tenants of the site are not known. Were the lives of the tenants substantially different than those of subsequent owners? What is the relationship between changes in the local and regional economy and the various tenant and owner occupations? Did tenants, because they did not own the land, utilize and maintain the property in the same way as the later owners who named the farm and carefully improved it? These questions may be answerable through historical documentation, including probate records, tax lists, and census records, as well as through the archaeological remains. Moreover, data concerning dietary patterns, spatial patterns, and artifact classes are present at the site. These patterns can be examined as reflections of the social status and lifeways of the site's inhabitants over time.

The archaeological context of Domestic Economy is also relevant on a local and regional level, including the larger historical context of agriculture (Ames, Herman, and Siders 1989). Through artifact analysis and historical research the Woodville Farm site can be compared to several other local archaeological sites. Specifically, the Woodville Farm site could be compared to a number of lower socio-economic status tenant archaeological sites recently investigated in Dover and Little Creek hundreds (Grettler, Bachman, and Custer 1991, Grettler et al. 1991), particularly, the W. Eager House site (7K-C-383) and the Wilson-Lewis site (7K-C-375). Data on the tenant occupation of the Woodville Farm site could also be compared to similar data from owner-occupied sites in Kent County, particularly the Moore-Taylor site (7K-C-380) and the Buchanan-Savin Farm (7NC-J-175) (Grettler, Bachman, and Custer 1991). Other sites which can be compared include several domestic occupations from the nineteenth and twentieth centuries located throughout the state (Catts and Custer 1990; Catts, Hodny, and Custer 1989; Coleman et al. 1983; Hoseth et al. 1990; and Heite and Heite 1985). Such comparative studies offer the potential for significant information on site layout, social status, ethnicity, and consumerism.

DISCUSSION AND CONCLUSIONS

SUMMARY

Phase II excavations at nine sites have clarified their potential for nomination to the National Register of Historic Places. The findings are summarized in Table 11. Four small prehistoric sites, Conrail South A, Conrail South B, Weaver, and Dragon Run North A (7NC-E-92, 7NC-E-93, 7NC-G-102, and 7NC-G-103), are not significant. Two larger prehistoric sites, Parkway Gravel and Dragon Run North B (7NC-G-100 and 7NC-G-104), yielded much more cultural material and also important information, but were not deemed eligible for the National Register because of the poorly-preserved contexts. Two prehistoric sites, Wrangle Hill South and Snapp (7NC-G-101 and 7NC-G-105), and one historical site, Woodville Farm (7NC-E-98), yielded evidence of intact features and important cultural information. The sites are eligible for nomination to the National Register of Historic Places and further research is recommended. Preservation of these three eligible sites is the preferred mitigation alternative. However, if this

TABLE 11

Summary of Research Recommendations

Site Number	C.R.S. Number	Site Name
No further research required		
7-NC-93	N-12119	Conrail South A Prehistoric site
7NC-E-92	N-12118	Conrail South B Prehistoric site
7NC-G-103	N-12125	Dragon Run North A Prehistoric site
7NC-G-102	N-12124	Weaver Prehistoric site
7NC-G-100	N-12116	Parkway Gravel Prehistoric site
7NC-G-104	N-12126	Dragon Run North B Prehistoric site
Further research recommended		
7NC-G-105	N-12127	Wrangle Hill South Prehistoric site
7NC-G-101	N-12117	Snapp Prehistoric site
7NC-E-98	N-5053	Woodville Farm Historical site

alternative is not possible, minimal impact with data recovery of the impacted portions of the sites is recommended. If any of these three eligible sites are to be completely impacted, then complete recovery of the impacted site is recommended.

SMALL PROCUREMENT SITES IN NORTHERN DELAWARE

Phase II investigations of four small prehistoric sites, Conrail South A, Conrail South B, Weaver, and Dragon Run North A (7NC-E-92, 7NC-E-93, 7NC-G-102, and 7NC-G-103), produced no more information on the occupations of the sites than had Phase I investigations (Hodny, Bachman, and Custer 1989). Further research is not necessary for these sites. Despite the lack of cultural material recovered at the four sites, locations of the sites provide information on prehistoric life. The sites are low density, artifact scatters that probably represent hunting and gathering procurement sites occupied during short forays away from larger base camps (Custer

1984:104-105). Sites like these four are very common in the region; therefore, they represent a significant part of the settlement pattern and adaptive strategy of the Woodland I time period (Custer 1988:35; see also Sullivan 1992 and Tainter 1979 on the significance of small sites).

For the Chesapeake and Delaware Canal section of the State Route 1 Corridor discussed here, approximately 194 acres were surveyed and nine small sites were discovered (Hodny, Bachman, and Custer 1989). The average density of procurement sites is then one site per 21.6 acres (194 acres/9 sites). All four of the sites discussed in this report are situated on higher ground adjacent to ephemeral or intermittent drainages on the edge of the Mid-drainage zone. The tops of low knolls were preferred.

The State Route 1 Corridor runs along a physiographic boundary that may have been a preferred habitat because of access to the resources of more than one environmental zone (Figure 27). However, the State Route 1 Chesapeake and Delaware Canal segment is a sample of less than 0.1 percent of New Castle County. Thus, the estimates above for the density of small, procurement sites may be grossly inaccurate. Custer (1988:41) calculated the density of small sites in the Piedmont of New Castle County at 30 sites per square kilometer. The figure given above for the State Route 1 Corridor converts to 11.4 sites per square kilometer. Thus, the density of small sites varies between the different physiographic and environmental zones of northern Delaware (Figure 3).

LARGER, HIGHER-DENSITY SITES

Both the Parkway Gravel (7NC-G-100) and Dragon Run North B (7NC-G-104) sites have been damaged by plowing and other activities. Further significant cultural information is unlikely to be preserved at the sites. Few subsurface prehistoric features were found at either site, and artifacts were not recovered from sediments below the plow zone. Research at each site did add to our knowledge of the prehistoric past, however. At the Parkway Gravel site, there may be evidence of a Contact Period aboriginal occupation, and at the Dragon Run North B site, ironstone use was unusual.

Contact Period Occupation in Northern Delaware

Archaeological evidence of the Contact Period in Delaware have been difficult to identify (Custer 1989:337; Fithian 1992). Documented contact between aboriginal peoples and Europeans in the Middle Atlantic region exists for the period 1600-1740 (Becker 1984). For example, the "Brandywine Band" of the Lenape was living on the Pennsylvania-Delaware border at the Big Bend of the Brandywine River until 1701, but no archaeological evidence was found there (Becker 1984). William Penn and his representatives purchased land from the Indians, as had the previous Swedish and Dutch colonists (Weslager 1987). In 1691, a payment was made to the Brandywine

Band for all the lands between Duck Creek and Upland Creek. Penn allowed the Indians to stay on the land they occupied after such sales (Becker 1984). Payment for a purchase of 600 acres between Duck and St. Jones Creeks was three matchcoats, 12 bottles of drink, and four-double handfuls each of powder and shot (Hazard 1850). Thus, the Indians of northern Delaware had direct access to the types of items found at the Parkway Gravel site.

Another possible Contact Period site (7NC-E-42) in Delaware had Woodland II artifacts in association with some European material in an unplowed context (Custer and Watson 1985). Gunflints made of local raw materials are known from the Arrowhead Farm site in Kent County, Maryland and from Susquehannock sites in Pennsylvania (Custer 1989:338-339). According to Becker (1984), R. Thomas excavated a mid-eighteenth-century trash heap containing English flint worked into gunflints and Indian-style tools at the Morton Homestead site in Delaware County, Pennsylvania. No mention was made of any flaked glass at the site.

The Susquehannocks politically dominated the local Lenape Indian groups of Northern Delaware and virtually monopolized the fur trade (Custer 1989:340). Thus, the lack of European trade goods, such as beads or kaolin pipes, is not a basis for dismissing the presence of a Contact Period occupation at the Parkway Gravel site.

The possibility of late Contact Period Indian occupation of the Parkway Gravel site is somewhat speculative based on the meager evidence, but there is no documentary evidence for an early eighteenth-century European habitation of the site. If Indians occupied the site in the late seventeenth or early eighteenth century, they may have had access to some European goods, but only some European technology (e.g., guns). Thus, the type of assemblage found at the Parkway Gravel site may be typical of Contact Period Refuge Complex sites (Custer 1984:179). The location of the site a short distance away from a contemporaneous European settlement at St. Georges and along a transportation route might also be typical for Contact Period sites in Delaware. Even if the Parkway Gravel site finds are not definitive evidence of a Contact Period occupation, they nonetheless suggest some hypotheses for further testing. Much more information is necessary on the Contact Period.

Ironstone Use in Northern Delaware

The unusual amounts of ironstone debitage at both the Dragon Run North B and the Wrangle Hill South sites sparked a reevaluation of ironstone use in the region. Ward (1985) had documented the presence of a quarry site on the western side of the Delmarva Peninsula at Herring Island in the Elk River. Ward hypothesized that ironstone was traded in the region as biface preforms. Several archaeological projects have been undertaken in northern Delaware since Ward's (1985) M.A. thesis. Percentage of ironstone bifaces among all bifaces recovered at a site was calculated for 15 sites (Table 12). These data were combined with the data given in the

TABLE 12

Ironstone Biface Data for Figure 29

Site Number	UTM* Easting	UTM* Northing	Percent of All Bifaces made from Ironstone	Reference
7NC-A-017	439000	4402360	7.7	Custer and Hodny 1989
7NC-D-068	439820	4391770	0.0	Hoseth et al. 1990
7NC-D-075	442648	4393832	0.0	Bachman and Custer 1983
7NC-D-129	440090	4391930	0.0	Custer et al. 1988
7NC-E-009	443780	4390370	3.9	Custer et al. 1990
7NC-E-041	444688	4387184	0.0	Thomas 1981
7NC-E-043	443083	4394024	0.0	Bachman and Custer 1983
7NC-E-045	442960	4393952	0.0	Bachman and Custer 1983
7NC-E-050	444136	4389464	0.0	Catts et al. 1988
7NC-E-054	443120	4391440	0.0	Catts et al. 1988
7NC-E-081	445070	4385430	28.6	Catts et al. 1988
7NC-G-100	444160	4376440	10.0	This report
7NC-G-101	443980	4377750	0.0	This report
7NC-G-104	443260	4380250	37.5	This report
7NC-G-105	443190	4380750	20.0	This report

Data added to Update Ward (1985, Figure 13). Percentages calculated as in Ward (1985: 53; verified by personal communication July 1992).

* Universal Transverse Mercator grid coordinates

Appendix of Ward (1985:119-128) and then re-contoured to update Ward's Figure 13 (1985:58; this figure is also shown in Custer 1989:237; see Appendix IV for a listing of all data). Figure 28 shows the results. The quarry site at Herring Island still shows a regional influence, however, a second possible source area is indicated by a peak in eastern Delaware centered on the Dragon Run North B site.

To further investigate the possibility of an ironstone source area in northern Delaware, the percentage of ironstone in excavated debitage assemblages was tabulated for 18 sites in northern Delaware (Table 13). Ward (1985) found that there was insufficient debitage data for the larger region, but focusing in on the smaller area of interest to this report, the available data are adequate for an initial assessment (Figure 29). The results suggest a center of ironstone use on the eastern margin of the Upper Coastal Plain below the Piedmont where ironstone occurs within the Columbia Formation of Pleistocene sands and gravels (Spoljaric 1971). Anecdotal information confirms that tabular ironstone outcrops occur near Hares Corner, Delaware. The high percentage of ironstone at the Dragon Run site, at a site just to the north (7NC-E-39; Ward 1985:125), as well as, at the Wrangle Hill South site suggests that high-quality ironstone was available locally.

The availability of ironstone may be controlled by exposure of the raw material in deeply incised streams (see Figure 27) at the boundary between the Mid-drainage and Delaware Shore zones on the Upper Coastal Plain (Figure 3). This setting on the east side of the Delmarva Peninsula is analogous to the setting of the quarry at Herring Island on the west side of the Delmarva Peninsula where the Elk River has cut into the Upper Coastal Plain. This suggests the hypothesis that ironstone was used in the same manner as secondary cobble raw materials were on the Upper Coastal Plain — that is, wherever it was available (Custer and Galasso 1980). More data on the use of ironstone at sites on the upper Delmarva Peninsula could test this hypothesis.

The occurrence and use of ironstone locally on the east side of the Delmarva Peninsula does not disprove the hypothesis of Ward (1985) that ironstone may have been included in an exchange system that spread it down the Chesapeake Bay and the interior of the Delmarva Peninsula. Ironstone outcrops are still limited to a small area at the northern end of the bay and peninsula, and

TABLE 13

Ironstone Debitage Data for Figure 32

Percent Ironstone flakes in excavated debitage Collections from Northern Delaware

Site Number	UTM* Easting	UTM* Northing	Percent Ironstone Flakes	Reference
7NC-A-017	439000	4402360	0.34	Custer and Hodny 1989
7NC-D-054	440660	4394720	0.00	Custer et al. 1981
7NC-D-062	440920	4394850	0.00	Custer et al. 1981
7NC-D-068	439820	4391770	0.00	Custer et al. 1981
7NC-D-075	442648	4393832	0.00	Bachman and Custer 1983
7NC-D-129	440090	4391930	0.00	Custer et al. 1988
7NC-D-130	436060	4384450	0.88	Lothrop, Custer and DeSantis 1987
7NC-E-009	443780	4390370	0.00	Custer et al. 1990
7NC-E-043	443083	4394024	0.00	Bachman and Custer 1983
7NC-E-045	442960	4393952	0.00	Bachman and Custer 1983
7NC-E-050	444136	4389464	1.59	Catts et al. 1988
7NC-E-054	443120	4391440	0.20	Catts et al. 1988
7NC-E-081	445070	4385430	0.00	Catts et al. 1988
7NC-F-061	436440	4380560	0.00	Lothrop, Custer and DeSantis 1987
7NC-G-100	444160	4376440	3.63	This report
7NC-G-101	443980	4377750	0.21	This report
7NC-G-104	443260	4380250	88.67	This report
7NC-G-105	443190	4380750	55.09	This report

*Universal Transverse Mercator grid coordinates

the basic model of Ward (1985:58) and Custer (1989:237) still holds. Ironstone preforms may have been distributed from the narrow zone of availability with two centers, one on the west and another on the east side of the peninsula.

The local quarrying and reduction of ironstone is supported by the amount of cortex on ironstone flakes at the Dragon Run North B site (Table 6) and the larger average size of flakes at Dragon Run in comparison to the Parkway Gravel site (Figure 30). If the debitage at Dragon Run came from the reduction of ironstone preforms obtained by trade, then less cortex and smaller flakes would be expected. However, the percentage of ironstone flakes with cortex at Dragon Run is comparable to the percentage of cobble cortex seen at sites, like Parkway Gravel, where locally available stream cobbles were being exploited. Thirty percent of the ironstone debitage sample observed by Ward (1985:63) had cortex. There is no ironstone biface reduction sequence, as

FIGURE 30

Comparison of Flake Sizes at Parkway Gravel and Dragon Run North B Sites

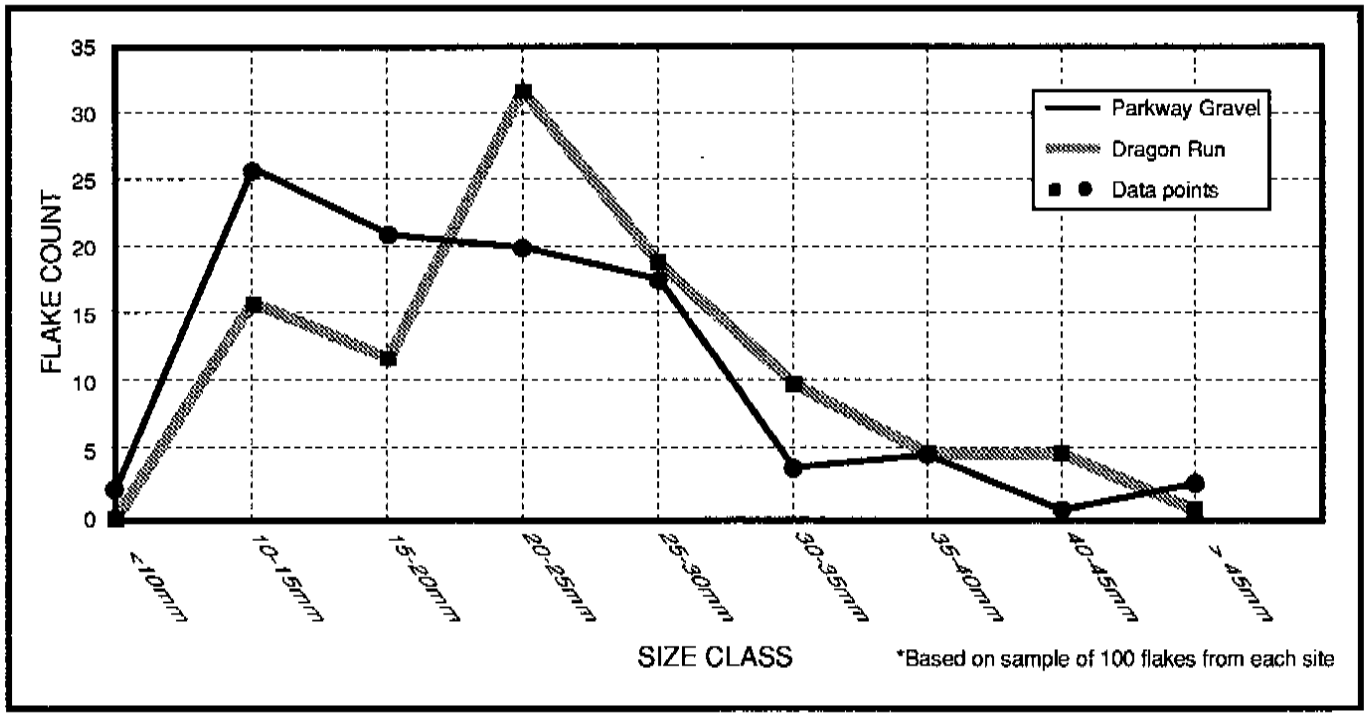


FIGURE 31

Ironstone vs. Cobble Flaking Model

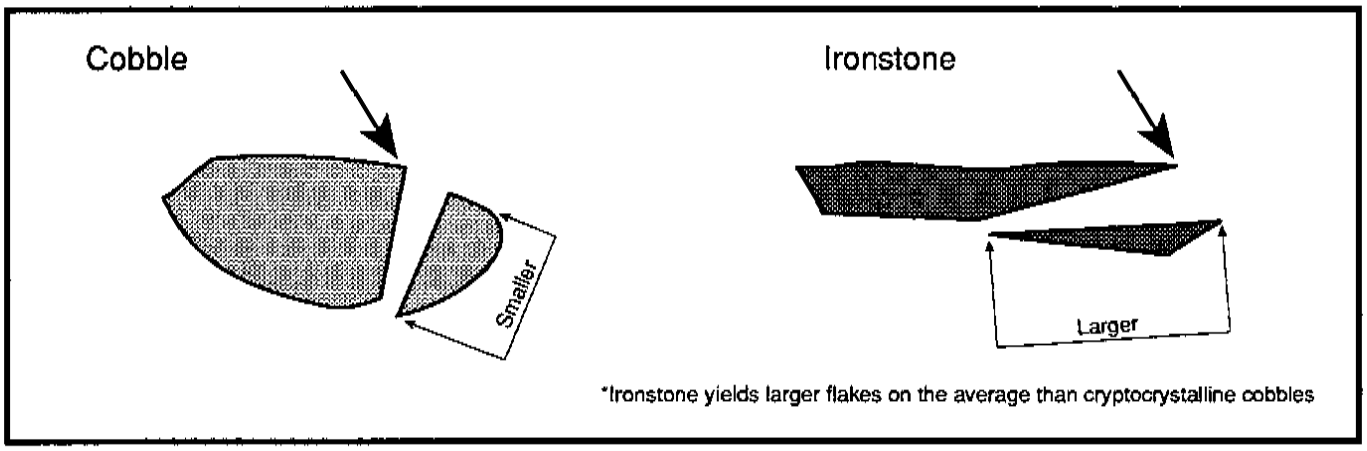


PLATE 9

Taking Data for Flake Attribute Analysis

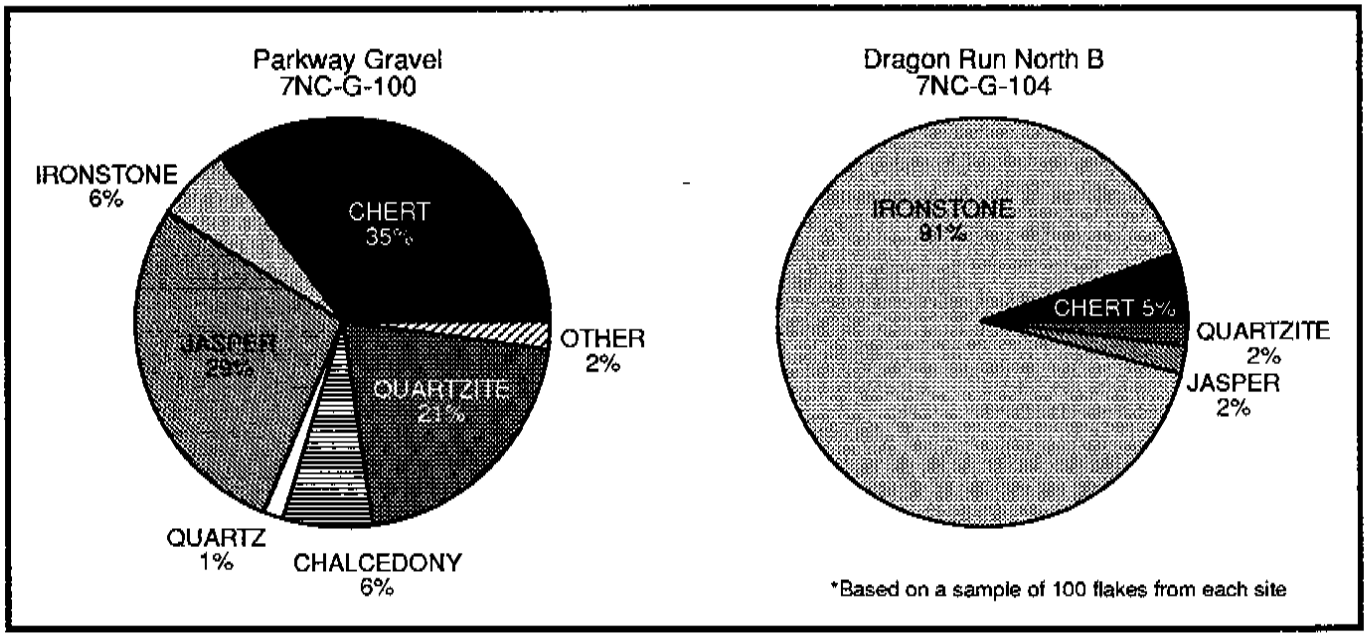
Edward Moyse measuring flake sizes in the lab. A whole sequence of observations are made on a sample of flakes from a site.

described by Ward (1985:37-42), at the Dragon Run North B site. This suggests that some preliminary reduction may have been done at the ironstone outcrops before raw materials were transported to campsites.

The larger size of ironstone flakes may be due, in part, to the tabular form in which ironstone naturally occurs. Angular raw material offers more immediate access for the knapper to better working angles and striking platforms conducive to larger flakes (Figure 31). On the other hand, the initial size of tabular ironstone raw materials may be larger than the size of cobbles available at sites like Parkway Gravel. This is another avenue for further research.

FIGURE 32

Flake Material Comparisons



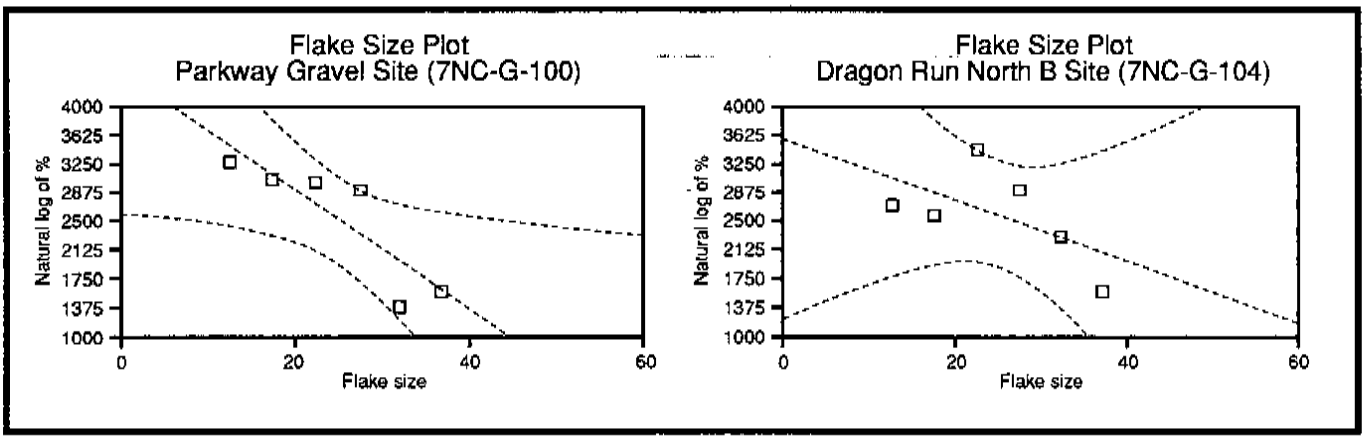
Flake Attribute Analysis

Flake attribute analysis (Plate 9) reveals contrasts between the Dragon Run North B site and the Parkway gravel site (Table 5). The mean Scar Counts differ at the 0.05 significance level, but the Direction Counts are not different at Alpha = 0.05. Both cobble core reduction and biface manufacture are indicated for the Parkway Gravel site. At the Dragon Run North B site, reduction of raw materials predominates over finishing of tools. However, the contrasts in raw materials between the two sites (Figure 32) makes it difficult to compare the flake attribute statistics because of the different flaking characteristics of various raw materials. Furthermore, the difference in starting form between cobbles and ironstone slabs confounds the comparisons. It may be productive to undertake attribute analysis by material type in order to compare the uses of different lithic raw materials.

Large samples of debitage would likely be recovered from further excavations at the Snapp and Wrangle Hill South sites. Lithic resources used at the Snapp site mirror those at Parkway Gravel, while the Wrangle Hill South site contains high percentage of ironstone. Flake attribute analysis of the collections from these sites could be used to further explore the issues raised here. Patterson (1990) showed that there is a characteristic slope to a plot of flake sizes produced from bifacial reduction. Plots of flake size distributions from the Parkway Gravel and Dragon Run North B sites (Figure 33) show the characteristic negative slope of bifacial reduction (more smaller

FIGURE 33

Regression Analysis of Flake Size Data



Flakes from the Parkway Gravel site tended to be smaller than those at the Dragon Run North B site as shown by the different slopes of the regression lines.

flakes than larger flakes). The plot for the Dragon Run North B site is much less steeply sloping than the plot for the Parkway Gravel site. The larger ironstone flakes at the Dragon Run North B site contribute to the difference. An earlier stage of reduction may be indicated at the Dragon Run site, or again the difference may be attributed to the raw material contrasts between the sites.

Flake attribute analysis for sites in the Dover area of the State Route 1 project (Riley et al. 1993) suggests that flake sizes decrease from north to south in Delaware as the size of available cobble raw materials decreases. However, the two sites reported here do not fit well into the trend. The Dragon Run North B site stands out especially. The slope of the linear regression line calculated for the Dragon Run North B site (see Figure 33) is lower (-0.08) than for any of the twelve other sites in Delaware for which Riley et al. (1993) present data. This result emphasizes the uniqueness of the Dragon Run North B site flake assemblage. The slope of the regression line for the Parkway Gravel site is -0.102, also a very low value that indicates large flakes and cobble reduction.

NATIONAL REGISTER ELIGIBLE SITES

Wrangle Hill South Prehistoric Site

The Wrangle Hill South Prehistoric site (7NC-G-105) is significant for four reasons. The first is the abundance of subsurface features at the site. Three pit features were located during Phase II testing. It is estimated that 70 features are present in the core area of the site — one feature for every 5.7 square meters (400 square meters/70 features). The second reason is the presence of

an area of intact soils that covers an estimated 15 square meters. The third reason is the presence of Nassawango ceramic artifacts on the site. This type of pottery is better known from further south in Delaware where it is associated with Delmarva Adena occupations. Finally, the presence of a large percentage of ironstone flakes in the debitage from the site is unusual, as discussed previously.

Snapp Prehistoric Site

The Snapp Prehistoric site is a large site suggesting intensive occupation. The abundance of fire-cracked rock on the site suggests household activities, and the features also suggest domestic activities. This contrasts sharply with the ephemeral procurement sites and other short-term occupations in the region. The site represents a Woodland I, Clyde Farm Complex, macro-band base camp. Testing revealed the presence of unplowed soils that are rare in northern Delaware. The site has a high potential of yielding important information on the Woodland I Period. As noted above, the site will yield a larger sample of debitage as well as a wide range of tools. Analysis will allow the exploration of lithic procurement and technology, and questions of trade and exchange in the region. The site can be compared to other Clyde Farm Complex sites further north such as the Clyde Farm site (Custer, Bachman, and Grettler 1986) and the Delaware Park site (Thomas 1980). The Snapp site is situated in a transitional zone where the Upper Coastal Plain slopes down to the Lower Coastal Plain. Prehistoric culture complexes show regional variation (Custer 1989:185-192). The Snapp site is located where there is a gap in our knowledge of the prehistory of the Delmarva Peninsula.

Woodville Farm Historical Site

The Woodville Farm site was occupied from the beginning of the nineteenth century until the late twentieth century. The site was owner-occupied for a time and tenant-occupied at other times. During the time of occupation, the fortunes of agriculture in northern Delaware fluctuated and the fortunes of the owners and occupants waxed and waned in response. The site prospered for a time, but was seized in default later. Recently the area has seen the decline of agricultural land use and increasing suburbanization and industrialization. The site figures little in the political history of the region; the major players are hardly mentioned in the history books except to note the exploits of real estate broker, William Bright, who foreclosed on the Penningtons (Scharf 1888:690,740,809-810,1219). Yet, the farm participated in the processes of change and development in northern Delaware for over 170 years.

The fact that the farmers who worked the land did not end up in the history books is precisely why the archaeological study of such sites is so important. The Woodville Farm site preserves important information on the everyday lives of its occupants. A variety of features document the domestic and agricultural activities on the site, and architectural remains document the construction and subsequent growth and evolution of the house itself.