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Cover Page Footnote

We would like to thank Dave Cooke and the dedicated members of the Albert Morgan Archaeological Society who spent many hours of careful excavation and mapping in the field and tedious cataloging in the laboratory. Their tireless efforts and high quality work made this paper possible. We are grateful to Douglas Morgan and the Morgan family for graciously allowing us the opportunity to dig up their rich farmland. A special thank you to Marina Mozzi of Archaeological Research Specialists for her help with the tables, maps, and photographs. Figures 1, 3, 5, and 6 originally were printed in the Bulletin of the Archaeological Society of Connecticut. We thank the reviewers of this volume for their constructive critique of the first draft of this paper, and editors Nan Rothschild and Diana Wall and the Council for Northeast Historical Archaeology for allowing us to participate in this tribute to Professor Bert Salwen.

POTTERY PRODUCTION AND CULTURAL PROCESS: PREHISTORIC CERAMICS FROM THE MORGAN SITE

Lucianne Lavin, Fred Gudrian, and Laurie Miroff

Bert Salwen was a pioneer in the study of prehistoric ceramics. In this paper, we use Bert's procedures of classification and interpretation to analyze the pottery assemblage from the Morgan site, a Late Woodland horticultural community located in the lower Connecticut drainage at Rocky Hill, Connecticut. The analysis provides insight into Native American cultural development in southern New England during the 12th and 14th centuries A.D. especially in the realm of social interaction and inter-regional exchange with Hudson valley groups.

Bert Salwen a fait oeuvre de pionnier dans l'étude de la céramique préhistorique. Dans cet article, nous utilisons ses méthodes de classification et d'explication pour analyser l'assemblage de poterie provenant du site Morgan, localité horticole du Sylvicole supérieur située dans le bassin inférieur de la Connecticut à Rock Hill (Connecticut). L'analyse fournit des lumières sur le développement culturel des populations autochtones dans le sud de la Nouvelle-Angleterre durant les XII^e et XIV^e siècles de notre ère, surtout dans le domaine de l'interaction sociale et des échanges interrégionaux avec des populations de la vallée de l'Hudson.

Introduction

As most of the articles in this volume demonstrate, Bert Salwen was a prime mover in the establishment of historical archaeology and cultural resource management. Many people are unaware, however, that he was also a major force in northeastern prehistoric archaeology. His early research concerned the excavation and analysis of many important Native American sites in New Jersey, New York, and southern New England (e.g., Salwen 1966, 1968, 1969, 1970, 1972, 1975).

Bert's pioneering efforts in the study of prehistoric ceramics generated technical and theoretical frameworks upon which later researchers have built (e.g., Lavin 1980, 1986; Lavin and Morse 1985; McBride 1984; Puniello

1990; Weigand 1987; Williams 1972). His studies of local pottery assemblages helped to refine the techniques of analysis originally described by Rouse (1945, 1947) and by Smith (1947, 1950) in their classic works on regional ceramic sequences.

Following Rouse and Smith, Salwen classified body and rim sherds according to the multiple criteria of paste, surface treatment, decoration, and vessel shape. Complete documentation of sherd characteristics allowed the placement of all non-eroded sherds within the classification system. It also facilitated intersite comparisons by other researchers.

Like Rouse and Smith, Salwen realized that attribute analysis and typology, the two major approaches to

ceramic classification, were complementary systems whose application to the same pottery assemblage could provide different kinds of cultural information. In his study of ceramics from the Muskeeta Cove site in western Long Island, for example, Bert employed typological analysis to date the site's cultural components and placed them within a spatio-temporal framework. He used attribute analysis to help decipher cultural processes once operative at the site (Salwen 1968).

There is a problem with Smith's typological method that Smith himself (1950: 189) has pointed out: it is possible for an undecorated sherd to be placed in one sherd lot while a decorated sherd from the same vessel might be placed in another sherd lot. To overcome this weakness, Salwen (1968) performed three semi-independent sortings of the undecorated sherds, decorated sherds, and the vessels they represented. To certify that undecorated and decorated sherds from the same vessel would be assigned to the same type and to that same vessel, only decorated sherd lots and undecorated sherd lots containing rim sherds were categorized as pottery types and used to formulate minimum vessel counts. By quantifying his analyses and determining minimum vessel counts, Salwen was able to alleviate the biases of artifact preservation and sampling that Newell and Krieger (1949) showed were inherent in the analysis of individual sherd counts.

It is obvious that one cannot ignore Bert's work on ceramics without losing important cultural information. In this paper, we have utilized his procedures of classification and interpretation to analyze the prehistoric pottery assemblage from the Morgan site, a Late

Woodland settlement located in central Connecticut (FIG. 1).

The Morgan Site

The Morgan site (6HT-120) is situated on the floodplain of the Connecticut River in Rocky Hill, Connecticut (FIGS. 1, 2; Cooke 1988; Lavin 1988). Surface finds in the plowed field indicate that the site is several acres in area. It was excavated by members of the Albert Morgan Archaeological Society, an affiliate of the Archaeological Society of Connecticut, from 1985 to 1990 under the direction of David Cooke and the senior author.

Thousands of lithic and ceramic artifacts were recovered. Floral and faunal remains from the site are remarkably well preserved and abundant. A variety of fauna are represented, including birds, turtles, rabbit, wildcats, dog, freshwater finfish, fresh and salt water shellfish. White-tailed deer was the major staple. A wide range of charred floral remains were recovered. They include fragments of nuts, wild fruits such as blueberries and raspberries, grasses, seeds from wild plants, and numerous kernels of maize.

The site exhibits a typical floodplain stratigraphy: a thin humus layer underlain by a stratum of undifferentiated, lighter brown, silty soil. The area had been plowed to a depth of 10 in (25 cm). Below the plow zone, the undisturbed silt was excavated in arbitrary 2-in (5 cm), 4-in (10 cm), and 6-in (15.25 cm) levels down to a maximum depth of 5.5 ft (1.65 m) below surface. The aboriginal pit features seem to originate mainly in the 10-16-in levels below surface, and the 20-23-in levels below surface (see Lavin, Gudrian, and Miroff 1993: tables 3, 4, 9, 10).

Figure 1. Location of the Morgan Site, Rocky Hill, Connecticut.

Charcoal from four pit features provided radiocarbon dates of A.D. 1170 $\pm$ 90 years, A.D. 1170 $\pm$ 70 years, A.D. 1320 $\pm$ 70 years, and A.D. 1360 $\pm$ 70 years. The two earliest dates are from features that begin 19–22 in below surface. The later dates were derived from pits beginning 12 and 14 in below surface. These dates suggest at least two major Late Woodland components at the site, a late 12th-century component and an early to mid-14th-century component. These are the earliest published dates in southern New England and southern New York for what appears to be a maize-intensive horticultural community.

Because the radiocarbon dates from the site indicate 12th-century dates for two pits beginning in the 20–22-in level and 14th-century dates for two pits originating in the 12–14-in level, we have assumed that the soil levels and

pit features beginning 20 in below surface and lower are associated with the remains of a 12th-century component, while those between 10 and 19 in represent remains of a later, 14th-century component. There is, of course, a possibility that artifacts originating in the undated 15–19-in levels may date to a third, 13th-century component, but this remains to be proven. In any case, the radiocarbon dates divide the soil levels into a 12th-century component and a post-12th-century component, represented mainly by features and artifacts originating above and within the soil levels associated with the 14th-century radiocarbon dates. For this reason, we refer to the lower site levels as the 12th-century occupation levels, and the upper levels as the 14th-century occupation levels. For the purpose of this paper—the elucidation of cultural processes through an

Figure 2. Location of archaeological sites mentioned in the text.

Figure 3. Point Peninsula-Owasco Pottery from the Morgan site. Top row: Jack's Reef Corded rim, Jack's Reef Corded rim, Jack's Reef Corded Punctate rim. Middle row: Three Bainbridge Notched Lip rims. Bottom row: Three Point Peninsula Corded rims.

analysis of changes in pottery production over time—however, the division of the Morgan site into 12th-century and post-12th-century prehistoric occupation levels also would be sufficient.

One of the most interesting aspects of the Morgan site is its pottery assemblage. Clay pottery sherds are the most abundant and ubiquitous artifacts at the site. The 10-in plow zone contained thousands of potsherds. The undisturbed levels and pit features below plow zone have yielded numerous large sherds, partial vessels, and at least two virtually complete pots (FIG. 3). (One of these pots was under restoration and unavailable for analysis, and so it is not included in our sherd and vessel counts.) The combination of the large number of sherds, the locally available clay deposits in the nearby Connecticut River and Goffe Brook, and the presence at

the site of 44 unfired clay lumps, coil fragments, and "smidgins" with the potter's fingerprint still extant demonstrate that the Morgan site was a major locus for the manufacture of clay pottery vessels and pipes. Those readers familiar with southern New England archaeology will understand the importance of these finds. For those who are not, it is important to point out that discoveries of large pottery-bearing sites are rare in the circum-Long Island Sound region, so much so that some researchers tend to believe clay pots did not play a very important part in the local material culture. Undisturbed, closed Late Woodland components are even rarer.

Although great strides have been made in the last 15 years, southern New England archaeology is still in its nascent stage. Cultural chronologies and histories are incomplete, and little is known about the cultural processes

once operative within the region, especially in the realm of exchange and intergroup relationships. As Salwen (1968) had shown in his study of the Muskeeta Cove site, data from the analysis of pottery assemblages can yield important insights into social group interactions, specifically when dealing with concepts like migration, invasion, diffusion, and trade. Consequently, it was hoped that analysis of the prehistoric ceramics from the Morgan site would yield information on Late Woodland cultural contacts and exchange during the 12th through 14th centuries A.D.

Analysis of Morgan Ceramics

A total of 13,685 potsherds, 29 clay pipe fragments, one clay whistle or flute fragment, and 44 unfired clay lumps and coil fragments has been recovered from the Morgan site to date. Six thousand and eighty-nine (6,089) potsherds were excavated from the undisturbed features and levels located below plow zone. All of the latter sherds from undisturbed contexts were analyzed in this study. Three thousand, five hundred and ninety-one (3,591) or 59% of the total sherds analyzed were unclassifiable; they were either too eroded or too small for identification purposes. The remaining 2,498 (41%) sherds were sorted into undecorated and decorated categories, and classified into sherd lots consisting of sherd groups and types (TABS. 1, 2). Spatial restrictions precluded detailed descriptions of each sherd lot and extensive tables noting their occurrence within each feature and excavation level. For this information, please refer to Lavin, Gudrian, and Miroff (1993).

Following Lavin (1986: 5), a sherd group is defined as "a category whose

members share a combination of traits distinct from those of other sherds in the assemblage. It should not be confused with a type, however, as it may represent the undecorated lower walls and base of a previously typed decorated sherd lot, or it may represent an idiosyncrasy rather than a cultural entity." A type is a category whose members share a combination of traits consistently chosen by the potters of a cultural group and, as such, reflects spatial and temporal patterning.

Undecorated Sherds

Two thousand and ten (2,010) or 33% of the sherds are undecorated (80.5% of the classifiable sherds). They constitute 27 sherd lots (TAB. 1). Two of these lots are types: Hollister Plain and Jack's Reef Corded/East River Cord-marked (FIG. 3). Representative sherds from 21 of these sherd lots occur in both the upper (10-20 in) and lower (20-60 in) levels of the site. The exceptions are 1) the smoothed-over, cross-paddled cordmarked exterior/smoothed interior sherd group; and 2) the impressed exterior/brushed interior sherd group, both of which only occurred in the upper 10-16-in levels; 3) the type Jack's Reef Cordmarked or East River Cordmarked, which occurred at the 18-in level; 4) the unknown exterior/brushed interior sherd group, which occurred at the 20-in level; 5) the smoothed-over fabric-marked exterior/smoothed interior sherd group, which occurred at the 22-in level; and 6) the type Hollister Plain, which occurred in the 24-30-in levels.

The interior and exterior brushing, usually performed with a scallop or ark shell, is diagnostic of the late Middle Woodland and Late Woodland Windsor ceramic tradition of coastal

Table 1. Totals and percentages of undecorated sherd lots within upper and lower levels, Morgan site, Rocky Hill, CT.

Soil level (in):	Upper (10-20)		Lower (20-36/60)		Total
	Total	%	Total	%	
Jack's Reef Corded or East River Cordmarked	2	0.1	0	0	2
Possible Hollister Plain	0	0	1	0.2	1
Cordmarked/Smoothed	164	11.8	91	17.9	255
Cordmarked/Eroded	17	1.2	1	0.2	18
Cordmarked/Brushed	5	0.4	3	0.6	8
Smoothed and Cordmarked/Smoothed	3	0.2	3	0.6	6
Smoothed Over Cordmarked/Brushed	16	1.2	4	0.8	20
Smoothed Over Cordmarked/Smoothed	270	19.4	116	22.9	386
Smoothed Over Cordmarked/Eroded	19	1.4	5	1.0	24
Cross-Paddled Cordmarked/Smoothed	139	10	34	6.7	173
Cross-Paddled Cordmarked/Eroded	7	0.5	6	1.2	13
Cross-Paddled Cordmarked/Brushed	5	0.4	1	0.2	6
Smoothed Over Cross-Paddled Cordmarked/Smoothed	6	0.4	0	0	6
Smoothed/Smoothed	618	44.5	179	35.3	797
Smoothed/Eroded	40	2.9	8	1.6	48
Smoothed/Brushed	3	0.2	4	0.8	7
Unknown/Brushed	0	0	1	0.2	1
Brushed/Smoothed	9	0.6	10	2.0	19
Brushed/Eroded	14	1.0	2	0.4	16
Brushed/Brushed	20	1.4	8	1.6	28
Fabricmarked/Smoothed	11	0.8	13	2.6	24
Smoothed Over Fabricmarked/Smoothed	0	0	1	0.2	1
Fabricmarked/Brushed	2	0.1	1	0.2	3
Fabricmarked/Eroded	3	0.2	1	0.2	4
Impressed (Cordmarked or Fabricmarked)/Smoothed	10	0.7	12	2.4	22
Impressed (Cordmarked or Fabricmarked)/Brushed	2	0.1	0	0	2
Roughened/Smoothed, Roughened, or Eroded	5	0.4	2	0.4	7
Totals	1390	100	507	100.2	1897

Connecticut and eastern Long Island. Hollister Plain is also a Late Woodland Windsor pottery type (Lavin 1980). The presence of cross-paddled cordmarked surface treatment may be a local attempt to imitate the check-stamped surface treatment of central New York potters. The sherds representing a Jack's Reef Cordmarked or an East River Cordmarked vessel

suggest influences from either the pre-Owasco Point Peninsula tradition of interior New York or the East River tradition of western coastal New York and southwestern Connecticut (Ritchie and MacNeish 1949; Smith 1950). Possibly, they may represent a Windsor Cordmarked variant whose smoothed interior surfaces are the result of Owasco-Iroquois influences. In any

Table 2. Totals and Percentages of decorated sherds lots within upper and lower levels, Morgan Site, Rocky Hill, CT.

Soil level (in):	Upper (10-20)		Lower (20-36/60)		No provenience	Site total
	Total	%	Total	%		
Niantic Incised	40	11.6	10	8.3	2	52
Phillips Incised	1	0.3	0	0	0	1
Incised/Smoothed or Eroded	87	25.2	23	19.0	8	118
Incised or Brushed	15	4.3	6	5.0	2	23
Niantic Linear Dentate	7	2.0	0	0	1	8
Linear Dentate Stamped	1	0.3	4	3.3	0	5
Punctated/Smoothed	3	0.9	1	0.8	2	6
Notched/Smoothed	1	0.3	0	0	0	1
Niantic Punctate	0	0	1	0.8	0	1
Niantic Stamped	5	1.4	2	1.7	0	7
Sebolic Stamped	11	3.2	3	2.5	0	14
Scallop Shell or Pseudo-Scallop Shell Stamped/Smoothed or Eroded	16	4.6	11	9.1	0	27
Scallop Shell or Pseudo-Scallop Shell Stamp and Drag/Smoothed or Eroded	5	1.4	3	2.5	0	8
Scallop Shell Stamped and Brushed	0	0	3	2.5	0	3
Hollister Stamped	2	0.6	0	0	0	2
Windsor Brushed	57	16.5	5	4.1	1	63
Brushed/Smoothed, Brushed, or Eroded	64	18.6	26	21.5	6	96
Brushed and Incised or Combed	19	5.5	9	7.4	0	28
Bainbridge Notched Lip	2	0.6	1	0.8	0	3
Jack's Reef Corded Punctate	0	0	1	0.8	0	1
Point Peninsula Corded	0	0	2	1.7	0	2
Cordwrapped-Stick Stamped	0	0	3	2.5	0	3
Unknown Stamp	8	2.3	7	5.8	0	15
Impressed or Punctated	1	0.3	0	0	0	1
Total	345	99.9	121	100.1	22	488

case, these sherd lots suggest coastal and western contacts at the Morgan site.

Even though most of the undecorated sherd lots are present in both the 12th- and 14th-century levels, several lots demonstrate percentage differences between the two levels (TAB. 1). The smoothed exterior/smoothed interior group comprised over 9% more of the undecorated sherds in the upper levels (44.5%) than they did in the lower levels (35.3%). In contrast, the lower levels contained higher percentages of cordmarked exterior/smoothed interior sherds (17.9% to 11.8%), and smoothed-over cordmarked exterior/smoothed in-

terior sherds and smoothed and cordmarked exterior/smoothed interior sherds (23.5% to 19.6%).

The change from a cordmarked exterior/smoothed interior surface treatment to a smoothed exterior/smoothed interior surface treatment is a well-documented sequence in the Late Woodland Owasco and Iroquoian ceramic traditions of interior New York and the East River tradition of southern New York (Ritchie 1969; Ritchie and MacNeish 1949; Smith 1950). Documentation of such a change at the Morgan site suggests increasing western influences on Morgan potters over time.

Decorated Sherds

Four hundred and eighty-eight (488 or 8%) of the sherds are decorated (19.5% of the classifiable sherds). They constitute 24 sherd lots (TAB. 2). Eleven of these sherd lots are types: Niantic Incised (FIG. 4); Niantic Linear Dentate (FIG. 5); Niantic Punctate (FIG. 5); Niantic Stamped (FIG. 5); Phillips Incised (FIG. 5); Sebonac Stamped (FIG. 6); Windsor Brushed; Hollister Stamped; Jack's Reef Corded Punctate (FIG. 3); Point Peninsula Corded (FIG. 3); and Bainbridge Notched Lip (FIG. 3).

Fourteen of these sherd lots occur in both the upper and lower levels of the site. The exceptions include the types: 1) Phillips Incised; 2) Niantic Linear Dentate, both of which occurred only in the 10–16-in levels (although the sherd group linear dentate stamp, which occurred in the 19–24-in levels, may represent Niantic Linear Dentate

vessels); 3) Hollister Stamped, which occurred at the 14-in level; both 4) notched/smoothed and 5) impressed or punctated occurred only in the 16–20-in level; 6) cordwrapped-stick stamped sherd group, which occurred in the 18–22-in level and the lower 24–30 and 30–36-in levels; 7) Niantic Punctate, which occurred in the 30–36-in level; 8) the scallop shell stamped and brushed group; 9) type Point Peninsula Corded; and 10) Jack's Reef Corded Punctate, which all occurred only in lower levels (24–30-in, 30–48-in, and 54–60-in, respectively).

Windsor Brushed and Hollister Stamped are typical Windsor uncollared pottery types that occur during late Middle Woodland times and extend into the Late Woodland period (Smith 1950; Lavin 1987). Uncollared Sebonac Stamped pots characterize Windsor sites along the Connecticut coast and lower Connecticut

Figure 4. Niantic Incised rim sherds from the Morgan site.

valley from about A.D. 900–A.D. 1500 (McBride 1984). Niantic Linear Dentate, Niantic Punctate, and Niantic Stamped are collared pottery types diagnostic of the late Windsor tradition (Keener 1965; Lavin 1987).

Based on artifact associations, researchers traditionally have held the belief that collared pottery dated to the very late, final Woodland and historical periods in southern New England (e.g., Rouse 1947; Smith 1950; Keener 1965; Lavin 1987). The earliest published reference to the type “Niantic Incised” is by Keener (1965: 26), quoting a personal communication from Ben Rouse. The pottery type is not described by either gentleman, but Keener does note its frequent occurrence at the Phillips Rockshelter site (FIG. 1), whose pottery assemblage indicates occupation(s) by Windsor social groups. Except for the Morgan site and the Nick’s Niche Rockshelter site in

Haddam (FIG. 1), which yielded one Niantic Stamp and Drag pot and a date of A.D. 1690 (McBride 1984: 201), there are no published radiocarbon dates for closed components in southern New England containing the collared pottery types mentioned above.

The radiocarbon dates from the Morgan site verify that collared pottery vessels occur much earlier than previously thought, at least in central Connecticut. Collared incised pottery appears c. A.D. 1200–1250 in central New York (Niemczycki 1986: 27–36), just about the same time as the lower Morgan component, whose mean radiocarbon date of A.D. 1170 has an age range within one standard deviation (± 90 years) of A.D. 1080–A.D. 1260. The closeness of the dates suggests the quick introduction and early acceptance of the collared vessel form by Connecticut groups. This ready acceptance coincides with the advent

Figure 5. Windsor tradition collared rim sherds from the Morgan site. Top row: Niantic Linear Dentate rims. Middle row: Niantic Stamped rims. Bottom row: Niantic Punctate rim, Niantic Stamped rim, Phillips Incised rim.

of intensive wild grain harvesting and maize horticulture (Lavin 1988), and probably arises from the functional advantage of cooking maize and other starchy seeds in these round-bottomed, constricted-neck pots (Braun 1980).

The constricted neck helped contain heat in the pot, while the rounded base provided even heating and lessened the chance of breakage. Pots could be hung by their collars over hot coals instead of being set directly within the fire as is the done with the pointed base, uncollared vessels. Foods could be cooked more slowly for longer periods of time (a necessary development for parched corn and seeds), with less chance of the pot cracking or breaking, or the food sticking to the pot and burning. Significantly, many of the postmolds uncovered at Morgan appear to encircle or straddle the pit features, suggesting posts were used as supports for roasting spits, drying platforms, and

racks for hanging pots (Lavin 1988: 16–17).

Bainbridge Notched Lip is a very late Owasco type dated to c. A.D. 1200–1300 (Ritchie and MacNeish 1949: 116). The occurrence of two sherds of Owasco type pottery in the 16–20-in level is compatible with the radiocarbon dates of A.D. 1170 in the 20–21-in level and A.D. 1320–1360 in the 12–14-in level. The occurrence of a third sherd of Bainbridge Notched Lip in the 24–30-in level is not so compatible. Since all three sherds are fragments of the same vessel, the deeper provenience may be a result of cryoturbation, animal activities, or slopewash because this particular area of the site is located along the edge of an old riverbank. (It has been documented since the colonial period that this part of the Connecticut River has been moving eastward. Several relict banks exist between the Morgan site and the present river edge.)

Figure 6. Windsor tradition uncollared rim sherds from the Morgan site. Top and middle rows: Sebonac Stamped sherds. Bottom row: Hollister Stamped.

Point Peninsula Corded is a Middle Woodland Point Peninsula tradition pottery type whose recovery in the lower levels at Morgan is compatible with its dated occurrence on New York sites (Ritchie 1969). The type Jack's Reef Corded Punctate dates to "closing Point Peninsula times" (Ritchie and MacNeish 1949: 107), c. A.D. 900-1000. Its recovery from the deepest site levels is also in tune with the radiocarbon sequence from the site. The Point Peninsula Corded and Jack's Reef Corded Punctate sherds may even represent an earlier, late Middle Woodland or early Late Woodland component at Morgan.

The untyped cordwrapped-stick stamped sherds are rather an enigma. Although cordwrapped-stick stamped pottery has been recovered from coastal Windsor contexts, they have never been considered part of the Windsor ceramic tradition (e.g., Rouse 1947; Smith 1950; see Lavin 1987: 33-34 for discussion). In contrast, the decorative technique is characteristic of the Point Peninsula and Owasco traditions (Ritchie and MacNeish 1949; Ritchie 1969) and so the sherds may be another indicator of western contacts during the earlier occupation of Morgan, but this interpretation is equivocal.

As in the undecorated sherd analysis, even though the majority of decorated sherd lots are present in both the 12th- and 14th-century occupation levels, the percentages of several lots differ (TAB. 2). There is a higher percentage of incised sherds in the upper site levels (9.6% higher) and a corresponding higher percentage of scallop or pseudo-scallop shell-stamped sherds in the lower levels (7.1% higher). The higher percentage of brushed sherds in the upper levels (7.6% higher) may be a result of the popularity of horizontally brushed

neck decoration on Phillips Incised and other vessels.

Tempering Material

The majority of decorated and undecorated sherds for the site as a whole are grit tempered (86.9%) and within both the upper (84.7%) and lower (92%) levels. The grit (crushed stone) particles are primarily quartz from locally available sandstone cobbles. Table 3, which depicts the relationship of temper type to site depth, shows a decrease in the use of grit temper (7.3% lower) from the lower levels to upper levels, and a slight increase in both shell tempering (5.6% higher) and in sherds exhibiting no visible temper (1.8% higher).

These changes correspond to a general trend toward increasing use of shell temper during late Middle Woodland and Late Woodland times in southern New England and coastal New York. The increase appears to be much more substantial as one moves south (Smith 1950; Lavin 1980). Interestingly, 47% of the pottery from the Late Woodland Niantic phase at the Ben Hollister site, located across the river from the Morgan site in Glastonbury, Connecticut (FIG. 1), was shell-tempered (Lavin 1980: 25-26). The reason for the great difference in the percentages of temper types between the two sites is unknown. There are no radiocarbon dates for Ben Hollister. Perhaps the collared vessels from Hollister represent a later occupation than those vessels from the 14th-century component at the Morgan site.

Vessels

The minimum number of vessels represented by the sherds in this analysis is 144 (TAB. 4). This is a very conservative estimate based on rim

Table 3. Range of Temper types by depth for undecorated and decorated sherds, Morgan site, Rocky Hill, CT.

	Grit temper	Shell temper	No visible temper	Total sherds
<i>Upper soil levels*</i>				
10-16"	1028	83	56	1167
12-18"	20	5	1	26
16-20"	421	80	41	542
<i>Lower soil levels*</i>				
18-22"	20	0	4	24
18-24"	132	6	1	139
20-24"	75	4	6	85
24-30"	120	9	7	136
30-36"	150	5	5	160
36-44"	1	0	37	
44-48"	0	0	0	0
48-52"	3	0	0	3
52-58"	38	1	0	39
54-60"	4	0	1	5
Total (%)	578 (92.0)	26 (4.1)	24 (3.8)	628 (99.9)
<i>No provenience</i>				
Total (%)	124 (91.0)	1 (0.7)	10 (7.4)	135 (100)
Site total (%)	2171 (86.9)	195 (7.8)	132 (5.3)	2498 (100)

*Overlapping depth levels are the result of a site excavation strategy that utilized both 4 and 6-in arbitrary levels.

sherd attributes, especially distinctive decorative motifs. Sherds whose primary motifs could not be discerned (i.e., smaller sized sherds, and decorated sherds located below the primary rim area of decoration) were not included in the vessel count, although in reality they may indeed represent additional individual pots.

Sixty-six percent (66%), or ninety-five (95), of the vessels were recovered from the upper levels of the site, which suggests a greater number of inhabitants and/or a lengthier, more intensive settlement during the 14th-century occupation. Table 4 demonstrates very similar percentages of Windsor type vessels for the upper (30.5%) and the lower (30.2%) site levels. The levels also share similar percentages of Point Peninsula-Owasco type vessels—2.1% for the upper levels, 4.7% for the lower levels. There are, however, 11.6% more Windsor vessels exhibiting Owasco-Iroquoian traits in the upper levels of

the site than in the lower levels (44.2% compared to 32.6% for the lower site levels).

The large quantities of Windsor vessels indicate that both the lower and upper components belong to the Windsor tradition. It suggests that the inhabitants of the Morgan site were closely related to the Indian groups living in the lower Connecticut Valley and along Long Island Sound. The presence of Point Peninsula-Owasco type vessels and Windsor vessels exhibiting Owasco-Iroquois attributes indicates that the inhabitants of both occupations were in contact with Native American societies from interior New York. The greater percentage of Windsor vessels containing western formal and decorative characteristics in the upper levels at Morgan suggests increasingly stronger contacts with Hudson Valley groups during the later, 14th-century component.

Table 4. Totals and Percentages of vessels ascribed to regional ceramic traditions, Morgan site, Rocky Hill, CT.

	Upper level		Lower level		Upper and lower levels		No provenience		Total
	total	%	total	%	total	%	total	%	
Windsor Tradition*	29	30.5	13	30.2	0	0	1	25	43
Windsor Vessels†	42	44.2	14	32.6	1	50	2	50	59
Exhibiting Owasco-Iroquoian Traits									
Point Peninsula-Owasco Tradition‡	2	2.1	2	4.7	1	50	0	0	5
Unknown§	22	23.2	14	32.6	0	0	1	25	37
Total	95	100	43	100.1	2	100	4	100	144

*Includes the following vessel styles: Sebonac Stamped; Scallop Shell or Pseudo-Scallop Shell Stamped or Stamp and Drag; Hollister Stamped; Windsor Brushed; Brushed exterior/Brushed, Smoothed, or Eroded interior; Smoothed exterior/Brushed interior; Hollister Plain.

†Includes the following vessel styles: Niantic Stamped; Niantic Punctate; Niantic Linear Dentate; Niantic Incised; Phillips Incised; Brushed and Incised or Combed.

‡Includes the following vessel styles: Levana Cord on Cord; Jack's Reef Corded Punctate; Bainbridge Notched Lip; Jack's Reef Corded or East River Cordmarked.

§Includes the following vessel styles: Cord-wrapped-Stick Stamped; Unknown Stamp; Smoothed exterior/Smoothed interior; Impressed exterior/Smoothed interior; Incised; Incised or Brushed.

As Tables 2-4 show, Windsor Brushed and Sebonac Stamped vessels—types traditionally assigned to the late Middle Woodland Shantok Cove and Late Woodland Sebonac cultural stages of the Windsor tradition—often occur with Niantic Stamped, Niantic Incised, and Niantic Linear Dentate vessels, types normally assigned to the later Late Woodland Niantic cultural stage and early historical period. These ceramic associations suggest that we should rethink our models of cultural history and change. Northeastern cultural histories are often depicted as a series of material culture replacements. Each stage or phase is characterized by unique artifact types that completely replace (or virtually so) the prior set of diagnostics.

The ceramic data from the Morgan site and artifact analyses from other sites in southern New England (e.g.; Lavin and Salwen 1983; Lavin 1987) indicate that such a model of change is

untenable for our geographic region of study, because few artifact types may be considered time markers for a single cultural stage/phase. More appropriate is the model of gradual material culture replacement proposed by Hatch (1983) to describe Late Woodland culture change at the Fisher Farm site in Pennsylvania. In this model, recurring combinations of artifact types can be used as time markers as well as discrete types.

Interpretations

In summary, 6,089 sherds from the Late Woodland components of the Morgan site at Rocky Hill, Connecticut, were studied, and 2,498 were classified according to the multiple criteria of paste, surface treatment, decoration, and vessel shape. To maximize retrieval of cultural information from the data at hand, we followed Salwen's procedure of performing three semi-independent sortings of the undecorated

sherds, decorated sherds, and vessels represented.

All three analyses indicate that the inhabitants of the Morgan site were members of the coastal Windsor ceramic tradition who experienced increasingly stronger cultural interactions with social groups to the west (i.e., the Hudson Valley region) from A.D. 1170 to at least the mid-14th century A.D. The ceramic data are supported by floral evidence from the Morgan site assemblage.

Excavation and ongoing flotation analysis has so far recovered numerous maize kernels and one bean seed. Horticulture was most probably introduced to the Morgan people by Owasco groups to the west, since the earliest dates for maize horticulture in the Northeast come from central New York. The maize-yielding Roundtop site in Endicott, New York (FIG. 2) was radiocarbon-dated to A.D. 1070 $\pm$ 60 years. The Maxon-Derby site in Jordan, New York (FIG. 2), yielded maize, beans, and squash seeds and a radiocarbon date of A.D. 1100 $\pm$ 100 years (Ritchie and Funk 1973: 186, 210).

Inter-regional Cultural Dynamics and Connecticut Prehistory

To really understand the cultural dynamics behind the increasing Hudson Valley-Connecticut Valley social interactions, we must look at the broader, inter-regional picture during this time period. The Ohio and Mississippi River valleys were occupied by Late Woodland, Fort Ancient, and Mississippian culture groups, complex societies with an agricultural economy and a settlement system centered about large, fortified, temple-mound urban centers. By A.D. 1000, several major regional centers were established along

the Ohio River (FIG. 2): the Marietta site at the mouth of the Muskingum River; the 82-acre Angel site in what is now southern Indiana; the Caborn-Welborn complex of sites at the mouth of the Wabash River; the 150-acre Kincaid site near the mouths of the Tennessee and Cumberland Rivers; the Cairo Lowland sites at the confluence of the Ohio and Mississippi Rivers. The 6-mi (9.6 km) square urban center of Cahokia, located on the Mississippi River near present day East St. Louis, reached its peak of development between A.D. 1000 and A.D. 1250 (Cole 1951; Fowler and Hall 1978; Griffin 1978; Hasenstab 1987).

The artifact assemblages from these sites suggest a ranked society with extensive exchange networks and with craft specialization in the manufacture of status items and grave goods. Researchers in the area have theorized that these societies were emergent states, or at least chiefdoms. Several workers have posited that the societies regularly set up colonies in the hinterlands to extract goods for status and burial, and for the general upkeep of the urban centers (Stoltman 1991).

Hasenstab (1987) has argued effectively for Midwestern intrusions into western Pennsylvania and New York for the purpose of long-distance resource extraction. He cites the occurrence of nonlocal Fort Ancient materials on Allegheny Valley sites as indicative of such exchange, and demonstrates the ease of water transport between the midwestern regional centers and the Northeast by citing early historical sources on the large size of Mohawk, Huron, and Ohio Indian canoes; the large amounts of bulk cargo such a boat could carry; the ease of portage because of the canoe's light weight; and the surprisingly short time necessary to canoe from western New York to the urban

centers dotting the Ohio and Mississippi valleys. According to Little (1987), the average travel time from western New York at the headwaters of the Allegheny River to the Fort Ancient center of Marietta was 13 days. It would have taken another 13 days to reach the Mississippian towns at Angel and those within the Caborn-Welborn complex at the mouth of the Wabash.

Hasenstab cites James Smith's 1808 descriptions of mid-18th-century long-distance procurement expeditions by Ohio Indians and their camps at "carrying places" or portage areas, and hypothesizes that Mississippian groups followed these procedures. He lists New York sites located near areas of portage (i.e., drainage divides) that date to the time period in question, and notes their association with palisaded villages. The palisades obviously denote the indigenous peoples' need for security. Many of these settlements contained concentrations of storage pits, nonlocal ceramics, and exotic items such as Busycon shell ornaments.

Hasenstab's (1987) and Dincauze's (Dincauze and Hasenstab 1987) hypothesis that groups to the west and south of the Owasco-Iroquois settlements were expanding their territories on the margins of the lower Great Lakes and the Allegheny Valley is supported by Niemczycki's (1986, 1987) findings in west-central New York. Niemczycki's research has led her to conclude that the development of the Seneca tribe was due to the eastward intrusion of Ontario Iroquois groups into Seneca territory c. A.D. 1250, resulting in the displacement of the latter's western settlements. She describes the indigenous, pre-Iroquoian Owasco communities as having basically hunting and gathering economies with few storage pits, no evidence of permanent

structures, and little horticultural activity. The settlement pattern is mainly one of temporary camps and dispersed population. The intrusion of the Ontario Iroquois promoted local environmental unpredictability and stimulated the Owasco groups to develop concentrated palisaded settlements and a more complex social organization, supported by an intensive horticultural economy.

In sum, archaeological evidence indicates indigenous Ontario and west-central New York groups moving eastward c. A.D. 1250-1300. The areas into which they were migrating were not uninhabited. Regions east of the Seneca were inhabited by predecessors of the Onondaga and Mohawk Iroquois and, in the Hudson River Valley, by those of the Mahican (Ritchie 1969). The infringement on and eventual displacement of the latter groups would certainly mean the eventual intrusion of Hudson Valley groups into Connecticut. Indeed, the only Late Woodland ceramic collection from northwestern Connecticut known to us (a collection from Kent, presently housed at the Institute for American Indian Studies in Washington, Connecticut), consists of collared incised sherds reminiscent of Iroquois pottery types.

We hypothesize that the infringement of Midwestern Fort Ancient groups on the indigenous peoples of western New York created a "domino" effect whereby the displacement eastward of the latter peoples caused continual displacement eastward throughout interior New York and western Connecticut. The consequence of this movement was increased contacts with Windsor groups like the Morgan people, culminating in the diffusion of new economic ideas, such as a maize-intensive economy and collared pottery vessel forms.

Interestingly, the terminal Owasco Markham Pond site located near Avon in central New York (FIG. 2), which dates to ca. A.D. 1250—just about the time Niemczycki postulates the Ontario Iroquois intrusion, contains a ceramic assemblage quite similar to that of the Morgan site. The Markham Pond assemblage consists of a contemporary mix of uncollared, indigenous early Late Woodland pottery types and collared incised types. This mix of types—in this case, uncollared, impressed pots and collared, incised vessels—traditionally thought to represent two historically discrete cultural stages, is apparently characteristic of a situation of cultural confrontation in which one culture migrates or otherwise intrudes upon another culture. The recovery of such a mix in a closed component might be used to identify this form of social interaction. More work at similar undisturbed sites is needed to verify such a procedure. As at the Morgan site, the ceramic data best fit Hatch's (1983) cultural change model of gradual material culture replacement.

Conclusions

In summation, analysis of the 6,089 sherds from the Morgan site in Rocky Hill, Connecticut, have allowed us to make a number of conclusions about Late Woodland cultural development in the lower Connecticut Valley. These are:

- 1) The coastal Windsor tradition extended at least as far as what is now the greater Hartford area during early Late Woodland times (c. A.D. 1170–1360). Both occupations at Morgan demonstrate strong ceramic ties to social groups inhabiting the Long Island Sound area. The data support Lavin's (1980) earlier study of the geographic scope of the Windsor tradition.

- 2) The Morgan community experienced increasingly stronger western influences from interior New York over time.

- 3) The increase in western contacts may have been the ultimate result of the intrusion of Midwestern Mississippian and Fort Ancient groups into western New York and Ontario. Midcontinent social pressures and the displacement eastward of western New York groups into other group territories created a "domino" effect that eventually led to the eastward movement of Hudson Valley groups into Connecticut, stimulating exchange and the introduction of new economic ideas such as intensive maize horticulture and round-bottomed, collared pots.

- 4) Changes in temper type over time at the Morgan site correspond to the general trend in southern New England and coastal New York toward increasing popularity of shell temper. But the increase in shell temper at Morgan is relatively slight, demonstrating that Late Woodland assemblages from southern New England may be overwhelmingly grit tempered and that, consequently, grit temper should not be considered a time marker for the earlier Woodland period.

- 5) The similarity in ceramic assemblages between Morgan and the Markham Pond site of west-central New York suggests that such a great array of pottery types and attributes traditionally considered diagnostic of discrete cultural phases reflects the confrontation of two distinct societies and, as such, may be used to identify this kind of social interaction.

- 6) Such a contemporary mix of pottery types and attributes argues for a restructuring of traditional models of northeastern culture history and change based on a series of complete type replacements into a model of gradual material culture replacement.

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