TABLE 14

Debitage Attribute Frequencies, Site 7K-C-360, Activity Area D

Flake type		**Size**		**Platform shape**		**Platform preparation**	
Complete	19	< 2 cm	31	Triangular	9	Present	0
Proximal	2	2 - 5 cm	19	Flat	7	Absent	21
Medial	5	> 5 cm	0	Round	5	No observation	29
Distal	24			No observation	29		
		Scar count				**Directions count**	
Cortex		Mean	= 1.34	**Remnant biface edge**		Mean	= 1.22
Present	17	Standard deviation	= 1.32	Present	2	Standard deviation	= 1.08
Absent	33			Absent	48		

*Based on a sample of 50 flakes

platform preparation, which would be more typical of biface reduction. In short, a mixed technology of bifaces and cores supplemented by local cobbles is indicated by the test results. Figure 68 shows the location of fire-cracked rocks from both Phase II and Phase III excavations. Pockets of fire-cracked rock concentrations exist in various parts of Area D, including the area of quartzite chipping activity.

In sum, Area D appears to have functioned as a quartzite chipping area and possibly a locus for the reduction or refurbishing of curated tools made of argillite. It further appears that these activities took place in the vicinity of a hearth. The low level of cortex present on the quartzite flakes suggests that either bifaces of primary quartzite were carried into the site and reduced into finished tools which were then carried away from the site and used elsewhere, or that cores of cobble quartzite had the majority of their cortex removed at an earlier time and were carried into the site where decortication was completed and the manufacture of flakes for tools commenced. Additional activities in this part of the site included the expedient manufacture of flake tools and utilized flakes which were used and immediately discarded. The manufacture of new tools to replace discarded tools also seems to have taken place in Area D. The presence of diagnostic artifacts dating to both the Archaic and Woodland I periods indicates that the site was occupied more than once over time, but the absence of features and the low number of artifacts suggests that the occupations were of short duration.

All of the data indicates that Site 7K-C-360 functioned primarily as a procurement/processing site. Diagnostic artifacts dating to both the Archaic and Woodland I periods and several small hearth areas suggest that the site was occupied more than once over the span of time. However, the absence of habitation and storage features indicates that the duration of these occupations was relatively short.

EXCAVATION RESULTS AND INTERPRETATIONS - DOVER DOWNS SITE, HILL A (7K-C-365A)

Circumstances similar to those at 7K-C-360 appear to have existed at the Dover Downs Hill A (7K-C-365A), which is located south of 7K-C-360 on Muddy Branch. Hill A also seems to have been favored by prehistoric populations for procurement/ procurement/ processing activities throughout the long span of Delaware prehistory. A discussion of the archaeological investigations at Dover Downs follows.

SITE STRATIGRAPHY

The following section will discuss the soil types and soil formation processes observed at 7K-C-365A, and will consider the relationship of the soil types to the vertical distribution of artifacts at the site. The implications of the site's stratigraphy on site chronology and the vertical separation of the Paleo-Indian through Woodland II occupations will also be addressed. Figure 69 shows the location of the north/south and east/west composite profiles of the site. Figure 70 is the east/west profile, and Figure 71 shows the north/south profile. The analysis of soils at Dover Downs Hill A will focus on the five major horizons observed at the site. These soils are present across the entire site area, but each has

FIGURE 68

Distribution of Fire-Cracked Rocks, Site 7K-C-360, Activity Area D

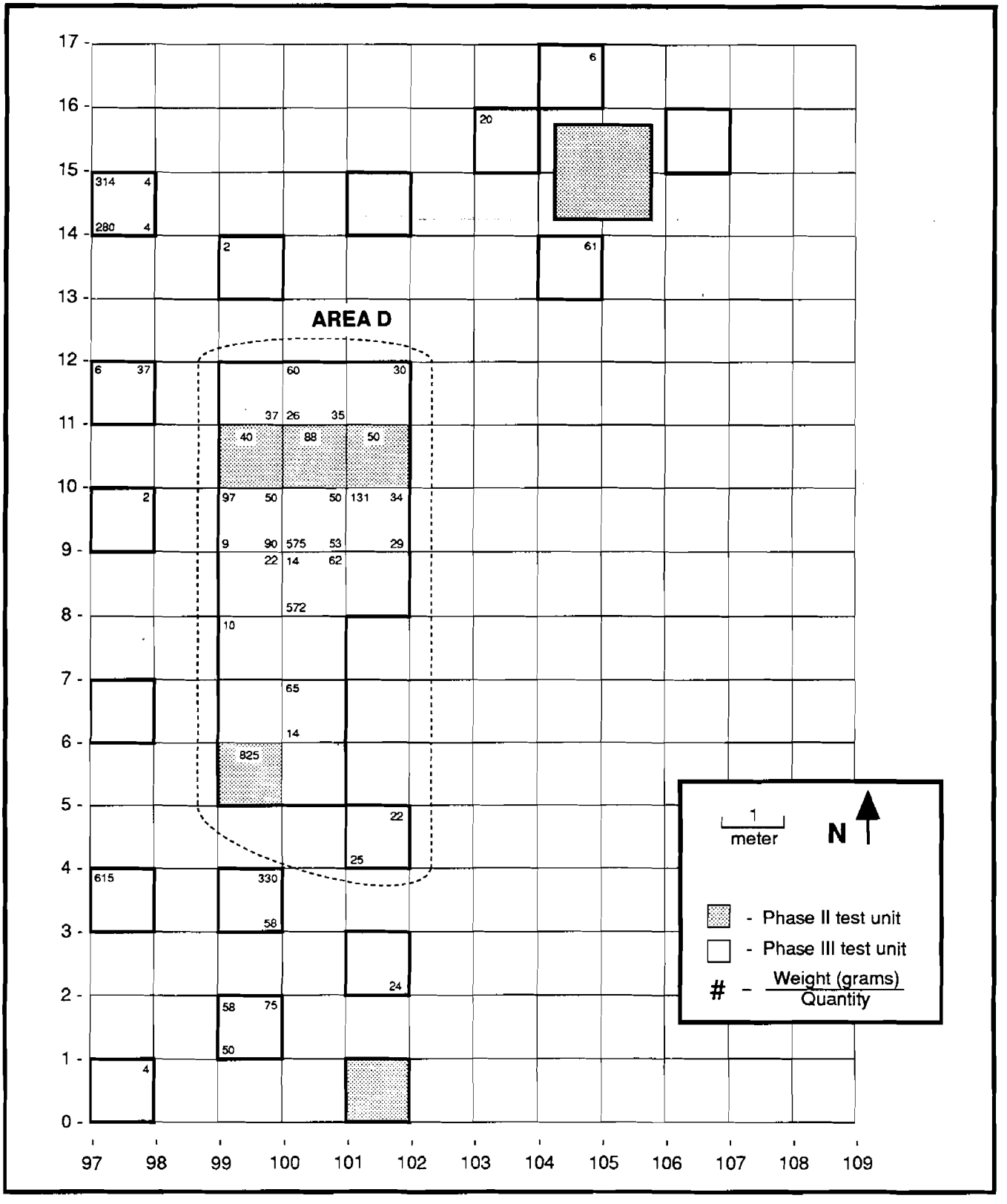
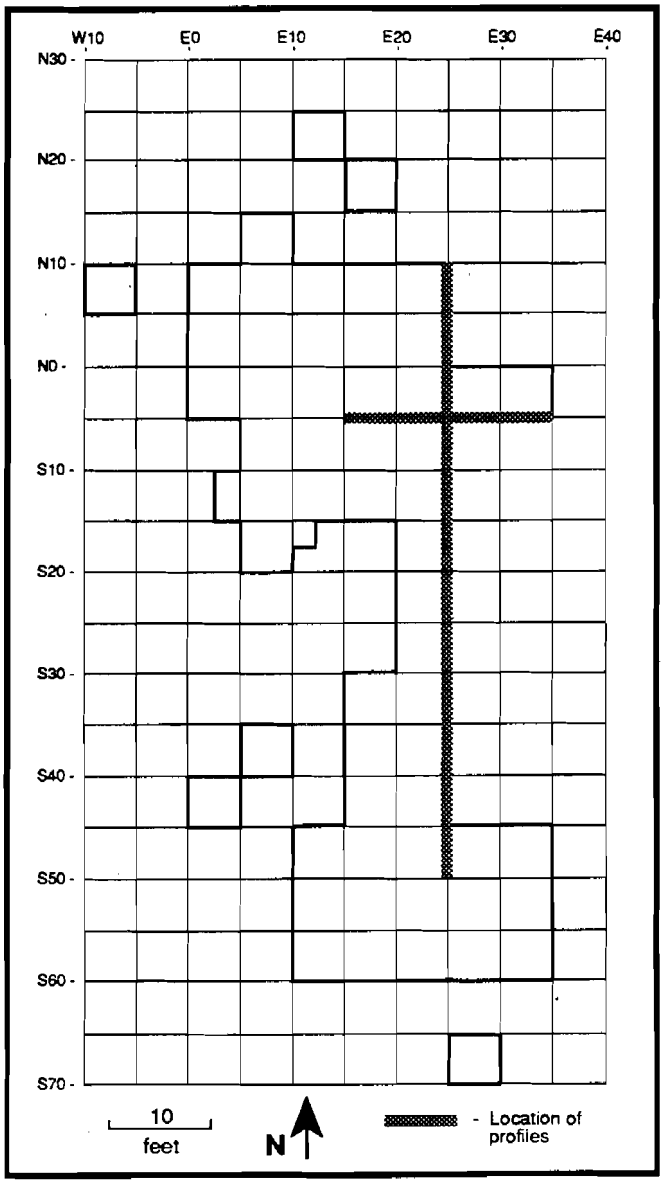


FIGURE 69

Location of North/South and East/West Composite Profiles, Dover Downs Site, Hill A (7K-C-365A)



been disturbed in varying degrees and at various locations by both natural processes and the mechanical removal of standing trees. This tree removal was performed by the property owners prior to the start of Phase II investigations. A description of the disturbed soils is included on the composite profiles (Figures 70 and 71, Horizons VI to XII) but they will not be enumerated in the text.

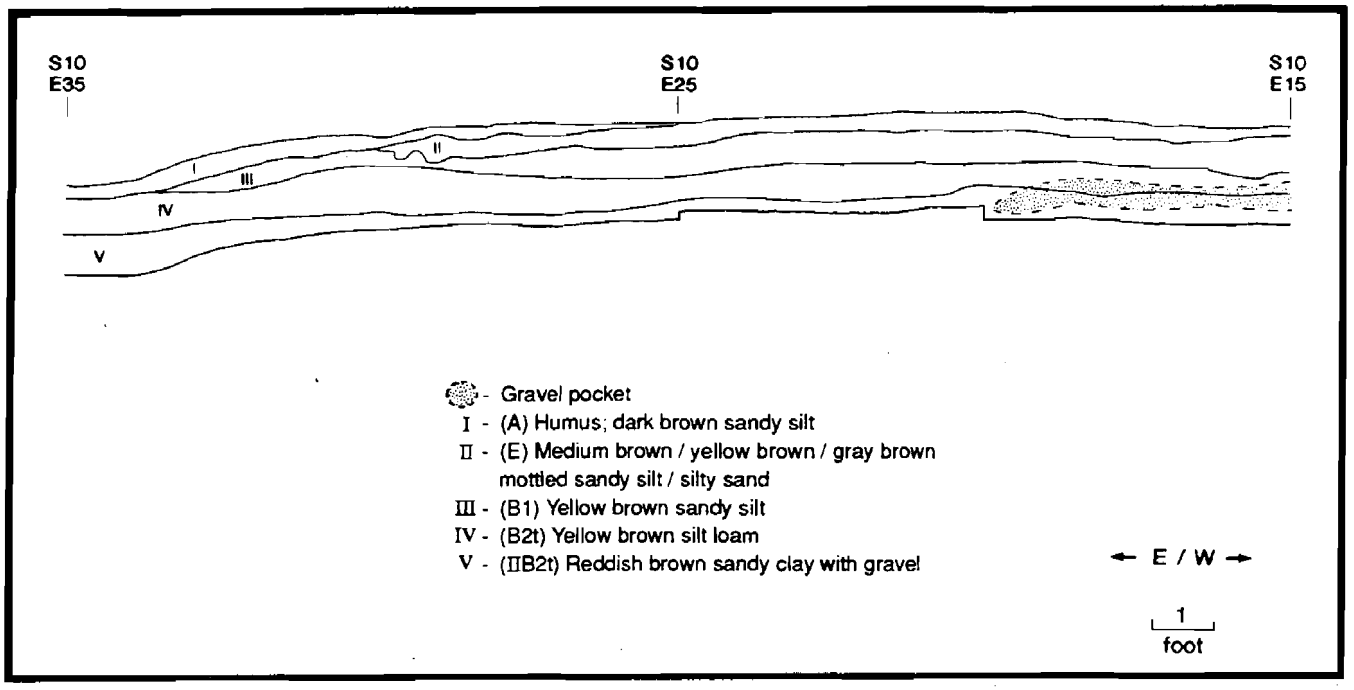
Soil Horizon I (Figures 70 and 71) is a humus or A horizon which is found across most of the site. It has been removed in places as a result of tree removal. Horizon I corresponds to excavated Level 1. This soil is a dark brown sandy silt containing decayed organic material and leaf litter, which was found to be up to 0.4 feet thick. Thirteen percent of total prehistoric artifacts were recovered from Horizon I, including a Stanly/Neville point, a stemmed point, and Wolfe Neck ceramics (Figure 72).

Soil Horizon II (Figures 70 and 71) is an E Horizon consisting of a medium-brown/yellow-brown/gray-brown mottled sandy silt to silty sand. This soil was found continuously across the site, except in areas disturbed by natural processes and/or tree removal. On the eastern side of the knoll, Horizon II has been eroded (Figure 70). The soil was generally figure 70 around 0.3 feet thick, and it contained a stemmed point and Wolfe Neck ceramics (Figure 72). It corresponds to excavated Level 2, which contained 21 percent of all artifacts.

Horizon III is a B1 soil composed of yellow-brown sandy silt (Figures 70 and 71). Little to no clay was found in this horizon and it has been disturbed in places by tree roots. The soil is friable, non-sticky, and non-plastic, and contains fine-grained sand. The border between Horizon III and Horizon II is clear and smooth to wavy. As may be seen in Figure 70, this soil has been eroded on the eastern edge of the knoll. Diagnostic artifacts recovered from this horizon include a Kirk/Palmer point, stemmed and notched points, a teardrop point, and Wolfe Neck ceramics (Figure 72). Soil Horizon III ranged from 0.3 feet to 0.8 feet in thickness, and corresponds to excavated Levels 3, 4, and portions of 5. Fifty percent of all prehistoric artifacts recovered from Dover Downs Hill A were found in this soil.

Soil Horizon IV contained a moderate increase in clay content, and is labeled a B2t soil. The soil was a firm, sticky, slightly plastic yellow-brown silt loam, with fine-grained sand. The border between Horizon IV and Horizon III was clear and smooth to wavy. A Kirk/Palmer point and a stemmed point were found in this soil (Figure 72). This soil was excavated in portions of Level 5, Level 6, and portions of Level 7, and it ranged in thickness from 0.2 feet to 0.9 feet. Approximately 15 percent of all artifacts found at 7K-C-365A were from Horizon IV.

FIGURE 70
East/West Composite Profile, Dover Downs Site, Hill A (7K-C-365A)



A sharp stratigraphic break occurs between Horizons IV and V (Figures 70 and 71). Horizon V exhibited a dramatic increase in clay content compared to the soil above it, and the border between the two soils is abrupt and wavy. Horizon V is a IIB2t soil composed of a very sticky, plastic, reddish-brown sandy clay with gravel. The sand is medium- to fine-grained, and the gravel is medium in size. No prehistoric artifacts were found in undisturbed areas of this horizon, and after limited testing, excavations were usually halted at this soil type. Its maximum observed thickness was 0.6 feet.

Soil Horizon I is a recent humus deposit, with a zone of elluviation below it. This E Horizon (Horizon II) is the leached-out upper portion of Horizon III. Horizon IV is an argillic B horizon containing clay-sized particles translocated from upper soils. The fine-grained sands and silts of which Horizons III and IV are composed suggest that these soils are aeolian deposits, and the elevated topography on which these soils are located precludes any other method of accumulation. Although the amount of clay in Horizon IV is not great, it does show enough pedogenic development to indicate a 3,000 to 5,000-year period of stability.

As previously mentioned, the amount of clay in Horizon V was much greater than in Horizon IV, and was significant enough to indicate a Late Pleistocene/Early Holocene (10,000 B.C.) age for this soil. The presence of large amounts of gravel in Horizon V further indicated that this soil is derived from Late Pleistocene/Early Holocene glacial outwash of the Columbia Formation, ca. 15,000 to 10,000 B.C. Horizon V is a Bt horizon formed in the upper portions of these deposits.

The fact that an apparently younger soil rests unconformably on Horizon V gives evidence of a stratigraphic break or discontinuity at this location in the profile. This discontinuity has been noted at other sites both in Delaware and other areas of the Middle Atlantic and it is thought to be associated with large scale erosional events at the onset of warm and dry climate conditions ca. 3,000 B.C. (Custer and Watson 1987; Ward and Bachman 1987;

FIGURE 71

North/South Composite Profile, Dover Downs Site, Hill A (7K-C-365A)

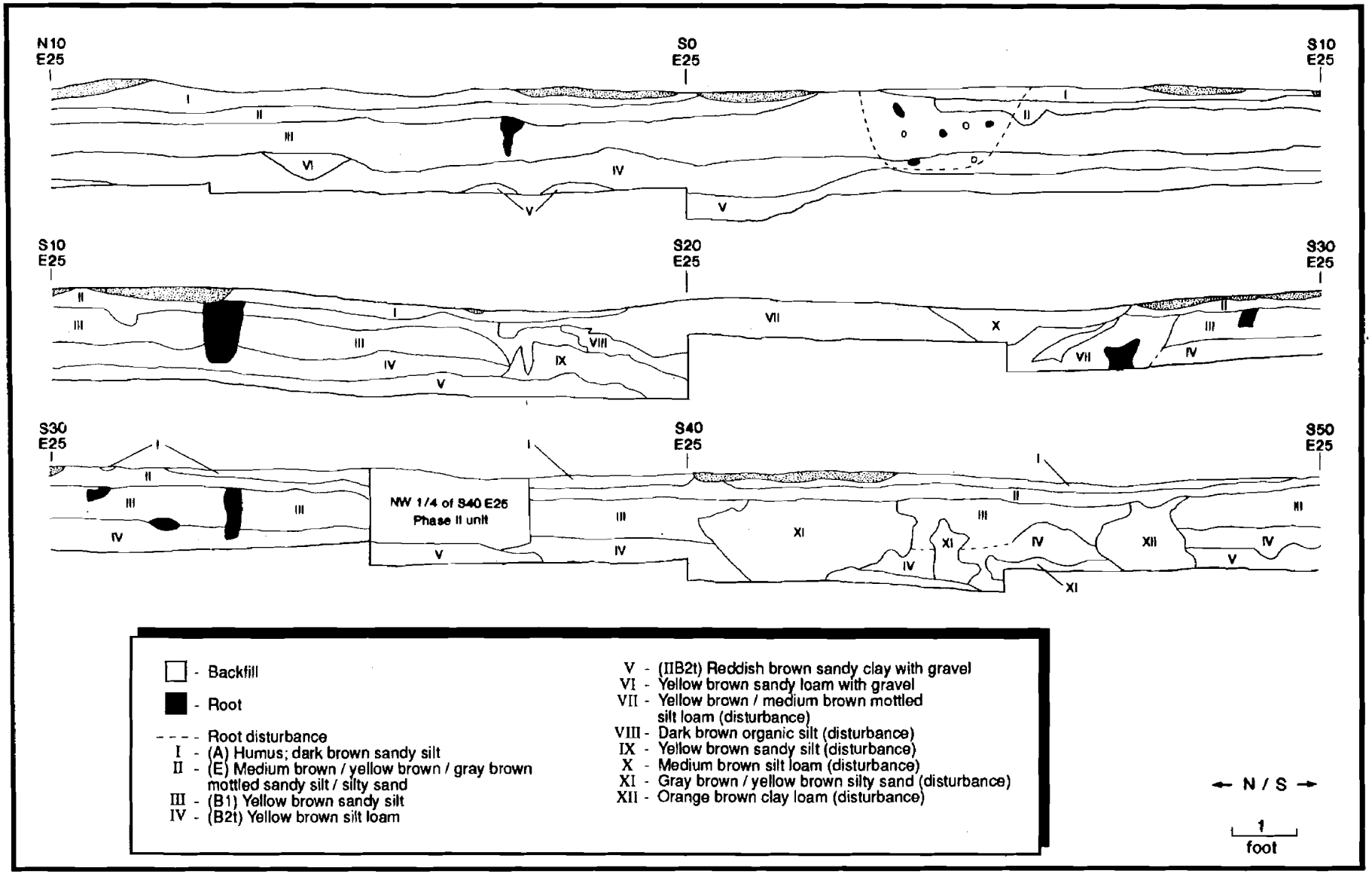
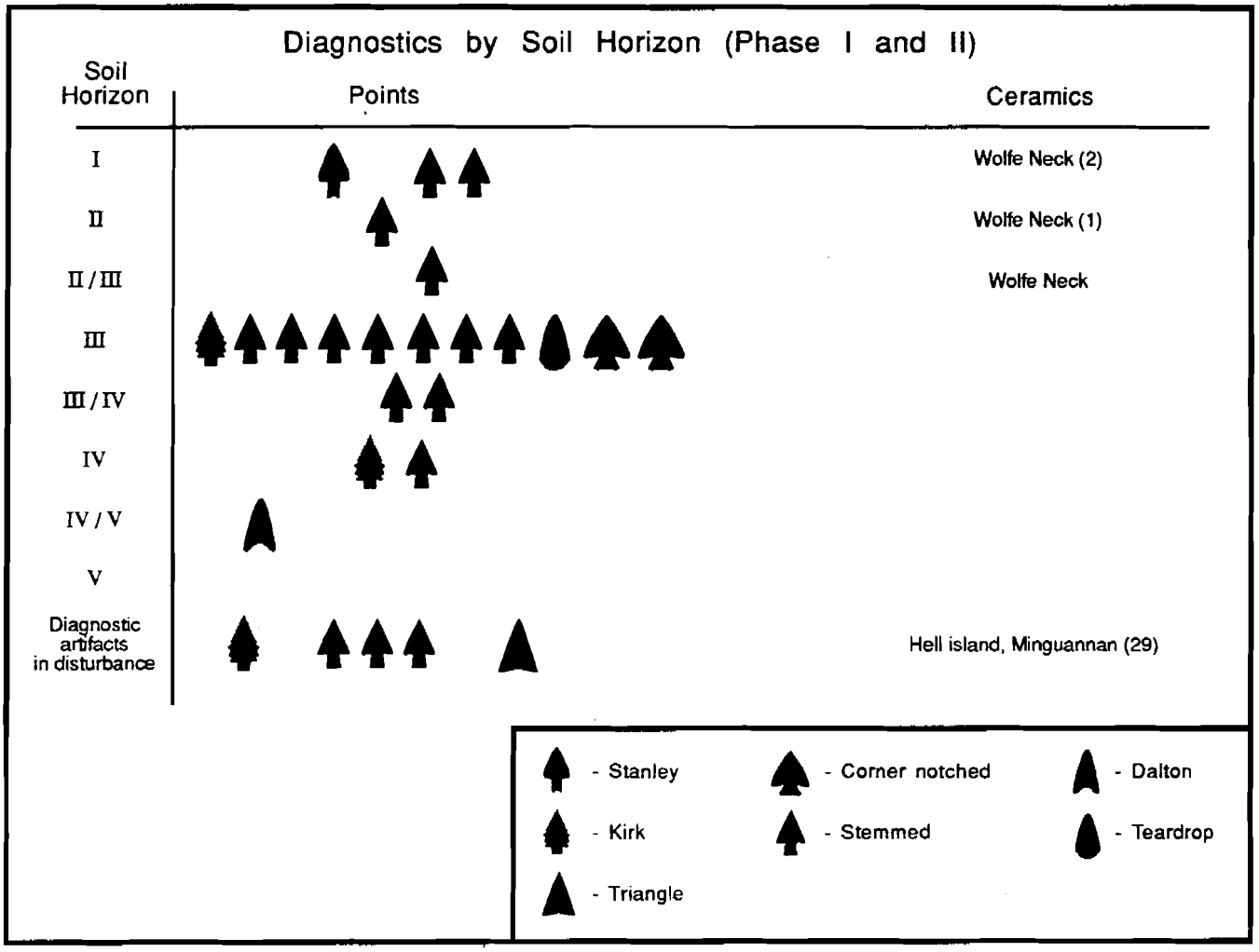


FIGURE 72

Phase II/III Diagnostics by Soil Horizon, Dover Downs Site, Hill A (7K-C-365A)

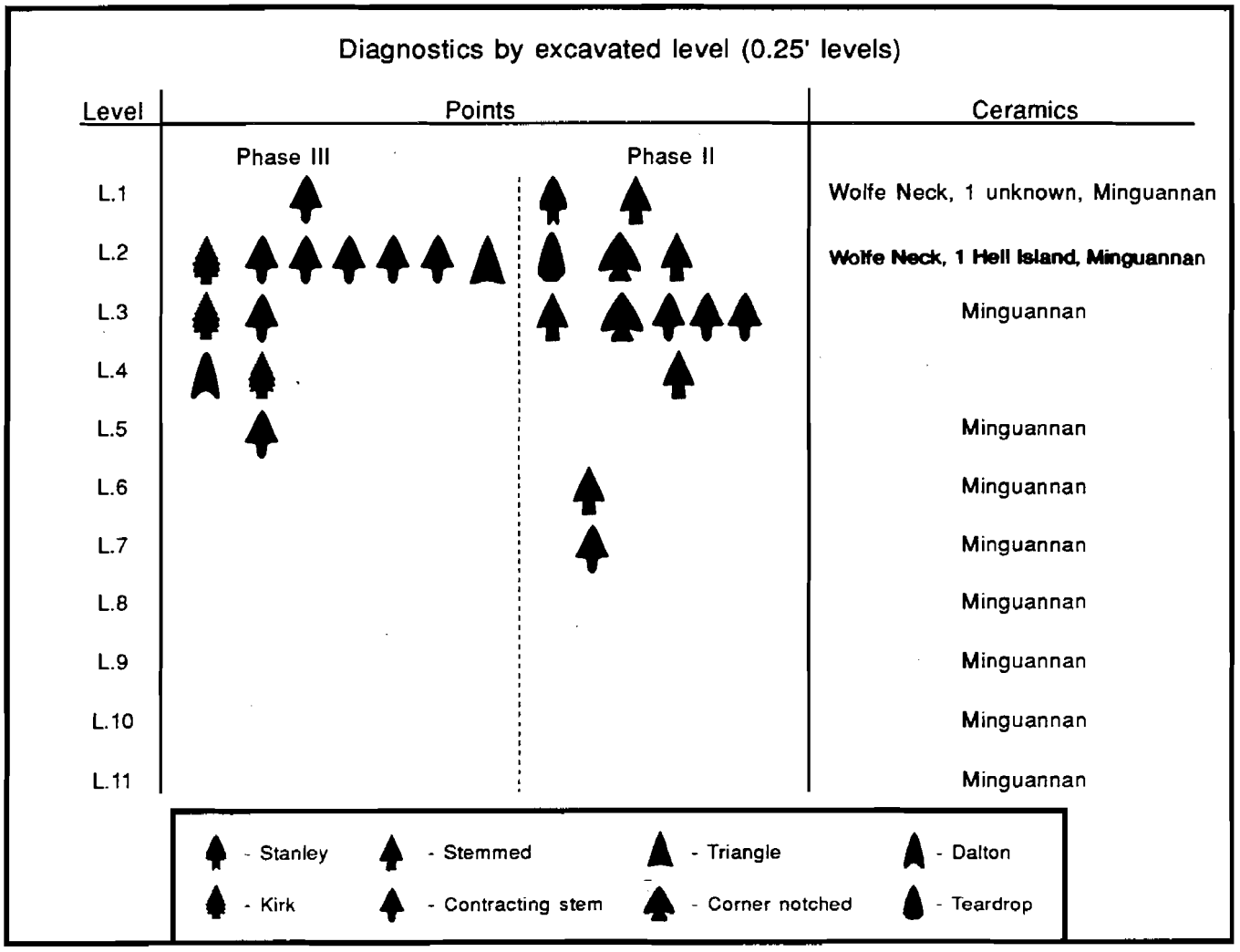


Stewart 1983). This erosional event would have been precipitated by the local denudation of landscape vegetation in response to climatic change, with the resultant erosion and wind-born transportation of topsoil. In the case of 7K-C-365A, soils predating 3000 B.C. would have been wind-eroded to what is presently the top of existing Horizon V (which may itself be truncated), followed by the deposition of aeolian soils at the same location. Later pedogenesis would then have formed existing Horizons IV and III, creating the stratigraphic break now visible between Horizons IV and V.

The ability to use the temporally diagnostic prehistoric artifacts recovered from Dover Downs Hill A as chronological guides to soil formation processes has unfortunately been rendered useless by natural and man-made landscape disturbances. Figure 73 shows the vertical distribution of diagnostic artifacts by both excavated level and soil horizon. As may be seen, a considerable amount of artifact movement is apparent when viewed by 0.25-foot levels, with Woodland I stemmed points recovered from below the late Paleo-Indian Dalton/Hardaway point, and with Woodland II Minguannan ceramics found as deep as 2.75 feet below surface (Level 12). An examination of diagnostic artifacts from observably undisturbed contexts still shows some mixing of styles. A Stanly/Neville point variant, ca. 5000 B.C., was found above 88 percent of the Woodland I point varieties, ca. 3000 B.C. to A.D. 1000; a Kirk/Palmer point

FIGURE 73

Vertical Distribution of Diagnostic Artifacts, Dover Downs Site, Hill A (7K-C-365A)



variant, ca. 8000 B.C. to 6500 B.C. was recovered from the same soil horizon as a Wolfe Neck ceramic sherd, (ca. 700 B.C. to 400 B.C.), and three Woodland I stemmed points were found below the Kirk/Palmer point.

Tree root disturbances seem to have been the most prevalent mechanism for artifact displacement at 7K-C-365A, and the composite profiles show many such examples (Figures 70 and 71, soil Horizons VI to XII). Tree falls and frost push/pull may have moved artifacts in an upward direction. The vertical movement of artifacts was apparently not limited to points and ceramics. A comparison of the horizontal distribution and frequencies of other artifact types and attributes (such as raw material percentages and presence of cortex) showed no significant changes with depth. The separation of artifacts from the Paleo-Indian, Archaic, and Woodland occupations at Dover Downs Hill A must therefore be limited to those with previously identified diagnostic characteristics.

EXCAVATED ARTIFACTS

A summary catalog of excavated artifacts is contained in Table 15. A total of 2,593 lithic artifacts were recovered in the Phase III excavations, including projectile points, bifaces,

TABLE 15

Prehistoric Artifact Summary, Dover Downs Site, Hill A (7K-C-365A)

	Quartzite	Quartz	Chert	Jasper	Rhyolite	Argillite	Ironstone	Chalcedony	Other	Total
Flakes	586(108)	478(88)	268(109)	845(555)	49	30	1(1)	79(19)	8(1)	2344(881)
Utilized flakes	2(1)	11(4)	3(1)	14(8)	---	---	---	3	---	33(14)
End scrapers	1(1)	1	5(2)	5(4)	---	---	---	2(2)	---	14(9)
Side scrapers	---	5(2)	1(1)	1(1)	---	---	---	---	---	7(4)
Burins	---	---	2	---	---	---	---	---	---	2
Wedge	---	---	---	1	---	---	---	---	---	1
Flake tools	1(1)	3(1)	2(1)	3(2)	---	---	---	---	---	9(5)
Paleo-Indian points	---	---	2	1	---	---	---	1	---	4
Woodland I points	---	---	1	1(1)	---	5	---	1	---	8(1)
Woodland II points	---	---	1(1)	---	---	---	---	---	---	1(1)
Early stage biface rejects	---	5(3)	---	---	---	1	1(1)	---	---	7(4)
Late stage biface rejects	---	---	---	3(3)	1	1	---	1(1)	---	6(4)
Other bifaces	---	3(1)	---	6(3)	---	2	---	---	---	11(4)
Miscellaneous stone tools	---	2(2)	---	4(4)	---	---	---	---	---	6(6)
Shatter	10	42(6)	2	14	---	---	---	---	---	68(6)
Cores	3(1)	4(3)	4(3)	5(5)	---	---	---	1(1)	---	17(13)
Total	603(112)	554(110)	291(118)	903(586)	50	39	2(2)	88(23)	8(1)	2538(952)

	Total count	Percent
Quartzite	603(112)	23.80%
Quartz	554(110)	21.80%
Chert	291(118)	11.50%
Jasper	903(587)	35.60%
Rhyolite	50	2.00%
Argillite	39	1.50%
Ironstone	1(1)	<1%
Chalcedony	88(23)	3.50%
Other	8(1)	<1%
Total		100.00%

52 Fire-cracked rocks (3,274 g)
2 Hammerstones
2 Grinding stones

2 Wolfe Neck ceramic sherds
1 Hell Island ceramic sherd
1 Unidentifiable ceramic sherd

cores, flake tools, fire-cracked rocks, and hammerstones. Four prehistoric ceramic sherds were also recovered.

FEATURE EXCAVATIONS

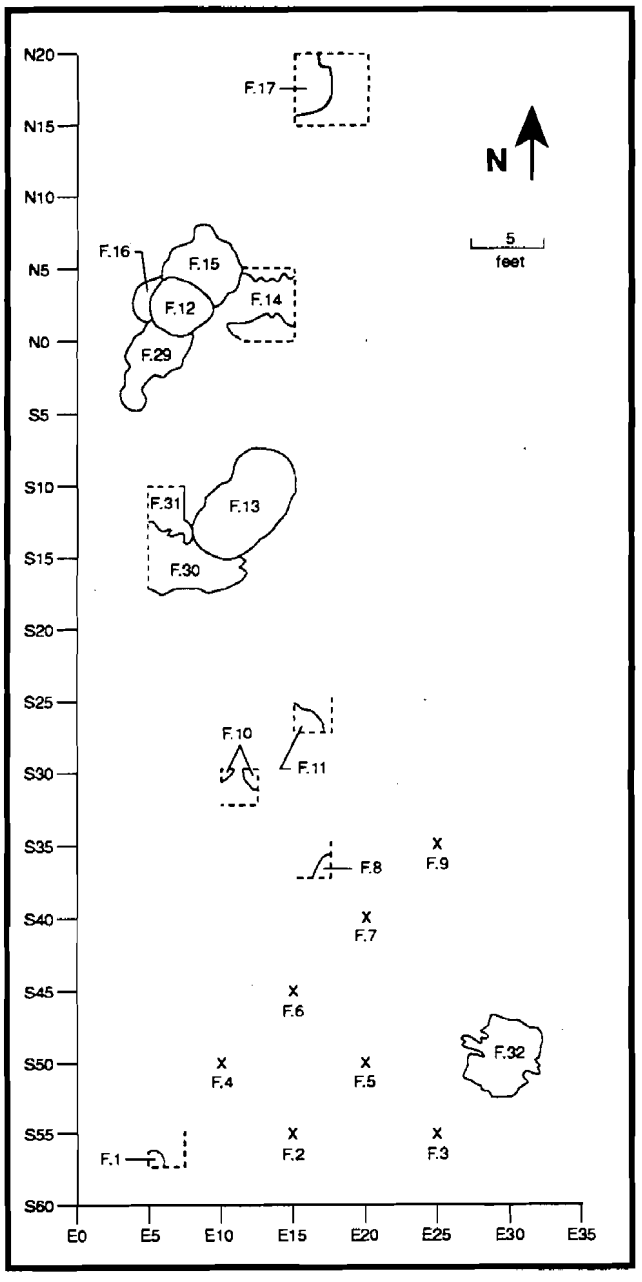
Phase II excavations at Hill A located 17 soil anomalies believed to be potential cultural features (Figure 74). Only three of these soil stains (Features 12, 13, and 15) were fully excavated during Phase II (Riley et al. 1993). In the course of Phase III excavations, the remaining soil stains were investigated and four additional potential cultural features (Features 29, 30, 31, and 32) were located (Figure 74). An error in assigning identification numbers to features at the completion of Phase II investigations resulted in two sets of numbers being assigned to Features 1 through 11, which also became identified as Features 18 through 28. For purposes of present and future identification, Features 1 through 11 will retain their original designations, and there will be a gap in numerical sequence from Feature 17 to Feature 29. In total, 21 features were investigated during Phase II and Phase III investigations. The locations of these features are shown in Figure 74, and a description of each is provided in Table 16.

After completion of Phase III investigations, fifteen of the "potential" cultural features (Features 1-6, 8-11, 14, 17, and 30-32) were either determined to be non-cultural root and rodent disturbances or naturally deposited soil pockets, or were unidentifiable during Phase III and will not be discussed further. An additional soil stain (Feature 15) was, as expected, determined to be the final remnant of Feature 15 that was left unexcavated in Phase II. Another soil stain (Feature 16) was determined to be a remnant of Feature 12 which was previously excavated in Phase II (Riley et al. 1993).

FIGURE 74

Location of Soil Stains,

Dover Downs Site, Hill A (7K-C-365A)



Feature 15 first appeared in Phase III as a semi-circular stain at the bottom of Level 3 in the northwest corner of Test Unit N0E10 (Figure 75). The feature was cross-sectioned and the west half excavated. A profile of the east wall of Feature 15 is shown in Figure 76. Feature fill consisted of yellow-brown sandy silt soil which matched the Feature 15 fill from Phase II. Six flakes and a charred seed were recovered from feature fill to a depth of 1.5 feet below surface. The portion of Feature 15 excavated during Phase III represents the southeastern edge of Feature 15 that was not excavated during Phase II (Figure 77). Feature 15 is a roughly circular stain with a basin shaped profile extending to approximately 3.8 feet below surface. No diagnostic artifacts or artifact concentrations were present in feature fill, and the feature's function cannot be ascertained.

Feature 16 first appeared in Phase III as a semi-circular stain at the top of Level 6 along the east wall of Test Unit N0E0 (Figure 78). The feature was cross-sectioned and the west half was excavated. A profile of the east wall of Feature 16 is shown in Figure 79. Feature fill consisted of yellow-gray silty loam soil that was more compacted than surrounding soils. No cultural materials were recovered from the feature fill. The portion of Feature 16 excavated during Phase III appears to be the western edge of Feature 12 that was not excavated with the rest of Feature 12 in Phase II (Figure 80). Phase II excavation of Feature 12 revealed a roughly circular feature with vertical walls and a curved bottom extending from approximately 1.25 feet to 4.1 feet below surface. Phase II excavations recovered a chert stemmed point, a core, several flakes, a few utilized flakes and flake tools, one scraper, and a few fire-cracked rocks from feature fill (Riley et al. 1993). TAMS radiocarbon dates recorded for the feature date to between 5515 and 5383 B.C. which were recalibrated to between 6381 and 6127 B.C. (Riley et al. 1993). The exact cultural function of this feature cannot be ascertained, but the presence of the core and numerous flakes suggests that some small degree of flake production took place in the location of the feature. In addition, the presence of small, heavily resharpened tools and fire-cracked rocks suggests the possibility that exhausted tools were being discarded in the area of a small hearth while the production of flakes for the manufacture of replacement tools or expedient tools was taking place.

The two remaining features were Feature 7 and Feature 29. Feature 7 was first observed and partially excavated in Phase II where yellow-brown silty sand and silty loam soils extended down in the profile to a depth of 1.75 feet below surface in the northwest quadrant of Test Unit S45E20 (Figure 74). These soils went deeper in this unit than was normal for the rest of the site. Phase III excavations commenced in the remaining quadrants to a depth of 1.75 feet, where these soils as well as soils of gray-

TABLE 16

Features at the Dover Downs Site, Hill A (7K-C-365A)

Feature number	Location	Artifacts		Description
1	S60E5, NW 1/ 4			Roughly circular soil stain in SW corner of 2.5' x 2.5' quad; naturally occurring soil pocket.
2	S60E15, NW 1/ 4			Soil stain; naturally occurring soil pocket.
3	S60E25, NW 1/ 4			Charcoal flecks and tree roots present; natural soil disturbance.
4	S55E10			Irregularly shaped soil stains; naturally occurring soil pockets.
5	S55E20			Soil disturbande in NW and SW quads - naturally occurring soil pocket.
6	S50E15, NW 1/ 4			Soil stain; naturally occurring soil pocket.
7	S45E20			Deep soil pockets extending down 1.75' below surface in eastern half; function unknown - possible tree root.
8	S40E15, NW 1/ 4			Soil stain in SE corner of 2.5' x 2.5' quad; naturally occurring soil pocket.
9	S40E25, NW 1/4			Soil stain extending southeasterly; probable tree root.
10	S35E10N NW 1/4			Soil stains in NW and SE corners of 2.5' x 2.5' quad; natural soil disturbance.
11	S30E15, NW 1/4			Soil stain in SW corner of 2.5' x 2.5' quad; natural soil or tree disturbance.
12	N0E5	flakes utilized flake flake tool Woodland I point	33(10) 1 1(1) 1	Circular feature with vertical walls and curved bottom; 1.25' - 4.1' below surface. Function unknown.
13	S10E5/ S15E5/ S15E10	flakes utilized flakes Paleo-Indian point Archaic point	39(10) 2(2) 1 1	Kidney-shaped feature (8.7' x 4.6'), 1.25' - 3.2' below surface. Function unknown.
14	N0E15			Irregularly shaped, shallow soil disturbance. Probable tree root.
15	N0E10	flakes shatter Fire-cracked rocks	19(9) 1 2	Semi-circular stain, approximately 3.25' deep. Eastern edge of Phase II Feature 15. Function unknown.
16	N0E0			Semi-circular stain, approximately 1.10' deep. Western edge of Phase II Feature 12. Function unknown.
17	N15E15, NW 1/ 4			Soil stain along western edge of 2.5' x 2.5' quad; natural soil disturbance.
29	S5E0/ S5E5/ N0E0/ N0E5			Circular stain with oblong extension, approximately 1.75' deep. Function unknown.
30	S15E5/ S20E5/ S20E10			Irregulary shaped, shallow soil disturbance. Probable tree root.
31	S15E5/ S15E0			Irregularly shaped soil disturbance approximately 1.85' deep. Probable tree root.
32	S50E25/ S50E30 S55E25/ S55E30			Roughly circular stain, approximately 2.40' deep. Probable tree root disturbance.

( ) = cortex

FIGURE 75

Feature 15 Plan View, Dover Downs Site, Hill A (7K-C-365A)

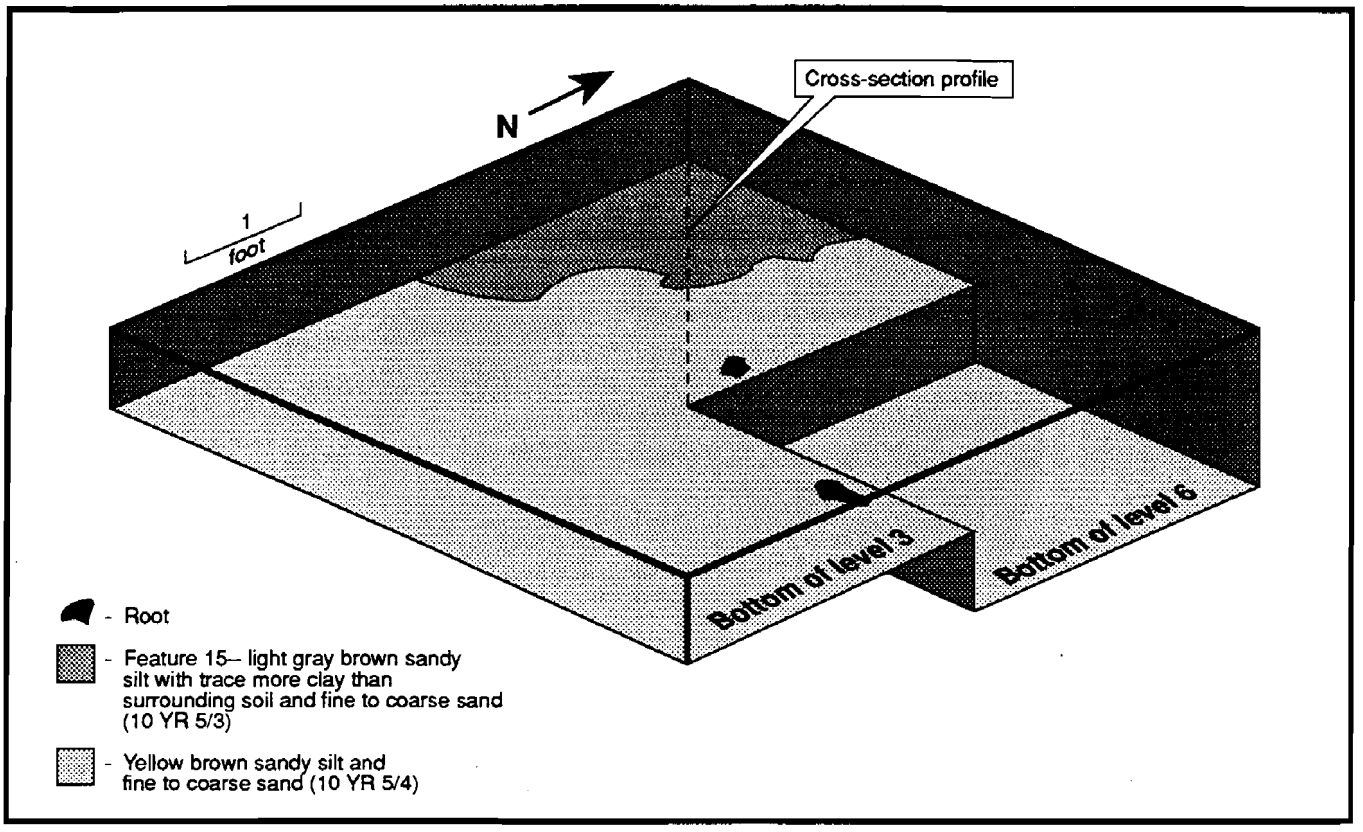


FIGURE 76

Feature 15 East Wall Profile, Dover Downs Site, Hill A (7K-C-365A)

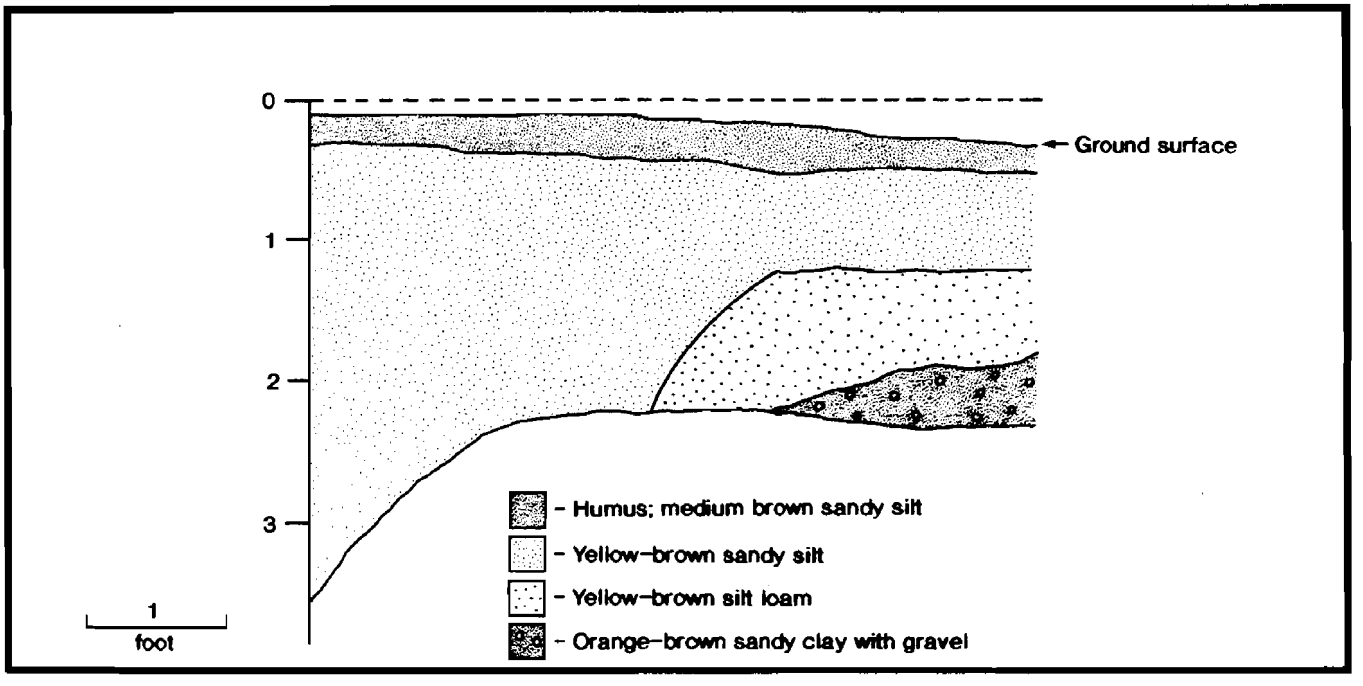


FIGURE 77

Feature 15 Phase II Plan View, Showing Unexcavated Section on Eastern Edge, Dover Downs Site, Hill A (7K-C-365A)

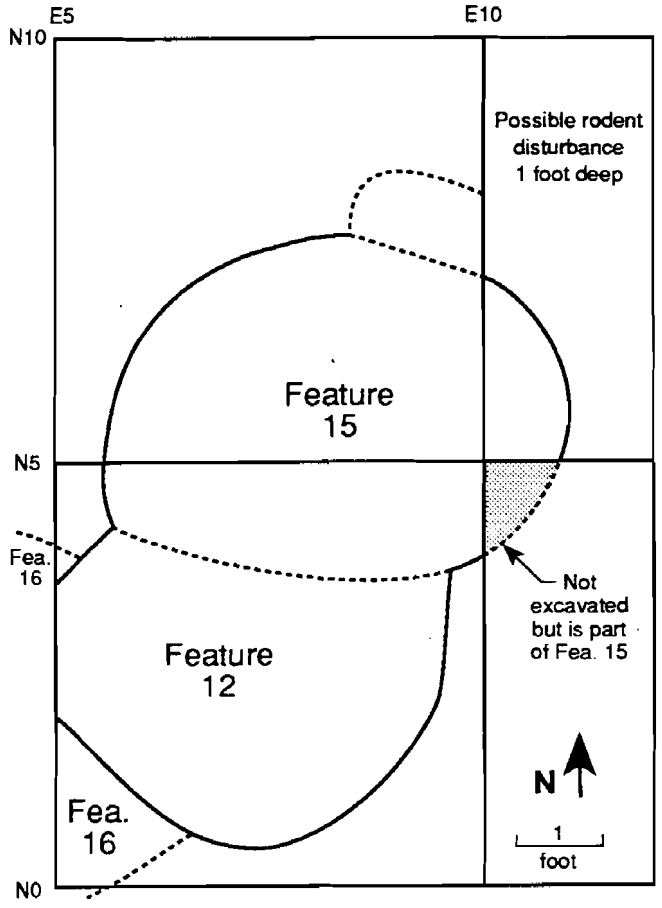
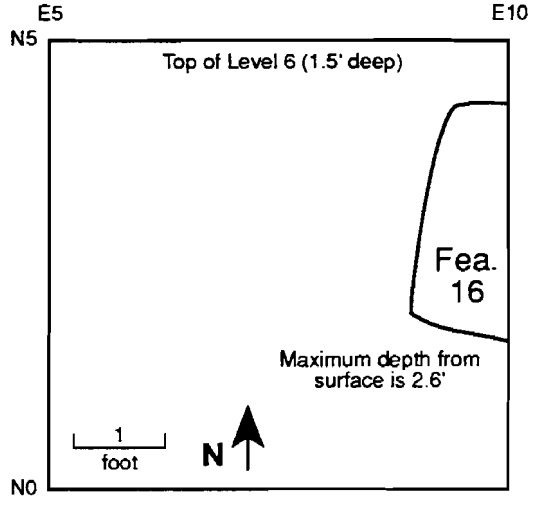


FIGURE 78

Feature 16 Plan View, Dover Downs Site, Hill A (7K-C-365A)



brown to yellow-brown silty sands continued in depth in the eastern half of the unit. A profile of Feature 7 is shown in Figure 81. In profile, these soil anomalies appear natural in origin, resembling tree root disturbances. A large number of tree roots were encountered in the first three excavated levels of this unit and other similar natural disturbances were found in nearby units. No clearly definable cultural feature was evident from the soil anomalies and the feature was not excavated separately. The feature was excavated in arbitrary .25 foot levels as part of the test unit. However, what is unusual in this feature is that although numerous flakes were present throughout the profile, the largest concentration, consisting of jasper flakes, was located in the southwestern quadrant of Level 3 (.50'-.75' below surface). Furthermore, concentrations of charred nut hulls were located in the southeastern quadrant of Level 4 (.75'-1.00' below surface) and the northeastern quadrant of Level 5 (1.00'-1.25' below surface). Although cultural activities are suggested by this distribution, there are no clearly observable criteria on which to classify this feature as cultural.

Feature 29 was first observed during the excavation of Test Unit S5E5 in Level 4 (.75'-1.00' below surface), where soil in the northern part of the southwest quadrant appeared to contain more clay than surrounding soils and to be slightly more compact (Figure 74). All other quadrants in this unit were then excavated down to Level 4 in order to better define the feature. At this level and through Level 5, the soils appeared to be mostly homogeneous in color and texture. Level 6 (1.25'-1.50' below surface) was divided into two .125 foot layers, and the feature, which had become more clearly visible as a roughly circular stain with an oblong extension to the south, was excavated separately. Surrounding test units N0E0, N0E5, and S5E0 were then opened up to fully expose Feature 29. A plan view of Feature 29 is shown in Figure 82.

The feature was then sectioned and the north half, located in Test Units N0E0 and N0E5, was excavated in .125 foot levels. Excavations were begun in Level 7 in N0E0 and Level 9 in N0E5, because this test unit had been previously excavated down to that level during Phase II. Feature fill consisted of light gray compacted silt with charcoal flecks in the western portion and light brown silty loam in the eastern portion. A profile of the south wall of the feature is shown in

FIGURE 79

Feature 16 East Wall Profile, Dover Downs Site, Hill A (7K-C-365A)

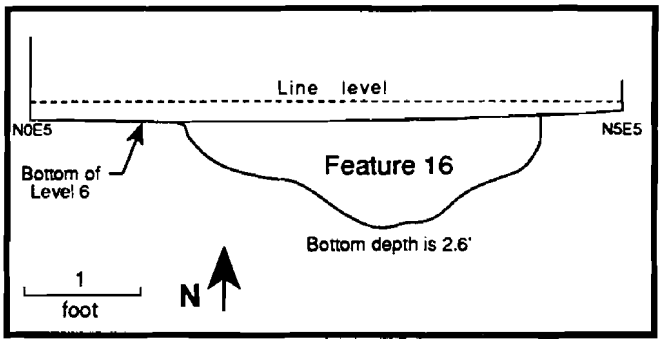


FIGURE 80

Feature 12 Phase II Plan View, Showing Unexcavated Section on Western Edge (Phase III Feature 16), Dover Downs Site, Hill A (7K-C-365A)

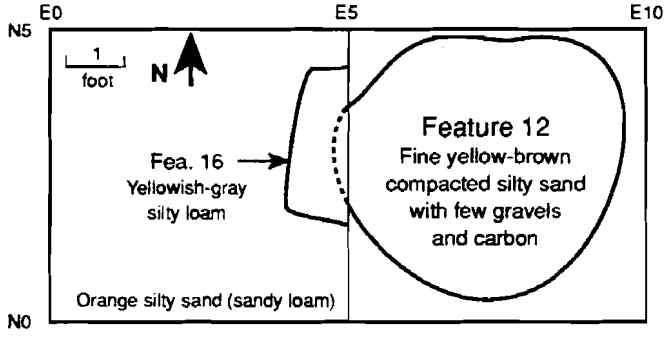


Figure 83. In Level 11 (2.75'-3.00' below surface), feature fill became more compact and generally lighter in color with one area of very compact sands containing swirls of orange-brown and light gray silt. The only artifacts recovered from this northern section of Feature 29 are three jasper flakes and one fire-cracked rock, which were found in Level 9 (2.25'-2.50' below surface) of Test Unit N0E5. The southern portion of the feature was then excavated in whole. Artifacts recovered from this part of the feature consist of 17 flakes and two fire-cracked rocks. Cross-sections across the width and length of the excavated feature are shown in Figure 84, and the locations of the cross-sections are shown on the plan view (Figure 82). No clear cultural function is indicated by this feature or the artifacts it contained. However, this feature and the other pit features identified at this site appear to be similar to types identified at the Delaware Park site (7NC-E-41) and interpreted to be storage features (Thomas 1981).

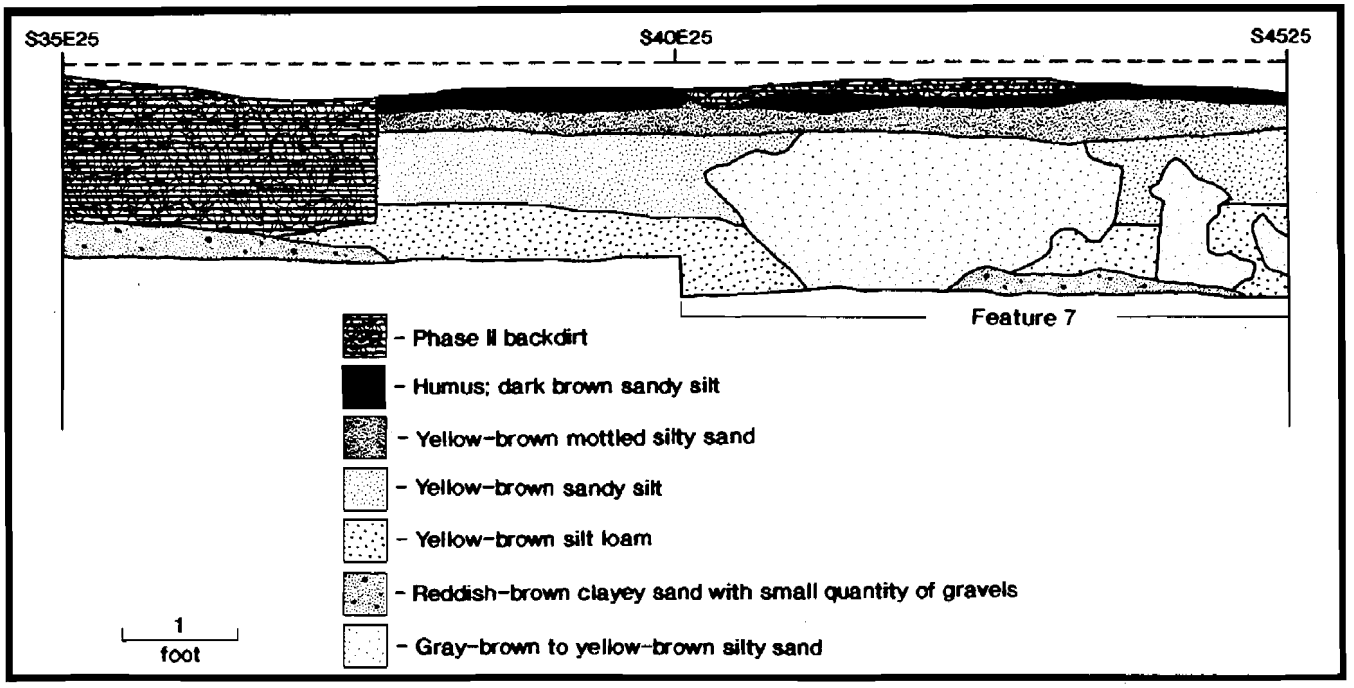
FLOATED ARTIFACTS AND ECOFACTS

Flotation samples were retained from eight 5' x 5' test units and one feature at Dover Downs, Hill A. All soil from one 2.5' x 2.5' square quadrant from each of these units was saved by 0.25 foot level as well as 10 liters of soil from the feature. This soil was then returned to the lab for processing. All samples were processed using a water driven flotation tank with light fractions being collected in a silk bag. After drying, all artifacts and ecofacts were removed and cataloged.

Table 17 shows a summary of all artifacts recovered from the heavy fraction as well as the light fraction. The majority of artifacts consist of debitage with a small amount of charcoal included. One charred Amaranth seed as well as two unidentifiable charred nut hull fragments and several unidentifiable charred semi-spherical seeds (probably spores) were also recovered from the flotation samples.

Table 18 shows a comparison of raw material frequency between debitage recovered from flotation and debitage recovered from 1/4-inch screens. Some notable differences are evident between the two assemblages. There is a significantly higher percentage of quartzite debitage in the 1/4-inch screen assemblage than in the flotation assemblage. Furthermore, quartzite is the second most common material among the 1/4-inch mesh debitage assemblage as a whole. However, only two utilized flakes and two flake tools in the assemblage were made of this material. Nevertheless, the prominence of quartzite in the Hill A assemblage would imply that it was relatively important in manufacturing activities at the site. Flake scars on quartzite cores from the site suggest that medium-size flakes were being produced from the reduction of

FIGURE 81
Feature 7 East Wall Profile, Dover Downs Site, Hill A (7K-C-365A)



these cores, and flakes of this size would not be present in flotation samples. However, the near absence of quartzite flakes in the flotation sample, given the brittle nature of the material, is somewhat unusual and may simply indicate that flotation samples were not taken from areas of quartzite chipping activity. The percentages of quartz debitage in both assemblages are similar.

Percentages of cryptocrystalline materials were generally higher in the flotation assemblage than in the 1/4-inch screen assemblage, particularly chalcedony and jasper. These materials were used to manufacture bifaces and flake tools, but were also well represented among the finished points and late stage bifaces. These materials produce a sharper, although less durable, edge than quartzites, argillites, and quartz. Therefore, more frequent resharpening is necessary to maintain these edges, and this activity would be expected to produce large numbers of small flakes which would be collected in flotation samples. There were no examples of argillite, rhyolite, ironstone, or other materials in the flotation debitage, and only very small percentages of these materials were present in the 1/4-inch mesh assemblage.

BLOOD RESIDUE ANALYSIS

Lithic artifacts from the site were subjected to blood residue analysis using the chemstrip testing method as described by Custer, Ilgenfritz, and Doms (1988). The results of these tests are summarized in Table 19. The analysis is used to determine the presence of hemoglobin on the tools, and the test measures presence or absence of blood but not species. The goal is to use this technique to aid in determining if animal butchering was conducted at the site.

Soil, pebble, and gravel samples were tested to control for the possibility of contamination at the site. All of the 864 tests that were conducted on 236 control samples produced negative results, indicating that the soils were free of contamination. Fifty tools and 394 pieces of debitage were then tested. The tests were applied to several loci on each artifact;

FIGURE 82

Feature 29 Plan View, Dover Downs Site, Hill A (7K-C-365A)

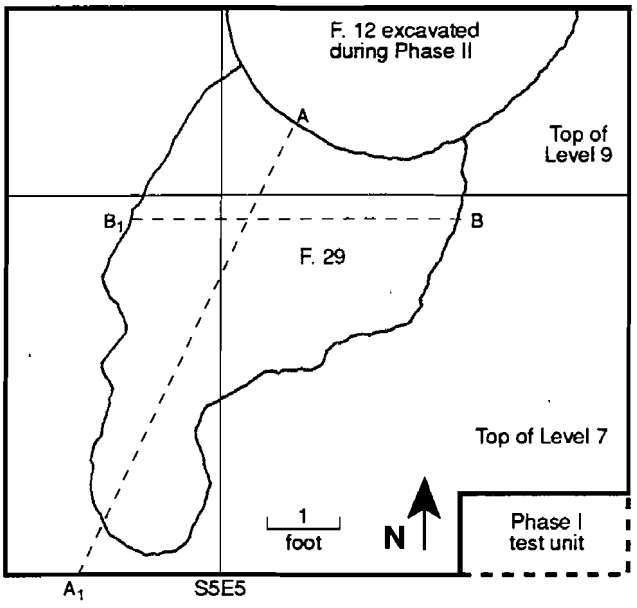


FIGURE 84

Feature 29 Cross-Section, Dover Downs Site, Hill A (7K-C-365A)

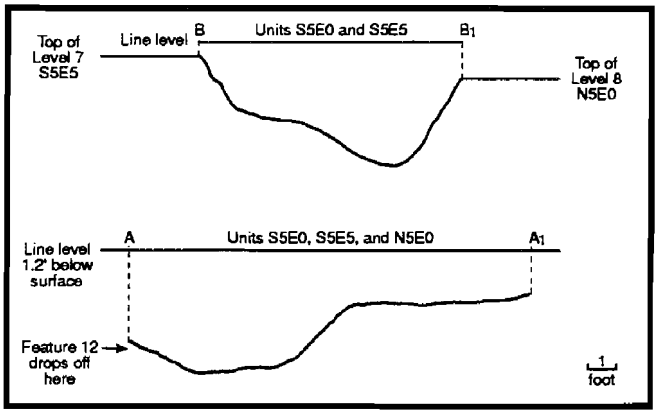


FIGURE 83

Feature 29 South Wall Profile, Dover Downs Site, Hill A (7K-C-365A)

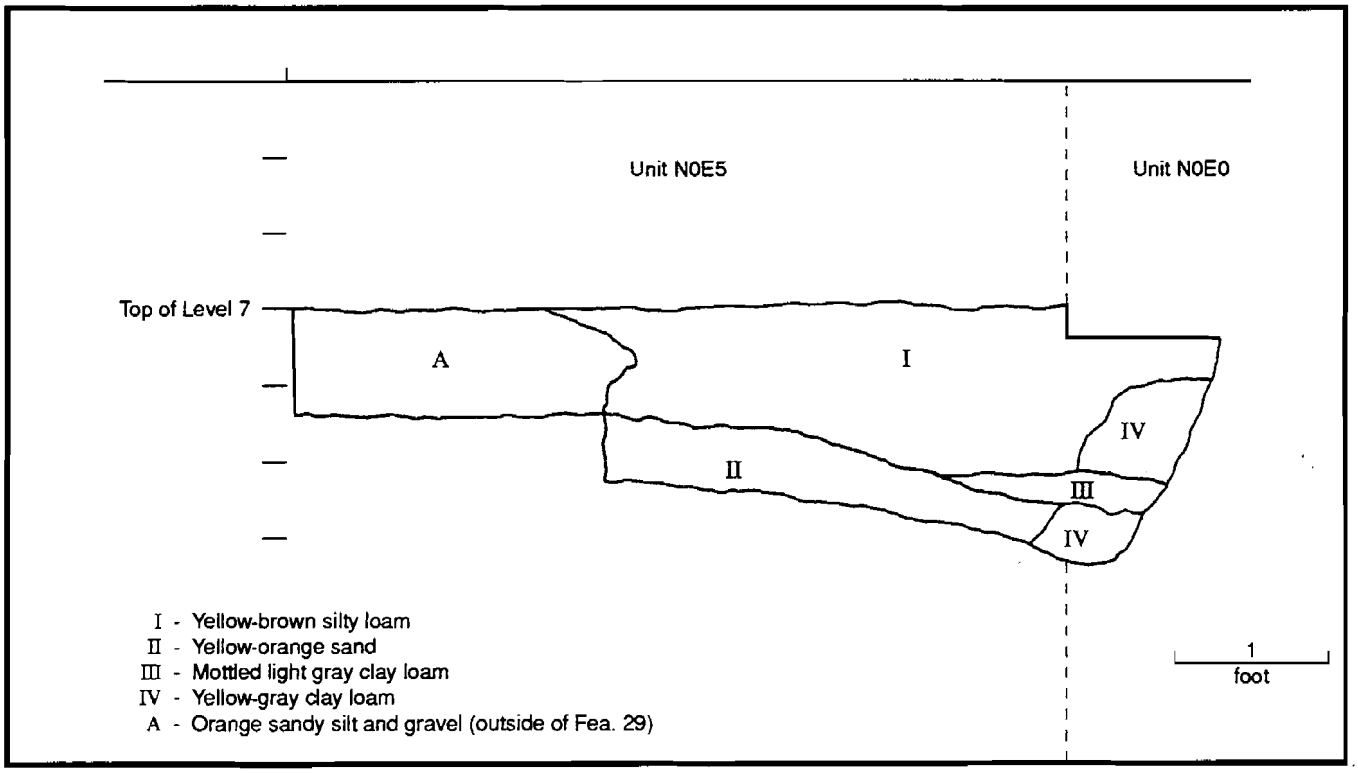


TABLE 17

Artifact Flotation Sample, Dover Down Site, Hill A (7K-C-365A), (N0E10, N0E15, N5E5, S5E5, S5E15, S15E10, S45E20, S50E20, S50E25, Feature 29)

Heavy Fraction		**Light Fraction**	
Lithic Artifacts		Charred seeds	
Quartzite flakes	1	Pigweed (Amaranthus retroflexus)	1
Quartz flakes	8	unidentifiable semi-spherical seeds	1239
Chert flakes	6		
Jasper flakes	21(1)	Charcoal	23.07g
Chalcedony flakes	14		
Quartz shatter	1		
Charred seeds			
charred unidentifiable nut hull fragments	2		
Charcoal	15.57g		

TABLE 18

Raw Material Frequency: Flotation vs. 1/4-Inch Mesh Screen Dover Downs Site, Hill A (7K-C-365A), (N0E10, N0E15, N5E5, S5E5, S5E15, S15E10, S45E20, S50E20, S50E25, Feature 29)

	Flotation			**Screen**	
Quartzite	1	2%	Quartzite	586 (108)	25%
Quartz	9	18%	Quartz	478 (88)	20%
Chert	6	12%	Chert	268 (109)	11%
Jasper	21 (1)	41%	Jasper	845 (555)	36%
Chalcedony	14	27%	Chalcedony	79 (19)	3%
Rhyolite	0	0%	Rhyolite	49	2%
Argillite	0	0%	Argillite	30	1%
Ironstone	0	0%	Ironstone	1 (1)	<1%
Other	0	0%	Other	8 (1)	<1%
Total	51 (1)	100%	Total	2,344 (881)	100%

KEY: ( ) = cortex

thus, a total of 139 individual tests were conducted on 50 tools and 810 individual tests were conducted on 394 flakes. All tests on flakes from the site produced negative results. Nine tests on seven of the tools produced slight positive results. Two of these tools were argillite contracting stem points (Figure 85-H and I), one which came from Test Unit S40E20, and one which came from Test Unit S45E0. The porous nature of weathered argillite, however, renders the results on these artifacts somewhat dubious. One other tool was a biface which came from Test Unit S55E25 (Plate 5-J), another was a utilized flake from Test Unit S60E20 (Figure 86-H), and two were flake tools which came from Test Units S55E10 and S50E25. Two utilized flakes and one stemmed projectile point from Phase II excavations also produced positive reactions for

TABLE 19

Summary of Blood Residue Analysis, Dover Downs Site, Hill A (7K-C-365A)

Sample type	Number of Samples	Number of tests conducted	Number of samples showing Positive reaction	Number of samples showing Negative reaction
Control (soils, pebbles, gravels)	236	864	0	236
Debitage	394	810	0	394
Tools	50	139	9~+	129

PLATE 5

Bifaces, Dover Downs Site, Hill A (7K-C-365A)

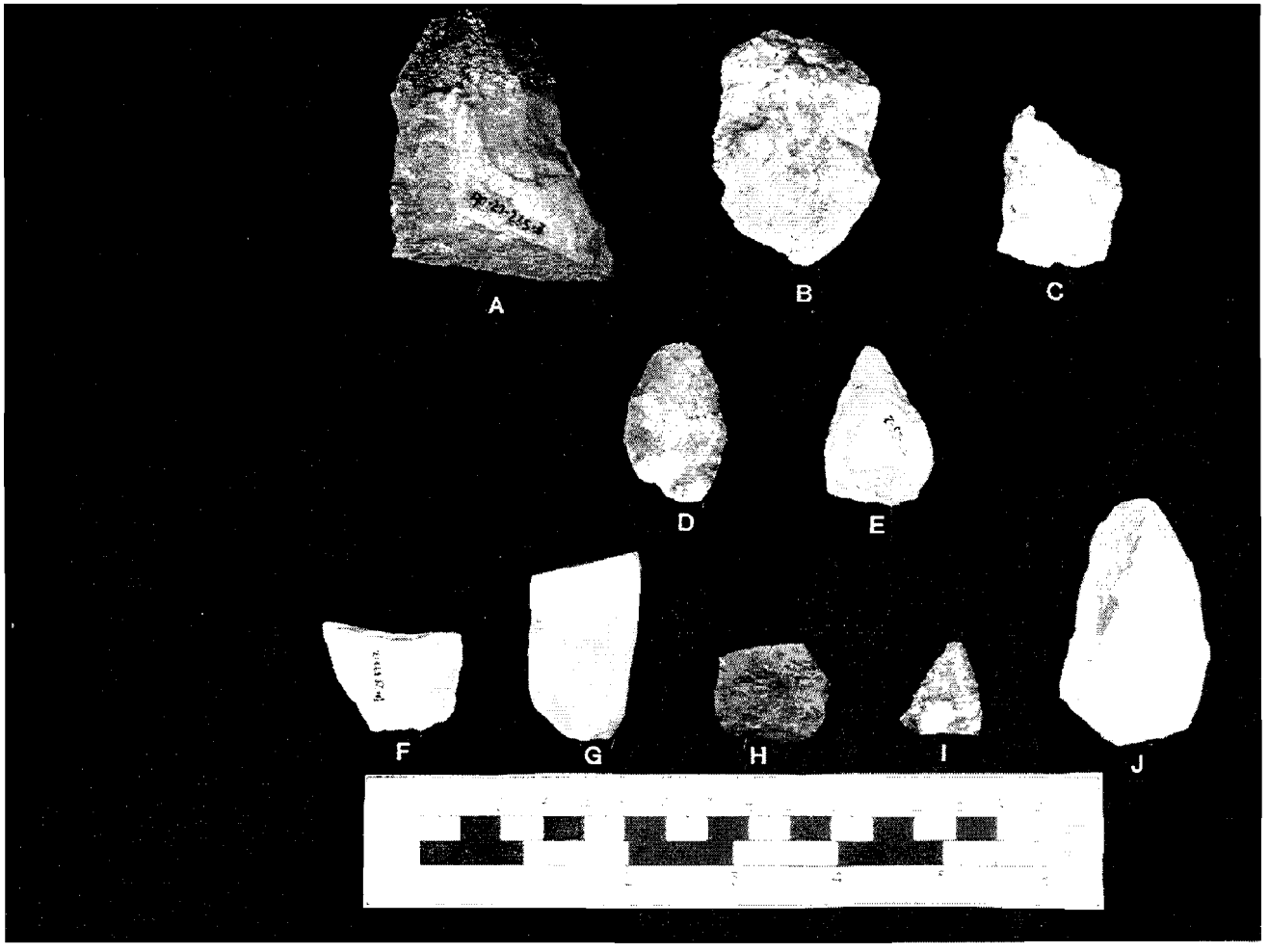
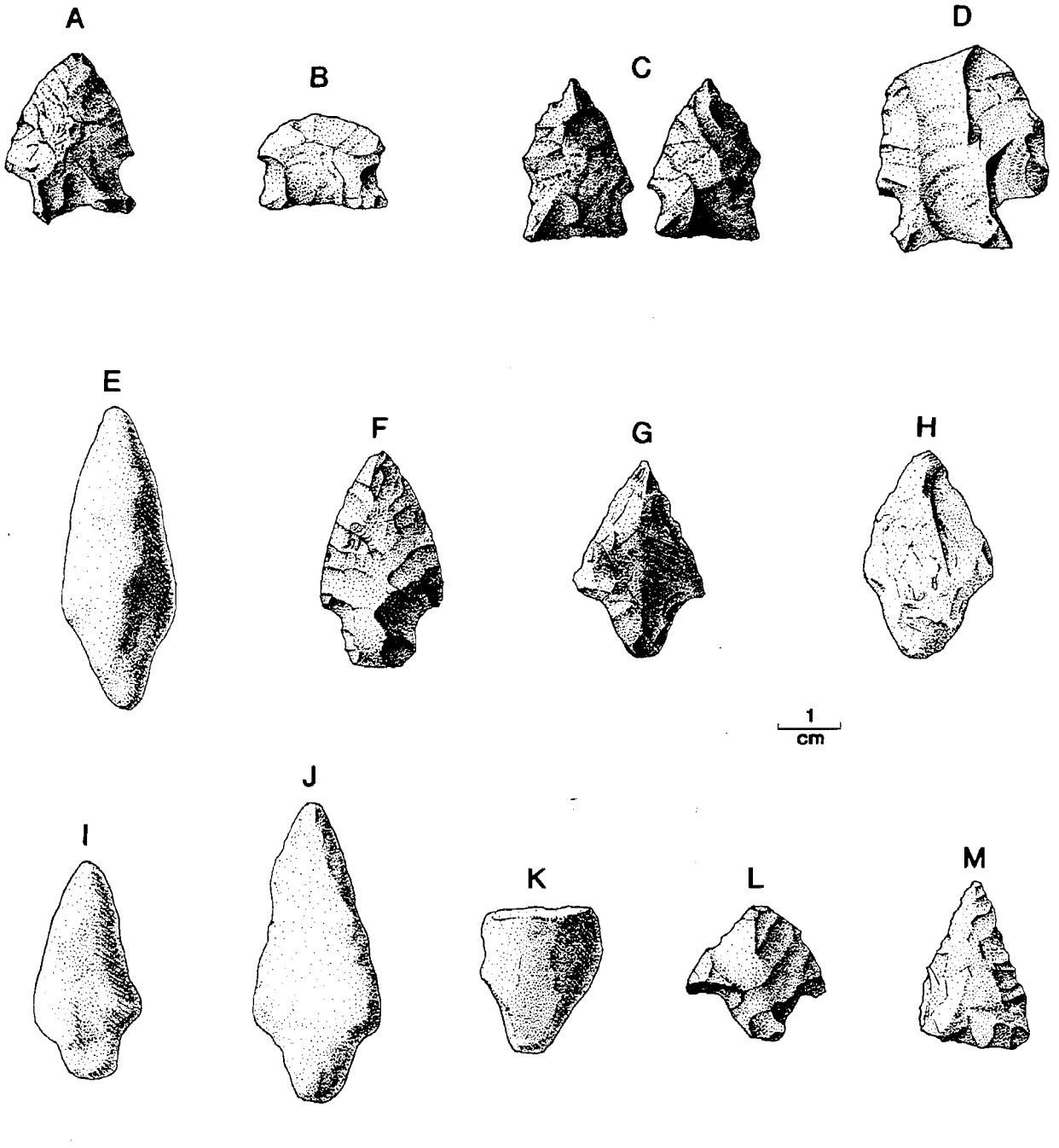


FIGURE 85

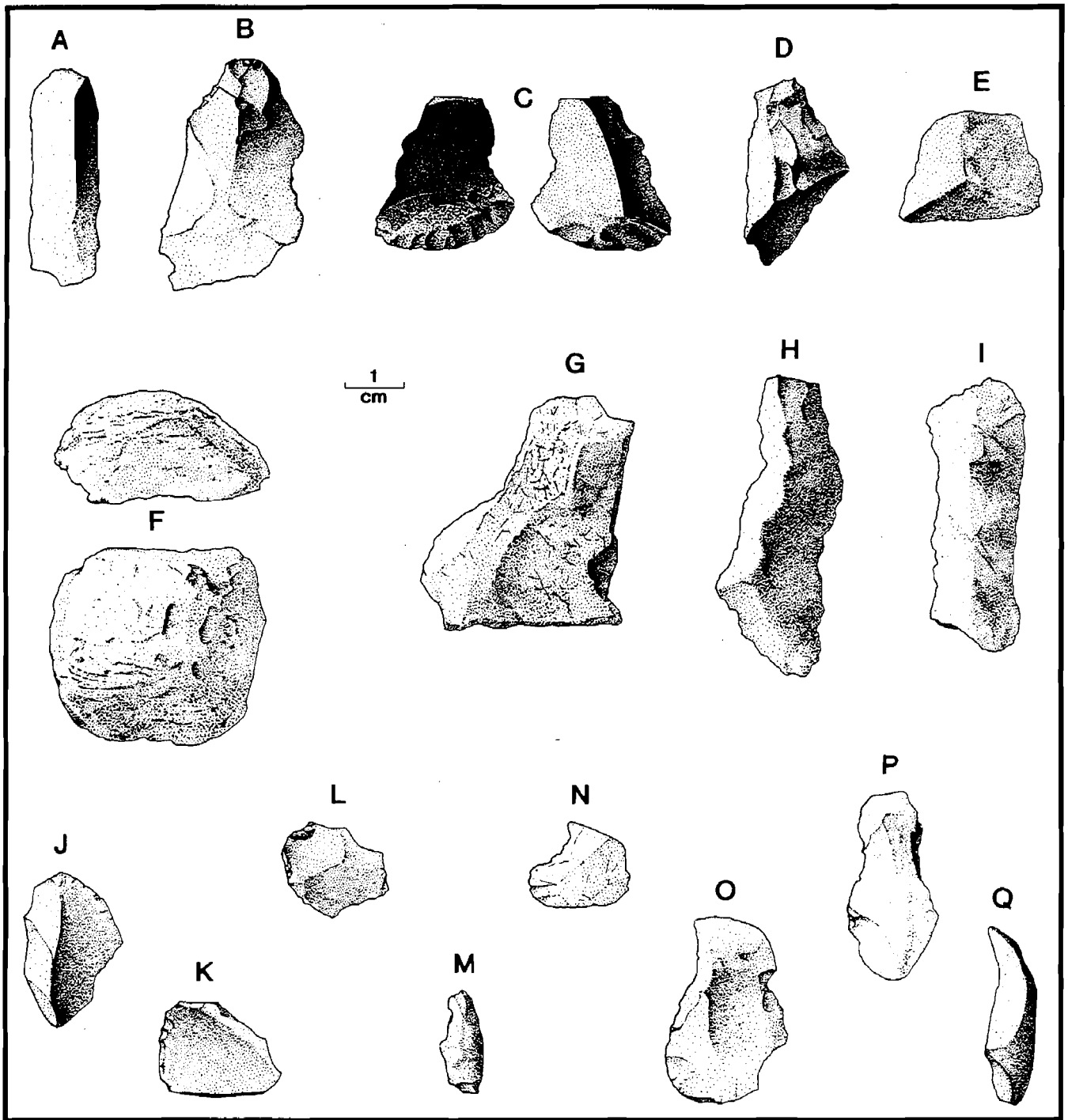
Projectile Points, Dover Downs Site, Hill A (7K-C-365A)



A - S35 E20, Level 4 NE, Chert
B - S55 E15, Level 2 NW, Jasper/chalcedony
C - N45 E15, Level 3 NW, Chert
D - S50 E10, Level 4 NE, Jasper
E - S30 E20, Level 2 NW, Argillite
F - S5 E15, Level 1 NE, Jasper
G - S10 E20, Level 2 SW, Chert
H - S40 E20, Level 2 SE, Argillite
I - S45 E0, Level 5 SW, Argillite
J - S60 E25, Level 3 NE, Argillite
K - S60 E20, Level 2 SE, Argillite
L - S5 E15, Level 2 NW, Chalcedony
M - S50 E15, Level 2 NE, Chert
*Artifacts shown actual size

FIGURE 86

Sample of Utilized Flakes, Dover Downs Site, Hill A (7K-C-365A)



A - S15 E0, Level 1 SE, Jasper
B - S45 E0, Level 3 NE, Jasper
C - S60 E10, Level 3 SW, Chert
D - S45 E0, Level 6 NE, Chert
E - S45 E0, Level 2 SE, Quartz
F - S45 E0, Level 1 SE, Quartz
G - S5 E5, Level 1 SW, Quartz
H - S60 E20, Level 4 SW, Quartzite
I - S50 E15, Level 6 SE, Quartz
J - S50 E15, Level 3 SW, Jasper
K - S45 E15, Level 4 SW, Jasper
L - N5 E15, Level 2 NW, Chalcedony
M - S40 E5, Level 1 SE, Jasper
N - S50 E10, Level 2 NW, Quartz
O - S60 E15 Level 1 NE, Jasper
P - S5 E25, Level 3 SW, Jasper
Q - S35 E15, Level 1 SE, Jasper
*Artifacts shown actual size

the presence of blood residue (Riley et al. 1993). Although these results cannot be interpreted as conclusive, the slight positive reactions on tools, all of which came from the same locations where debitage tested negative, may indicate that butchering activities took place at the site.

SITE CHRONOLOGY

Discussion of site chronology will consider both the age of the site, based on diagnostic artifacts and soils, and its duration of occupation. Each of these topics will be discussed below.

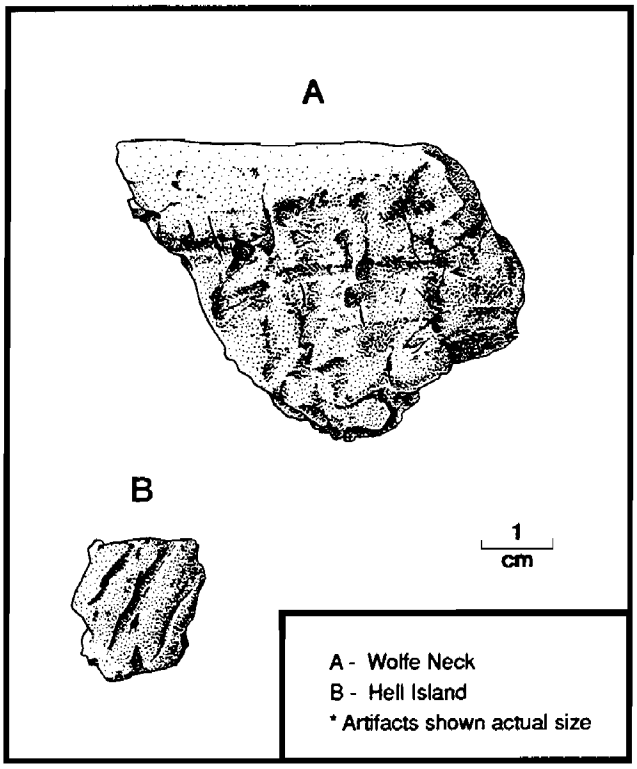
Diagnostic artifacts recovered in Phase III excavations of Hill A include both ceramic sherds and projectile points. Three identifiable ceramic sherds were recovered from the excavations. One of these fragments is a rim sherd with crushed quartz temper (Figure 87-A), and generally conforms to the description of Wolfe Neck ceramics offered by Griffith (1982) for the Wolfe Neck Complex (ca. 1000 B.C. to 500 B.C.) on the Delmarva Peninsula. The second sherd, a body fragment, also generally conforms to the Wolfe Neck description. A few Wolfe Neck ceramic sherds were also recovered during Phase II excavations of the site (Riley et al. 1993). Wolfe Neck ceramics have been associated with radiocarbon dates of 505 B.C. to 380 B.C. at sites on the Delmarva Peninsula (Artusy 1976; Griffith 1982), and with a time range of 700-400 B.C. elsewhere in the Middle Atlantic (Artusy 1976). The final identifiable sherd recovered in Phase III excavations is a small, quartz-tempered body fragment (Figure 87-B) with cord-marked exterior surface treatment. This sherd generally conforms to Griffith's (1982) description of Hell Island ceramics which have been radiocarbon dated at sites on the Delmarva Peninsula from A.D. 645 to A.D. 740 (Artusy 1976; Griffith 1982). This ceramic ware has been associated with the Webb Complex (ca. A.D. 500-1000) on the Delmarva Peninsula (Custer 1984a, 1989).

In addition to ceramic sherds recovered in Phase III excavations, several Minguannan ceramic sherds were recovered in Phase II excavations of the site (Riley et al. 1993). The majority of these sherds were located in a single, heavily disturbed test unit (S45E0) in levels ranging from 1.00 feet to 2.25 feet below surface. No radiocarbon dates are available for this ceramic type, but Minguannan sherds have been found in association with triangular points at sites on the Delmarva Peninsula (Custer 1989:300-308), placing them in the Woodland II Period (ca. A.D. 1000 to A.D. 1650). Custer (1986:313) notes that a Coastal Plain site on the Bohemia River (18CE148) contained a series of ceramic wares believed to be transitional between Hell Island ware and Minguannan ware. The co-occurrence of Wolfe Neck, Hell Island, and Minguannan ceramic wares at Hill A points to a trend of selective use of this site over a long, and perhaps successive, span of time.

A variety of styles of projectile points was recovered from the excavations, including notched, stemmed, and triangular types. These points are shown in Figure 85, and Table 20 shows the vertical distribution of individual projectile point types. Two of the notched points (Figure 85-A and D) were located in excavation Level 4 (.75' - 1.00' below surface) in the south half of the site. The first of these notched points (Figure 85-A) is a small, thin, heavily resharpened chert point with a concave base. Examination of the point reveals that the point had been thinned from the base. These morphological and technological attributes conform to those described by Coe (1964) for side-notched points from the Hardaway site in the North Carolina Piedmont and are thought to represent a time period of 8500-8000 B.C. Based on radiocarbon dates from Rodgers Rock Shelter, Goodyear (1982) places the Dalton horizon in a similar time frame. A second notched point (Figure 85-D) is a larger unfinished jasper point which also has a slightly concave base, and which also experienced basal thinning and basal grinding. Indeed, an overshot thinning flake from the base of this point resulted in the loss of the point's tip, after which the point was rejected. Since this point is unfinished, it is not possible to classify it as a particular point type. However, its morphological and technological similarity and its location in Level 4 (.75'-1.00' below surface) in the south half of the Dover Downs site, Hill A, suggests the possibility that it may be contemporaneous with the Hardaway point. On the other hand, the relatively shallow concavity of the base as well as some basal grinding may indicate a somewhat later affinity,

FIGURE 87

Ceramic Sherds, Dover Downs Site, Hill A (7K-C-365A)



perhaps with Palmer or Kirk varieties which are thought to date to 8000-7000 B.C. (Coe 1964; Broyles 1971; Carr 1986).

A third notched variety in the assemblage is a small, thin, very heavily resharpened chert point (Figure 85-C) located in excavation Level 3 (.50'-1.00' below surface) in the south half of the site. This point has a straight base which has been ground, and grinding is also evident around the notch. This point possesses the attributes described by Coe (1964) for the Palmer notched points also recovered from the Hardaway site. Coe (1964) places the Palmer Complex after the Hardaway Complex and before the Kirk Complex in the period spanning approximately 8000 B.C. to 7000 B.C.

The final notched point in the assemblage is a jasper point base (Figure 85-B) with a heavily resharpened or reworked distal edge. The base of the point is straight and shows evidence of grinding. This point was recovered from excavation Level 2 (.25'-.50' below surface) in the south half of the site. The point appears to be somewhat wider than the "Palmer" point previously discussed but exhibits a similar morphology and technology, suggesting that it, too, may date to a Palmer occupation. A similar but somewhat larger Kirk notched point was also described by Coe (1964) from the Hardaway assemblage, and it is possible that the jasper example from Dover Downs may date to this slightly later complex.

In addition to these Paleo-Indian points recovered in Phase III excavations, similarly dated points were also recovered in Phase II excavations (Riley et al. 1993). One such artifact was a Kirk stemmed point recovered from Feature 13 (S15E10) approximately 1.7 feet below surface. This point type has been dated in West Virginia to ca. 6800 B.C. (Broyles 1971:65) and at the Rose Island site in Tennessee to 7270 B.C. (Chapman 1975). Two Archaic points were also recovered in Phase II excavations. A jasper bifurcate point was recovered from Feature 13 (S15E10) approximately 1.8 feet below surface. Radiocarbon dates for bifurcate points have been recorded at the St. Alban's site at 6210 B.C. ± 100 years and 6880 B.C. ± 700 years (Broyles 1966:23-28), and occur no later than 6000-5500 B.C. (Broyles 1971:49; Michels and Dutt 1968). The second Archaic point is a Stanly stemmed variety that was recovered from Level 1 (0-.25' below surface) of Test Unit N0E15. Coe (1964:54) estimates the date for the Stanly occupation at the Doerschuk site to be about 5000 B.C.

Also included in the assemblage is a series of stemmed points (Figure 85-E through L). The majority of these points are small to medium in size, and narrow bladed with converging stems, characteristics which roughly correspond to the Poplar Island and Lackawaxen historical types (Ritchie 1961; Kinsey 1972). Also included in the assemblage is one straight stemmed point (Figure 87-F) of the Bare Island/Lackawaxen variety (Kinsey 1972:410). Although the majority of these points were recovered from excavation Level 2 (.25'-.50' below surface), Table 20 shows that they were also found in Level 3 (.50'-.75' below surface) and Level 5 (1.00'-1.25' below surface). The final point in the assemblage is a triangular shaped point (Figure 85-M), which was also recovered from excavation Level 2. In addition to these point

TABLE 20

Vertical Distribution of Projectile Point Styles

Dover Downs Site, Hill A (7K-C-365A)

Level	Notched	Stemmed	Triangle	Total
1	0	1	0	1
2	1	5	1	7
3	1	1	0	2
4	2	0	0	2
5	0	1	0	1

types recovered in Phase III excavations, additional notched, teardrop, and straight and contracting stem varieties were recovered in Phase II excavations at various depths from 0-2.0 feet below surface (Riley et al. 1993).

Narrow-bladed contracting stem points were described by Witthoft (1959:82-83) as comprising a component of an Archaic "cultural tradition" which he labeled "Poplar Island," and the term has since been used to describe projectile points of similar morphology (Kinsey 1972; Ritchie 1961, 1969:224). Other varieties of stemmed points, such as Bare Island and Lackawaxen, have also been regarded as representing individual stages or components of the Archaic Period, particularly the Late Archaic (Kinsey 1959, 1972:335, 337). Additionally, these various styles of stemmed points have been described as being temporally discrete, with a known chronology (Kinsey 1972:411). While these distinctions may have relevance at individual sites, other research has indicated that they are not applicable over large geographic regions.

Excavations at the Hawthorn site (7NC-E-46), a Woodland I procurement site consisting of a well documented single occupation, revealed various stemmed point styles in association with one another (Custer and Bachman 1984). Similar findings at the Clyde Farm site (7NC-E-6A), the Boni site (Morris 1974:11-12), and the Lerro Farm site (Blenk 1977:24-25), suggest that in many areas these various stemmed point forms are contemporaneous. Indeed, the affinity between Lackawaxen/Bare Island and Poplar Island points has previously been noted (Ritchie 1961:14, 44). Custer and Bachman (1984) have noted that the normative view of a single point style for one group at one time, used in early typologies, is probably overly simplistic and that distinctions among stemmed point styles most likely have little diagnostic significance. Additionally, the distinctions made between the various base forms may be quite subjective, particularly with bifaces made from highly weathered argillite.

In light of these findings, the assemblage of stemmed points recovered at Dover Downs, Hill A is considered to be diagnostic only of the general period between 3430 B.C. and 700 B.C., based on its association with a radiocarbon date from the Faucett site (Kinsey 1972:396) and its association with a radiocarbon date and Marcey Creek/Dames Quarter ceramic types (1200 B.C. to 700 B.C.; Artusy 1976:1-2) and radiocarbon dates at the Clyde Farm site (Custer, Watson, and De Santis 1987).

The single triangular shaped point in the assemblage (Figure 85-M) is a small, thin generalized variety similar to those described by Kinsey (1972:441) and does not add much information about the age of the assemblage. Triangular shaped forms (i.e., "Beekman") have been found in association with various stemmed points (Kraft 1975:40) but more commonly with Late Woodland assemblages (Kinsey 1972; Ritchie 1961). Therefore, the Dover Downs triangular point can be generally ascribed to the Woodland II Period (A.D. 1000 - A.D. 1650).

In sum, the absence of radiocarbon dates at the site necessitates reliance on diagnostic ceramic and point types for determining the age of the site. The earliest diagnostic point types found at the site, the Hardaway side-notched and the Palmer/Kirk varieties, date to the Paleo-Indian Period (ca. 12,000 B.C. to 6500 B.C.). Coe (1964) ascribes these complexes specifically to a range between 8000 B.C. and 6000 B.C. Bifurcate points similar to the one recovered from Feature 13 have been radiocarbon dated at the St. Alban's site to between approximately 7580 B.C. and 6110 B.C., and Coe (1964) places the Stanly points in a 5000 B.C. time frame. Stemmed points can be ascribed in general to the Woodland I Period (ca. 3000 B.C. to A. D. 1000). The straight and converging stem varieties such as those recovered from this site can be dated somewhat more specifically to a time frame of 3430 B.C. to 700 B.C. based on their association with ceramics and radiocarbon dates (Kinsey 1972; Artusy 1976; and Custer, Watson, and De Santis 1987). Wolfe Neck ceramics found at the site suggest a Wolfe Neck Complex occupation (ca. 500 B.C. to A.D. 0), and these ceramics have been previously dated at sites on the Delmarva Peninsula to between 505 B.C. and 380 B.C. (Artusy 1976; Griffith 1982). Hell Island ceramics suggest a Webb Complex occupation (ca. A.D. 500 - A.D. 1000), and these ceramics have been previously dated at sites on the Delmarva Peninsula to between A.D. 645 and A.D 740 (Artusy 1976; Griffith 1982). Finally, the single triangular shaped point suggests a Woodland II occupation of the site (ca. A.D. 1000 - A.D. 1650), as does the concentration of Minguannan ceramics.

TECHNOLOGIES: STONE TOOL MANUFACTURE AND USE

This section will describe the process of stone tool manufacture and tool use that took place at the Dover Downs site, Hill A (7K-C-365A). First, the bifaces and projectile points will be considered in light of the tool manufacturing activities that took place at the site. Lithic debitage will also be considered in the context of tool manufacturing activities. Finally, the various functions of artifacts found at the site will be discussed.

Three categories of bifaces were noted from Dover Downs, Hill A. The first category includes early stage biface rejects, which are bifaces that do not pass beyond the first steps of stone tool production due to either material flaws or manufacturing errors. The second category, late stage biface rejects, includes bifaces broken during the later stages of tool reduction. The final category includes late stage biface discards, which are nearly finished bifaces damaged during their use as tools. Also discarded at the site and included in the recovered assemblage were a variety of broken biface fragments. Plate 5 shows the bifaces of various categories from the site. Projectile points can also be divided into rejects and discards. It should be noted that several of the points from this site were made of argillite, a material that weathers significantly over time. The cultural modification of artifacts made from this material is thus difficult to distinguish.

Table 21 shows a summary cross-tabulation of the biface and point manufacturing stages and raw materials as well as the presence of cortex. Table 22 shows a more detailed listing. Early stage bifaces and late stage bifaces appear in the same quantity and contain the same percentage of cortex (50%). It appears, then, that the manufacture of bifaces, at least in the early stages, was important only to the extent of replacing discarded tools or those broken in the late stages of manufacture or resharpening.

The material most preferred for projectile points and late stage bifaces was jasper. Cortex percentages (67%) on these tools suggest that they were largely made from local cobbles. The next most preferred material for these types of artifacts was argillite. The absence of cortex on these tools suggests that they were not made from local cobbles, but instead, would have been either directly procured during a foray to primary sources, the closest of which would be located along the Delaware and Susquehanna drainages north of the Delmarva Peninsula (Custer

TABLE 21

Summary of Biface/Point Types and Raw Materials, Dover Downs Site, Hill A (7K-C-365A)

Tool class	Quartz	Chert	Jasper	Rhyolite	Argillite	Ironstone	Chalcedony	Total
Rejects	5(3)	0	4(3)	1	2	1(1)	1(1)	14(8)
Discards	0	4(1)	1(1)	0	5	0	2	12(2)
Total	5(3)	4(1)	5(4)	1	7	1(1)	3(1)	26(10)
Early stage biface	8(4)	0	2(1)	0	1	1(1)	0	12(6)
Late stage biface	0	0	7(5)	1	3	0	1(1)	12(6)
Points	0	4(1)	2(1)	0	5	0	2	13(2)
Total	8(4)	4(1)	11(7)	1	9	1(1)	3(1)	37(14)

KEY: ( ) = cortex

TABLE 22

Biface/Point Types and Raw Materials, Dover Downs Site, Hill A (7K-C-365A)

Tool class	Quartz	Chert	Jasper	Rhyolite	Argillite	Ironstone	Chalcedony	Total
Early stage rejects	5(3)	0	0	0	1	1(1)	0	7(4)
Late stage rejects	0	0	3(3)	1	1	0	1(1)	6(4)
Discarded points	0	4(1)	1(1)	0	5	0	2	12(2)
Rejected points	0	0	1	0	0	0	0	1
Middle/Late biface fragments	0	0	4(2)	0	2	0	0	6(2)
Early stage biface fragments	3(1)	0	2(1)	0	0	0	0	5(2)
Total	8(4)	4(1)	11(7)	1	9	1(1)	3(1)	37(14)

KEY: ( ) = cortex

1989:245), or received in trade. Also included among late stage tools was a biface made from rhyolite that had suffered a transverse fracture (Plate 5-F). The fracture likely occurred while the knapper was trying to remove a thick edge with step fractures. The closest outcrops of rhyolite occur in central Pennsylvania and western Maryland (Stewart 1984a, 1984b), a considerable distance from the Dover Downs site. Therefore, this artifact, too, appears to have been carried or traded into the site. It appears that the most preferred material for newly manufactured replacement tools was quartz, and that a large percentage (50%) of these bifaces were made from local cobbles.

The only discards in the assemblage were projectile points, and all of the projectile points except one were classified as discards. The single projectile point classified as a reject (Figure 85-D) was an unfinished jasper point that had been damaged in the late stages of manufacture when an overshot thinning flake from the base took off the point's tip. There is a relatively low incidence of cortex on discards (17%) in the assemblage, but a high incidence of cortex on replacement tools (57%), once again suggesting that curated tool kits were being replenished by implements manufactured from local cobbles.

Among the discards is a small, asymmetrically shaped chert Hardaway side-notched point (Figure 85-A). The point's size and shape indicate repeated resharpening, which had likely exhausted the point's usefulness and thereby provided the reason for its discard. Another discarded point (Figure 85-B) is a small chalcedony point that had been reworked into a hafted scraper. The point has a straight base that shows basal thinning as well as grinding in the tradition of the Palmer and Kirk varieties. It is likely that this tool had been a projectile point earlier in its life and had been either repeatedly resharpened until reaching its present size and reworked into a scraper, or had been broken and then reworked into a scraper. This type of multiple use illustrates the careful husbanding of tools practiced by the site's early occupants. A third discarded point (Figure 85-C) is another small, very heavily resharpened, asymmetrically shaped, chert side-notched variety with evidence of grinding on a straight base. This point, too, appears to be from the Palmer/Kirk tradition, and was likely discarded only when it became too small and thin to sustain further attempts at resharpening.

Several argillite converging stem points (Figure 85-E and H-K) were also among the discards. Argillite is a material that weathers significantly over time; therefore, cultural modification of artifacts made from this material is difficult to distinguish. Because the argillite points from Dover Downs, Hill A largely appear to be in finished form and unbroken, they are classified here as discards rather than rejects that would have suffered damage from manufacture. One of these points (Figure 85-J), however, does appear to have experienced a deep flake scar at its tip that may have occurred in the late stages of thinning or in the process of resharpening. It should also be noted that one of the argillite artifacts (Figure 85-K) is a point base. Because of the deteriorated condition of the material, it is not possible to determine whether this point was broken in manufacture or from use. Its general form indicates that it is either finished or in the very late stages of manufacture. Since there are no cores or other evidence of early stage manufacture of tools from this material and since it is part of an assemblage that includes similar discarded forms, this point is also classified as a discard. Also included among the stemmed points is one straight stemmed variety (Figure 85-F) made of jasper with cortex on its stem. The point is carefully flaked and symmetrical in shape but has experienced a small impact fracture on its tip as well as some blunting and parallel scarring along one lateral edge of the distal end. The point, therefore, appears to have been made from a split pebble or cobble and used as a projectile point. It appears, then, that the curated biface assemblage was being supplemented by bifaces made from local cobbles.

Also among the discards is a small, somewhat thick chert contracting stem point (Figure 85-G). This point appears to have experienced damage during the thinning process, when a deep flake scar sectioned the point's tip leaving the tip considerably thinner than the remainder of the point. The somewhat smoothed and polished tip suggests that it may have then been used,

perhaps as a perforator, before being discarded. The final contracting stem point (Figure 85-L) is a very small point made on a chalcedony flake. Although flakes were removed from both faces around the stem, no other flakes were removed from the remnant ventral surface. The final discarded point in the assemblage (Figure 85-M) is a chert triangular-shaped variety with remnant cortex on one face. The point is too small and thin to sustain further resharpening and was likely discarded for this reason.

In addition to bifaces, there are 17 cores and core fragments in the Dover Downs site, Hill A assemblage. A sample of these cores is shown in Figure 88-A through L. Seventy-six percent of these cores are of cobble origin, show little or no elaborate platform preparation and appear to have been expediently produced. A couple of the core fragments (Figure 88-A and B) show that elongated, blade-like flakes were being produced at the site, while other cores (Figure 88-C and D) indicate that wider flakes were also being produced. Moreover, there is evidence of bipolar core technology being practiced at the site (Figure 88-E) which Parry and Kelly (1987) have suggested would have been desirable to groups situated in areas of scarce lithic materials. A few of the cores are of moderate size and were discarded before their utility had been fully exhausted (Figure 88-F and G), whereas the majority of cores are quite small, had been used intensively and contained little usable material when they were finally discarded (Figure 88-H through L). It appears, then, that the majority of cores from the site are of cobble origin and were used as expedient sources of a variety of flake types and then discarded.

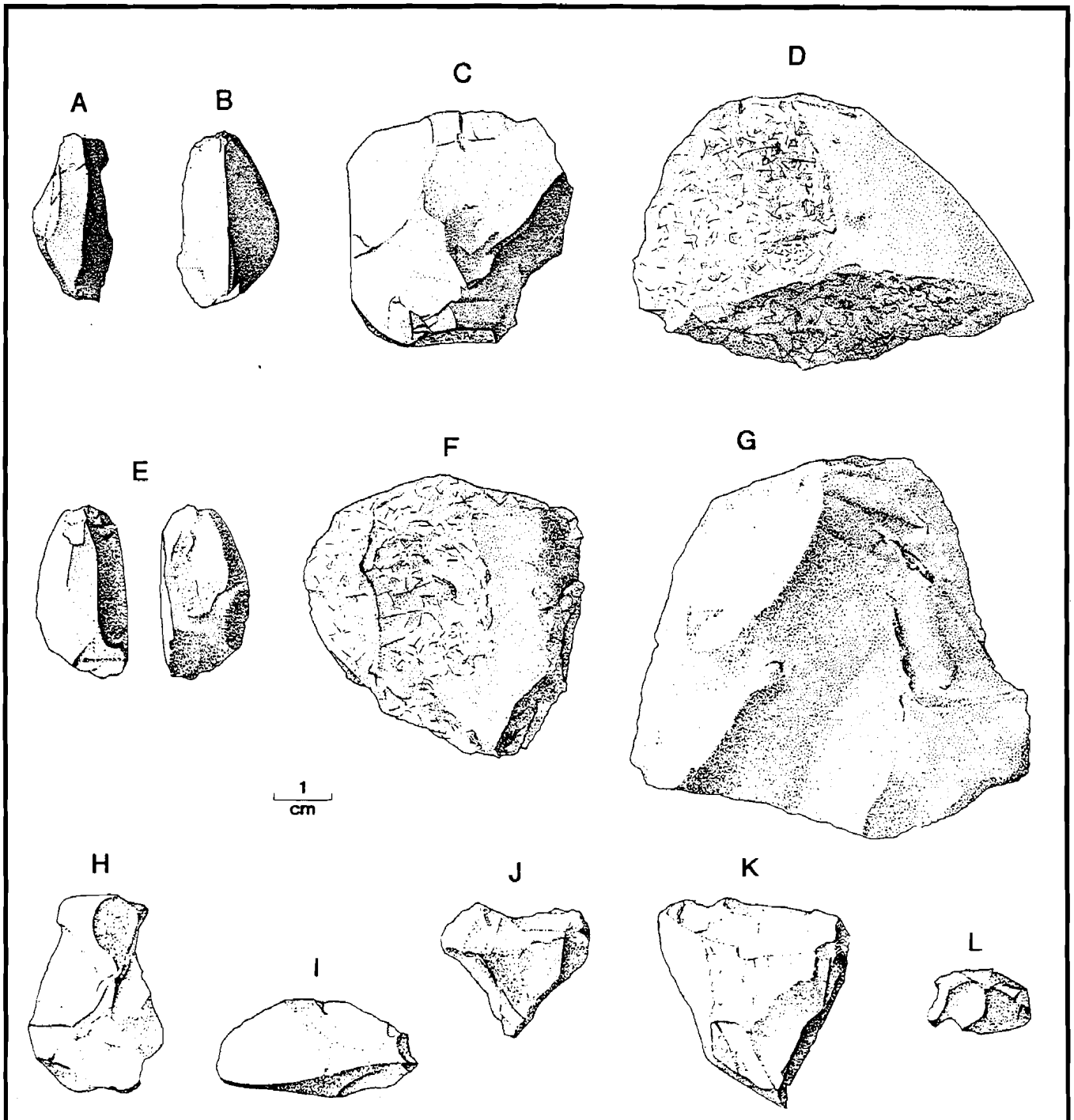
Table 23 shows the distribution of various types of raw materials and the presence of cortex on the debitage from the Dover Downs, Hill A assemblage. There is a generally high incidence of cortex on the cryptocrystalline materials. A look at cores of these materials present in the assemblage shows that nine out of 10 cryptocrystalline cores contain remnant cortex. Flake tools (64%) and utilized flakes (45%) made from these materials also show a high incidence of cortex, suggesting that local cobbles were important sources of material for the manufacture of expedient tools, whereas the flakes represent the byproduct of these activities.

Table 23 shows a relatively low incidence of cortex on quartz and quartzite debitage. Only one of the three quartzite cores from the site contains cortex; however, the few flake tools and utilized flakes of this material contain a high percentage of cortex (75%). Although there is a relatively high frequency of quartzite debitage in the assemblage, there are no points or bifaces made from quartzite and there are very few flake tools and utilized flakes made from this material. The majority of quartzite flakes in the Hill A assemblage are gray and red in color and appear to be the same type of quartzite that was found in a small chipping area at Hill B. The quartzite in this particular area of Hill B (Area C), which will be discussed later in this report, appears to be of cobble origin. The red/gray quartzite from Hill A was recovered from excavation levels 1 through 6 (0.25'-1.50' below surface) and was densest in the southeastern and southwestern quadrants of Test Unit S50E20 and the northeastern and northwestern quadrants of S55E20, although it was also present in other parts of the site. It is not possible to state with certainty that the occupation of Hill B, which is primarily associated with the Woodland I Period, is related to an occupation of the multi-component Dover Downs site, Hill A, but it is certainly plausible to suggest that a group of people camped at Hill A for a brief period of time reduced some cobbles at Hill B for the manufacture of tools, and then took the partially completed tools back to the camp at Hill A and finished them there, thus producing the concentration of debitage at Hill A. The finished tools would have then been carried away from the site for use elsewhere, while the few tools expediently made from local quartzite cobbles were used only once and discarded.

There is also a fairly high frequency of quartz debitage among the assemblage, although a modest incidence of cortex was noted. Relatively high frequencies of cortex are present, however, on both bifaces and utilized flakes/flake tools (39%) made from quartz. Three of the four quartz cores from the site contain remnant cortex. One factor that may account for the low frequency of cortex on quartz debitage is that the quartz cores range from very small to medium

FIGURE 88

Sample of Cores, Dover Downs Site, Hill A (7K-C-365A)



A - S55 E25, Level 3 NW, Chert
B - S35 E15, Level 1 NW, Jasper
C - S20 E20, Level 2 SW, Jasper
D - S15 E15, Level 1 NE, Quartzite
E - N15 E15, Level 2 NW, Jasper
F - S45 E0, Level 3 SE, Quartz
G - S45 E15, Level 3 NW, Quartzite
H - S5 E25, Level 4 SE, Jasper
I - S15 E0, Level 3 NE, Jasper
J - S5 E5, Level 1 SW, Chalcedony
K - N5 E15, Level 3 SW, Chert
L - S40 E15, Level 5 SW, Chert
*Artifacts shown actual size

TABLE 23

Debitage Cortex and Raw Material, Dover Downs Site, Hill A (7K-C-365A)

Cortex present/ absent	Quartzite	Quartz	Chert	Jasper	Rhyolite	Argillite	Chalcedony	Other
Absent (% of raw material)	478 (82)	390 (82)	159 (59)	290 (34)	49 (100)	30 (100)	60 (76)	7 (88)
Present (% of raw material)	108 (18)	88 (18)	109 (41)	555 (66)	0 (0)	0 (0)	19 (24)	1 (12)
Total (% of raw material)	586 (25)	478 (20)	268 (11)	845 (36)	49 (2)	30 (1)	79 (3)	8 (<1)

TABLE 24

Summary Percentages of Raw Materials by Artifact Classes, Dover Downs Site, Hill A (7K-C-365A)

Artifact class	Quartzite	Quartz	Chert	Jasper	Rhyolite	Argillite	Ironstone	Chalcedony	Other
Early stage biface	0	67	0	17	0	8	8	0	0
Late stage biface	0	0	0	58	8	25	0	8	0
Points	0	0	31	15	0	38	0	15	0
Rejected bifaces and points	0	36	0	29	7	14	7	7	0
Discarded bifaces and points	0	0	33	8	0	42	0	17	0
Utilized flakes and flake tools	6	30	20	36	0	0	0	8	0
Debitage	25	20	11	36	2	1	<1	3	<1
Cores	18	24	24	29	0	0	0	6	0

in size, and very little reduction took place to produce the expedient tools, leaving much of the cortex on the tools even in finished form. Thus, fewer cortex-bearing flakes would be rendered in this process. The largest of the quartz cores (Figure 88-F), a much-used polyhedral variety, contains only a small patch of remnant cortex, and it may be that the cortex from this cobble was removed elsewhere. There is no cortex present on argillite or rhyolite debitage or tools, indicating that these artifacts likely originated from imported primary materials, largely in finished tool form.

The differential use of raw materials for various tool classes can be analyzed to see if any lithic raw materials were used for special purposes. Table 24 shows the percentage of raw materials among various tool classes. Numerous patterns can be noted in lithic raw material

utilization. Jasper appears to fulfill the widest variety of lithic needs at Hill A, being represented in virtually every artifact class. It is well represented among bifaces, cores, and utilized flakes and flake tools. By far, the most preferred material at the Dover Downs site, Hill A for replacement bifaces was quartz. Quartz cobbles, like jasper cobbles, are plentiful in the Delaware drainage (Custer and Galasso 1980) and are suitable to a variety of lithic needs. Quartz has been associated with cutting, slicing, and scraping activities (Custer 1985), and this association is corroborated at Hill A as shown by the high percentage of quartz in the utilized flake and flake tool category. Quartz has also been associated with manufacturing rejects (Custer 1985) and this association is also supported by the Hill A data in the form of broken rejected tools.

A material highly favored for projectile points at Hill A was argillite. However, the low incidence of early stage and rejected bifaces of argillite at the site and the low incidence of debitage in this material class supports the inference that artifacts made of this material were being brought into the site as part of the prepared tool kit. Furthermore, non-local materials such as argillite are not commonly used for manufacturing flake tools (Custer and Bachman 1984:73). These materials are more commonly used for bifaces and projectile points. The high incidence of argillite in both the late stage and discarded biface categories indicates that these tools were being discarded at the site, possibly to be replaced by tools made from local quartz and jasper.

As previously discussed, the overwhelming majority of cores at the site were of cobble origin. It can be seen from cortex percentages on flake tools, scrapers and utilized flakes (Table 15) that these local cobbles provided a source of flakes for use as expedient tools. The general pattern of lithic utilization thus seems to be one in which a series of prepared bifacial tools were brought into the site, utilized as tools, broken and discarded immediately or after an unsuccessful attempt at resharpening. At the same time, local cobbles were probably utilized as core sources for flake tools. Finally, a small amount of early stage tool manufacturing took place using local materials, or perhaps early stage bifaces brought into the site were reduced to provide replacement tools.

Numerous insights into activities which took place at Hill A can be gained by considering the functions for which the various tools may have been used. Determination of stone tool use was accomplished by examination of edge wear and tool damage. Low power magnification (20x-40x) studies were undertaken using the techniques described by Wilmsen (1970). High power magnification studies (e.g., Keeley 1980) were not undertaken.

Projectile points from Dover Downs Hill A show evidence of usage beyond that of spear points. Indeed, only one point (Figure 85-F) shows a tip fracture indicative of its use as a spear point. Several points (Figure 85-A, C, E, G-J, and M) exhibit asymmetrically excurvate edges, indicative of resharpening, as well as considerable rounding and crushing of edges and flake scar ridges along their lateral edges. Ahler (1971) observes that this kind of wear is indicative of use as butchering knives. Further underscoring this role for the Hill A projectile point assemblage is the presence of one contracting stem point (Figure 85-K) with a transverse medial fracture. This type of fracture has been associated with cutting and prying motions employed in butchering activities (Ahler 1971:84, 119-121).

In addition to the use-wear characteristics discussed above, two of the projectile points (Figure 85-H and I) tested positive for the presence of blood. Neither of these points shows impact fractures that would suggest their use as spear points, and one of the points (Figure 85-I) shows attributes that have been associated with processing activities. This point (Figure 85-I) is made from argillite and does not show detailed use-wear characteristics, but a concave area along the mid-section of its lateral edge indicates its possible use as a scraping implement. The second point (Figure 85-H) is also made of argillite and contains a deep flake scar on the surface along one edge. The edge is irregular in shape and may indicate the tool's use as a cutting implement in butchering or processing activities. Another small point in the assemblage (Figure

85-L) also shows characteristics associated with scraping activities. There is a small smoothed area along one lateral edge of this point with small scalar flake scars along one surface. In addition, there are striations present running perpendicular to the edge. Tringham et al. (1974) have associated these attributes with scraping activities.

Further evidence of scraping activities is present in the form of one projectile point (Figure 85-B) that had been converted into a scraper. This "scraper" exhibited a rounded distal edge with smoothed flake scar ridges on the surface above the edge. In addition, small, shallow, scalar flake scars were present on the surface above the edge. These attributes have been associated with scraping on soft materials such as skin or flesh (Tringham et al. 1974:188-189) as might take place with animal processing activities. A final activity suggested by use-wear characteristics on projectile points from Hill A is represented by a small, relatively thick chert projectile point (Figure 85-G) which has been worked at the tip to a very sharp point. A deep flake scar at the very tip of the point left that section somewhat thinner than the rest of the point. Examination under 40x magnification shows slight smoothing and polishing on the point tip, possibly suggesting its use as a perforator. In sum, projectile points in the Hill A assemblage appear to have functioned largely in butchering and animal processing activities.

Analysis of bifaces and biface fragments did not provide much functional information. A late stage argillite biface (Plate 5-G) and a late stage jasper biface (Plate 5-A) show transverse fractures, but the thickness of the artifacts suggests that they were not finished tools and that the fractures most likely occurred in the later stages of manufacture. Four jasper point tips were also discarded at the site. Only one of these fragments (Plate 5-I) shows signs of impact.

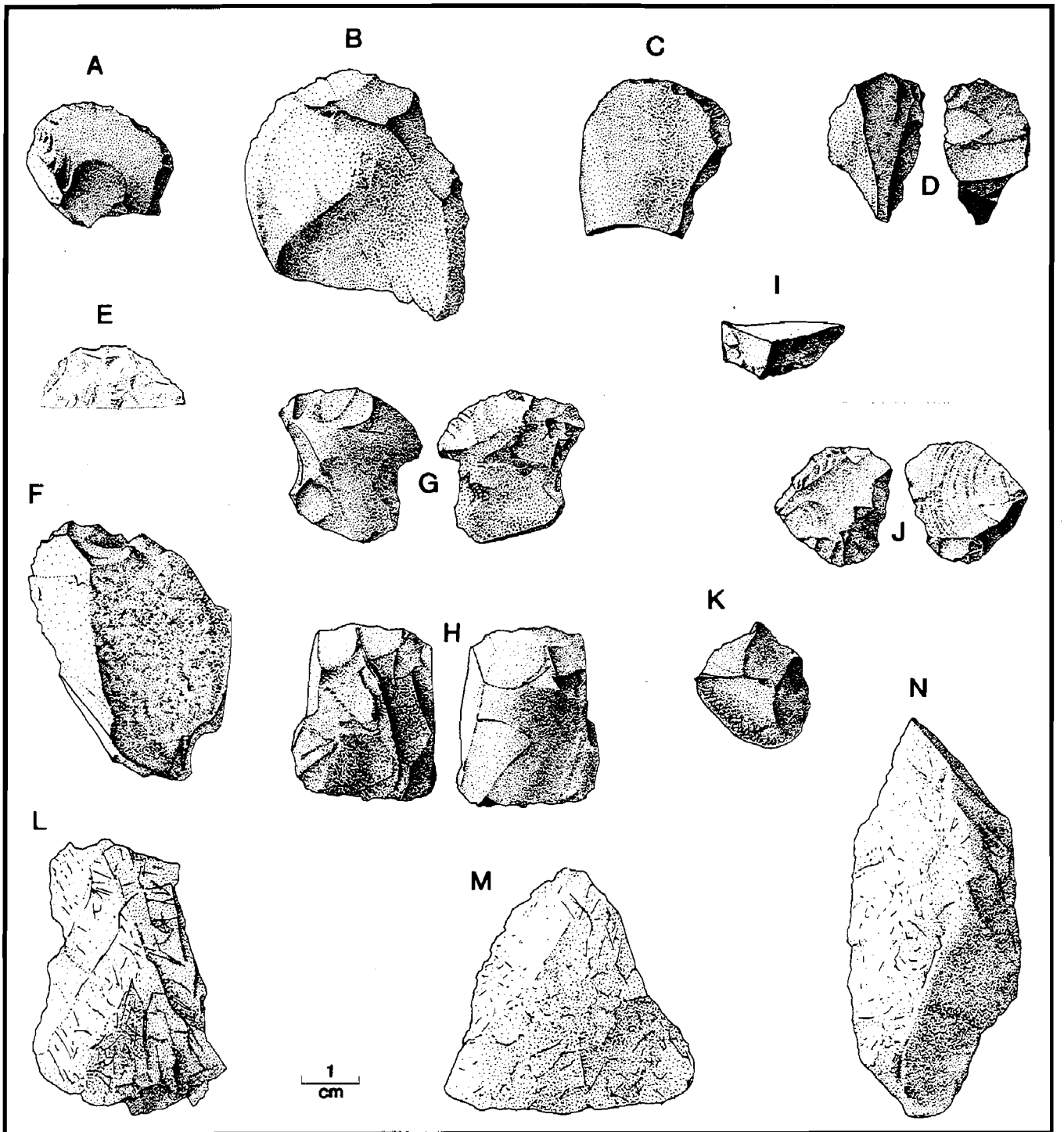
One category of tools that was fairly prominent in the assemblage was that of scraping tools. A sample of these tools is shown in Figure 89-A through V), and a description is provided in Table 25. End scrapers, which comprise the majority of examples at this site, are defined as unifacial flake tools which have been retouched along either their distal or proximal edges and may also have been retouched along their lateral edges (Lowery and Custer 1990:90). This tool class has been associated with the manufacture of tools from wood, bone, and antler as well as those activities related to the preparation of hides (Wilmsen 1970:71-73; Tringham et al. 1974). Side scrapers, which are also represented in the assemblage, are defined as flake tools which have been retouched along either or both of their lateral edges but not along their distal or proximal edges (Lowery and Custer 1990:89). These artifacts also likely functioned as cutting and scraping implements in animal processing and hide preparation activities.

Eighty-seven percent of the end scrapers from Hill A were made from cryptocrystalline jasper, chert, and chalcedony materials and show a high incidence of cortex (67%), indicating that these tools were made from local cobbles. Moreover, very few of these tools conform to classic end scraper morphology as defined by Bordes (1961); the majority are simply gross approximations of the classic form (Figure 89-A through D) manufactured from the flakes of local cobbles. One end scraper (Figure 89-D) appears to have been made on a thick chert core fragment as indicated by the presence of small elongated flake scars on its ventral surface.

Use-wear analysis conducted under low power (20x-40x) magnification revealed numerous instances of step scarring along the distal edges of the end scrapers, suggesting the application of pressure against a hard surface such as wood, bone or antler (Wilmsen 1970:72-73; Tringham et al. 1974:188-191). One example (Figure 89-E) made from quartz experienced a transverse fracture, which may have resulted from pressure applied against such a hard surface. This scraper has an extremely steep edge angle and numerous step scars along its distal edge. Edge angles greater than 65° have been associated with wood and bone working as well as heavy shredding (Wilmsen 1970:71), and step scars confined to the edge of a flake have been associated with antler contact (Tringham et al. 1974:191). Another scraper in the assemblage also exhibits use-wear related to antler working. Tringham et al. (1974) have observed that

FIGURE 89

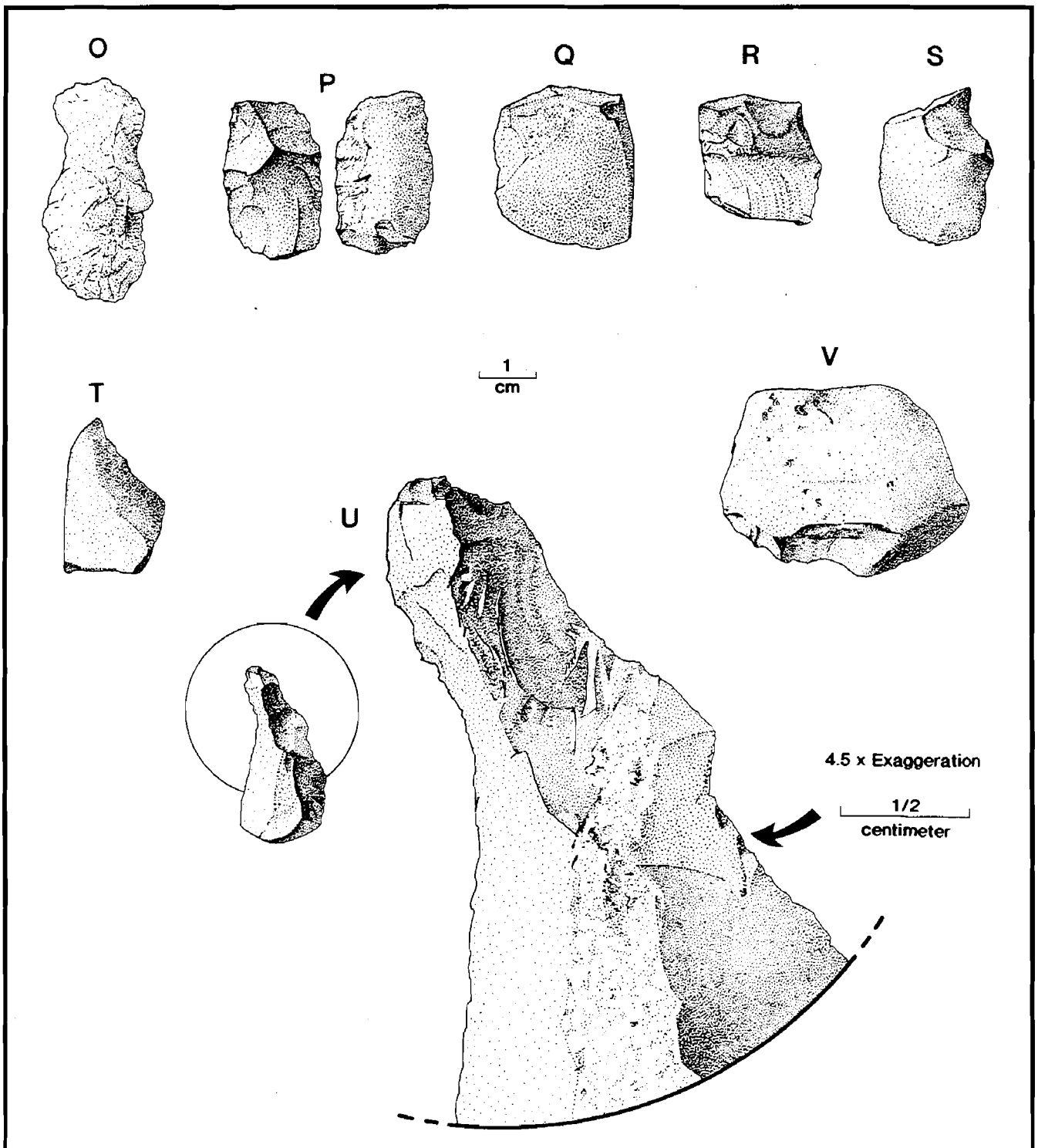
Sample of Flake Tools, Dover Downs Site, Hill A (7K-C-365A)



A - S45 E15, Level 4 NE, Chert
B - S35 E15, Level 2 SW, Chalcedony
C - S5 E5, Level 2 SW, Jasper
D - S45 E15, Level 5 SE, Chert
E - S40 E5, Level 4 SE, Quartz
F - S35 E20, Level 2 SE, Chert
G - S55 E10, Level 3 SW, Jasper
H - S40 E5, Level 1 NE, Chert
I - S10 E20, Level 2 SW, Jasper
J - S45 E15, Level 3 SW, Jasper
K - S5 E15, Level 2 SE, Chert
L - S5 E25, Level 2 SE, Quartz
M - S40 E0, Level 3 SE, Quartz
N - S55 E30, Level 6 NE, Quartz
*Artifacts shown actual size

FIGURE 89 (Continued)

Sample of Flake Tools, Dover Downs Site, Hill A (7K-C-365A)



O - S50 E10, Level 3 NW, Quartz
P - S5 E5, Level 2 SW, Chert
Q - S50 E10, Level 3 SW, Jasper
R - S55 E15, Level 4NW, Jasper
S - N5 E20, Level 2 SW, Chert
T - S60 E10, Level 1 SW, Chert
U - S5 E5, Level 2 NE, Jasper
V - S5 E5, Level 2 SE, Jasper
*Artifacts shown actual size

TABLE 25

Flake Tools and Utilized Flakes, Dover Downs (7K-C-365A)

Provenience	Artifact	Description
S35E15, Level 4, SE	1 Quartz side scraper	cortex present, 30.6 x 15 x 7.8 mm, 15.4 mm worked edge
S15E20, Level 1, NW	1 Jasper end scraper	cortex present, 16.4 x 14.4 x 4.6 mm, 11.5 mm worked edge
S40E15, Level 2, SW	1 Chalcedony end scraper	cortex present, 27.3 x 16.8 x 3.7 mm, 15.2 mm worked edge
S55E25, Level 2, SE	1 Chert end scraper	15.4 x 23.9 x 5.7 mm, 28.1 mm worked edge
S50E20, Level 4, NE	1 Chert end scraper	21.2 x 19.6 x 13.4 mm, 13.8 mm worked edge
S55E10, Level ?, NE	1 Quartzite flake tool	cortex present, 46.5 x 26.6 x 11.8 mm, 46.5 mm worked edge
S55E10, Level 2, SE	1 Jasper flake tool	18.3 x 11.8 x 2.3 mm, 11.7 mm worked edge
S60E25, Level 4, SW	1 Quartz flake tool	25.1 x 23.2 x 9.1 mm, 3.7 mm worked edge
S50E10, Level 3, SE	1 Quartz side scraper	21 x 19.7 x 11 mm, 54.5 mm total for 3 worked edges
S35E20, Level 2, NE	1 Quartz utilized flake	cortex present, 39.6 x 23.2 x 12.2 mm, 20.5 mm utilized edge
S15E0, Level 1, SE	1 Jasper utilized flake	blade flake, 36.3 x 11.7 x 2.2 mm, 72.3 mm total of 3 utilized edges
S45E0, Level 3, NE	1 Jasper utilized flake	38.2 x 20 x 2.9 mm, 27.5 mm total of 3 utilized edges
S60E10, Level 3, SW	1 Chert utilized flake	26 x 17.7 x 4.3 mm, 23.7 mm of utilized edge
S45E0, Level 6, NE	1 Chert utilized flake	cortex present, 31 x 16 x 6.5 mm, 76.3 mm total for 4 utilized edges
S45E0, Level 2, SE	1 Quartz utilized flake	cortex present, 22.4 x 19.7 x 7.3 mm, 43.9 mm total for 2 utilized edges
S55E25, Level 5, SW	1 Chert utilized flake	29.7 x 8.4 x 6.5 mm, 27.2 mm utilized edge
S10E20, Level 3, SW	1 Jasper utilized flake	cortex present, 29.3 x 16.7 x 4.1 mm, 15.1 mm utilized edge
N0E10, Level 3, SE	1 Jasper utilized flake	21.4 x 9.8 x 6.1 mm, 22.8 mm utilized edge
S45E15, Level 3, NW	1 Jasper utilized flake	23.7 x 14.1 x 3.8 mm, 10.3 mm utilized edge
S5E5, Level 1, ?	1 Jasper utilized flake	26.3 x 11.9 x 2.7 mm, 22.1 mm utilized edge
S60E20, Level 3, NW	2 Chalcedony utilized flakes	red, 27.6 x 18.3 x 2.5 mm, 16.4 mm utilized edge white, 25.3 x 17.1 x 3.4 mm, 9 mm utilized ege
S45E15, Level 5, NW	1 Jasper utilized flake	23.6 x 18.1 x 2.8 mm, 45.3 mm total for 2 utilized edges
S10E20, Level 1, SE	1 Jasper utilized flake	cortex present, 21.8 x 13.3 x 2.7 mm, 23 mm utilized edge
S5E5, Level 2, SE	1 Chalcedony utilized flake	26.7 x 20.1 x 4.1 mm, 23.7 mm utilized edge
S5E20, Level 3, NE	1 Quartz utilized flake	cortex present, 36.8 x 19.4 x 11.7 mm, 17.3 mm of utilized edges
S10E20, Level 3, NE	1 Quartz utilized flake	30 x 23.6 x 7.8 mm, 61 mm total for 3 utilized edges
S45E0, Level 2, NE	1 Quartz utilized flake	cortex present, 37 x 30.8 x 7.9 mm, 50.3 mm total for 2 utilized edges
S55E25, Level 3, SW	1 Quartz utilized flake	cortex present, 22.8 x 17.3 x 5.1 mm, 27.1 mm utilized edge
S40E15, Level 2, SW	1 Quartz utilized flake	32.9 x 13.8 x 6.8 mm, 37.4 mm total for 2 utilized edges
S15E20, Level 1, NW	1 Quartz utilized flake	29.1 x 19.1 x 8.5 mm, 33 mm utilized edge
S45E15, Level 3, NW	1 Quartzite utilized flake 1 Quartz utilized flake	cortex present, 23.7 x 10.2 x 2.8 mm, 14.2 mm utilized edge 32.9 x 17.5 x 14.5 mm, 30 mm utilized edge
S5E5, Level 1, SW	1 Quartz utilized flake	40.1 x 26.5 x 8.9 mm, 24.9 mm utilized edge
S60E20, Level 4, SW	1 Quartzite utilized flake	49.9 x 15.3 x 8.1 mm, 10.2mm utilized edge
S50E15, Level 6, SE	1 Quartz utilized flake	45.8 x 13.2 x 10 mm, 38.3 mm utilized edge
S50E15, Level 3, SW	1 Jasper utilized flake	cortex present, 25.7 x 15.8 x 3.5 mm, 8.9 mm utilized edge
S45E15, Level 4, SW	1 Jasper utilized flake	cortex present, 22.2 x 16.5 x 4.1 mm, 14.5 mm utilized edge
N5E15, Level 2, NW	1 Chalcedony utilized flake	17.4 x 14.8 x 2.2 mm, 9 mm utilized edge

TABLE 25

Flake Tools and Utilized Flakes cont.

Provenience	Artifact	Description
S40E5, Level 1, SE	1 Jasper utilized flake	cortex present, 17.1 x 7.5 x 2.2 mm, 8.4 mm utilized edge
S50E10, Level 2, NW	1 Quartz utilized flake	cortex present, 15 x 13.6 x 2.3 mm, 9.2 mm utilized edge
S60E15, Level 1, NE	1 Jasper utilized flake	cortex present, 30.9 x 18 x 3.6 mm, 22.4 mm utilized edge
S5E25, Level 3, SW	1 Jasper utilized flake	cortex present, 31.8 x 13.8 x 9.6 mm, 10.5 mm utilized edge
S35E15,Level 1, SE	1 Jasper utilized flake	cortex present, 30.1 x 8.9 x 4.7 mm, 37.2 mm utilized edge
S45E15, Level 4, NE	1 Chert end scraper	cortex present, retouched edge, 23.2 x 20.2 x 6.2 mm, 34.9 mm edge
S35E15, Level 2, SW	1 Chalcedony end scraper	cortex present, 36.8 x 37.8 x 9.9 mm, 24.8 mm total edge
S5E5, Level 2, SW	1 Jasper end scraper	cortex surface except for edge, 25.3 x 21.5 x 5.8 mm, 21.7 mm edge
S45E15, Level 5, SE	1 Chert end scraper 1 Jasper end scraper 1 Quartzite end scraper	24.8 x 25.6 x 10.5 mm, 24.0 mm edge cortex present cortex present
S40E5, Level 4, SE	1 Quartz end scraper	24.3 x 9.5 x 8.3 mm, 10.3 mm edge
S35E20, Level 2, SE	1 Chert end scraper	cortex present, 47.7 x 27 x 10.7 mm, 24 mm edge
S55E10, Level 3, SW	1 Jasper end scraper	cortex present, bifacially retouched, 28.7 x 21.8 x 6.7 mm, 45 mm total edge
S45E15, Level 3, SW	1 Jasper end scraper	bifacially reworked, multiple scraping edges, 20.3 x 18 x 3.9 mm, 36.4 mm total edge on front, 18.3 mm edge on reverse
S40E5, Level 1, NE	1 Chert end scraper	30.1 x 19.7 x 12.7 mm, 13.7 mm of micro-chipping edge
S5E15, Level 2, SE	1 Chert scraper with graver	cortex present, 20 x 17.3 x 6.1 mm, 11.4 mm total edge
S55E15, Level 4, NW	1 Jasper wedge	20.3 x 20 x 7.2 mm, 17.1 mm of worked edge
N5E20, Level 2, SW	1 Chert flake tool/ burnin	23.6 x 19.5 x 7.3 mm, 2 worked notches totalling 22.4 mm
S60E10, Level 1, SW	1 Chert flake tool/ burnin	26.4 x 15.6 x 7.3 mm, 19.5 mm of worked edge
S5E5, Level 2, NE	1 Jasper flake tool	cortex present, tool has chisel limace-like end, 31.4 x 13.2 x 8 mm, 51.5 mm of worked edge
S5E5, Level 2, SE	1 Jasper end scraper	cortex present, 41.7 x 31 x 25.1 mm, 19.9 mm of worked edge
S5E25, Level 2, SE	1 Quartz side scraper	46.3 x 25 x 21.1 mm, 44 mm of worked edge
S40E0, Level 3, SE	1 Quartz side scraper	45.7 x 33.8 x 11.7 mm, 2 edges 66.0 mm total
S55E30, Level 6, NE	1 Quartz side scraper	cortex present, 62.3 x 28.7 x 16.8 mm, 58.9 mm long edge
S50E10, Level 3, NW	1 Quartz side scraper	concave edge, 38 x 17.5 x 7 mm, 19.9 mm edge
S5E5, Level 2, SW	1 Chert side scraper	cortex present, 27.5 x 16.8 x 7.3 mm, 2 edges, 39.1 mm total
S50E10, Level 3, SW	1 Jasper side scraper	cortex present, 27.4 x 23.6 x 11.6 mm, 14.9 mm edge

striations are more common on materials used to work antler. Perpendicular striations are present on the ventral surface of one end scraper in the Hill A assemblage that was made from cobble chert (Figure 89-F), and may indicate that antler products were also being manufactured at the site. Three of the Hill A scrapers (Figure 89-G, H, and J) contain bifacial retouch, which may have facilitated greater use of the scrapers' edges. In fact, one of these tools (Figure 89-J) has three worked edges, all with step scars present on the surface above the edges. This scraper was made from a small jasper flake, which had no signs of cortex. Another scraper (Figure 89-H) made from a flake from a chert cobble with cortex present on the platform also contained three worked edges. Two of the edges are worn and highly polished as are flake scar ridges on the dorsal surface. Part of the proximal end of this scraper has been broken off, and a series of scalar flake scars are present along the broken edge. These types of use-wear

characteristics have been associated with tool use on soft materials such as skin and flesh (Tringham et al. 1974:189). Unlike several of the other scrapers that appear to have been used briefly and discarded, these three artifacts show that at least some tools were being rather carefully conserved.

In addition to the careful conservation and recycling of the artifacts discussed above, there are other examples of economic use of materials and tools in the Hill A assemblage. One very small jasper core fragment (Figure 89-I) with a patch of cortex and unifacial retouch along one edge appears to have been reworked into a scraping tool. Another unifacial scraping tool also contains a graver (Figure 89-K). This tool was made from a flake from a chert cobble and contains cortex over much of its dorsal surface.

Side-scrapers are also present in the Hill A assemblage. A sample of these scrapers is shown in Figure 89-L through Q, and a description is provided in Table 25. Seventy-one percent of these tools were made from quartz, and 57 percent contain remnant cortex. In general, these scrapers are larger and thicker than the end scraper variety, and have been retouched only along one edge. Although edge wear is difficult to discern on quartz tools, a few of these examples exhibit irregular shaped edges which have been crushed and blunted (Figure 89-L and M). This type of wear suggests use as cutting or slicing tools, and the use of quartz has been associated with these types of butchering activities (Custer 1985:6-7).

Use-wear on other tools in this category consists of one tool with a worn and flattened lateral edge (Figure 89-N) and another with a small concave section along one lateral edge (Figure 89-O). The absence of step scars and deep scalar flakes suggests that they may have been used to scrape soft materials such as skin and flesh or soft wood. One of these tools (Figure 89-N) also has a projection at its distal end which may have been used for engraving or incising on bone or for boring holes in skins or hides.

The two remaining tools with lateral edge retouch (Figure 89-P and Q) were made from thick cobble flakes with cortical surfaces. Both appear to have been made as expedient tools and used only once before being discarded.

In addition to the formal tool categories discussed above, a couple of other tool categories are represented in the assemblage by one or two artifacts. One such category is that of wedges. These tools, also known as pièces esquillées (Bardon and Bouyssonie 1906; Lothrop and Gramly 1982), have been defined as bifacially retouched tools that have at least one flattened battered end and one thin end which shows bifacial retouch and wear (Lowery and Custer 1990). Only one such tool was identified at Hill A. This tool (Figure 89-R) was manufactured from jasper and shows no signs of cortex. Use-wear consists of one crushed edge with longitudinal step fractures running parallel to the edge. Wedges are believed to have been used in the manufacture of bone and wood tools (Lothrop and Gramly 1982; Lowery and Custer 1990).

Another category of tools represented by two artifacts from the Dover Downs site, Hill A is that of burins. The first of these artifacts was manufactured from a chert flake with no signs of cortex (Figure 89-S). Two flakes were removed from either side of the burin projection. The very tip of the projection is crushed and shows signs of polish. A small series of concentric striations is also present on the dorsal surface beneath the tip. The second burin (Figure 89-T) was also manufactured from a chert flake with no presence of cortex, and appears to have had more than one use. One edge of this tool shows bifacial retouch and some edge rounding and flattening, as well as polish on parts of the edge and adjacent dorsal surface. The burin point is also flattened and polished. These tools are believed to have been used for engraving on bone, antler, or stone. The presence of polish on stone flake tools has been associated with their use on bone (Tringham et al. 1974:191).

Another unique flake tool in the Hill A assemblage was manufactured from a jasper pebble or cobble and contains a "chisel" limace-like end (Figure 89-U). This unifacial tool is generally teardrop shaped and bilaterally asymmetric. It has been retouched on the tip of the narrow end and the edge of the tip is rounded and polished. In addition, examination under 40x magnification shows that scalar flake scars are present on the ventral surface of both lateral edges in the proximal area of the tool, and one generally straight lateral side has a rounded edge, which is crushed and polished along its full length. The distal end of the tool is thicker and wider than the "chisel" end and is cortex covered. The general morphology of the tool conforms to that described by Grimes and Grimes (1985) for a tool type those authors have designated "flakeshavers." Grimes and Grimes (1985) suggest that such tools functioned as whittling or shaving tools for hard materials such as bone, antler, and wood. The use-wear observed on the Hill A specimen indicates that such a function was probable.

Another expediently manufactured tool in the assemblage was made from a jasper pebble (Figure 89-V) that was almost completely cortex covered. One unifacially retouched edge was created on this tool and the edge shows signs of wear in the form of a slightly concave groove over half of the retouched area. The ventral surface of the tool is coarse and abrasive. A possible function suggested by these attributes is that of a bark-stripping tool.

The remaining flake tools consist of flakes which have been retouched but are not definable as particular formal types. Four of these five remaining tools were made from quartz and quartzite, and both the materials and the expedient form of manufacture make formal identification dubious. Two of these tools contain remnant cortex on their dorsal surfaces.

In addition to flake tools at the site, there are also a few flaked cobbles in the assemblage. Three of these cobbles are jasper and two are quartz. There are no apparent signs of utilization on these artifacts, and they may simply represent investigation by the site's occupants to assess the potential of the raw material to produce usable flakes for tools.

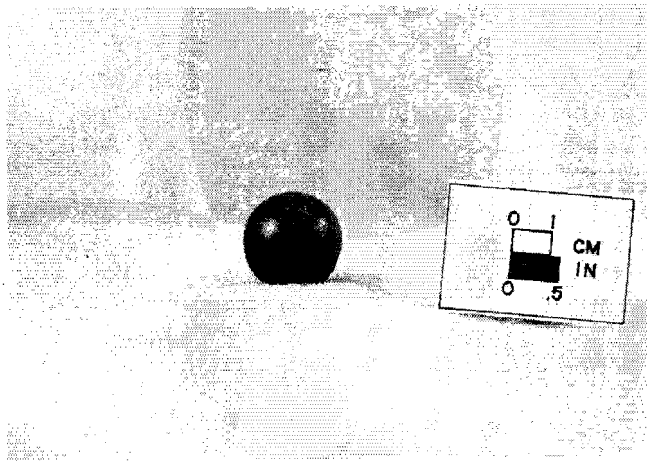
There is one other possible artifact in the assemblage that is worthy of note, although it does not appear to be a tool. This artifact (Plate 6) is a small spherical piece of silicate material, possibly chert, with a diameter of approximately one inch and a smooth polished surface. The polished stone was found in the northeast quadrant of Level 5 (40-50 cm below surface) in an undisturbed test unit (S50E30). The function of this possible artifact is unknown.

Another category of artifacts that are prominently represented in the assemblage is that of unretouched utilized flakes. A sample of these artifacts is illustrated in Figure 86-A through Q) and described in Table 25. Forty-nine percent of the utilized flakes from the Dover Downs site, Hill A contain cortex, indicating that a sizable portion of this tool class originated from local cobbles. The great majority of these flakes (60%) are of cryptocrystalline materials such as jasper, chert, and chalcedony. However, quartz also seems to have been a desirable material (34%) for some of the processing activities at the site, and quartzite makes up the remaining portion of utilized flakes. None of the flakes shows signs of utilization on more than one edge, indicating that these artifacts were mainly used for immediate needs and then discarded.

The utilized flakes appear in a variety of sizes, shapes, and raw materials, and seem to have functioned in the same kind of cutting, slicing, and scraping activities as the flake tools in the assemblage. One of the jasper utilized flakes (Figure 86-A) is a thin, narrow, elongated blade-like flake. No cortex was present on its surface and it appears to have been derived from a prepared core of primary jasper. Other flakes in the assemblage (Figure 86-B and C), however, contain remnant biface edging, complex flake scar patterns on their dorsal surfaces and an absence of cortex, suggesting that they were derived from bifaces of primary materials. Still other cortex bearing utilized flakes (Figure 86-D and E) appear to have originated from small cobbles. Utilized flakes of quartz in the assemblage are generally larger and thicker (Figure 86-F through I) than those of cryptocrystalline materials (Figure 86-J and K). A few of the flakes, however, are extremely small (Figure 86-L through N) and appear to

PLATE 6

Unidentified Chert Spherical Object, Dover Downs Site, Hill A (7K-C-365A)



have been utilized mainly in scraping activities. Another group of jasper utilized flakes almost completely covered with cortex (Figure 86-O through Q) roughly resembles the limace-like flake tool previously discussed (Figure 89-U) and may have been similarly used in bone and wood whittling activities.

Another category of artifacts at the site consists of grinding implements. There are two grinding stone fragments in the Hill A assemblage (Plate 7-A and B). The first of these tools is a large flat metamorphosed sandstone fragment with a concave area in the center and a smoothed concave area on one edge. The second groundstone tool is also a flat broken fragment made of the same material and also exhibits a concave area on one face. However, this fragment also shows some battering along one edge and was probably reused as a hammerstone. This example of multiple use shows that the site occupants were recycling large tools in addition to the smaller varieties.

The final category of artifacts to be discussed consists of hammerstones. Two hammerstones are present in the Hill A assemblage (Plate 7-C and D). The first of these hammerstones is a palm-sized cobble with battering at one end (Plate 7-C). The second hammerstone is slightly larger than the first and shows signs of battering and chipping along two edges (Plate 7-D).

In sum, examination of lithic tools from the Dover Downs site, Hill A indicates that exhausted projectile points and bifaces were being culled from curated tool kits and discarded at the site, while a low level of manufacture to replace these tools was taking place. Although cryptocrystalline cherts, jaspers, and chalcedonies were the preferred materials, the sources of a significant portion of the curated tools were outcrops of argillite located some distance from the site. Replacement tools were mainly coming from local cobbles of quartz. Numerous flake tools and utilized flakes are also present in the assemblage. These tools exhibit a high incidence of cortex indicating that they too were expediently manufactured, largely from local cobbles, used for immediate needs and then discarded. Micro-wear analysis of these artifacts indicates that they functioned mainly as cutting and scraping implements and were likely used on both hard materials such as bone and antler and soft materials such as skin and flesh. In addition, use-wear analysis on points and bifaces in the assemblage indicates that these tools functioned mainly as knives for butchering activities, although impact fractures on one point and one broken point tip suggest that these particular tools functioned as spear points.

ACTIVITY AREAS

In order to delineate any horizontal artifact clustering, the spatial distributions of various artifact classes (tools, debitage, and fire-cracked rocks) were mapped using each 2.5 foot square excavation block as a minimum provenience unit within undisturbed soils. As mentioned in the section on site chronology, the vertical position of artifacts is thought to be disturbed; therefore, artifacts from all levels have been combined for the analysis of activity areas with the expectation that patterns of human activity would become evident in the horizontal distribution of various artifact classes.

PLATE 7

Grinding Stone Fragments and Hammerstones, Dover Downs Site, Hill A (7K-C-365A)



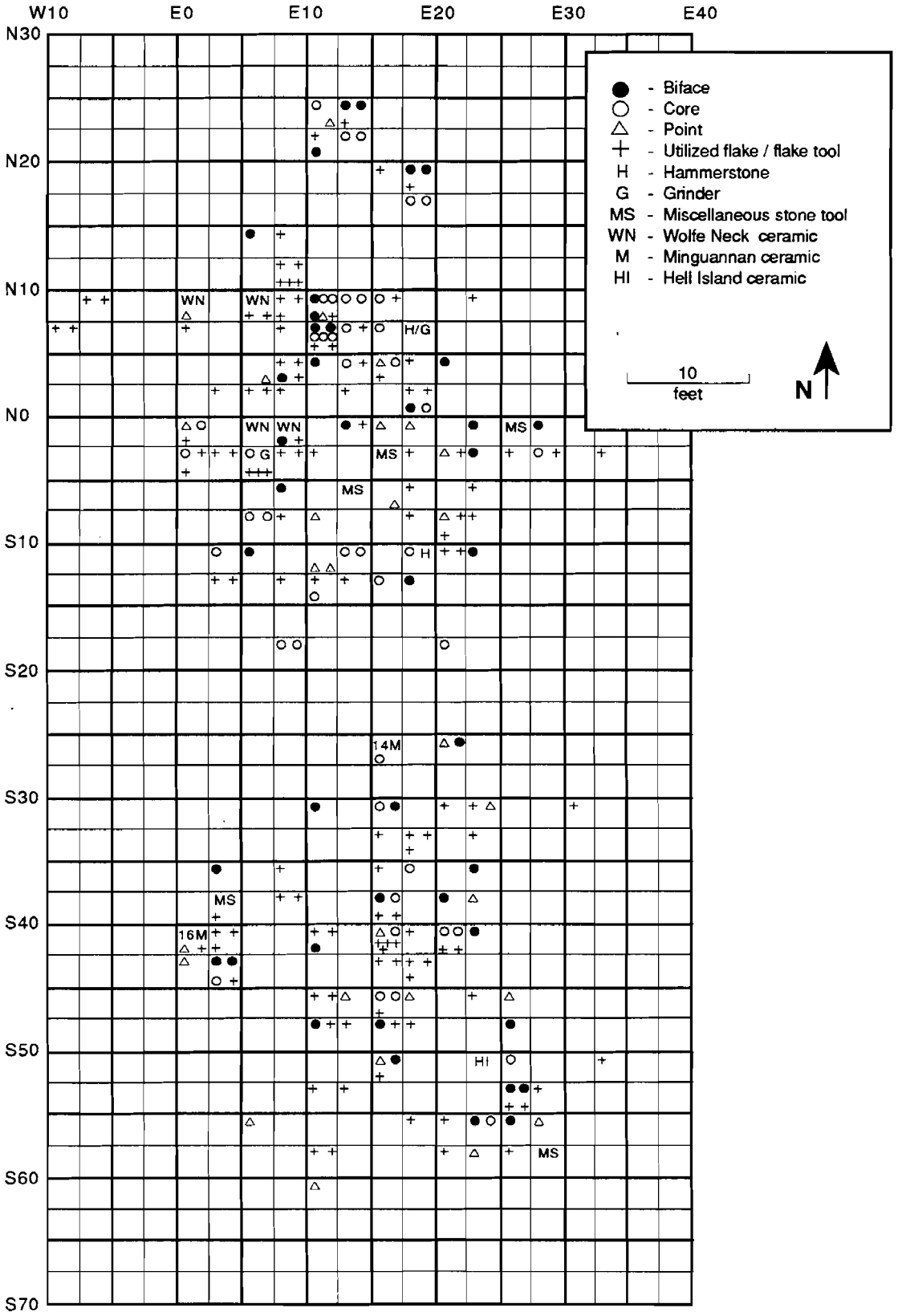
Figure 90 shows the location of all tools recovered from excavated levels. The various tool classes show a relatively even distribution for each type across the site. No particular classes of artifacts appear in clearly isolated clusters that might indicate separate activity areas. The only appearances of possible artifact clustering exist with grinding tools in the northern half of the site (Figure 91) and with tools which produced slight positive reactions for the presence of blood residue in the southern half of the site (Figure 92).

In the northern half of the site, two broken grinding stones were found in Test Units S5E5 and S5E15. As previously discussed, one of these tools appears to have been reused as a hammerstone. In addition to these tools, one double-sided mortar was also recovered from the northern part of the site in Test Unit S10E5 during Phase II excavations (Riley et al. 1993). One side of this mortar exhibits arcuate grinding marks as would result from a circular grinding motion. The reverse side contains pecking marks. These diverse patterns once again suggest multiple uses for even the large stone tools at the site. Several charred unidentifiable seeds and one charred unidentifiable nut fragment were recovered from flotation samples taken from the northern part of the site. Evidence suggests the possibility that some degree of plant food processing may have taken place in the northern half of the Dover Downs site, Hill A.

A second area of clustering occurred in the southern half of the site where five tools and two utilized flakes were found to produce slight positive reactions for the presence of blood. Two of these tools are contracting stem projectile points (Figure 85-H and I). This evidence suggests that animal butchering activities may have taken place in the southern half of the site during a Woodland I occupation; however, since the reactions were not strongly positive, this inference is somewhat speculative.

FIGURE 90

Total Tool Distribution, Phase II and III, All Levels, Dover Downs Site, Hill A (7K-C-365A)



The only additional example of artifact clustering occurs with the distribution of ceramic sherds (Figure 93). Wolfe Neck ceramic sherds, which date to the Woodland I Period, were confined to the western part of the northern half of the site; whereas, Minguannan ceramic sherds, which date to the Woodland II Period, were confined to the southern half of the site. The single Hell Island ceramic sherd, which dates to the end of the Woodland I Period, was also found in the southern half of the site. Although this separation exists in the distribution, diagnostic points from various periods of prehistory do not occur in any horizontally segregated pattern. Therefore, the ceramic distribution is most likely a matter of coincidence rather than an indicator of separate occupations or activities.

Figure 94 shows the location of early and late stage bifaces, and Figure 95 compares the location of fractured versus complete bifaces. No clustering of any type is discernible among these sub-categories of bifaces.

Figure 96 shows the distribution of total debitage from the site. The distribution of debitage, like tools, is relatively even across the site, although the quantity is somewhat greater in the southern half of the site. Figure 97 shows the location of flakes with cortex, and although these flakes are generally evenly distributed across the site, they, too, appear to be somewhat more prevalent in the southern half. A comparison of the distribution of flakes of various raw materials (Figures 98 to 104) shows that quartz, chert, chalcedony, rhyolite, and argillite generally conform to the distribution for total debitage. Quartzite and jasper debitage also generally conform to the total distribution, but the concentrations of these materials are significantly greater in the southern half of the site.

Figure 105 shows the distribution of fire-cracked rocks across the site. This distribution also generally conforms to those for tools and debitage. Small concentrations are apparent at the north central limit of the excavations and in the far southeastern portion of the site. Several unidentifiable charred seeds and one unidentifiable charred nut hull fragment were recovered from flotation samples in the southeastern portion of the site, suggesting that some degree of cooking may have taken place in this area. However, numerous other fire-cracked rocks are scattered across both the northern and southern parts of the site, and the small concentrations do not seem to signify discrete activity areas. The absence of large and/or discrete hearth areas suggests that the site was not occupied for a long duration of time. Moreover, although the density of debitage is somewhat greater in the southern half of the site, no discrete area of lithic reduction separate from other activities is indicated. A small concentration of grinding implements in the northern half of the site may indicate that plant processing activities took place in that part of the site, but there is no evidence to suggest that such activities took place on a large scale. A concentration of artifacts that produced slight positive reactions when tested for blood residue may indicate that animal butchering took place in the southern half of the site. Use-wear attributes on tools in this part of the site offer further support of butchering and processing activities. However, the overall low number of artifacts and the absence of discrete activity areas suggest that the site was a transient camp occupied for short durations of time rather than a large seasonally occupied base camp.

In sum, evidence from tool, debitage, and fire-cracked rock distributions and use-wear analysis suggest that the Dover Downs site, Hill A functioned as a small procurement processing station which was occupied on many different occasions throughout prehistory. The presence of a few pit features, ceramic sherds, grinding tools, and small fire-cracked rock concentrations indicates that some of these occupations may have lasted as long as a few days, but the absence of abundant storage and habitation features, discrete hearths, and specialized activity areas indicates that the site probably did not function as a large seasonally occupied base camp.

FIGURE 91

Location of Groundstone Tools, Dover Downs Site, Hill A (7K-C-365A)

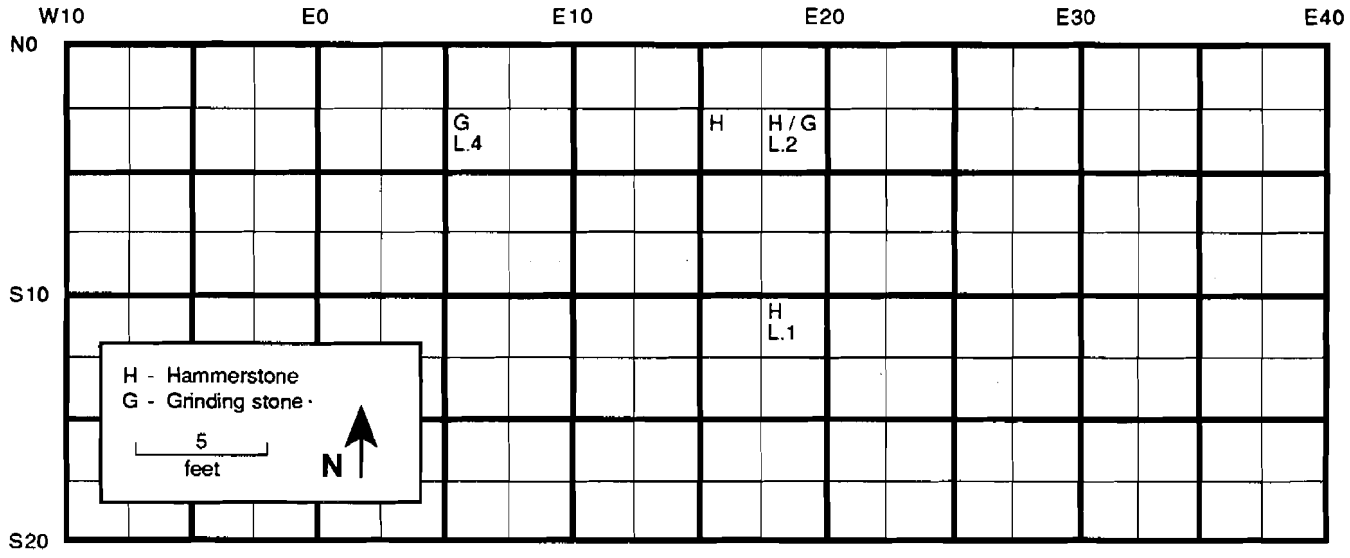


FIGURE 92

Location of Tools that Tested Positive for Blood Residue, Dover Downs Site, Hill A (7K-C-365A)

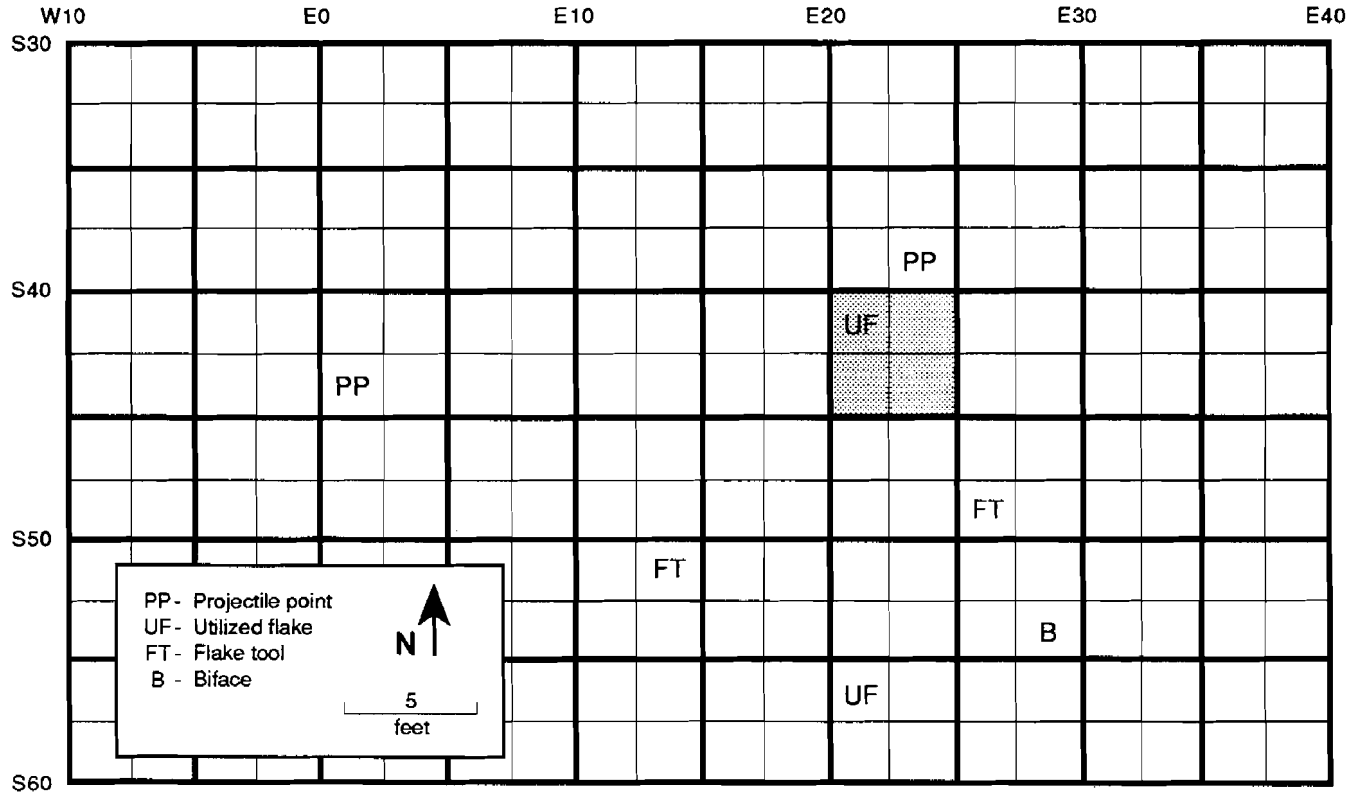


FIGURE 93

Location of Ceramic Sherds, Dover Downs Site, Hill A (7K-C-365A)

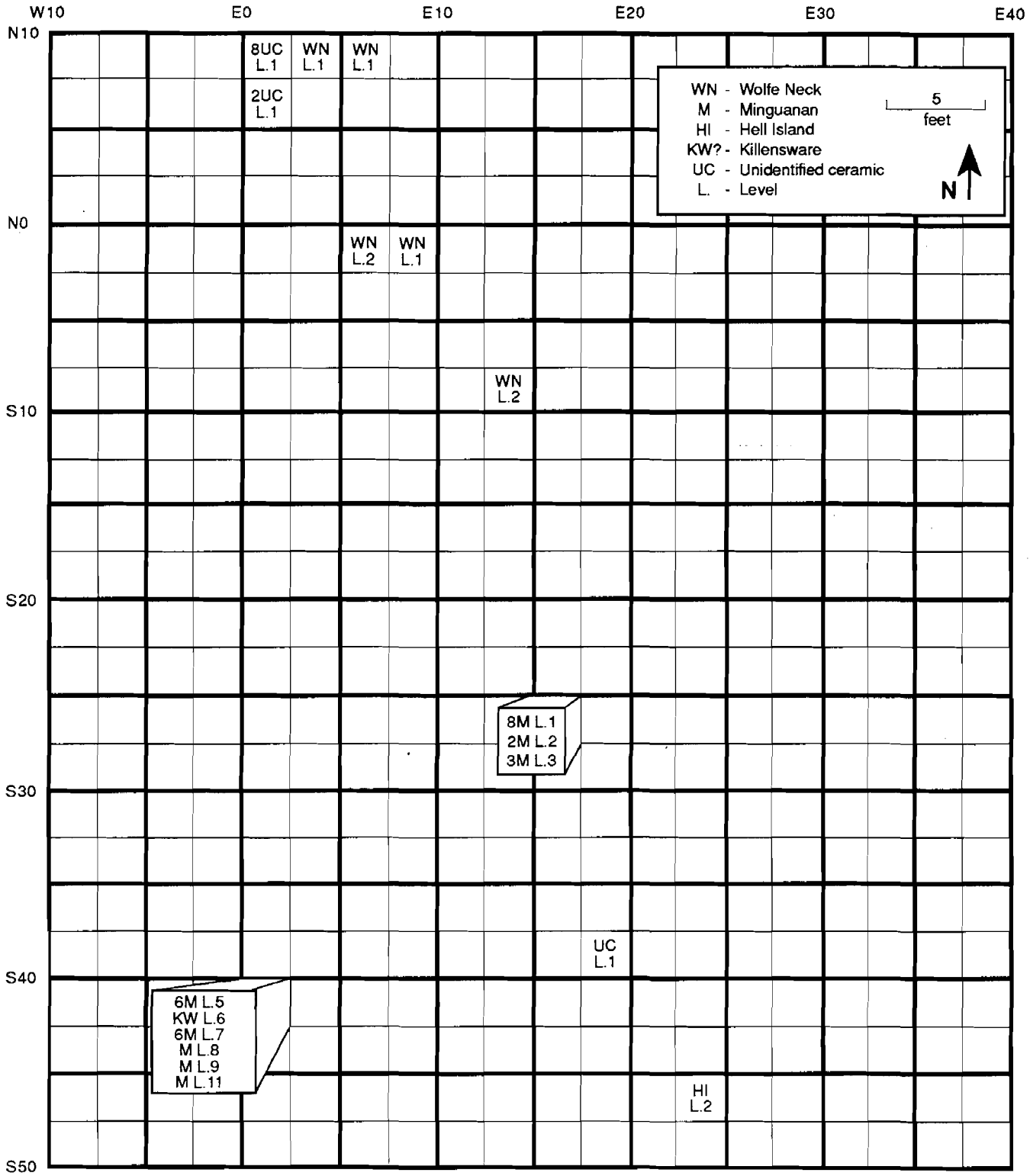


FIGURE 94

Biface Stage Distribution, Dover Downs Site, Hill A (7K-C-365A)

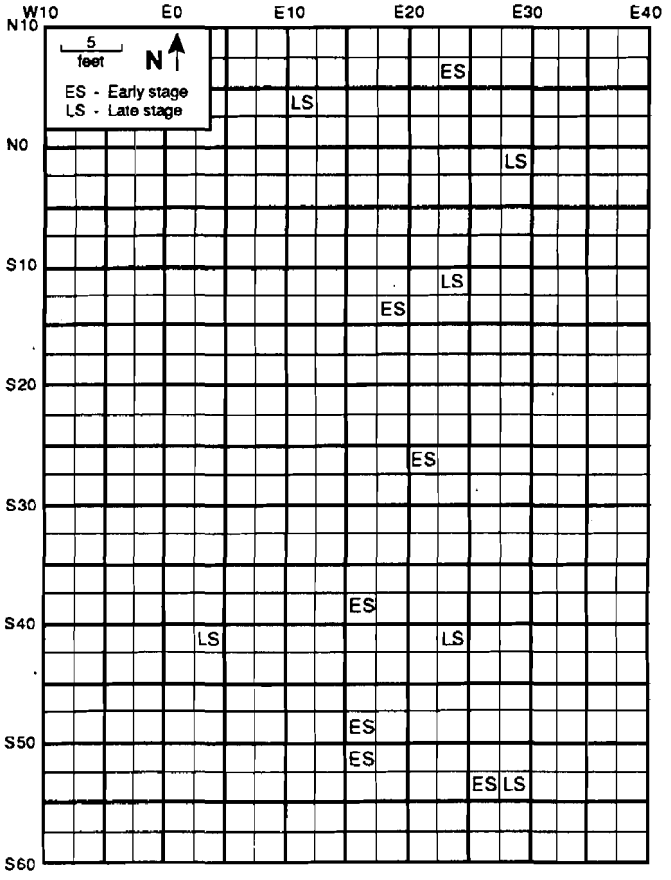
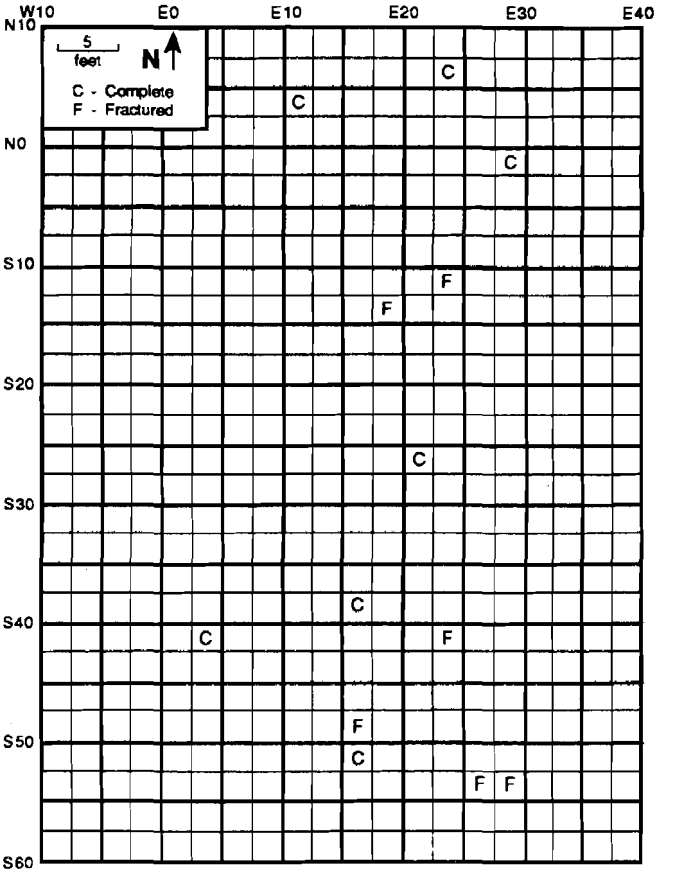


FIGURE 95

Fractured Biface Distribution, Dover Downs Site, Hill A (7K-C-365A)



EXCAVATION RESULTS AND INTERPRETATIONS - DOVER DOWNS SITE, HILL B (7K-C-365B)

Although Dover Downs Hill A and Site 7K-C-360 represent similar types of occupation, the Dover Downs site, Hill B appears to have served a different type of function. Hill B, too, was the site of a low level of butchering and processing activities, but this site functioned mainly as a quartzite reduction station. A discussion of the archaeological investigations at Hill B follows.

SITE STRATIGRAPHY

The Dover Downs site, Hill B is located on a knoll consisting of relatively poorly drained soils of Othello silty loam (Matthews and Ireland 1971). Phase I testing of the site indicated that although the site was historically unplowed, all of the ground on the south, southeast, and east slopes of the knoll had been filled and graded to the top of the rise (Bachman, Grettler, and Custer 1988). Furthermore, although a concentration of historic artifacts was present on the surface, Phase I subsurface testing located a concentration of approximately 300 high-grade quartzite flakes of various sizes, suggesting that further subsurface testing held the potential of locating intact deposits of prehistoric artifacts (Bachman, Grettler, and Custer 1988). Phase II testing, however, found the integrity of the site to be problematic.

FIGURE 96

Distribution of Debitage, Dover Downs Site, Hill A (7K-C-365A)

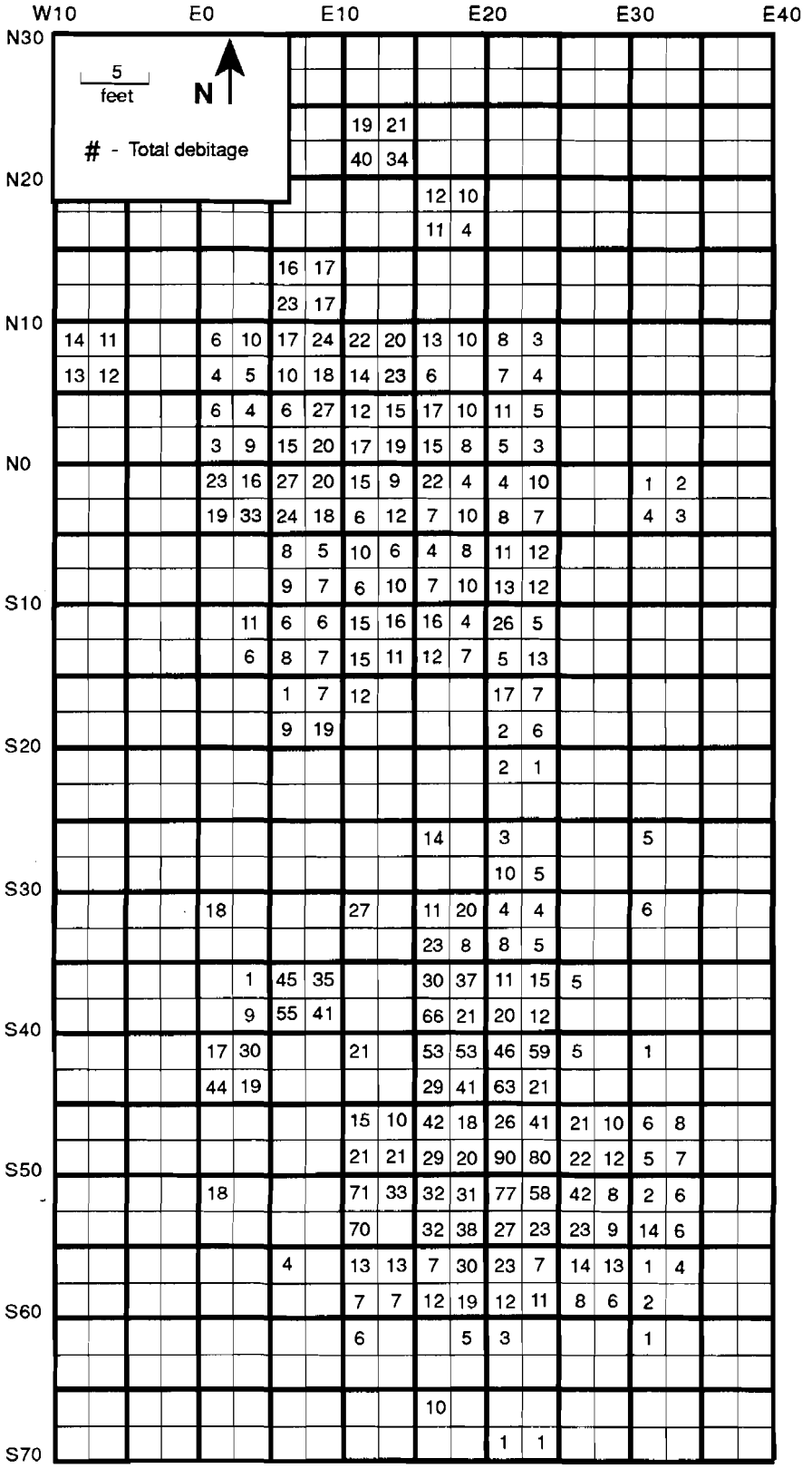


FIGURE 97

Distribution of Debitage with Cortex, Dover Downs Site, Hill A (7K-C-365A)

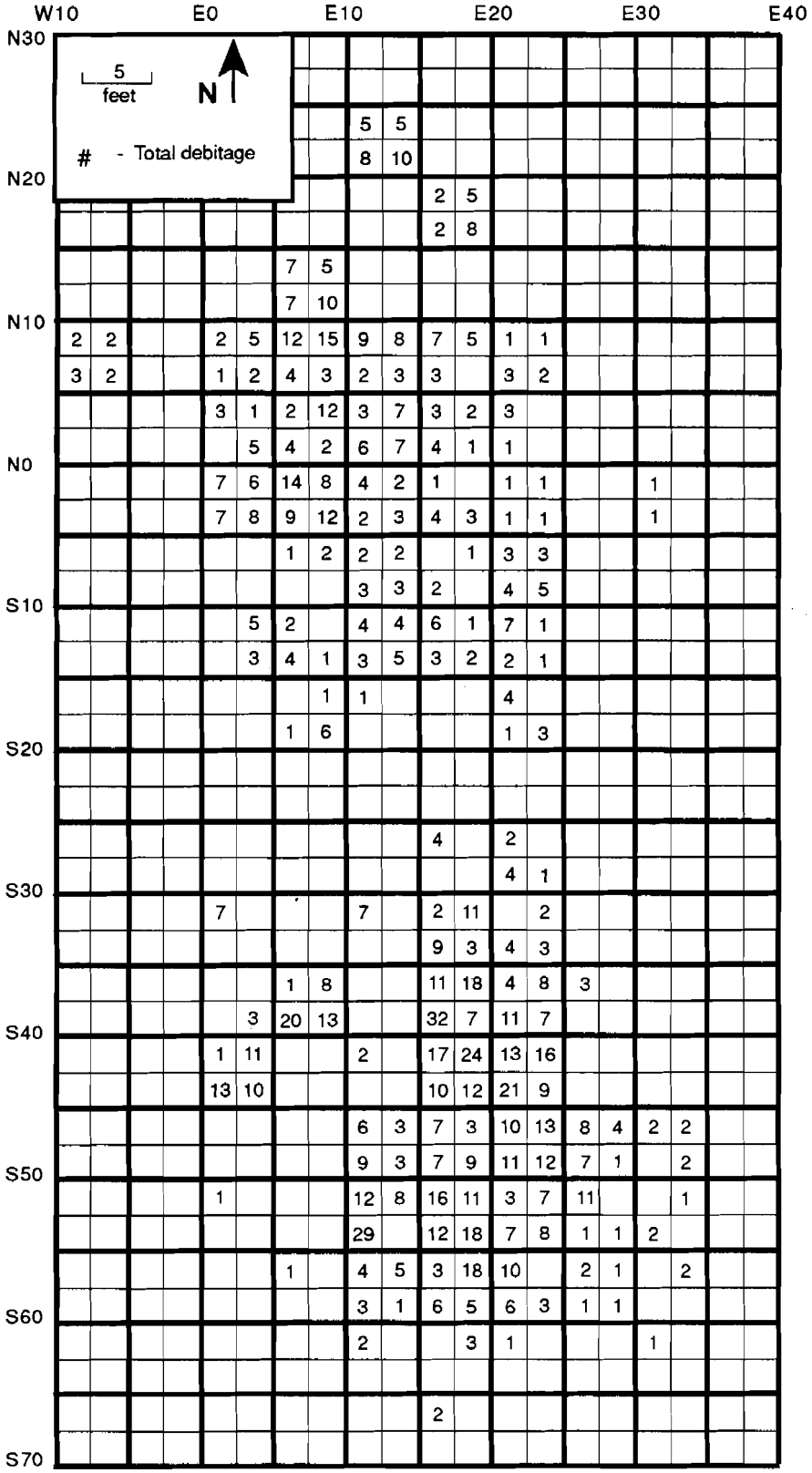


FIGURE 98

Distribution of Quartzite Debitage, Dover Downs Site, Hill A (7K-C-365A)

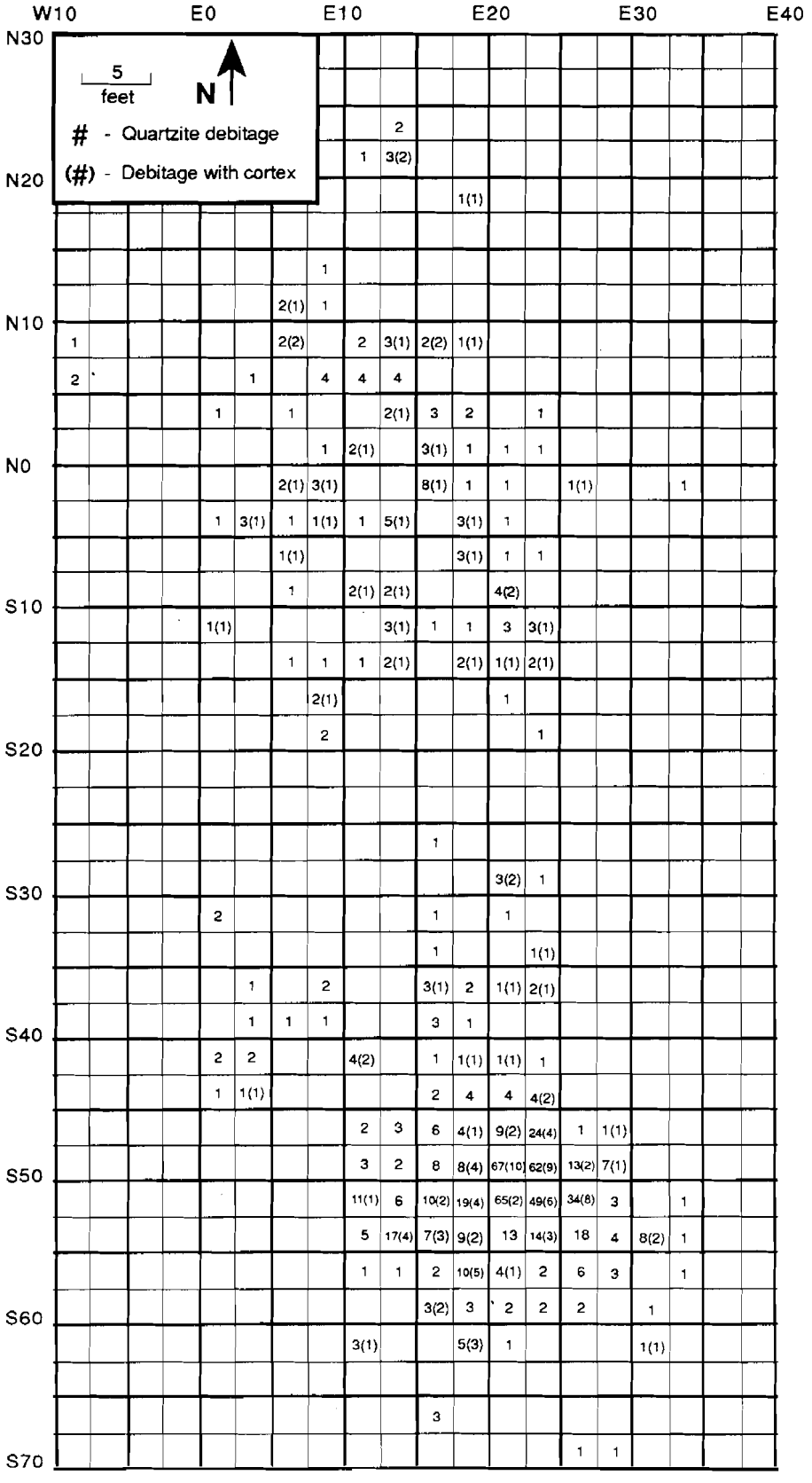


FIGURE 99

Distribution of Quartz Debitage, Dover Downs Site, Hill A (7K-C-365A)

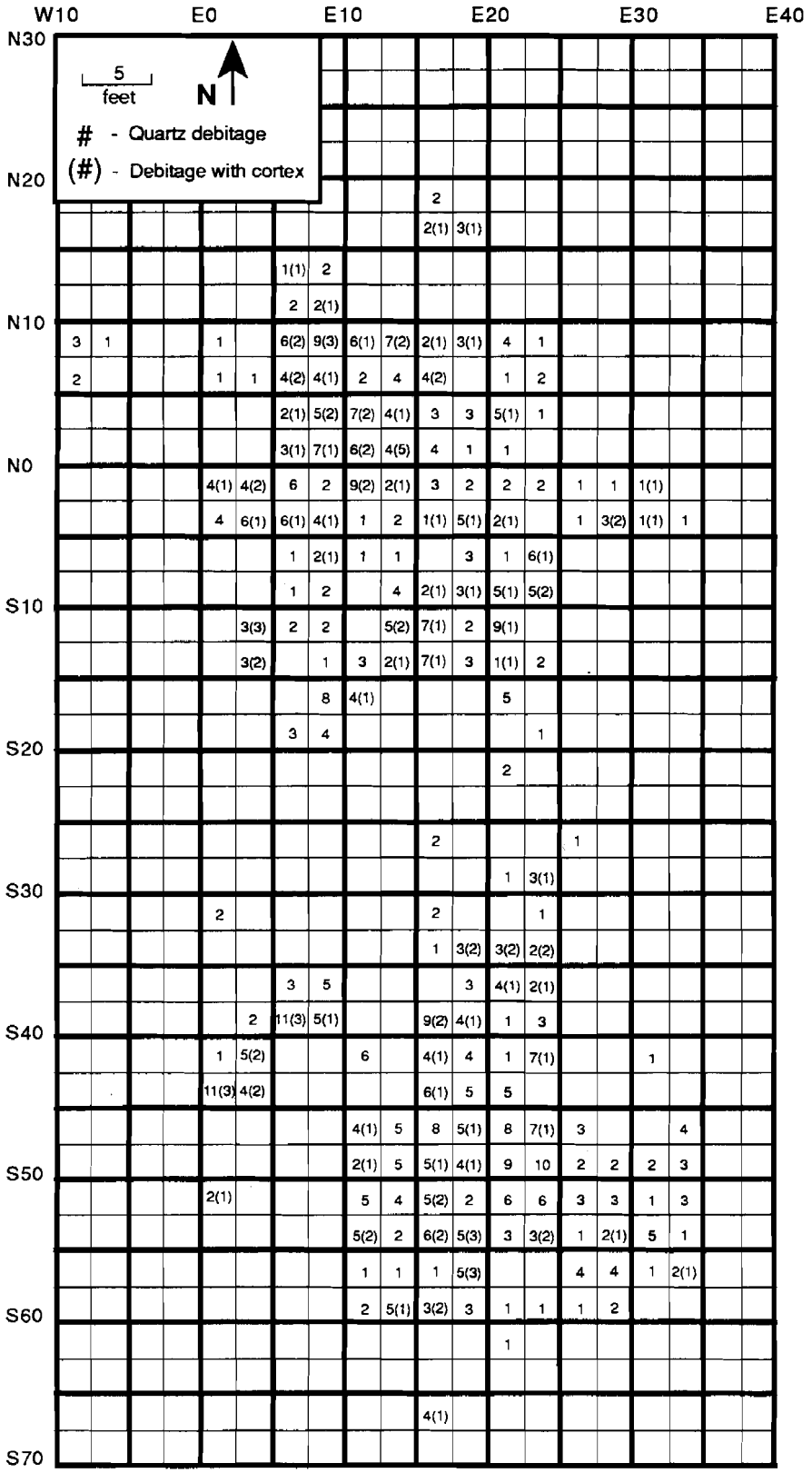


FIGURE 100

Distribution of Jasper Debitage, Dover Downs Site, Hill A (7K-C-365A)

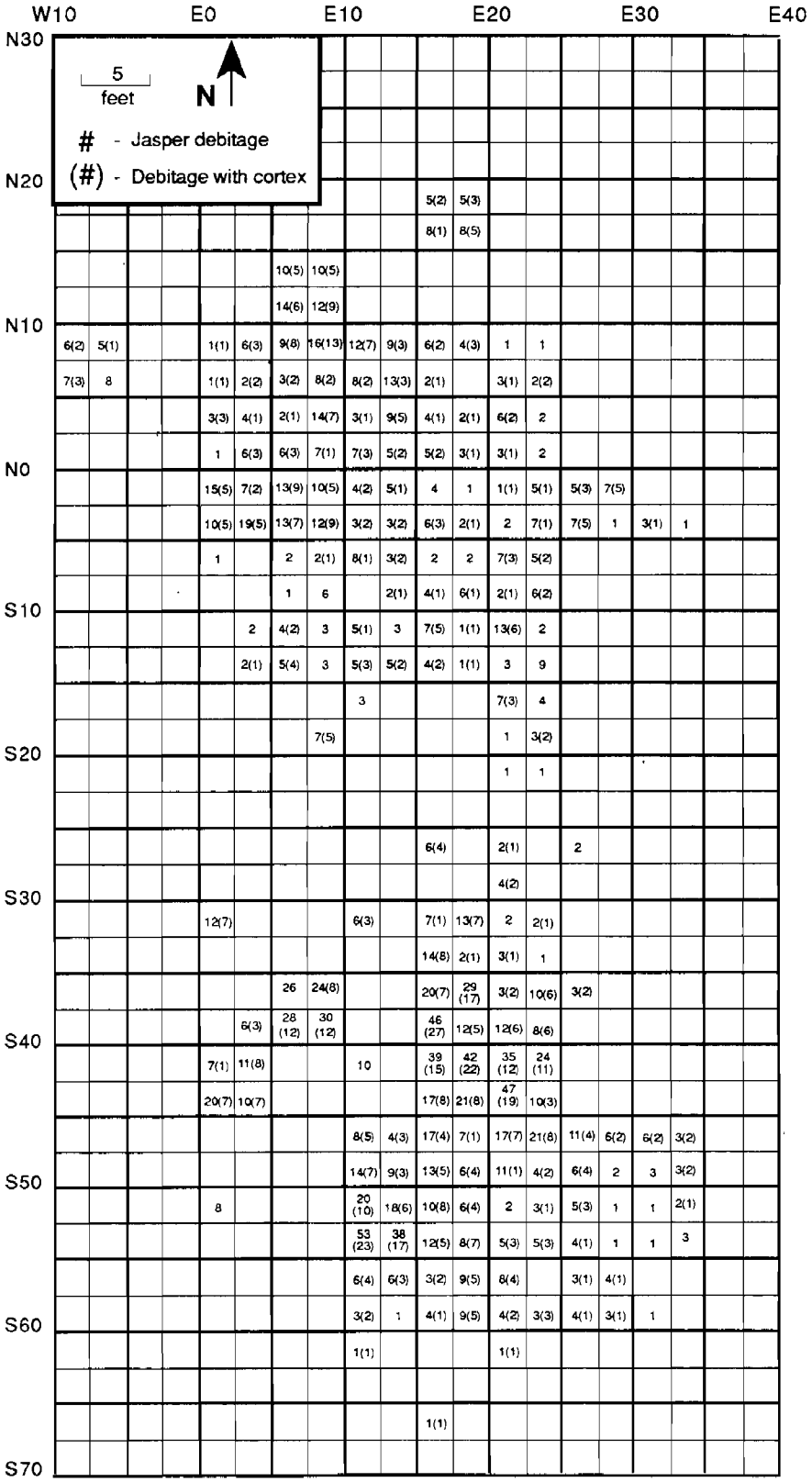


FIGURE 101

Distribution of Chert Debitage, Dover Downs Site, Hill A (7K-C-365A)

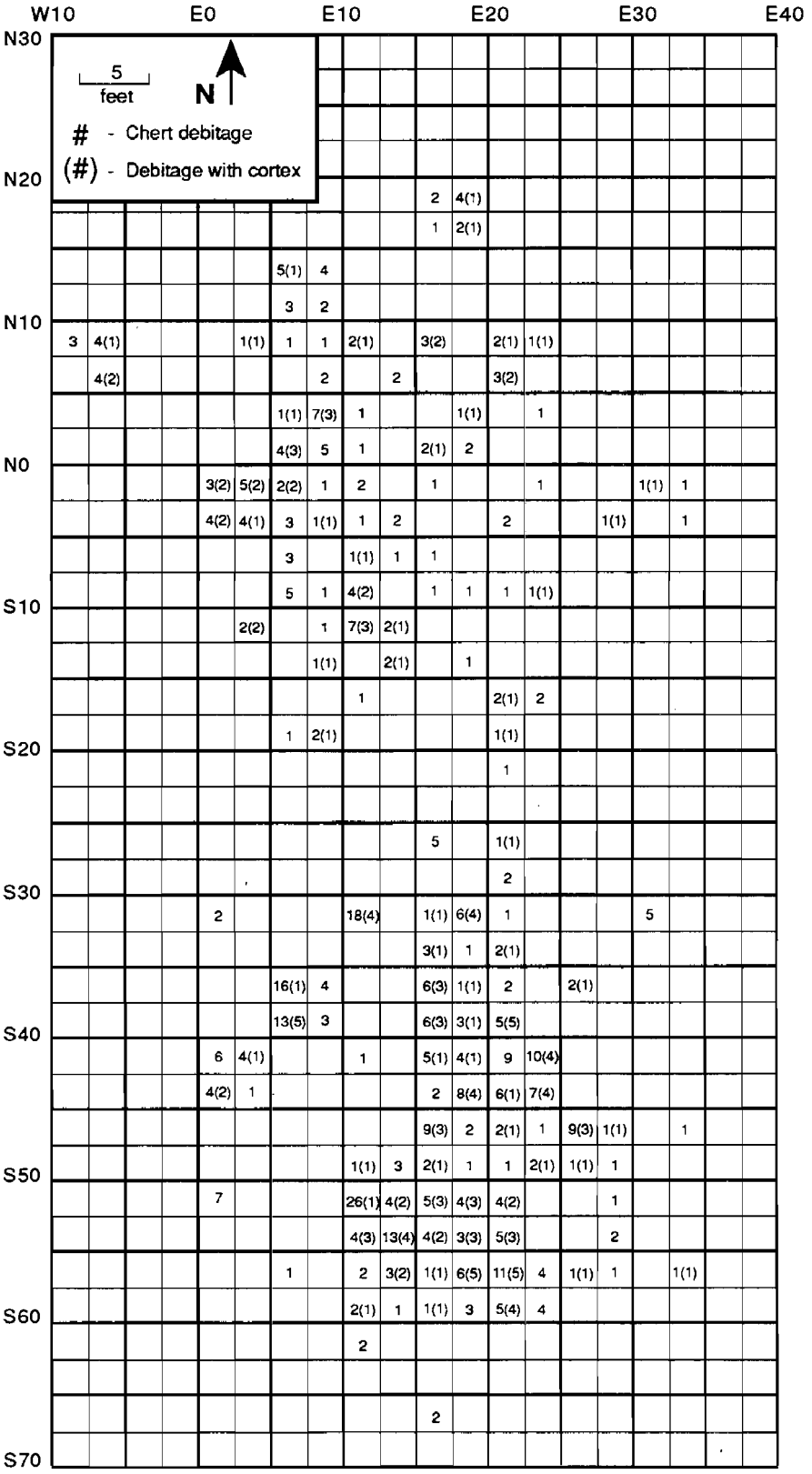


FIGURE 102

Distribution of Chalcedony Debitage, Dover Downs Site, Hill A (7K-C-365A)

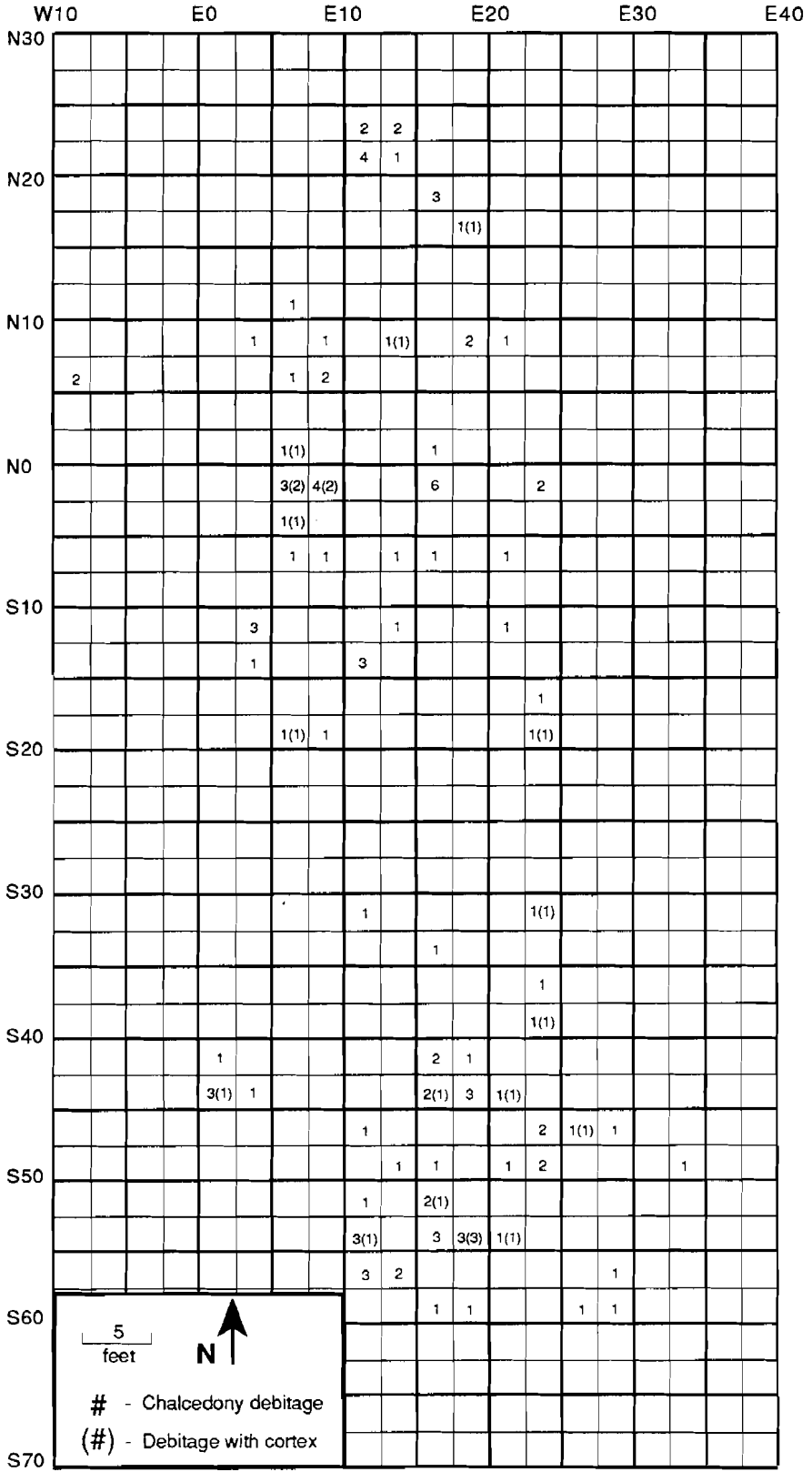


FIGURE 103

Distribution of Rhyolite Debitage, Dover Downs Site, Hill A (7K-C-365A)

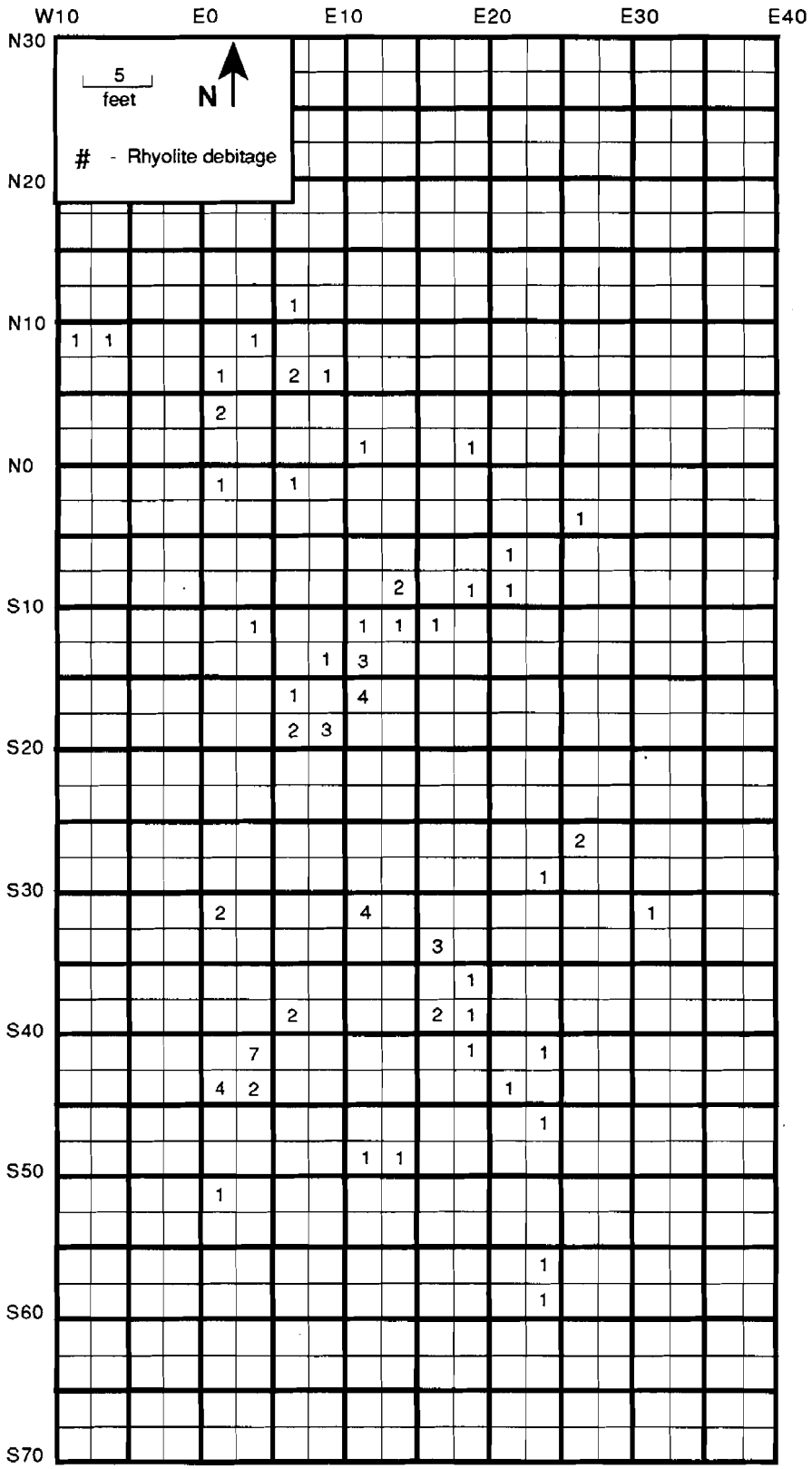


FIGURE 104

Distribution of Argillite Debitage, Dover Downs Site, Hill A (7K-C-365A)

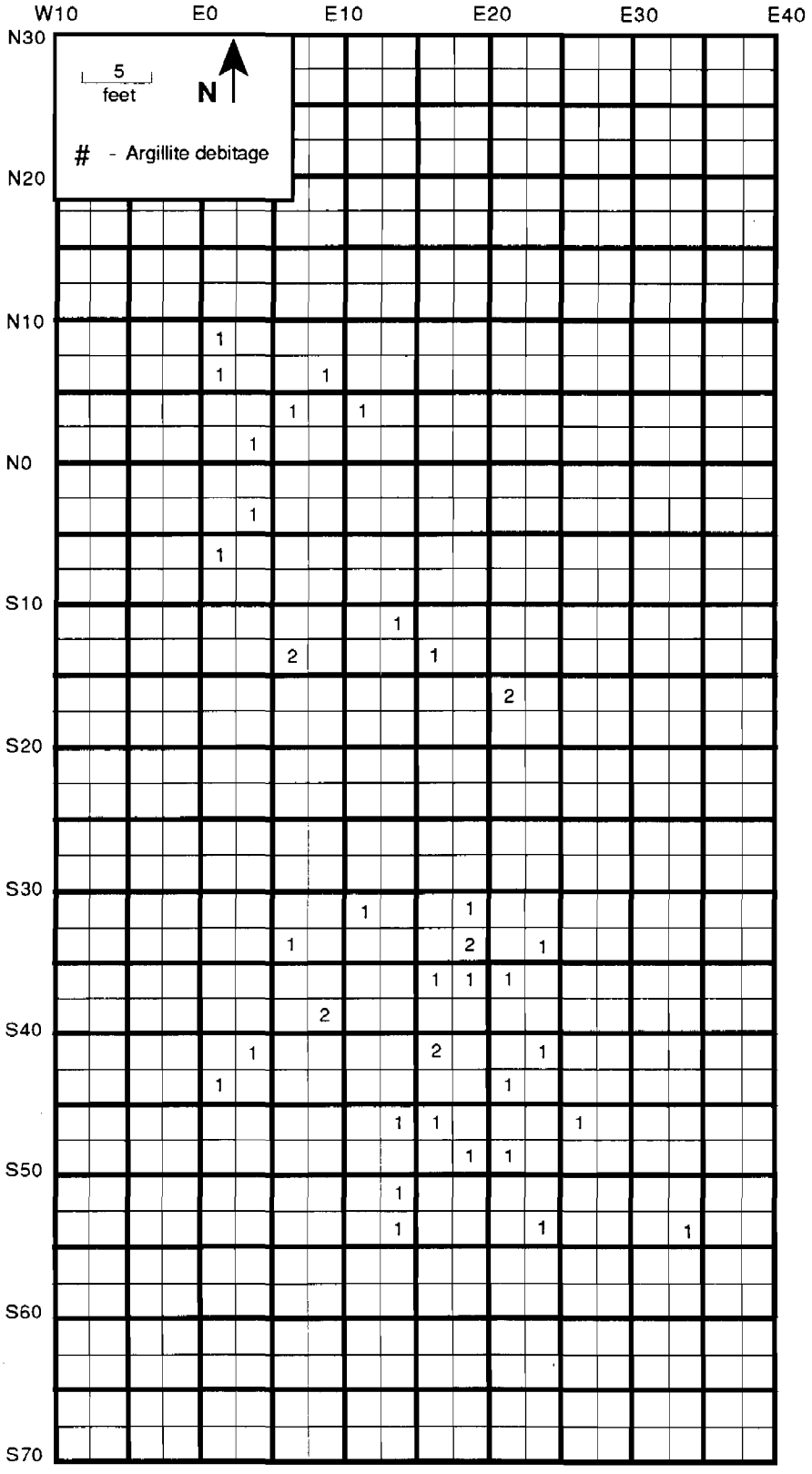


FIGURE 105

Distribution of Fire-Cracked Rocks, Dover Downs Site, Hill A (7K-C-365A)

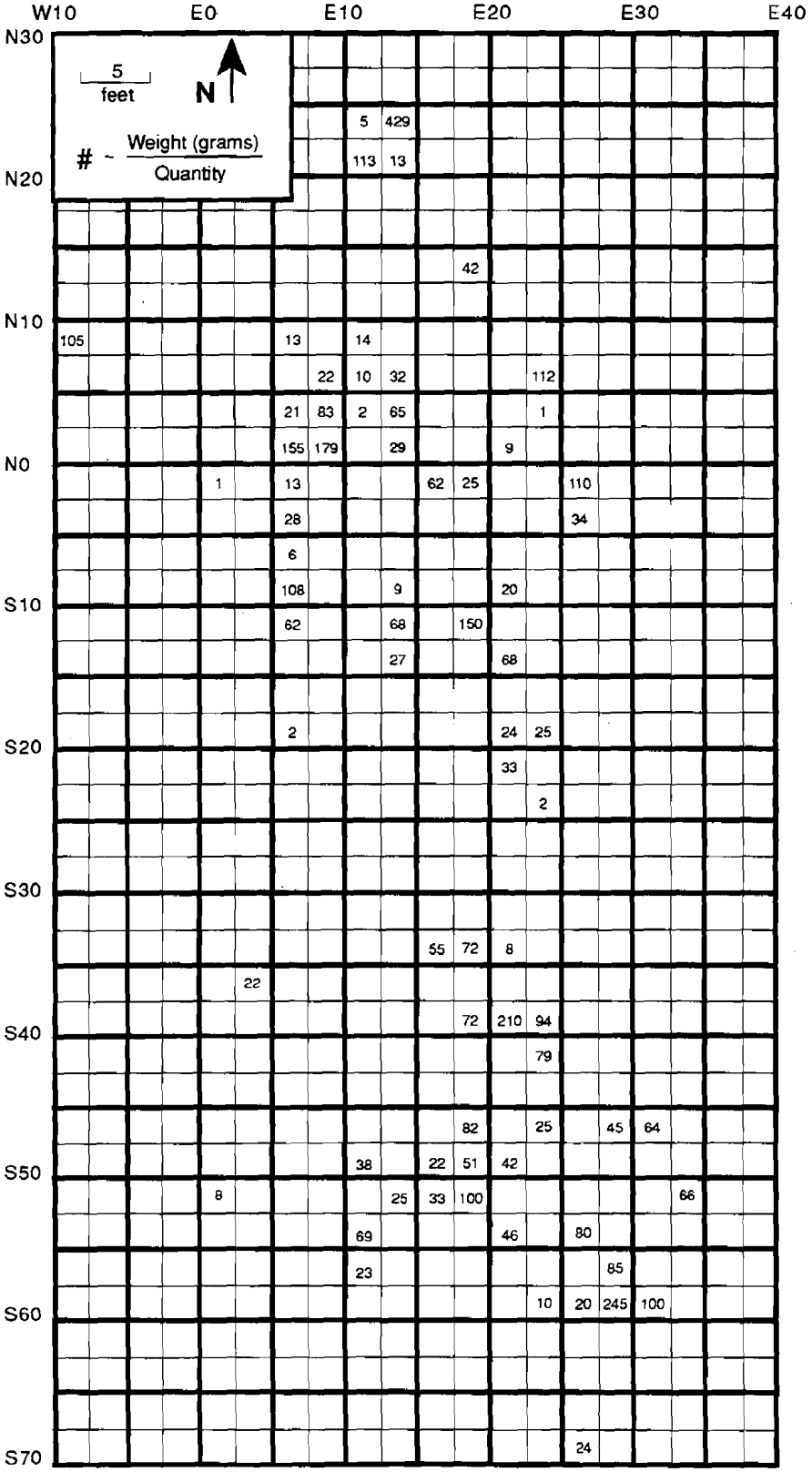


Figure 106 shows a typical stratigraphic sequence at the site which was taken from the north walls of Test Units N45W10, N45W5, and N45E0 in the northern part of the site. These units were excavated to a depth of 1.5 feet below surface. As would be expected from a surface soil, excavation Level 1 contained an "A" Horizon of dark brown organic sandy silt. Beneath this horizon was a shallow "B1" Horizon of light brown sandy silt underlain by a slightly deeper "B2" Horizon of yellow-brown sandy silt. Historic artifacts consisting of redware, stoneware, bottle and window glass, brick fragments, and nails were present down through the "B2" Horizon in these units to a depth of approximately 1.0 foot below surface, and prehistoric artifacts consisting of flakes and fire-cracked rocks were encountered to a depth of approximately 1.25 feet below surface. At approximately 1.25 feet below surface, a culturally sterile "B3" soil horizon consisting of reddish yellow-brown sandy silt was reached. No pebbles or gravels were observed throughout the profiles, thus making it difficult to classify the different soils in terms of their age or the circumstances of their deposition. However, the presence of artifacts throughout the various upper soil horizons suggests that these soils may have been deposited during the Holocene by means of aeolian and cultural processes. There were no diagnostic artifacts present in these particular units, and no diagnostic artifacts dating prior to the Woodland I Period (ca. 3000 B.C. - A.D. 1000) were present in any part of the site.

As previously suggested, the vertical integrity of the site is somewhat problematic. Initial Phase II testing of the site located the remains of a mid-eighteenth century agricultural tenancy (the Loockerman's Range site), which subsequent documentary research indicated had been occupied ca. 1723-1765 (Grettler et al. 1991). Diagnostic mid-eighteenth century ceramics were recovered from intact contexts and eight historic features were located (Figure 107). In addition to the presence of the historic component, root and rodent activity was present throughout the core area of the site. Finally, the eastern limit of the site abutted a large, inaccessible area of heavy brush and fallen timber - the result of the area being cleared by bulldozers in preparation for a proposed parking lot.

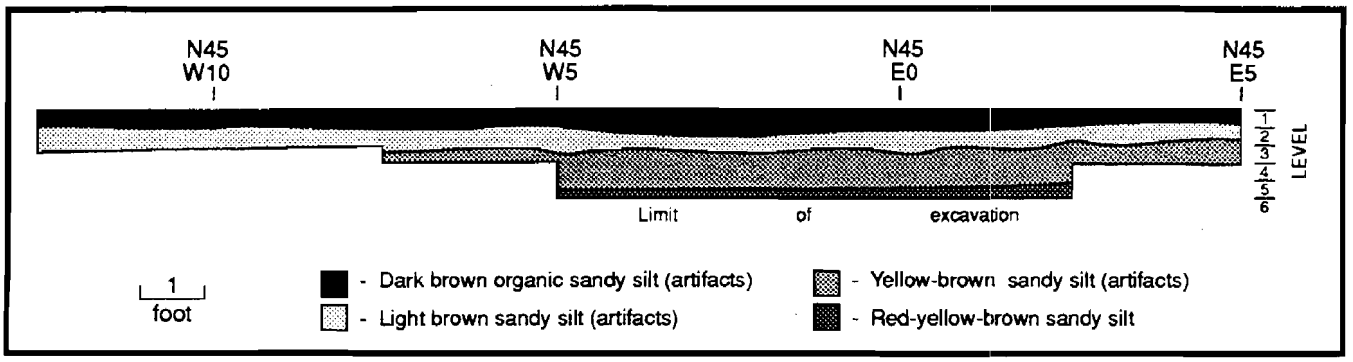
In an attempt to determine whether the prehistoric artifact assemblage resulted from a single occupation or multiple occupations, and to assess the degree of disturbance of the prehistoric component, artifact densities were examined by .25 foot levels to see if the configuration implied distinct living floors. Figure 108 shows a comparison of the vertical position of historic versus prehistoric artifacts. Ninety percent of all historic artifacts were recovered from the first two excavated levels. Although one historic artifact was found as deep as Level 6 (1.25' to 1.50' below surface), there is a substantial drop in frequency below Level 2. A graph of their vertical distribution results in an "inverted triangle" indicative of the natural migration of artifacts through a soil profile. It is quite likely that the root disturbances translocated historic artifacts from the upper layers into deeper levels of subsoil.

The vertical location of prehistoric artifacts is quite different from that of historic artifacts, showing a much more even distribution. Instead of an inverted triangle, the percentage of artifacts recovered actually increases in the first two excavated levels below humus, thus creating a battleshape distribution curve, and 62 percent of their total number were found below historically disturbed levels. It is likely that some downward movement of prehistoric artifacts has taken place through the same processes which moved the historic artifacts. Evidence for this inference can be seen in Test Unit N50E0 where the heavier proximal section of a biface broken in the course of manufacture (Figure 109) was deposited in Level 2, whereas the smaller tip was located in Level 4 of the same unit.

In a further attempt to determine whether the distributions represented occupation levels, specific classes of artifacts were traced through the profile. By far, the predominant artifact class at the site was quartzite debitage, representing 90 percent of the prehistoric artifact assemblage. Seventy-seven percent of the quartzite debitage was concentrated in nine contiguous test units (N60W5, N60E0, N60E5, N55W5, N55E0, N55E5, N50W5, N50E0, and N50E5). Figure 110 shows the vertical distribution of quartzite flakes in these test units by

FIGURE 106

Typical Stratigraphic Profile, North Walls of Test Units N45W10, N45W5, and N45 E0, Dover Downs Site, Hill B (7K-C-365B)



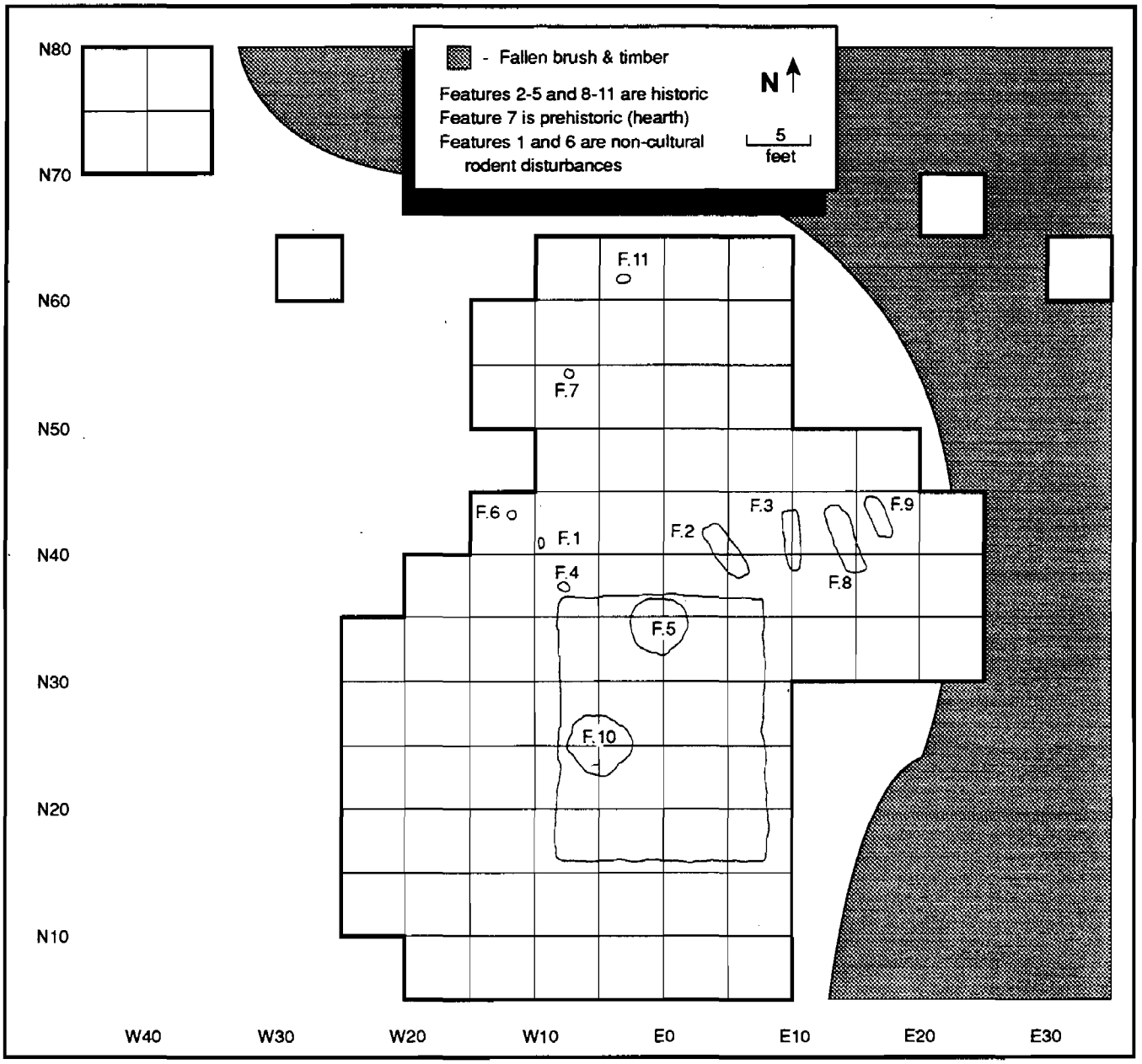
level. This distribution shows that the concentrations persist down through the profile, although the majority of units show Level 3 to have a generally higher density of quartzite flakes. There are, however, a few exceptions to this pattern. The densest level in Test Units N60E5 and N50E0 was Level 4, and the densest level in Test Units N55E5 and N50W5 was Level 2. The slight increase in Level 4 may represent either a separate chipping episode or a natural migration of artifacts that was facilitated by the prominent root disturbances in this portion of the site. The increase of quartzite flakes in Level 2 may represent the accretion of flakes from Level 3. Excavation levels 2, 3, and 4 comprise a single soil horizon, the "B2" Horizon. These levels together, therefore, may encompass a single prehistoric occupation, which has been somewhat compromised by the historic occupation and root activity.

Another artifact class examined in light of the concern over stratigraphic integrity was that of steatite bowl fragments. The seven fragments of steatite from the Hill B assemblage were located variously in excavation levels 1, 3, 4, and 5 in three test units (N50E0, N55W5, and N60E0). All of these fragments are too small (1.2-2.5 cm) to determine whether they were broken parts of a single finished product or chipped pieces from the process of manufacture. All fragments, however, are very similar in appearance and may have come from a single vessel. Four of the fragments were found in the same level (Level 3) of one test unit (N60E0). All of the fragments are medium gray in color, mottled with white and show crystalline and mica inclusions. Striations are present on the smooth surface of five of the pieces. The rough exterior surfaces are grainy and granitic in appearance. If these fragments are from a single vessel, it would appear that their context has been somewhat disturbed. Root disturbance was prominent in the area of the test units containing steatite fragments and may have facilitated the translocation of these small fragments.

A final class of artifacts to consider in the discussion of stratigraphic integrity is diagnostic projectile points. Only eight projectile points were recovered in the Phase II testing, six of which are stemmed varieties dating to the Woodland I Period, and two of which are triangular points diagnostic of the Woodland II Period. These points will be discussed in greater detail in the section on chronology. For the purpose of the present discussion, it is necessary to note that these stemmed varieties can be dated only in general to the Woodland I Period (ca. 3000 B.C. to A.D. 1000), not to any specific culture complex. Similarly, the triangular points can only be dated in general to the Woodland II Period (ca. A.D. 1000 to A.D. 1650). Figure 111 shows an illustration of the excavated diagnostic points, and Figure 112 shows the test units in which the points were located and the excavation levels from which they were recovered. The majority of stemmed points were located in Level 1, however two of these points were located in Level 2 (Figure 112). In one unit, N35E5, a stemmed point and a triangular point were both present in Level 1. The vertical placement of these artifacts further confirms that mixing has occurred, at least in the upper levels. In sum, prehistoric artifacts in stable, intact soils are present, but much of the site has been disturbed by root activity and the historic occupation to varying depths.

FIGURE 107

Location of Features 1-11 and Possible Domestic Structure, Dover Downs Site, Hill B (7K-C-365B)

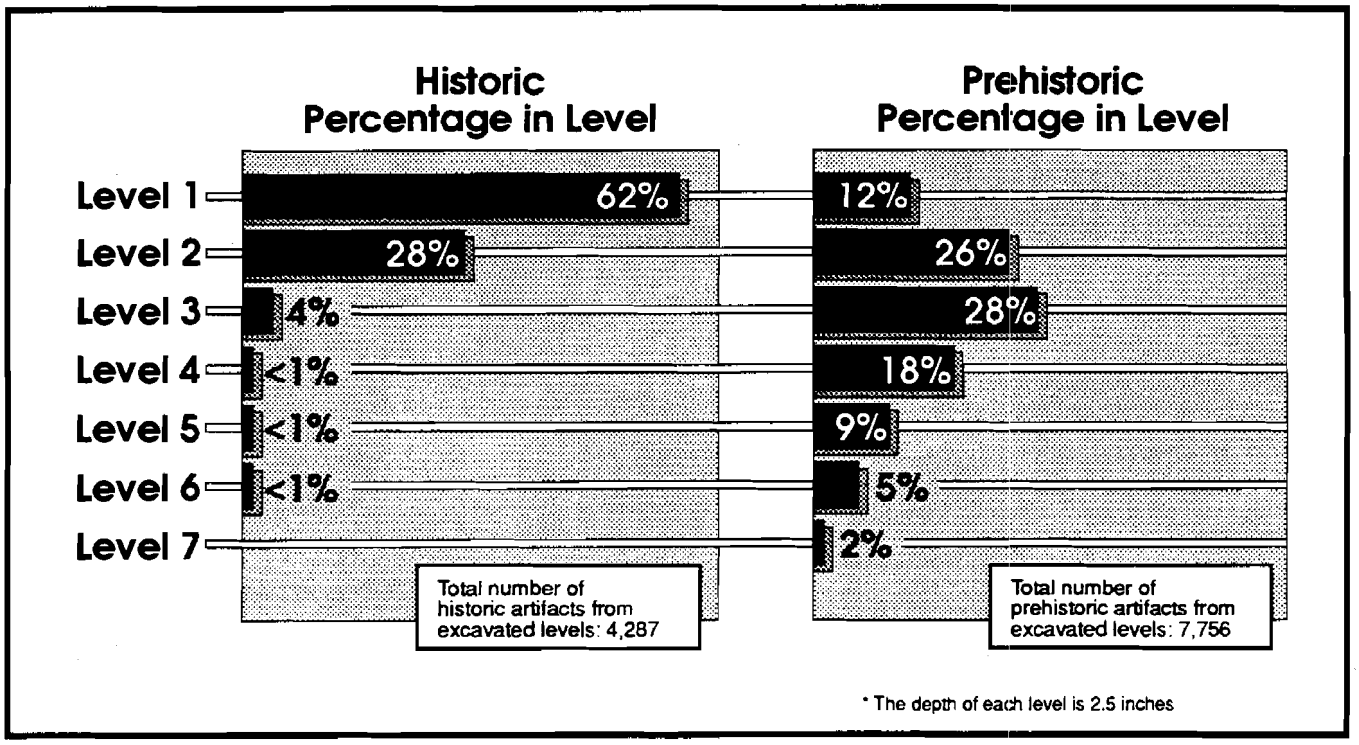


EXCAVATED ARTIFACTS

A summary catalog of excavated artifacts is contained in Table 26. A total of 8,132 lithic artifacts were recovered in the Phase II excavations, including projectile points, bifaces, cores, a hammerstone, and steatite bowl fragments. The largest single class of artifacts in the assemblage (90%) consisted of quartzite flakes.

FIGURE 108

Historic and Prehistoric Artifact Counts by Level, Dover Downs Site, Hill B (7K-C-365B)



FEATURE EXCAVATIONS

During the course of Phase II excavations at Hill B, 11 features were located (Figure 107). Only one of these features can be classified as prehistoric; the remainder consist of historic features and non-cultural rodent disturbances (Grettler et al. 1991). The prehistoric feature (Feature 7), a hearth, was found .5 feet below surface in Test Unit N50W10. The northern edge of the feature extended into Test Unit N55W10. The feature consisted of 11 fire-cracked rocks and charcoal flecks to a depth of approximately .7 feet below surface. A plan view of Feature 7 is shown in Figure 113. Additional prehistoric artifacts from the feature consisted of one jasper flake, one quartz flake, 14 quartzite flakes, and a battered hammerstone in two pieces (Figure 114). No diagnostic artifacts were present.

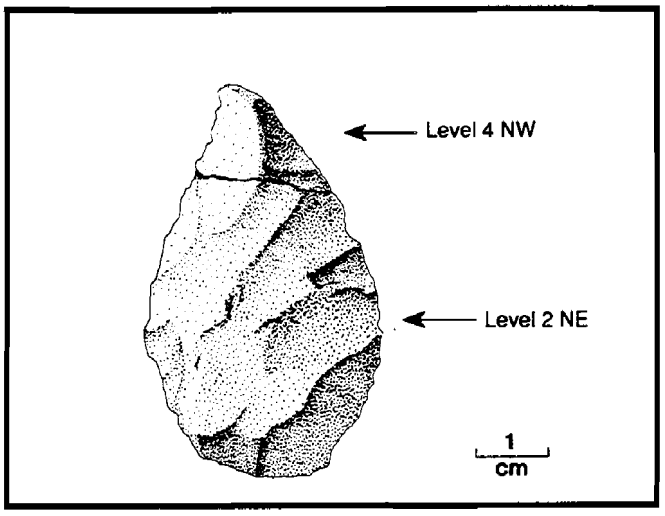
FLOATED ARTIFACTS AND ECOFACTS

Flotation samples were retained from 14 5' x 5' test units at Dover Downs, Hill B. All soil from one 2.5' x 2.5' square quadrant from each of these units was saved by .25 foot level and was returned to the lab for processing. All samples were processed using a water driven flotation tank with heavy fractions being collected in window mesh sized screen and light fractions collected in a silk bag. After drying, all artifacts and ecofacts were removed and cataloged.

Table 27 shows a summary of all artifacts recovered from the heavy fraction as well as the light fraction. The majority of artifacts consist of debitage with a relatively substantial amount of charcoal included. One charred pokeberry seed (Phytolacca americana), one unidentifiable charred seed, and three unidentifiable nut hull fragments were also recovered from figure 110 the flotation samples. This

FIGURE 109

Broken Biface from Levels 2 and 4 of Test Unit N50E0, Dover Downs Site, Hill B (7K-C-365B)



sample of ecofacts is too small to enable any inferences regarding seasonality of site occupation or plant resource utilization.

Table 28 shows a comparison of raw material frequency between debitage recovered from flotation and debitage recovered from 1/4-inch screens. No notable differences exist between the assemblages. The percentage of chert recovered from flotation is slightly higher than that from 1/4-inch screens, which may indicate a degree of tool edge maintenance on late stage or finished bifaces. Resharpening is particularly necessary on cryptocrystalline materials to maintain sharp tool edges. A few such tools were present in the Hill B assemblage. The generally high incidence of quartzite debitage in the 1/4-inch screen assemblage is likely due to the fact that relatively large preforms were necessary for the production of bifaces and other tools. Chipping of quartzite cores to produce such flakes appears to have been the primary focus of activity at the site. The prominence of quartzite in the flotation assemblage may be a result of the fracturing characteristics of quartzite which produces more small fragments when broken than does lithic material with a finer crystalline structure. There were no examples of argillite, ironstone or other materials in the flotation debitage, and only fractional percentages of these materials were present in the 1/4-inch mesh assemblage.

BLOOD RESIDUE ANALYSIS

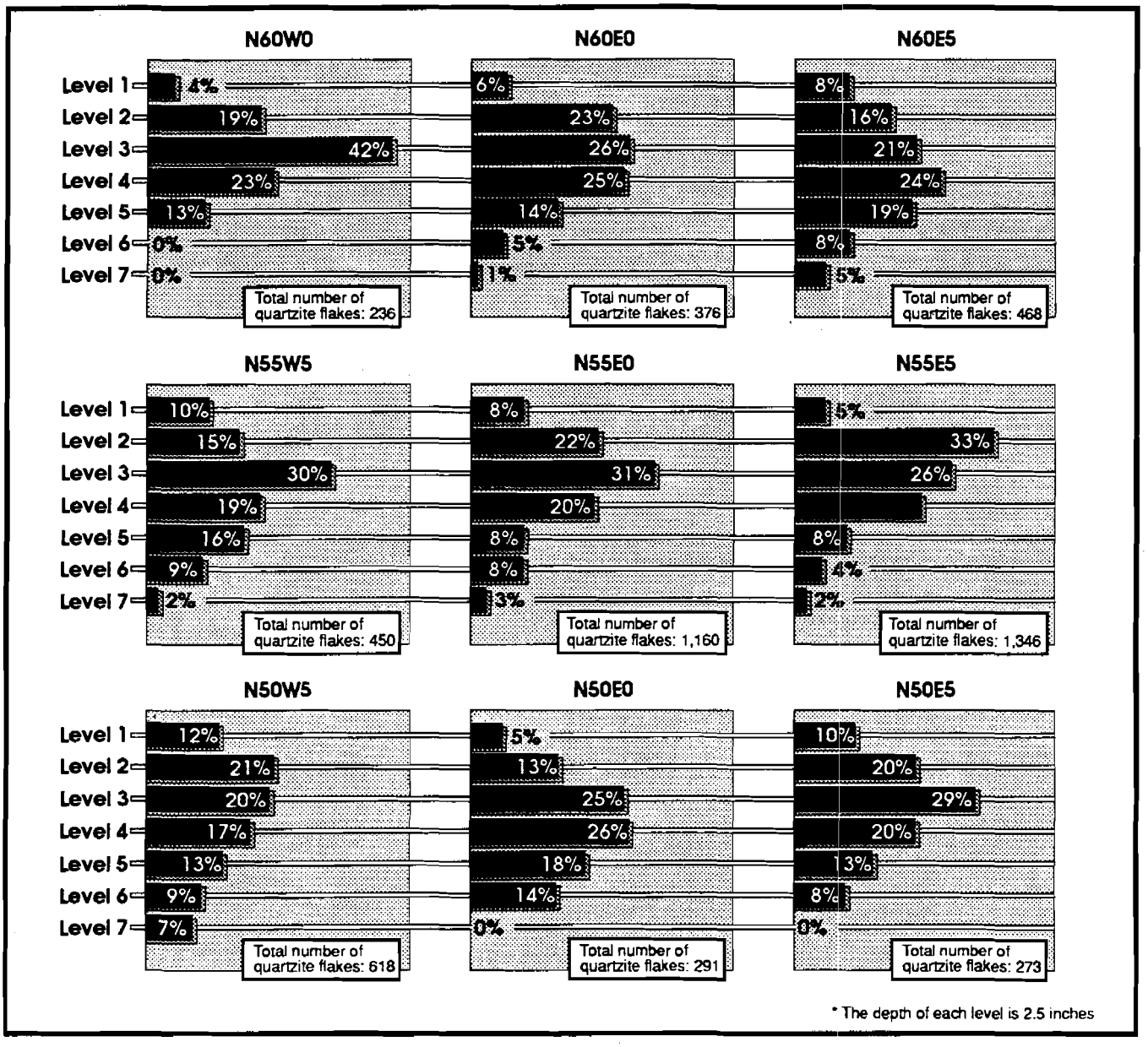
Tests to determine the presence or absence of blood residue on lithic artifacts were undertaken using protocols developed by the University of Delaware Center for Archaeological Research (Custer, Ilgenfritz, and Doms 1988). Results of the tests are summarized in Table 29. Soil and pebble samples were tested to control for the possibility of contamination at the site. All of these samples tested negative, indicating that any positive reaction found on artifact surfaces would be a reliable indication of the presence of blood residue. Eighteen tools from the site (bifaces, utilized flakes, and flake tools) and 15 pieces of debitage showing no apparent edge wear were tested. The test was frequently applied to several loci on each tool for a total of 85 tests on 33 artifacts. Positive results were obtained from one test on one artifact, a quartz early stage biface reject from Level 1 of the southeast quadrant of Test Unit N40W10 (Figure 115-B). It appears, then, that at least some butchering was being conducted at the site, and the positive reading obtained from the tool was not a "false positive" resulting from soil contamination.

SITE CHRONOLOGY

Discussions of site chronology will consider both the age of the site and its duration of occupation. Because no organic material suitable for a radiocarbon date was recovered, the site's relative age and placement in regional cultural chronologies will be based on diagnostic artifacts. Diagnostic artifacts from the Dover Downs site, Hill B consist only of projectile points; no prehistoric ceramics were found at the site. However, seven steatite fragments, probably from a stone bowl, were found in three separate test units in the northern part of the site. As previously discussed, steatite was utilized during the early Woodland I Period for the manufacture of carved stone bowls (Ward and Custer n.d.) and has been associated with the

FIGURE 110

Vertical Distribution of Quartzite Debitage, Dover Downs Site, Hill B (7K-C-365B)

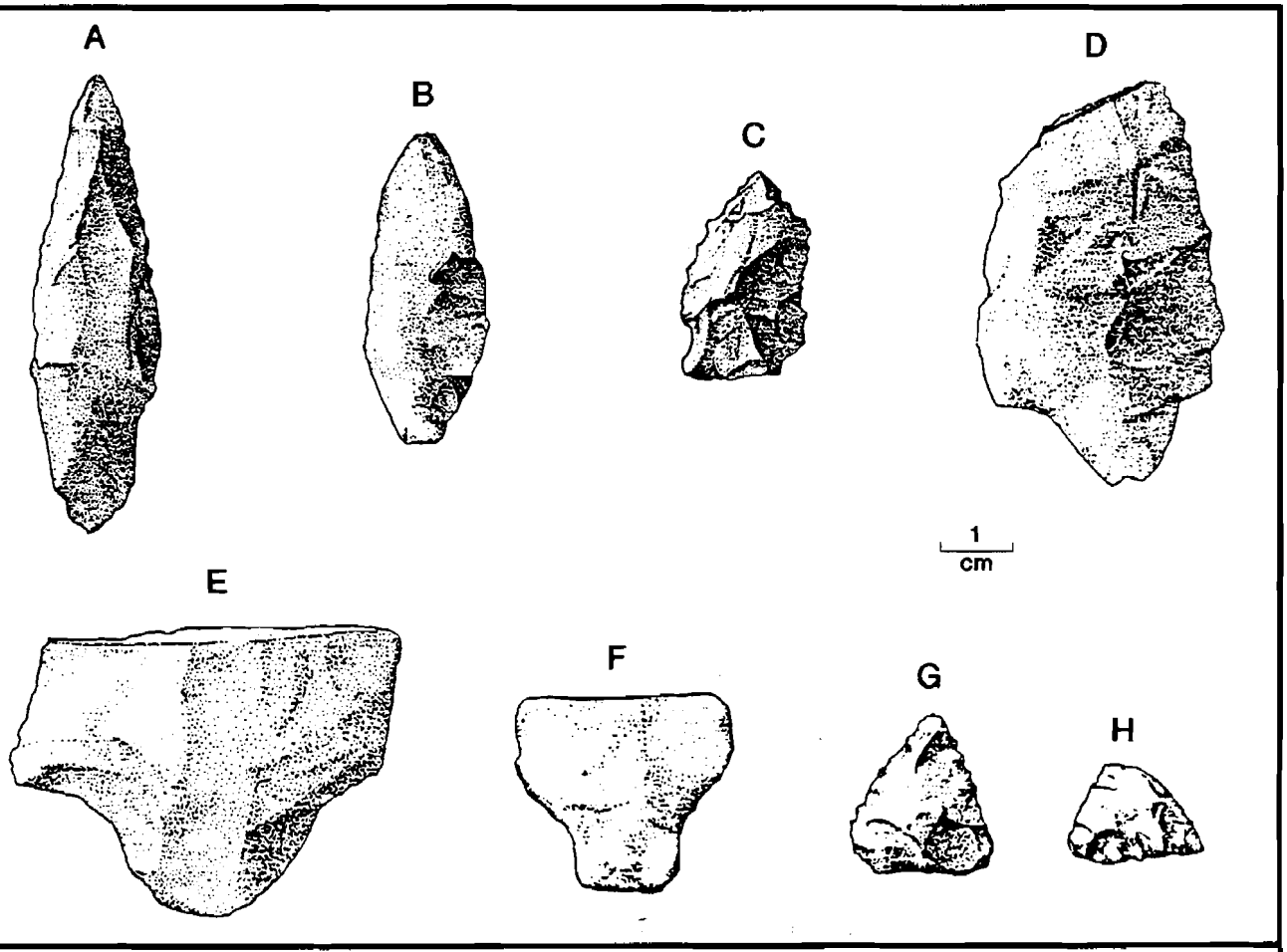


Clyde Farm and Barker's Landing complexes in the Low Coastal Plain of Delaware (Custer 1984c).

Figure 111 shows the projectile points recovered from the site. Two of the projectile points (Figure 111-A and B) are narrow-bladed, contracting stem forms, which roughly correspond to the standard types, Poplar Island and Lackawaxen (converging stem) (Ritchie 1961; Kinsey 1972:410). Kinsey (1959:128-129) has noted the association of the Poplar Island variety with steatite bowls, placing this variety contemporaneous with their use in the Late Archaic. Custer (1984a:109) has noted a similar affiliation of Lackawaxen points with steatite bowl fragments at the Barker's Landing Site (7K-D-13), which may also indicate an early Woodland I association. One of the points (Figure 111-A) is made from ironstone, which Ward (1985, 1988) has noted to be most frequently utilized during initial Woodland I times.

FIGURE 111

Projectile Points, Dover Downs Site, Hill B (7K-C-365B)



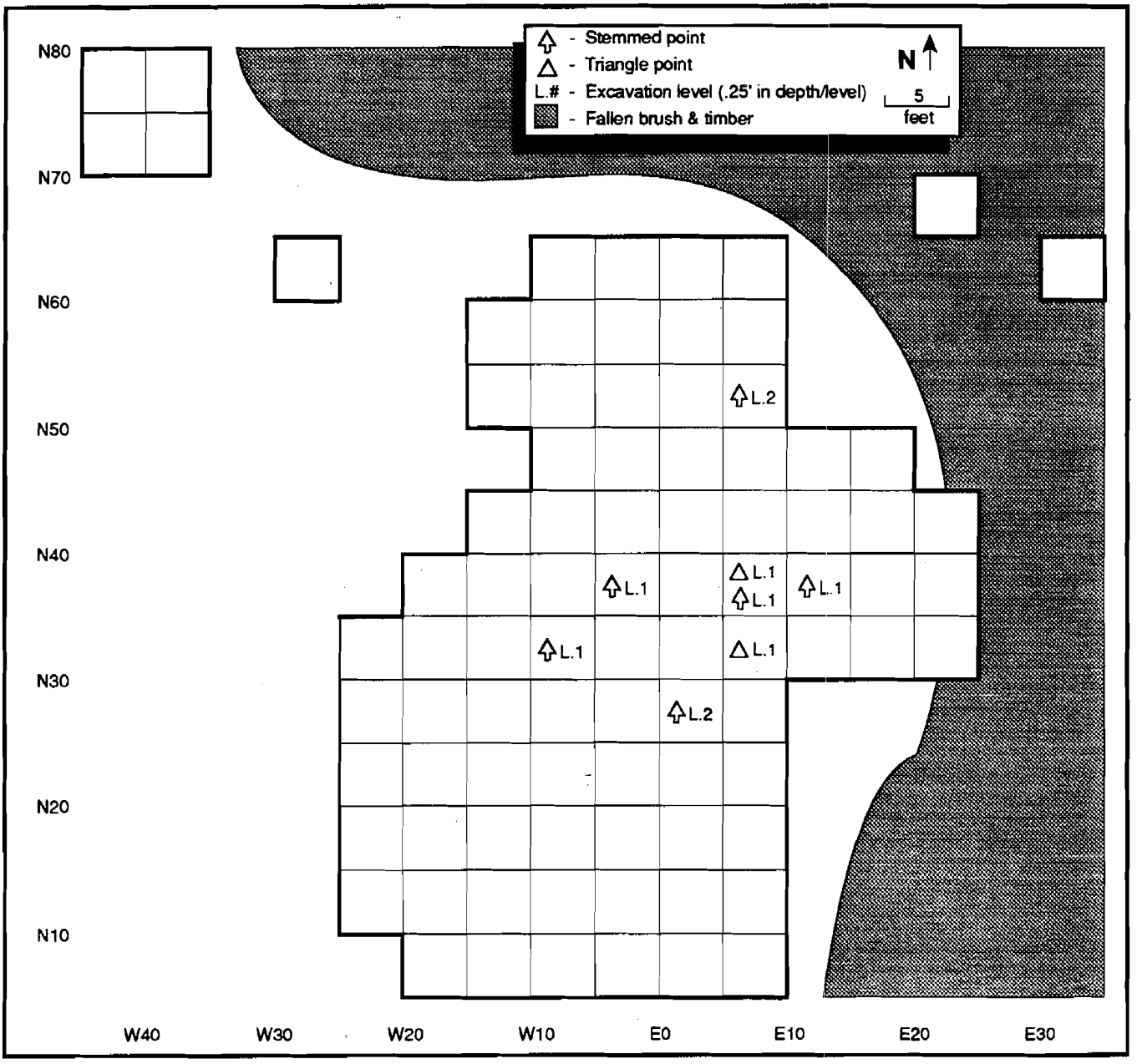
A - N35 E5, Ironstone Woodland I point
B - N50 E5, Quartzite Woodland I point
C - N30 W10, Chert Woodland I point
D - N25 E0, Quartzite Woodland I point
E - N35 W5, Quartzite Woodland I point stem
F - N35 E10, Argillite Woodland I point stem
G - N30 E5, Chert Woodland II point
H - Feature 2 North 1/2, Jasper Woodland II point
*Artifacts shown actual size

Narrow-bladed contracting stem points were described by Witthoft (1959:82-83) as being a component of an Archaic "cultural tradition" which he labeled "Poplar Island," and the term has since been used to describe projectile points of similar morphology (Kinsey 1972; Ritchie 1961, 1969:224). Other varieties of stemmed points, such as Bare Island and Lackawaxen, have also been regarded as representing individual stages or components of the Archaic Period, particularly the Late Archaic (Kinsey 1959, 1972:335, 337). Additionally, these various styles of stemmed points have been described as being temporally discrete, with a known chronology (Kinsey 1972:411). While these distinctions may have relevance at individual sites, other research has indicated that they are not applicable over large geographic regions.

As previously discussed, excavations at the Hawthorn site (7NC-E-46), a Woodland I procurement site consisting of a well documented single occupation (Custer and Bachman 1984), the Clyde Farm site (7NC-E-6A), the Boni site (Morris 1974:11-12), and the Lerro Farm site (Blenk 1977:24-25), suggest that in many areas these various stemmed point forms are contemporaneous.

FIGURE 112

Location of Stemmed and Triangle Points, Dover Downs Site, Hill B (7K-C-365B)



Custer and Bachman (1984), therefore, caution that the traditionally held view that ascribes a single point style to a single group in time may not be the most judicious method for determining temporal sequence.

In light of these findings, the stemmed points from the Dover Downs Hill B assemblage are considered to be diagnostic only of the general period between 3000 B.C. and A.D. 1000, based on their association with a radiocarbon date from the Faucett site (Kinsey 1972:396) and their association with a radiocarbon date and Marcey Creek/Dames Quarter ceramics (1500 B.C. to 1000 B.C.; Artusy 1976:1-2) at the Clyde Farm Site (Custer, Watson, and De Santis 1987).

TABLE 26

Prehistoric Artifact Summary, Dover Down Site, Hill B (7K-C-365B)

	Quartzite	Quartz	Chert	Jasper	Argillite	Ironstone	Chalcedony	Other	Total
Flakes	7260(106)	375(53)	96(29)	260(60)	1	6(4)	51(23)	4	8053(275)
Utilized flakes	7(2)	1(1)	4(2)	3(1)	—	—	1(1)	—	16(7)
Flake tool	—	1	1	1	1	1(1)	—	—	5(1)
Woodland I points	3	—	—	1	1	1	—	—	6
Woodland II points	—	—	1	1	—	—	—	—	2
Early stage biface rejects	6(1)	1	1	—	—	—	1(1)	—	9(2)
Late stage biface rejects	—	—	—	1(1)	—	—	—	—	1(1)
Other bifaces	5	2	2	1	1	—	—	—	11
Miscellaneous stone tools	—	—	—	1	—	—	—	—	1
Cores	19(7)	—	2(2)	2(2)	—	—	2(2)	—	25(13)
Total	7300(116)	380(54)	107(33)	271(64)	4	8(5)	55(27)	4	8129(299)

	Total	Percent
Quartzite	7302(117)	89.80%
Quartz	379(60)	4.70%
Chert	107(33)	1.30%
Jasper	271(65)	3.30%
Argillite	4	0.05%
Ironstone	8(5)	0.10%
Chalcedony	55(27)	0.70%
Other	4	0.05%
Total	8130(307)	100.00%

1 Groundstone tool
1 Hammerstone (2 pieces)
7 Steatite bowl fragments
184 Fire-cracked rocks (11.54g)

Also included in the assemblage is a small weakly side-notched chert point (Figure 111-C). It is difficult to place this point in any specific typological category because the tip and one "ear" of the base have been broken off. However, this point resembles those found at other Woodland I Period sites (Werner 1972; Kinsey 1972) and, as such, is not considered particularly diagnostic (Custer 1984a:85; Kinsey 1972:443-444; Custer and Bachman 1984:61-62).

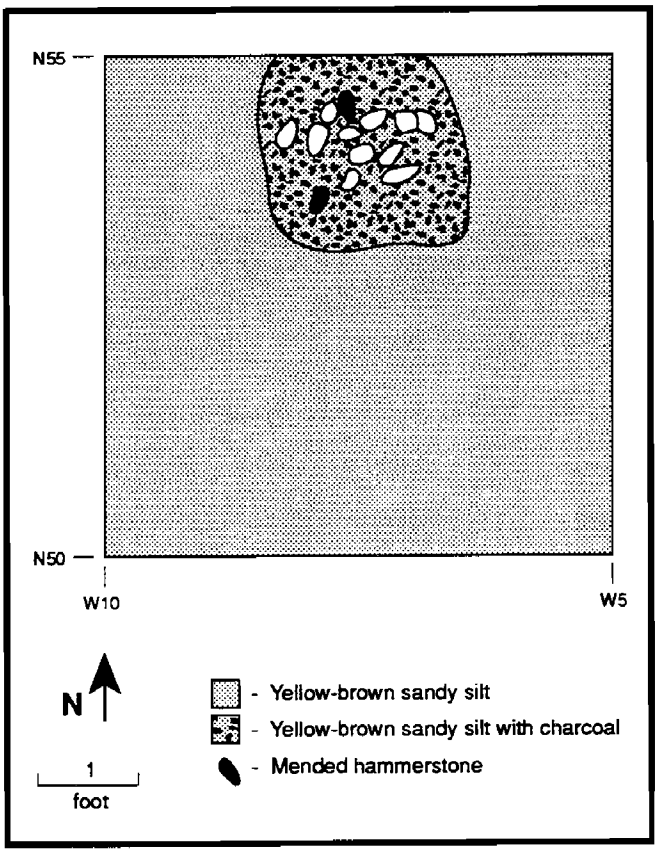
The next group of projectile points from the Hill B assemblage consists of three broad-bladed points. Two of these points (Figure 111-D and E) were made of quartzite and have contracting stems. The third point (Figure 111-F) was made from argillite and has a straight stem. All of these blades measured between 30 mm and 50 mm wide. Two of the points have transverse medial fractures, and the third point has a tip fracture, thus length measurements could not be taken. One of these points, Figure 111-D, resembles the Lehigh/Koens Crispin/Snook Kill broadspear types described by Kinsey (1972:20) and Ritchie (1961). Another of the broadspears, Figure 111-E, resembles the Savannah River variety. Kinsey (1972:426) notes that these "corner-removed" varieties described by Witthoft for the Long site (Witthoft 1959:81-83) are part of a "family of similar and closely related Late Archaic broad points," including Lehigh/Koens Crispin, Snook Kill, and Savannah River stemmed points. Dates for these point varieties range from 1800 B.C. to 1600 B.C. (Kinsey 1972:425-426; Ritchie 1961:47-48; Coe 1964:44-45; and Custer 1992). In general, broad-bladed projectile points appear in the tool kits of the Delmarva Peninsula at approximately 2000 B.C. and are absent by 1000 B.C. (Custer 1989:155-165).

The final projectile points from the Hill B assemblage are two triangular-shaped points (Figure 111-G and H), a type ascribed in general to the Woodland II Period (ca. A.D. 1000 - A.D. 1650). By A.D. 1000, the very small triangular points, such as those in the Hill B

FIGURE 113

Plan View of Feature 7,

Dover Downs Site, Hill B (7K-C-365B)



assemblage, were the only styles seen in prehistoric tool kits (Kinsey 1972:441-443; Ritchie 1961:31-33; Custer 1984a:148).

All of the points in the Hill B assemblage were recovered from historically disturbed Levels 1 and 2. The relatively intact Level 3 contained four steatite bowl fragments in a single unit. However, additional steatite fragments were found in other root disturbed units in Levels 1, 4, and 5, indicating that some transport through the profile may have been facilitated by root activity. Furthermore, a stemmed point and a small triangular point were found together in Level 1 of one unit (Figure 112).

As discussed previously, seven fragments of steatite were also present in the Hill B assemblage in excavated levels to a depth of 1.25 feet below surface. Kraft (1970:55-56) and Artusy (1976:2) have ascribed a date range from 1900 B.C. to 1200 B.C. for steatite bowls.

In sum, the absence of radiocarbon dates at the site and the lack of ceramic wares forces reliance on diagnostic point types and steatite bowl fragments for determining the age of the site. Stemmed points have been shown to lack the temporal "sensitivity" sometimes attributed to them, and can best be applied only to the general time frame of 3000 B.C. to A.D. 1000. The large broad-bladed projectile points have a similarly general, though somewhat narrower horizon extending from approximately 2000 B.C. to 1000 B.C. However, varieties similar to those found at Hill B have been previously ascribed to a more tightly defined period from 1800 B.C. to 1600 B.C. In addition, steatite bowl fragments have been dated to a period ranging from 1900 B.C. to 1200 B.C. These dates may also represent the range in which the Woodland I occupation of Hill B occurred. Dates on side-notched points fall within the general Woodland I range. Small triangular points can be ascribed only in general to the period spanning A.D. 1000 to A.D. 1650. A Woodland I date (3000 B.C. to A.D. 1000) is therefore attributed to the main occupation of the Dover Downs site, Hill B, with a Woodland II occupation (A.D. 1000 to A.D. 1650) present in Level 1.

TECHNOLOGIES: STONE TOOL MANUFACTURE AND USE

This section of the report will interpret the excavated artifacts with regard to the stone tool manufacturing technologies and stone tool use taking place at the Dover Downs site, Hill B. Bifaces, projectile points, and debitage will be considered in the context of tool manufacturing activities, and this information, combined with analysis of other artifact types, will be used to infer stone tool functions. The various lithic raw materials utilized at the site will also be considered as they reflect lithic procurement strategies. In addition, the results of attribute tests on samples of debitage from three areas of the site will be discussed.

Three of the basic categories of bifaces were noted from the Dover Downs site, Hill B based on the work of Callahan (1979). The first category includes early stage biface rejects,

TABLE 27

Artifact Flotation Sample, Dover Downs Site, Hill B (7K-C-365B), (N20W5, N25E5, N30E0, N30E5, N30W5, N30W15, N40E5,N40W5, N40E15, N40W15, N45W5, N50E5, N50W5, N55E5)

Heavy Fraction		**Light Fraction**	
Lithic Artifacts		Charred Seeds	
Quartzite flakes	208	Pokeberry (*Phytolocca americana*)	1
Quartz flakes	15	small nut hull fragment	2
Chert flakes	9	spores	20
Jasper flakes	11(1)		
Chalcedony	6	Charcoal	7.71g
Charred Seeds			
1 mm semi-spherical seeds	10		
Unidentifiable nut hull fragments	1		
Spores	5		
Charcoal	182.83g		

TABLE 28

Raw Material Frequency: Flotation vs. 1/4-Inch Mesh Screen, Dover Downs Site, Hill B (7K-C-365B), (N20W5, N25E5, N30E0, N30E5, N30W5, N30W15, N40E5, N40W5, N40E15, N40W15, N45W5, N50E5, N50W5, N55E5)

	Flotation			**Screen**	
Quartzite	208	84%	Quartzite	7260 (106)	90%
Quartz	15	6%	Quartz	375 (53)	5%
Chert	9	4%	Chert	96 (29)	1%
Jasper	11 (1)	4%	Jasper	260 (60)	3%
Chlcedony	6	2%	Chlcedony	51 (23)	<1%
Argillite	0	0%	Argillite	1	<1%
Ironstone	0	0%	Ironstone	6 (4)	<1%
Other	0	0%	Other	4	<1%
Total	249 (1)	100%	Total	8,053 (275)	100%

KEY: ( ) = cortex

which are bifaces that do not pass beyond the initial steps of stone tool production due to either material flaws or manufacturing error. The second category is late stage biface rejects, which are bifaces broken during the later stages of manufacture. The final category includes late stage biface discards, which are nearly completed bifaces damaged during their use as tools. No early stage biface discards were found at the site. Additional fragments of bifaces not identifiable by stage are included in the assemblage. Projectile points were also classified as rejects and discards.

FIGURE 114
Hammerstone from Feature 7, Dover Downs Site, Hill B (7K-C-365B)

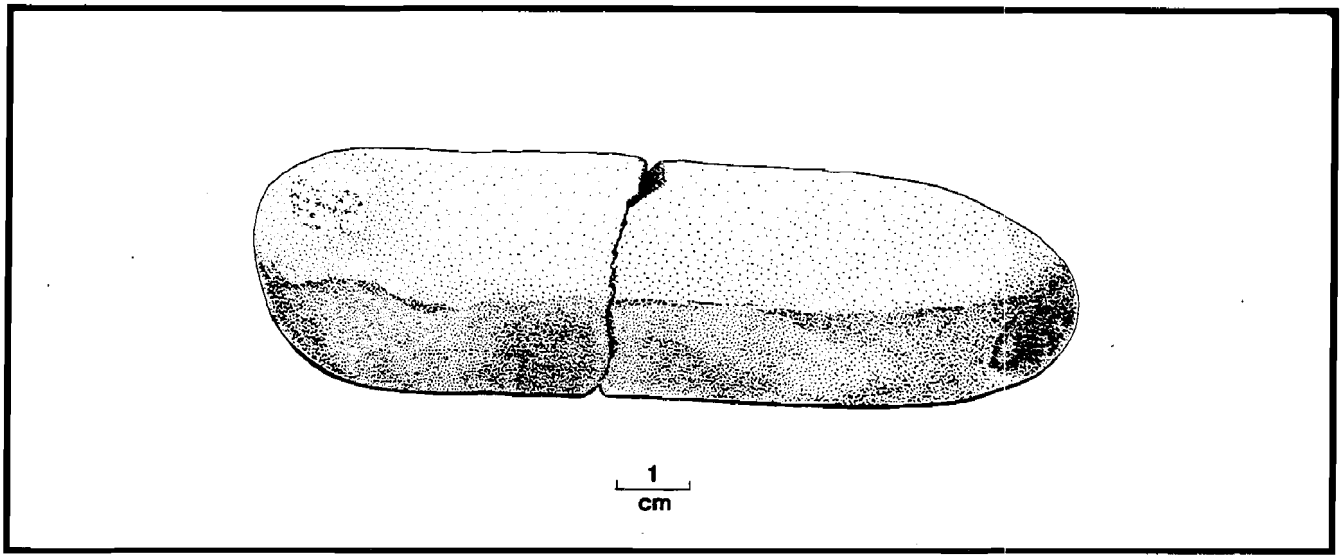


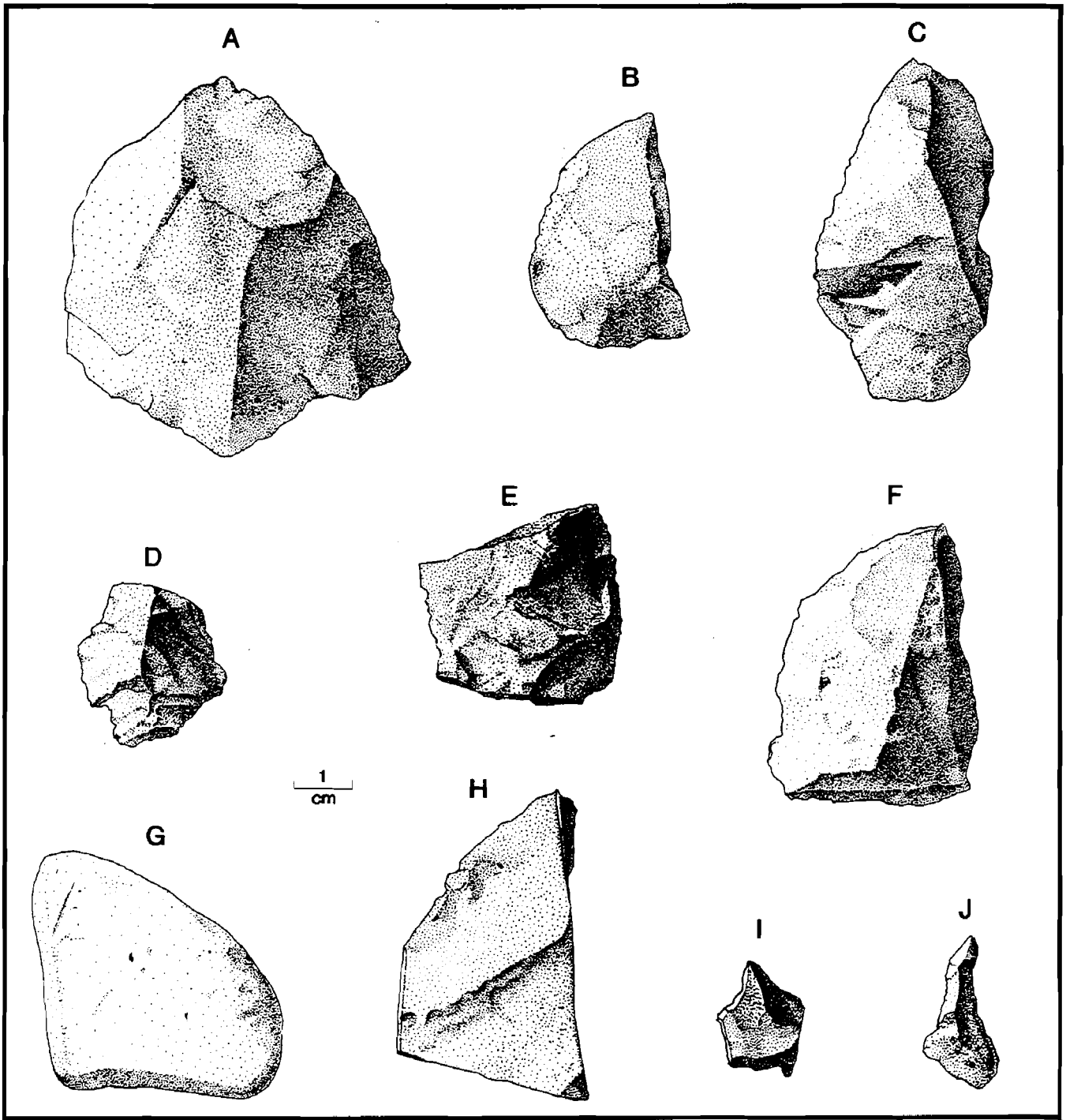
TABLE 29
Summary of Blood Residue Analysis, Dover Downs, Hill B (7K-C-35B)

Sample type	Number of samples	Number of tests conducted	Number of samples showing Positive reaction	Number of samples showing Negative reaction
Debitage	15	36	0	15
Tools	18	49	1	17

Table 30 shows a cross tabulation of the biface and point manufacturing stages and raw materials, as well as the presence of cortex. Three of the five bifaces with cortex were made from cryptocrystalline materials commonly occurring in local cobble beds. One biface with cortex is a quartzite early stage biface reject collected from the surface. The final biface with cortex is a quartz early stage biface reject. Since most of the bifaces were made from quartzite obtained at a primary source, the cortical surfaces were probably removed at the source of initial procurement. The number of early stage biface rejects in the assemblage is significantly greater than late stage biface rejects, indicating that the activity of reducing primary bifaces and cores into replacement tools was an important activity at the site. While it is likely that some of these bifaces were used as tools in this form, many appear to have been rejected due to manufacturing errors (transverse medial fractures). Although surface detail is frequently poor on quartzite, flake scars are still visible. Scars indicating the use of these bifaces as tools are absent.

FIGURE 115

Sample of Artifacts from Area A, Dover Downs Site, Hill B (7K-C-365B)



A - N35 W10, Level 2 SE, Quartzite core
B - N40 W10, Level 1 SE, Quartz early stage biface **reject**
C - N40 E0, Level 3 NW, Quartzite early stage biface **reject**
D - N40 W5, Level 2 SE, Chert biface fragment
E - N40 E15, Level 1 NW, Quartzite biface fragment
F - N25 W15, Level 2 NW, Chert biface fragment
G - N40 W15, Level 2 NE, Argillite flake tool
H - N35 W10, Level 2 SE, Ironstone flake tool
I - N25 W5, Level 2 SE, Chert punch/graver
J - N25 W5, Level 1 SE, Jasper drill
* Artifacts shown actual size

TABLE 30

Biface Types and Raw Material, Dover Downs Site, Hill B (7K-C-365B)

Points	Quartzite	Quartz	Chert	Jasper	Argillite	Ironstone	Chalcedony	Total
Contracting stem	3	---	---	---	---	1	---	4
Straight stem	---	---	---	---	1	---	---	1
Side notched	---	---	1	---	---	---	---	1
Triangle	---	---	1	1	---	---	---	2
Bifaces								
Early stage biface reject	6(1)	2(1)	1	1(1)	---	---	1(1)	11(4)
Late stage biface reject	---	---	---	1(1)	---	---	---	1(1)
Miscellaneous bifaces	5	2	2	1	1	---	---	11
Total	14(1)	4(1)	5	4(2)	2	1	1(1)	31(5)

The single late stage biface reject in the assemblage experienced a transverse medial fracture and was also apparently rejected due to manufacturing error. Although transverse medial fractures have been associated with the use of bifaces as butchering tools (Ahler 1971:84, 119-121), the absence of use-wear or resharpening scars suggests that these fractures are related to manufacture. Callahan (1979:73-80) illustrates bifaces with similar fractures which were broken during end and lateral thinning stages of manufacture.

All of the projectile points can be classified as discards. However, some qualification must be made with regard to the points made of quartzite and argillite. Use-wear characteristics are not well manifested or preserved in these materials, and it therefore remains possible that the damage suffered by these artifacts resulted from manufacturing error. Two of the stemmed points (Figure 111-E and F) have transverse medial fractures which could have resulted either from their use as butchering tools or knives, or from manufacturing errors. Both are broad-bladed varieties and are made from the above mentioned argillite and quartzite. Another stemmed point (Figure 111-D), also made from quartzite, has a tip fracture which could have resulted either from impact, from its use as a butchering tool, or from manufacturing error. It is least likely that the tip fracture resulted from impact because this point is a broad bladed variety which Custer and Mellin (1986) have concluded to be ineffective for use as projectile points for either impalement hunting and fishing, which require maximum penetration capacity, or for shock hunting, which requires sufficient penetration capacity to inflict a fatal wound. Based on analysis of an ethnographic sample of arrow and spearpoint specimens by Thomas (1978:469), Custer and Mellin (1986) have concluded that narrow-bladed projectile points less than 30 mm wide would have been the most reliably successful penetration devices. The broadspears in the Hill B assemblage, therefore, would fall outside the width range associated with optimum penetration, and it is therefore unlikely that they would have been manufactured for use as projectiles. Figure 111-D also shows that this particular point is somewhat asymmetrical in shape, indicating that it may have experienced some resharpening although it remains relatively thick. The tip fracture could have occurred in the process of manufacture, resharpening or from its use in a prying or twisting fashion as a butchering tool.

Of the two narrow-bladed varieties in the assemblage (Figure 111-A and B), the quartzite point is small and somewhat asymmetrical, and shows, under low power magnification, some crushing along one of its lateral edges. The point appears to have been made from a flake and

contains a small "hump" with step and hinge fractures on its ventral surface. Examination of the point's edge suggests that it was used, perhaps in cutting activities, before being discarded. The other narrow-bladed stemmed point appears to be in relatively good condition, but again, the ironstone material from which it is made makes it difficult to see detailed wear patterns. However, some chipping along the lateral edges is evident. This point may have been discarded because it was too narrow to sustain further resharpening. The final Woodland I point from the assemblage is a weakly side-notched point made from chert. This point had a tip and shoulder fracture which could have resulted from impact. On the other hand, even considering the missing tip, the point appears to be quite small and asymmetrical. Examination of the edge under low power magnification shows flattened and dulled edges with some chipping, indicating its possible use as a cutting tool. This tool, too, appears to have been discarded because of its damage and its small size, which would have precluded further resharpening. The two triangular points (Figure 111-G and H) are quite small and thin. Both show slight shoulder fractures which may have resulted from impact, and appear to have been discarded because of their small size from frequent resharpening.

In addition to bifaces, several prepared cores and cobble cores were also present at the site, the majority of which were quartzite. One distinct type of quartzite at the site was a gray and red variety, which was concentrated in four test units (N70W40, N70W45, N75W40, and N75W45) (Figure 116). Four of the five gray and red quartzite cores from these units contained cortex. Although this variety of quartzite was present in other parts of the site, it was present in very small quantities across the remainder of the site's core area. The majority of quartzite in the remainder of the core area ranged in color from light gray to yellow/tan to pink, and the cores were largely blocky cores in a range of sizes up to approximately 6 cm in diameter, most with no cortex present. Cores of cryptocrystalline chert, jasper, and chalcedony were also present at the site. All six of these cores contained cortex.

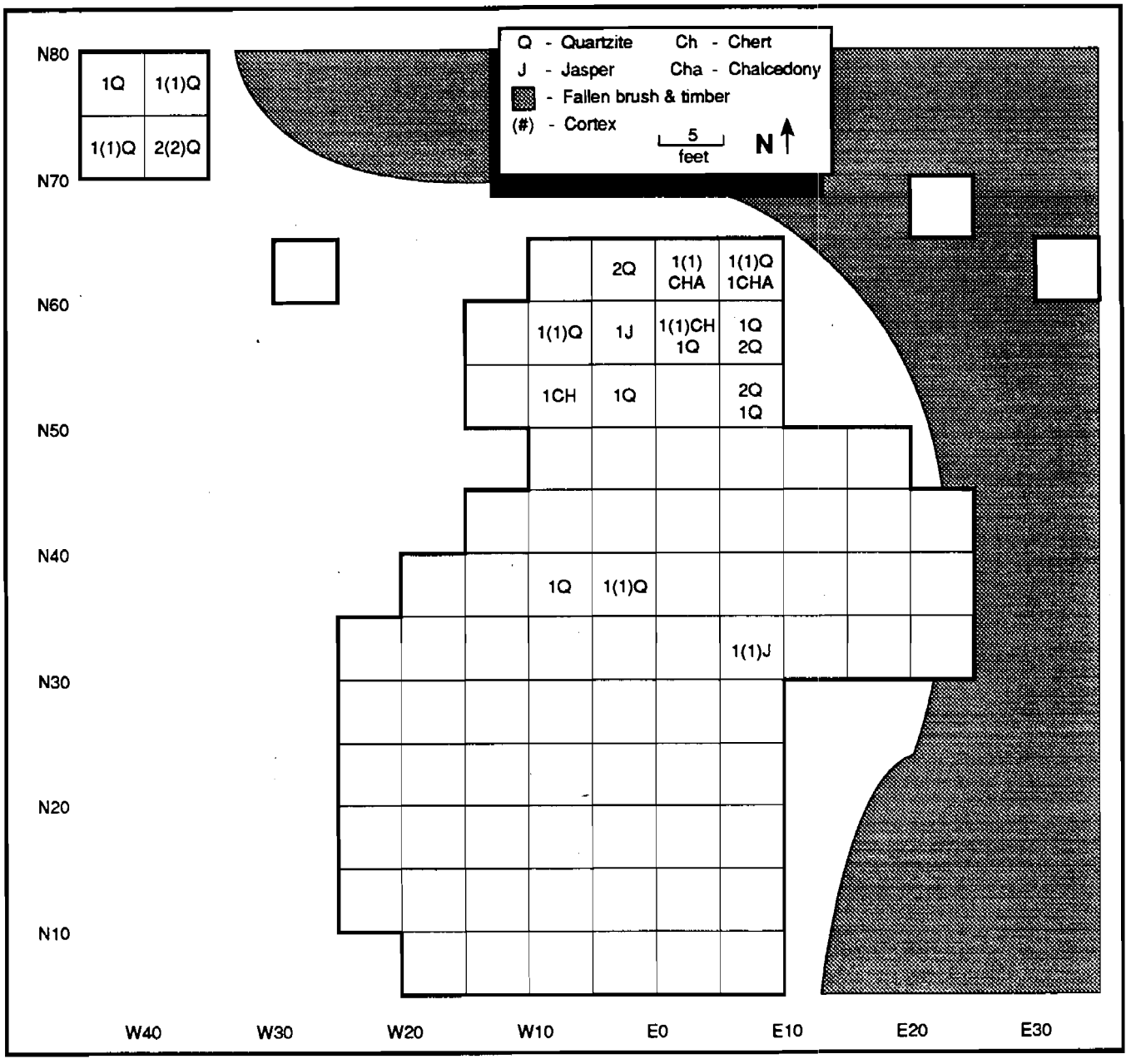
Table 31 shows the distribution of various types of raw materials and the presence of cortex on the debitage from the Hill B assemblage. The most abundant material in the debitage assemblage is quartzite, comprising 90 percent of the total debitage. All other materials are present in very low quantities. The cortex percentage for quartzite is extremely low. Cortex percentages for ironstone and chalcedony are relatively high, although this number may have been influenced by the small sample sizes for these categories. There is a moderate presence of cortex on the jasper and chert debitage. As discussed previously, jasper, chert, and chalcedony cores in the assemblage, though few in number, all contained cortex, indicating that at least some local cobbles were being used to make tools. However, the overall indication suggests an overwhelming emphasis on the use of primary quartzite at Hill B for the manufacture of tools.

Two hammerstones were also present at the site. The first (Figure 114) is an elongated hammerstone with pitting evident on the surface of both ends. The second is a palm-sized hammerstone (Figure 117) with small abraded areas centered on both faces and chipping and battering evident along one edge. These characteristics have been found to result from bipolar cobble reduction processes (Kalin 1981), although the use of this type of tool has also been hypothesized for nutting activities (Kraft 1986:67-68). The processing of plant foods is not clearly indicated by these artifacts. If seed or nut processing did take place, it was a minor activity.

In sum, the major activity taking place at the Dover Downs site, Hill B was the reduction of quartzite cores and cobbles into bifaces and tools. The tools were then removed for use elsewhere. At the same time, a limited number of exhausted and broken tools were culled from existing tool kits. Various raw materials were utilized, although quartzite predominated. Two distinctly different types of quartzite were found at the site, a gray and red variety which appears to have been cobble derived, and a white/pink/tan variety of prepared cores which appears to have been derived from primary outcrops. The source of the cobble quartzite is unknown, but may have been nearby. The nearest sources of primary quartzite would have been located in

FIGURE 116

Concentration of Cores, Dover Downs Site, Hill B (7K-C-365B)



southeastern Pennsylvania (Custer and Galasso 1980). In addition to quartzite, local cobbles were used to produce a limited number of flake tools, and some unmodified flakes were utilized, thereby suggesting that butchering or animal processing activities took place. The recovery of a possible nutting or grinding stone suggests the possibility of plant food processing to a limited degree, as does a hearth and a small quantity of fire-cracked rock across the site.

ACTIVITY AREAS

In order to delineate any horizontal artifact clustering, the spatial distributions of various artifact classes (tools, debitage, and fire-cracked rock) were mapped using each 5' x 5' square

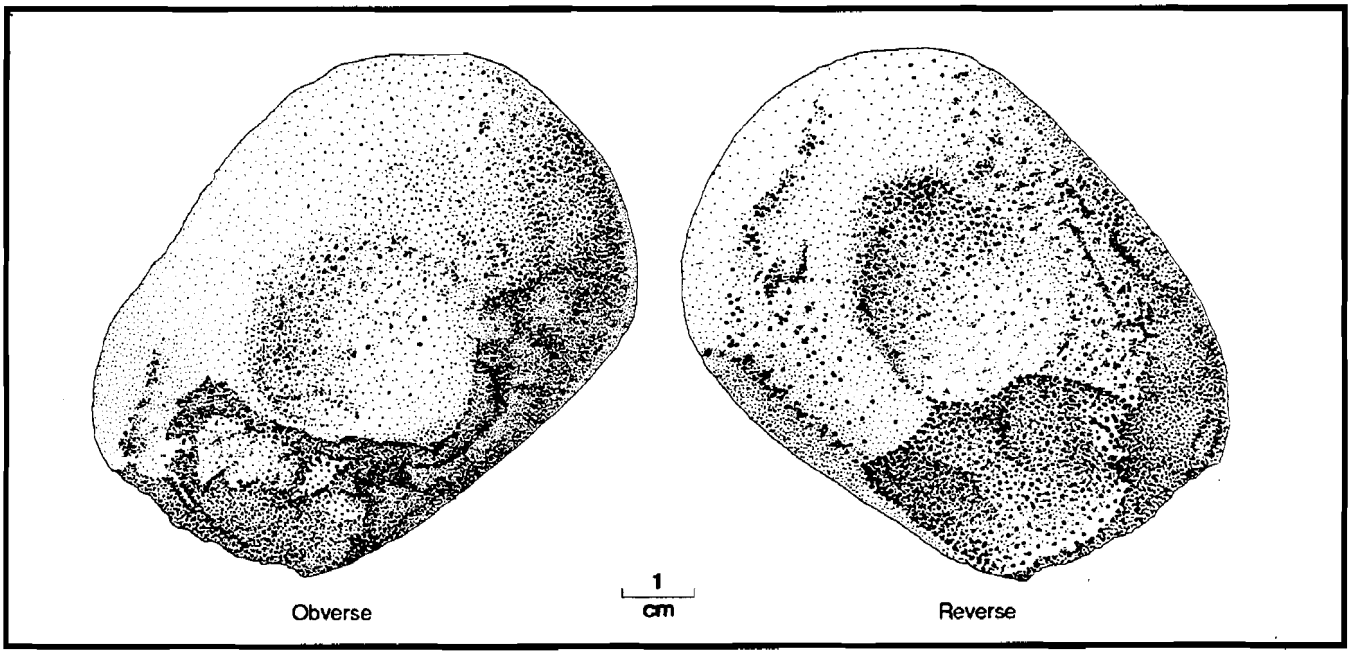
TABLE 31

Debitage Cortex and Raw Material, Dover Downs Site, Hill B (7K-C-365B)

Cortex present/ absent	Quartzite	Quartz	Chert	Jasper	Ironstone	Argillite	Chalcedony	Other
Absent	7154	322	67	200	2	1	28	4
(% of raw material)	(99)	(86)	(70)	(77)	(33)	(100)	(55)	(100)
Present	106	53	29	60	4	0	23	0
(% of raw material)	(1)	(14)	(30)	(23)	(67)	(0)	(45)	(0)
Total	7260	375	96	260	6	1	51	4
(% of raw material)	(90)	(5)	(1)	(3)	(<1)	(<1)	(<1)	(<1)

FIGURE 117

Bi-Pitted Hammerstone, Dover Downs Site, Hill B (7K-C-365B)



excavation block as a minimum provenience unit within undisturbed soils. As previously discussed, the vertical position of artifacts is thought to be disturbed; therefore, artifacts from all levels have been combined together for the analysis of activity areas. Three areas of activity were apparent from the distribution of artifacts. The location of these activity areas, identified as Areas A, B, and C, are shown in Figure 118.

FIGURE 118

Location of Activity Areas, Dover Downs Site, Hill B (7K-C-365B)

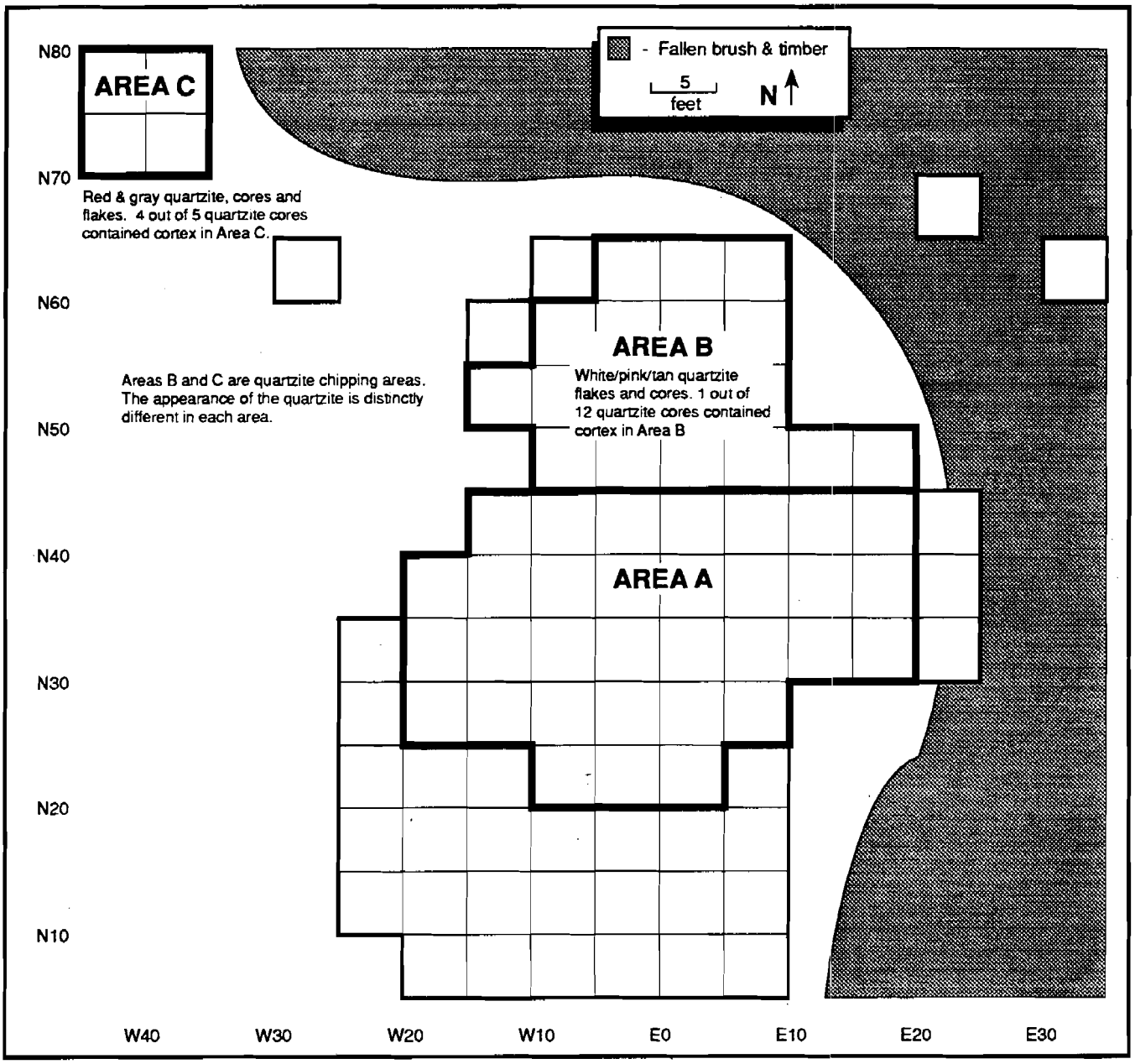
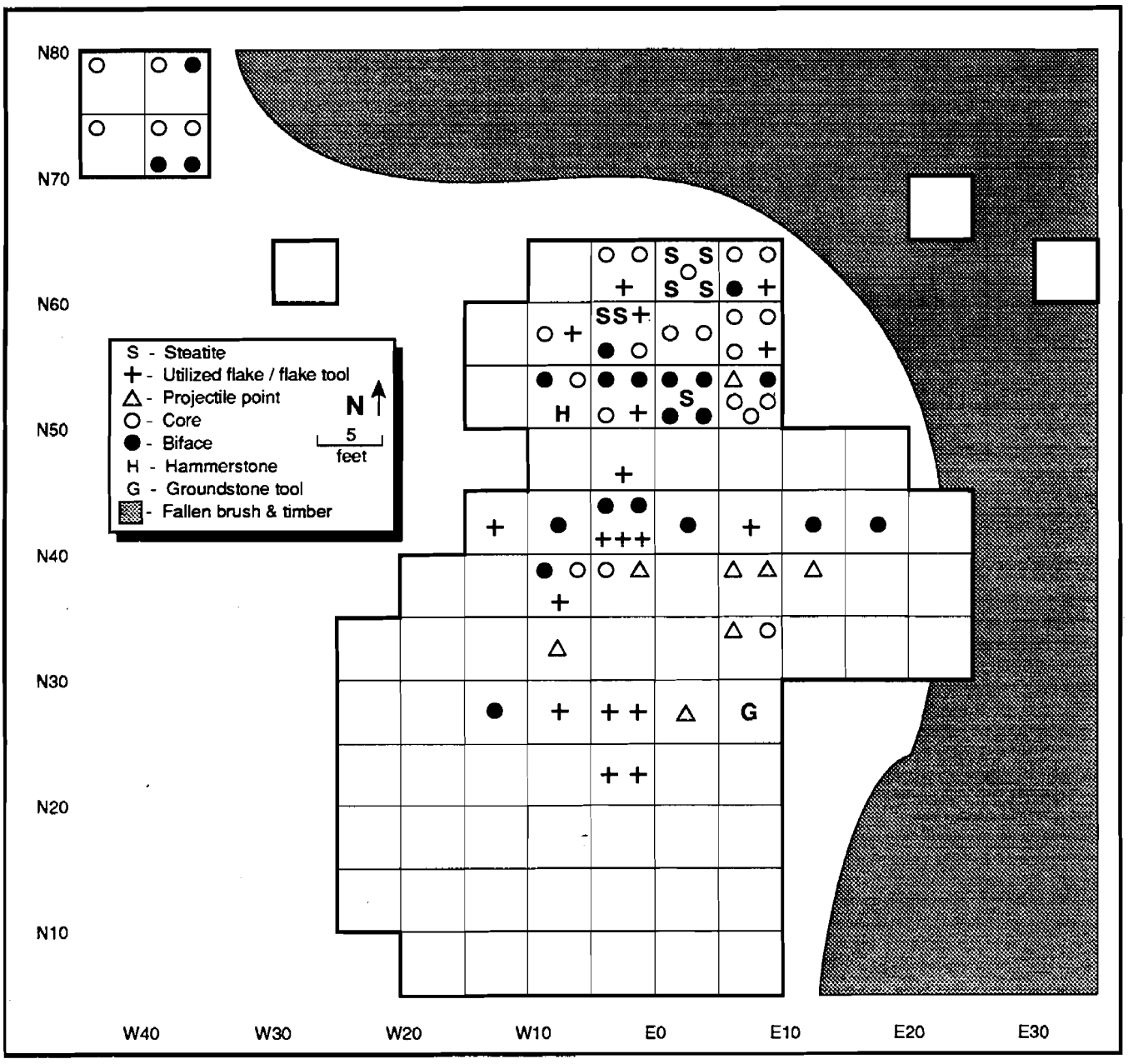


Figure 119 shows the location of all tools recovered from the site, and Figures 112, 116, 120, and 121 show the specific distributions of projectile points, cores, bifaces, and utilized flakes and flake tools. Examination of the distribution of flakes and tools indicates that activities related to animal butchering and processing took place in Area A. Seven of the eight projectile points from the site were located in this section (Figure 112) between N20 and N40 and between W10 and E10, largely in association with utilized flakes and flake tools. In addition, a few cores, a hammerstone, and several bifaces were located nearby (Figures 116, 119, and 120). A sample of the tools recovered from Area A is shown in Figure 115.

FIGURE 119

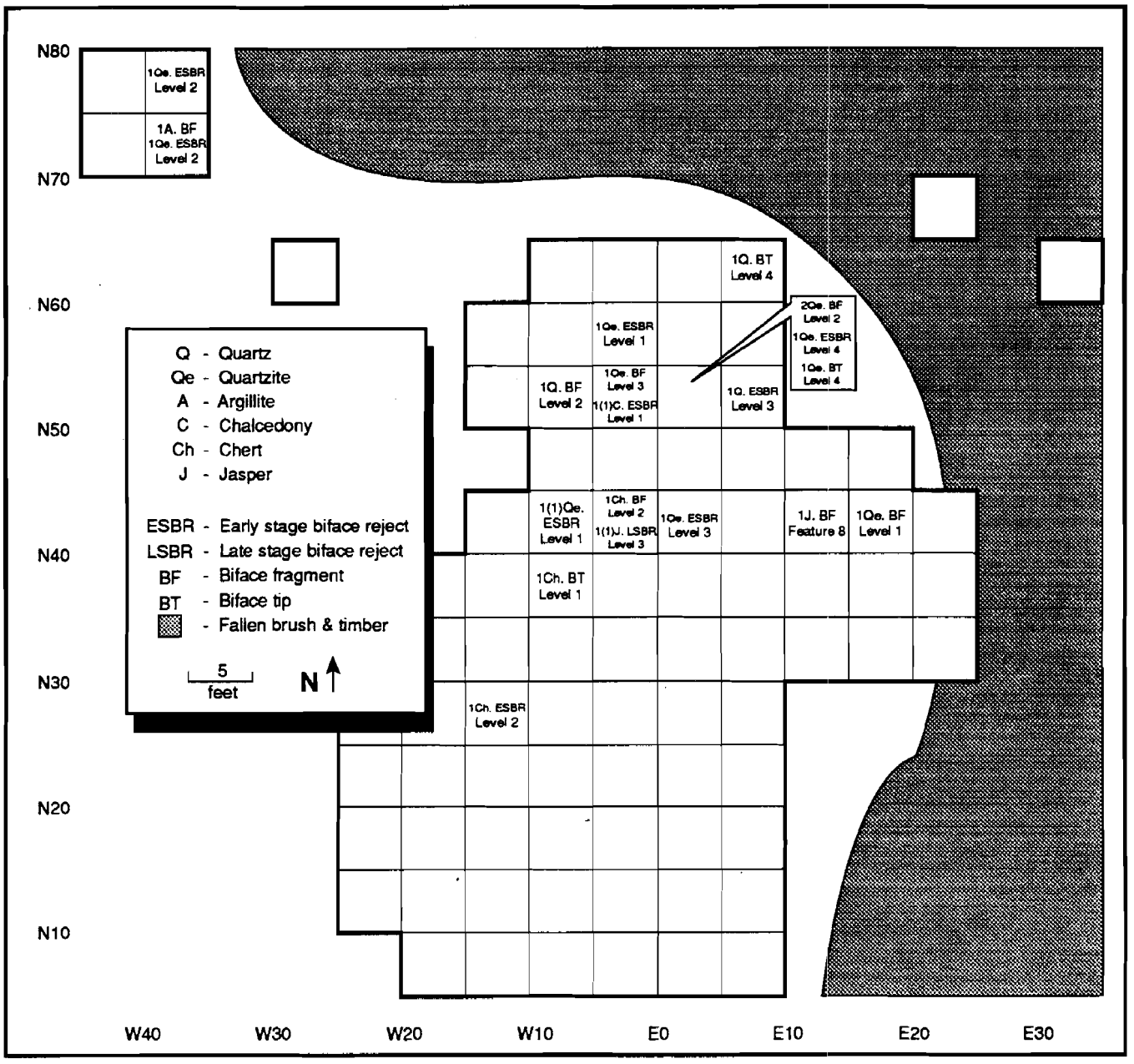
Location of Tools, Dover Downs Site, Hill B (7K-C-365B)



The single hammerstone (Figure 117) in the Area A assemblage appears to be palm-sized with thumb-sized grooves in both faces. These grooves may represent depressions resulting from their use in the bipolar cobble reduction process (Kalin 1981). One end of the hammerstone shows signs of battering, which may indicate that it was used either to flake and shape points and other stone tools or to crack bones for the extraction of marrow (Kraft 1986:67) or for the production of bone tools. Scraping tools, which have been associated with the manufacture of bone and wood tools (Wilmsen 1970; Tringham et al. 1974), were located in this part of the site. Additional flake tools, a jasper drill (Figure 115-J), a chert graver (Figure 115-I), and utilized flakes with a relatively high incidence of cortex were also found in this part of the site. In addition, one early stage biface reject (Figure 115-B) recovered from this portion of the site (Test Unit N40W10) produced a positive result when analyzed for the presence of blood, supporting the inference that butchering and animal processing took place in Area A.

FIGURE 120

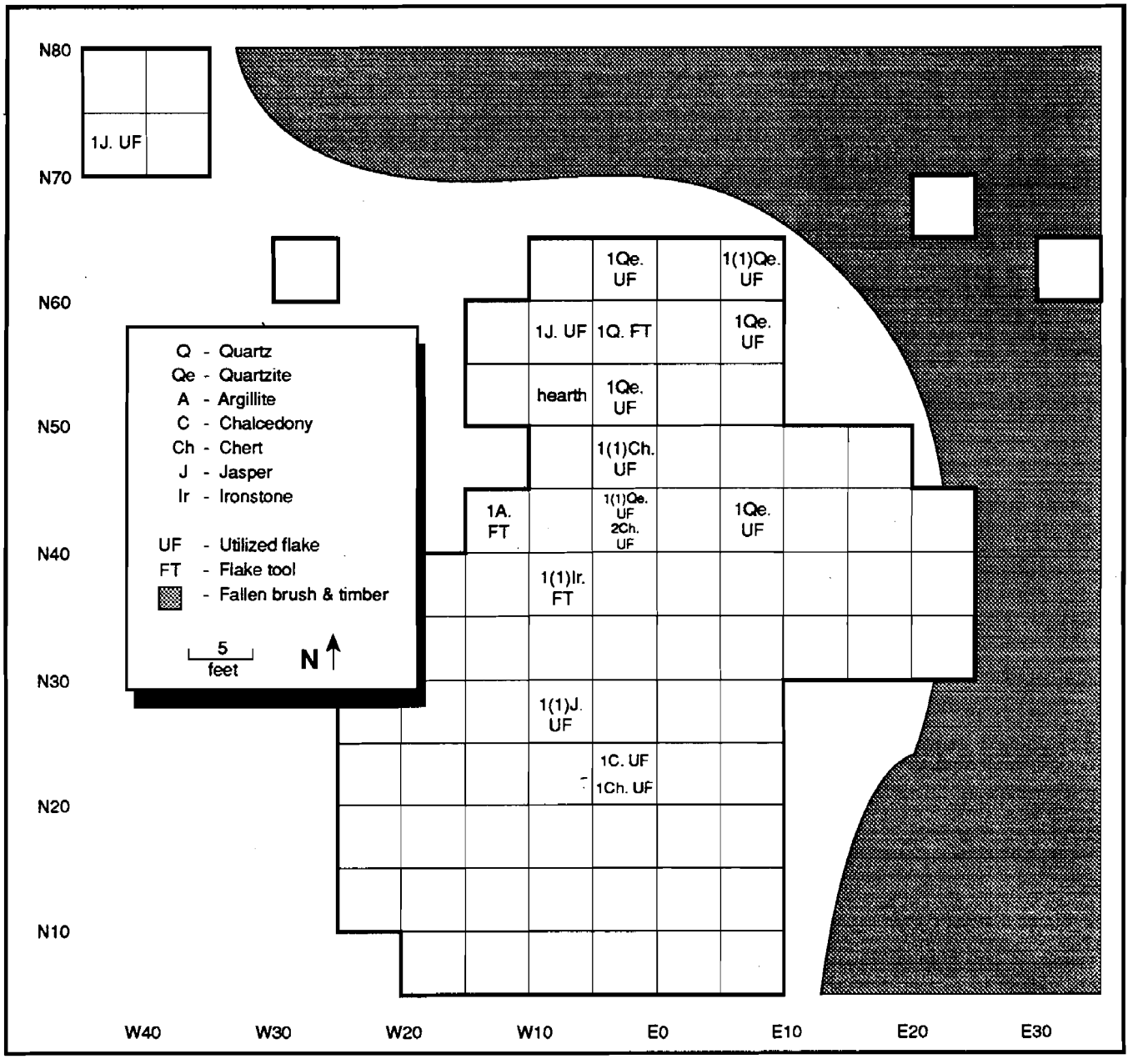
Location of Bifaces, Dover Downs Site, Hill B (7K-C-365B)



An attribute test based on the work of Verrey (1986), Magne (1981), and Gunn and Mahula (1977) was conducted on a sample of 50 flakes from Area A (Appendix II). Table 32 shows the distribution of attributes for the sample. Test results from Area A indicate that a mixed technology of bifaces and cores supplemented by local cobbles was practiced. In the sample, the majority of flakes (58%) were unbroken as would be expected from core reduction. There was a moderate presence of cortex (24%) on the sample flakes, indicating that local cobbles served supplementary or expedient needs. The overwhelming majority of flakes (68%) were very small in size indicating that they were derived either from small cores and bifaces or from the process of tool edge maintenance. The mean values for scar and directions counts align most closely with those recorded for late stage bifaces (Appendix II:Table 51). The majority of sample flakes (47%) exhibited round platforms, indicative of early stage biface reduction and decortication; however, triangular

FIGURE 121

Location of Flake Tools and Utilized Flakes, Dover Downs Site, Hill B (7K-C-365B)



platforms, indicative of biface reduction, were also well represented (37%). There is a low incidence of biface edging on the sample flakes, but a relatively high incidence (45%) of platform preparation, which is also indicative of biface reduction. Figures 116 and 120 show that both cores and bifaces were found in Area A, although bifaces were more strongly represented, and Figure 121 shows that utilized flakes and flake tools with a relatively high percentage of cortex were also well represented, supporting the inference that local cobbles were important sources of raw material for the production of expedient tools.

TABLE 32

Debitage Attribute Frequencies, Dover Downs Site, Hill B (7K-C-365B), Area A

Flake type		**Size**		**Platform shape**		**Platform preparation**	
Complete	29	< 2 cm	34	Triangular	14	Present	17
Proximal	9	2 - 5 cm	16	Flat	6	Absent	21
Medial	3	> 5 cm	0	Round	18	No observation	12
Distal	9			No observation	12		
		Scar count				**Directions count**	
Cortex		Mean	= 2.86	**Remnant biface edge**		Mean	= 2.12
Present	12	Standard deviation	= 1.69	Present	4	Standard deviation	= .99
Absent	38			Absent	46		

*Based on a sample of 50 flakes

Three of the diagnostic points found in Area A of the site (N35W5, N25E0, and N35E10) were broad-bladed varieties, all of which exhibited transverse fractures (Figure 111-D, E and F). Callahan (1979) has suggested that this type of fracture commonly occurs in the process of manufacturing tools while attempting later stage thinning of a biface. On the other hand, Custer and Mellin (1986:15) and Ahler (1971:84, 119-121) have suggested that transverse fractures can occur as the result of twisting or prying motions which are associated with heavy cutting and butchering activities. As discussed previously, it has been shown that such broad-bladed points are too large and too wide to be efficient penetrating projectile points (Thomas 1978; Custer and Mellin 1986). However, it should be noted that the argillite point from Hill B (Figure 111-F) measures exactly 30 mm wide, which, it was concluded, is the upper limit of width for efficient projectile point penetration. Thus, this point could have functioned as a projectile point rather than a broad-blade knife. However, the point is very thin and appears to be in either finished form or at least the later stages of manufacture.

Empirical data on use wear (Custer 1992:8-9; Custer and Mellin 1986:15) have shown that breakage patterns on large broad-bladed points do not conform to breakage patterns of small penetrating projectile points, but do conform to wear and breakage patterns associated with generalized cutting activities. This data further supports the interpretation of their function as generalized cutting tools or knives. Furthermore, the single chert side-notched point (Figure 111-C) from Area A exhibited asymmetrically excurvate sides, indicative of resharpening, as well as considerable rounding and crushing of the edges and flake scar ridges along its lateral edge. Ahler (1971) notes that this kind of wear is also indicative of a point's use as a butchering knife. In addition, the remaining stemmed point from Area A (Figure 111-A) is a long ironstone, narrow-bladed variety - a type which has also been associated with use as a butchering implement (Ward 1985:108; Custer and Bachman 1984:77; Custer 1989:149). These tools provide further evidence that processing activities took place in this area of Hill B.

In sum, the presence of broken finished bifaces in association with flake tools, utilized flakes, and other bifaces, including one with the presence of blood, suggests that this area of the site (Area A) may have been used for the butchering and processing of hunted game. The association of bone and woodworking tools with this activity area further supports an inference of processing activities.

Figure 122 shows the distribution of total debitage from the site, and Figures 123, 124, and 125 show the distribution of flakes by raw material. The most prominent pattern reflected in these distributions is the dense concentration of quartzite debitage, largely from the N45 line north to the limits of the core excavation area which defines Area B (Figure 124). This pattern conforms to that shown by the distribution of total debitage. Cortex is relatively low over the entire area (Figure 122), but is especially low in the areas of highest quartzite density.

FIGURE 122

Distribution of Total Debitage, Dover Downs Site, Hill B (7K-C-365B)

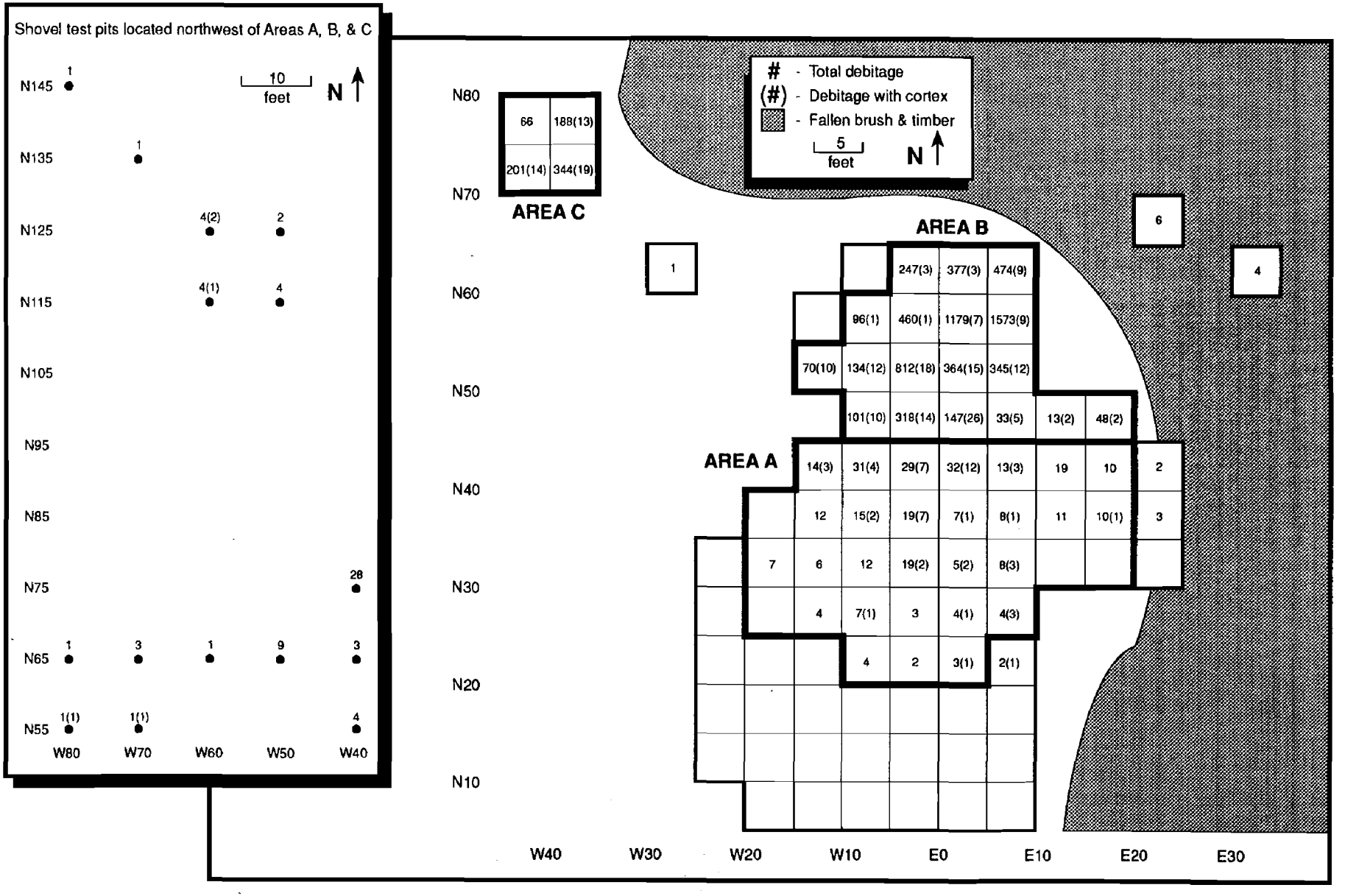


FIGURE 123

Distribution of Chert and Jasper Debitage, Dover Downs Site, Hill B (7K-C-365B)

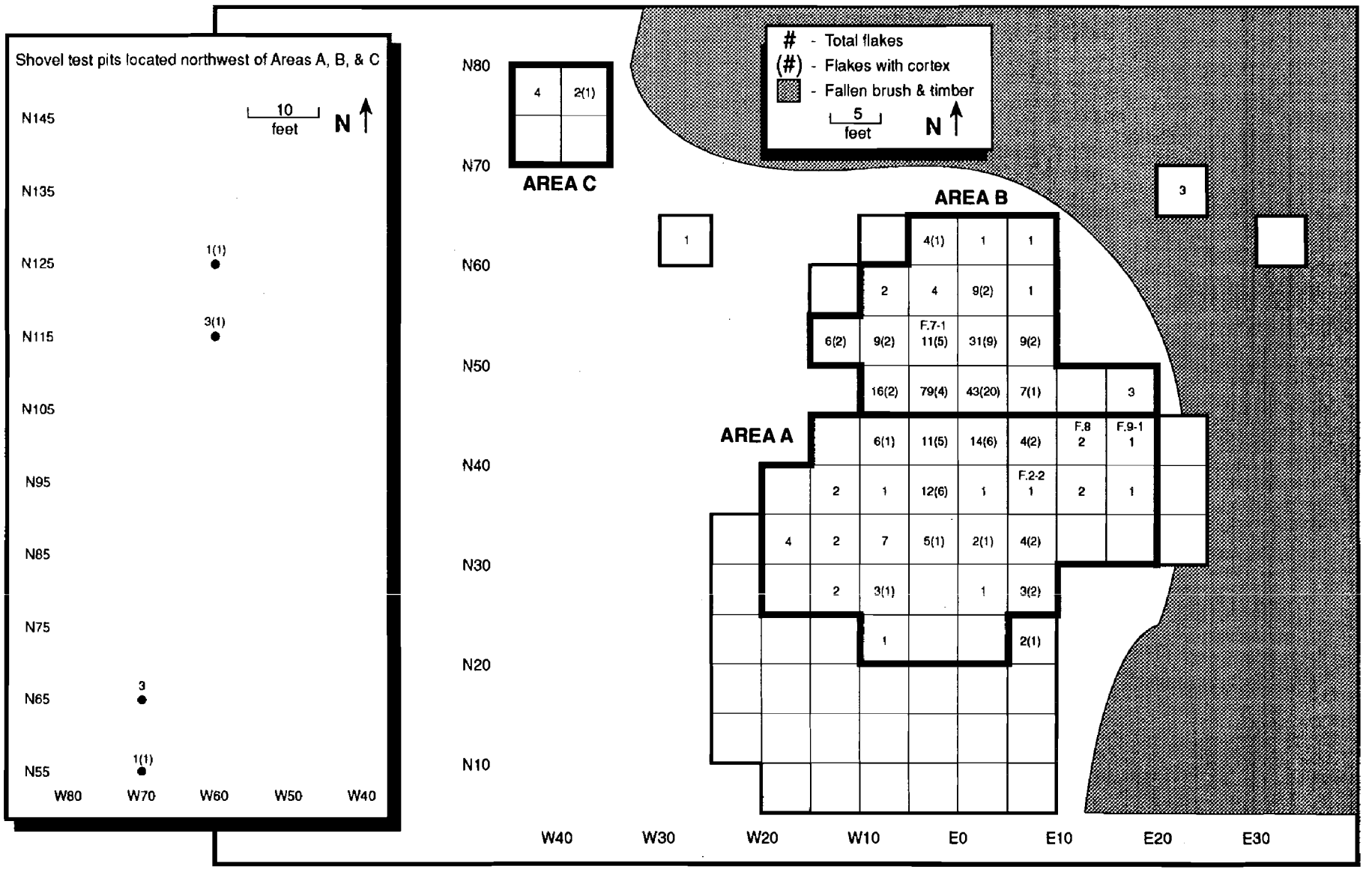


FIGURE 124

Distribution of Quartzite Debitage, Dover Downs Site, Hill B (7K-C-365B)

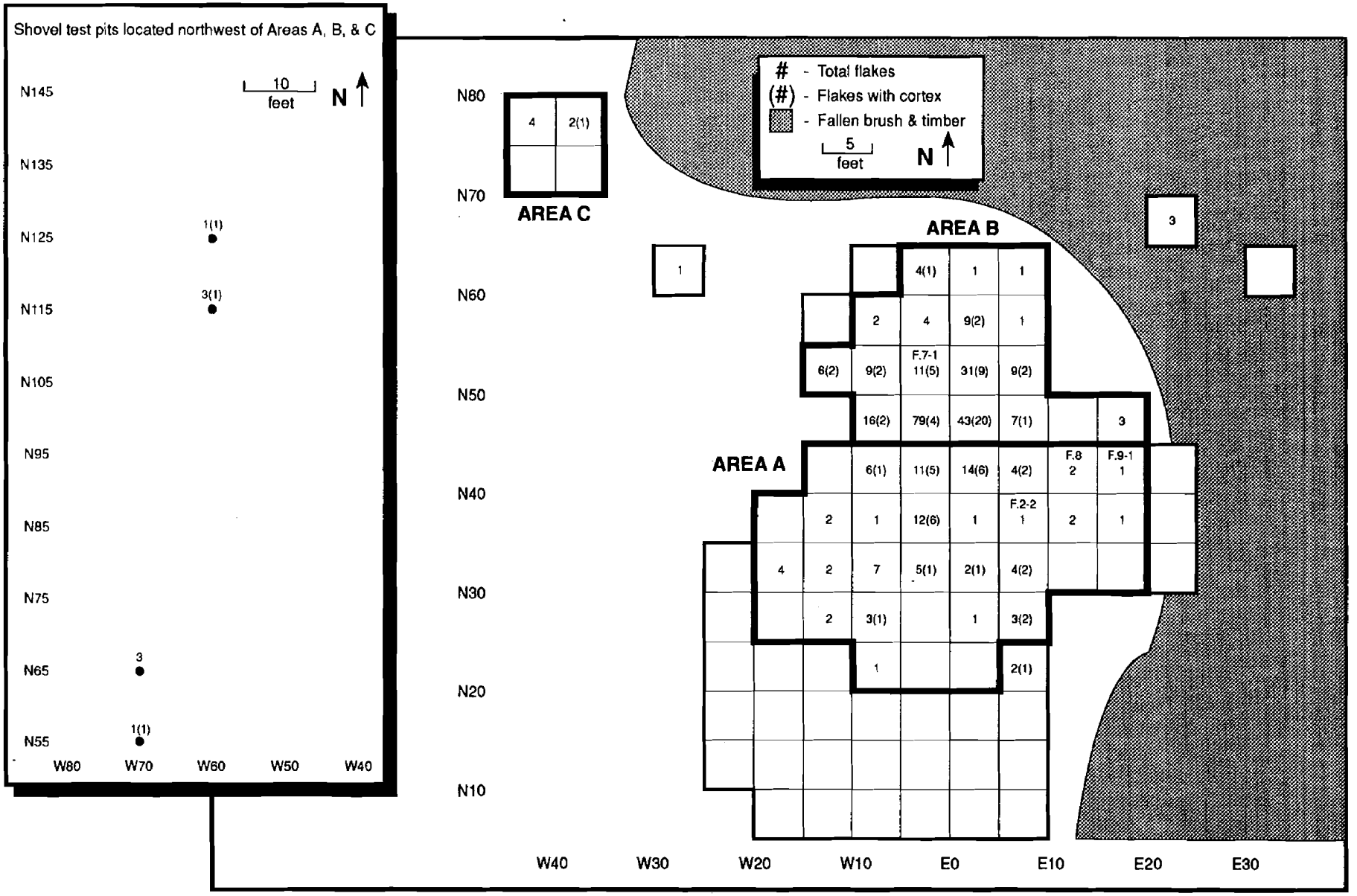


FIGURE 125

Distribution of Quartz Debitage, Dover Downs Site, Hill B (7K-C-365B)

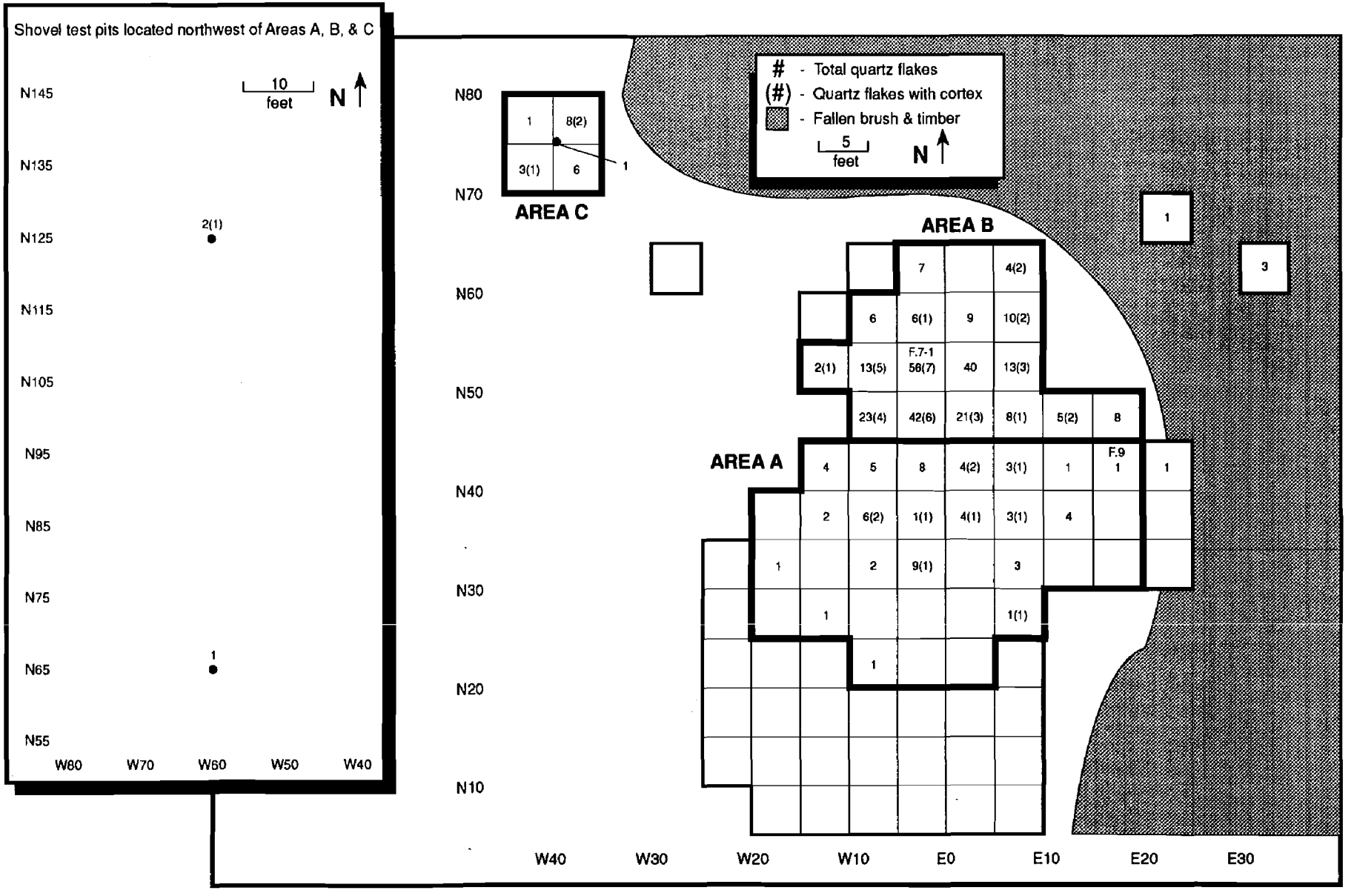
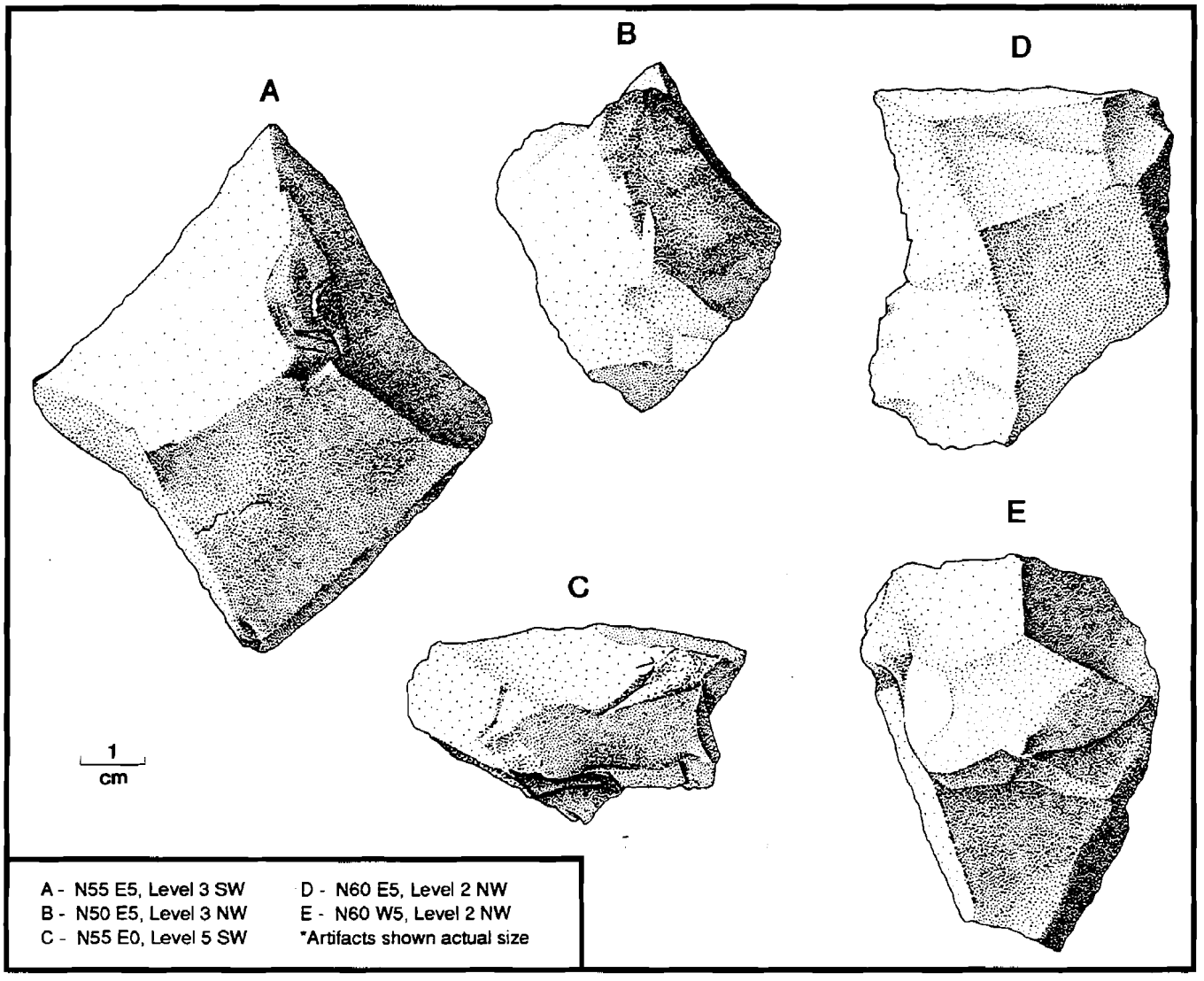


FIGURE 126

Sample of Quartzite Cores from Dover Downs Site, Hill B (7K-C-365B)



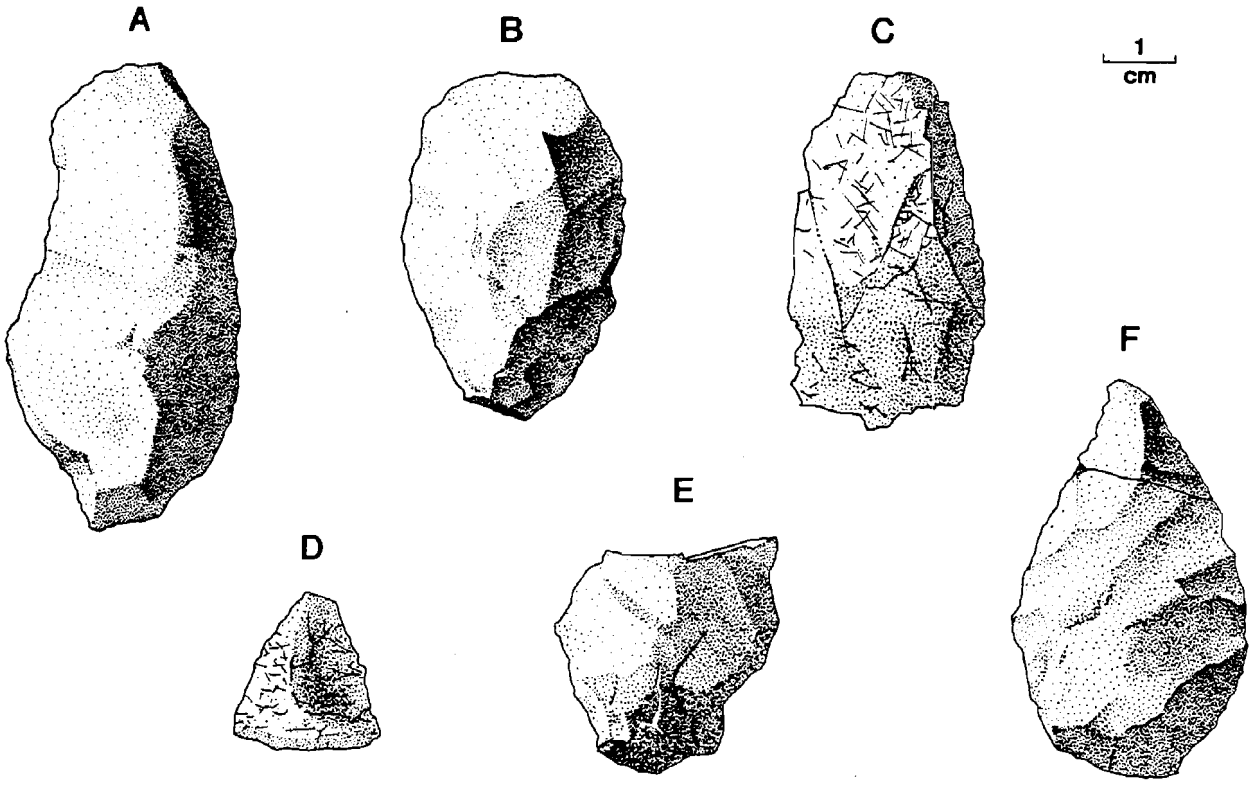
The overwhelming majority of cores (Figures 116 and 126) from the site were located in Area B. Seventy-one percent of the cores in this area were derived from quartzite. Of these quartzite cores, only one contained remnant cortex. Several quartzite bifaces in various stages of manufacture (Figures 120 and 127-A, B, and F), including two early stage biface rejects, were also located in Area B.

Only one diagnostic artifact was located in Area B. This artifact, a quartzite narrow bladed stemmed point (Figure 111-B), was found in Level 2 of Test Unit N50E5 in Area B. As previously discussed, this point was very small, thin, and asymmetrical in shape, with evidence of crushing along its lateral edge, indicating that the point had probably experienced considerable resharpening and reuse before being discarded. The presence of both discarded tools and early stage bifaces in Area B indicates that at least one purpose of the chipping activity may have been the replacement of exhausted tools.

An attribute test based on the work of Verrey (1986), Magne (1981), and Gunn and Mahula (1977) was conducted on a sample of 100 flakes from Area B (Appendix II). Results

FIGURE 127

Sample of Bifaces from Dover Downs Site, Hill B (7K-C-365B), Area B



A - N50 E0, Level 4 SW, Quartzite early stage biface reject
B - N50 W5, Level 3 NW, Quartzite biface (non-diagnostic)
C - N50 E5, Level 3 SW, Quartz early stage biface reject
D - N60 E5, Level 4 NW, Quartz tip
E - N50 W5, Level 1 NE, Chalcedony early stage biface reject
F - N50 E0, Level 4 NW, Quartzite tip
- Proximal section, Level 2 (non-diagnostic)
*Artifacts shown actual size

TABLE 33

Debitage Attribute Frequencies, Dover Downs Site, Hill B (7K-C-365B), Area B

Flake type		**Size**		**Platform shape**		**Platform preparation**	
Complete	65	< 2 cm	25	Triangular	19	Present	7
Proximal	16	2 - 5 cm	70	Flat	18	Absent	74
Medial	3	> 5 cm	5	Round	44	No observation	19
Distal	16			No observation	91		
		Scar count				**Directions count**	
Cortex		Mean	= 2.37	**Remnant biface edge**		Mean	= 2.01
Present	11	Standard deviation	= 1.11	Present	0	Standard deviation	= .78
Absent	89			Absent	100		

*Based on a sample of 100 flakes

from Area B indicate that the production of flakes from prepared cores was the predominant activity in this part of the site. In contrast to Area A, Area B contained far more cores than bifaces (Figures 116 and 120), though bifaces (largely quartzite) were nevertheless prominent in this area. Table 33 shows the distribution of attributes for the sample. In the sample, complete flakes account for 65 percent of the assemblage, indicating that these flakes were most likely derived from core reduction. There is a relatively low incidence of cortex present on the sample debitage indicating that most of the flakes were not derived from cobble cores. Most flakes (70%) are of a medium size indicating that they were not derived from either large early stage bifaces or large cores, nor were they likely to have been by-products of tool edge maintenance activities. Mean values for scar and directions counts are somewhat anomalous for flakes from this area, being most closely aligned with those recorded for late stage bifaces (Appendix II:Table 51). Round platforms, which have been associated with core reduction as well as the early stages of biface reduction, are most prominent on the sample debitage which have observable platforms. Triangular platforms (23%), associated with biface reduction, and flat platforms (22%), associated with core reduction, are fairly equally distributed over the remaining flakes. There is a complete absence of remnant biface edge on the sample debitage and a very low incidence of platform preparation, both of which are more typically associated with biface reduction than core reduction. The data, therefore, indicates a mixed technology with a greater reliance on prepared cores than on secondary cobble resources.

As previously discussed in the section on Feature Excavations, Area B was also the locus of a hearth. This hearth was located in Test Unit N50W10, just west of the focus of chipping activity. Just to the east of the hearth was the small concentration of steatite bowl fragments. Steatite, or soapstone, is a variety of talc produced by metamorphic processes. This material exhibits the physical characteristics of softness (1-2.5 Moh's scale), a high melting point (1350-1400 Celsius), and impermeability, which make the material ideal for the manufacture and use of stone bowls (Ward and Custer n.d.; Turnbaugh and Kiefer 1979). These attributes enabled the material to be carved with stone tools and to withstand the application of high cooking temperatures. The presence of steatite fragments in the vicinity of a hearth may indicate that cooking also took place in this part of the site. One charred edible seed was recovered from flotation samples taken from Area B.

In sum, data from Area B suggests that this part of the site served largely as an area of quartzite chipping activity. The main purpose of this activity appears to have been the manufacture of replacement tools, and the activity appears to have taken place in the vicinity of a hearth, where a small degree of cooking may have also taken place.

Northwest of Area B, within the quartzite chipping area, are four contiguous test units (N70W40, N70W45, N75W40, and N75W45) which make up Area C. Although Figure 124 indicates a dense concentration of quartzite debitage in this area, what makes Area C different from Area B, as discussed in the section on Technologies, is the variety of quartzite largely unique to Area C. The quartzite in Area C is gray and red in color, whereas the quartzite in Area B and elsewhere across the site ranges in color from light gray to yellow/tan to pink. In addition, four of the five red/gray quartzite cores recovered from Area C contain remnant cortex, whereas only two of twelve quartzite cores from Area B contain cortex. One of the two Area B cobble cores is also made of red and gray quartzite. The percentage of cortex on quartzite debitage is quite low in both areas although it is generally higher in Area C than in Area B. As previously discussed in the section on Hill A, the same distinct type of red/gray cobble quartzite that was present in Area C of Hill B was also present at Hill A, and may indicate that at least one of the occupations of both sites consisted of the same group of people. In addition to the cores found in Area C, two quartzite early stage biface rejects and one argillite biface fragment were also recovered. No other tools or utilized flakes were found in this area of the site, and very little non-quartzite debitage was among the assemblage.

An attribute test based on the work of Verrey (1986), Magne (1981), and Gunn and Mahula (1977) was conducted on a sample of 100 flakes from Area C (Appendix II). Table 34

TABLE 34

Debitage Attribute Frequencies, Dover Downs Site, Hill B (7K-C-365B), Area C

Flake type		**Size**		**Platform shape**		**Platform preparation**	
Complete	56	< 2 cm	39	Triangular	16	Present	10
Proximal	17	2 - 5 cm	61	Flat	17	Absent	63
Medial	7	> 5 cm	0	Round	40	No observation	27
Distal	20			No observation	27		
		Scar count				**Directions count**	
Cortex		Mean	= 2.43	**Remnant biface edge**		Mean	= 1.80
Present	23	Standard deviation	= 1.53	Present	8	Standard deviation	= .86
Absent	77			Absent	92		

*Based on a sample of 100 flakes

shows the distribution of attributes for the sample. The results of the test shows that a mixed technology of bifaces and cores served the lithic needs of Area C's occupants, with a supplemental reliance on local cobbles. In the sample, complete flakes account for 56 percent of the assemblage, indicating that these flakes were derived from cores. Cortex was present on a significant minority of the flakes (23%) suggesting that cobble cores were important for supplementary or expedient needs. The majority of flakes (61%) were of a medium size, indicating that they did not result from the reduction of either large early stage bifaces or large cores. The remainder were small and may have resulted from the reduction of small cobbles or tool maintenance activities. Round platforms, associated with early stage biface reduction and decortication, were present on the majority of flakes (55%) with observable platforms; the remainder were fairly equally divided between triangular platforms (22%), associated with biface reduction, and flat platforms (23%), associated with core reduction. There was a low incidence of both remnant biface edge and platform preparation, which are more typically associated with biface reduction. Therefore, a mixed technology is indicated, with an emphasis on core reduction that included a reliance on local cobbles.

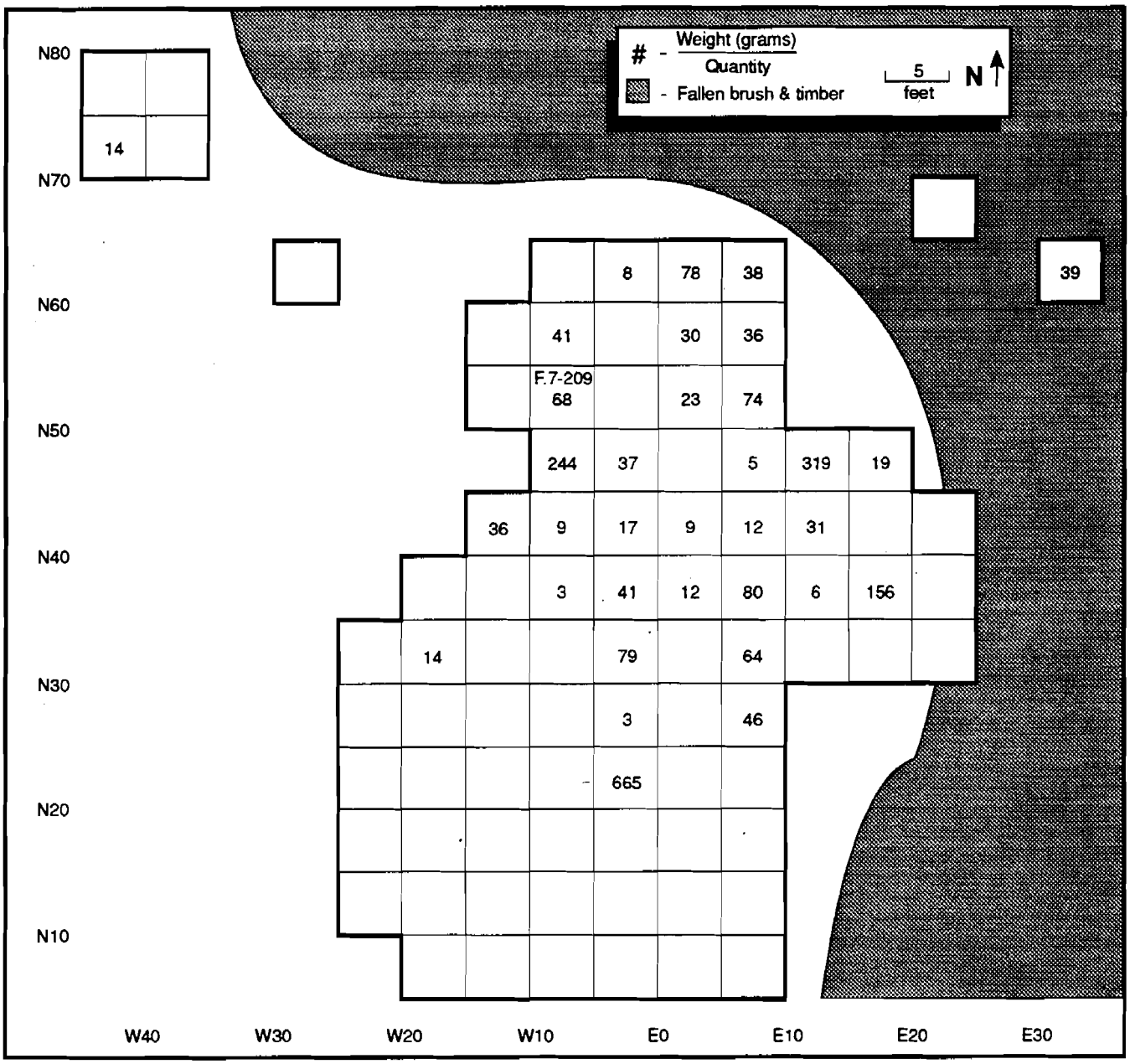
In sum, the data suggests that Area C was the locus of intensive chipping activity. This activity appears to have been largely concentrated on a single variety of quartzite which appears to have originated in cobble form.

There were several small concentrations of fire-cracked rocks across the site as shown in Figure 128. One such concentration appeared along the N45 line, an area which seems to separate the activities of Area A from those of Area B. Another area of concentration was at the southern terminus of Area A (Figure 128), and a final concentration of fire-cracked rocks constituted a prehistoric hearth, Feature 7, in Test Unit N50W5. Feature 7 is further discussed in the section on Feature Excavations. The remainder of fire-cracked rocks in the assemblage were fairly evenly distributed across the northern half of the site. It should be noted that an anomaly exists in one area of the distribution. The largest concentration of fire-cracked rock (52 pieces) was found in Test Unit N60W5. The total weight of these rocks, however, amounted to only 416 grams. The rocks were found in Levels 1, 2, and 3 and were apparently placed there to secure an historic post. The post mold was discovered at the top of Level 5 approximately 1.2' below surface. Historic ceramics were also found in the first four excavated levels above the feature.

The evidence from all three activity areas suggests that the northern half of the Dover Downs site, Hill B (Areas B and C) was the focus of intensive chipping activity particularly focused on the single material type of quartzite. Furthermore, the source materials for the chipping activity appear to have derived from both primary and secondary sources. The southern part of the site (Area A) appears to have been the locus of butchering and related processing activities. Although these activities are apparent from horizontal distributions, the disturbed nature of the stratigraphy precludes associating particular activities with particular temporal occupations.

FIGURE 128

Distribution of Fire-Cracked Rocks, Dover Downs Site, Hill B (7K-C-365B)



In sum, although some segregation of activities is evident from the horizontal distributions, the absence of ceramics, the narrow range of artifact types, and the absence of storage and habitation features suggests that the site was not likely to have been a large or even small base camp inhabited for a long period of time. Instead, the site seems to have operated as a transient station for the purpose of resource procurement and the reduction of primary and cobble cores, primarily of quartzite.