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Cover: Lyent W. Russell
It is with great pleasure that the Archaeological Society of Connecticut dedicates this volume to Lyent W. Russell for his many years of service to the Society and for his commitment to the promotion of public education in archaeology.
POSSIBLE SOURCES OF MYLONITE AND HORNFELS DEBITAGE
FROM THE COOPER SITE, LYME, CONNECTICUT

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ABSTRACT

Debitage of three metamorphic rock types, a mylonite and two types of hornfels, have been identified from the Cooper Site (75-60), a Middle to Late Woodland occupation on a Connecticut River terrace in Lyme, Connecticut. The mylonite, a fine-grained rock from a fault zone, may have come from the nearby Honey Hill Fault (8 km upriver), in which case this would be the first documented use of material from this source. The two hornfels, which are composed of cordierite-chiastolite-biotite-spinel (spotted) and magnetite-orthorhombic pyroxene-cordierite, have no known source in Connecticut. Van Houten (1971), however, described similar hornfels from New Jersey, where the Lockatong shales have been baked by igneous intrusions. Such metamorphic rocks, which frequently are overlooked in prehistoric trade studies, have great potential in sourcing material because of their diagnostic but variable mineralogy, which can be determined easily in thin section.

INTRODUCTION

The Cooper Site (75-60) was initially reported by McBride (1984) but largely excavated by David R. George and the University of Connecticut Archaeological Field School during the 1994 field season. The site has yielded artifacts from Middle and Late Woodland occupations. We will discuss three metamorphic materials from the site’s lithic assemblage: a mylonite and two types of hornfels. All three rock types have been identified in thin section. These identifications add to the list of diverse lithic materials utilized by the prehistoric occupants of Connecticut (e.g. Calogero and Philpotts 1995). The mylonite is likely from a previously unrecognized locally available source. In contrast, the hornfels, which is unlike any found in Connecticut, indicates possible long-distance trade in a material frequently considered locally distributed.

The Cooper Site overlooks the Connecticut River on a terrace 10 meters above the high tide mark. The site is 300 meters south of Hamburg Cove, and 11 km north of Long Island Sound. Only a portion of the total site area has been excavated, as determined by transect sampling. A 113-square-meter excavation block has been exposed, revealing 23 features and over 10,000 lithic artifacts (Figure 1). Although the site lacks natural stratigraphy, analysis of the feature and artifact concentration patterns suggest two discernable temporal components.

The Middle Woodland component of the Cooper Site appears limited to the northern portion of the excavated area. It is interpreted as a series of small, briefly-occupied camps. Relatively small amounts ofdebitage and tools from this component were found near rock-lined hearths, two of which have been dated to 1875±70 B.P. and 1358±100 B.P. or 75 AD and 592 AD, respectively (Table 1). The Late Woodland component we interpret as the remains of at least one wigwam structure and a series of associated pits and hearths. Thirty-three post molds near the center of the excavation block form an ovoid ring with dimensions equal to those of wigwams from historical accounts (Gookin 1970; Stiles 1761: cited in Sturtevant 1975; Williams 1970; Wroth 1970). One hearth was radiocarbon-dated to 858±50 B.P. or 1092 AD, and two ceramic sherds were thermoluminescence dated to 908±20% B.P. and
880±20% B.P. 942 AD and 1070 AD, respectively (Table 1). These dates fall within the early portion of the Late Woodland Selden Creek Phase of the Lower Connecticut River Valley sequence (McBride 1984).

**TABLE 1: RADIOMETRIC DATES FROM THE COOPER SITE**

<table>
<thead>
<tr>
<th>Date</th>
<th>Context</th>
<th>Laboratory Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Uncalibrated)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1930±70 B.P.</td>
<td>Feature 9</td>
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<tr>
<td>(Calibrated)</td>
<td>Charcoal</td>
<td></td>
</tr>
<tr>
<td>1875±70 B.P.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1490±100 B.P.</td>
<td>Feature 1</td>
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<tr>
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<td>McBride (1984)</td>
</tr>
<tr>
<td>1875±70 B.P.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>970±50 B.P.</td>
<td>Feature 13</td>
<td>Beta #80914</td>
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<tr>
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<tr>
<td>858±50 B.P.</td>
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</tbody>
</table>

Dates calibrated according to Stuiver et al. (1973).

**Thermoluminescence Dates**

<table>
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<td>908±20%</td>
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<td>Alpha #496</td>
</tr>
<tr>
<td>880±20%</td>
<td>ceramic sherd*</td>
<td>Alpha #497</td>
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</table>

Provenience unrecorded, dates reported in McBride (1985).

Dense concentrations of debitage and tool fragments were found within several of the pit features, with well over half of the site's total lithic assemblage from the largest of these pits (Figure 1: Feature 3). Over 5,000 fragments of lithic debris concentrated in a group of non-overlapping pits suggests a period of very intensive use. Floral and faunal analysis of the Late Woodland component indicates at least a spring, summer, and fall occupation (George 1995; George and Bendremer 1995).

Within each component, there appears to have been episodic depositions of lithic debris. Debitage occurs in spatially discrete concentrations of visually distinct material types. However, because the material type of each concentration was often unidentifiable on macroscopic visual characteristics alone, representative flakes from the concentration were chosen for petrographic analysis.

For the making of a standard polished petrographic thin section, the selected flake is epoxied to a glass slide, ground and finally polished to a thickness of 30 μ (1 micron = 1/1000 mm). At this thickness, most rocks are translucent, allowing their crystalline fabric and mineral composition to be observed under a microscope and the material identified according to this information (Philpotts 1989; Williams et al. 1982).

The present study focuses only upon the metamorphic rocks from the Cooper Site because of such material's variable but diagnostic mineralogy. Petrographic analysis can determine the parent material and means of subsequent metamorphism. An understanding of a metamorphosed rock's formational history is critical to locating an artifact's geologic source. Further, contact zones have a geographically limited
Figure 1. Plan view of the Cooper Site.
distribution. These combined factors make metamorphic rocks amenable to sourcing. By identifying material type and potential sources, the geographic extent of lithic procurement areas can be estimated.

**MYLONITE**

The mylonite debitage is associated with the Middle Woodland component. Mylonite is an extremely fine-grained rock formed in a fault zone. The intense shear stresses near some faults recrystallize the surrounding rock into a fine-grained material (Philpotts 1989). Macroscopically, the material from the site resembles a dark grey, translucent hybrid of chert and quartzite with streaked inclusions. Without the aid of a microscope, this material is difficult to differentiate from chert. The 15 flakes from the Cooper Site are a mylonitized granite, as evidenced by the streaks visible in hand specimen. Under the microscope, it is evident that the streaks are actually undestroyed parent rock within the recrystallized matrix.

The Honey Hill and Lake Char faults, both of which could produce mylonite, cross south-eastern Connecticut. The Honey Hill Fault crops out 8 km upriver from the site, at Gillette Castle State Park (Figure 2). This outcrop, and a second in Preston, Connecticut, were sampled for mylonite. While both outcrops contain mylonitic material suitable for the production of stone tools, these materials differ from that found at the site. The rock from Gillette Castle State Park is a pseudotachylite, which is an intrusive mylonitic glass formed by frictional fusion, and the outcrop in Preston contained mylonitized gabbro. Thus, we are presented with the interesting scenario of having located two sources of material which could

![Figure 2. General locations of sources referenced in text, in relation to the Cooper Site.](image-url)
have been utilized for the production of stone tools, but to our knowledge has not yet been documented in the archaeological record. The source of the mylonitized granite from the Cooper Site has yet to be determined. Given the site’s proximity to a major fault zone and the variety of rocks through which this fault cuts, the source likely lies undiscovered along the margins of the Honey Hill Fault.

HORNFELS FROM THE COOPER SITE

Two types of hornfels were identified from the lithic assemblage of the Cooper Site. Hornfels is any contact metamorphic rock that has been recrystallized by high temperatures into a hard, fine-grained, homogenous material (Calogero and Philpotts 1995). Its presence in the archaeological record is frequently misidentified or unrecognized (Calogero 1991, 1992), with petrographic analysis of the unweathered interior often the only method of identification.

The first of the two hornfels is a "spotted" hornfels, so-called because subsoil artifacts are yellow-grey (Munsell 2.5Y 6/3), with numerous small, dark spots of less than 1 mm in diameter irregularly distributed across the surface, roughly 2 mm apart. When ultrasonically cleaned, samples appear purplish-grey (Munsell 2.5Y 6.5/1). The material exhibits conchoidal fracture, and fresh breaks reveal a black, fine-grained interior. Five thin sections were made.

Hornfels is classified according to its constituent mineral assemblage. The "spotted" hornfels is thus a cordierite-chiastolite-biotite-spinel hornfels. It exhibits absolutely no bedding, schistocity, or foliation. This hornfels was formed from an aluminous shale. The fine-grained (~1 μm) granoblastic matrix is composed predominately of red biotite, and quartz or feldspar. The "spots," visible in hand-specimen, are chiastolite crystals (d = 47 μm) which have been altered to a clay mineral and are ringed by green spinel (d = 3 μm). Some spinel also occurs throughout the matrix. Also present are porphyroblasts of cordierite similar in size to the chiastolite crystals but lacking the rims of spinel crystals. Veins of chlorite (w = 3 μm) and tourmaline (w = 3 μm) are visible.

Fifty-seven pieces of cordierite-chiastolite-biotite-spinel "spotted" hornfels debitage and an assortment of tools are found within the Middle Woodland component, concentrated near Feature 7 (Figure 1). These tools include a utilized blade, several biface fragments, and utilized flakes. No cortical flakes were recovered, suggesting that this material was transported to the site as a prepared core or biface.

A second hornfels, also a metamorphosed aluminous shale but visually distinct from the "spotted" hornfels, was recovered from the Cooper Site. The weathered exterior of the artifacts is blue-grey (Munsell 7.5YR N6/0), with some white, tan, or brown layering. Several pieces display a rough cortical surface, which follows the relict bedding planes of the parent shale. Samples emit a clay odor when moistened. The material exhibits conchoidal fracture, and fresh breaks reveal a black, extremely fine-grained interior. Six thin sections were made.

This hornfels is a magnetite-orthorhombic pyroxene-cordierite hornfels. The matrix is composed of ~1 μm grains of magnetite and orthorhombic pyroxene, with porphyroblasts of cordierite (d = 12 μm) throughout. The layers visible in hand-specimen are marked by the presence of an unidentified amphibole, possibly anthophyllite. Veins filled with red biotite (w = 9 μm) and limonite (w = 6 μm) are also present.

This hornfels is associated with the Late Woodland component, and 861 pieces of hornfels debitage and tools were found near Features 13-17 and 21-22 (Figure 1). These tools include scrapers, utilized flakes, and core fragments. Unlike the hypothesized prepared core of the spotted hornfels, this material appears to have been brought to the site as very roughly shaped "tablets." Several core fragments display planar cortical surfaces which are apparently the natural bedding of the parent rock. These tablets were little modified before being transported to the site.
POSSIBLE SOURCES OF HORNFELS

At present, neither of the hornfels are attributed to an exact geologic source. Hornfels in Connecticut occur only in the Hartford Basin, where three extrusive basalt flows have metamorphosed micaceous siltstone and arkosic sandstone (Figure 2). No basalt dikes are known to have intruded through shales (Calogero 1991; Philpotts and Martello 1986). In addition, the shales that are present in the Hartford Basin are coarser-grained than that which produced the artifacts from the Cooper Site and typically contain detrital mica grains.

Rocks similar to those in Connecticut occur in central Massachusetts. The one basalt flow there contacts only coarse sandstone. Farther east, hornfels does occur in the Massachusetts Quarry outside of Boston (Figure 2). This material is referred to as Braintree Hornfels (Bowman and Zeoli 1977; Ritchie and Gould 1985). No thin sections of this material were available for comparison, but published mineralogical descriptions (Chute 1969) indicate a different composition than either hornfels from the Cooper Site. Braintree Hornfels is common in the archaeological assemblages of sites in southeastern Massachusetts and northern Rhode Island, but appears to be limited to a 30 km radius from the quarries (Ritchie and Gould 1985; D. Ritchie, personal communication; Strauss 1992).

Hornfels similar to that from the Cooper Site is also not known to occur geologically in Rhode Island. All formations in which hornfels might be formed have been subjected to the large-scale regional metamorphism characteristic of the area (Murray 1988). The shales which produced the Cooper Site artifacts have not been regionally metamorphosed, for foliation in the rock fabric would be visible in thin section.

Thus, the apparent source of the Cooper Site hornfels does not lie to the north or east. This is perhaps not surprising given what is currently understood about Middle and Late Woodland exchange systems. Rhyolite is the only identified material occurring abundantly in archaeological sites in Connecticut from sources generally north and east (Figure 2). Calogero has noted that this material appears almost exclusively in Archaic contexts, and reports no Woodland Period sites with rhyolite artifacts from central Connecticut (Calogero 1991; Calogero and Philpotts 1988, 1989).

In marked contrast, the Middle and Late Woodland sites in Connecticut do show increasing amounts of trade in material originating generally from the south and west (Calogero 1991; Feder 1984; McBride 1984). Chert and jasper are the two non-local lithic materials that most frequently appear in these artifact assemblages. Both chert and jasper have sources in the Delaware Watershed and Hudson Valley (Figure 2) (Hammer 1976; Hatch 1994; Lavin 1983, 1987; LaPorta 1994; Wray 1948). Particularly for cultures in the Delaware Watershed, trade volume seems to have peaked during the transitional Middle and Late Woodland periods (Hatch and Maxham 1995; Luedtke 1987; Stewart 1989).

Sources of hornfels have been identified in the Mid-Atlantic from the Lockatong shales (Figure 2). These shale beds extend from southeastern New York, across north-central New Jersey, and terminate in northeast Pennsylvania (Van Houten 1969). Argillite and hornfels from these shales are often indistinguishable macroscopically. Both are well documented in the archaeological record of New Jersey and surrounding areas (Didier 1975; L.E. Williams et al. 1981). Geological descriptions of these materials based on over 150 thin sections and 750 X-ray diffraction analyses have been published by Van Houten (1960, 1962, 1965, 1969, 1971), and he describes (1971:4) a "spotted" hornfels identical to that from the Cooper Site. Similar descriptions also exist for the hornfels found within the Late Woodland component. Inspection of the thin sections from the Cooper Site by Van Houten confirms the similarity of this material to that from the Lockatong Formation (Van Houten, personal communication).

While matching written descriptions are not sufficient for absolutely attributing the Cooper Site artifacts to this source, archaeological evidence of similar exchange patterns supports the possibility. Based solely on visual identification, argillite, and possibly hornfels artifacts attributed to the Lockatong Formation have been described from sites in coastal New York (Ritchie 1965, 1971), Long Island (Rutsch 1970), and as far north as Massachusetts (Carty 1983; Massachusetts Historical Commission 1980: cited in Strauss 1989). Further, Calogero has identified hornfels containing corundum from three sites in central
Connecticut. The nearest source of this material is in the Hudson Valley, south of Peekskill, New York (Calogero 1991; Calogero and Philpotts 1995).

Therefore, raw material sources of chert, jasper, and hornfels all occur in relatively close geographic proximity. Within the Late Woodland component of the Cooper Site, concentrations of all three of these materials are found in adjacent deposits. This suggests that these materials may have been part of a common trade connection (George and Tryon 1996), and show not only the range of materials imported from the south and west, but also hint at the extent of social ties and exchange systems with cultures in these areas.

CONCLUSION

That hornfels may have been included in systems of exchange in chert and jasper is an important consideration when studying Middle and Late Woodland sites in Connecticut. Hornfels is often assumed to be of local origin, and such an untested assumption could drastically alter interpretations of lithic procurement patterns. Similarly, misidentification of locally available mylonite as non-local chert might overplay the role of long distance trade. Petrographic analysis of metamorphic rocks will hopefully continue to serve a pivotal role in lithic sourcing studies. Only by such methods can the full range of available lithic resources and cultural contacts of the Woodland Period Connecticut inhabitants be determined.

ACKNOWLEDGEMENTS

This paper would not have been possible without the aid, inspiration, and encouragement provided by David George, Eric Tyson (who also provided Figure 1), and Drs. Barbara Calogero and Lucianne Lavin. We would like to thank Dr. Franklyn Van Houten for his comments and inspection of our thin sections, and Shirley Albright of the New Jersey State Museum for helpful discussions. An earlier draft of this paper was presented at the 36th Northeastern Anthropological Association Meetings in Plymouth, New Hampshire.

REFERENCES CITED

Bowman, William F. and Gerald D. Zeoli

Calogero, Barbara L.A.

Calogero, Barbara L.A. and Anthony R. Philpotts
Carty, Frederick M.

Chute, Newton E.

Didier, Mary Ellen

Feder, Kenneth L.

George, David R.

George, David R. and Jeffrey C. Bendremet

George, David R. and Christian A. Tryon

Gookin, Daniel

Hammer, John

Hatch, James W.

Hatch, James W. and Mintcy D. Maxham

LaPorta, Phillip

Lavin, Lucianne M.

Lavin, Lucianne and Donald R. Prothero

Luedtke, Barbara E.
McBride, Kevin A.  

Murray, Daniel P.  
1988 *Rhode Island: The Last Billion Years.* University of Rhode Island Press, Kingston.  

Philpotts, Anthony R.  

Philpotts, Anthony R. and Angela Martello  

Ritchie, Duncan and Richard A. Gould  

Ritchie, William A.  
1965 *The Archaeology of New York State.* The Museum of Natural History Press, Garden City, NY.  

Rutsch, Edward S.  

Stewart, R. Michael  

Strauss, Alan E.  


Sturtevant, William  

Van Houten, Franklyn B.  

Williams, Howel, Francis J. Turner, and Charles M. Gilbert


Williams, L.E., D.C. Parris, and S.S. Albright


Williams, Roger


Wray, Charles Foster


Wroth, Lawrence C.

ABSTRACT

This paper explores the variability in archaeobotanical remains from six sites in the Connecticut River Valley, three in the middle valley and three in the lower valley. Further, information concerning the microenvironment these plant species represent is identified and discussed. The results indicate that strategies for procuring indigenous plants differed among lower and middle valley sites. Middle valley sites have archaeobotanical assemblages reflecting the collection of indigenous plant species primarily from disturbed habitats, likely horticultural fields. In contrast, indigenous plant assemblages from the lower valley indicate that a wider diversity of microenvironments was accessed, including disturbed habitats, marshes, meadows and streams. These findings are also discussed in terms of their implications of the interplay between maize horticulture and the collection of indigenous plant species.

INTRODUCTION

Over the last few decades plant remains have received increased attention by northeastern North American archaeologists. The identification of native domesticates in the midcontinent (Smith 1992) has encouraged some New England archaeologists to consider the possibility of the domestication and cultivation of native plants prior to the adoption of maize (*Zea mays*) (Benison 1993; George 1994, 1995). This research has also prompted consideration of the relative dietary contribution of native plants and the importance of identifying variability in archaeobotanical assemblages (George 1995).

With few exceptions, however, the analysis of prehistoric plant remains in New England continues to be directed toward understanding the role of maize in Late Prehistoric economies. Most studies of maize horticulture have focused on its time of arrival and climatic necessities (see for example Bendremer and Dewar 1993; Bendremer et al. 1991; Bernstein 1993; Bumstead 1980; Demeritt 1991; Heckenburger et al. 1992; Megadalia et al. 1990). Others have considered how maize horticulture articulates with settlement patterns and social and economic organization (Benison 1993; McBride and Dewar 1987). Based on archaeobotanical data and ethnohistorical accounts, New England archaeologists have constructed two models of the adoption and intensification of maize horticulture. These models are problematic, however, since they simply do not apply to all areas of New England.

The traditional model suggests that maize diffused to New England from the Midcontinent at about A.D. 1000 (Salwen 1978; Silver 1980). As a result, a shift from foraging to farming took place and dispersed settlement patterns, characterized by small seasonal and temporary camps, coalesced into a nucleated pattern with large sedentary villages. Villages, in turn, were supported by small, task-specific sites used for the collection of distant but necessary resources (McBride 1984; Snow 1980:320).

A second model maintains that maize horticulture and sedentary villages located in coastal settings are more recent developments (Ceci 1982; 1990a). Proponents of this view argue that the appearance of sedentary villages supported by maize horticulture was an outgrowth of contact with Europeans during the late protohistoric and early historic periods. According to this model, coastal villages were established largely for trading purposes and were situated in areas containing whelk and quahog used in the production of wampum (Ceci 1982; 1990b). In this instance, the transition to maize horticulture was necessary to provide a stable subsistence base in an essentially mercantile economy.
In reviewing the archaeological and archaeobotanical evidence it is clear that neither model is satisfactory for explaining the transition to maize horticulture across New England. Abundant data concerning the adoption of maize horticulture are now available in New England (George and Bendremer 1995). Over 40 sites containing maize have been excavated. Thirty-one of these sites have been radiocarbon dated, yielding a total of fifty-seven dates associated with carbonized maize (Figure 1). These sites offer information concerning the dates at which maize was used at each site and its relative importance in the diet of the sites' inhabitants.

The earliest date associated with maize in New England (1100±70 B.P. Beta 53452) calibrates to A.D. 970 and is from the 211-1-1 site located in the middle Hudson River Valley (Cassedy 1993). The Selden Island site in the lower Connecticut River valley also yielded an early date of 985 A.D. (one standard deviation = AD 894-1021) from a feature containing one maize kernel (McBride 1984).

In addition to these 10th century dates, there are five eleventh and twelfth century dates associated with maize from sites in eastern New York, Boston Harbor and eastern Pennsylvania (Funk et al. 1973; Luedtke 1990; Prezzano and Stepontaitis 1990; Ritchie 1969). These early dates suggest the arrival of maize in New England at about A.D. 1000 (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George and Bendremer 1995; Lavin 1988; McBride and Dewar 1987).

The archaeobotanical data from sites that have yielded maize reveal an interesting pattern. Sites with early radiocarbon dates and substantial amounts of maize are primarily located in inland, riverine areas such as the middle and upper reaches of the Susquehanna, Delaware, Connecticut, and Hudson river valleys. The overall distribution of sites containing tropical cultigens suggests a relatively rapid dispersal of maize horticulture into interior New England (George and Bendremer 1995). Data concerning the use of maize in coastal settings, on the other hand, are more sparse. Of the sites in New England that have yielded maize, 22 are located in coastal or near coastal contexts. Fourteen of these have been radiocarbon dated, while the remaining eight are identified as belonging to the Late Woodland period based on ceramic assemblages or other diagnostic artifacts.

Calibrated dates for sites along the coast range from as early as 985 A.D. (McBride 1984) to as late as 1450 A.D. (Cassedy 1993). While they represent a considerable temporal span, evidence for the intensification of maize horticulture through time is still lacking. Both early and late coastal sites have consistently failed to yield more than a few charred maize kernels. This is in contrast to evidence from interior/riverine sites, where maize is found in larger amounts. Stewart (1993) reports a similar dichotomy between coastal and interior maize use has been reported for portions of the Mid-Atlantic region. The question that remains is: why was there such variability in the adoption of maize horticulture between coastal and interior zones during the Late Prehistoric period?

Two factors may have discouraged the adoption of maize horticulture in coastal settings. The first factor that may have affected the decision of whether or not to adopt maize horticulture along the coast is the distribution of soils suitable for cultivation. A review of coastal county soil surveys along Long Island Sound indicates that areas of tillable soil comprise between only five and fifteen percent of the total land area. These soils occur in small, scattered pockets and are largely restricted to county areas particularly far away from the coastline. Coastal soils are, for the most part, very acidic and soil fertility is low (U.S.D.A. 1983). These problems are of little concern in the interior where tillable soils are widespread, pH is less acidic, and problems associated with low soil fertility are alleviated by annual flooding.

A second factor that may have contributed to the delayed adoption of maize horticulture in coastal zones was scheduling conflicts between the hunting and gathering of naturally occurring resources and maize cultivation. At the time when interior peoples were preparing and planting fields, coastal New Englanders would have been expending efforts on harvesting anadromous and coastline fish runs, hunting, and collecting shellfish and wild plant foods. Coastal areas have a much higher ecological diversity and contain a number of ecozones including salt marshes, fresh water streams, rivers and, of course, the Long Island Sound. In short, resources were abundant and provided a diverse diet of easily acquired foods without the risk and labor associated with maize cultivation.
The Archaeobotany of the Middle Connecticut River Valley

While much effort has been directed towards understanding the role of maize horticulture in Late Prehistoric economies, less attention has been paid to describing and interpreting the diversity of archaeobotanical assemblages with respect to native species. Archaeobotanical remains from Middle and Late Woodland components in the Connecticut River Valley and adjacent coastline (Figure 2) indicate that Late Prehistoric plant use was varied in terms of the types of plants used and the habitats they represent.
Figure 2. Map of southern New England shows the two study regions and the archaeological sites discussed in the text.
The Burnham-Shepard, Morgan and 6-HT-116 sites, for example, have yielded interesting and diverse botanical assemblages (Figures 3-5). All three sites are situated in the middle Connecticut River Valley. The Burnham-Shepard site has been radiocarbon dated to the mid-14th century (Bendremer 1993). Occupations at the Morgan site have been radiocarbon dated to the late 12th century and to the early and mid-14th century (Lavin 1988), whereas the 6-HT-116 site is dated to the mid-15th century (McBride 1984).

![Figure 3. Histogram and tabular information concerning the plant remains recovered from the Burnham-Shepard site.](image)
At Burnham-Shepard 18 native plant species were recovered from flotation samples collected from hearths and storage pit features (Bendremer 1993). The archaeobotanical assemblage indicates that in addition to cultigens (maize, squash and the only known sunflower seeds from New England), five nut
species, four types of herbaceous annuals, four species of grass and five types of fruits were exploited (Table 1). These remains reflect use of a variety of microenvironments accessible on the Connecticut River floodplain, including, woodlands, thickets, meadows and disturbed habitats associated with horticultural fields or the occupation area itself.

Figure 5. Histogram and tabular information concerning the plant remains recovered from the 6-HT-116 site.
## TABLE 1. PLANT REMAINS RECOVERED FROM ARCHAEOLOGICAL SITES IN SOUTHERN NEW ENGLAND

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<td>Phaseolus vulgaris</td>
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132-14: Burnham Shepard 6-HT-120: Morgan 45-21: Giant's Neck 152-11: Mago Point 75-60: Cooper site

Lavin (1988) has reported a collection of native plants similar to the Burnham-Shepard assemblage from the Morgan site. A total of 17 native species has been identified in flotation samples collected from hearth and pit features (Lavin 1988:17-18). The assemblage is composed of nut, annual, grass and fruit species and reflects use of a wide variety of microenvironments similar to those represented in the Burnham Shepard material (see Table I). In addition, hundreds of maize kernels have been recovered during hand excavation and from flotation samples from the Morgan site (Lavin 1988).

Finally, in addition to a single maize kernel, six native plant species have been noted at the 6-HT-116 site (McBride 1984). While grasses are absent from the archaeobotanical assemblage, nuts, seeds of herbaceous annuals and fruits have been identified (see Table I). The assemblage, like those from Burnham-Shepard and Morgan, indicates a pattern of native plant use that relied on collecting resources from microenvironments situated on the Connecticut River floodplain or adjacent terraces.

The Archaeobotany of the Lower Connecticut River Valley

Archaeobotanical assemblages recovered from the lower Connecticut River valley and the adjacent coastline, on the other hand, exhibit both similarities to and differences from plant remains noted from the middle Connecticut River valley. While data from coastal and near coastal contexts are still accumulating and are in need of further analysis, some broad patterns are discernible. Recent excavations at the Giant's Neck site in East Lyme, the Cooper site in Lyme and previous analyses of the Mago Point site in Waterford, Connecticut (McBride and Dewar 1987) indicate that many, widely scattered microenvironments were used for plant gathering (Figure 2).

The Giant's Neck site was excavated by the Public Archaeology Survey Team, Inc. during the fall and winter of 1993 as part of a project designed to upgrade existing sewer lines. During excavations 63 features were encountered, including hearths, middens and storage and refuse facilities. Radiocarbon dates indicate that the area was occupied during the 12th century (762±70 B.P. or 1188 A.D. (Beta 70368)), or the onset of the Late Woodland period.

Archaeobotanical remains recovered from the site represent 22 species, including two nut species, two types of fruits, 13 herbaceous annuals and five grasses (see Table I, Figure 6). Most notably a grain of what appears to be wild rice (*Zinzania aquatica*) was recovered from a refuse pit. The archaeobotanical remains from the Giant's Neck site indicate that a diversity of microenvironments, including uplands, disturbed habitats, and fresh and saltwater marshes were exploited.
Figure 6. Histogram and tabular information concerning the plant remains recovered from Giant’s Neck site.
Archaeobotanical data from the Cooper site paint a similar picture (Figure 7). The Cooper site is situated at the confluence of Hamburg Cove and the Connecticut River in Lyme and contains two components. One is radiocarbon dated to the first half of the Middle Woodland period (1358±100 B.P. or 592 A.D. (Beta 5318) and 1875±70 B.P. or 75 A.D. (Beta 80913) and the other is dated to the first century of the Late Woodland period (858±50 B.P. or 1092 A.D. (Beta 80914)). Analysis of feature contents is ongoing, but preliminary results suggest a diversity of plant species was collected and brought back to the site during both occupations. The plant remains analyzed to date include two nut species, seven annuals, four fruit and two grass species (see Table 1). As is the case with the Giant’s Neck site, these remains indicate that several different microenvironments were exploited, including uplands, fresh and salt water marshes and disturbed habitats presumably associated with the occupation area.

Finally, Mago Point, an 11th century occupation (977±110 B.P. or 973 A.D. (Beta 8740 and 1037±180 B.P. or 913 A.D. (Beta 8742)) located on the northern fringe of Long Island sound, contained numerous features, including storage and refuse pits, hearths and a midden area extending over a 3,500 square meter area. Flotation samples from these features yielded two nut species and the remains of five annuals (see Table 1, Figure 8). While grasses and fruits are absent from the Mago Point assemblage, the identified remains point to the use of uplands, marshes, meadows and disturbed habitats.

NOTE: The original report of the Mago Point site archaeobotanical data by McBride and Dewar (1987) indicated the recovery of 11 herbaceous annuals and four tree species. Subsequent review of the inventories of these remains indicates that only two of the tree species and four of the originally identified herbaceous annuals are represented by carbonized nut and seed remains. The other species originally reported in McBride and Dewar (1987) are represented by non-carbonized specimens and should be viewed with caution as they may be intrusive. Subsequent flotation of Mago Point feature matrix curated at the University of Connecticut by the author found no remains of the species represented by the non-carbonized specimens reported by McBride and Dewar (1987). The author did, however, recover over 150 whole and fragmentary carbonized Chenopodium seeds. Chenopodium was not identified in the Mago Point flotation samples analyzed by McBride and Dewar (1987).

Archaeobotanical assemblages recovered from sites in the lower Connecticut River valley and the adjacent coastline indicate that a wide variety of microenvironments were exploited for the collection of native species. Due to the general geography and topography of the lower Connecticut River valley and the northern shore of Long Island Sound, microenvironments that supported the plant remains just discussed were widely scattered. Consequently, collecting forays for native plants would have required somewhat more careful planning than those in the middle Connecticut River valley. Additionally, archaeobotanical assemblages from coastal sites suggest that just before or at the time maize was introduced into the region, aboriginal populations used a variety of native plant species. Whether or not any of these plants was cultivated is currently unknown. It is clear, however, that some of the native plants species recovered from sites in New England were cultivated and domesticated prehistorically in the midcontinent. This fact should prompt New England archaeologists to consider the possibility of premaize plant cultivation in the Northeast.

While establishing domesticate status for prehistoric archaeobotanical specimens is not a simple task, it is one that can be achieved. With the use of a scanning electron microscope certain changes in seed morphology can be noted and attributed to the domestication process (Smith 1988). Midcontinental researchers have observed morphological changes in at least three native species: sunflower (Helianthus annuus), sumpweed (Iva annua) and goosefoot (Chenopodium berlandieri) (Asch and Asch 1985; Heiser 1985; Smith 1992; Yarnell 1978). In the case of sunflower and sumpweed, increases in achene size are indicative of domestication, whereas a reduction in testa thickness and a truncate seed margin attest to the domestication of Chenopodium.

Archaeobotanical remains of native plants in New England should be subjected to the same kinds of analyses. Our focus on the arrival and transition to maize horticulture has led us to the conclusion, perhaps too hastily, that plant cultivation began only after about A.D. 1000 (at least in interior New
Figure 7. Histogram and tabular information concerning the plant remains recovered from the Cooper site.
In summary, it is clear from the archaeobotanical data that there was considerable variability in the way interior and coastal groups used both domesticated and wild plant foods. Because of previous emphasis on maize horticulture New England archaeologists have underestimated the importance and use of native plant species during the Late Prehistoric period. Careful study of archaeological remains of native plant species may provide us with additional insights into such topics as dietary breadth, food processing technologies and land use patterns during the Middle and Late Woodland periods. Future...
archaeobotanical studies will no doubt help to shed more light on these issues and construct a proper context for the arrival and assimilation of maize into Late Prehistoric food economies.

ACKNOWLEDGEMENTS

I would like to thank Dr. David Bernstein for inviting me to participate a symposium concerning the prehistory of coastal Connecticut and Long Island at the 1995 annual meeting of the Eastern States Archaeological Federation in Wilmington, Delaware. This paper was originally prepared for that event. I would also like to thank Catherine Labadia and Christian Tryon for reading an earlier draft of the paper and providing valuable comments.

REFERENCES CITED

Asch, David and Nancy Asch

Bendremer, Jeffrey C.

Bendremer, Jeffrey, Elizabeth Kellogg, and Tonya Baroody Largy

Bendremer, Jeffrey and Robert Dewar

Benison, Chris

Bernstein, David

Bumstead, Pamela

Cassedy, Daniel

Ceci, Lynn
Demerritt, David

Funk, Robert E., B. Rippeteau and R. Houck

George, David

George, David

George, David and Jefferey Bendremer

Heckenburger, Michael, James Petersen, and Nancy Asch-Sidell

Heiser, Charles Jr.

Lavin, Lucianne

Luedtke, Barbara


McBride, Kevin

McBride, Kevin and Robert Dewar

Megadalila, Christian, Elizabeth Little, and Margaret Schoeninger
Prezzano, Susan C. and Vincas Steponaitis
1990 Excavation at the Boland Site, Broom County: 1984-1987. Report to the National Geographic Society, University of North Carolina, Chapel Hill.

Ritchie, William A.
1969 The Archaeology of New York State. Natural History Press, Garden City, NY.

Salwen, Bert

Silver, Annette

Smith, Bruce D.

Snow, Dean

Stewart, Michael

United States Department of Agriculture

Yarnell, Richard
FORT SHANTOK NATIONAL HISTORIC LANDMARK

LORRAINE E. WILLIAMS
NEW JERSEY STATE MUSEUM
KEVIN A. MCBRIDE
UNIVERSITY OF CONNECTICUT
ROBERT S. GRUMET
NATIONAL PARK SERVICE

ABSTRACT

Fort Shantok, a large single component archaeological site in Montville, New London County, Connecticut, was designated as a National Historic Landmark (NHL) in 1993. The largest, most diverse, best preserved, and most intensively documented Historic Contact period archaeological assemblage in Southern New England, Fort Shantok meets NHL Significance Criterion 6, a property that has "yielded or may be likely to yield information of major scientific importance." This article is an abridged version of the NHL nomination form used to demonstrate the significance of the Fort Shantok archaeological site.

BACKGROUND AND OVERVIEW

The Secretary of the Interior designated Fort Shantok as a National Historic Landmark (NHL) on April 19, 1993. Fort Shantok was one of 17 properties designated for their significance in documenting relations between Indian people and colonists in the Northeast in the Historic Contact Theme Study (Grumet 1995).

The following article is an abridged version of the designation form used to nominate Fort Shantok as a NHL (Williams et al. 1993). New Jersey State archaeologist Lorraine E. Williams, who served as a field director in the New York University archaeological investigations at Fort Shantok under the direction of the late Bert Salwen, and Kevin A. McBride, associate professor of the University of Connecticut’s Department of Anthropology and director of its Laboratory of Archaeology, provided documentation and reviewed both nomination form and revised article text prepared by National Park Service archaeologist Robert S. Grumet. Descriptions of the excavations at the site and resulting data are drawn from Salwen (1966, 1978, 1984) and Lorraine Williams (1972).

Fort Shantok is a large, virtually single-component archaeological site located on Mohegan Indian tribal lands within the former Fort Shantok State Park on the west bank of the Thames River in the town of Montville, approximately three miles south of the city of Norwich in New London County, Connecticut. Archival and archaeological investigations carried out by field crews under the direction of the late Bert Salwen from Columbia University between 1962 and 1965 and New York University from 1966 to 1968 and again in 1970 corroborated earlier studies and local traditions associating the locale with the site of Uncas his fort, the main Mohegan town from 1636 to 1682 and the home of the most prominent and influential Mohegan leader and statesman of his era (Johnson 1996; Salwen 1966, 1969, 1970, 1978, 1984; Salwen and Otteson 1972; L. Williams 1972).

Fort Shantok is situated on a triangular-shaped promontory just below the place where Shantok Brook flows into the Thames River estuary. The site is located on a level terrace 60 feet AMSL (Above Mean Sea Level). The terrace is flanked by the Thames River on the east and Shantok Brook on the west. The peninsula-like terrace constrains into a narrow neck connecting the site area with the rest of the park to the south. Steep slopes surrounding all but this southerly neck are covered with underbrush and densely wooded with hardwood and softwood trees.
Analysis of stratigraphic profiles exposed during Columbia University and New York University excavations revealed that a 1-to 2-inch-thick layer of humus covered the site area. Below this topsoil, investigators found an 8- to 10-inch-thick layer of previously plowed culture-bearing dark brown sandy soil identified as a disturbed midden layer. Rocky and gravelly yellow sandy subsoil underlay this midden layer everywhere in the site area. Small amounts of scattered shell, bone, lithics, and ceramics occur in the upper 10 to 12 inches of the subsoil. Subsoils below this depth are culturally-sterile. Investigators removing midden level soils found intact pits, post molds, stone foundations, and other features containing datable deposits intruding into these subsoil strata from the midden layer.

Indian people had been living along the Thames River Valley for thousands of years (McBride 1984; Salwen and Otteson 1972) when Dutch mariner Adriaen Block penned the earliest known written references to Moricon Indians living on the Frisian [Thames?] River on a 1616 map of his 1614 voyage along the coast of New England (Block [1614] and de L Mist [1625] in Salwen 1978:172). People identifying themselves as Mohegans first appeared as signatories to a deed conveying Indian title to lands at Windsor, Connecticut near Hartford in April 25, 1636 (De Forest 1851:83-84).

Later in life, Mohegan leader Uncas recalled that he and his people then lived along the upper Thames River Valley. A document dated 1663 records Uncas's recollection that he had been allowed to remain on his father's land at Montononesuck after the Mohegans had been defeated by the Pequots and forced to submit to their authority or flee the country sometime before the Pequot War of 1636-37 (Connecticut Archives n.d.-- Towns and Lands [1]:67). Like many other Connecticut Indian leaders, Uncas was related to the most prominent Pequot families. Recounting his genealogy in 1679, he noted that he was connected by birth to the most notable Pequot line through his mother and grandmother and that he married the daughter of the paramount Pequot sachem Tatobem as the first of his two known wives "about ten years before the Pequott warres" (Hoadly 1857-58[1]:227-228).

Evidently unwilling to accept Pequot authority, Uncas reportedly rebelled and was driven from his home by Sassacus on five separate occasions. Five times, Sassacus allowed him to return after Uncas "humbled himself to the Pequot sachem, and desired that he might have liberty to live in his own country again" (Trumbull and Hoadly 1850-90[3]:478-480). The sixth time, Uncas returned as a conqueror at the head of 60 Mohegan and other Indian men. In company with the force of Connecticut colonists and Narragansett warriors commanded by John Mason, Uncas helped to defeat and subjugate the Pequots in 1637 (Underhill 1897:67).

Uncas was first noted in European records as the leader of a small Indian community at Munnicke in 1636 (Winthrop 1929-47[3]:270-271). Uncas's community grew considerably as he emerged as the most prominent Indian client of Connecticut authorities at Fort Saybrook, New Haven, and Hartford after the end of the Pequot War. In 1638, Uncas expanded his political horizons by concluding a mutual defense pact with Massachusetts Bay colonists in Boston (Winthrop 1908[1]:271).

Attracted by his success and influential connections, substantial numbers of Connecticut Indian people joined his community. Writing in 1637, Roger Williams of Rhode Island noted that 300 men, of whom less than 50 were Mohegans, lived with their families at Uncas's town (R. Williams n.d.:11). Williams further alleged that as many as 40 of these people were Pequot refugees on Long Island rescued by Uncas (R. Williams n.d.:18). In 1638, Connecticut authorities formally ordered 80 other Pequot men and their families to live under Uncas's supervision (Mason 1897:40). Asserting authority over the lands and lives of his followers, Uncas subsequently laid claim to nearly all remaining Indian lands in eastern Connecticut. This claim was not secure, however. Many Pequots ordered to live with Uncas, for example, reportedly moved back to their own homes in 1639 (Trumbull and Hoadly 1850-90[1]:32). Others began moving away shortly thereafter. Aware of the difficulties Uncas had in retaining followers, the General Court of the Connecticut Colony ordered the governor to send six men in the summer of 1641 to live and plant corn with him at Mohegan until after the harvest in order to encourage followers to remain in the town (Hoadly 1857-58 [1]:65).
All surviving documents indicate that Uncas continued to live at Mohegan from 1636 until his disappearance from colonial records the year before his son Owanoce first appeared as his successor in 1683. Although Williams wrote that the main Mohegan community was located on the Thames River in 1638, the first direct written reference to Uncas’s Fort appears in a document reporting a Narragansett assault on the town in 1643 (Hoadly 1857-58[1]:65). No known contemporary reference identifies any seventeenth-century Mohegan community by name as Fort Shantok. A document recording a 1659 property damage claim lodged by Jonathan Brewster, a trader who set up his post directly across the river from the mouth of Shantok Brook in 1650, clearly places the town at the site of the present Fort Shantok NHL (Winthrop 1929-1947[3]:270-271). Another source, a letter describing Connecticut Governor John Winthrop, Jr. and Reverend Thomas Peters’s journey to Uncas’s Fort to aid Mohegans wounded during a Narragansett attack in the spring of 1645, clearly indicates that Uncas and his people lived in houses located within their settlement’s fortification walls (Connecticut Archives n.d.–Indian Records[1]).

Connecticut and Massachusetts records show that Uncas’s Fort was repeatedly besieged at brief intervals by Narragansett and other Indian enemies between 1643 and 1657. Uncas and his people managed to repel all attacks. Honoring their mutual defense pact, Massachusetts sent 14 "musketeers... home with Onkus to abide a time with him for his defense" in 1643 (Winthrop 1908[1]:136). Hartford and New Haven also sent men at this time. Two years later, 40 men led by Governor Winthrop came to Uncas’s aid after the already-mentioned 1645 attack (Bradford 1901[1]:514-16). Another 40 Massachusetts Bay soldiers subsequently were sent to assist Uncas when Narragansetts and their allies again assaulted the fort shortly after the Connecticut soldiers withdrew (Bradford 1901[1]:514-16). In 1657, the General Court at Hartford gave Brewster permission to station four or five men at Uncas’s fort (Trumbull and Hoadly 1850-90[1]:302). This assistance proved increasingly important to Uncas as growing numbers of his followers, discouraged by their losses and increasingly unwilling to accept his authority, moved away from the Mohegan Fort.

Connecticut authorities depending upon Uncas to help manage Indian affairs and guard their frontiers did what they could to protect their Mohegan allies. New London colonists claiming Mohegan lands for themselves, for example, occupied the fort while Uncas and most of his people were out hunting in February, 1654 (Hoadly 1857-58[1]:251). Responding quickly, the General Court ordered the settlers to vacate the premises and return them to the Mohegans on the following March 11. Continually pressing for more lands, Connecticut settlers ultimately compelled Uncas and his people to put their marks on deeds alienating much of their remaining territory during the following decades. A survey establishing a boundary line between Uncas’s territory and New London’s lands undertaken on March 11, 1663 contained the last known written reference to Vnkos his fort (Hoadly 1857-58[1]:393-394). Designating John Mason as receiver and agent for his lands in 1665, Uncas evidently remained on a tract set aside by Mason for his occupation and use at the fort site until his death sometime after his last known appearance in European records in 1681 (Trumbull and Hoadly 1850-90[3]:309-311).

Discoveries of small amounts of European objects dating to the early eighteenth century found in the abandoned stone foundation of a structure in the Fort Shantok site area corroborate written accounts stating that most Mohegans gave up planting and became a wandering people depending upon hunting, fowling, and fishing for their livelihoods by the early 1700s. Almost completely dispossessed after selling most of their remaining lands, they had become a tiny minority forced to live on unwanted lands along the fringes of the colonial towns. By 1738, only 19 men above the age of 16 reportedly were living at the present site of the Mohegan settlement in Uncasville several miles south of Uncas’s Fort (Love 1899:21). Attending a school and a mission first established at Uncasville during the 1730s, one of the town’s younger residents, Samson Occum, grew up to become an important New England Indian leader and one of the most noted clergies of his day.

Located on the contested border between Norwich and New London, Connecticut settlers did not begin moving onto lands at Mohegan in any numbers until colonists settled their dispute in 1738 (Caulkins 1895:424-431). Colonists planned, but never built, a defensive work on what later became known as Fort Hill just north of the old Mohegan Fort during the War of Independence (Caulkins 1895:624). More inten-
sive settlement probably began after all Mohegan lands were included within the newly incorporated town of Montville in 1786 (Caulkins 1895:605). Although local farmers probably began planting crops at Fort Shantok at this time, they evidently did little more than cultivate and fence fields in the site area.

Mohegan people continued to periodically camp on or near the site of Uncas's Fort during these years. Many of these visits were made to inter community members in a cemetery that Mohegan people continue to use and maintain up to the present day. Alerted to the significance of the site by the presence of the Mohegan Cemetery and by reports of collectors discovering artifacts on nearby newly plowed fields, Connecticut authorities began purchasing land in and around the old fort site during the 1920s. First established on 110 acres in 1925, Fort Shantok State Park had grown to encompass an area of 171 acres when Bert Salwen and a group of Columbia University students conducted the first systematic scientific excavations at the site in 1962.

**ARCHAEOLOGICAL RESOURCES**

Archaeological deposits in and around the Fort Shantok NHL had been known to local collectors for more than 150 years when Irving Rouse (1945, 1947) first identified distinctive aboriginal ceramics in a small unprovenienced collection of pottery from the site at the Yale Peabody Museum as Shantok wares. At about the same time, Carlyle S. Smith (1944, 1947, 1950) identified a nearly identical assemblage at the Fort Corchaug site on the northern fork of nearby eastern Long Island. Noting that these wares occurred in sites containing large amounts of seventeenth-century European goods, Rouse and Smith named this complex the Shantok tradition, a distinctive localized development associated with Indian people living in southeastern Connecticut and adjacent portions of eastern Long Island during the middle to late 1600s.

Rouse described Shantok pottery as thin, shell tempered wares with globular bodies and constricted necks. Smoothed both inside and out, they vary in color from dark grey to buff. Distinctive lobes channeled out of the clay body or applied onto vessel collars characterize these wares. Frequently elaborate geometric incised designs, punctations, and occasional abstract modeled applique figures appear on exterior surfaces of vessel collars, lobes, ridges, and castellations. Shantok wares are broadly similar in appearance to other ceramics more commonly found along the upper Hudson River valley and the Mohawk River drainage in the Mahican and Mohawk Indian homelands. Noting similarities between the names and the pottery, earlier investigators generally thought that Mohegan people and their Pequot neighbors were recent immigrants from upstate New York (De Forest 1851:59-61). Utilizing data recovered during his excavations at Fort Shantok from 1962 to 1970, Salwen has since shown that the Shantok tradition most probably represents an in situ cultural development (Salwen 1969). Subsequent work by Kevin McBride has shown that Mohegan people producing Shantok wares crafted ceramics distinctly differing from Hackney Pond pottery associated with Pequot and other eastern Connecticut Indian people (Lavin 1987; McBride 1984:159-167).

Interested in gaining insight into the origins, history, and way of life of the Mohegan and Pequot people, Salwen led field crews working at Fort Shantok during eight field seasons between 1962 and 1970. Six different site locations were investigated during these years. Investigators removed and screened humus and midden layer soils in order to expose the tops of numerous features intruding into site subsoils. Pits and some post molds were cross-sectioned or quarter-sectioned and excavated in arbitrary levels in order to detect depositional episodes. Trench features and the dry-laid stone foundation encountered in Excavation Unit II were exposed and mapped. These features and the undisturbed portions of tested pits and post molds were then reburied in order to preserve them for future study.

Excavation Unit I, consisting of three five-foot squares placed in the eastern side of the site, was the first area of the site excavated by Columbia University field crews in 1962. Excavators encountered only one feature, a small pit designated Feature I/1, in these units. Investigators also opened 33 1/2 five-foot squares at Excavation Unit II in the southeastern portion of the site. Large numbers of post
molds, 12 pits (Features II/1 through II/12), the rectangular dry-laid fieldstone foundation of a structure measuring 12 by 16 feet (Feature II/13), and evidence of three distinct episodes of palisade wall construction were encountered in this excavation unit.

Investigators searching for further information on the site's fortifications excavated 28 two-foot wide trenches along the northwestern side of the park terrace and uncovered a 150 square foot area (Excavation Unit III) in the southwestern corner of the site in 1962, 1963, and 1968. Post molds and ditches associated with site fortifications were found (Figure 1). Investigations at Excavation Unit IV in the central portion of the site began in 1963 and continued until 1970. Digging seven one- to two-foot-wide test trenches and excavating 92 contiguous five-foot squares, field crews uncovered 45 pits (Features IV/1 through IV/45), and a north-south running line of post molds that may represent a palisade line or a house wall. A single poorly-defined feature was encountered during test trench excavations at Excavation Unit V in the southeastern corner of the site in 1963. Investigators working in Excavation Unit VI at the northern end of the site in 1964 also found no identifiable intact deposits on either side of the fieldstone fence running southwest to northeast across the area.

These investigations collectively revealed the presence of one of the largest assemblages of aboriginal and European materials found within intact deposits in a historically-chronicled site yet discovered in southern New England. A substantial variety of metal objects, such as hoes, axes, knives, wampum drills, pot hooks, scissors, hand-forged nails, finger rings, mouth harps, ladles, triangular arrow heads, a thimble, a hair comb, spoons, buttons, buckles, and scraps have been found in pits and hearths (Figures 2, 3). Most were found alongside European earthenwares and delftwares, mostly English white clay tobacco smoking pipes manufactured during the seventeenth century, and contemporary glass beads, bottle glass, and gunflints. Whelk and quahog shells were found with substantial amounts of Shantok ware sherds, aboriginal lithics, two ground stone gunshot molds, and well-preserved animal remains.

All but 59 of the 4,509 sherds found during site excavations belong to shell-tempered pots. Shantok sherds associated with at least 107 vessels represent the overwhelming majority (4,421 out of 4,450) of these wares (Figure 4). Another 136 chipped stone artifacts or pieces of artifacts, 20 ground or polished stone tools, and 45 hammerstones, abraders, and similar types of modified stone artifacts were found. Half of all chipped stone materials were Archaic period projectile points and flakes reused or inadvertently deposited in features by historic Mohegan site occupants. Some 68 bone needles, awls, scoops, gravers, flakers, and 11 worked bone blanks were found with 1,882 specimens of worked whelk or quahog shell representing all phases of wampum shell bead manufacture.

Nearly all larger mammal bones found at Fort Shantok have been associated with white-tailed deer. A few bear and horse bones, numerous bones of dogs, smaller mammals, birds, and fish also were recovered. Several features containing artifacts dating to the later years of site occupation show that sheep and cattle became increasingly important parts of the Mohegan diet during the 1660s and 1670s. Analysis of depositional frequencies of domesticated animals and other European imports confirms written reports stating that such materials assumed growing importance in the Mohegan community during the 1600s.

Most of these materials were found in the midden layer or in the 15 storage pits, 11 "steaming" pits containing concentrated layers of cobbles covered by dense masses of shell, five stone-lined hearths, and 31 other storage, cooking, or refuse pit features primarily unearthed in Excavation Units II and IV. A long narrow dark soil stain extending along the western and southern limits of the site deposit, identified as Palisade No. 1, is believed to represent the remains of a trench dug to support a fortification wall built on or about the time Uncas moved to the locale in 1636. Two parallel lines of post molds (Palisade Nos. 2 and 3) overlaying earlier Palisade No. 1 trench deposits are believed to represent later fortification lines. Palisade No. 2 may have been built during the period of the Narragansett Wars from 1643 to 1657. Discovery of cross-mended pottery sherds in Features II/6 and II/10 containing diagnostic artifacts dating to the 1660s between the post mold line of Palisade No. 2 indicates that no barrier to their deposition may have existed at this time. Discovery of a European ceramic sherd dating to ca. 1670 in Feature II/10 fill overlain by the Palisade No. 3 post mold line suggests that this fortification episode may have occurred at the time of King Philip's War in 1675-76.
Figure 1. Bert Salwen’s original plan drawing of postmolds, ditches, and other features uncovered in his excavations at Fort Shantok, including the three episodes of palisade construction.
Figure 2. Iron axe heads recovered from Saiwen's excavations at Fort Shantok.
Figure 3. Various metal trade items recovered from the Fort Shantok excavations, including scissors, buckles, and a hand forged nail.
Figure 4. Large rim sherd from a pottery vessel of the type Shantok Incised, recovered from Fort Shantok.
Extensions of the trench line of Palisade No. 1 in Excavation Unit III and in the line of post molds associated with Palisade No. 3 in Excavation Unit Nos. II and III may represent bastions. The line exposed in Excavation Unit II enclosed the above mentioned stone foundation. The post mold line associated with Palisade No. 2, for its part, parallels the bastion-like pattern identified in Excavation Unit III and runs underneath the stone foundation in Excavation Unit II. This clearly indicates that both the stone foundation and the post mold line of Palisade No. 3 extending around the foundation were erected sometime after Palisade No. 2. Another 100-foot-long line of post molds extending north and south through the central part of the site may represent a portion of what is thought to be either the eastern wall of a town much reduced from its earlier size or another as yet unidentified structure.

Feature II/8, a small pit containing grit-tempered pottery and stemmed points dating to the Late Archaic or Early Woodland period, represents the only in situ evidence of earlier occupation at the site (Salwen 1966:36). No materials clearly dating to the last quarter of the seventeenth century have been found in intact features. Staffordshire wares and marbled mug fragments found in fill deposited in the depression within the stone foundation walls of Feature II/13 represent the only evidence of later intermittent early eighteenth-century occupation at the site.

SITE AND COLLECTIONS INTEGRITY

Overall integrity of intact sub-plowzone site deposits at the Fort Shantok NHL is excellent. The site landscape is carefully maintained. Undertakings potentially impacting archaeological deposits are carefully monitored by the Mohegan Tribe.

Most disturbances to site deposits occurred during the eighteenth and nineteenth centuries. Farmers plowing the area after the Indians were forced to leave disturbed all but the lowermost levels of the 10- to 12-inch-thick midden deposit covering most of the site area. New London, Willimantic, and Springfield Railroad Company workers cutting into the terrace bluff to widen the line’s right-of-way between 1847 and 1849 disturbed portions of the easternmost part of the site deposit (Caulkins 1895:664). Early park landscaping further affected already disturbed upper portions of plowzone deposits in places.

Although the site has been a focal point of archaeological interest for over a century and a half, excavators and collectors have had little discernible impact on intact sub-plowzone deposits. Only five percent of known site deposits were affected by archaeological excavations conducted during the earlier mentioned Columbia University and New York University field seasons. The majority of the features depicted on the site excavation map, for example, were exposed, mapped, purposely not fully excavated, and carefully reburied in order to preserve their archaeological values. Today, erosion along unstabilized portions of the steep bluffs flanking the eastern and western margins of the park and the root systems of trees located in central areas of the site represent the main potential threats to the locale’s archaeological deposits. Aware of these problems, the Mohegan Tribe continually monitors and stabilizes areas threatened by erosion.

Archaeological data systematically excavated by Columbia and New York University field crews are presently curated in the University of Connecticut’s Laboratory of Archaeology in Storrs. Other collections are stored at the Yale Peabody Museum in New Haven.

Present Appearance

Until its recent designation as a federal Indian reservation, the Fort Shantok NHL was within a State Park primarily used for picnicking and other kinds of recreation. Mohegan Indian people use the park for their annual August powwow. The archaeological site area is covered with regularly mown lawn grass. Red cedar and other trees cover the lawn at intervals and line the edges of the terrace. Dirt and gravel paths cross the reservation area. The Mohegan Indian Cemetery, a paved parking lot, and paved access roads and paths are all located to the south of the site area.
Significance

The Fort Shantok NHL contains perhaps the largest, most diverse, and best preserved assemblage of archaeological data associated with seventeenth-century Indian life in southern New England. Fort Shantok is also a place of paramount spiritual significance to Mohegan Indian people.

Archaeological materials from the Fort Shantok locale represent a unique body of tangible physical evidence capable of corroborating both oral traditions and written accounts of Mohegan Indian life and culture during the earliest phases of direct contact between native people and colonists. The assemblage contains abundant artificial and biological evidence of trade relationships. Discovery of locally produced and imported non-Indian metalwares, glasswares, and ceramics, as well as remains of extensive wampum shell bead manufacture and bones of imported European domestic animals like sheep and cattle document changing patterns of trade relations between Mohegan Indian people and New England colonists.

Discovery of evidence associated with three fortification construction episodes, recovery of brass, iron, and stone triangular projectile points, gunflints, and stone gunshot molds produced by site occupants, and the placement of the site on a prominent and easily defensible hilltop locale graphically reflects the many Mohegan diplomatic and military activities documented in the many seventeenth-century records reviewed earlier.

Physical evidence of activities of Indian or English missionaries reported to have been active in the area have not been found in Fort Shantok archaeological deposits. Although no readily discernible objects associated with traditional Mohegan religion have yet been found by site investigators, the absence of objects related to Christian beliefs corroborates historic documents depicting Uncas as a vigorous defender of native religion. In 1678, for example, the Reverend Fitch wrote that Uncas was quick to "villify [Christian] ... religion, and is a great opponent of any means of souls' good and concernment to his people, and abounding more & more in dancings & all manner of heathenish impieties since the warrs" (Connecticut Archives n.d.--Indian Records [1]:33).

Fort Shantok contains one of the largest and best documented bodies of datable white clay tobacco pipes, glass beads, and other European objects in the North Atlantic region. These and other imported wares, animal bones, and shells associated with wampum bead production have the potential to yield new insights into changing processes of technology transfer to Indian people in southern New England during the Historic Contact period.

Several bodies of archaeological evidence found within Fort Shantok NHL archaeological site deposits document information associated with Mohegan demographic and settlement patterns. Archaeological documentation of the movement of several hundred eastern Connecticut Indian followers of the Mohegan leader Uncas into a single nucleated and often fortified locale represents a dramatic shift from earlier less sedentary settlement strategies. Decreases in site size further reflect documented Mohegan population losses caused by war, emigration, and less well-documented factors.

Archaeological evidence of the three episodes of palisade-line construction identified at the site also reflects shifting patterns of fortification development (Figure 1). The long trench associated with Palisade No. 1 may have been the most effective construction technique available to builders using fire and stone tools to fell trees. Unable to easily sharpen their ends, such builders may have found it more expedient to bury lines of blunt-ended poles together in long trenches. Discovery of lines of individual post molds associated with Palisade Nos. 2 and 3 suggest that iron tools like the axes found in site features enabled later townsfolk to sharpen and drive individual trees into the ground.

Identification of post mold patterns reminiscent of bastions discovered at other locales in the Northeast also may represent other evidence of new developments in Mohegan military architecture. Discovery of a dry-laid fieldstone structural foundation further may reflect Mohegan adoption or adaptation of European building techniques.

Previous archival and archaeological research has revealed a great deal of information on the types of habitations at the Fort Shantok NHL. Analysis of the results of this research strongly suggests that thus far unstudied portions of the site have high potential to yield further data on seventeenth-century aboriginal habitation types and distributions in the Thames River Valley and throughout eastern Connecticut.
Fort Shantok NHL deposits also document the Mohegan impact upon the changing images of Indian people in American life. The role of Uncas and the Mohegan community in New England history during and after the Pequot War of 1636-37 have been recounted in schoolrooms across America for more than 200 years. The name of Uncas has also become familiar to the millions of American Boy Scouts inducted into an organization known as the Order of the Arrow. Founded as a brotherhood of honor campers in 1915, the rituals of this organization portray Uncas as a paragon of fidelity and virtuous self-sacrifice.

Novelist James Fenimore Cooper first brought the name of Uncas to international attention as the fictional young son of the equally fictional Chingachgook in James Fenimore Cooper's novel *Last of the Mohicans* (Cooper 1826). Cooper took considerable license with his subject. The Mohicans in Cooper's novel, for example, were Mahican people from upstate New York. And the fictional Uncas and his father were not the last members of their tribe. Today, both the Mohicans of Wisconsin and Ontario and the Mohegans of Connecticut remain vibrant and vital cultural communities that continue to be parts of America's cultural mosaic.

The historic Uncas has been lionized as a faithful friend of colonists, praised as a heroically pragmatic defender of his people's rights (Caulkins 1895), and derided as a colonial dupe or ruthlessly ambitious opportunist (De Forest 1851). However he is viewed, Uncas's life has served as a metaphor of the many ways Indian people have responded to the challenges of contact and of the many and often contradictory ways others have interpreted their experience.

Mohegan people have cherished Fort Shantok as a burial place, festival ground, and locale for quiet reflection for several centuries. Describing the significance of the place to her people, Mohegan Nation Department of Cultural Resources director Melissa Fawcett affirms that "at Shantok, lies the spirit of Mohegan. It is the place that we, Mohegans, come from, the place from which we draw strength during our lives, and the place where we ultimately journey into the Spirit Land" (Fawcett 1993).

Today, both the Mohegan tribe and other Americans regard Fort Shantok as a place of paramount significance. Knowledge preserved in Mohegan oral traditions and in archaeological deposits preserved at the Fort Shantok NHL represent a uniquely valuable resource capable of helping all Americans better understand Mohegan culture and the continuing contributions of all Indian people to the nation's heritage.

REFERENCES CITED

Bradford, William

Caulkins, Frances M.

Connecticut Archives

Cooper, James Fenimore
1826 *The Last of the Mohicans*. New York.

De Forest, John W.

Fawcett, Melissa

Grumet, Robert S.
Hoadly, Charles J. (editor)  

Johnson, Eric S.  

Lavin, Lucianne  

Love, W. DeLoss  

Mason, John  

McBride, Kevin A.  

Rouse, Irving  


Salwen, Bert  


Salwen, Bert and Ann Otteson  

Smith, Carlyle S.  


Trumbull, J. Hammond and Charles J. Hoadly (editors)  
Underhill, John

Williams, Lorraine E.

Williams, Lorraine E., Kevin A. McBride, and Robert S. Grumet

Williams, Roger

Winthrop, John, Jr.
THE COTTON HILL STEATITE QUARRY

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ABSTRACT

The Cotton Hill Steatite Quarry is located in New Hartford, Connecticut. The author describes artifacts excavated from the site.

This quarry is located in the town of New Hartford, Litchfield County, Connecticut. About 60 years ago three men: Messrs. Edward N. Rogers, Henry L. Harrison and Herman Fisk (Mr. Harrison's chauffeur) made several trips to the site and made a series of excavations. I was their guest on one dig. I have an index card from Mr. Rogers' file which states that, "the quarry was formerly Kimberly Farm, known as the Cotton Hill section of New Hartford, Conn. Also recorded, three depressions -- largest 70 x 50 x 10 feet. Major part of relics found on north side of largest depression." These men found several bushels of fragments of bowls, dishes and other vessels along with a very large number of end picks and other tools used to quarry the steatite. The objects discovered do not vary very much from those found at other quarries.

The procedure in the manufacture of these vessels is the same at each quarry (Bullen 1940; Dunn 1945; Fowler 1943, 1951, 1956, 1961, 1966, 1967, 1968, 1969; Holmes 1919; Howes 1944; Moorehead 1900; Neshko, 1970; Williams 1897; Willoughby 1935). The mass of steatite was blocked out on the ledge, undercut around its periphery, then broken off probably with a long wooden lever. Many times this final operation proved to be disastrous due to flaws or other irregularities in the stone hence the large number of broken bowls. Although these vessels were difficult to fabricate they would resist heat, and were not easily broken by fire, with the added advantage that they would retain heat. I recall that in my youth a piece of soapstone (steatite) was heated on the stove then removed, wrapped in a piece of flannel and placed at the foot of the bed on cold nights.

Complete pots of blanks are very scarce or absent from these quarries and it is believed that unfinished vessels were taken to camp or village sites to be completed. I do have a small unfinished ladle or a toy pot made for a child found by Mr. Fisk (Figure 1). Mr. Rogers donated a large number of quarry tools and fragments of bowls to the Yale Peabody Museum. All objects found by Mr. Harrison were given to Mr. Rogers. I acquired Mr. Fisk's specimens from his widow several years ago. The American Indian Archaelogical Institute, now known as the Institute for American Indian Studies, purchased the Rogers' collection before and after his death in 1972. These museums could set up an interesting exhibit illustrating how the Indians quarried steatite and made their vessels.

The broken pot (Figure 1) is of special interest because of the kind of fracture which resulted in failure to complete the bowl. In hollowing out the interior, the craftsman used too forceful a blow with the end pick, with the result that it went through the bottom. We know that the blow was from the inside because the hole was larger and more material removed on emergence of the pick than on entering. Another good example of this fact is when a bullet enters a pane of glass; the hole is smaller on entering than leaving.

The fractured bowl (Figure 1) is rather unusual because it was apparently used although extremely crude. The rim of this vessel on the left side was broken off during its use. How does one know that it was used? It seems obvious that decoration was the final stage in completing any object. The notches on the right rim of this vessel, either for ornamentation or for the record of events would have been made.
Figure 1. Steatite containers from the Cotton Hill Quarry, New Hartford, CT.
Left and middle: broken steatite vessel. Right: steatite ladle or toy pot.

Figure 2. Steatite bowl blank, Cotton Hill Quarry, New Hartford, CT.
Figure 3. Small steatite dish, Cotton Hill Quarry, New Hartford, CT.

Figure 4. End picks from the Cotton Hill Quarry, New Hartford, CT.
after it was finished. This object might have been mounted on a wooden handle and served as a ladle, obviously it is too small for a cooking pot.

The object shown in Figure 2 is a blank for a small pot. The object in Figure 3 appears to be complete and possibly served as a dish for a small child. Figure 4 illustrates three end picks and Figure 5 shows a grooved ax used for quarrying the steatite and shaping the vessels. I have several of the pointed ends from broken picks. All pieces of shattered tools should have been saved for the possibility of restoration. Such a large quantity of broken bowls, dishes and perfect quarry tools were discovered that many fragments were left there. In excavating sites today all cultural material is saved, a great improvement over some crude procedures of the past.

These steatite quarries were worked during the Terminal Archaic period about three thousand five hundred years ago. Fragments of soapstone bowls were found associated with Orient points at the Grannis Island site and with Susquehanna points at the Burwell-Karako site, both of which are located in New Haven. It is interesting to note that at Grannis Island a part of a steatite bowl was found in situ on the beach, which is covered at present by several feet of water at high tide. In other words it is a submerged site which had been occupied by the Orient people; the water table has risen considerably since they were there.

Another interesting observation that I have made is that in excavating a site all fragments of a broken vessel are seldom found. Although one searches over the site very carefully, many pieces or a large part of a steatite pot is missing. I believe that the fragments were saved and taken to another site where they were utilized to make other objects because the source of raw material was far away. I recall finding at the Burwell-Karako excavation a very fine highly polished small fragment of a banded soapstone pot but the rest of the vessel was missing. In my collections is a plummet or fish line sinker made from a fragment of a steatite bowl from Pomfret, Conn. It is grooved at the smaller end for attachment to the line. Probably many of the small steatite objects were made from pieces of broken vessels.

Figure 5. Grooved axe from the Cotton Hill Quarry, New Hartford, CT.
ACKNOWLEDGMENTS

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REFERENCES CITED

Bullen, Ripley P.

Dunn, Gerald C.

Fowler, William S.

Holmes, William H.

Howes, W.J.

Moorehead, Warren K.
1900 Prehistoric Implements. 99-102.

Neshko, Jr., John

Williams, Frederick

Willoughby, Charles C.
SACRED LANDSCAPES AND TRADITIONAL CULTURAL PROPERTIES: PLANT-GATHERING LOCI FROM NEW JERSEY’S OUTER COASTAL PLAIN

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ABSTRACT

The primary purpose of this paper is to assess a series of late prehistoric Native American sites which may represent sacred medicinal herb-gathering loci from New Jersey’s Outer Coastal Plain in the Middle Atlantic region of the Eastern United States. Nine sites are systematically described and compared, using artifactual data in conjunction with associated floral availability, on the basis of standardized catchments surrounding each of these studied sites. Subsequently, these sites are evaluated as potential Traditional Cultural Properties, or Sacred Places, as currently defined in National Register Bulletin 38.

INTRODUCTION

Recent studies in ethnobotany (Cox and Balick 1994; Balick et al. 1994) and newly introduced Federal legislation to protect Traditional Cultural Properties in the United States (Parker and King 1990), presents a perplexing problem to Northeastern anthropology: the identification of sacred herb-gathering sites. In the Northeast, these sites have probably been overlooked by researchers due to low archaeological visibility and a general lack of extant native informants to bring attention to this site category, when compared to the western United States (Greiser and Greiser 1993; Parker and King 1990. To my knowledge, a sacred herb-gathering site has yet to be identified in the Middle Atlantic region.

Although ethnobotanists have only recently begun to systematically collect data on medicinal plant uses of indigenous native cultures in the Americas (Alcorn 1984; Vickers 1984; Boom 1986), early explorers, travelers, and colonists reported large-scale uses of plants for medicinal purposes by Native American cultures since at least the seventeenth century in North America (Yarnell 1964; Vogel 1970; Moreman 1986), and particularly from the Middle Atlantic region (Lawson 1714; Loskiel 1794; Weslager 1973).

There has also been a recent surge of interest by the modern scientific community to study and identify traditional medicine as a source of therapeutic drugs to find cures for diseases such as cancer and AIDS. Modern scientists and anthropologists alike have voiced their concern over the loss of the tropical rainforest in Latin America, and associated traditional tribal cultures. Because with the loss of plant resources and traditional medicinal practices, we may in fact be losing vital and potential drug cures to diseases which plague humankind. Plants have been determined to possess a rich source of medicines because they have been found to produce a host of bioactive molecules, most of which probably evolved as chemical defenses against predation or infection (Cox and Balick 1994:82-83).

In Belize, concerned researchers have been able to establish the world’s first ethnobiomedical forest reserve in the Terra Nova rainforest. In 1993, a 2400 hectare reserve was created in this lowland tropical rainforest to preserve locally known medicinal plants from destruction and possible extinction. This lowland reserve was deeded to the Belize Association of Traditional Healers, and was designed to preserve the botanical resource and allow local resident herbalists to teach cultural traditions of medical healing, in an indigenous setting (Balick et al. 1994:316-317).

The primary purpose of this paper is to evaluate a series of prehistoric sites which were recently discovered in New Jersey’s Outer Coastal Plain, as part of predictive model survey (Ranere and Hansell 1994).
1987). These sites have not been designated a specific site type, and are tentatively classified as artifact scatters, but may in fact represent herb-gathering loci. These sites will be described, compared, and subsequently evaluated as potential Traditional Cultural Properties as currently presented in National Register Bulletin 38 (Parker and King 1990).

Prior to these site evaluations, we will define Traditional Cultural Properties, or sacred sites, summarize some of the compiled anthropological literature from North America, as well as examine the ethnohistoric and more recent ethnographic literature from the Middle Atlantic region.

BACKGROUND

A Traditional Cultural Property is defined "as eligible in the National Register because of its association with cultural practices or beliefs of a living community that a) are rooted in that community’s history, and b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1990:1). Traditional Cultural Properties are usually determined eligible for inclusion in the National Register under National Register Criterion A, because of its association with events which reflect broad patterns of history or prehistory in an area’s or group’s traditional cultural history (Parker and King 1990:11).

The majority of Traditional Cultural Properties, or Sacred Places, have been documented in Western North America, among Native American tribes, such as the Navajo (Downer 1989; Winters 1993), Hopi (Ferguson et al. 1993), and Zuni (Hadley 1993; Hart 1993) of the American Southwest, as well as the Pomo of California, the Lakota of South Dakota, and the Kootenai of Idaho, to name a few (Parker and King 1990). Sacred sites have also been designated in non-Indian communities, related to activities such as traditional harvest festivals in Hispanic communities in New Mexico (Levine and Merlan 1993) and plant-gathering areas used by South Carolina African-American basketmakers (King 1993).

Many sacred sites are still in use today by Native American groups, and serve important tribal, clan and family ceremonial functions. For example, Native groups distinguish geographical landforms as sacred places of pan-tribal mythological origins and where individuals travel to on vision quests; some locales have been used for renewal ceremonies and as medicinal plant gathering places for several generations (Downer 1989). Other site categories include shrines and petroglyphs (Hart 1993:39), as well as pilgrimage trails (Hadley 1993:46).

Sacred sites are often in themselves indistinguishable from the local surrounding landscape to the untrained observer, but important to the specific native group. Traditional Cultural Properties are usually identified by way of interviews with informed and knowledgeable users, in conjunction with historical documentation and archaeological survey (Parker and King 1990:13). It is important to note that significance of sacred sites cannot be made solely on the basis of historic, ethnographic, or archaeological data, but that it must be determined by the community that values them (Parker 1993:5).

In the Middle Atlantic region, few extant informants exist to bring sacred sites to our attention; therefore, much of the sacred landscape of this region goes virtually undetected. Although archaeological evidence exists for petroglyphs and cemeteries in this part of the country, relatively little evidence exists for whole classes of information related to the sacred. Ethnohistoric data of Iroquoian and Algonquian-speaking groups of the Northeastern United States suggest a rich cosmology (Tooker 1979), but rapid European introduced epidemic diseases and cultural disruption has hampered research attempts to reconstruct the sacred landscape of aboriginal groups in this region.

Historically, New Jersey was occupied by Native American populations collectively referred to as Lenape, an Eastern Algonquian-speaking people (Goddard 1978). During the seventeenth century, the Lenape are believed to have been composed of a number of extended-family bands linked to specific drainages (Lindestrom 1654-55; Becker 1986). The Lenape appear to have had a dispersed settlement pattern, practicing a mixed economy of hunting, wild plant gathering, fishing, shellfish collecting, and horticulture. This settlement pattern was characterized by a complex series of seasonal residential movements.
The Delaware River and its tributaries were probably the primary focus of settlement. The major waterways were used as transportation corridors and for the exploitation of anadromous fish; the nearby alluvial floodplains, in certain areas, were used for farming activities. The interior regions, away from the Delaware River, were most likely used by organized task groups, who established short-term encampments from which they exploited seasonally available mammal and mast forest resources (Kraft 1986).

Although a rather large body of literature exists for the region, in terms of site categories such as base camps, shell middens, hunting stations, and quarries, few sacred sites such as petroglyphs and cemeteries have been systematically studied by anthropologists in New Jersey (Kraft 1969, 1986; Custer 1989). Furthermore, potentially sacred plant-gathering loci used for medicinal purposes have yet to be positively identified. The identification of sacred plant-gathering loci would surely make a contribution to a better understanding of Lenape sacred land-use.

What little information which exists on Lenape cosmology, and for that matter, sacred plant-gathering sites is from fragmentary historical documents from the seventeenth century, and ethnographic information collected from Lenape who were moved to Oklahoma and Canada in this century (Kraft 1985, 1986). Kishelemukong was known as the creator of all plants, animals, and celestial bodies to the Lenape; Manetuwak were a variety of spirit forces which resided in all objects, such as wind, water, animals, and plants. Mother Corn, or Earth was the spiritual force of all vegetation. These spiritual forces are believed to have placed medicinal plants on the earth to benefit the Lenape; each plant had an individual spirit which had to be appeased with tobacco offerings, when collected (Harrington 1921:19-26).

According to the Lenape, meteiniu (medicine person) and nentpikes (herbalists) were intermediaries between humans and the supernatural world, who assisted in healing. Meteiniu, or a shaman, was knowledgeable in plant medicines, witchcraft, and evil spirits (Lindestrom 1925:247-248); nentpikes, or herbalists, were most often described as physicians and healers, using medicinal herbs as remedies, with less superstition (Heckewelder 1876:228). Individuals were drawn to these professions by dreams or visions, and had to be trained by older medicine people and herbalists, using specific rituals associated with the use of plants (Hill 1971:5). In this study, most of our attention will be focused upon herbalists in the ethnohistoric and ethnographic literature.

Since the seventeenth century, European explorers (Jameson 1909; Smith 1910; Lindestrom 1925), travelers (Lawson 1937) missionaries (Loskiel; Heckewelder 1876; Zeisberger 1910), colonists (Myers 1912; Penn 1970), and botanists (Kalm 1937) have noted a well-developed pharmacopoeia of the Native American Indians in the Middle Atlantic region. Healers, or herbalists, are reported to have had an extensive knowledge of the local flora to cure illness, in conjunction with ritualistic practices. Dried leaves, barks, and roots were usually boiled into a tea and consumed; other treatments required the application of fresh green plants or roots onto the body to promote healing (Weslager 1973:19).

Several native Lenape informants have been interviewed about medical practices and the use of plants since the first half of the twentieth century in Oklahoma and Canada (Tantaquidgeon 1942; Hill 1971; McCartlin and Rementer 1986). Gladys Tantaquidgeon, a Mohegan Indian from Connecticut, interviewed Lenape informant Mr. John Weber about medicinal uses of plants during the 1930’s. In 1969-1970, George Hill studied several Lenape informants, particularly herbalists Ms. Nora Thompson Dean, who possessed a rich knowledge of medicinal plant uses in Oklahoma; Mr. Richard Rementer also studied Ms. Dean. Glenn McCartlin collected information from his grandmother, Ms. Minnie Fouts (1871-1949), who was an herbalist as well. On the basis of these studies, we have attempted to evaluate what plants were used for specific medicinal uses. However, it should be noted that these data were collected from informants removed both spatially and temporally from New Jersey. All information was collected from informants residing in Oklahoma and Canada during the twentieth century.

The most detailed ethnobotanical list which has been compiled from a single informant was that of Nora Thompson Dean by George Hill (1971). According to Ms. Dean, all plants had spiritual forces within them that protected the plant, and that these herbs had to be collected with proper ritual observances for the medicine to be effective against illness. Ms. Dean would never collect the first plant she encountered, but instead, would place tobacco near the plant as an offering to the plant spirit. She would then search
for other desired plants, and collect them according to certain prescribed rituals (Hill 1971:5). Medicinal herbs would be crushed and pulverized with stone or wooden mortars and then placed in clay containers to be taken home (Hill 1971:3-7; Tantaquidgeon 1942:69). Table 1 is a list of flora which have been documented to have been used by Lenape informants for medicinal purposes, which would have been readily available in New Jersey’s Outer Coastal Plain.

TABLE 1: WILD PLANTS AND DELAWARE MEDICINAL USES

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Medicinal Use</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayberry</td>
<td>infusion of bark used as a blood purifier for kidney ailments</td>
<td>(Tantaquidgeon 1942: 29,76)</td>
</tr>
<tr>
<td>Blackhaw</td>
<td>boiled bark into tea - stomach cramps</td>
<td>(Tantaquidgeon 1942: 26,80; Hill 1971: 9)</td>
</tr>
<tr>
<td>Black oak</td>
<td>inner bark boiled into tea - colds, hoarseness</td>
<td>(Tantaquidgeon 1942: 26,78)</td>
</tr>
<tr>
<td>Cattail</td>
<td>compound of root used to dissolve kidney stones</td>
<td>(Tantaquidgeon 1942: 30,80)</td>
</tr>
<tr>
<td>Dogwood</td>
<td>compound of root used as a tonic to relieve body pains and aches</td>
<td>(Tantaquidgeon 1942: 26,74)</td>
</tr>
<tr>
<td>Dandelion</td>
<td>compound of root used as a tonic laxative</td>
<td>(Tantaquidgeon 1942: 32,80)</td>
</tr>
<tr>
<td>Goldenrod</td>
<td>leaves chewed to cure diarrhea and to reduce fever</td>
<td>(Tantaquidgeon 1942: 28,80)</td>
</tr>
<tr>
<td>Hickory</td>
<td>compound of bark taken as a tonic for &quot;general debility&quot;</td>
<td>(Tantaquidgeon 1942: 68,82)</td>
</tr>
<tr>
<td>Holly</td>
<td>compound of root used as an all-purpose medicinal tonic</td>
<td>(Tantaquidgeon 1972: 119)</td>
</tr>
<tr>
<td>Pin oak</td>
<td>infusion of inner bark taken for intestinal pain</td>
<td>(Tantaquidgeon 1942: 26,78)</td>
</tr>
<tr>
<td>Plant Type</td>
<td>Medicinal Use</td>
<td>Citation</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Poke (Phytolacca americana)</td>
<td>compound of root used as blood medicine and to cure rheumatism</td>
<td>(Tantaquidgeon 1942: 27,30,78)</td>
</tr>
<tr>
<td>Red cedar (Juniperus virginiana)</td>
<td>infusion of leaves and twigs as antineumatic to cure rheumatism</td>
<td>(Tantaquidgeon 1942: 30,76)</td>
</tr>
<tr>
<td>Red oak (Quercus rubra)</td>
<td>boiled inner bark into tea - infusion of bark for coughs and hoarseness</td>
<td>(Tantaquidgeon 1942: 25,78; Hill 1971: 8)</td>
</tr>
<tr>
<td>Sassafras (Sassafras albidium)</td>
<td>boiled bark into tea - used as a blood purifier</td>
<td>(Tantaquidgeon 1942: 30,80; Hill 1971: 9)</td>
</tr>
<tr>
<td>Sumac (Rhus typhina)</td>
<td>infusion of berries for diarrhea - antidiarrheal boiled into a soft pulp - used as a poultice to ease toothaches</td>
<td>(Tantaquidgeon 1942: 69,82; Weslager 1973: 75)</td>
</tr>
<tr>
<td>White oak (Quercus alba)</td>
<td>compound of bark used as an antiseptic to heal cuts and scratches</td>
<td>(Tantaquidgeon 1942: 30,78)</td>
</tr>
<tr>
<td>White pine (Pinus alba)</td>
<td>infusion of twigs used as a pulmonary aid</td>
<td>(Tantaquidgeon 1942: 32,82)</td>
</tr>
<tr>
<td>Wild carrot (Daucus carota)</td>
<td>boiled blossoms into tea - used to treat diabetes</td>
<td>(Tantaquidgeon 1942: 29,76)</td>
</tr>
<tr>
<td>Wild cherry (Prunus serotina)</td>
<td>boiled bark into tea - used for colds and coughs</td>
<td>(Tantaquidgeon 1942: 27,78 Hill 1971: 6)</td>
</tr>
<tr>
<td>Wild grape (Vitis vulpina)</td>
<td>sap used as dermatological aid - beneficial to hair, scalp treatment</td>
<td>(Tantaquidgeon 1942: 26,80 Hill 1971: 14)</td>
</tr>
</tbody>
</table>
METHODOLOGY

As mentioned, the data which is presented in this study was collected as part of a predictive model survey of New Jersey’s Outer Coastal Plain in Atlantic County (Ranere and Hansell 1987). Nine were evaluated, using discovered artifactual data in conjunction with associated floral availability, on the basis of standardized catchments surrounding these studied sites. A catchment is defined as a zone of resources, both wild and domestic, that occur within a designated distance of a given point (Vita-Finzi and Higgs 1970). Subsequently, the data from Atlantic County were evaluated in relation to the major plant species which are reported to have been used by traditional Lenape herbalists, which would have been available to prehistoric Native American populations in New Jersey’s Outer Coastal Plain. In this study, two main types of data were assessed: environmental data and cultural data. Each type of data is discussed below.

Environmental Data

Atlantic County is situated in the Outer Coastal Plain, which is characterized by a broad, low-lying coastal plain that slopes gently and drains into the Atlantic Ocean (Figure 1). The Outer Coastal Plain is composed of two major sub-ecozones; outer lowlands consist of low-lying areas along the coastal margins, mostly within 100 feet (30m) of sea level. Relief is low, characterized by streams, marshes, and estuaries, with broad, flat divides at only slightly higher elevations. The central uplands rise to about 200 feet above sea level (asl), and consists of well-drained sandy soils located on isolated hills and broad divides. The uplands consist of pine and oak forests, commonly referred to as the Meschi Uplands and the Pinelands (Robichaud and Buell 1973; Wolfe 1977).

In this study, environmental information obtained from United States Department of Agriculture Soil Conservation soil surveys (USDA) and United States Geological Survey maps (USGS), in conjunction with a modified Land-use Sensitivity (LUS) analysis, a research methodology developed by the author, which is designed to assess the potential for human use of landscapes (see Pagoulatos and Walwer 1991). LUS variables used to evaluate the relationship between human land-use and the environment include: 1) distance to water, 2) surface slope, 3) surface drainage, 4) soil type, 5) landform, and 6) habitat resource potential. All environmental variables were measured within a 500-foot-radius (152m) catchment from the centerpoint of each Native American site. Each environmental variable is presented below.

Distance to Water. The distance to the largest body of flowing water (rivers, streams) from the center point of each site within the nine catchment areas was measured, using USDA and USGS maps. Large bodies of water constitute high-order drainage sources such as permanent flowing rivers; low-order watersources consist of smaller, feeder streams, based on USDA and USGS determinations. In cases where there was no water source within the 500-foot-radius of a site catchment, the nearest distance to water beyond the site catchment was measured. Water intervals were measured to the nearest 20 feet (6m) interval.

Surface Slope. Surface slope is defined as the vertical distance divided by the horizontal distance, multiplied by 100 (Jablonski and Baumley 1989:103). For example, surface slope is 10% when there is a drop of 10 feet (3m) in 100 feet (30m) of horizontal distance. For the purposes of this study, surface slope types include level (0-5%), sloping (6-10%), and steep (>10%). Surface slope type was determined from the center point of each site catchment.
Figure 1. Atlantic County of New Jersey's Outer Coastal Plain.
Surface Drainage. Surface drainage refers to the (natural) frequency and duration of periods of saturation or partial saturation of soils. Surface drainage types include soils which are well drained, somewhat well drained, and poorly drained (Johnson 1978). Information on this variable was obtained by determining the specific soil type(s) where the center point of the site catchment was located on.

Soil Type. In this study, some of the major soil types included Lakehurst (LaA), Downer (DoA), Klej (KmA), and Hammonton (HaA) soils. Information concerning different soil types was gathered from USDA maps. The soil type was determined on the basis of the center point placement of the site catchment.

Landform Type. Landform is defined as a physical feature of the landscape. Landform types include terraces, divides, side slopes, flats, ridges, and floodplains, to name a few. Information concerning different landform types was gathered from USGS and USDA maps; landform type was recorded from the center point of the site catchment.

Habitat Resource Potential. The Habitat Resource Potential (HRP) is determined by gathering data on soil types, and is designed to assess the potential for human land-use (Pagoulatos and Walwer 1991). Information was obtained from USDA soil surveys. Each 500-foot-radius site catchment was analyzed for six major habitat resource potential types, including grain and seed crops, hardwood trees, wild herbaceous plants, wetland plants, woodland wildlife, and wetland wildlife (Johnson 1978). Soil types are assigned a rating between one and four (1=very poor 2=poor 3=fair 4=good); the proportion of each individual soil type within the catchment forms the basis for calculating that catchment's overall HRP rating.

Cultural Data

Cultural Data will be used as a tool to interpret human behavior, as reflected in the archaeological record. Cultural Data used in this study will include: 1) the assignment of sites to specific cultural time periods (i.e., Early, Middle, and Late Woodland periods) on the basis of diagnostic artifacts, 2) the classification of specific artifact classes to discern the range of human activities at a site, and 3) the establishment of occupation types, using the activity diversity index. Each cultural variable is presented below.

Chronology. The nine prehistoric sites were assigned to specific cultural time periods on the basis of temporally diagnostic clay pottery styles; no projectile points were recovered, nor radiocarbon materials collected during the survey (Ranere and Hansell 1987). For example, a site yielding cord-impressed Riggins style pottery would be assigned to the Middle Woodland period (2,000-1,000 B.P.).

Artifact Classes. Site activities are usually inferred from the presence of particular artifacts which can be assigned to different artifact classes. Artifact classes such as shatter, cores, and flakes represent stone tool-making activity; retouched tools such as bifaces and unifaces were probably used for a variety of tasks. The recovery of pottery reflects their use as containers, as related to domestic tasks.

Activity Diversity Index. The Activity Diversity Index (ADI) is designed to assess the range of human activities at archaeological sites. The distribution of specific classes of artifacts may reflect certain occupation types (i.e., base camps, hunting stations, plant collecting loci). The ADI is determined by the presence or absence of eight major classes of data from Native American sites, including: 1) chipped stone artifacts, 2) projectile points, 3) pottery/steatite containers, 4) features, 5) marine resources, 6) faunal remains, 7) floral remains, and 8) groundstone artifacts.

Each site is assigned an activity diversity index number ranging from one (low) to eight (high). Sites with a low ADI contain few classes of data and are considered specialized loci, where a limited range of human activities took place. Sites with the presence of more classes of data are considered areas where a wide range of cultural tasks took place, indicative of multiple activities or re-use.
ANALYSIS

In this study, the nine sites (28-At-51, 53, 58, 61-63, 70-71, and 74) are situated in the general vicinity of Stephens Creek and South River, on the Dorothy and Mays Landing USGS quadrangles in Atlantic County. These sites were tested by placing 0.5 meter square shovel tests at approximately 10 meter intervals, along designated transect lines. The discovered sites were small and diffuse, producing a low quantity of flakes, pottery sherds, and tool fragments, generally attributed to the Woodland period (3,000-350 B.P.).

Table 2 presents a summary of the site data used in this study, in reference to variables such as their respective distances to water, landforms, soil types, surface slope and drainage, site size and chronology, as well as recovered artifactual material. Each environmental variable is evaluated in relation to cultural data below.

Environmental Data

**Distance to Water.** Human land-use should be closely correlated to distance to flowing bodies of water, since availability of water is important for human survival. The mean distance to water of the nine documented prehistoric sites is 484ft/147m; only one of these sites (11%) was situated within 100ft/30m of water.

Also, seven of the nine sites were situated in relative proximity to Stephens Creek, a low-order stream; only two sites were found in proximity to the South River, a higher-order water course. These data appear to demonstrate that proximity to large bodies of flowing water was generally not an important site determinant.

**Surface Slope.** Humans tend to locate themselves in places which are generally level, with little slope, for ease of travel, habitation, and communication. Thus, the degree of slope is an important factor for site selection. All nine sites are situated on nearly level terrain (<5%). These data indicate that sites were present on level ground surfaces.

**Surface Drainage.** Humans tend to choose locations which are generally dry and well drained, for easier habitation and travel. Eight of nine sites were found on moderately to well-drained soils; only one site is situated on somewhat poorly drained soils. These data reflect the general tendency to place sites on relatively well-drained soils.

**Soil Type.** Soil types are considered important because they are a major determinant of biotic communities which develop on them. All nine sites are situated on Lakehurst, Klej, Hammonton, or Downer soils, with the Lakehurst variety (N=5) the most common. The above-mentioned soil types would have been best-suited for wild herbaceous plants and hardwoods, indicating that the positioning of sites in locales where wild plant related-resources could be collected was an important determining factor.

**Landform Type.** Humans generally locate themselves on landforms which are relatively level, well-drained, and close to prominent water sources. All nine sites are situated either on flats or ridges; these landforms are generally about 20 feet above sea level, and are a considerable distance from water.

**Habitat Resource Potential.** Humans tend to locate themselves in optimal habitat locations, close to several resource zones, thus minimizing movement across the landscape. Eight of nine sites are positioned in specialized microenvironments best suited for wild herbaceous plants and hardwood forests (Table 3). Perhaps the nine sites were situated in locations where Native American populations could best exploit certain wild plant resources (Table 4).
### TABLE 2: NATIVE AMERICAN SITE LOCATION DATA

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Dis Wtr.</th>
<th>Land Form</th>
<th>Soil Type</th>
<th>Soil Drg.</th>
<th>Surf. Size</th>
<th>Site Size</th>
<th>Site Chrono</th>
<th>Artifact Class</th>
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<tbody>
<tr>
<td>28AT51</td>
<td>200 (PSTR)</td>
<td>FLAT</td>
<td>KmA</td>
<td>MWDR</td>
<td>5468</td>
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<td>206 (PSTR)</td>
<td>FLAT</td>
<td>LaA</td>
<td>SPDR</td>
<td>2033</td>
<td>EWD</td>
<td>CER, FLK</td>
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<td>24 (PRVR)</td>
<td>RIDGE</td>
<td>LaA</td>
<td>MWDR</td>
<td>4228</td>
<td>MWD</td>
<td>CER, FLK, TOOL, MODCOB</td>
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<tr>
<td>28AT61</td>
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<td>RIDGE</td>
<td>LaA</td>
<td>MWDR</td>
<td>350</td>
<td>MWD</td>
<td>CER, FLK</td>
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<tr>
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<td>RIDGE</td>
<td>LaA</td>
<td>MWDR</td>
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<td>LaA</td>
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<td>MWDR</td>
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</table>

### TABLE 3: NATIVE AMERICAN SITES AND HABITAT RESOURCE POTENTIAL

<table>
<thead>
<tr>
<th>Site #</th>
<th>GRNS</th>
<th>HEPLTS</th>
<th>HWDS</th>
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</table>
Cultural Data

Chronology. All nine sites are assigned to the Woodland period (3,000-350 B.P.), and particularly to the Middle Woodland (2,000-1,000 B.P.) and Late Woodland (1,000-350) periods, on the basis of chronologically diagnostic pottery (Ranere and Hansell 1987). For example, pottery attributes include plain and cord-marked, grit-tempered sherds which may be attributed to the Early Woodland period (28-At-53); medium thickness, quartz-tempered, fabric-impressed sherds appear to resemble the Riggins type, which dates to the Middle Woodland period (28-At-51, 58, 61-63, 71, 74). Thin and fine-tempered sherds probably date to the Late Woodland period (28-At-70).

Artifact Classes. All nine sites produced a similar, but limited range of artifact classes, perhaps representing specialized tasks. These sites tend to yield locally available quartz and cobble chert flakes, clay ceramics, and a very low quantity of chipped stone tool fragments. For example, Sites 28-At-53, 61-63, 70-71, and 74 only produced flakes and pottery fragments. Sites 28-At-51 and 58 produced a similar array of flakes and pottery, with the addition of a small quantity of shatter, a core, a retouched tool, and a chopper. Collectively, these sites appear to represent similar specialized behaviors, related to domestic-related activity (Table 5).

Artifact Diversity. The nine sites are generally small (<5,000sqm) in size (Table 1), and characterized by thin and diffuse scatters of flakes debris, pottery sherds, and an occasional chipped stone tool fragment (see Tables 2 and 5). Using the ADI, all nine sites yield a 2 rating (chipped stone artifacts, pottery), which is indicative of specialized activity loci, perhaps representing wild plant processing loci.

DISCUSSION

On the basis of this current study, six important issues will be addressed: 1) What do we know about these nine documented sites? 2) What possible medicinal plants could have been collected from these sites? 3) What are some of the problems of field recovery of this category of site? 4) Why is this new site category important? 5) What are some of the problems of current site evaluation? 6) What can we do to increase the recovery of this site category, learn more about this site type, and protect existing ones from further destruction? Each issue is addressed in more detail below.

What do we know about these sites?

The nine sites are quite small, specialized, and probably reflect places where certain domestic-related tasks which took place. Also, these activities occurred on flats and ridges in oak-pine forest zones which were optimal for wild herbaceous plants and hardwoods, away from large bodies of water, dating to at least the Middle and Late Woodland periods.

What types of possible medicinal plants could have been collected from these sites?

Eight of nine of these sites exhibit a high habitat resource potential for wild herbaceous plants and hardwoods, within these arbitrarily designated 500-foot-radius catchments. Wild plant resources available in these oak-pine forests (catchment areas) today, which were reportedly used by Native American populations in the region in the past as medicines include white and black oaks, dogwood, goldenrod, holly, red cedar, sassafras, and sumac, to name a few. These wild plants are known to have been used for medicinal purposes to cure colds, alleviate cramps, serve as laxatives, deal with intestinal problems, rheumatism, used as antiseptics, as well as to soothe toothaches (see Table 1).

Problems of field recovery?

Sites such as those presented in this study would typically not be found by most conventional cultural resource management surveys in the Northeastern United States. If these sites do represent plant
### TABLE 4: HABITAT RESOURCE POTENTIAL AND SELECTED WILD PLANTS USED BY DELAWARES (LENAPES) FOR MEDICINAL PURPOSES

<table>
<thead>
<tr>
<th>HRP</th>
<th>GRD</th>
<th>WC</th>
<th>PO</th>
<th>DD</th>
<th>DKS</th>
<th>PNS</th>
<th>CHY</th>
<th>HOL</th>
<th>DGD</th>
<th>SUM</th>
<th>REC</th>
<th>SAS</th>
<th>HIC</th>
<th>BAY</th>
<th>BKW</th>
<th>GRP</th>
<th>CAT</th>
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</thead>
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<td>HEPTS</td>
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<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>HWDS</td>
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<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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### TABLE 5: SITES AND ARTIFACT CLASSES

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<thead>
<tr>
<th>Artifact Class</th>
<th>Site #51</th>
<th>Site #53</th>
<th>Site #58</th>
<th>Site #61</th>
<th>Site #62</th>
<th>Site #63</th>
<th>Site #70</th>
<th>Site #71</th>
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<tbody>
<tr>
<td>Flake</td>
<td>19</td>
<td>5</td>
<td>22</td>
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<td>11</td>
<td>5</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Shatter</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Burnt stone</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Core</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
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<td>34</td>
<td>7</td>
<td>5</td>
<td>12</td>
<td>218</td>
<td>16</td>
<td>2</td>
<td>3</td>
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<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Chopper</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>
Outer Coastal Plain Study - Key for abbreviations

**Dis. Wtr** = Distance to water (meters)
- PSTR = Perennial Stream
- PRVR = Perennial River

**Soil Type** = U.S.D.A. Soil Conservation Survey Soil Types
- DoA = Downer
- HmA = Hammonton
- KmA = Klej
- LaA = Lakehurst

**Soil Drg.** = Soil Drainage
- MWDR = moderately well-drained
- SPDR = somewhat poorly drained
- WDR = well drained

**Surf Sip.** = Surface Slope
- NLVL = Nearly level (0-5%)

**Site Chrono** = Site Chronology
- EWD = Early Woodland
- MWD = Middle Woodland
- LWD = Late Woodland

**Artifact Classes:**
- CER = Ceramic
- COR = Core
- FCR = Fire-Cracked Rock
- FLK = Flake
- MODCOB = Modified Cobble
- TOOL = Chipped stone tool

**HRP** = Habitat Resource Potential
- GRNS = Grains, Seeds, and Crops
- HEPLTS = Wild Herbaceous Plants
- HWDS = Hardwood Trees
- WPTS = Wetland plants
- WDWL = Woodland Wildlife
- WTWL = Wetland Wildlife
gathering loci of a sacred nature, then it would be important to have living (extant) informants to assist in the cultural resource management process, as in the western United States (Downer 1989; Winters 1993). However, with the general absence of living Native American informants to help assist in the reporting of these sites, we are left with ethnohistoric and archaeological methods of data recovery. However, the ethnohistoric literature as it relates to sacred medicinal herb-gathering locales is nonexistent in the Northeastern United States. To complicate the situation, current archaeological field testing methods in the region are generally inadequate toward the recovery of these small, low visibility (archaeologically) sites, which are situated away from water sources. Instead, most current cultural resource management survey schemes tend to test at 50 foot intervals (near water) which often miss small, diffuse scatters.

Why is this site category important?

If these nine documented sites do in fact represent sacred herb-gathering sites then they could possibly possess National Register status as Traditional Cultural Properties, according to Bulletin 38. As mentioned previously, a Traditional Cultural Property is defined "as eligible in the National Register because of its association with cultural practices or beliefs of a living community that a) are rooted in that community’s history, and b) are important in maintaining the continuing cultural identity of the community (Parker and King 1990:1).

However, the one fundamental problem is that no locally available Native American informants exist which can bring these sites to our attention. The closest Native American groups which could have a say in the importance of these sites would be the transplanted Delaware (Lenape) Indians who currently reside in Oklahoma and Canada. The problem is that they are both temporally (hundreds of years) and spatially removed (over a thousand miles) from the cultural resource in question. Thus, with the lack of living informants we may never know whether these nine sites truly represent sacred plant-gathering loci in New
Jersey's Outer Coastal Plain.

Interestingly, local present-day Euro-American residents of New Jersey's Pine Barrens in the Outer Coastal Plain have voiced their concern over the loss of long-held community-valued traditions, due to recent development. Hufford (1986:7) notes the disintegration of traditional folklife, as well as the destruction of habitats and cultural resources in the New Jersey Pine Barrens. With these concerns in mind, ecologists, social scientists, and cultural resource managers have begun studying landforms, plant and animal communities, as part of a larger Pinelands Comprehensive Cultural Resource Management Plan (Pinelands Commission 1980).

Several Euro-American community activities are unique to the Pine Barrens, including annual events such as the blessing of the lake on St. Vladmir's Day in Cassville, the Italian procession of saints' statues through the streets of Hammonton on the feast of our lady of Mount Carmel, the Chatsworth cranberry festival, and the Whitesbog blueberry festival (Hufford 1986:17). Also, long-time residents of the Pine Barrens refer to a land-use pattern called "working the cycle" where residents used to make a living from a variety of sources depending on the season, such as shellfishing, trapping, plant gathering, gardening, fishing, as well as local cottage industries such as boat building, lumbering and oystering, since the late 18th century (Huffard 1986:44). In a sense, many of these activities could also be considered potentially significant Traditional Cultural Properties to the local community of the region, as defined by the National Parks Service (Parker and King 1990:1).

Therefore, this is not only a problem of prehistoric significance, but one of significance to Euro-American populations who currently reside in the region today.

Problems of current site evaluation?

Returning to the question of prehistoric site evaluation, current cultural resource management methods of site evaluation are totally inadequate in relation to this new and potentially important prehistoric cultural resource. In most cases, when low density sites consisting of a few potsherds and flakes are recovered, testing is frequently stopped due to low recovery of features and artifacts. These low density sites are usually deemed as not significant and unlikely to provide important information on the prehistory and history of a specific region, according to criterion D, of the 106 process.

What can we do to protect these sites?

The first step we must take toward protecting any future potential wild plant gathering loci in this region is to pay special attention to locales such as those reported in this study, especially those situated in areas of high wild plant resource potential. Once in these areas, survey should be decreased in interval, in order to recover sites of low archaeological visibility. Once these sites are reported, state agencies should take the opportunity to test one of these sites more thoroughly (data recovery level), perhaps as a case study, to retrieve information such as artifacts, plant processing features, and associated organic (floral) remains. Only with this information can we begin to understand one aspect of Native American sacred land-use (medicinal plant collection) in the Northeastern United States.

CONCLUSION

Early explorers, colonists, and missionaries have reported the large-scale utilization of wild plants for medicinal purposes by numerous Native groups in the Eastern Woodlands, extending from Florida to the Great Lakes (Yarnell 1964; Moreman 1986). However, until this study, no herb-gathering sites in the Eastern United States had been systematically evaluated in terms of environmental variables and artifactual data. Although the medicinal uses and practices (and the sites they produce) of extant Native groups have been studied in Western North America by ethnographers, the general lack of living informants in the East makes this endeavor exceedingly difficult. Therefore, researchers in the Eastern Woodlands must resort to indirect measures of evaluation, such as making greater use of ethnohistorical, environmental, and archaeological data.
Current survey data from the Ranere and Hansell study (1987) indicate that the nine discovered sites in question are typically quite small, diffuse scatters of flakes, pottery, and tool fragments. These sites are generally situated on level and relatively well-drained flats and ridges, in the general vicinity of low-order water sources. Also, these sites are found on soils and within catchments best-suited for wild herbaceous plant and hardwood resource potential; soil types within these catchments yield numerous indigenous flora (i.e., sassafras, holly, goldenrod) which are known to have been used for medicinal purposes by Native groups to the region. Perhaps these nine Outer Coastal Plain sites do represent sacred plant-gathering loci; however, without extant Native informants to verify this evaluation, we may never know.

Thus, without living informants to tell us what these sites actually represent, we are basically left with environmental and archaeological data. I would recommend the systematic excavation of similar sites such as those presently reported in the Outer Coastal Plain of New Jersey, and elsewhere. First, sites should be evaluated in terms of environmental variables. Second, artifactual data should be analyzed in conjunction with usewear and residue analyses. Third, cultural features as related to plant-processing should be exposed, including the retrieval of floral specimens in the form of macro-specimens (nuts, seeds) and micro-specimens (pollen). These three classes of information should allow researchers to begin to evaluate hypotheses related to site use and function. With this gathered information, we can return to the general ethnohistorical and ethnographic data of the region to address questions concerning sacred medicinal plant collection and use by Native American groups of the Eastern Woodlands.

ACKNOWLEDGEMENTS

I wish to thank Jonathan Gell and Michael Gregg of the New Jersey Historic Preservation Office for making the Outer Coastal Plain data available for this study, as well as Dale Sadler, Tracy Bakie, Robin French, and Julia Cheung, who calculated the nine site catchments and compiled certain tables and figures for this paper. Any accuracies in this paper are the sole responsibility of the author.

REFERENCES CITED

Alcorn, Janis B.


Becker, Marshall J.

Boom, Brian M.


Custer, Jay F.


1986  *The Lenape.* Seton Hall University Museum, South Orange.

Levine, Frances and Thomas W. Merlan
Lindestrom, Peter
Loskiel, George H.
McCartlin, Glenn & James Rementer
Moerman, Daniel E.
Myers, Albert C.
1912 *Narrative of Early Pennsylvania, Western New Jersey and Delaware, 1630-1707*. Charles Scribner's Son, NY.
Pagoulatos, Peter, and Gregory Walwer
Parker, Patricia L.
Parker, Patricia L., and Thomas F. King
Penn, William
1970 *William Penn's Own Account of the Lenni Lenape or Delaware Indians*. The Middle Atlantic Press, Somerset, NJ.
Pinelands Commission
Ranere, Anthony, and Patricia Hansell
1987 Predicting Prehistoric Site Distribution and Density in New Jersey's Outer Coastal Plain. Submitted to the ONJH, NJ Department of Environmental Protection, Trenton.
Robichaud, Beryl and Murray F. Buell
Smith, John
Tantaquidgeon, Gladys
Tooker, Elizabeth
Vickers, William T.
1984 *Useful Plants of the Siona and Secoya Indians of Eastern Ecuador*. Field Museum of Natural History, Chicago.
Vita-Finzi, F. and E.S. Higgs

Vogel, Virgil J.

Weslager, C.A.

Winter, Joseph C.

Wolfe, Peter

Yarnell, Richard A.

Zeisberger, David
GUIDE FOR THE AVOCATIONAL ARCHAEOLOGIST, PART II: POTTERY ANALYSIS

FRED W. GUDRIAN
ALBERT MORGAN ARCHAEOLOGICAL SOCIETY

ABSTRACT

Most people view archaeology as just digging up artifacts and are unaware of the many hours that go into cleaning, cataloging, preserving and analyzing the artifacts. More time is actually spent on these activities than in actually digging. In this paper I will be describing some information necessary for a basic understanding of how avocational archaeologists might begin to analyze prehistoric pottery.

INTRODUCTION

In a previous article (Gudrian 1993), I discussed the basic techniques used by an avocational archaeologist while participating in a dig. In this article, I will be covering the basic information that avocationalists should know in order to begin to analyze the prehistoric pottery they may find during a dig. I will also provide for the reader a list of references for someone looking for more detailed information. This list of references is by no means complete but does represent works that are often available at local libraries or local archaeological societies.

WHY ANALYSIS?

Each artifact we have cleaned, cataloged and stored has a story to tell and through analysis of the item we can begin to understand that story. We can then combine their individual stories to make an educated guess about what happened at that site. Once we do that we can then understand the importance of the site. We also can make comparisons with previously excavated sites and develop time and spatial relationships between the artifacts.

Characteristics about the clay vessel, such as surface treatment and decorations can give us information about the cultural background of the individual who made it. Also, pottery can help define the general time period during which the vessel was made.

A site where evidence proves that pottery was actually made is very rare in this area. Most of the sites containing pottery do not contain any indication that pottery was actually made at that location. Vessels could have been made somewhere else and just used at the site. Through very careful digging at the Morgan site we have found evidence that proves that pottery was actually manufactured at that site. We have found pieces called smidgens that are the remains of pieces of clay that stuck to the pot maker’s fingers while they formed the clay into vessels. We also found the ends of clay coils that were made when one coil was placed on top of another coil and was too long so the end was broken off. These items were preserved when they fell into a hearth and so were accidentally fired. Both items show that vessels were made on site and not just imported from other geographic locations.

You may find pottery at a site that has the decorative style of another area. Some pottery recovered at the Morgan site shows the decoration styles found on vessels from New York State. The similarities can be explained in several ways. A vessel may have arrived at a site through trade or through an exchange of ideas or of people coming into the area and bringing the style with them. The following
section on pottery analysis uses the definitions used by Lucianne Lavin and Laurie Miroff (1992) and is based on their ideas.

POTTERY ANALYSIS

Analysis of pottery consists of classifying each and every piece (sherd) into a grouping based on the exterior and interior surface treatment, decoration and temper type. This grouping is called a 'sherd lot'. Based on the initial classification a sherd could be placed into what is called a Sherd Group or into a TYPE. A Sherd Group is "a category whose members share a combination of traits distinct from those of other sherds in the assemblage". A TYPE is "a category whose members share a combination of traits consistently chosen by the potters of a society and as such reflects spatial, temporal and cultural patterns". TYPES are typical of general time periods and can therefore be used in helping to identify a site's spatial and cultural components (Lavin and Miroff 1992). Relative dating of a living level at a site from pottery types in Connecticut was pioneered by Bert Salwen (Lavin et al. 1992-1993), Rouse (1947), Smith (1947) and Lavin (1986, 1987) among others.

This is a list of some common terminology used to identify parts of a clay vessel:

1. Rim: the area of a clay vessel containing the lip and extending downwards.
2. Lip: the very top edge of a clay vessel.
3. Base: the very bottom of the clay vessel.
4. Neck: the constricted area below the rim and not always found on every vessel.
5. Collar: the part of the vessel that extends above the neck and is not found on every vessel.
6. Body: the main part of the vessel located above the base and below the rim.

Most of what I will be discussing concerning pottery analysis is based on the techniques used and/or developed by Lucianne Lavin and which were used by Luci, Laurie Miroff and myself in the analysis of the Morgan site's approximately 13,000 sherds (Lavin et al. 1992-1993). I have made some minor changes based on my analysis of the Robert Tucker collection (approximately 1,000 sherds from New Milford) and my own collection of over 3,000 sherds from the same New Milford site. I was also influenced by the works of Carlyle Smith (1950), Pope (1953), Rouse (1947), Ritchie and MacNeish (1949), Smith (1947, 1950) and Ernest Wiegand (1987).

How to Group Pottery Sherds

We will be sorting the sherds into individual lots by surface treatment and temper type. First, examine each sherd and identify the exterior surface treatment used. Then place the sherd in a grouping corresponding to that exterior surface treatment. For example, you may have a grouping of sherds with smooth exteriors and another grouping with cordmarked exteriors. Now, take each of these groupings of sherds and make up separate subgroupings based on their interior surface treatment. For example, you may have a grouping of sherds with smooth exteriors and that grouping may be broken into a subgrouping of smooth interiors and another with brushed interiors. Finally, sort each of these subgroupings by temper type. Now, for example, we might have a grouping of sherds after this final sorting that represents all sherds with smooth exteriors and have smooth interiors and have grit temper. This final grouping is called a 'sherd lot'. Please note that I will be discussing how to identify the surface treatment and temper types later on in this paper.

Normally we will be keeping the sherds together by the bag number that they are stored in for the identification process. One thing that I have found useful is when dealing with a large number of sherds, the grouping is actually easier if all the sherds are lumped together and then sorted out at one time. Please note that the individual sherd has the storage bag number written on it. By sorting a large number of sherds at one time I found that small variations in surface treatments tend to blend out and more accurate lots can be determined. If the grouping is done by bag, fewer sherds are examined at one time and so
variations tend to be magnified and consistency of groupings between bags may be a problem. This is especially a problem when first learning pottery analysis.

Next, we will count each of the sherds in each of the lots we just identified. Count as unclassifiable any sherd just too small to identify or where both surfaces are eroded. At this point we can actually write up the description of the sherd lot. We will be keeping the individual descriptions by bag number for reference later. For each of the numbered bags you will write the following on the top of each description page:

**BAG #, GRID, DEPTH, FEATURE#, TOTAL COUNT, UNCLASSIFIED COUNT**

For each lot you will be writing down as a separate entry the following:

- **EXTERIOR SURFACE TREATMENT**
- **INTERIOR SURFACE TREATMENT**
- **TOTAL SHERD COUNT in that group**
- **WHAT PART OF THE VESSEL IT IS FROM** (i.e., neck, shoulder, body, ...)
- **TYPE OF TEMPER**
- **MINIMUM+MAXIMUM THICKNESSES** of the sherds in this group, and finally the **COLOR OF SHERDS** in the group. (This last item can be optional.)

An example of a description for a sherd lot:

**SMOOTHED OVER CORD MARKED EXTERIOR/SMOOTHED INTERIOR**

2 SHERDS, NECK + RIM

FINE-MEDIUM GRIT TEMPER, 5-9MM THICK

GRAY-BROWN COLOR

For all decorated sherds trace the outline of the sherd and draw in the decoration. Also, describe the decoration in a brief sentence or two. If the piece is a rim, draw a side profile of the sherd. If the lip is decorated, draw a plan view of the surface of the lip.

Vessel color can be defined even more specifically by using a Munsell Color Scale which breaks down colors into very fine groups. This chart is set up extremely well by having a sample of the color with a hole in the middle of the sample. This structure is so you can put the sample over the object you wish to classify and you can tell exactly if it matches or not. Other charts where you match squares of color don’t work as easily in my opinion.

After we have finished the descriptions we can decide, based on the description, whether the lot is a **TYPE** or not. But, before we get to that, let us discuss another grouping of sherds called Minimum vessel count. This next section is based on the work of Bert Salwen, Carlyle Smith and Lucianne Lavin among others.

**Minimum Vessel Count**

When counting sherds we try to determine the number of vessels represented by the collection of sherds. A problem comes up when we try to do this. How can we determine the number of vessels if we have 100 sherds? This count might represent just one vessel or it could represent 100 vessels or any number in between. You just don’t know.

Experts have tried to solve this problem for years and they have come up with the idea that since you can’t determine the actual count you can try to determine the minimum number represented. Minimum vessel count can be determined by counting only undecorated rim sherd lots and decorated sherd lots (Lavin 1986). You can also increase the count by the number of sherd groups containing temper types not represented in the rim/decorated count (Lavin, personal communication). This adjustment would allow, for example, the counting of a sherd group with shell temper as one vessel if no other rim nor decorated sherd had shell temper. What we are trying to avoid is the counting of a rim sherd as one vessel and the...
related body sherd as another vessel. While not exact, this technique produces reasonable counts.

This ends the last technique that I will be discussing for counting sherds. I will now be going into some detail to define what actually makes up the attributes that we used to divide our sherds into sherd lots, namely temper and surface treatments.

Types of Temper

The three main types of temper in Connecticut are: grit, shell and grog. When an organic temper has leached out, sherds will exhibit a porous fabric or leaching. There are other types but these are the most common in southern New England. A single sherd may contain more than one type of temper. For classification we will note the presence of all temper types found.

When stone or shell is used as temper it is broken up into very small pieces and then it is added to the clay to strengthen the walls of the vessel and to change the vessel's heating properties. In firing the vessel, use of the smallest size temper is usually the best since when heated the temper will expand the least and the resultant cracks the smallest. The use of small size temper would therefore create vessels with the strongest walls and stand up better with use. The use of different materials as temper may be, in part, cultural as well as functional.

Grit Temper. To identify grit temper, look for pieces of stones (grit) imbedded in the clay at the edges of the sherd. Grit can range in size from grains of sand to stone pieces more than 5mm large. Typically quartz or feldspar was used as temper in Connecticut but pieces of other stones such as basalt can also be found.

Shell Temper. Shell temper can be identified by looking for white particles, visible in the edges of the sherd, that are the remains of broken up shells. The shell will have a very flat shape and straight sharp edges often appearing slightly rectangular. Sometimes milky white quartz temper looks a lot like shell, but quartz will have slightly jagged edges and usually the quartz temper will not have as smooth a surface.

Grog Temper. Grog is a small piece of broken up pottery that has been added to the clay for temper. Look for bright orange lumps in the clay where broken pottery (the orange) was added. There may be grog temper in addition to other temper materials in the same sherd.

Leaching

Leaching is identified by looking for holes in the sherd edges where either shells or occasionally vegetation matter was used as temper and then eroded away. I have found sherds containing the impressions of vegetation in the paste of the sherd. Since we usually can't tell if the hole is from eroded shell or botanical remains we then use this category. The botanical remains may in fact be contaminants that just fell into the clay during the vessels manufacturing process. When viewing small sherds we can't make the distinction between accidental and intentional inclusion.

Size of Temper

The following are the usual size groupings used when referring to temper size:

SMALL: temper is less than 1mm long
MEDIUM: 1mm-3mm long
COARSE: Greater than 3mm long

Within a sherd lot you may have sherds with more than one size temper present. Even in just one sherd you may find temper of several sizes. We will not make separate lots by temper size, but rather just indicate in the lot description the range of sizes found in the lot, i.e; small to medium. A single sherd can sometimes contain two or more temper sizes, making size classification of limited use. I suggest that there
be some indication of the number of temper pieces found on the sherd since that would give some indication on the quality of the clay used. When poorer grades of clay were used it seems to have required more temper to hold the clay together. I suggest that a count of the number of pieces of temper found on a 10 mm length of one side of a representative sherd be included in the lot description.

**Typical Surface Treatment for Sherds**

Listed in Appendix A are very brief descriptions of the most common surface treatments found on pottery in southern New England. Surface treatments apply to the vessels' body sherds and may or may not appear on rim or neck sherds, due to possible decorations being placed over the original surfacing. When I started to do pottery analysis, I was struck by the lack of written definitions in currently available works in this field. Only the roughest descriptions of surface treatments can be found and when you get to typology of vessels there is even less to go on. While my descriptions here are basic, they are at least a place to start and can be expanded upon later based on actual experience with a specific site's sherds. These descriptions are based in part on the works of Smith (1950) and Lavin (1980) as well as my own experiences examining sherds.

**Exterior Decorations**

Decorations differ from surface treatments in that decorations appear in a deliberate but limited pattern on the rim, neck and/or shoulder of a vessel. Surface treatments on the other hand appear over a large part of the vessel including the vessel's body. Please note that this applies to vessels made in southern New England and may not be true for vessels manufactured elsewhere. I have listed in Appendix B some of the major styles of decorations found on pottery from southern New England. These descriptions are based on the works of Smith (1950), Lavin (1980) and Ritchie and MacNeish (1949).

**Some Pottery Types**

A TYPE is a name given to a group of sherds that reflect spatial, temporal and cultural patterns. They are believed to represent a limited time span and can be used in the general dating of a living level at a site and represent a distinct cultural occurrence. This differs from a "Group", which is a grouping of sherds similar to a TYPE except they do not represent a limited time span nor cultural distinction.

Listed in Table 1 are some of the more common pottery TYPES that are found in Connecticut along with a very brief description. Please note that the descriptions only point out some of the characteristics that make up the TYPE. For additional information about TYPES refer to Smith (1950), Rouse (1947), Wiegand (1987), Lavin (1980, 1987, 1988) and Lavin and Miroff (1992).

The classification of sherds into TYPES is by no means cut and dry. Because of the nature of the influence that individual potters had while making a vessel, not all vessels within a TYPE have exactly the same characteristics. The TYPE consists of characteristics that must be present, but other characteristics may be found on one vessel but not on the next. When dealing with sherds, consistency of classification is important.

The period of time when pottery came into use is called the 'Woodland period'. This period in this southern Connecticut is commonly divided into five time groups defined in part by pottery TYPES. The earliest period is referred to as Early Woodland and it dates approximately from 1000 BC to 1 AD. Vinette I, Modified Vinette I and Matinecock Point Stamped make up this period. The Middle Woodland period which is dated approximately from 1 AD to 1000 AD includes Clearview Stamped, Windsor Brushed, Windsor Fabricmarked and Hollister Stamped. The Late Woodland period is approximately dated from 1000 AD to 1500 AD and includes the Shantok Cove Incised Ware, Sebonac Stamped, Windsor Cordmarked, East River Cordmarked, Bowman's Brook Stamped and Bowman's Brook Incised. The Final Woodland period is approximately dated from 1500 AD to 1633 AD. This period includes Niantic Stamped, Niantic Stamp and Drag, Niantic Incised, Niantic Linear Dentate, Niantic Punctate and Hollister Plain. The last of the five periods is called the Historic period and it is dated starting from 1633. The Shantok Incised and Eastern Incised make up this group.
TABLE 1: MAJOR POTTERY TYPES IN CONNECTICUT

<table>
<thead>
<tr>
<th>Style</th>
<th>Exterior Surface treatment</th>
<th>Interior Surface treatment</th>
<th>Decorations</th>
<th>Misc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinette I, also called Vinette</td>
<td>Cordmarked</td>
<td>Cordmarked</td>
<td>Undecorated</td>
<td>Thick straight walls and a pointed base</td>
</tr>
<tr>
<td>Interior Cordmarked</td>
<td></td>
<td></td>
<td></td>
<td>Same as above</td>
</tr>
<tr>
<td>Modified Vinette I</td>
<td>Cordmarked with some smoothing</td>
<td>Cordmarked with some smoothing</td>
<td>Undecorated</td>
<td></td>
</tr>
<tr>
<td>Matinecock Point Stamped</td>
<td>Cordmarked</td>
<td>Cordmarked or smooth</td>
<td>Dentate stamping</td>
<td>May have flared rims, has straight walls, Pointed base</td>
</tr>
<tr>
<td>Clearview Stamped</td>
<td>Smoothed or brushed</td>
<td>Brushed</td>
<td>Dentate stamping</td>
<td></td>
</tr>
<tr>
<td>Windsor Brushed</td>
<td>Brushed</td>
<td>Brushed, occasionally smooth</td>
<td>Decorative motif brushed style</td>
<td></td>
</tr>
<tr>
<td>Windsor Fabricmarked</td>
<td>Impressed with fabric-wrapped paddle</td>
<td>Brushed or smooth</td>
<td>Undecorated</td>
<td></td>
</tr>
<tr>
<td>Hollister Stamped</td>
<td>Smooth</td>
<td>Smooth</td>
<td>Parallel horizontal rows of crescent-shaped stamps</td>
<td></td>
</tr>
<tr>
<td>Shantok Cove Incised Ware</td>
<td>Fabricmarked</td>
<td>Brushed or smooth</td>
<td>Band of incised pendant triangles filled in with incised lines and short linear punctates and/or a band of opposed diagonals and punctates</td>
<td></td>
</tr>
<tr>
<td>Schonac Stamped</td>
<td>Brushed, Fabricmarked or cordmarked</td>
<td>Usually brushed but sometimes smooth</td>
<td>Decorated with edge of a scallop shell or pseudo scallop shell applied in short parallel lines and sometimes showing dragging</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cordmarked</td>
<td>Brushed</td>
<td>Usually undecorated but occasionally cordwrapped decorations occur</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Windsor Cordmarked</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>East River Cordmarked</strong></td>
<td>Vertically or diagonally Cordmarked and slightly smoothed</td>
<td>Smoothed</td>
<td>Undecorated</td>
<td></td>
</tr>
<tr>
<td><strong>Bowman’s Brook Stamped</strong></td>
<td>Cordmarked except in decorated areas where it is over a smoothed surface</td>
<td>Smoothed</td>
<td>Rim and neck decorated with parallel horizontal rows of cordwrapped stick stamping. Rim interior may also have cordwrapped stick stamping</td>
<td></td>
</tr>
<tr>
<td><strong>Bowman’s Brook Incised</strong></td>
<td>Smoothed or Cordmarked</td>
<td>Smoothed</td>
<td>Rim and lower areas are decorated with broad incising usually in the form of herringbones and triangular or rectangular plats</td>
<td></td>
</tr>
<tr>
<td><strong>Niantic Stamped</strong></td>
<td>Smoothed or Cordmarked</td>
<td>Smoothed</td>
<td>Scallop or pseudo scallop shell impressions</td>
<td></td>
</tr>
<tr>
<td><strong>Niantic Stamp and Drag</strong></td>
<td>Smoothed or Cordmarked</td>
<td>Smoothed</td>
<td>Same as Niantic stamped except decoration produced by stamp and drag</td>
<td></td>
</tr>
<tr>
<td><strong>Niantic Incised</strong></td>
<td>Smoothed</td>
<td>Smoothed</td>
<td>Incised decoration over smooth surface</td>
<td></td>
</tr>
<tr>
<td><strong>Niantic Linear Dentate</strong></td>
<td>Smoothed or Cordmarked</td>
<td>Smoothed</td>
<td>Decorated with rows of rectangular or square dentate stamping</td>
<td></td>
</tr>
<tr>
<td><strong>Niantic Punctate</strong></td>
<td>Smoothed or Cordmarked</td>
<td>Smoothed</td>
<td>Decorated with rows of punctuation</td>
<td></td>
</tr>
<tr>
<td><strong>Hollister Plain</strong></td>
<td>Smoothed</td>
<td>Smoothed</td>
<td>Usually undecorated but has been found with Cordwrapped stick stamping along top of lip</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Thick, straight sided vessel</td>
<td></td>
</tr>
</tbody>
</table>
CONCLUSION

I hope that the information I have tried to pass on here has been of some help to avocationalists in understanding the basics of analyzing prehistoric pottery. The work may be slightly different at different locations and different individuals may use somewhat different terminology but the basics that have to be done are the same.

One aspect of archaeology where I feel a lot more work is needed is in typology classification for pottery. There seems to be a need for clearer standards of what is included in a particular TYPE and what should not be. Anyone who tries to type pottery has quite a challenge before them. While there always exists the problem of classifying humanly altered natural materials since the variables are immense and human behavior is difficult to pigeonhole, establishing a set of definitions must be done to at least allow artifacts to be described with more consistency.

ACKNOWLEDGMENTS

I would like to thank the members of the ALBERT MORGAN ARCHAEOLOGY SOCIETY for all the help I have received from them. I would like to offer special thanks to the staff of Librarians at the Meriden Public Library and especially Tina Roberts, Nancy Whitfield, Frances Hernandez and Roxanne Moreau who managed to order most of the books used as reference. I would like to thank Lucianne Lavin who tried to teach me something about pottery analysis. All the mistakes, etc., that I have made in this article are solely mine and should not reflect on the instructions that I received from Luci.

REFERENCES CITED

Gudrian, Fred W.

Hamilton, Nathan D. and David R. Yesner
Lavin, Lucianne

Lavin, Lucianne, Fred Gudrian, and Laurie Miroff

Lavin, Lucianne and Laurie Miroff

Nelson, Ben A., (ed.)

Orton, Clive, Paul Tyers and Alan Vince

Petersen, James B. and Marjory Power

Pope G. D.

Rice, Prudence

Ritchie, William A.
1969a *The Archaeology of Martha's Vineyard*. The Natural History Press, Garden City, N.Y.

Ritchie, William A. and Richard S. MacNeish

Rouse, Irving

Rye, Owen S.

Shepard, Anna O.
Smith, Carlyle S.

Wiegand, Ernest A.
APPENDIX A. DESCRIPTION OF SURFACE TREATMENTS FOR POTTERY

SMOOTH
Identify as SMOOTH treatment when the sherd surface is smooth or nearly so. The sherd will not show any actual coiling or cord marking. It may contain a few fine wipe marks.

WIPED
To identify WIPED surface treatment look for very fine, faint and well spaced lines on a smoothed surface. They are similar to brushing but much thinner and shallower and not as wide. If the wipes cover the entire surface of the sherd I classify it as WIPED but if the lines are few in number then I classify it as SMOOTH WITH WIPING. Wiping is believed to have been made when a clump of grass, etc. was very lightly brushed over the surface of the vessel.

CORDMARKED
Identify as CORDMARKED treatment when the sherd surface shows the image of the twisted cords pressed into surface of the clay vessel but without any signs of being smoothed. The surface treatment was made by covering a paddle or similar object with rows of twisted cords and pressing the paddle against the side of the vessel leaving behind the negative image of the core.

SMOOTHED OVER CORDMARKED
SMOOTHED OVER CORDMARKED sherd surfaces show evidence of the original cordmarks but will also show signs of smoothing over on the cording. Some sherds were smoothed so much that only very faint cording is visible while others show each specific row of cording but with a smoothed surface to each.

CROSS PADDLED CORDMARKED
CROSS PADDLE CORDMARKED is a style of cordmarking where a criss-crossing effect is achieved. Check all cross hatching with modeling clay to see if the surface treatment is FABRICMARKED, NETMARKED or really CORDMARKED. These three styles are very similar looking surface treatments and can best be identified by taking an impression of the surface with modeling clay. Looking at the impressions of the individual fibers making up the surface treatment and closely examining the points where the lines overlap will determine which surface treatment you have on the sherd.

The cross hatching was made when a paddle or similar tool was pressed into the clay in one direction and then pressed again into the clay at an angle to the original impressions. This surface treatment will show groups of parallel lines of cords in both directions and the top impression completely covers the lower impression at the points of intersection. If at the intersection of the stamping the lines show the overlapped cording weaving in and out then see the description on FABRICMARKED. If on the other hand you find knots at the intersections then see NETMARKED.

The hatching is sometimes found at ninety degrees to each other but some can be found with smaller angles between groups. Some sherds will contain 3 or 4 levels of cording overlaying each other.

SMOOTHED OVER CROSS PADDLED CORDMARKED
SMOOTHED OVER CROSS PADDLED CORDMARKED is the same as cross paddled cordmarked except that there is some smoothing of the surface.

FABRICMARKED
Look for a woven style of cording to classify the sherd as FABRICMARKED. Use of modeling clay pressed into the surface will show the over-under weave that separates this style from regular CROSS PADDLED CORDMARKED.

SMOOTHED OVER FABRICMARKED
SMOOTHED OVER FABRICMARKED surface treatment looks the same as FABRICMARKED except that you can see signs of smoothing of the surface.
NETMARKED

To identify NETMARKED sherds look for a surface similar to CROSS-PADDLED CORDMARKED but using modeling clay will show the use of knots where the lines intersect.

SMOOTHED OVER NETMARKED

This treatment is identified as being the same as NETMARKED except that the surface shows signs of smoothing.

IMPRESSED

We classify any sherd as IMPRESSED when we are not able to clearly distinguish between CROSS PADDLED CORDMARKED or FABRICMARKED or NETMARKED surface treatments for that piece.

BRUSHED

To identify BRUSHED surface treatment look for groups of shallow lines made with a brushing motion in either a single direction on the surface or in a totally random manner. The depth of the lines should be only slightly below the surface level. Most of the brushed lines will show the very fine, thin lines called striations on the inside of the line. The key word here is "groups". If you are dealing with a single line, what you then have is a decoration and so should see that description.

Brushing is believed to have been made using the edge of a scallop shell or the end of a stick, sometimes shredded, and dragged over the surface of the vessel. Some sherds show evidence that brushing may have been done with stone tools which would therefore not leave striations. Unless the brushing with the flake is very shallow, it is most likely going to be classified as incised especially when dealing with very small sherds where only one or two lines may appear. I prefer to classify this type of stone tool brushing based on depth of the lines. If the lines are very shallow (at surface level) then I would classify the sherd as brushed surface treatment. If the depth of the lines are well below the surface level then I would go with incised decoration as the classification.

To separate brushed decoration from brushed surface treatment once the brushing has been decided on, I have come up with the following. When the brushing is in two or more directions or is in a pattern or is well below the surface classify the sherd as BRUSHED DECORATION otherwise I classify the sherd as BRUSHED SURFACE TREATMENT.

There is always a problem when trying to distinguish between deep brushing and incising. The best you can hope for is to be consistent in your classification.
APPENDIX B. EXTERIOR DECORATIVE STYLES FOR POTTERY

INCISED STYLE I
To identify INCISED STYLE I, look for deliberate single, straight, sharp lines cut into the sherd surface making up the decoration. The lines have squared edges and flat bottoms. The depth of the lines can vary but is always well below the surface level. This decoration is believed to have been made by using a single edged tool, probably made from a stone flake but bone, shell or wood could have been used.

INCISED STYLE II
To identify INCISED TYPE II, look for lines with rounded bottoms and contain striations but otherwise are the same as INCISED. These decorations are believed to have been made by using a twig or similar botanical item.

BRUSHED STYLE I
To identify BRUSHED STYLE I, look for lines that are either single or grouped in a pattern. They are shallow (on or just slightly below surface). On long lines formed by brushing you can see a slight waviness to the line that helps to identify this style from shallow incising.

BRUSHED STYLE II
To identify BRUSHED STYLE II, look for deep lines with striations. I have always found the individual lines with rounded bottom and squared edges. The decoration appears as groups of parallel lines usually on the vessel’s neck. The lines are deep (well below surface) which if not in a group and without striations would be classified as incised.

PUNCTATED STAMP
To identify PUNCTATED STAMP look for groups of single puncture marks on the sherd surface, usually a circular stamp but not always. You will usually find groups of punctate stamps in rows or in other patterns. The stamping may have regular spacing between individual punctate stamps but occasionally will be rather random. They can vary in size and depth.

DENTATE STAMPING
DENTATE STAMP decoration appears as rectangle shapes of impressions, usually found in rough groups and are at least several millimeters long. This stamping is made by a notched or toothed tool being pressed into the clay surface.

LINEAR DENTATE STAMPING STYLE I
To identify LINEAR DENTATE STAMPING STYLE I, look for rows of rectangle stamping all with about the same depth and size. Occasionally the stamp was made at an angle to the surface leaving one edge deeper than the other. The rectangles are narrow (almost dash-like), short and very close together.

LINEAR DENTATE STAMPING STYLE II
To identify LINEAR DENTATE STAMPING STYLE II, it looks the same as STYLE I, except the stamp has been pushed in deep enough that the edges of the stamp have made marks on the surface that give the appearance of a deep line with fine vertical divides as opposed to the individual rectangle marks of STYLE I.

CORDWRAP STICK STAMP
To identify CORDWRAP STICK STAMP look for a line of very small, similar oval shapes. They usually appear as a group of lines of decorations similar in style to LINEAR DENTATE except these are not rectangles but ovals. They are formed when the edge of a paddle wrapped with cording was pressed into the surface of the clay only deep enough so that the tops of each cord appears and not the whole twisted piece.
SCALLOP SHELL STAMP

To identify SCALLOP SHELL STAMP look for a mark that looks like a series of 'C' shapes laying on the open edge and each 'C' connected to the next by a straight line connecting the edges. This stamp is formed when the edge of a scallop shell was pressed into the clay. The stamp was used sometimes in a stamp+drag manner and was made when the edge of the shell was stuck into the surface and pulled slightly in one direction. The stamp may appear as single marks or in groups. Most of the time the sherd has either shell temper or is leached.

A list of pottery types with scallop design includes: Sebonac Stamped, Hollister Stamped and Niantic Stamped. You can refer to the descriptions under POTTERY TYPES for more information on what each of these looks like.

PSEUDO SCALLOP SHELL STAMPING

PSEUDO SCALLOP SHELL STAMPING looks like scallop shell stamping but was made by a tool and not the edge of a scallop shell. Check the actual pattern of each stamp for a squarish shape (true scallop shell) between each 'C' shape rather than a smooth round 'S' shape from using a tool. It appears that they tried to imitate the scallop shell decoration without actually using a shell.

STAB + DRAG STAMPING

To identify STAB + DRAG STAMPING look for a design that shows signs of a tool being stuck in the clay and dragged to one side. One end of the design will be deeper than the other showing where the tool was stuck in (deep) and where it was lifted out (shallower). Often, but not always, a scallop shell was used. The length of the individual marks can vary. Often the stamp pattern curves either up or down and is most noticeable in the longer marks. This is also referred to as STAMP+DRAG or PUSH+PULL.

ROCKER STAMP

ROCKER STAMP was made when a stamp was pressed into the clay and rocked from one side of the stamp to the other. Look for a stamp where one side is deeper than the opposite side of the stamp mark to identify this treatment. The decoration may have a slightly zigzag appearance, formed when the stamp was rocked forward then back at a slight angle to the original motion and then was repeated several more times.
ABSTRACT

A high degree of stylistic variation has been postulated for aboriginal ceramics in New England, possibly even to preclude their classification into categories reflecting cultural affiliations, such as political units, language groups or other relevant social groupings. To test the ramifications of such theory for southernmost New England, several ceramic assemblages from three private collections reflecting a general east to west geographic distribution through what is now the State of Connecticut were subjected to attribute analysis.

INTRODUCTION

In the last few years there have been a number of discussions -- mostly informal and unpublished, emphasizing the variation of style in aboriginal ceramics from New England and the implications of such diversity (e.g., Chilton 1996; Goodby 1994, 1995). Some researchers suggest that in some cases the degree of ceramic variation may preclude their classification into categories reflecting cultural affiliations such as tribes, language groups, or other relevant social groupings. To test the case in regard to southernmost New England, pottery from assemblages representing southwestern Connecticut, central Connecticut and eastern Connecticut have been subjected to attribute analysis and compared with published data from other sites in their respective regions. The assemblages represent sites within the townships of Seymour, Marlborough, Old Lyme, Montville, Preston, Scotland, Lisbon, and Voluntown (Figure 1). They all derive from private collections whose owners have graciously allowed access to help further local archaeological knowledge.

RINALDI ROCKSHELTER

This assemblage is from the private collection of Jeffrey Tottenham. The site was a rockshelter in the western uplands region of Seymour, Connecticut, overlooking the Housatonic River Valley. The assemblage contained 70 sherds. Sixteen of these were too eroded for classification; 15 eroded sherds were tempered with crushed stone and one eroded sherd was tempered with shell. The remaining 48 sherds could be divided into four sherd lots representing a minimum of three vessels. Vessel attributes indicate a late Middle to Late Woodland occupation.

Lot 1 (Figure 2) represents a cordwrapped-stick stamped and punctated vessel (six near rims).

Paste: Very compact paste containing crushed stone temper, a good deal of which is fairly coarse (3 - 5 mm long); 6.0 - 9.2 mm thick.

Surface Treatment: Smoothed below decoration/smoothed interior surface with some wiped marks.

Shape: Curvature of near rim sherds indicate a fairly long neck, greater than 45 mm (ca. 2 inches) long, with either a flaring rim or a shoulder, or both.

Decoration: At least 11 horizontal rows of fine cordwrapped-stick stamping divided into zones by horizontal rows of two punctates. The punctates range from 3.9 - 4.2 mm in length and exhibit cord impressions, indicating they were made with the edge of a cordwrapped paddle or dowel.
Figure 1. Locations of aboriginal pottery assemblages analyzed in the text.

Comments: The shape and decoration is reminiscent of the Late Woodland types Owasco Platted (Ritchie and MacNeish 1949) and Bowman's Brook Stamped (Smith 1950:191), but fits neither type exactly.

Lot 2 (Figure 2) represents cord-impressed body sherds (30 body sherds).

*Paste:* Crushed stone temper; 4.5 - 10.0 mm thick.

*Surface Treatment:* Cordmarked exterior surfaces/smoothed interior surfaces with some wiped marks.

*Shape:* Unknown.

*Decoration:* None.

Comments: Some of the sherds appear to have been in a fire; they are reddened, blackened, and/or contain potlid fractures. Because of the similarity in paste characteristics and cord impressions, these sherds may represent the body sherds of Lot 1. Lot 2 may represent the body sherds of two vessels; two sherds exhibit both smoothing and brushing on their interior surfaces, and they are relatively thin -- 4.5 - 5.0 mm.
Lot 3 (Figure 2) represents an undecorated, uncollared cord impressed vessel (one rim and 19 body sherds; rim mends to one body).

*Paste:* Shell-tempered; 5.0 - 8.5 mm thick. Coil breaks are evident in the sherd profiles, indicating incomplete melding of the coils.

*Surface Treatment:* Cordmarked exterior surfaces/smoothed interior surfaces with some wiped marks.

*Shape:* Flattened, straight lip and straight rim.

*Decoration:* None.

*Comments:* Undecorated cord-impressed vessels in the Northeast have been assigned to the Middle Woodland and Late Woodland periods. This vessel fits the description of both the Late Woodland types East River Cordmarked (Smith 1950:192) and Jack’s Reef Corded (Ritchie and MacNeish 1949:106).

Lot 4 represents a lip-stamped vessel (one rim, three body sherds).

*Paste:* Shell-tempered and leached; 5.0 - 6.0 mm thick.

*Surface Treatment:* Smoothed exterior and interior surfaces.

*Shape:* Lip is flattened and appears straight but the sherd is quite small, only 13.3 mm long.

*Decoration:* Lip is decorated with a row of stamping perpendicular to the rim. Plasticine impressions suggest they may have been produced with the edge of a clam shell but identification is equivocal. Significantly, quahog shell was recovered from the site.

*Comments:* The rim sherd is too small for identification purposes. The use of shell temper and the smoothed surfaces indicate a Middle or Late Woodland date for the vessel.
THE MARLBOROUGH ROCKSHELTER (6HT79-1)

This assemblage is from the private collection of the late Ray Marin. Its site was a rockshelter in the town of Marlborough in the eastern uplands area of east-central Connecticut. The assemblage totals 82 sherds. Six of the sherds are too eroded for identification; four were tempered with crushed stone and two sherds were tempered with shell. The remaining 76 sherds can be divided into seven sherd lots representing a minimum of four vessels. Stylistic distinctions indicate a Late Woodland to Contact period occupation(s), with the possibility of a late Middle Woodland occupation as well.

Lot 1 (Figure 3) represents the upper portion of a pot characterized by a small incised collar and ring (four rims, two near-rims).
- **Paste:** Shell-tempered and leached; 6.0 mm thick at the lip to 7.0 mm thick at the ring.
- **Surface Treatment:** Exterior surfaces smoothed under decoration/smoothed interior surface.
- **Shape:** Small collar 8.7 mm in height below which is a ring 24.0 mm high. Lip is flattened.
- **Decoration:** Top of lip is undecorated. Interior rim is decorated with a row of parallel slightly diagonal incisions. The collar exterior is bisected by a single horizontal incision apparently encircling the collar. The ring is decorated with a row of parallel diagonal incisions, below which is a band of filled in chevrons or triangles. The base of the ring is encircled by a row of small, shallow circular punctates. The incised lines are finely incised, shallow and closely spaced.

Figure 3. Aboriginal pottery from the Marlborough Rockshelter (Marin collection). Top row: Two rim sherds from the incised and punctated collared vessel. Middle row: Rim and near rim sherds from the incised and punctated collared and ringed vessel; two near rims from the incised and punctated collared vessel represented in the top row. Bottom row: Sherd representing undecorated vessel with interior brushing; combed and stamped neck sherd; two impressed body sherds.
Comments: This vessel is reminiscent of the Contact period type incised vessels from the Hackney Pond site, located in Haddam, Connecticut on the east side of the Connecticut Valley. McBride believes these incised vessels represent the Guida Incised type, named for the type site in Westfield, Massachusetts (Byers and Rouse 1960; McBride 1984:154, 157, Figure 4.24).

Lot 2 (Figure 3) represents the upper portion of a pot with incised and punctated collar (three rims, seven near rims).
Paste: Shell-tempered and leached; one sherd is 5.5 mm thick, but the remainder range from 7.0 - 11.2 mm.
Surface Treatment: Smoothed under decoration and smoothed neck/smoothed interior surface.
Shape: Medium size collar at least 43.4 mm in height. Lip is flat and thickened. Neck is constricted.
Decoration: Lip is decorated with a row of shallow parallel incisions. The collar is incised with parallel horizontal lines, below which is an interlocking band of filled chevrons. The incisions are narrow and shallow. The base of the collar is encircled with a row of D-shaped punctates 7.5 mm in length.
Comments: The pot's shape and decoration place it within the Late Woodland or Contact period.

Lot 3 (Figure 3) represents the combed and stamped neck of a vessel (two neck sherds).
Paste: Compact paste with crushed stone temper, mostly fine quartz; 8.4 mm thick.
Surface treatment: Exterior surface treatment unknown (completely decorated)/smoothed.
Shape: Constricted neck.
Decoration: The neck appears to have been combed and then stamped with a two-pronged object of unidentifiable origin. Combing is suggested because the impressions are narrow and deep, unlike the impressions produced by a scallop shell or frayed twig. Also, plasticine impressions showed no evidence of cord impression.
Comments: The paste from Lot 3 exhibits the same texture as that for Lot 7, suggesting that the latter may represent the lower body sherds of the same vessel. Because its rim is missing, the most one can say about this vessel is that it post-dated the Early Woodland period.

Lot 4 (Figure 3) represents an undecorated vessel with interior brushing (one rim).
Paste: Shell-tempered; 7.2 mm thick.
Surface Treatment: There is not enough exterior surface to identify the surface treatment/interior brushed to top of lip.
Shape: Constricted neck with slightly rounded and slightly everted lip.
Decoration: None.
Comments: The rim is too small for identification purposes; however, the interior brushing indicates a late Middle Woodland or Late Woodland origin.

Lot 5 (Figure 3) represents notched body sherds (two body sherds).
Paste: Shell-tempered and leached; 5.7 - 5.8 mm thick.
Surface Treatment: Smoothed below decoration/smoothed interior.
Shape: Unknown.
Decoration: Horizontal row of diagonal, narrow notches 4.7 - 5.3 mm long.
Comments: These sherds may represent the upper body sherds of the same vessel as Lot 4 or possibly even Lot 2, or they may represent a previously unidentified vessel from the site. Again, the most one can say about these sherds is that their use post-dated the Early Woodland period, as indicated by their smoothed surfaces and shell temper.

Lot 6 represents smoothed undecorated body sherds (44 body sherds).
Paste: Shell-tempered and leached; 5.2 - 7.5 mm thick.
Surface Treatment: Smoothed exterior/smoothed interior.
Shape: Unknown.
Decoration: None.
Comments: These sherds may represent the body sherds from the decorated vessels of Lot 1 and/or Lot 2.

Lot 7 (Figure 3) represents undecorated impressed body sherds (15 body sherds).
Paste: Compact paste with fine crushed stone temper; 5.4 - 8.9 mm thick.
Surface Treatment: Cordmarked and cross-paddled exterior/smoothed interior.
Shape: Unknown.
Decoration: None.
Comments: Paste characteristics are similar to those of Lot 3. Possibly Lot 7 represents the lower body of the same vessel as Lot 3.

EASTERN CONNECTICUT SURFACE COLLECTIONS

These six small pottery assemblages are from the private collection of Mel Greiner. They were surface-collected within the townships of Old Lyme, Montville, Preston, Scotland, Lisbon, and Voluntown. They contain a total of 19 sherds representing 12 vessels.

Old Lyme, Great Island area. This assemblage consists of one rim sherd (Figure 4) representing a scallop shell stamped vessel.

Figure 4. Aboriginal pottery from eastern Connecticut sites (Greiner collection). Top: Sebonac Stamped rim from Great Island site, Old Lyme; two Sebonac Stamped body sherds, an interior stamped rim, and a dentate stamped rim from Preston. Bottom row: Two dentate stamped body sherds from Scotland; rim and near rim from collared, incised and punctated vessel from Lisbon.
Lot 1
_Paste_: Shell-tempered; 7.0 - 8.2 mm thick.
_Surface Treatment_: Smoothed exterior/smoothed interior.
_Shape_: Flattened lip, slightly thickened; straight neck.
_Decoration_: Parallel horizontal rows of scallop shell stamping.
_Comments_: This sherd fits the description of the Late Woodland type Sebonac Stamped (Smith 1950:194).

_Montville_. Four decorated sherds (Figure 5) represent three cordwrapped stick decorated pots.

Figure 5. Aboriginal pottery from eastern Connecticut sites (Greiner collection). Top row: Three cordwrapped-stick stamped sherds representing three pots from Montville. Bottom row: One rim and three body sherds from the cordwrapped-stick stamped pot from Voluntown.

Lot 1 (one rim sherd, three near rim sherds).
_Paste_: Relatively coarse crushed stone temper, 3 - 5 mm long; 7.5 - 9.0 mm thick.
_Surface Treatment_: Smoothed exterior surface/smoothed interior surface with one exception; one vessel exhibits wiped marks.
_Shape_: Coil breaks are evident. Vessel 1, represented by the rim sherd, has a slightly flaring lip, flattened by impression, and a straight neck.
_Decoration_: Cordwrapped impression with the edge of a paddle or a dowel. Vessel 1 exhibits at least six horizontal parallel rows of cordwrapped stick stamping as well as a row to the top of the lip. Vessel 2 exhibits two horizontal rows of cordwrapped stick stamping below which are horizontal plats of cordwrapped stick stamps, which may be forming pendant triangles. Vessel 3 exhibits at least 4 horizontal rows of cordwrapped stick stamping.
Comments: These vessels resemble pots recovered from sites in southeastern Massachusetts and Rhode Island (Fowler 1966) as well as Point Peninsula Corded vessels from New York and western Connecticut (Lavin and Miroff 1992:57; Ritchie and McNeish 1949:102).

Scotland. This assemblage (Figure 4) consists of two decorated body sherds representing two dentate stamped vessels.

Lot 1
Paste: Compact, sandy paste tempered with medium crushed stone, including quartz (1 - 3 mm long, a few temper particles are larger). Thickness ranges from 9.1 - 10.3 mm; coil breaks are evident.
Surface Treatment: Smoothed exterior surface/cordmarked and smoothed over cordmarked on the upper interior surface, below which is smoothed.
Shape: Straight body wall.
Decoration: Fine dentate stamping with rectangular impressions; appears to represent plats of parallel horizontal dentate stamps. Each stamp is about 44.5 mm long; each dentate impression, or rectangle is 2.3 mm long and ca. 0.5 mm wide.
Comments: This sherd fits the description of the type Matinecock Point Stamped (Smith 1950:196).

Lot 2
Paste: Compact paste with medium to coarse crushed stone temper (mostly 2 - 4 mm long), much of it quartz; sherd thickness is 12.0 - 12.9 mm; coil break is evident.
Surface Treatment: Exterior surface smoothed below decoration/smoothed over cordmarked interior surface.
Shape: Unknown.
Decoration: Rocker dentate stamping, consisting of square dentates 1.6 to 2.7 mm wide. Size of stamp is unknown.
Comments: Fits the type description of Point Peninsula Rocker Stamped (Ritchie and MacNeish 1949:102-103), except that its interior surface is cordmarked, like that of the type Matinecock Point Stamped (Smith 1950:196).

Lisbon. One near rim sherd and one rim sherd (Figure 4) represent a single collared vessel decorated with incising.

Lot 1
Paste: Shell-tempered, some leaching; 4.0 - 6.5 mm thick; presence of coil break.
Surface Treatment: Smoothed and wiped exterior/smoothed interior.
Shape: Flattened, undecorated lip.
Decoration: Incising with D-shaped punctates 7.3 - 8.2 mm long. The motif consists of parallel horizontal lines encasing a nested triangle. The base of the collar is decorated with a row of the punctates.
Comments: The sherd's curvature indicates that it is a collar sherd. The collar appears to have been about 24.2 mm long. The incising does not appear to be as fine as that of the collared incised vessel from Marlborough, discussed above. However, its small collar, black coloring, and rather hard paste suggest that it may be contemporary with it and such Contact period types as Guida Incised and Shantok Incised.

Preston, Poquetanuck Cove Area. This assemblage (Figure 4) consists of four sherds representing four vessels. At least two cultural components are present, a Middle Woodland as represented by the Vinette Dentate vessel and a Late Woodland as represented by the two Sebonac Stamped vessels.
Lot 1 represents the rim of a dentate stamped pot (one rim sherd).

*Paste*: Crushed stone temper; 5.7 - 8.0 mm thick.

*Surface Treatment*: Smoothed exterior/smoothed interior.

*Shape*: Rounded lip partly flattened by the application of decoration; lip is slightly outflaring with a straight neck.

*Decoration*: The lip is decorated with a row of notching along its top; the rim exhibits at least four parallel horizontal rows of rectangular to square dentate impressions.

*Comments*: This vessel fits the description of the type Vinette Dentate (Ritchie and MacNeish 1949:100).

Lot 2 represents the rim of a stamped pot (one rim sherd).

*Paste*: Heavily tempered with shell; no evidence of leaching. Thickness ranges from 5.8 mm at the lip to 7.8 mm on the rim.

*Surface Treatment*: Smoothed exterior/smoothed interior prior to decoration.

*Shape*: Rounded lip; rim exhibits a slight constriction which may indicate either a slightly outflaring rim or a neck with a shoulder, of which the sherd is too small to ascertain

*Decoration*: The interior rim exhibits parallel diagonal stamps. Plasticine experiments suggest they were made with the edge of a quahog clam shell, or shell containing similar parallel lines along its edges.

*Comments*: This sherd fits none of the pottery types described in the published literature. The exterior of the vessel appears to have been plain (i.e., smoothed and undecorated), but the sherd is only 22.5 mm long. Along its base is a line suggesting an incision or impression, but identification is equivocal. It could also be the result of post-depositional damage, such as a plow scar.

Lot 3 represents a single brushed and stamped body sherd (one body sherd).

*Paste*: Shell-tempered; 6.6 - 6.9 mm thick.

*Surface Treatment*: Brushed decoration covers the exterior surface/brushed interior surface.

*Shape*: Unknown.

*Decoration*: The decoration suggests a motif of brushed filled-in diagonals or chevrons above (or below) which is a horizontal row of vertical stamps produced by either a scallop or ark shell held at an angle, or an unknown instrument (a comb?) simulating scallop shell stamping. It should be noted here that the tool which produced this brushed decoration may have been a comb instead of a scallop or ark shell. Plasticine experiments indicate that both implements can produce virtually identical designs. However, because such decoration has traditionally been referred to as brushing or scoring, and because there are as yet no in-depth replicative experiments demonstrating how we might differentiate between the two techniques, I have continued to employ the term "brushed" to describe the decoration so local researchers will easily perceive my observations.

*Comments*: This sherds fits the traditional description of the type Sebonac Stamped (Smith 1950:194).

Lot 4 consists of a shell-stamped body sherd (one body sherd).

*Paste*: Shell-tempered; thickness ranges from 5.2 - 6.7 mm.

*Surface Treatment*: Exterior smoothed prior to decoration/brushed interior surface.

*Shape*: Unknown.

*Decoration*: Parallel horizontal rows (at least three) of shell stamp and drag.

*Comments*: This form of decoration is typical of the pottery type Sebonac Stamped (Smith 1950:194).

Voluntown. Seven sherds (Figure 5) represent a single cordwrapped stick stamped vessel.

Lot 1 represents seven decorated sherds (one rim sherd, six near rim sherds).

*Paste*: Flaky paste tempered with coarse, crushed stone medium-coarse in size (3 - 7.5 mm long).
Thickness ranges from 5.2 mm at the lip to 10.2 mm, but most sherds range with 7.1 - 10.2 mm in thickness; coil breaks are evident.

**Surface Treatment**: Exterior surfaces smoothed prior to decoration/smoothed interiors.

**Shape**: Pointed lip, straight rim.

**Decoration**: Cordwrapped stick stamping with a paddle edge or dowel, and cored punctates. Motif consisted of five parallel horizontal lines edged above and below by horizontal rows of slightly diagonal to vertical parallel lines, mostly the latter. These short vertical to diagonal lines could be interpreted as cored punctates. The lip is notched on the top with cordwrapped stick stamping; below this are at least two vertical to slightly diagonal rows of the cored punctates.

**Comments**: This vessel is similar to the type descriptions of both Jack’s Reef Corded Punctate (or Wickham Punctate) and Point Peninsula Corded (Ritchie and MacNeish 1949:102,107), but it does not really fit either. Actually, it exhibits a combination of traits from both types. Similar vessels have been reported from Rhode Island and southeastern Massachusetts (Fowler 1966:54-57).

**DISCUSSION**

Table 1 clearly reveals the diversity of stylistic attributes and attribute combinations more fully described in the text. But does this support Chilton’s (1996:76) hypothesis that the variability is a result of the "highly mobile, fluid and variable" settlement patterning of Late Woodland groups? Not necessarily, although my research in Connecticut does indicate semi-sedentary settlement for both Late Woodland and Contact period Native American societies as well as a social fluidity and mobility for the latter exacerbated, if not caused, by Euro-American political pressures (Lavin 1988, 1996). An alternative, but not necessarily conflicting hypothesis is that the small number of pottery sherds recovered from New England sites creates an impression of diversity greater than the reality of the situation. This is obvious when the data from the 19 vessels analyzed here are compared with previous ceramic studies within the survey area.

There are no published pottery studies from the Seymour-Oxford location of the Rinaldi site. There are two reports from the Shelton area immediately downriver from the site (Lavin 1995; Lavin and Salwen 1983), and a good number for sites to the west and north (e.g., Lavin and Miroff 1992; Lavin and Morse 1985; Smith 1950:163-164, 171; Suggs 1958; Wiegand 1987). These studies indicate that the identifiable pots from Rinaldi – the undecorated cordmarked vessel and the cordwrapped stick decorated vessel, conform to the styles from both the southwestern Connecticut-Westchester area (i.e., the western Sound region) and the upper Housatonic Valley region. This is no surprise, since the Rinaldi site is literally located midway between these two areas. Based on the homogeneity of their pottery styles, sites located in the western Sound region had been placed within the East River ceramic tradition while those from the upper Housatonic display strong affinities with the Point Peninsula and Owasco ceramic traditions.

In regard to the Marlborough and eastern Connecticut sites discussed in this paper, there are a number of in-depth ceramic studies from the Connecticut Valley, the Thames Valley, Long Island Sound and interior Rhode Island and southeastern Massachusetts with which to compare the data (e.g., Childs 1984:260-263; Fowler 1966; Goodby 1994; Lavin 1980, 1984,1987; Lavin and Kra 1994; Lavin et al. 1992-1993; McBride 1984; Rouse 1947; Smith 1950; Williams 1972). Within this regional survey the ceramics from the Great Island and Preston sites blend well with those previously documented for the lower Connecticut Valley and eastern Coastal Plain geographic province. They represent typical ceramics of the local Windsor ceramic tradition.

The Marlborough site, located in the eastern uplands east of the Connecticut Valley, cannot as yet be as easily interpreted. Although interior brushing is a Windsor trait, it is also found in other ceramic traditions, including the Point Peninsula. For this reason, I was unable to classify the interior brushed vessel from Marlborough unequivocally due to its eroded exterior surface. In regard to the combed vessel, virtually no combed pottery has been identified from the region; however, because the results of combing
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cws st = cordwrapped stick stamped
cord punct = corded punctate
sm = smoothed
om = cordmarked
inc = incised
st = stamped
dent = dentate
erod = eroded.
are very similar to that of scallop shell brushing, it is possible that the technique of combing may have been misidentified as brushing in some cases. In regard to the collared incised sherds, so few such vessels have been described in the published literature that it would be premature to classify or otherwise interpret their presence. This problem also pertains to the collared incised and punctated vessel from Lisbon. It should be noted, however, that the only two published pottery types exhibiting rings are Shantok Incised and Guida Incised, including the vessels from the Hackney Pond site which McBride considers to represent Guida Incised. For the record, the collared and ringed vessel from Marlborough resembles more closely the Hackney Pond vessels rather than those of Shantok Incised (McBride 1984; Williams 1972: 348-352). What is sorely needed is more data on incised, collared pottery from southern New England. Goodby's (1994) survey effort was valiant, but more vessel counts are needed, especially from northern and western New England, so that diversity due to small samples can be an alleviated bias.

The two dentate stamped vessels from Scotland are typical of such vessels found throughout southeastern New England (e.g., Childs 1984; Fowler 1966; McBride 1984). The cordwrapped stick decorated pots from Montville and Voluntown are not unusual when they are compared with the rather numerous cordwrapped stick decorated pottery from Rhode Island and southeastern Massachusetts (Childs 1984; Fowler 1966; unpublished collections housed at the Cape Cod Museum of Natural History and Rhode Island College). Their presence at the inland and upland sites of Montville and Voluntown suggest that the Late Woodland people inhabiting the areas north and east of the coast and east of the Connecticut Valley shared a ceramic tradition more in common with Native societies to the east than with those participating in the Windsor tradition, centered along the Sound and in the lower Connecticut Valley (Lavin 1987).

CONCLUSIONS

Because New England sites are normally small, semi-sedentary or temporary campsites rather than large sedentary villages, they often produce small numbers of potsherds relative to those recovered from Iroquois villages. The latter often contain hundreds of vessels in comparison to the single and double-digit numbers of pots from New England settlements. When viewed alone, the relatively small amounts of pottery from each site suggest significant stylistic variation among New England potters. But when multi-site assemblages from the same locale are compared, the extent of variation decreases to a point where vessel lots may be classified into categories which reflect cultural patterning, at least for the Late Woodland period in southern New England. In summary, because the low vessel counts per site in New England may mask an actual degree of homogeneity on the regional level, it is a necessity for researchers to perform intensive intra-regional comparisons to substantiate any socio-cultural interpretations.

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REFERENCES CITED

Byers, Douglas S. and Irving Rouse

Childs, S. Terry

Chilton, Elizabeth

Fowler, William S.

Goodby, Robert G.

Lavin, Lucianne

Lavin, Lucianne, Fred Gudrian, and Laurie Miroff

Lavin, Lucianne and Laurie Miroff

Lavin, Lucianne and Birgit Morse

Lavin, Lucianne and Renee Kra

McBride, Kevin A.

Ritchie, William a. and Richard MacNeish
Rouse, Irving

Smith, Carlyle s.

Suggs, Robert

Wiegand, Ernest A.

Williams, Lorraine E.
1972 *Fort Shantok and Fort Corchaug: A Comparative Study of Seventeenth Century Culture Contact in the Long Island Sound Area*. University Microfilms, Ann Arbor.
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