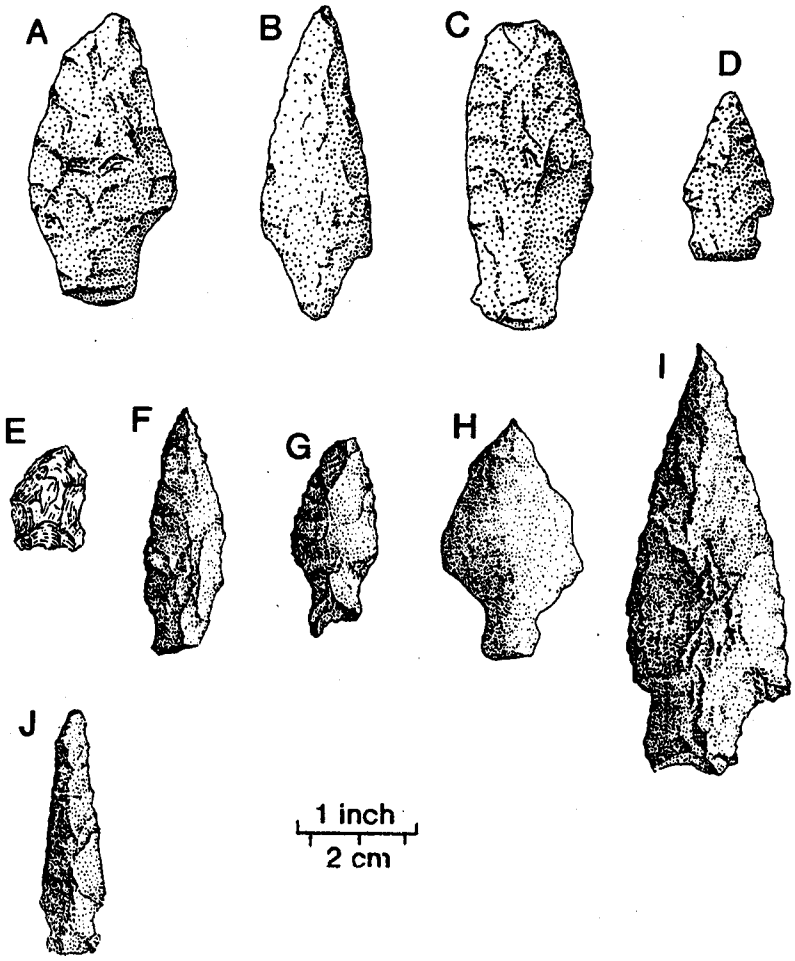
Fishtail Points--Faucett Site



Note: All examples shown are argillite. These point illustrations are based on specimens in a special chronological display at the North Museum, Franklin and Marshall College, Lancaster, Pennsylvania

FIGURE 97

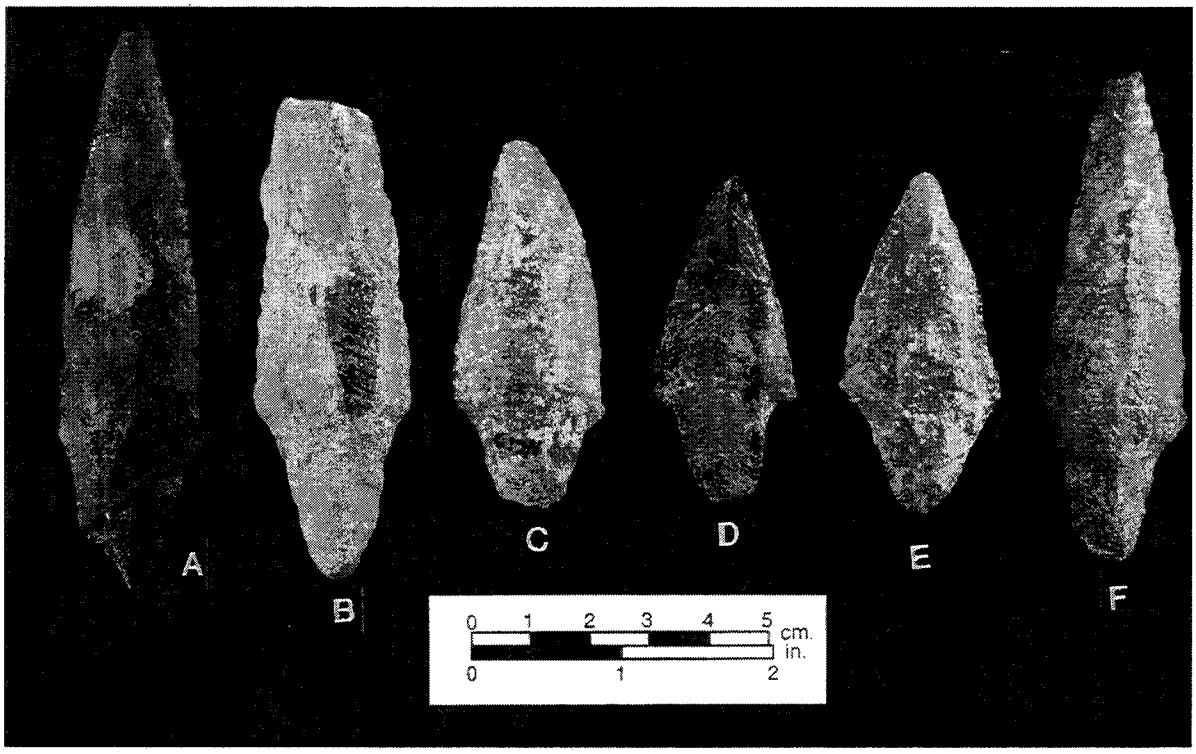
Projectile Points--Clyde Farm Site



A - Argillite Type D stemmed
B - Argillite Type B stemmed
C - Ironstone Type I stemmed
D - Chert Type I stemmed
E - Chert unknown type
F - Chert Type I stemmed
G - Chert fishtail
H - Argillite broadspear
I - Ironstone Type D stemmed
J - Ironstone Type I stemmed

PLATE 48

Type B Stemmed Points from Northern Delaware



Note: All points from Site 7NC-A-2, New Castle County, Delaware.
Raw Materials: A - Ironstone, B - Argillite, C, E, and F - Quartzite, D - Chert.

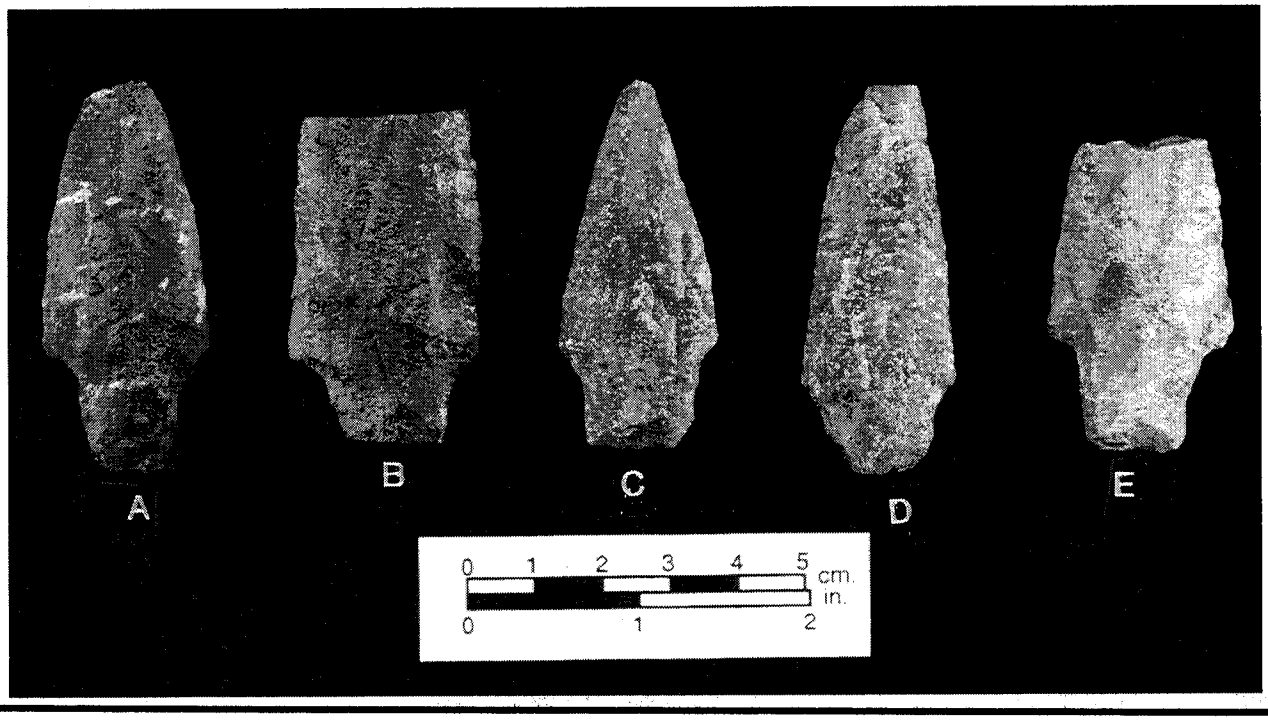
PLATE 49

Type D Stemmed Points from Northern Delaware

Note: All points from Site 7NC-A-2, New Castle County, Delaware. Raw Materials - all Quartzite.

PLATE 50

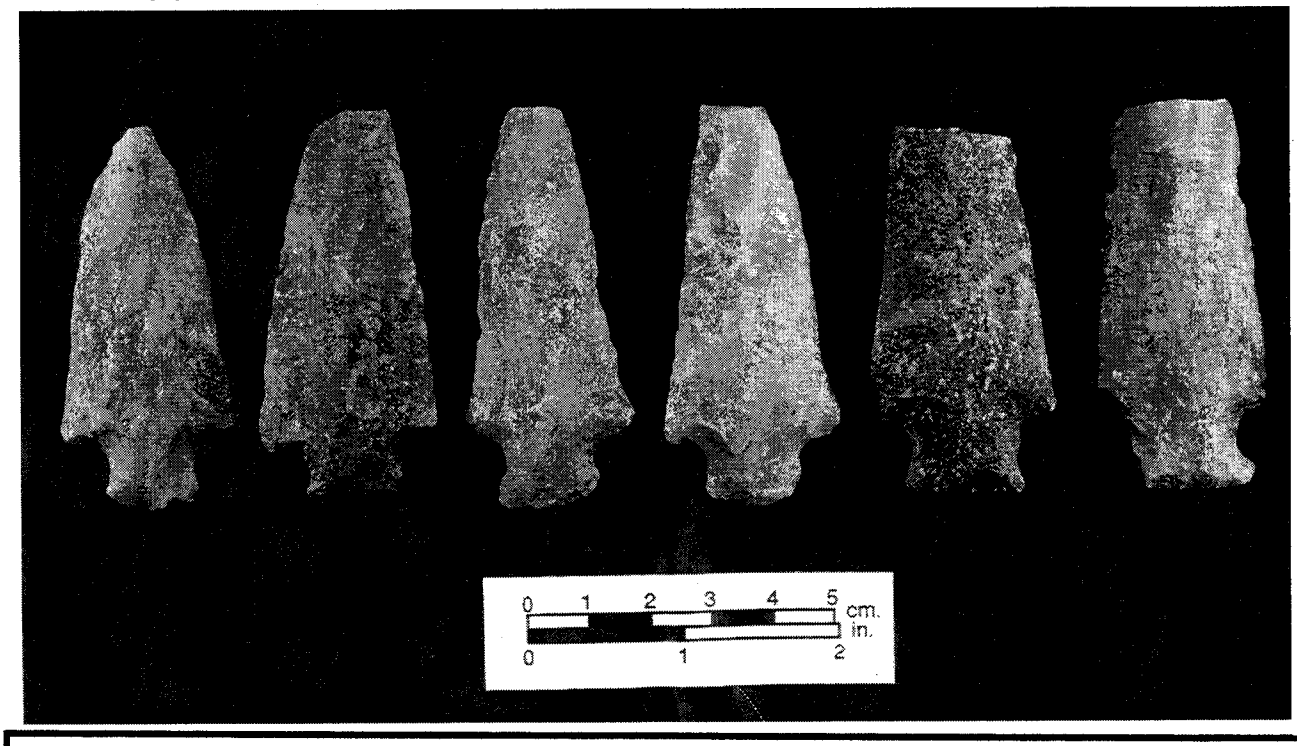
Type E Stemmed Points from Northern Delaware



Note: All points from Site 7NC-A-2, New Castle County, Delaware. Raw Materials: A - Argillite, B - E - Quartzite.

PLATE 51

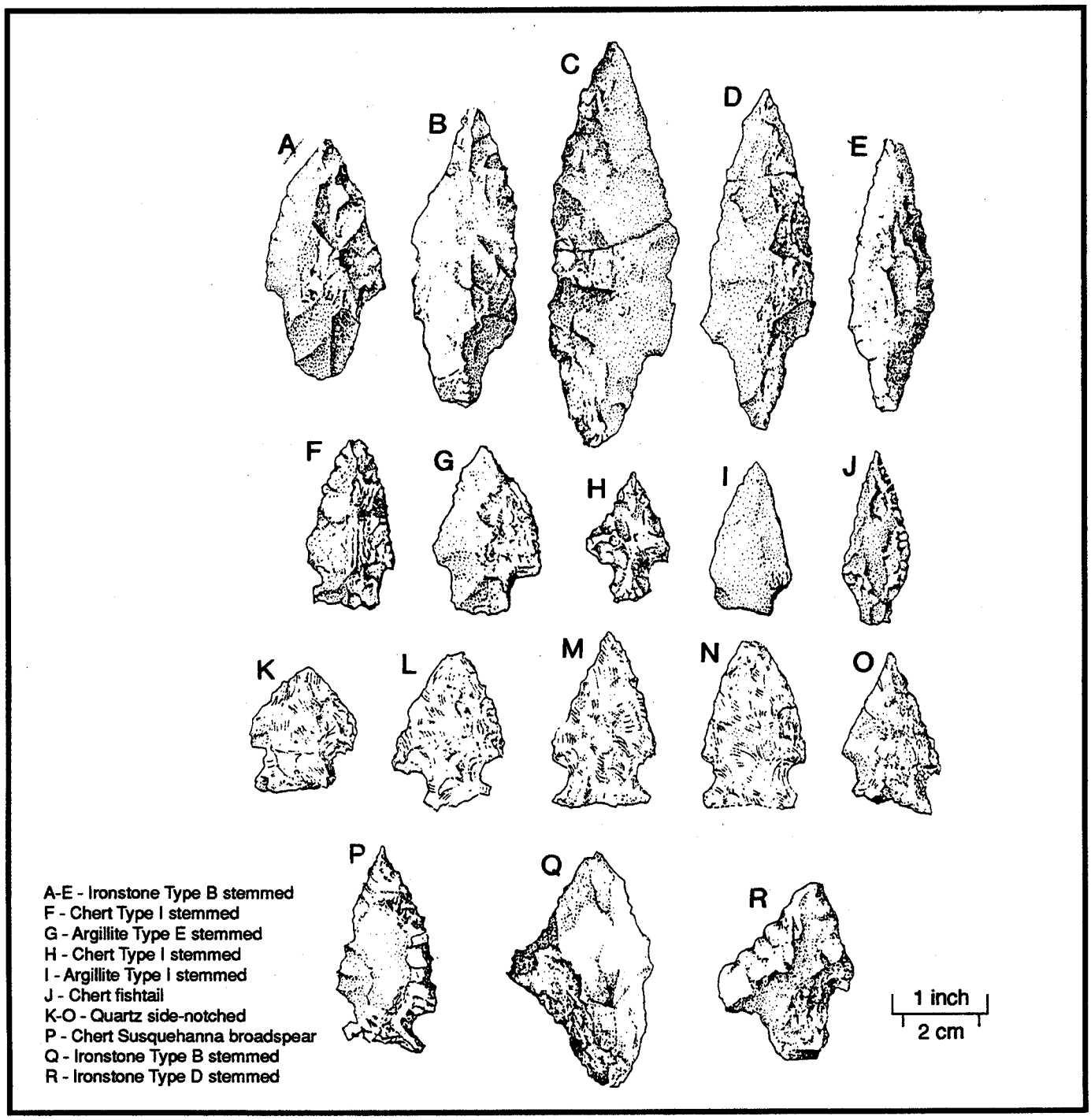
Type I Stemmed Points from Northern Delaware



Note: All points from Site 7NC-A-2, New Castle County, Delaware. Raw Materials - all Quartzite.

FIGURE 98

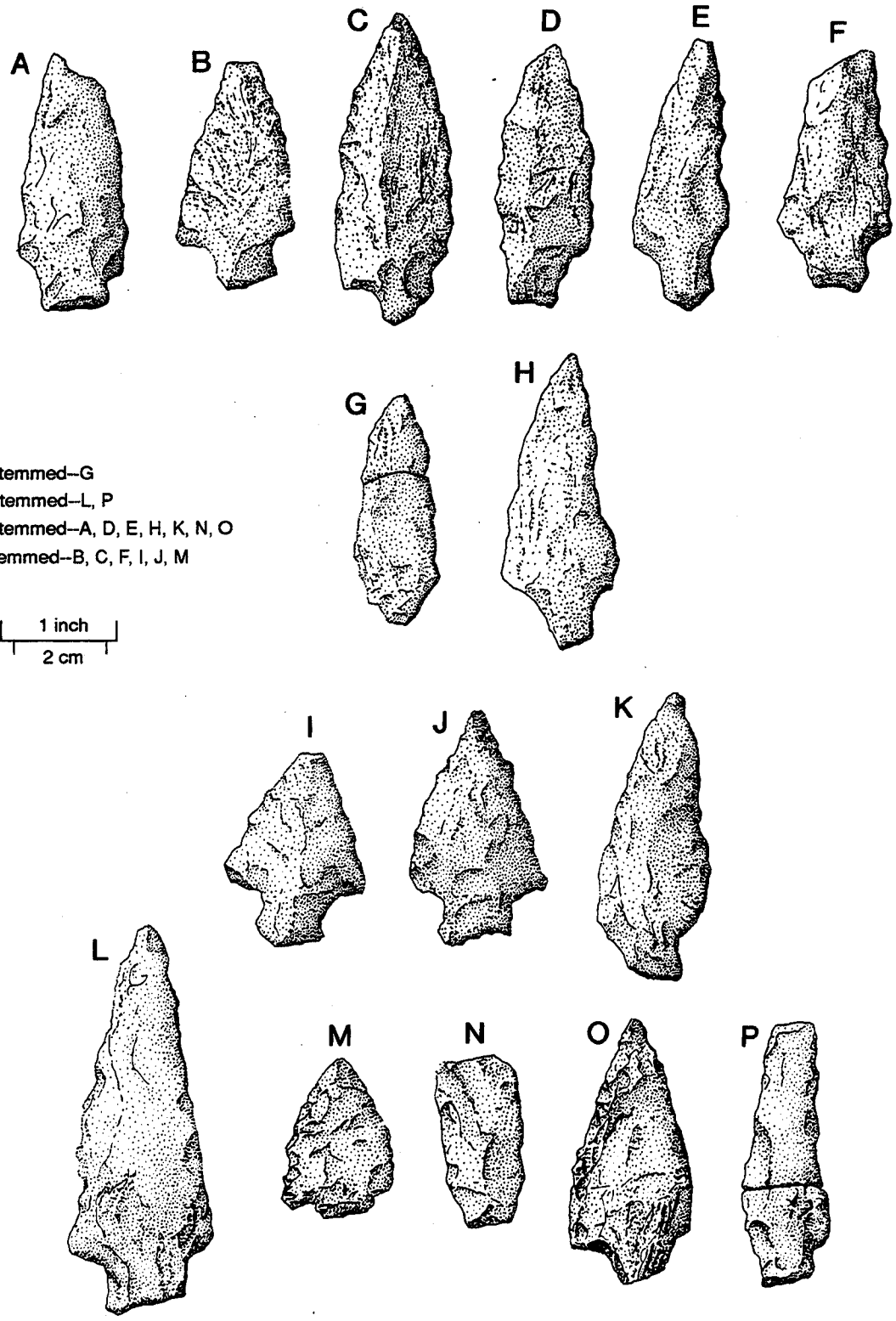
Stemmed and Notched Points--Hawthorn Site



assemblages and is derived from especially well-defined contexts. The Clyde Farm Site assemblage (Figure 97) is derived from the type site for the Clyde Farm Complex in northern Delaware and this particular assemblage comes from a single excavated household cluster (Custer, Watson, and De Santis 1985). The three Piney Island assemblages come from separate strata at this deeply stratified site in the Lower Susquehanna Valley (Kent 1970; Custer 1994). The Hawthorn Site assemblage (Figure 98) comes from a well-defined stratigraphic context at this site in northern Delaware (Custer and Bachman 1984) and shows a wide range of variability. Finally, the assemblage from the Lackawaxen component of the Faucett Site (Figure 99) is from a series of stratified deposits at this site in the Upper Delaware River Valley (Kinsey 1975:52-60).

FIGURE 99

Lackawaxen Points--Faucett Site

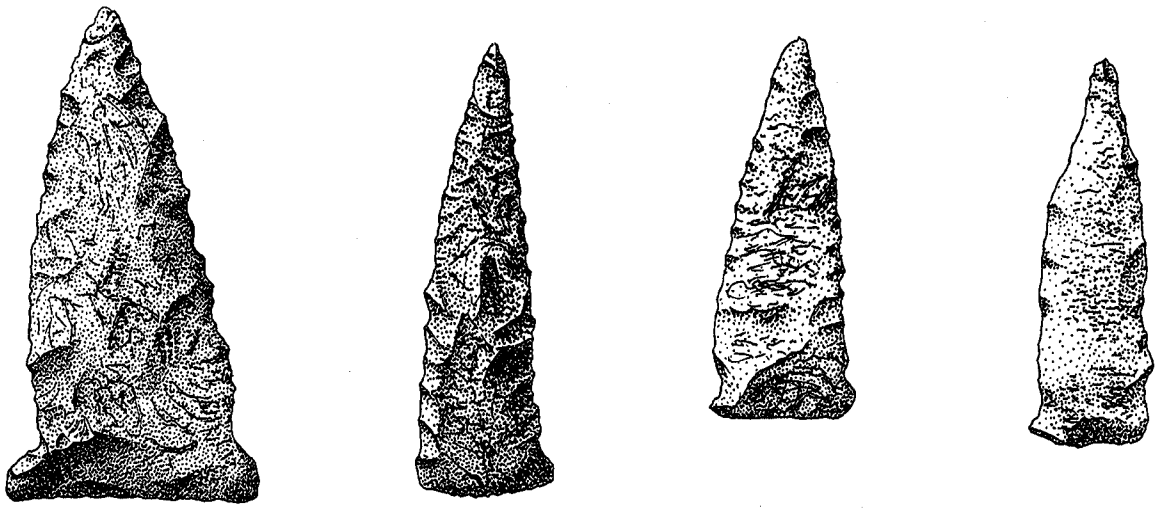


Type B stemmed--G
Type D stemmed--L, P
Type E stemmed--A, D, E, H, K, N, O
Type I stemmed--B, C, F, I, J, M

Note: All examples are argillite. These point illustrations are based on specimens in a special chronological display at North Museum, Franklin and Marshall College, Lancaster, Pennsylvania.

FIGURE 100

Hellgrammite Points



Note: These projectile point illustrations are based on type specimen collections from southeastern Pennsylvania maintained at the Archaeology Section, State Museum of Pennsylvania, Harrisburg, Pennsylvania.

1 inch
2 cm

The projectile point types noted in Table 54 include the four stemmed point varieties illustrated in Figure 65 and Plates 48 - 51 as defined by Kent (1970). Fishtail points include Orient fishtail varieties (Ritchie 1961:39) and Dry Brook varieties (Kinsey 1972:430-433) and both varieties are present in Figure 96. The large and small side-notched varieties are not usually defined as specific types and represent variations on a general morphological type. Large side-notched points are more than 40 millimeters in length and small varieties are less than 40 millimeters long. Hellgrammite points (Figure 100 are noted by Kinsey (1959) in the original report on the Bare Island Site, have shallow side notches, and slightly serrated edges (Hummer 1991).

The data in Table 54 suggest that side-notched forms are not particularly diagnostic during the time frame covered by Table 54, and this observation has been made based on other data (Custer 1989:160). The four main stemmed point types co-occur in many of the assemblages, although Type I points are missing from the more recent assemblages. Similarly, Type B points are missing from the earlier assemblages. The data in Table 54 would suggest that Type B is characteristic of later assemblages post-dating 3000 B.C. and that Type I is characteristic of earlier assemblages pre-dating 1200 B.C. Fishtail points are present only in assemblages post-dating 1200 B.C., as are Hellgrammite points.

Some more refined chronological observations for the stemmed projectile point types can be made by considering the percentages of occurrence of the projectile point types at each site and these percentages are shown in Table 55. Table 56 lists the mean percentages of occurrence for the four main stemmed point types (Figure 65, Plates 48 - 51) within the entire projectile point assemblages in three grouped chronological periods. The grouped chronological periods are based on similarly dated sites in

TABLE 55

Percentages of Projectile Point Types at Various Middle Atlantic Sites

Site	Date	Projectile Point Types							
		Type B Stem	Type D Stem	Type E Stem	Type I Stem	Fishtail	Small Side Notched	Large Side Notched	Hellgramite
Rosenkrans (Fig. 95)	600 B.C.	5	25	30	0	5	25	10	0
Faucett-Orient Component (Fig. 96)	810 B.C.	0	0	0	0	100	0	0	0
Snapp	**1200-700 B.C.**	**10**	**20**	**20**	**0**	**30**	**10**	**10**	**0**
Williamson	1300-800 B.C.	2	9	2	7	7	14	32	27
Clyde Farm (Fig. 97)	1000 B.C.	10	20	0	20	30	20	0	0
Piney Island Upper Component	2000-2200 B.C.	28	48	19	5	0	0	0	0
Hawthorn (Fig. 98)	2250 B.C.	33	17	6	11	0	28	5	0
Piney Island Middle Component	2200-2800 B.C.	17	55	15	13	0	0	0	0
Faucett-Lackawaxen Component (Fig. 99)	3400 B.C.	0	17	39	39	0	6	0	0
Piney Island Lower Component	3700-500 B.C.	0	19	50	31	0	0	0	0

Table 55. The time period from 1300 - 600 B.C. includes the Rosenkrans Site, the Snapp Site, the Williamson Site, and the Clyde Farm Site. The Orient component from the Faucett Site was not included because it probably does not represent the full range of projectile point variability. The time period from 2800 - 1300 B.C. includes the upper and middle components from Piney Island and the Hawthorn Sites. The time period from 5500 - 2800 B.C. includes the Lackawaxen component of the Faucett Site and the lower component of the Piney Island Site. Table 57 shows mean percentages based only on the stemmed point assemblages for the same sites and grouped chronological periods.

Figure 101 shows seriation diagrams based on the data in Tables 56 and 57. The data in the two seriation diagrams differ to some extent, but still show the same basic ordering of stemmed point types through time. Although all four types could co-occur at any given time, the relative ordering of the point types through time from oldest to youngest is Type I, Type E, Type D, and Type B. When the occurrence of the other types of points, such as broadspears and fishtails, are added to this chronological ordering, it is possible to provide a tentative listing of projectile point associations for the Clyde Farm

TABLE 56

Stemmed Point Percentages by Grouped Chronological Periods - Total Point Assemblage

	Point Types			
	B	D	E	I
1300-600 B.C.	7	19	13	7
2800-1300 B.C.	26	40	13	10
5500-2800 B.C.	0	18	44	35

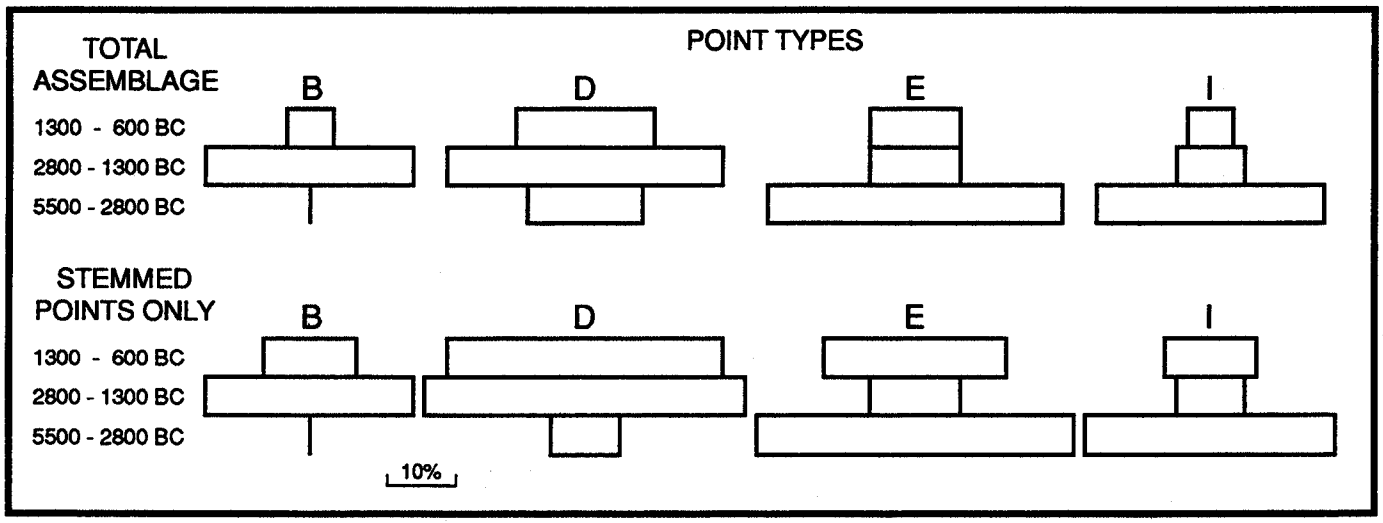
TABLE 57

Stemmed Point Percentages by Grouped Chronological Periods - Stemmed Points Only

	Point Types			
	B	D	E	I
1300-600 B.C.	15	41	28	15
2800-1300 B.C.	29	45	15	11
5500-2800 B.C.	0	19	45	36

FIGURE 101

Seriation of Stemmed Point Types

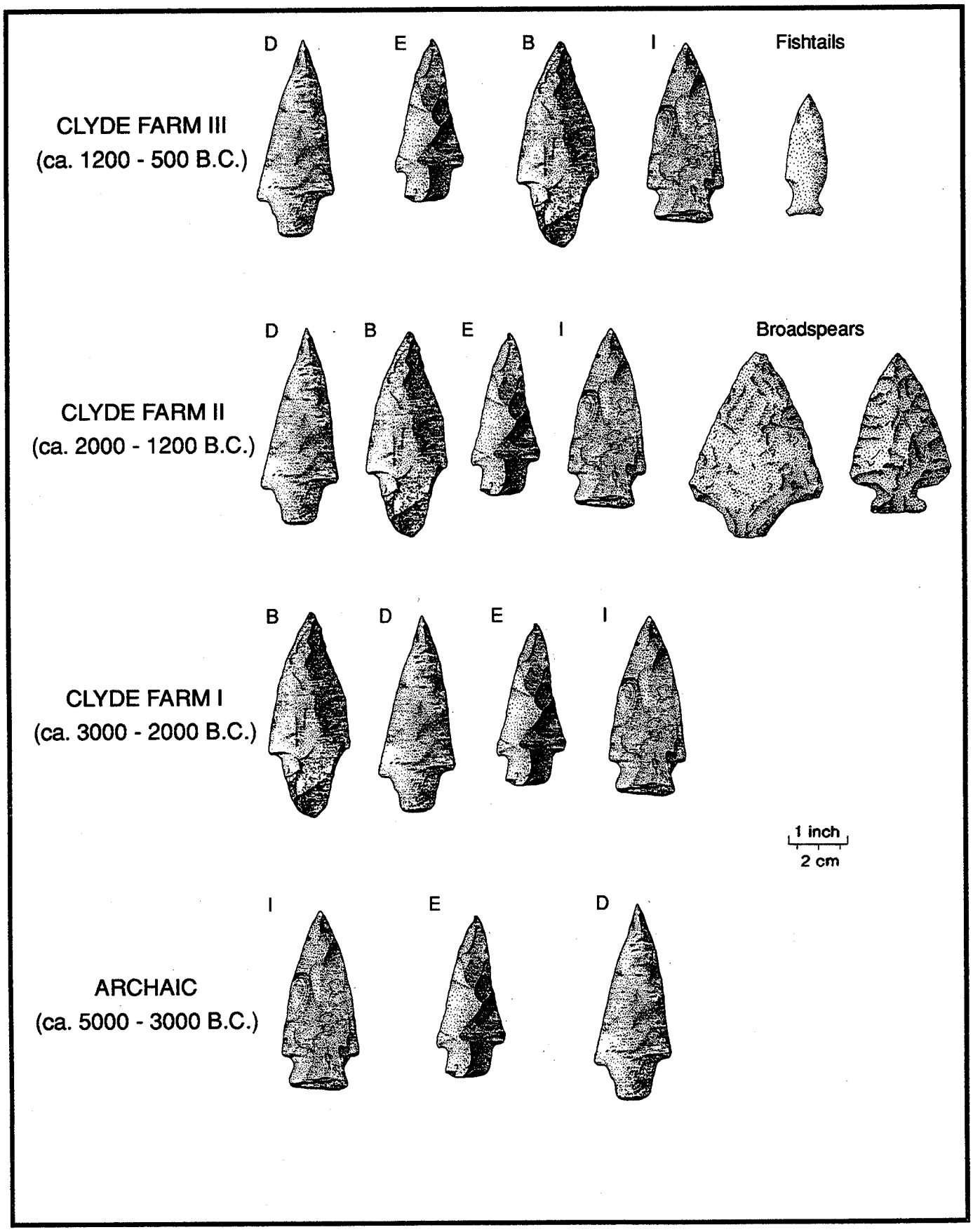


Complex and the later portion of the preceding Archaic Period. These associations are depicted in Figure 102. The stemmed points are depicted in order of decreasing abundance from left to right for each time interval.

The associations depicted in Figure 102 and the changing relative abundances of stemmed point types show that the Clyde Farm Complex, which heretofore had been treated as a single chronological unit, could be divided into three separate chronological units. Ceramics can also be added to the defining diagnostic projectile point types of the time periods noted in Figure 102. Stone bowls would be found in the Clyde Farm II Period and experimental ceramics including Marcey Creek, Ware Plain, Selden Island, Dames Quarter, and the varied un-named wares from the Snapp Site would be associated with

FIGURE 102

Projectile Point Associations



the Clyde Farm III Period. The main occupation of the Snapp Site would fall within the Clyde Farm III Period. The associated Barker's Landing Complex (Custer 1989:221-233) could probably also be divided into three sub-periods with the same date ranges.

In sum, the association of projectile points identified at the Snapp Site can be placed within a regional context and is similar to other similarly dated assemblages from other sites in the central Middle Atlantic. When seriation analyses are undertaken, the internal chronology of the Clyde Farm Complex, and other related complexes of the central Middle Atlantic, can be more clearly defined. The definition of the sub-periods noted in Figure 102 allows a more precise dating of point assemblages at other sites from the central Middle Atlantic region in the future.

Regional Lithic Technologies

Various aspects of the Snapp Site lithic technology data can be compared to data from other sites to further our understanding of regional lithic technologies. The lithic technology issues discussed in this section of the report include relationships between projectile point functions and lithic raw material use, comparative tool kit composition, use of non-local raw materials, and general trends in the use of varied primary and secondary lithic raw materials.

Analysis of the projectile point assemblage from the Hawthorn Site (Figure 98), a Clyde Farm I period site in northern Delaware (Custer and Bachman 1984), to use the new chronological distinctions described above, suggested that there was a link between projectile point function and raw material use. In general, ironstone was used for manufacture of large stemmed, heavy cutting tools; chert, jasper, and argillite were used for small stemmed projectile points; quartz was used for side-notched butchering tools; and quartzite and ironstone were used for generalized stemmed tools with multiple functions (cutting and scraping). Table 58 summarizes these data and notes the associations of raw materials and point functions at the Snapp Site and Clyde Farm Site (Custer, Watson, and De Santis 1985). High grade crpytocrystalline materials are not present in any of the heavy cutting tool assemblages. Ironstone was used at Clyde Farm and Hawthorn and rhyolite and quartz at Snapp. Although cryptocrystalline materials are easier to work and can be made to have very sharp edges, the edges can be somewhat brittle. It is possible that the non-cryptocrystalline materials were chosen to manufacture heavy cutting tools because these materials were less brittle and because it was not as important to have an exceptionally sharp edge on these tools. Durability of these tools' edges may have been more important than their sharpness.

TABLE 58

Point Use and Raw Materials

	Sites		
Functions	**Hawthorn**	**Snapp**	**Clyde Farm**
Heavy Cutting	Ironstone	Rhyolite Quartz	Ironstone
Projectile Points	Chert Jasper Argillite	Chert Jasper Argillite Quartz	Chert Rhyolite Argillite
Knives	Quartz	Quartz Jasper Chert	Quartzite Argillite
Multi-Function	Quartzite Ironstone	Chert Jasper	Chert Jasper

Projectile points show the widest range of raw materials of any of the functional tool classes listed in Table 58, and similar observations have been made about other projectile point assemblages. Some authors (e.g., Gardner 1989) have noted that projectile points are more likely to be replaced in tool kits because their function of being the tips of projectiles launched into the air makes them more likely to be lost or broken. As these tools were broken, replacements were manufactured from whatever raw material was readily at hand; therefore,

there would be a wide range of materials used. Furthermore, projectile points would be part of the transported tool kits because hunting weapons would be needed on a more or less continual basis. As a prehistoric group moved across the landscape it is likely that they would accumulate a variety of projectile points made from varied materials. Table 58 shows that such varied assemblages do indeed characterize these sites.

The assemblage of knives from the Hawthorn Site is comprised completely of quartz; however, the Snapp and Clyde Farm assemblages show more varied raw material use (Table 58). The hafted knife assemblage at the Hawthorn Site was thought to represent an expediently manufactured technology (Custer and Bachman 1984) and the Hawthorn Site is a transient camp. On the other hand, the Snapp and Clyde Farm sites are base camps and may not have required the same types of expedient tools due to the more intensive nature of their occupation. It is also possible that the exclusive use of quartz for this tool type at the Hawthorn Site represents the idiosyncratic lithic preferences of that site's inhabitants. Multi-function tools from the Clyde Farm and Snapp Sites also differ from the Hawthorn assemblages in that cryptocrystalline materials are used at the former and non-cryptocrystalline tools are used at the later. This difference may reflect the same factors noted above for knife forms.

In sum, the relationships between lithic raw material use patterns and projectile point function are somewhat similar among the three sites, especially in connection with heavy cutting and projectile point functions. More variability is seen among the points used as knives and multi-function tools. Further research on this topic using point assemblages from other sites may reveal similar patterns.

The system of lithic tool types used to describe the Snapp Site assemblage in Table 34, which was taken from the work of Lowery and Custer (1990), can be used to systematically compare the Snapp Site assemblage with those of other sites where the data were organized and gathered in a similar fashion. Unfortunately, comparable data are not available from a wide range of sites. Nevertheless, Table 59 shows comparable data from four other sites in the central Middle Atlantic region. The Slackwater Site is a Shenks Ferry village of the Woodland II Period from Lancaster County (Custer et al. 1993). The Crane Point Site (Lowery and Custer 1990) and the Paw Paw Cove Site (Lowery 1989) are Paleo-Indian Period sites from Talbot County on the Eastern Shore of Maryland. Site 36LA336 (Smoker and Custer 1986) is a Paleo-Indian site from the Triassic Lowlands of northern Lancaster County, Pennsylvania. None of these sites date to the same time period as the Snapp Site. Nonetheless, it is still interesting to compare their assemblages to that of the Snapp Site. For the purposes of this report, a reanalysis of the tool assemblage from the Hawthorn Site, which was described and discussed earlier in this report, was undertaken, and Table 60 lists its tool kit data along with that of the Snapp Site.

Figure 103 shows the plot of the cumulative percentages shown in Tables 59 and 60. The Snapp, Hawthorn, Slackwater, and Site 36LA336 are the most similar and all are different from Paw Paw Cove and Crane Point. In general, Paw Paw Cove and Crane Point have fewer formalized tool forms and cores than the other assemblages. Numerous studies (e.g., Gardner 1989) have suggested that Paleo-Indian groups relied heavily on bifaces as core sources for flakes, and the relatively low proportion of cores in the Paw Paw Cove and Crane Point assemblages provides support for this observation. It is interesting that the assemblage from Site 36LA336 is not grouped with the other Paleo-Indian sites. Instead, it is grouped with the other later sites with its larger number of cores and formalized tools. Site 36LA336 may end up grouped with the later sites because all of the later sites and Site 36LA336 share the characteristic of being located rather close to either primary or secondary lithic outcrop sources. In

TABLE 59

Comparative Tool Kit Data - Miscellaneous Sites

	Slackwater			Crane Point			Paw Paw Cove			36 LA 336		
	N	%	cum %	N	%	cum %	N	%	cum %	N	%	cum %
Points/ knives	48	9	9	78	18	18	19	19	19	2	10	10
Late stage bifaces	91	17	26	20	5	23	6	6	25	4	20	30
Early stage bifaces	81	15	41	5	1	24	0	0	25	1	5	35
Drills	1	1	42	4	1	25	0	0	25	0	0	35
Concave/ biconcave scrapers	48	9	51	3	1	26	2	2	27	0	0	35
Bifacial side scrapers	0	0	51	9	2	28	5	5	32	1	5	40
Unifacial side scrapers	3	1	52	7	2	30	9	9	41	3	15	55
Trianguloid end scrapers	65	12	64	12	3	33	6	6	47	3	15	70
Slug: shaped unifaces	0	0	64	4	1	34	1	1	48	0	0	70
Wedges	4	1	65	5	1	35	1	1	49	0	0	70
Primary cores	55	10	75	0	0	35	0	0	49	0	0	70
Secondary cores	0	0	75	9	2	37	5	5	54	0	0	70
Denticulates	11	2	77	3	1	38	2	2	56	0	0	70
Gravers	14	3	80	5	1	39	7	7	63	0	0	70
Regular utilized flakes	106	20	100	197	45	84	24	24	87	6	3	100
Blade-like utilized flakes	0	0	100	73	16	100	12	13	100	0	0	100
Total	527	--	--	434	--	--	99	--	--	20	--	--

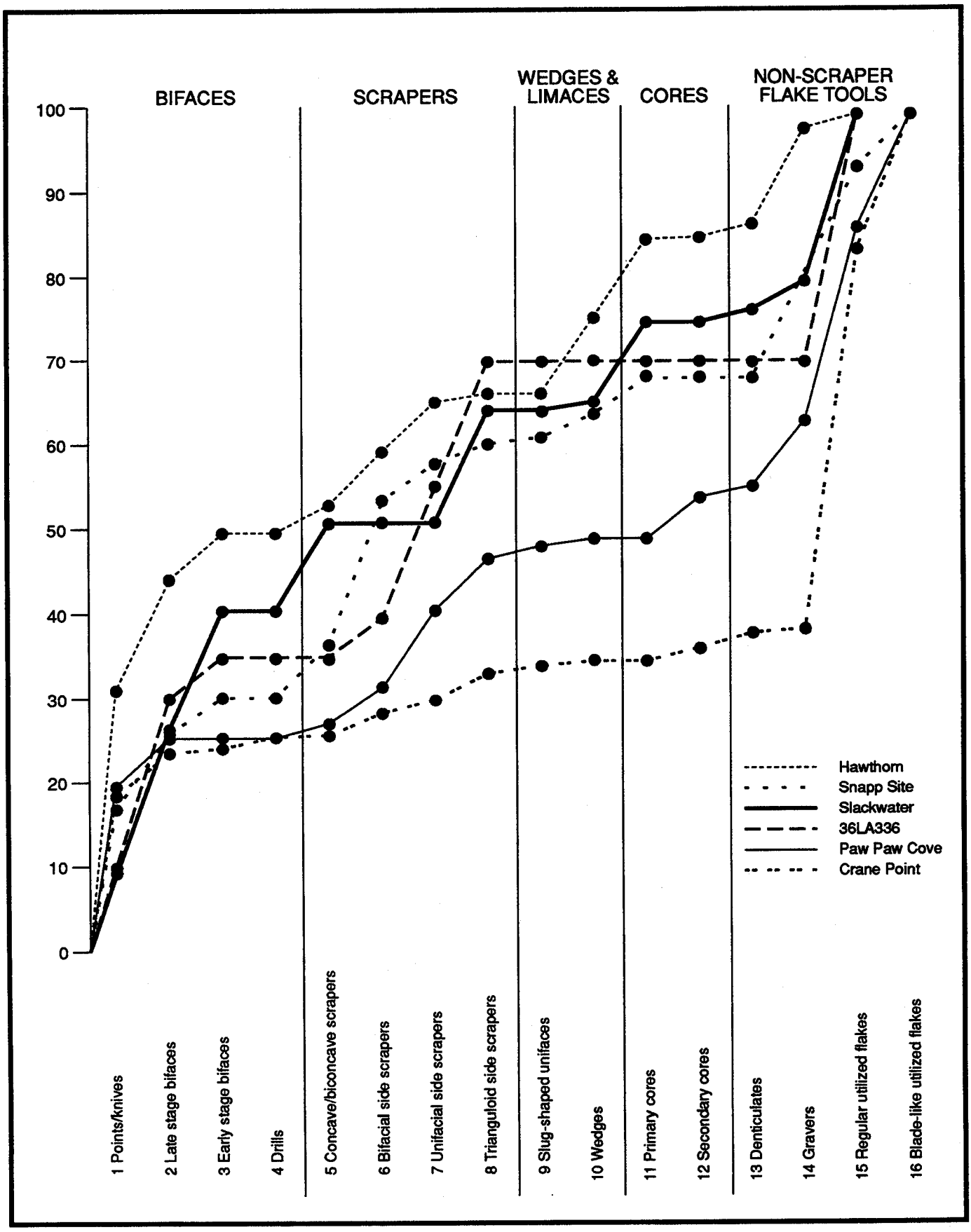
TABLE 60

Comparative Tool Kit Data - Hawthorn and Snapp Sites

	Hawthorn			Snapp-Clyde Farm		
	Count	%	Comparative %	Count	%	Comparative %
Point/Knives	61	31	31	16	17	17
Late Stage Bifaces	29	15	46	7	7	24
Early Stage Bifaces	6	3	49	6	6	30
Drills	0	0	49	0	0	30
Concave-Biconcave Scrapers	2	1	50	0	0	30
Bifacial Side Scrapers	3	2	52	5	5	35
Unifacial Side Scrapers	14	7	59	17	18	53
Trianguloid End Scrapers	8	4	63	3	3	56
Slug-shaped Unifaces	0	0	63	3	3	59
Wedges	0	0	63	2	2	61
Primary Cores	21	11	74	4	4	65
Secondary Cores	20	10	84	4	4	69
Denticulates	0	0	84	0	0	69
Gravers	3	2	86	0	0	69
Regular Utilized Flakes	25	13	99	24	25	94
Balde-like Flakes	2	1	100	4	4	100
Total	**194**			**95**		

FIGURE 103

Comparison of Tool Kits



contrast, Paw Paw Cove and Crane Point are located fairly far from lithic resources, and only very small pebble outcrops are available at these locations. Thus, groupings shown in Figure 103 may reflect proximity to lithic resources along with relative reliance on bifaces as cores.

Within the grouping of 36LA336 and the later sites, Slackwater, Snapp, and 36LA336 are the most alike. These are all either base camps (Snapp, 36LA336) or villages (Slackwater) and their similar tool kit composition probably reflects the mix of a variety of tools that is present at residential sites regardless of the time period. Hawthorn, which is a transient hunting camp, differs from the residential sites with its high proportion of points/knives and bifaces. The higher proportions of these tools, which are associated with the killing and processing of game, may be indicative of hunting camps. In sum, when compared to other assemblages, the Snapp Site tool assemblage is similar to those from residential sites with a ready access to lithic raw materials.

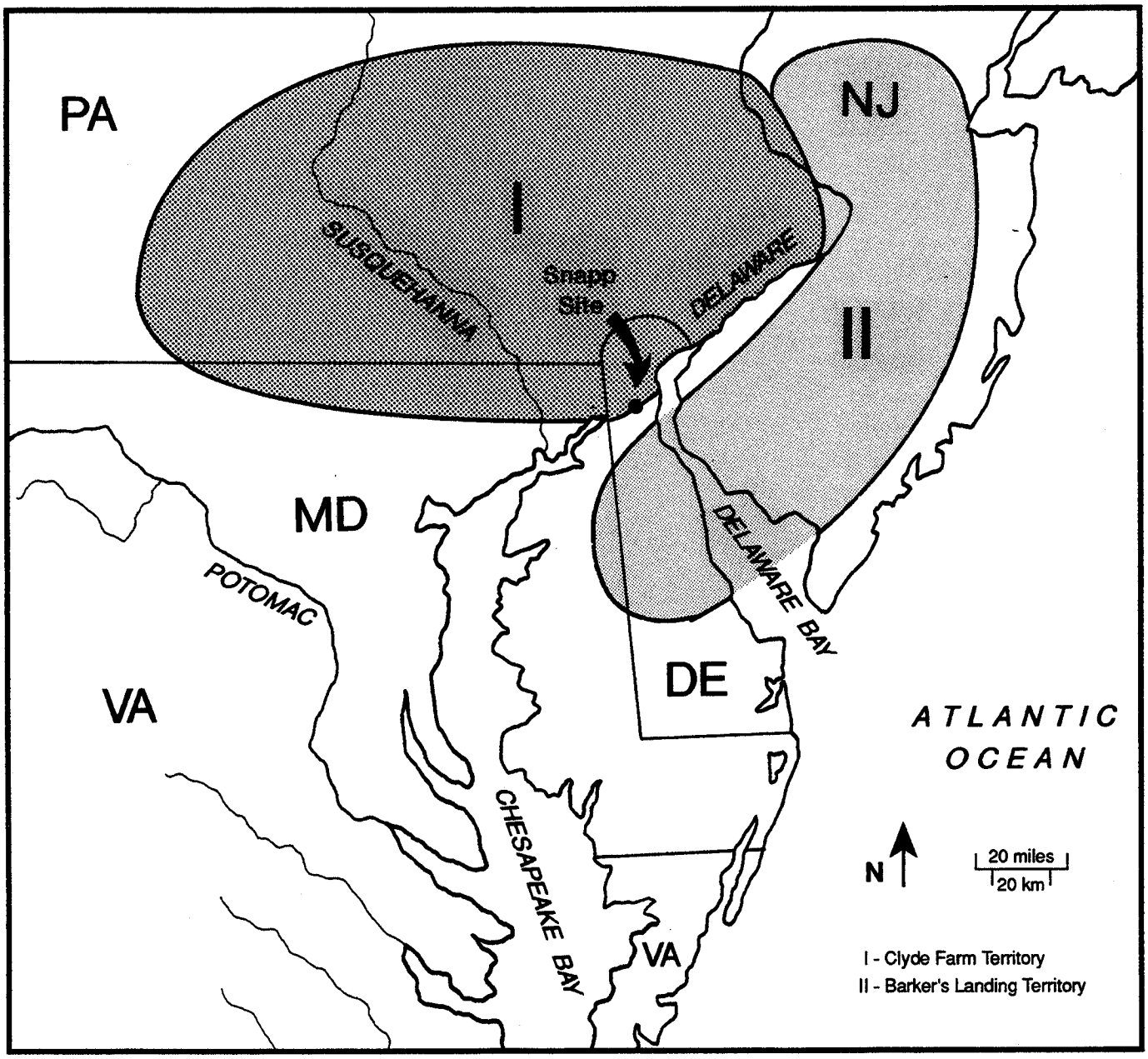
The Snapp Site lithic assemblage included numerous artifacts of rhyolite and argillite, neither of which are locally available. Argillite is found in the Middle Delaware River Valley and rhyolite is found in the northern Blue Ridge physiographic province of western Maryland and south central Pennsylvania (Stewart 1984). Artifacts manufactured from both of these materials are present at Woodland I sites throughout the Delmarva Peninsula and in some cases they comprise the major portion of the lithic tool kits (Custer 1989:235-248). Trade and exchange systems are thought to be the main mechanism whereby these materials were brought to the Delmarva Peninsula (Custer 1989:235-248); however, it has also been suggested that these non-local materials were procured via direct procurement from the quarry sources (Watson and Custer 1990; Stewart 1989). Rhyolite and argillite may have come to the Delmarva Peninsula through a combination of both mechanisms; however, it is interesting to see if either of these mechanisms can account for the argillite and rhyolite found at the Snapp Site.

For the most part, the argillite and rhyolite artifacts at the Snapp Site were finished tools, primarily projectile points and bifaces. As was noted earlier in this report, the rhyolite and argillite artifacts seem to have been part of curated tool kits that were brought to the site. There were no data to suggest that significant reduction of rhyolite or argillite bifaces or cores took place at the site even though such data are present at other Woodland I sites on the Delmarva Peninsula (Custer 1989:235-248). The context of the argillite and rhyolite artifacts at the Snapp Site would thus indicate that only finished and well-used argillite and rhyolite artifacts were brought to the site. No early stage bifaces or large cores were present. If trade and exchange systems, or even specialized direct procurement, were the mechanisms that brought these materials to the site, one would have to believe these rather elaborate systems existed to bring worn tools to the inhabitants of the Snapp Site. Such a scenario is unlikely, therefore, the argillite and rhyolite artifacts in the Snapp Site assemblage are most likely to represent remnants of curated tool kits that had been replenished when the prehistoric groups were in the vicinity of the rhyolite and argillite outcrops. It is also possible that rhyolite and argillite were procured in very small amounts through informalized trade and exchange networks as the Snapp Site inhabitants interacted with groups who had visited the quarry sources. In either case, the Snapp Site data do not suggest either formalized trips to quarry sources to procure large quantities of raw materials or highly developed trade and exchange mechanisms for the site's inhabitants during Clyde Farm III times.

If the Snapp Site inhabitants did indeed procure the argillite and rhyolite themselves when in the vicinity of the outcrops, then we can estimate a minimum area for their wandering patterns. Figure 104 shows a hypothetical territory that would include both outcrop areas and the Snapp Site. Also included within this territory are a number of sites in northern Delaware in the vicinity of Churchman's Marsh

FIGURE 104

Hypothetical Prehistoric Territories



(Custer 1989:193-204) and sites in the vicinity of Elkton, Maryland (Ward 1985), which show similar patterns of argillite and rhyolite use. This territory encompasses a wide area, but it falls well within the range of territories reported for modern hunters and gatherers in temperate forests (Custer and Stewart 1990). However, the territory is large enough to suggest a level of group mobility beyond that usually envisioned for Woodland I groups (e.g., Custer 1989:202-203). However, Parry (1989) has argued for greater mobility of these prehistoric groups based on certain aspects of lithic tool kits.

Figure 104 also shows a territory that had been hypothesized for Barker's Landing Complex groups (Watson and Custer 1990). The Barker's landing Complex is coeval with the Clyde Farm Complex (Custer 1989:221-233), and the territory was defined based on an especially heavy reliance on argillite

TABLE 61

Comparative Lithic Resource Use Data

Site	Function	Total Artifacts	Cortex %	Cryptocrystalline %	Quartzite/ Quartz %	References
Snapp Clyde Farm Complex	Base Camp	2,388	28	79	17	---
Webb Complex	Base Camp	153	37	73	25	---
Woodland II Period	Base Camp	329	23	80	14	---
7NC-D-125 Area A	Staging/ Processing	10,576	1	98	2	Riley, Custer, Hoseth, and Coleman 1994
Area B	Staging/ Processing	1,931	2	92	8	Riley, Custer, Hoseth, and Coleman 1994
Area C	Staging/ Processing	1,096	13	54	45	Riley, Custer, Hoseth, and Coleman 1994
7NC-D-129	Procurement	2,207	7	74	26	Custer et al. 1988
7NC-D-140	Procurement	133	21	75	25	Catts, Hodny, and Custer 1989
7NC-E-9	Micro-band Base Camp	4,090	14	81	18	Custer et al. 1990
7NC-E-46	Staging/ Processing	10,512	20	22	69	Custer and Bachman 1984
7NC-E-6A Area 2A	Macro-band Base Camp	5,515	9	60	34	Custer 1982
7NC-E-6A Area 2B	Macro-band Base Camp	6,206	9	71	23	Custer 1982
7NC-D-5	Quarry Reduction Base Camp	94	0	60	32	Custer, Ward, and Watson 1986
7NC-D-19	Quarry Reduction Base Camp	653	0	74	26	Custer, Ward, and Watson 1986
7NC-D-55A	Cobble Reduction Base Camp	132	45	30	69	Custer et al. 1981
7NC-A-2	Base Camp	845	2	18	67	Custer and De Santis 1985
7NC-A-17	Staging/ Processing	279	9	23	71	Custer and Hodny 1989
7NC-F-61A	Quarry Reduction Base Camp	1,922	1	99	1	Watson and Riley 1994

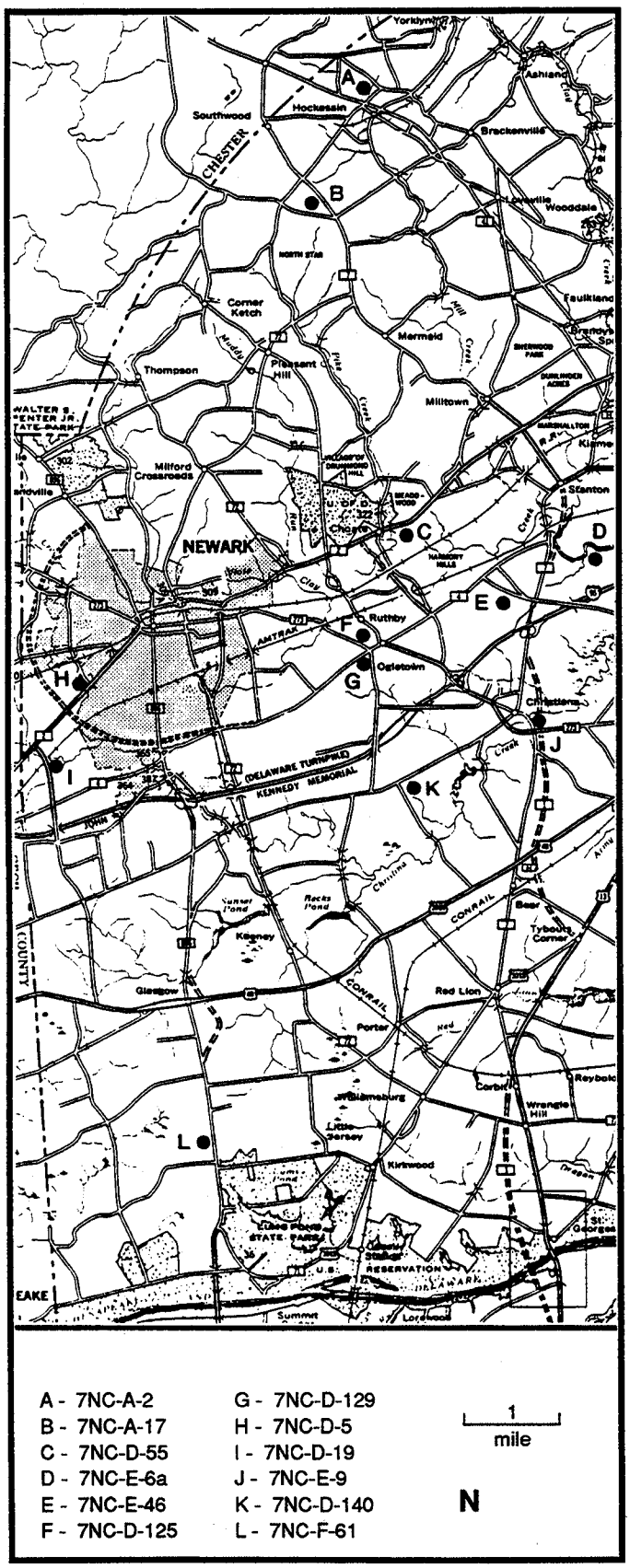
in the bifacial portion of the tool kit. The two territories do not overlap and tool kits found in each territory are quite different. Thus, these territories may represent territories of different social groups during the time period between 1500 and 700 B.C. Distributions of early ceramic types (Custer 1989:234) also support the definition of similar territories. Further research is needed to test the validity of the definition of these territories.

The Snapp Site lithic assemblages from dated feature clusters can be compared to those from other sites using a series of techniques applied in other reports in this series. These techniques focus on the analysis of percentages of artifacts with cortex and varied lithic raw material use (e.g., Riley, Custer, Hoseth, and Coleman 1994). Table 61 lists the data used in these comparisons and Figure 105 shows the locations of the sites used in the analyses. Table 62 lists the results of the comparisons among the sites and the Snapp Site dated assemblages have been added to Table 62 and placed in the appropriate locations based on their percentage values.

With regard to cortex percentage, which is an indicator of secondary cobble utilization, only the cobble reduction base camp of 7NC-E-55A shows a more intensive utilization of secondary cobbles than the Snapp Site. The placement of all three dated assemblages from the Snapp Site among the highest cobble cortex percentages underscores the importance of cobble utilization at the Snapp Site through all of the Woodland Period occupations.

FIGURE 105

Locations of Sites Used in Lithic Resource Use Comparisons



The Snapp Site assemblages fall with a group of sites in the upper part of the central groupings of sites with regard to cryptocrystalline material use. The Snapp assemblages also fall in the middle range of sites with respect to quartzite and quartz utilization. These findings suggest that a mix of cryptocrystalline and non-cryptocrystalline materials were being extracted from the cobble deposits at the site for tool use, and that this kind of balanced lithic resource is quite common at sites in northern Delaware. In sum, the Snapp Site is typical of many northern Delaware sites dating to the Woodland Period even though there is a slightly more intensive use of cobbles at the Snapp Site compared to other sites. As was noted earlier, the cobble lithic sources immediately available at the site were probably used to replenish tool kits of the site's inhabitants during their stay at the site.

Ceramic Technologies

The Snapp Site produced a wide variety of early ceramics that would be classified as "Experimental wares" (Wise 1975) in the current ceramic typologies (Custer 1989:168-171). The placement of these ceramics in the local ceramic sequence is based on the work of Gardner (1975) and Wise (1975). Wise (1975) was the first to apply the term "experimental" to these early ceramic wares because they showed a tremendous variety of construction methods, and vessel shapes, and tempers. Gardner (1975) has suggested that prehistoric ceramics first appeared in Eastern North America in the Southeastern Coastal Plain and that soapstone bowls were Middle Atlantic copies of Southeastern vessels. Later, Middle Atlantic groups began to produce flat-bottomed modeled ceramic copies of the stone bowls tempered with soapstone, probably derived from the vessels themselves (Custer 1987). By 1200 B.C., the flat-bottomed modeled vessels, known as Marcey Creek wares were distributed throughout the Middle Atlantic region. After 1200 B.C., variability in vessel shapes, temper,

TABLE 62

Summary of Lithic Resource Use Patterns

Cortex		Cryptocrystalline		Quartzite/ Quartz	
7NC-D-5	Quarry Reduction Base Camp-0	7NC-A-2	Base Camp-18	7NC-F-61A	Quarry Reduction Base Camp-1
7NC-D-19	Quarry Reduction Base Camp-0	7NC-E-46	Staging/ Processing-22	7NC-D-125A	Staging/ Processing-2
7NC-F-61A	Quarry Reduction Base Camp-1	7NC-A-17	Staging/ Processing-23	7NC-D-125B	Staging/ Processing-8
7NC-D-125A	Staging/ Processing-1	7NC-D-55A	Cobble Reduction Base Camp-30	Snapp-Woodland II	Base Camp-14
7NC-D-125B	Staging/ Processing-2	7NC-D-125C	Staging/ Processing-54	Snapp-Clyde Farm	Base Camp-17
7NC-A-2	Base Camp-2	7NC-D-6A(2A)	Macro-band Base Camp-60	7NC-E-9	Micro-band Base Camp-18
7NC-D-129	Procurement-7	7NC-D-5	Quarry Reduction Base Camp-60	7NC-E-6A(2A)	Macro-band Base Camp-23
7NC-E-6A(2A)	Macro-band Base Camp-9	7NC-D-6A(2B)	Macro-band Base Camp-71	7NC-D-140	Procurement 25
7NC-E-6A(2B)	Macro-band Base Camp-9	Snapp-Webb	Base Camp-73	Snapp-Webb	Base Camp-25
7NC-A-17	Staging/ Processing-9	7NC-D-19	Quarry Reduction Base Camp-74	7NC-D-129	Procurement-26
7NC-D-125C	Staging/ Processing-13	7NC-D-129	Procurement-74	7NC-D-19	Quarry Reduction Base Camp-26
7NC-E-9	Micro-band Base Camp-14	7NC-D-140	Procurement-75	7NC-D-5	Quarry Reduction Base Camp-32
7NC-E-46	Staging/ Processing-20	Snapp-Clyde Farm	Base Camp-79	7NC-E-6A(2B)	Macro-band Base Camp-34
7NC-D-140	Procurement-21	Snapp-Wodland II	Base Camp-80	7NC-D-125C	Staging/ Processing-45
Snapp-Woodland II	Base Camp-23	7NC-E-9	Micro-band Base Camp-81	7NC-A-2	Base Camp-67
Snapp-Clyde Farm	Base Camp -28	7NC-D-125B	Staging/ Processing-92	7NC-E-46	Staging/ Processing-69
Snapp-Webb Complex	Base Camp-37	7NC-D-125A	Staging/ Processing-98	7NC-D-55A	Cobble Reduction Base Camp-69
7NC-D-55A	Cobble Reduction Base Camp-45	7NC-F-61A	Quarry Reduction Base Camp-99	7NC-A-17	Staging/ Processing-71

Note: Sites are listed in order from lowest to highest by percentage frequency; sites with no significant differences in percentages are joined by brackets. This table was prepared by using data from previous site comparisons (Custer and Hodny 1989; Catts, Hodny, and Custer 1989, Riley, Custer, Hoseth, and Coleman 1994) with the addition of the Snapp Site components.

and construction methods began to appear and many different ceramic types are noted for the time period between 1200 and ca. 700 B.C. After 700 B.C., there was a clear reduction in ceramic variability and most Middle Atlantic ceramics had conoidal shapes, were constructed from coils, and were tempered with crushed rock or shell. The 500-year period between 1200 B.C. and 700 B.C., with its tremendous ceramic variability is thought to be one during which prehistoric potters experimented with different technologies and materials, hence the term "Experimental wares".

The Snapp Site experimental ceramics show a variety of tempers and combinations of vessel shapes and construction methods not previously noted in the local archaeological literature. Many different tempering materials, including crushed quartz, hornblende, and a number of unidentified metamorphic rocks from the Piedmont Uplands, are present. Some of these have tempering materials, especially the unidentified Piedmont metamorphic materials, that have never been previously noted in the local literature. As was previously noted, the combination of flat-bottomed vessel shape and coiled construction technique is also unique. In general, the Snapp Site experimental ceramic assemblage shows that there was even greater ceramic variability during the time period of experimental ceramics than was previously thought.

It is important to note that some studies (Gardner 1975) have suggested that the greatest ceramic variability should be seen at base camp sites along the major drainages during this time period. Major drainages were important lines of communication and transportation, and the base camp sites in these locations are viewed as places where people could have heard and seen different types of ceramic technologies. The Snapp Site is indeed a base camp, but St. Georges Creek is hardly a major drainage. Furthermore, the site is located too far from the Delaware Bay to consider it to be directly associated with that large body of water. Thus, the Snapp Site would not seem to fit with previous ideas about where high levels of early ceramic variability should be present. On the other hand, as was noted earlier, the Snapp Site is located where it is relatively easy to cross from the Chesapeake Bay to the Delaware Bay drainage. The headwaters of St. Georges Creek, on the Delaware Bay drainage, come very close to those of Back Creek, on the Elk River of the Chesapeake Bay drainage. The ease of crossing the northern Delmarva Peninsula at this location is also evident because it is at this location that the Chesapeake and Delaware Canal was constructed. In sum, the Snapp Site does fit the profile of sites with high experimental ceramic variability because it is located on a major communication path between two drainages just as sites on major rivers are located on major communication and transportation lines within drainages.

Subsistence Systems

The floral assemblage from the Snapp Site can be compared to similar assemblages from other sites in Delaware to see if there are patterns of plant food use during Woodland I and Woodland II times. Table 63 shows the data from the Snapp Site along with those from other Woodland sites in Delaware with comparable data. With the exception of the Hawthorn Site (7NC-E-46), all of the other sites either do not date to the same time period as the Snapp Site, or contain multiple components. The notes on Table 63 describe the specific components and their dates for each site.

Almost all of the sites show a basic plant food assemblage that usually includes hickory nuts, Chenopodium, and Amaranth. However, the Snapp Site includes a few additional plant foods, and the Delaware Park Site (7NC-E-41) shows a very large range of additional plants. Not all of these plants are foods, however. Some have medicinal uses (e.g., spurge (Euphorbia). The Delaware Park Site includes occupations spanning the time period from the initial portion of the Woodland I Period to the final portions of the Woodland II Period (Thomas 1981) and the long time frame may account for all of the varied plant remains. For example, beans (Leguminosae) are present and certainly date to the Woodland II Period. However, the Snapp Site includes features from a wide range of time periods as well and does not show as wide a range of plant foods. Preservation differences may account for some of the variability in plant food remains; however, additional explanations of the variability can be offered to provide some future research directions.

The three sites from Sussex County (7S-K-21, 7S-D-9, and 7S-G-79) contain shellfish remains and show relatively intensive use of maritime resources. The shells in the feature matrices at these sites provide for excellent preservation of organic materials, yet these sites have very few different types of plant remains. It is possible that the intensive use of maritime resources precluded the use of an extensive array of plant foods and the low numbers of plant types found at these sites reflects this subsistence pattern.

TABLE 63
Comparison of Plant Food Remains

	Snapp	7K-D-21 (1)	7K-D-3 (2)	7NC-E-41 (3)	7NC-E-46 (4)	7S-K-21 (5)	7S-D-9 (6)	7S-G-79 (7)
Copperleaf	X							
Hickory	X	X	X	X	X	X	X	X
Butternut	X	X				X	X	
Acorn				X		X		
Chenopodium	X			X	X	X		
Amaranth				X	X	X		
Carpetweed				X				
Clammyweed				X				
Chickweed				X				
Mustard				X				
Flax				X				
Sedge				X				
Spurge	X			X				
Mint				X				
Skullcap				X				
Sage				X				
Thyme				X				
Bean				X				
Hog Nut				X				
Bayberry	X			X				
Pokeweed				X				
Smartweed	X			X				
Raspberry	X			X				
Wild Grape				X				
Walnut				X				X
Corn								X
Hackberry					X			
Thimbleberry	X							
Ragweed	X							
	Interior Sites					Coastal Sites		

Citations and Notes

(1) Thomas, et al. 1975. Dates to Carey Complex (A.D. 600)

(2) Griffith 1974. Dates to Carey Complex (A.D. 0-60)

(3) Thomas 1981. Variety of Woodland I and Woodland II Components

(4) Custer and Bachman 1984. Clyde Farm Complex ca. 2200 B.C.

(5) Custer, Stiner, and Watson 1983. Delmarva Adena and Carey Complex Occupations (ca. 500 B.C. - A.D. 600)

(6) Custer and Mellin 1987. Carey Complex Occupation (A.D. 0-600)

(7) Doms, Custer, Davis, and Trivelli 1985. Woodland II - Slaughter Creek Complex Occupation (ca. A.D. 1000-1500)

The other five sites noted in Table 63 (Snapp, 7K-D-21, 7K-D-3, 7NC-E-41, and 7NC-E-46) are not associated with any intensive maritime resource use with the exception of 7K-D-3 which had one pit with oyster shell remains (Griffith 1974). The absence of shells in the pit fill of features at these sites could produce poor preservation of organic materials, especially when the porous soils of Coastal Plain sites, which inhibit organic preservation, are considered. Indeed, several of these sites show very few different types of plant remains. Nonetheless, the Delaware Park Site (7NC-E-41) still shows the largest array of plant remains of any of the sites. It is possible that the inhabitants of non-maritime, or interior, sites needed to use a wider array of plants to fill the place in their diets that would have been taken by coastal resources. In sum, the preliminary data suggest that there were differences in prehistoric plant utilization in coastal and interior areas. Future research should seek to see if these differences are truly the result of differences in prehistoric behavior patterns, or if they result from preservation biases. Future research can also seek to establish links between varied resource use through time at these sites. The refined Clyde Farm Complex chronology presented earlier in this report is one step towards a better definition of temporal differences at sites with plant food remains.

Household Settlement Patterns

The varied features present at the Snapp Site, and their interpretations as houses, storage/refuse pits, and possible sweat lodges provide numerous insights to the study of household settlement patterns. The discovery of a house pattern complete with post molds (Feature 153 - Figure 30) is especially important because it provides a context within which the constituent features can be interpreted. The identification of the unique D-shaped features (Feature Type 1 - Figure 25) that form the "sub-basement" of the houses (Figure 32) allows the identification of other houses in other parts of the Snapp Site, and at other sites, based on the presence of this feature type alone.

The size of the houses discovered at the Snapp Site clearly implies that the main social unit of the site's inhabitants was the nuclear family. The houses are so small (Figure 32) that there is no room for any larger social unit. The house size also does not appear to change through time from the beginning of the Woodland I Period throughout the Woodland II Period. The absence of change in house size implies that there was no change in the basic social unit of prehistoric groups through a relatively long period of time, from ca. 1200 B.C. to A.D. 1500.

The continuity of house size, and presumably the size of the basic social units, is not seen in other areas. For example, in southeastern Pennsylvania, there is a clearly defined increase in the size of houses through the Late Woodland Period (Custer et al. 1993). This increase in household size occurs after the adoption of agriculture and occurs in association with the development of settled village communities. The absence of such social change in northern Delaware suggests that the associated factors of adoption of agriculture and development of settled villages did not occur in this area. Other data have led to similar conclusions (Stewart, Hummer, and Custer 1986).

The presence of Type 6 features (Figure 26) within some of the household clusters is of interest. If these features were indeed sweat lodges, as was suggested as one possible interpretation noted earlier in this report, they appear to have been associated with individual houses. Ethnographic data (e.g., - Hudson 1976; Reynolds 1978) indicate that sweat baths had ritual significance for many Eastern Woodland groups and the association of these features with individual houses suggests that rituals were managed

and performed by individual families, not by combinations of households. This association of individual families and ritual features further supports the notion that individual nuclear families were the basic social units of Woodland societies in northern Delaware.

Based on previous research, Type 6 features appear to be unique to the Snapp Site on the Delmarva Peninsula. Type 6 features are similar to so-called "keyhole features" which have been found at Woodland II sites throughout the Upper Susquehanna Valley (Smith 1976). These features date to earlier time periods at the Snapp Site, and their presence in earlier contexts may indicate that these features have a greater antiquity than previously thought. The presence of this feature type, which is usually found in the Susquehanna Valley, in northern Delaware also reinforces the validity of the idea that the prehistoric cultures of northern Delaware were part of a territory that included southeastern Pennsylvania, and that they were part of an interaction sphere that was different from the sphere that included the societies of central and southern Delaware (Figure 104).

Community Settlement Patterns

The description of the feature clusters in terms of households and overlapping occupations (Figures 76 - 82) provides a look at the intensity of settlement at the Snapp Site and a basis for the analysis of prehistoric communities. For the most part, the "communities" at the Snapp Site seem to consist of individual nuclear families. Only one feature cluster (Cluster 1 - Figure 76) shows signs of multiple, contemporaneously occupied houses, and at most there were only 3 - 5 families present at the site at one time.

After the completion of Phase II research, the Snapp Site was considered to be a "macro-band base camp" based on its size, the presence of numerous features, and the site's size. Macro-band base camps are defined as habitation sites for numerous families and are contrasted with micro-band base camps, which presumably were inhabited by fewer people at any given time (Custer 1989:129-130). If most of the occupations at the Snapp Site were individual families, is it really a "macro-band" base camp? Does the one occupation of three to five families represent a "macro-band" base camp? We feel that "macro-band" base camp label is probably not an accurate description of the Snapp Site. With individual family occupations through most of its history of use, the site does not really match the implicit idea in the definition of a "macro-band" base camp in that it does not show evidence of being the home for multiple social units. The occupation of the site by three to five families, may meet the definition of a macro-band base camp, but only at a minimal level.

The discovery that a large site like the Snapp Site consisted of a series of overlapping individual occupations is not a complete surprise. A lesson to be learned is that the excavation of large contiguous areas is needed to truly assess the contemporaneity of features and individual occupations. It is recommended that future excavations of similar sites include excavation and exposure of similarly large areas.

Even though there are problems with calling the Snapp Site a "macro-band" base camp, there are still significant differences between sites like Snapp and traditional micro-band base camps. In general, micro-band base camps are not as large and have fewer artifacts. The excavations at the Snapp Site show that its larger size and artifact assemblage are due to its repeated reuse, and such repeated reuse is missing at the traditional micro-band base camps. Perhaps it would be best to refer to sites like

Snapp as "repeatedly reused base camps" and traditional micro-band base camps as "individual base camps". Further research at both kinds of sites is needed to clarify this issue before changing the site typology terminology.

The long time frame of the repeated reuse of the Snapp Site, the continuity in its use as a habitation site mainly by individual families, and the absence of change in house size and household cluster composition all point to significant levels of cultural continuity. This settlement continuity supports the idea that there are continuities in prehistoric life ways between 3000 B.C. and A.D. 1000 which define the Woodland I Period (Custer 1989:141-144). The Snapp Site settlement data also show that this continuity extends into the Woodland II Period and spans the Woodland I/Woodland II transition that occurred ca. A.D. 1000. In other parts of the Middle Atlantic region there are significant settlement pattern changes associated with this transition (Stewart 1992; Gardner 1982) and these settlement pattern changes are probably linked to the adoption of agricultural subsistence systems. The absence of such settlement pattern changes in northern Delaware supports the idea that agriculture was not that important in the northern Delmarva Peninsula (Stewart, Hummer, and Custer 1986).

The existence of settlement pattern continuities through the Woodland I/Woodland II transition is also interesting because even though it does not appear that the adoption of agriculture caused significant culture change on the Delmarva Peninsula at this time, some culture change is evident (Custer 1990). The culture change that is present has been linked to a hypothesized migration of Algonkian-speaking groups into the region (Fiedel 1987, 1990; Luckenbach, Clark, and Levy 1987). The settlement pattern continuities evident at the Snapp Site span the time frame of this hypothesized migration and suggest that if such a migration took place, it did not involve groups with adaptations and household organizations that were significantly different from those of the original inhabitants of the region.

Regional Settlement Patterns

The settlement pattern data from the Snapp Site can also be used to address issues concerning regional settlement patterns. Regional Woodland I and Woodland II settlement pattern models have always included macro-band base camps (e.g., Figure 13). Although Cluster 1 suggests that multiple families did indeed live at some base camps sites, the Snapp Site data also indicate that individual family occupations were more common. Thus, we probably should consider the possibility that there were two potential settlement systems in operation at any given time during the Woodland I and Woodland II periods (Figures 13 and 14). The first model is the traditional interpretation with groups coalescing at larger base camps during the cold weather months as shown in Figure 13, and then dispersing in the spring and summer. The second model would have individual families rarely joining together and spending most of their time moving alone across the northern Delaware landscape (Figure 14). Riverine base camps, like the Snapp Site, would still be the locus of cold-weather occupations.

Both of these settlement systems were probably in operation at the same time during the Woodland I and Woodland II periods. It is unlikely that prehistoric groups never lived together in anything larger than nuclear family groups due to problems with inbreeding and genetic isolation. Therefore, there had to be some social mechanism for amalgamations of larger groups to facilitate exchange of mates and information. Such amalgamations were present among most hunting and gathering societies of Native North Americans and probably existed in Delaware as well during Woodland I and Woodland II times. Ethnohistoric data (e.g., Becker 1986) for the Lenape clearly shows the existence of multi-family bands who ranged over large areas and occasionally acted together as corporate groups. It is significant that

corporate action and amalgamation of social groups did not always occur regularly among the Lenape and other hunting and gathering societies. Instead, amalgamation occurred only when special resources requiring communal processing were present, or especially abundant.

Individual nuclear family groups almost certainly comprised the main social unit for prehistoric inhabitants of Delaware during Woodland I and Woodland II times. These groups spent most of their time living and traveling alone across the landscape. In most cases, the settlement model in Figure 14 would apply. However, on a irregular basis, probably not seasonally or yearly, they came together in larger social units and Figure 13 would apply. The presence of a large communal processing hearth, which is thought to be tied to processing of nuts or fish, among the contemporaneously occupied house features in Cluster 1 suggests that the communal processing of these resources may have been the focus of the periodic amalgamations of social units. However, these resources may not have been sufficiently abundant to allow such amalgamations on a yearly basis.

If we are correct in our interpretation that Cluster 1 could have been occupied by up to five individual nuclear families, then it is possible to speculate on potential regional populations. Numerous studies (e.g., Hassan 1981) have suggested that a community like the small group of families at the Snapp Site requires a support territory that approximates a circular area with a radius of 5 kilometers. The size of this territory is based on ethnographic studies which show that the inhabitants of such a community will move the community rather than travel more than 5 kilometers to procure critical resources. This territory is called a catchment area and Figure 106 shows the placement of such a catchment area in relation to the Snapp Site. Figure 106 also shows the reconstructed St. Georges Creek drainage prior to the construction of the Chesapeake and Delaware Canal based on historic maps (Figure 3). The 5 kilometers circle roughly approximates the entire Saint Georges Creek area. Ethnographic data (e.g., Snow 1980) suggests that drainage areas defined Native American territories, so it is not unreasonable to assume that up to five families comprised the total prehistoric population of the Saint Georges Creek drainage.

The catchment area is approximately 78 square kilometers, or 30 square miles. If we assume an average of five people per family and five families are present, then the population for the drainage would be 25 people. This population figure yields a population density of .83 people per square mile or one person per 1.2 square mile. Table 64 shows a series of population density estimates for Eastern North America and the estimate presented here fits well with most of the other estimates.

If this population density is projected throughout the state of Delaware (Table 65), a total population estimate for the state during any given year of the Woodland Period would be approximately 1650 people. This estimate is probably too high because it assumes a constant population density throughout the state, and

FIGURE 106

Snapp Site Catchment Area

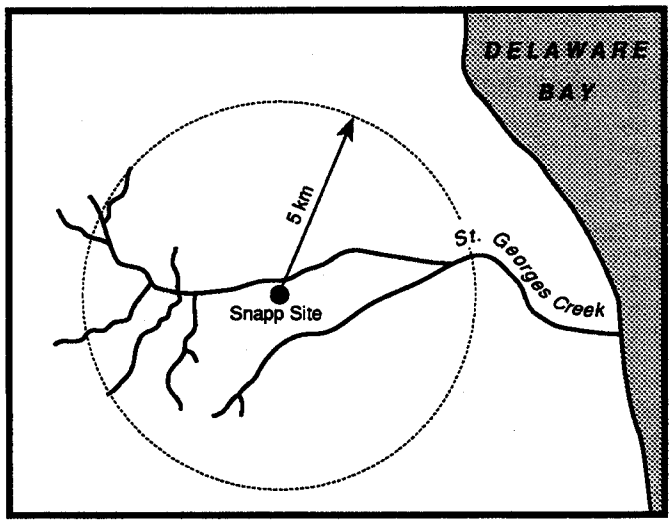


TABLE 64
Original Population Densities

Group	Population Density *	Citation
Delaware	1	Goddard 1978:214
Upper Chesapeake and Eastern Shore of Maryland and Virginia	3	Feest 1978a:242
Virginia Algonkians	2	Feest 1978b:256
Huron	60	Heidenreich 1978:369
Iroquois	2	Tooker 1978:421
Eastern Sub-Arctic Algonkians	<1	Brasser 1978:78

* Rounded to nearest person per square mile

numerous studies (e.g., Custer 1989) have shown that Woodland settlement is concentrated along the major drainages and not in interior areas. If we estimate that major drainage settings comprise approximately half of the state, then the population estimate would be 825 people. This population estimate may seem low, but fits well with the population densities described for other hunting and gathering populations.

A final topic to consider in regional settlement patterns is the extent to which the occupations of the Snapp Site conform to expectations shown in Figures 11 - 15 based on the state plan for management of cultural resources (Custer 1986). The presence of occupations from all time periods, except the Contact Period, confirms the expectations. Similarly, the intensity of occupations increases over time as suggested by models provided by the state plan. Thus, the results of Phase III testing at the Snapp Site fulfills expectations of regional site distribution models noted in the state plan.

TABLE 65
Prehistoric Populations of Delaware

County	Square Miles	Population
New Castle	437	364
Kent	595	495
Sussex	946	788
	Total	1647

In conclusion, the excavations at the Snapp Site gathered data that allowed a wide range of research issues to be investigated. In some cases, the results of the research confirmed previous ideas about Delaware prehistory, but in other cases, we were forced to reevaluate our ideas. As such, the data from the site were significant and justified the time, energy, and money invested in their collection and analysis.