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BULLETIN OF THE MASSACHUSETTS ARCHAEOLOGICAL SOCIETY

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VOL 49 No 2

IN MEMORIAM: PETER F. THORBACHN 1943-1987

Brona G. Simon

We have recently lost an enthusiastic and innovative fellow archaeologist and member of the MAS. Peter F. Thorbahn died suddenly on August 31, 1987 at the age of 43 in Barnstable, Massachusetts.

Dr. Thorbahn graduated from Brown University and earned his Ph.D. from the University of Massachusetts at Amherst in 1979. He did his graduate research in Kenya, Africa. He taught anthropology and archaeology at Brown University for five years, and was the principal investigator for archaeological research at Brown University's Public Archaeology Laboratory. After Brown University closed the lab, Dr. Thorbahn helped form and directed the Public Archaeology Laboratory, Inc. of Providence. Most recently, Dr. Thorbahn was the director of the Great House Foundation and Hammerway Research, Ltd. in Massachusetts.

Dr. Thorbahn's interest in prehistoric archaeology of southern New England is well known from the numerous reports, manuscripts and articles he wrote on the subject. His innovative approach to site survey and regional settlement studies have had a lasting effect on the advancement of archaeological research in Massachusetts. He is most well-known for directing the archaeological research for the Route 495 highway segment between Mansfield and Bridgewater, where over a dozen important prehistoric sites were excavated, ranging from Early Archaic through Late Woodland occupations.

Dr. Thorbahn was also very active in what he liked to call "Home Town Archaeology." When he and his wife Barbara lived in Plainville, Massachusetts, he served on the Plainville Conservation and Historical Commissions. Most recently, he actively pursued the identification and protection of archaeological sites in Barnstable. The Barnstable Historical Commission has established the Peter Frederic Thorbahn Archaeological Preservation Memorial Fund to continue his efforts. Memorial donations may be made to the fund c/o Barnstable Historical Commission, Town Hall, Hyannis, MA 02601.

I could not write this notice without a few personal observations on Peter as an archaeologist, a teacher and a friend. Peter gave me my first job in archaeology in New England almost 11 years ago and was an important force in shaping my own career. His enthusiasm and creative thinking never ceased to amaze me. Frequently Peter would come up with new ideas or innovative techniques to interpret sites; he always had the "big picture" in mind, and would put individual sites into a broader context of what prehistoric people were doing and why. His commitment to archaeological site preservation was inexhaustible, and he combined this effort with environmental conservation as well. As a teacher he sincerely cared about his students and helped to create a positive atmosphere for learning and creative thinking. Peter was a building block, a foundation for the growth and development of the field of New England archaeology. His sudden death, so unexpected and at such a young age, has taken away one of the major forces shaping archaeology in New England today.

PUBLICATIONS OF PETER F. THORBAHN

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- 1979a The Ivory Trade of Precolonial East Africa: Reconstruction of a Human Elephant Ecosystem. Ph.D. Dissertation, Anthropology Department, University of Massachusetts. University Microfilms, Ann Arbor.
- 1979b Roger Williams National Memorial, Rhode Island. Archaeological Resource Study Series, Northeast Region, No. 1. National Park Service, Washington (with Susan Gibson et al.).
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- In press Humanists and Hackers, Applications of Computers for Historic Sites. North American Archeologist.

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In press The Effect of Estuary Formation on Prehistoric Settlement in Southern Rhode Island. In Environment and Archaeology in the Northeast, edited by George B. Nicholas. Baywood Publishing, New York (with Deborah C. Cox).



Peter F. Thorbahn, with "Woody", Memorial Day Weekend 1987 (photo courtesy B. Thorbahn).

WHERE ARE THE WOODLAND VILLAGES?: PREFACE

Jordan E. Kerber, compiler

A workshop entitled "Where are the Woodland Villages: A Workshop on Late Prehistoric Settlement Systems in Southern New England" was organized by the late Peter F. Thorbahn and presented at the 27th Annual Meeting of the Northeastern Anthropological Association, University of Massachusetts, Amherst on March 20, 1987. Peter had wanted very much to publish the results of the workshop, and so the discussants, Jordan Kerber, Betty Little, Barbara Luedtke and Kevin McBride, rallied together to complete their papers toward this goal. Due to space constraints, some papers will be published in the next number of the Bulletin. Contributors were Deborah Cox, Fred Dunford, Curt Hoffman, Alan Leveillee, Frank McManamon, Tom Mahlstedt, Pierre Morenon and George Stillson.

The success of the workshop is undoubtedly due to Peter's special talents and efforts and his innovative way of organizing the session as a dialogue to enable the free exchange of information, ideas and questions. The workshop participants dedicate this publication to the memory of Dr. Peter Thorbahn.

As stated in the abstract of the workshop proposal:

Except for a few areas in southern New England, such as the middle and lower Connecticut River valley, there is very little archaeological evidence for village-based settlement systems during the Late Woodland period (A.D. 500 to 1600). This is in sharp contrast to most of the rest of Eastern North America. Yet ethnohistoric data indicate that relatively large, semi-permanent villages were common, especially along the coast, at the time of the first European contact. This workshop will examine recent evidence and alternative models of the enigmatic Woodland settlement systems in southern New England (Thorbahn 1987:1).

The workshop was organized into two parts: presentations by discussants; and discussion/question and answer period. Four discussants were chosen by the organizer to summarize and synthesize recent evidence from Woodland sites for specific geographic areas along the southern New England coast: Barbara Luedtke for eastern Massachusetts, Elizabeth Little for Cape Cod and the Islands, Jordan Kerber for Narragansett Bay and Kevin McBride for the Connecticut-Long Island shores. Each discussant was asked to contact four contributors to provide recent evidence in the form of short (two page) written statements or contributions, and to address the extent to which recent data support or reject one or more of three alternative Woodland settlement system models presented by McManamon and Bradley (1986:22-23), which are described in detail by Thorbahn (1987: 1-2) in his workshop proposal. Each model deals with three dimensions of the Woodland settlement systems: (a) scheduling and location of activities; (b) range of activities; and (c) intensity of activities. The models are:

I. Infrequent, seasonal use of the coast until European contact, followed by rapid aggregation in villages stimulated by trade. The range of activities at Woodland sites was limited and the intensity of activity was low (Ceci 1982).

II. Intensive use of the coast during summer as part of a coast-interior seasonal round beginning as early as the Late Archaic. Permanent settlements were rare. Activities had a wider range and were more intense than in model I (Salwen 1978:

164; Snow 1980: 230).

III. Permanent or semi-permanent settlements along the coast associated with cultivated fields, special activity sites and communal burial grounds as early as the Middle Woodland. However these settlements were smaller and less aggregated than villages in other regions of the Eastern Woodlands. The activities would have had a very wide range and intensity would have been highly variable from site to site (McManamon and Bradley 1986; Sanger 1982; Spiess, et al. 1983).

Following the four presentations, a substantive discussion took place among discussants, contributors and other workshop participants lasting almost an hour. Although few questions were answered, several issues were followed up and new ones addressed. The result was a valuable interchange of information, ideas and questions, which was recorded on tape. The presentations published here have been revised from their oral form. In addition, a paper Peter had submitted to the Bulletin in 1984, entitled "Where are the Woodland Villages of Southern New England?" has been included. Although he intended to revise it in light of the workshop findings, the past and present editors have agreed to include it in this issue with minor editorial changes, as a forceful exposition of the ideas motivating the workshop, and as a basis for the subsequent papers.

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WHERE ARE THE LATE WOODLAND VILLAGES IN SOUTHERN NEW ENGLAND?

Peter F. Thorbahn

INTRODUCTION.

In the spring of 1980, Brona Simon discovered the Swift prehistoric site while conducting a reconnaissance survey along the future route of a sewer inceptor in Acushnet on the east bank of the upper Acushnet River, across the river from New Bedford (Simon 1980). The river is tidal at this point (see Figures 1 and 2). Cultural material was found on both the lower and upper terraces (separated by the 3m or 10 ft contour) immediately adjacent to the river. This property was part of the Rudolphus Swift estate in the 19th century.

There seemed to be no reason to believe that the site was confined to the immediate area of the sewer easement. It was likely that it would extend well up the slope from the upper terrace into a large, overgrown field. Simon had a very limited amount of information to work with, which is the nature of a reconnaissance level survey, but on the basis of the excavated artifacts and background research, she made the following preliminary assessment:

The Swift Site is a large, multi-component site. Cultural material is dense and widespread within the project area and probably outside as well. The site may even have been the locale of a small Woodland village. The possibility of a Contact Period component also should not be eliminated, considering the many historic references to Cushenas and undefined Wampanoags living within the present Acushnet town limits (Simon 1980:32).

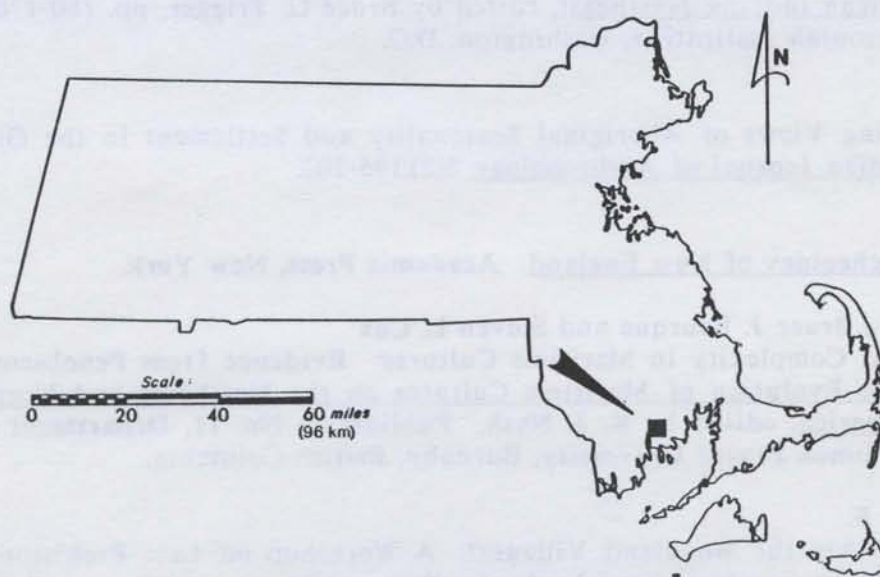


Figure 1. Location of Project on State Map (One mile = 1.6 kilometers).

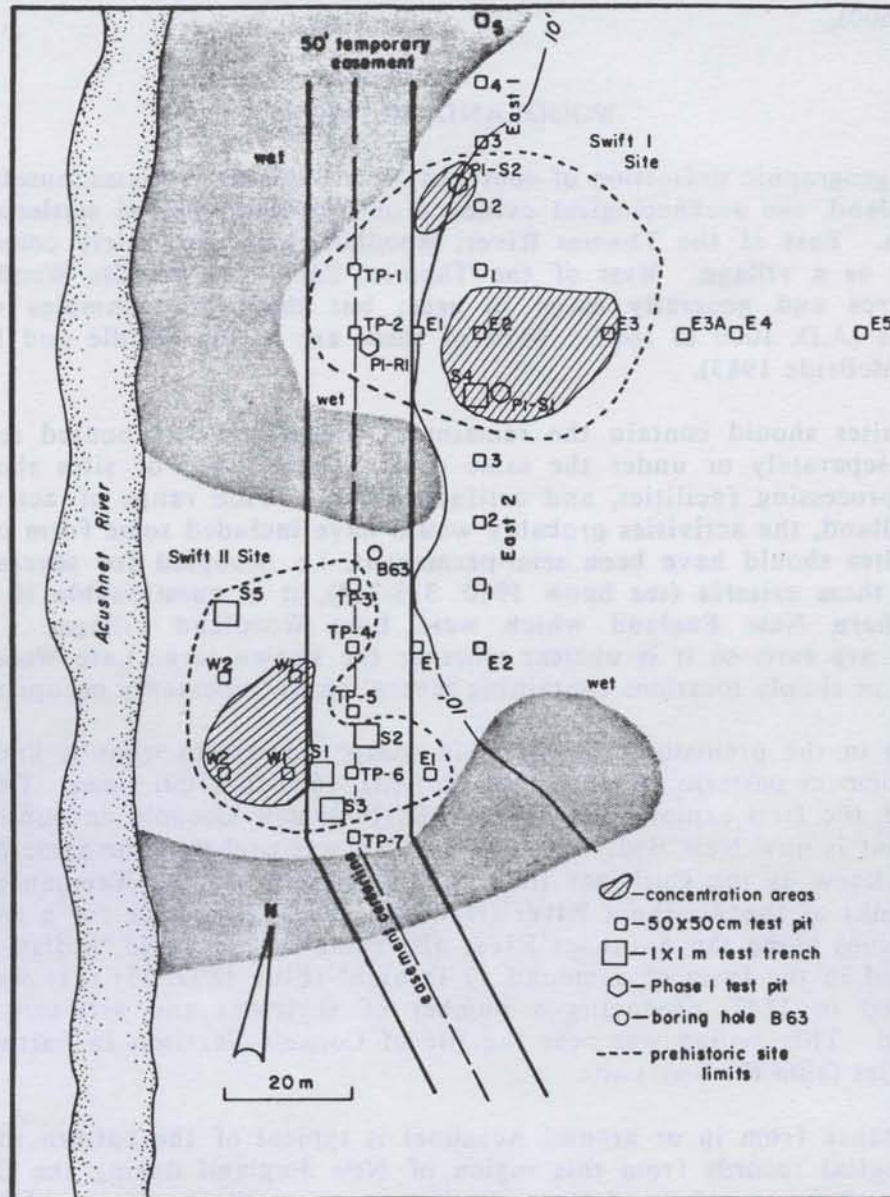


Figure 2. Site Examination of the Swift Sites, Acushnet, Massachusetts (not to scale).

Besides historic references to Native Americans living in and around Acushnet, she also found documentation of artifacts being recovered on the property of the Swift estate that included the area of her finds (Howland 1907:86). The Woodland period was the last 2500 years of the prehistoric era, and one of the artifacts from the Swift site, a Levanna-type projectile point, probably dated to the Late Woodland, i.e., within perhaps 700 years of the first European settlement in the area.

If the Swift site was the locus of a Woodland period village, it would have been an extremely important discovery. One of the major problems in the prehistory of southern New England is that there are no solid data on large sites where a large number of

people stayed for any appreciable length of time during any part of the Woodland (500 B.C. to A.D. 1600).

WOODLAND VILLAGES.

Using a geographic definition of southern New England as Massachusetts, Connecticut and Rhode Island, the archaeological evidence on Woodland period settlement patterns is painfully thin. East of the Thames River, Woodland sites are fairly common, but none could qualify as a village. West of the Thames, Early and Middle Woodland sites are relatively scarce and generally small in area; but there are examples of large, Late Woodland sites (A.D. 1000 to 1600). Most of these are in the Middle and Lower Connecticut Valley (McBride 1983).

Village sites should contain the remains of structures that housed several families living either separately or under the same roof. These kinds of sites should also have storage pits, processing facilities, and artifacts from a wide range of activities. During the Late Woodland, the activities probably would have included some form of horticulture. The village sites should have been semi-permanent, i.e. occupied for several months at a time. Given these criteria (see Snow 1980: 313-314), it is questionable if there are any sites in southern New England which were Late Woodland villages. Systematically collected data are rare, so it is unclear whether the known large Late Woodland sites are truly villages, or simply locations containing several small, repeatedly occupied camps.

This gap in the prehistoric record is in sharp contrast to what is known of Native American settlement patterns in early historic (A.D. 1600 to 1700) times. Taking Acushnet as an example, the first explorer of the area, Bartholomew Gosnold encountered a band of Indians in what is now New Bedford Harbor. This was probably the same population that early settlers knew as the Cushenas Indians (a sub-group of the Wampanoags) who lived along both banks of the Acushnet River (Howland 1907). Evidence for a concentration of Native Americans along the Acushnet River also came from a large "Indian settlement and burying ground in the form of a mound 17 ft high" (Ellis 1892: 25) that was unsystematically excavated in 1847, producing a number of skeletons and artifacts dating to the Contact period. This mound was near the site of Cooke's Garrison in Fairhaven, which is only a few miles from the Swift site.

The evidence from in or around Acushnet is typical of the pattern in the historical and archaeological records from this region of New England during the Contact period, numerous eye-witness accounts of large, semi-permanent villages, and a high frequency of excavated burial sites. Contact cemeteries have been found from Wareham, Massachusetts, to Wickford, Rhode Island. Unfortunately, archaeologists have yet to adequately investigate a single location where these Native Americans lived, as opposed to where they were buried.

Some researchers feel that the late prehistoric or Contact village sites may have been located just where Europeans chose to settle, and the development of Euro-American towns and cities resulted in the destruction of most of these archaeological sites. In particular, it has been predicted that late prehistoric populations were concentrated along the flood plains of major rivers to take advantage of the best agricultural land (Dincauze 1980). The Late Woodland in southern New England has been summarized as follows:

For the last few centuries of prehistory, the settlement system was heading toward the A.D. 1600 pattern in which major nucleated villages were located on main streams, often at the heads of estuaries, while smaller satellite sites such as shell middens served as special-purpose camps. The most un-

fortunate aspect of the Late Prehistoric settlement pattern is that the large central village sites were virtually all located at the very places most favored by European settlers. Few if any of these important sites have survived well enough to yield much information through excavation (Snow 1980:320).

THE SWIFT SITE.

Because the city of New Bedford and the town centers of Acushnet and Fairhaven cover most of either bank of the Acushnet River, the relatively undisturbed location of the Swift site seemed to be a rare instance where a late prehistoric village might be found intact. The project locus would have been ideal for farming and exploiting estuarine and riverine resources up or down the Acushnet River. In short, all indications were that the Swift site might contain very important evidence that could help resolve the paradox of the historically documented, but archaeologically unknown village-based settlement pattern of later prehistoric and early historic times in southern New England.

As will be shown in the rest of this article, a subsequent site examination program at the Swift property (Thorbahn 1983) failed to confirm these expectations. Instead, the evidence tends to show that the sharp discontinuity between archaeological and historical records may be a real reflection of a relatively sudden shift in the prehistoric land use patterns after the appearance of European explorers and settlers at the beginning of the 17th century. The results of our investigation are in many ways contradictory to conventional views of the later prehistory of southern New England.

A Public Archaeology Laboratory, Inc. (PAL Inc.) team under the direction of Peter Thorbahn began fieldwork on the Swift site in June of 1983. Total subsurface testing was confined to 15 pits (50 cm by 50 cm) and five trenches (100 cm by 100 cm) within the site boundaries for a total of 8.75 square m of excavations (see Figure 2 and Table 1). A final report on the project and its methodology was completed in September for Camp, Dresser & McKee, Inc. The investigations were conducted under permit number 575, issued by Valerie Talmage, State Archaeologist, of the Massachusetts Historical Commission. Other PAL staff members who worked on this project included Alan Leveillee, Paige Newby, Stephen Mrozowski, Stacey Perkins, and Ingrid Weinstein (who was also responsible for the project graphics). The opinions and conclusions in this article are solely the author's, and do not reflect those of Camp, Dresser & McKee, Inc. or the Massachusetts Historical Commission.

Site examination programs involve limited subsurface testing in order to determine the scientific and cultural value of archaeological properties (Massachusetts Historical Commission 1980). Normally the results are used only by planners, engineers and cultural resource managers to fulfill their responsibilities under state and federal laws. In this case, the site examination program in Acushnet produced data on late prehistoric settlements that are too important to be confined to such a narrow audience. This article summarizes our reasons for proposing that large, semi-permanent villages did not exist during the Late Woodland Period in southern New England.

RESULTS.

Our expectation before the site examination program began was that Swift would turn out to be a large, multicomponent site that was the locus of relatively intensive activities during several subsequent occupations over a long period of time. One or more of these occupations was thought to have been in the Late Woodland period.

Table 1. Site Examination of the Swift Site, Distribution of Artifacts by Test Units.

	Test Site Unit	Size sq. m	Numb. of Artifacts	Number per sq. m	Bone/Shell
Swift I:					
	East1-1	0.25	3	12	Yes
	East1-2	0.25	2	8	Yes
	S4	1.00	15	15	Yes
	TP1	0.25	1	4	
	TP2	0.25	2	8	
	P2-E1	0.25	1	4	
	TP2-E2	0.25	6	24	Yes
	TP2-E3	0.25	5	20	Yes
*	P1-S1	0.5	17	34	Yes
*	P1-S2	0.5	15	30	Yes
*	P1-R1	0.5	4	8	
	Totals:	4.25	71		
	Average:			15.2	
	Std. Dev.:			10.0	
	% Bone/Shell:				63.6%
Swift II:					
	S1	1.00	14	14	Yes
	S2	1.00	7	7	
	S3	1.00	19	19	Yes
	S5	1.00	3	3	Yes
	TP3	0.25	1	4	
	TP4	0.25	2	8	
	TP4-W1	0.25	6	24	
	TP4-W2	0.25	5	20	Yes
	TP6	0.25	3	12	Yes
	TP6-E1	0.25	2	8	
	TP6-W1	0.25	19	76	
	TP6-W2	0.25	17	68	Yes
	Totals:	6.00	98		
	Average:			21.9	
	Std. Dev.:			23.3	
	%Bone/Shell:				50.0%

* Previous Reconnaissance Survey (Simon 1980)

The results were that only the Late Woodland time period of occupation was congruent with the expectations. All the other characteristics of the site were radically different. Not the least of these differences was the fact that there are actually two sites. Figure 2 shows the reconnaissance (labeled Phase I on the map) and site examination testing along with the site boundaries and concentration areas within the sites. Swift I was the locus of the previous reconnaissance survey testing (Simon 1980). Swift II was delineated during the site examination. Swift I and II are only a bit more than 30 m apart, and this might seem to be a case of hair-splitting to call them two sites. Later in this section I will discuss why they should be considered as separate entities.

Even if their areas were combined, Swift I and II would still fall at the lower end of the area scale for sites in southeastern New England. Swift I is about 1600 sq. m and Swift II is roughly 1200 sq. m in extent. The areas containing artifact and feature concentrations were 350 and 200 sq. m respectively.

Not only are the sites limited in size, but the frequencies of artifacts per unit area are among the lowest that have been reported for sites in the region (Thorbahn and Cox 1983). Table 1 contains the data on the distribution of artifacts (lithic and ceramic tools, flakes, shatter, burnt rock) within the sites. Swift I has an average density of 152 (standard deviation of 10.0) artifacts per sq. m, and Swift II has an average of 21.9 (standard deviation of 23.3). The frequency of artifacts among the test pits and trenches is highly variable, with most of the material concentrated in just a few of the units. This tendency to have artifacts clustered in a small space within the sites is greater at Swift II. The variance to mean ratio is a measure of spatial aggregation and the figures are 6.5 for Swift I and 24.8 for Swift II. The higher the ratio, the greater the clustering.

Table 2 shows the breakdown of the chipping debris according to lithic material. Chipping debris consists of the flakes and pieces of shatter produced from the manufacture of stone tools. The distinction between flakes and shatter is that flakes are generally small, relatively flat pieces of debris that were deliberately removed, i.e., they have striking platforms and/or bulbs of percussion. Shatter is the blocky, angular debris produced in the early stages of manufacture to obtain workable pieces for final finishing.

The most common lithic material at both sites is quartz, which was probably obtained near the site as cobbles in gravel beds that were deposited during the period of glaciation about 14,000 years ago. The other kinds of lithic material could have come from the glacial drift, but it is more likely that some of these materials were obtained from quarried outcrops. Some of these sources are known to occur at a substantial distance from Acushnet, such as hornfels and rhyolite from around the Boston Basin. Attleboro Red felsite comes from a very localized source area near the northwest corner of Rhode Island and the Massachusetts state line. The chert may have come from as far away as eastern New York (Thorbahn, Cox and Ritchie 1983).

Both of the Swift sites display a very high diversity of lithic materials, with Swift I having the more varied inventory of the two. This indicates that the people who were at these sites either ranged very widely to obtain some of their raw materials for stone tool manufacture, or they were in close contact with people living near the distant sources.

Table 3 shows the distribution of all artifacts through the vertical levels across these sites. The overwhelming majority of cultural materials were found in the upper 30 cm of the soil, where it was fairly well mixed. In fact, the soil profiles from both sites clearly showed that this entire area was plowed repeatedly, probably in the last century before it was allowed to revert to a densely wooded field.

Table 2. Percentages of Chipping Debris (Both Flakes and Shatter) by Lithic Material.

Material	Swift I		Swift II	
	Number	Percent	Number	Percent
Quartz	38	62.3	52	78.8
Quartzite	2	3.3	2	3.0
Attleboro Red Felsite	3	4.9	1	1.5
Argillite	0	0.0	1	1.5
Felsite	5	8.2	5	7.6
Chert	4	6.6	2	3.0
Rhyolite	6	9.8	3	4.5
Hornfels	3	4.9	0	0.0
Total	61	100.0	66	100.0

Table 3. Percentages of Artifacts by Vertical Level.

Level	Swift I		Swift II	
	Number	Percent	Number	Percent
0-9 cm	16	22.5	24	24.5
10-19	19	26.8	39	39.8
20-29	25	35.2	29	29.6
30-60	11	15.5	6	6.1
Total	71	100.0	98	100.0

Table 4. Tools and Finished Artifacts from the Swift Sites. L=length (cm); W=width (cm); T=thickness (cm); Wt=weight (gm).

Unit-Level	Type	Material	Style	L	W	T	Wt
Swift I:							
E1-2 3	Hmmrstn	Quartzite	-	2.5	3.0	2.0	7.2
P1-S1 3	Point	Quartz	Levanna	3.1	2.0	0.5	2.6
3	Point	Felsite	Fox Creek	2.1	2.4	0.7	4.4
P1-S2 2	Biface	Chert	-	2.9	1.2	0.5	1.7
6	Point	Rhyolite	Unknown	1.0	1.4	0.5	0.5
Swift II:							
S1 3	Biface	Felsite	-	4.5	3.1	1.2	4.2
S3 2	Biface	Rhyolite	-	3.5	.03	1.0	6.0
S5 2	Biface	Quartz	-	3.5	2.4	0.8	6.0
TP6 2	Point	Rhyolite	Levanna?	3.0	5.0	0.6	3.0
2	Vessel	Ceramic	Dentate	1.0	3.0	0.5	0.4

Other than the vertical mixing from plowing, these sites are in good condition. The horizontal concentration of artifacts into a small area surrounded by a thin scatter of materials is typical of many prehistoric sites in southern New England. The original deposits were probably spread out somewhat by post depositional forces such as frost heaving, soils creep, root and animal action (Thorbahn 1982). The plowing probably had little effect on the relative spatial relationships among the artifacts. In other words, the materials in these sites are clearly not in their original locations, but the position of one artifact in relation to others is probably much the same as it was after the people left these sites in the prehistoric past.

The tools and finished artifacts at the Swift sites can tell us much about the age of these deposits and the activities that they represent. There is a fairly high frequency of finished artifacts for such low density deposits. Table 4 lists the ten tools and finished artifacts (see Figure 3), and Table 5 shows the artifact and ecofact assemblages from the Swift sites.

There was an insufficient quantity of organic material that could be radiocarbon dated from either site, but the styles of the projectile points, Fox Creek and Levanna, are known to have been made only from about 1650 to 1300 years ago (A.D. 300 to 650) and 1050 to 350 years ago (A.D. 900 to 1600). The one small sherd of grit tempered ceramics is thin, finely finished and has a dentate stamped decoration. This would indicate a date between the Middle and Late Woodland periods, ca. 1000 years ago (A.D. 950).

Looking at the kinds of stone tools and the whole artifact/ecofact assemblage from the Swift sites, one sees a striking difference between them. Swift I has three projectile points and only one biface. There is very little burnt rock, but a high quantity of shell (mostly quahog) and bone fragments. Most of this shell and bone came from the only feature that was found on either site. The emphasis at the Swift I site seems to have been working on highly finished tools, such as projectile points. There were 2.1 flakes to every piece of shatter in the chipping debris.

In contrast, at Swift II there were only 0.9 flakes per piece of shatter. Likewise, there were three bifaces and just one projectile point. Bifaces are crude tools that were probably used for cutting and scraping. There were only a few pieces of shell and bone. At Swift II the greater quantity of burnt rock suggests some sort of facilities for heating and cooking. One concentration of fire-cracked rock was found at Swift II, but it was too jumbled from plowing to identify it as a hearth or roasting platform. Perhaps plants, which leave few traces, were the kind of resources used at Swift II.

To summarize the results of the site examination program, the Swift I and II sites are small, low density deposits that are in good condition. Both sites date to within 700 years of A.D. 1600. They were occupied by small groups for short durations. The activities at both sites centered on obtaining shellfish, game and possibly plant materials in fairly low quantities. At Swift I the emphasis seems to have been on production and consumption of the resources, judging from the higher frequency of projectile points and faunal remains. Swift II was apparently a location where processing resources was the major activity, because of the bifaces, shatter and burnt rock in the assemblage.

Judging by the functional differences, these two sites appear to be separate occupations, despite the fact that they are so close together. In terms of the original prediction of a Woodland village at this location along the Acushnet River, the sites were occupied at the right time, but the results of the site examination show that these deposits are anything but a village or a semi-permanent base camp.

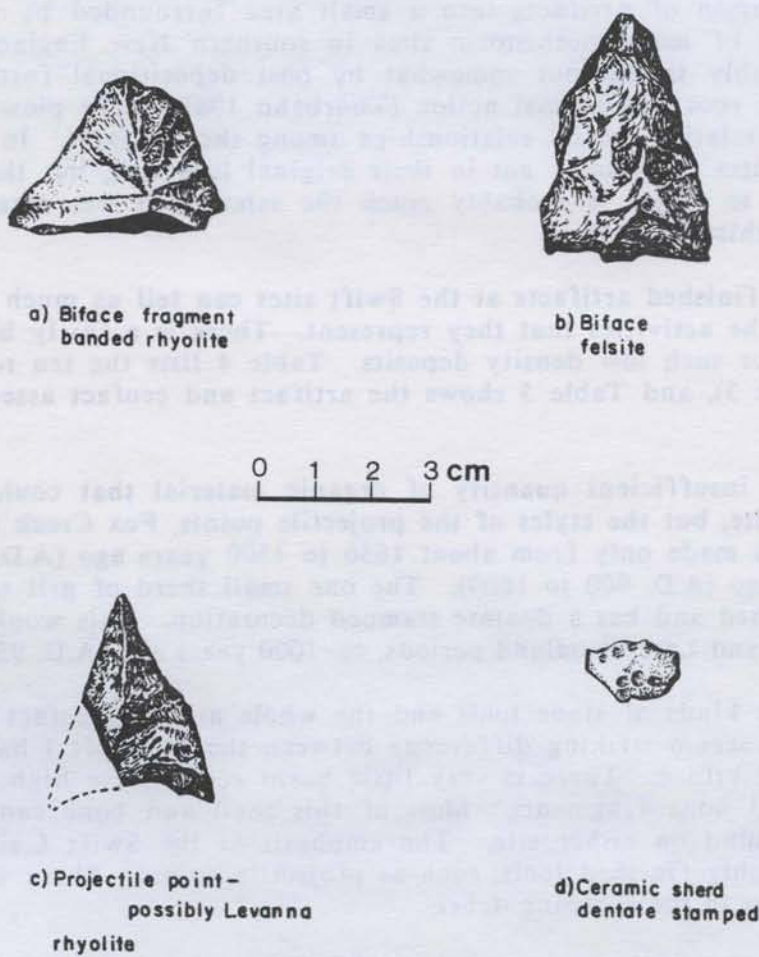


Figure 3. Artifact Drawings, Swift II Site.

Table 5. Functional Categories of Artifacts and Ecofacts from the Swift Sites

Site	Shatter	Flakes	Burnt Rock	Tools	Shell	Bone	Total
Swift I	20	41	5	5	89	34	194
Percent	10.3	21.1	2.6	2.6	45.9	17.5	100
Swift II	34	32	27	5	7	8	113
Percent	30.1	28.3	23.9	4.4	6.2	7.1	100

INTERPRETATION.

In eastern and central New York, there are many archaeological examples of large villages dating to several centuries before contact with Europeans (Snow 1980). Yet there is very little evidence from southern New England for large, semi-permanent habitation sites during any part of the Woodland period. There are several possible explanations for this lack of evidence:

(1) Prehistoric village sites could be very hard to find and recognize. Poor preservation of organic materials in the soils of the region would have destroyed many of the clearest archaeological indicators, such as large quantities of organic refuse, or the remains of wooden structures. By their very nature, there would have been many fewer village sites than temporary camps, because people stayed in them for longer periods and may have returned to the same spot time after time. In short, archaeologists do not have a clear idea of what they should be looking for, or where to look for this kind of site.

(2) Most of the late prehistoric villages have been destroyed by Euro-American development over the last 360 years. Early settlers probably chose the same locations that the Native Americans favored for their villages. There are many historical references to large shell middens being destroyed and prehistoric artifacts being uncovered during construction in or around New England cities and towns. In addition, there has been very little prehistoric archaeology done in urban settings.

(3) There is reason to believe that on Long Island NY there were no Native American villages prior to the historic period. Lynn Ceci has reviewed all the available data on site types and locations for the Woodland and Contact period on Long Island, and has found no evidence of a village based settlement pattern, nor an agriculturally based economy prior to the 17th century (Ceci 1980).

All three of these explanations are somewhat unsatisfactory because they are based on the absence of evidence, which logically cannot be taken to be evidence of absence. However, even if all the Late Woodland villages in southern New England were destroyed by Euro-American cities and towns, some sites from the period should still be left intact elsewhere. These sites would reflect close relationships to a village based economy and settlement pattern. For example, for the Contact period, many burial sites have been found and investigated, even though there are few known habitation sites.

Furthermore, the eye-witness descriptions of villages in the historic period, along with numerous examples of historic Native American burial grounds all along the southern coast of New England, does not necessarily mean that the same types of sites existed in prehistoric times. Wobst (1978) has convincingly argued that prehistoric models based on ethnographic or ethnohistoric analogies suffer from the fact that contact between aboriginal and modern populations can produce radical changes in the culture and economy of the aboriginal groups. One documented example of these kinds of changes in a contact situation is for aboriginal populations to aggregate in semi-permanent settlements to increase their access to modern trade goods (Lee 1972).

The importance of the Swift sites lies in the fact that they occur in the right location for a village, and they were occupied at the right time. However, they contain evidence for a high mobility/small group settlement pattern, and a wild-resource based economy. The people at the Swift sites appear to have been operating independently of a village or large base camp and their activities were neither intense or complex.

This interpretation must be tempered by the fact that these are the first two prehistoric sites on the Acushnet River which have been systematically examined, and only one other site has been located in this area (Simon 1980). There is not an adequate sample of late Woodland sites to really establish a regional or even local context for reliable interpretation. Even so, the Swift sites allow for alternative hypotheses about the late prehistoric land use systems in southern New England. It is possible that in the Woodland period, land use was based on wild plants and game obtained by small, widely dispersed and highly mobile groups. If domesticated crops were used, they may have played a minor part in the economy, and semi-permanent villages may not have appeared until after European contact.

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WHERE ARE THE LATE WOODLAND VILLAGES IN EASTERN MASSACHUSETTS?

Barbara E. Luedtke

Any discussion of Late Woodland settlement patterns must begin with definitions of crucial terms, or else we risk talking past each other. "Late Woodland" as used here refers to the period from A.D. 900 to 1600, thus including the early part of the Contact period before the devastating plagues or actual European settlement. "Eastern Massachusetts" refers primarily to the coastal lowlands as far inland as Worcester and north of Cape Cod, which is being covered in another paper. "Sedentary" is used to describe people who maintain a residence at a single location for the entire year (though occasional trips might be made to other locations for special purposes), and "semi-sedentary" to describe people who stay at one location for extended periods of time, usually more than two seasons, but not for the entire year. "Village" is defined here (following Funk and Wagnalls New College Standard Dictionary) as a collection of houses, usually grouped according to a regular plan, and usually occupied for large parts of the year, if not all year. "Regular plan" does not necessarily imply streets and avenues, but simply that the orientation and spacing of houses is not completely random. Villages in this sense are quite typical during the Late Woodland period to the west of New England in New York State (Snow 1980:90) and to the south in the Chesapeake Bay area (Custer 1986), but as Peter Thorbahn points out, are not known archaeologically for most of southern New England.

Three models of Late Woodland settlement have been suggested for New England (McManamon and Bradley 1986:22-23; see Kerber, this issue, pp. 44-45), and Peter asked a number of us to test them against the data from various parts of the region using three archaeological criteria. I feel that these models are useful heuristic devices for looking at the issue, but that there are serious problems with the criteria (scheduling and location of activities, range of activities, and intensity of activities) that have been suggested for testing between the models. I suggest that the first criterion, location and scheduling of activities can and should be separated into two variables, as will be discussed below. In addition, I have argued elsewhere that neither range nor intensity of activities can be determined using data from multicomponent, disturbed sites that have been tested primarily with non-contiguous test pits (Luedtke 1985b). Unfortunately, these are exactly the kind of data that we have for eastern Massachusetts. Given the shallow soil development and the amount of vertical mixing that seem to typify even relatively undisturbed multi-component sites in this region, we must be extremely cautious in assigning non-diagnostic artifacts and features to components. In order to determine the range and intensity of Late Woodland activities at such sites, we would need to open up broad contiguous areas, trace out living floors and shell lenses, and correlate features. In short, we would need to excavate on a scale that has not usually been possible because of funding limitations, the time constraints and narrow focus of much archaeology done under contract, and research designs with different goals.

Therefore, I propose to examine the three models using different criteria that are also implicit in the models, but which are somewhat easier to test with the kinds of data we have available to us for eastern Massachusetts. These are: (a) onset of reliance on cultigens; (b) whether settlements were nucleated or dispersed, (c) whether settlements were sedentary or seasonal, and (d) whether they were focused on the coast or inland. Note that the latter two basically correspond to the first of the original criteria, location and scheduling of activities. The relevance of each of these criteria to the three models

will be discussed below.

ONSET OF RELIANCE ON CULTIGENS

While hunter-gatherers can be sedentary where resources are rich and reliable (e.g. Robbins 1980:326-329), sedentary or semi-sedentary settlements are virtually imperative for people who base their economy on cultivated crops. After all, the New England farmer who goes away for even a short time during the growing season, abandoning fields to the tender mercies of the birds, raccoons, and deer, has a very small chance of harvesting a decent crop. If Bennett (1955:394) is anywhere close to correct in concluding that maize made up 65% of the diet of native New Englanders, they surely would have stayed very close to their fields from spring planting through fall harvest.

It is important to note that the first appearance of cultigens in a region does not necessarily signal the onset of reliance on farming. This distinction is one that has apparently been slow to diffuse across the Appalachians. In the Midwest, it is now clear that cultigens (especially the cucurbits, gourds and squash) were being grown as early as 5000 B.C. (Ford 1985:345), and corn is found occasionally in sites from 175 B.C. on (Chapman and Crites 1987). However, it is also clear that true reliance on maize and other cultigens did not begin until about A.D. 800, or Late Woodland times (Ford 1979). Archaic, Early Woodland and Middle Woodland people in this region were fundamentally hunter-gatherers, some of whom also grew small amounts of various cultivated plants to supplement their diet, or for variety, or perhaps for ritual or status purposes, but not as a major part of their economy. In the Midwest, as elsewhere in the New World, there seems to have been a long transition period during which cultigens slowly became incorporated into the diet, and then a radical transformation of diet and economy, after which people relied on cultigens for a significant proportion of their food. New Englanders, living in a region at the very northern limits of maize agriculture, should be expected to have been especially cautious in switching over to reliance on cultigens.

Model 1 states explicitly that the onset of reliance on cultigens was very late in New England. Lynn Ceci does not believe that much farming occurred at all, at least in the coastal zone, until after the Contact period began (Ceci 1982:8). The other models are less explicit on this criterion. For example, Salwen does not specify when farming began in New England, but believes that it may have been increasing in importance during the Contact period (Salwen 1978:162). On the other hand, Snow believes that cultigens were significant enough at an early time to justify grouping the Early and Middle Woodland periods into an "Early Horticultural Period" (Snow 1980:262). Model 3, as discussed by McManamon and Bradley, has farming beginning as early as A.D. 1000 but not playing a significant role in the diet at that time (McManamon and Bradley 1986:40).

There are a variety of direct and indirect methods for detecting the onset of reliance on farming. The appearance of cultigens in archaeological sites is certainly a necessary, although not a sufficient criterion, and here as far as I know the earliest date for New England is still that associated with a corn kernel from the Hornblower II site on Martha's Vineyard: A.D. 1160+ 80 (Ritchie 1969:52). Characteristics of the plant remains themselves can be used; Ford points out that people who are reliant on maize tend to plant very uniform varieties, while those who are not reliant use a diversity of forms (Ford 1979:237). Unfortunately, we do not have large enough samples of corn from any site in eastern Massachusetts to make such an analysis feasible.

Another view of prehistoric diet can be obtained from human skeletal remains, either through trace element and isotope composition of the bones, or from characteristics of the

population as a whole. Little research of this type has been done so far in southern New England, with the notable exception of Ann Magennis' work on the Indian Neck Ossuary population, radiocarbon dated to about AD 1000 (McManamon and Bradley 1986:18). She examined a series of indicators of health with the explicit goal of determining whether or not these people were reliant on refined carbohydrates, such as maize, and concluded they were not (Magennis 1986).

The appearance of changes in technology associated with farming should provide indirect evidence for the onset of farming. For example, we should expect to see an increase in large storage pits, processing implements such as mortars and pestles, and appropriate ceramics for cooking corn. Unfortunately, we lack evidence for the first two changes, most probably due to the very small samples excavated at most Late Woodland sites and to the difficulty of assigning dates to such features and artifacts in multi-component sites. With regard to ceramics, however, we do see changes toward thinner vessel walls and the use of more shell temper (at least in the coastal zone) during the Late Woodland (Luedtke 1986). These changes parallel those observed in the Midwest, and have been interpreted by Braun (1983) as tending to give pots increased resistance to thermal shock. Such pots would therefore be well suited for cooking maize mush for long periods. The dating of these changes is still problematical in New England, though.

Finally, there is evidence for a change in the uses of the Boston Harbor Islands during the Late Woodland period, which may be related to the onset of reliance on farming. Surveys of the larger islands close to the mainland have invariably produced a few large multi-component shell middens used repeatedly, from Late Archaic times through the Woodland period, as marine resource exploitation camps (Luedtke 1975, 1980, 1984). So far, each I have examined appears to have been abandoned at some point in the early Late Woodland, about the same time that several of the small outer islands started being used for the first time. I have argued elsewhere that this reflects the beginning of reliance on farming, resulting in the incorporation of the larger, more accessible islands into the defended territories of groups, and their use for farming as described in historic records (e.g. Mourt 1963:80). This would leave only the smaller and more distant islands for those wishing to establish fishing or hunting camps. This change may have occurred by about A.D. 1300; the presence of several maize kernels in trash pits at the Calf Island site suggests that maize was a common part of the diet by A.D. 1350 (Luedtke 1980).

On balance, I see no evidence for reliance on farming before the Late Woodland in eastern Massachusetts, but some evidence that it may have been established by A.D. 1300. Thus, Model 1 is not supported, and Models 2 and 3 are supported only by default, simply because they are not specific on this point.

NUCLEATED OR DISPERSED SETTLEMENT PATTERN

The second criterion used here is whether the settlement pattern is nucleated or dispersed. The term "village" implies nucleation and also large size; groupings of only one or two houses would more properly be called hamlets by most archaeologists. Model 1 says that Late Woodland sites should be small and dispersed, though Contact Period villages would be large and nucleated (Ceci 1982:8). The second model states that settlements were nucleated in the winter but dispersed in the summer (Salwen 1978:164; Snow 1980:79), while Model 3 states that they were dispersed during all seasons (McManamon and Bradley 1986:40).

Nucleated settlements should be relatively large and should have postmold, hearth and pit feature patterns suggesting a number of structures. It is important to be able to

demonstrate that these structures were occupied contemporaneously, in order to rule out the possibility that the "village" is actually a location where small groups camped repeatedly over many years. Determining this requires large-scale excavations, which have not yet occurred in this region.

Eastern Massachusetts has produced a good deal of archaeological evidence for dispersed settlement during the Late Woodland but none for nucleated settlements. There are also no nucleated settlements dated to the Contact period in this region. Numerous small Late Woodland sites have been reported. Bigger sites with Late Woodland components are also known, such as Shattuck Farm (Luedtke 1985a) and Nook Farm (Leveille 1986). However, both of these sites have extensive earlier components, both had been plowed, and neither had the large scale excavation necessary to separate components in such a situation. Thus they might have been nucleated villages, but they could also have been locations occupied repeatedly by small groups of Late Woodland people. Dincauze (1974) and others have argued that the nucleated settlements were at the estuary heads, and thus now buried under modern cities. This is a possibility that cannot be ruled out, but there is also no evidence to support it. Therefore, Model 3 seems best supported by what data we do have.

SEDENTARY OR TEMPORARY SETTLEMENTS

For reasons discussed previously, it is assumed that Late Woodland farming sites should have been occupied for long periods, at least from late spring through fall. Model 1 states that Late Woodland sites near the coast were all temporary seasonal camps (Ceci 1982:8), Model 2 states that many temporary camps should be found in the coastal zone, but that some major nucleated villages should also occur in or near this zone (Salwen 1978:164; Snow 1980:76), and Model 3 argues that Late Woodland sites on the coast were occupied year-round (McManamon and Bradley 1986:23).

Seasonality is generally inferred from characteristics of the plant and animal remains at sites. Certain species, because of their life cycles or migratory patterns, are only available for short periods of the year, and are thus excellent indicators of seasonality. Other plants and animals change their characteristics over the year (for example, clams put on growth rings, deer grow and shed antlers, twigs grow certain kinds of bark) and these species can also be used to determine seasonality accurately. Other species are either more abundant or more easily captured at some seasons than others, and some archaeologists have used this characteristic to infer seasonality (Ritchie 1969). It should be pointed out that the assumption that each species was taken only during its period of maximum availability is very likely to lead to a conclusion that the site was occupied for several seasons, while the more conservative assumption that a species could have been procured any time it was available will generally result in an interpretation of short-term occupation. Both of these assumptions have been used by different archaeologists in New England, thus complicating any attempt to compare seasonality between sites.

Seasonality is also especially difficult to determine for multi-component sites like most of those in eastern Massachusetts, unless floral or faunal remains have been dated directly or are in a dated feature. Furthermore, because of the acid soils common to more of New England, identifiable faunal remains are generally recovered only from coastal middens or from rockshelters. Once again, lack of sufficient evidence makes it difficult to reach a definitive conclusion about this criterion.

Nevertheless, I know of no Late Woodland site in eastern Massachusetts where year-round occupation has been demonstrated, but many with evidence for seasonal use. Thus Models 1 and 2 are supported, but not 3.

LOCATION OF ACTIVITIES

Model 1 states that Late Woodland people spent only the warm season on the coast, and is not explicit as to exactly where they were the rest of the year (Ceci 1982:8). Model 2 states that summers were spent on the coast and winters inland, but mentions that special purpose camps could be anywhere in any season (Salwen 1978:164; Snow 1980:79), and Model 3 states that people lived on the coast during all seasons of the year (McManamon and Bradley 1986:40).

Both Dincauze (1974) and Mulholland (1984) found that there were more Late Woodland sites on the coast than inland, suggesting a coastal emphasis, but once again, information on the seasonality and size of these sites is generally lacking. However, it can be demonstrated that people were inland during parts of the warm season and on the coast for at least part of the cold season. For example, the Calf Island site was occupied in fall and is coastal (Luedtke 1980), while the Reedy Meadow Brook site near Pepperell has a Late Woodland component representing occupation from late spring to mid-fall (Mahlstedt 1985), and the Hartford Avenue Rockshelter near Uxbridge was used by Late Woodland people in late spring and early fall (Ritchie 1985). Model 2 seems best supported by the available evidence.

DISCUSSION

Thus it appears that none of the three models is fully supported by the available archaeological data for eastern Massachusetts. Granted that our survey and excavation techniques have not been especially appropriate for defining villages, it would still seem likely that all of the archaeology done in this region over the last few decades would have produced clear evidence for at least one nucleated settlement of the Late Woodland or Contact periods if such settlements existed.

It would seem to be useful at this point to ask why we expected to find villages in eastern Massachusetts during the Late Woodland, other than because they are reported to the west and south of this region. I recently reread the early historic reports for this region, especially those predating 1640, and found: 1) innumerable detailed descriptions of single dwellings, or dwellings scattered through a district, and much mention of how often these dwellings were moved; 2) several rather detailed descriptions of palisaded enclosures, each clearly designated as a place of refuge in time of war and not as a regular settlement; and 3) references to "towns" but not a single description of such a town. I consulted the Oxford English Dictionary to see how the word "town" was being used during the seventeenth century and found that four definitions were in use at that time. The fourth is essentially the one given for a village at the beginning of this article, but the other three all used "town" to refer to a much less structured and nucleated entity; a "town" could refer to an enclosed area, to a farmstead on a holding, to a parish district, or to a manor. It thus seems entirely possible that the early writers could have used the word "town" to refer to a district, or an area with scattered houses (such as Champlain [1922] sketched for several places in eastern Massachusetts), especially one that was under the control of a particular sachem. In fact, Mourt's description of the Pilgrim attack on the town of Nemasket in 1621, to avenge the supposed murder of Squanto, makes the most sense if one assumes Nemasket is a relatively dispersed settlement (Mourt 1963:73-76).

Note that such a dispersed settlement pattern would have much less archaeological visibility than would a nucleated settlement. One would expect to find a little Late Woodland material at many sites, but no extensive concentrations, and this is exactly what we do see.

A dispersed settlement pattern may have been necessary during the planting season because of the nature of the soils in this region. As Jorgensen says, "Except for fairly large areas in the Connecticut Valley and relatively smaller areas in southeastern New Hampshire and elsewhere, good agricultural soils are found in isolated patches of only a few acres. Soil maps of most of southern New England resemble intricately sewn patchwork quilts, showing soils often of widely differing properties existing in close proximity" (Jorgensen 1978:97). Dispersed settlement during other times of the year may have occurred for ecological reasons, or because of political, social, or even ideological factors. Whatever the cause, a dispersed settlement pattern is also reported by Custer for coastal areas of New Jersey and the northern part of the Delmarva Peninsula (Custer 1986), and it would be worth exploring the similarities between these areas.

I want to end with a plea for acceptance of the possibility that there may have been a variety of settlement patterns in southern New England during the Late Woodland period (and perhaps at other times as well). I think Peter suspected this, and that is why he asked archaeologists working in a variety of different parts of New England to comment on the same topic. There is certainly evidence for variability in other aspects of culture in this region. For example, I was able to detect minor but consistent differences in ceramics between the Merrimack River area, Boston Harbor, and Nantucket throughout the Woodland period (Luedtke 1986). These areas are not very far apart and in Contact times were occupied by culturally and linguistically similar people who were also closely allied. John Tuma (1985) found differences in Contact Period burial practices between the areas occupied by the historic Narragansett and Massachusetts-speaking peoples, which again were closely related but culturally distinct. Why couldn't settlement patterns differ as well?

Southern New England is something of an ecological transition zone; a large number of trees of importance to people reach their northern limit in this region, and a number of northern species reach their southern limit here (Jorgensen 1978:41-2). It is also transitional in climate and fauna. Perhaps this diversity of resources, compared to regions to the south and west of us, allowed or encouraged greater diversity of cultural expression. This is an intriguing possibility to explore, and surely more satisfying than that perennial unspoken question of New England archaeology, "What's wrong with New England, that it's not like the rest of the Eastern Woodlands?"

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WHERE ARE THE WOODLAND VILLAGES IN THE NARRAGANSETT BAY REGION?

Jordan E. Kerber

What are Woodland Villages?

Before we ask "Where are the Woodland Villages?" we might want to ask "What are Woodland Villages?" We must first know what to look for before we decide where to look. What precisely are the archaeological manifestations of a village? Alan Leveillee, in his contribution, argues for the need to develop a good yardstick to define and identify a village. Do we know what to look for? What are some of the expectations for evidence of a village? Many of us would agree that such evidence includes features, such as structural remains, storage pits and processing facilities, as well as permanent and semi-permanent residence, and artifacts from a wide range of activities, including horticulture. In his contribution, Pierre Morenon wonders whether we are reading the clues properly or possibly missing the clues altogether. It may also be helpful to ponder "Why are there Woodland Villages, if any?"

The Narragansett Bay contributors and I are in agreement that the three settlement system models presented by McManamon and Bradley (1986: 22-23) are not explicit enough to account for natural and cultural variability within the Narragansett Bay region. Furthermore, since these three models are largely derived from data outside the Narragansett Bay area, they may not apply to the area at all. Morenon questions whether or not the data he has recovered from several projects can support or refute any of the three settlement system models. Indeed, McManamon and Bradley (1986: 22) admit that both they and some of the creators of the three models recognize that the models are incomplete and simplified and not necessarily applicable to the entire Northeastern coast.

The Narragansett Bay group also reaches consensus in identifying the difficulty in addressing data to any one settlement system model given the lack of adequately excavated and analyzed Late Woodland sites. Indeed, the majority of archaeological research around Narragansett Bay has been in the form of preliminary investigations, such as reconnaissance and locational surveys. Based upon the level of information obtained from these initial studies, we are often unable to reconstruct seasonality, specific time periods and intersite relationships. Consequently, we may be unable to distinguish between several small, repeatedly occupied Late Woodland camps within a confined area and a single Late Woodland Village.

Another issue affecting both the present data base and our interpretations concerns the sampling strategies employed to recover evidence. We all know that the vast majority of studies involve shovel test pits for either part or all of the subsurface testing strategy. Are the shovel test pits a reliable and accurate means to provide the evidence we are looking for? Alternative strategies, such as machine stripping of overlying, culturally sterile sediment to reveal horizontal living surfaces or the use of remote sensing to detect culturally produced anomalies, need to be addressed and further developed.

A related factor which cannot be ignored is that our research designs, by and large, do not explicitly set out to locate Woodland villages. Instead, they tend to focus primarily on attempts to locate sites or, more generally, on reconstructing subsistence/settlement systems or land-use patterns. Adding to this list of limitations, Thorbahn and other discussants have addressed the problem of post-depositional processes and poor preservation of organics, a vital class of information that is often underrepresented in the data base.

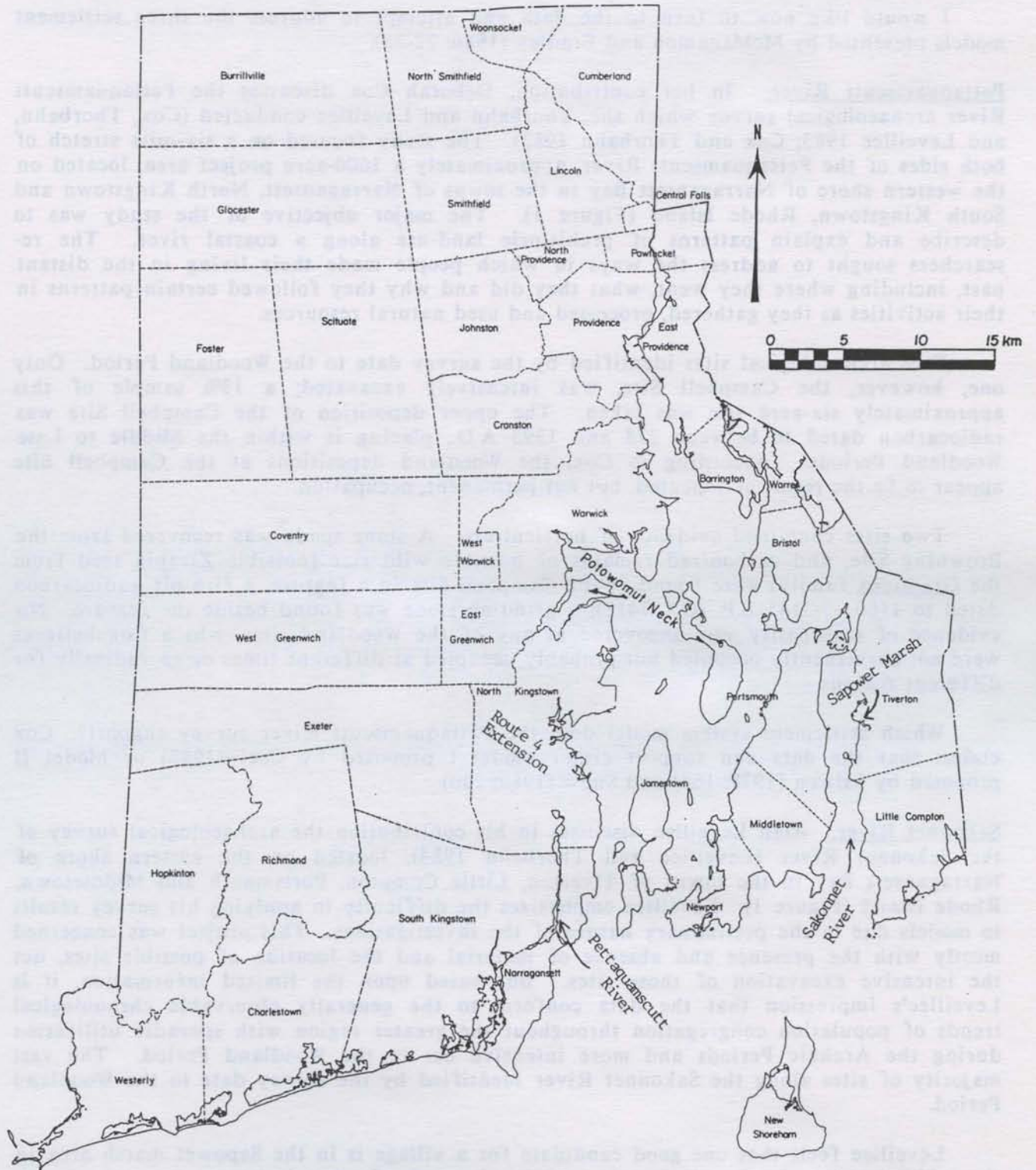


Figure 1. Rhode Island State Map Depicting Narragansett Bay Region and Archaeological Projects Discussed in Text.

The Data and The Three Models.

I would like now to turn to the data and attempt to address the three settlement models presented by McManamon and Bradley (1986: 22-23).

Pettaquamscutt River. In her contribution, Deborah Cox discusses the Pettaquamscutt River archaeological survey which she, Thorbahn and Leveillee conducted (Cox, Thorbahn, and Leveillee 1983; Cox and Thorbahn 1982). The study focused on a six-mile stretch of both sides of the Pettaquamscutt River, approximately a 1600-acre project area, located on the western shore of Narragansett Bay in the towns of Narragansett, North Kingstown and South Kingstown, Rhode Island (Figure 1). The major objective of the study was to describe and explain patterns of prehistoric land-use along a coastal river. The researchers sought to address the ways in which people made their living in the distant past, including where they went, what they did and why they followed certain patterns in their activities as they gathered, processed and used natural resources.

Five archaeological sites identified by the survey date to the Woodland Period. Only one, however, the Campbell Site, was intensively excavated; a 13% sample of this approximately six-acre site was taken. The upper deposition of the Campbell Site was radiocarbon dated to between 278 and 1393 A.D., placing it within the Middle to Late Woodland Periods. According to Cox, the Woodland depositions at the Campbell Site appear to be the result of repeated, but not permanent, occupation.

Two sites contained evidence of horticulture. A stone spade was recovered from the Browning Site, and carbonized remains of possible wild rice (possible *Zizania* seed from the *Graminea* family) were found at the Campbell Site in a feature, a fire pit, radiocarbon dated to 1100 +/- 145 B.P. (GX 7412); a grinding stone was found beside the feature. No evidence of seasonality was uncovered at any of the Woodland sites, which Cox believes were not permanently occupied but probably occupied at different times or sporadically for different reasons.

Which settlement system model does the Pettaquamscutt River survey support? Cox claims that the data can support either Model I proposed by Ceci (1982) or Model II proposed by Salwen (1978: 164) and Snow (1980: 230).

Sakonnet River. Alan Leveillee discusses in his contribution the archaeological survey of the Sakonnet River (Leveillee and Thorbahn 1984), located on the eastern shore of Narragansett Bay in the towns of Tiverton, Little Compton, Portsmouth and Middletown, Rhode Island (Figure 1). Leveillee emphasizes the difficulty in applying his survey results to models due to the preliminary nature of the investigations. This project was concerned mostly with the presence and absence of material and the location of possible sites, not the intensive excavation of those sites. But based upon the limited information, it is Leveillee's impression that the data conform to the generally observable chronological trends of population congregation throughout the greater region with sporadic utilization during the Archaic Periods and more intensive use in the Woodland Period. The vast majority of sites along the Sakonnet River identified by the survey date to the Woodland Period.

Leveillee feels that one good candidate for a village is in the Sapowet marsh area in the mid-Sakonnet vicinity (Figure 1). Although much of what is known from the marsh area comes from artifact collections made from plowed fields, evidence exists for a high complexity of activities reflected by the artifacts, a high diversity of exploitable resources provided by the saltmarsh and nearby river and a high incidence of burials from the surrounding area.

Concerning the three settlement systems models, Leveillee claims that Model I proposed by Ceci (1982) does not apply to the results of the Sakonnet River survey. Model II developed by Salwen (1978: 164) and Snow (1980: 230) is too seasonally restrictive. He adds that the shell middens he identified along the river were unlikely used exclusively during the summer months since they contained such excessive quantities of deer remains. He also expects much more variability in seasonal use during the Woodland Period than this particular settlement system model allows. Finally, Model III offered by Sanger (1982), Spiess, et al. (1983) and McManamon and Bradley (1986) applies to Leveillee's broad village interpretation for the Sakonnet. Leveillee thinks the wide range and varied intensity of associated activities hypothesized by this settlement system model are observable in the archaeological record of the project area, with the exception of communal burial grounds. Leveillee concludes by emphasizing that we have seen only a very small fraction of subsurface remains along the Sakonnet.

Potowomut Neck. The third project, the Potowomut Neck archaeological survey, is one I conducted on 500 acres of the southern portion of Potowomut Neck, a peninsula bordering the Potowomut River and the western shore of Narragansett Bay in Warwick, Rhode Island (Figure 1). The objective of this project was not to locate sites or define site size, but rather I was interested in studying the prehistoric human adaptation to a changing ecosystem, an ecosystem that was transformed from freshwater to estuarine during the Woodland Period (Kerber 1984a and 1984b). My focus was to examine the distribution and density of archaeological remains across the peninsula in order to reconstruct prehistoric land-use patterns.

The majority of the recovered remains date to the Late Woodland Period. It appeared that the intensity of occupation increased during the Woodland Period, presumably as a result of the development of the adjacent Potowomut River into a mature estuary after 3000 B.P. The results revealed a pattern of differential use of the 500-acre study area in the form of spatially distinct loci yielding remains of lithic manufacture and/or maintenance activities and varying degrees of food preparation and discard. Between these locations were relatively large intervening areas in which significantly fewer materials were encountered, implying sparse land use or at least the occurrence of activities that resulted in less remains.

Several shell middens were encountered, ranging in size, species composition, density and contents. The middens appeared to be mainly seasonal, special purpose stations for collecting and processing shellfish and also contained evidence of preparation of mammal meat, primarily deer, and lithic manufacturing. Seasonality reconstructed from a small sample of shellfish growth rings and of deer remains indicate summer and fall occupations only.

In sum, no structural remains or evidence of horticulture were encountered. I think that the data do not indicate a village but rather repeated occupation of seasonal specialized processing camps focusing on estuarine resources during the Woodland Period. But the Potowomut data are only a partial view of an entire subsistence-settlement system or systems, which need to be integrated with information from other site types both within and outside the coastal zone. To understand these systems we must go beyond individual sites and look at the larger picture of intersite relationships. In light of the above comments, no one settlement system model entirely applies to the Potowomut Neck data. Model II proposed by Salwen (1978: 164) and Snow (1980: 230) is relevant in so far as seasonal utilization of Potowomut was identified, but the evidence indicates more than just summer utilization. Model III presented by Sanger (1982), Spiess, et al. (1983) and McManamon and Bradley (1986) also applies, in part, with respect to the variable intensity of activities, excluding cultivated fields and communal burial grounds, reconstructed from

the project area.

Route 4 Extension and RI 102. Finally, Pierre Morenon has prepared a contribution in which he addresses the Route 4 extension data recovery project in North Kingstown, Rhode Island (Figure 1) and RI 102 excavation in Narragansett, Rhode Island. Some of the Woodland sites within the Route 4 extension project, located several kilometers from Narragansett Bay, contained a vast array of features, including large storage pits of oak, hazelnut, hickory and carbonized beans (Morenon 1986). Morenon believes a village is indicated by these data and that occupation occurred at least during the summer and fall seasons.

One particularly interesting observation made during the Route 4 extension project is that when one of the sites was investigated with shovel test pits at five-meter intervals, several artifact clusters were discovered. Enlarging the excavation units around these clusters revealed features. Following machine-stripping of overlying soil at the site, a complex arrangement of features of various sizes was revealed throughout the site, not only in association with high density artifact clusters.

Machine-stripping was also employed at RI 102 in Narragansett which is a 40-acre site dating to 1700 B.P. and also 4000 B.P. (Morenon 1986). Morenon believes that the habitation area of the 1700 B.P. component of the site may be a coastal Woodland village, as suggested by large quantities of pottery from concentrated features, a carbonized sunflower seed and a stone hoe. He is uncertain, however, whether or not the three settlement system models are explicit enough to test and claims that the data he has collected cannot support or refute any one model. In concluding, Morenon suggests in his contribution that it might be helpful to examine settlement system models from at least the following three perspectives:

1. How settlements served to facilitate the acquisition, storage and dispersal of available energy;
2. How settlements served to facilitate the creation, control and transmission of information; and
3. How settlements served to facilitate the interaction among people.

Conclusions.

As can be seen from the above discussion on the Narragansett Bay region, the data do not clearly support or refute the presence of Woodland villages. Nor do any of the three alternative settlement system models presented by McManamon and Bradley (1986: 22-23) entirely apply across the region. What the Narragansett Bay contributors and I are calling for is the need to develop indigenous models to account for the variability of data on Woodland settlement within the Narragansett Bay region. This workshop is one important step in that direction.

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WHERE ARE THE WOODLAND VILLAGES ON CAPE COD AND THE ISLANDS?

Elizabeth A. Little

McManamon and Bradley (1986:22-23) have outlined three models derived from recent research in the northeast. In Model I (Ceci 1982), the coastal settlement pattern for pre-Contact times consisted of small dispersed summer camps with no evidence for maize horticulture, while a later maize-based year-round settlement pattern reflected European trade requirements. In Model II (Salwen 1978; Snow 1980), historic and prehistoric occupations of the coast occur chiefly in the summer. In Model III (Sanger 1982; Spiess et al. 1982; McManamon and Bradley 1986) year-round sites at the coast are proposed. At Peter Thorbahn's suggestion, we address these three models for Cape Cod and the islands.

For coastal Massachusetts the definition of an early historic Indian village is a challenge, in part because of the reported mobility of the dwellings. The Indians of Narragansett Bay moved from "thick warm (woody) bottoms where they winter," to their Summer fields;...where they plant Corne" (Roger Williams [1643] 1973:127,28). According to William Wood of Lynn in 1635 (1865:99), the winter house was large, while the summer houses were small, as families dispersed to their planting fields. Ethnohistoric sources also identify seasonal special activity sites, such as hunting houses, fishing places (both salt and fresh, both summer and winter), fowling stations and refuges in swamps during hostilities. Other reasons for moving houses were fleas, depletion of firewood, the death of the owner, and major changes in shoreline (Williams 1973; Wood 1865; Salwen 1978; Winslow [1621] 1841; Gookin [1674] 1792; Little and Andrews 1986).

Although dwellings may have been dispersed and mobile, at the islands each early historic (1640-1700) sachem's territory or town (NCD 2:28,32), was well defined and included an estuary (Figure 1). The exact bounds varied with time. At Martha's Vineyard there were four early sachems (Banks 1966), each with an estuary: Nohtooksaet (Sq), Mankutoukquet (V), Tewanticut (E) and Pahkepunnassoo (Ch); and at Nantucket, there were two groups (Little 1982): Attapehat and partners (M) and Wanachmamack with Nickanoose (Nt). Thus, by estuaries we can identify early Indian sachemships on the islands, and probably on Cape Cod ("Francis, the Nosset [N] sachem" [1664 NCD 1:5]; Mattaquason [C] [Nickerson 1958]), no matter how dispersed or peripatetic dwellings may have been.

As for prehistoric Late Woodland settlement patterns, I here present short contributions, summarizing, in their own words, the views of four coastal archaeologists, Dunford, Stillson, McManamon and Little, which offer promising new approaches and some hard data.

FRED DUNFORD:

On Cape Cod, the rise of sea level stabilized about 3800 BP and allowed the formation of barrier beaches, protected embayments, and the development of estuaries at Sandy Neck, Nauset and Chatham [Figure 1]. Thus, most sites along estuaries date from the Late Archaic through Woodland. I present here a number of hypotheses, most of which are testable, for seasonal activities and changes therein.

Estuarine development provided increasingly rich resources for Early Woodland groups of 30-50 fairly mobile people, who, during the warm months, moved (every few weeks) through the estuarine zone. The activities of the entire group created

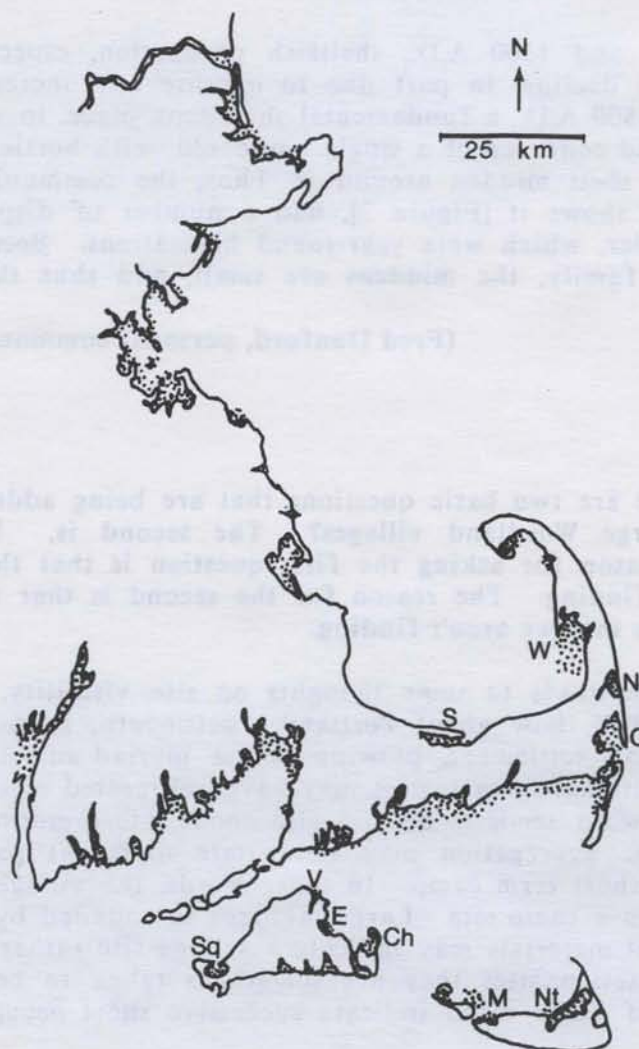


Figure 1. The distribution of shellfish beds (dots) along the coast of Massachusetts in 1909 (after Belding 1909), showing the discreteness of their locations (which are subject to change with time [Little and Andrews 1986]). Estuaries considered in the text are indicated by letters, N: Nauset Harbor; S: Sandy Neck; C: Chatham; W: Wellfleet; Sq: Squibnocket Pond; V: Vineyard Haven; E: Edgartown; Ch: Chappaquiddick; M: Madaket; Nt: Nantucket.

a fairly large shell midden, the focus of camp. During the winter, the group dispersed to the borders of inland ponds for ice fishing and hunting in the central Cape.

Some time in the Early or Middle Woodland, initial experimentation in horticulture began around estuaries in summer in small gardens. About 1000 A.D. maize horticulture, plus beans and squash, was added, with no major shifts or added risks. This resulted in an increase in the size of the population due to increased sedentism.

Between 1000 A.D. and 1300 A.D., shellfish production, especially oyster bed productivity, began to decline, in part due to overuse and increased fresh water run-off. After about 1500 A.D., a fundamental shift took place, in which agriculture intensified. A farmstead consisted of a single household, with horticultural fields, its own storage pits and shell midden around it. Thus, the community or village of Nauset, as Champlain shows it [Figure 2], had a number of dispersed farmsteads along the estuary border, which were year-round habitations. Because a farmstead represented only one family, the middens are small, and thus the archaeological visibility is small.

(Fred Dunford, personal communication 3/12/87)

GEORGE STILLSON:

As I see it, there are two basic questions that are being addressed. The first is, Where are the large Woodland villages? The second is, What were these villages like? The reason for asking the first question is that there is something we don't seem to be finding. The reason for the second is that we don't seem to be quite sure what it is that we aren't finding.

The first question leads to some thoughts on site visibility. Where are the Woodland villages? Well, how about Portland, Portsmouth, Boston, Providence or New Haven? European settlement, plowing and a myriad of other cultural and noncultural post-depositional disturbances may have obliterated most of the evidence for large villages. A word needs to be said also about interpretation of what we do find. A large village aggregation may necessitate different patterns of refuse disposal than a small short term camp. In other words, the village site would have to be kept cleaner than a camp site. Large middens surrounded by an area of very low density of cultural materials may indicate a village site rather than the special purpose resource extraction sites they are sometimes taken to be. A large area with a high density of finds could indicate successive short occupations by a few people.

To try to conceptualize what "a large woodland village" might mean, the first attribute to address is "large". To me that would imply a level of societal organization beyond the kinship level. A village such as Champlain found at Chatham [Figure 1] of 500 to 700 people would almost certainly need more than an ad hoc 'sequential' type hierarchy. Also such a village would be large enough to have been endogamous. Another attribute of village organization would be the exercise of hegemony over a peripheral area, and there might be a positive correlation between the reach of a village and the size of the village. What that means archaeologically is that the larger a village is the farther away we might expect to find a village of equal or greater size. Other attributes to consider would be the social mechanisms of articulation between villages of different sizes, such as social as well as physical boundaries and the mechanisms of crossing these boundaries. As the size of a village increases, biodegradation of nearby resources would necessitate bringing in resources from outside the village or moving the village. Thus we must also consider relations of production and exchange for bringing resources into the village.

Finally, since neither the physical nor the cultural environment was homogeneous across the region it may be inappropriate to look for a single regional settlement model or a single village type. Variation surely occurred between geographic zones such as the islands, the Cape, and the mainland. Ethnohistoric

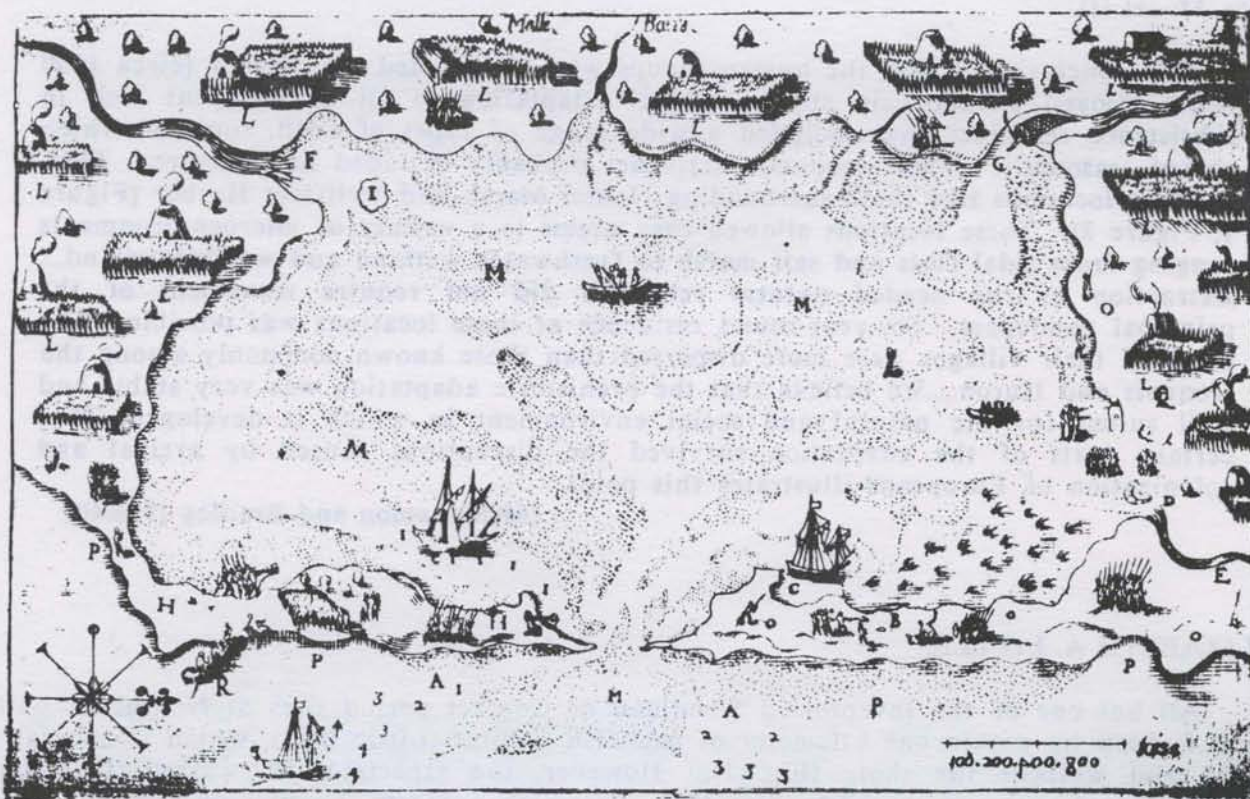


Figure 2. Champlain's Map of Nauset in 1605 A.D. (Champlain 1882).

accounts and modern Narragansett tradition indicates that people moved inland in the winter from coastal villages. At Chatham if you move far inland, you'll find yourself right back on the shoreline.

To find where the large Woodland villages were and to study the variation among them will enable us to start to formulate the important questions about the vibrant social dynamics involved in life during the Woodland Period. Finding the villages will involve more than a sharp trowel. It will involve an even sharper mind.

(George Stillson, personal communication 3/17/87)

FRANCIS MCMANAMON:

McManamon (1984:391) established from seasonality measurements on *Mercenaria mercenaria* (Hancock 1984:121-156; Table 1) that most Middle Woodland and all Late Woodland concentrations studied at Nauset contain only shells collected during the winter half (December through May) of the year. Only a Late Middle Woodland site (341.21) has shell collected in June, July, or August. These data falsify the hypotheses of Models I and II that the coast of Cape Cod was used only with low intensity or only in the summer. Although the seasonality of other midden remains has yet to be reported, McManamon (1984:Ch.16) argues that faunal and floral evidence, the variety of activities at

Nauset sites, and the ossuary at Wellfleet reflect the year-round use of these coastal sites, Model III.

Our conclusion is that the human groups who constructed the ossuary [circa 1000 A.D.] enjoyed a relatively stable cultural adaptation to an environment rich in subsistence resources...that included a wide range of types of food, some of which varied seasonally. Their economic activities probably included horticulture.... They lived in locations like those surrounding Nauset Marsh and Wellfleet Harbor [Figure 1; Figure 2]. These locations allowed easy access to a variety of microenvironments ranging from tidal flats and salt marsh to freshwater wetland and wooded upland.... Extraction of the needed natural resources did not require movement of the principal residences. So, year-round residence at these locations was possible. The plans of their villages were more dispersed than those known commonly among the Iroquois and Huron....We believe that the prehistoric adaptation was very stable and well suited for the natural and social environment in which it developed....That certain parts of the adaptation survived the disruptions caused by arrival and colonization of Europeans illustrates this point.

(McManamon and Bradley 1986:40)

ELIZABETH A. LITTLE:

All but one of the inventoried Woodland or Contact period sites at Nantucket with shell midden lie within one kilometer of shellfish habitat (Little 1983), which is generally north and west of the shore (Fig. 1). However, the aspects of 57 inventoried shell middens show a strong southerly bias (Fig. 3), which suggests the vigorous influence of winter winds at Nantucket, which are predominantly from the northwest during the months of November, December, January, February and March (winter for this discussion). Prevailing winds blow from the southwest in May, June, July, August and September (summer for this discussion).

I have proposed (Little 1985) that all winter sites at Nantucket will have southerly aspects for protection from the northwest wind, and that summer sites will be found with all aspects, although there was no conclusive data with which to test this hypothesis. At three sites at Vineyard Haven and three at Squibnocket Pond on Martha's Vineyard (Figure 1), Waters and Ritchie (1969), from studies of shell midden flora and fauna, inferred that the five southerly facing sites had year-round occupants or were visited sporadically at all seasons, and the sixth, with a northwest and a southeast aspect, was occupied in summer or sporadically all year round. The seasons of availability of foods found in middens cannot falsify any of these hypotheses.

Winter Site Locations at Nauset: an independent test of my hypothesis.

Seasonality tests were made by Mary Hancock (1984) on Mercenaria mercenaria (quahog) shell from shell midden concentrations at Nauset Bay. For the Middle and Late Woodland sites, the data show that all sites with shell concentrations were winter sites and had southerly (S, SE, SW) aspects (some were located in hollows) (McManamon 1984:3-91; Table 1). That is, all winter sites tested had shell midden and protection from northwest winds. Note that most winter shellfish gathering at Nauset took place from December through April; the one month delay of the season of shellfish gathering compared to the season of northwest winds may reflect ocean temperature inertia. McManamon has firmly established the locations of Woodland winter shellfishing sites, and

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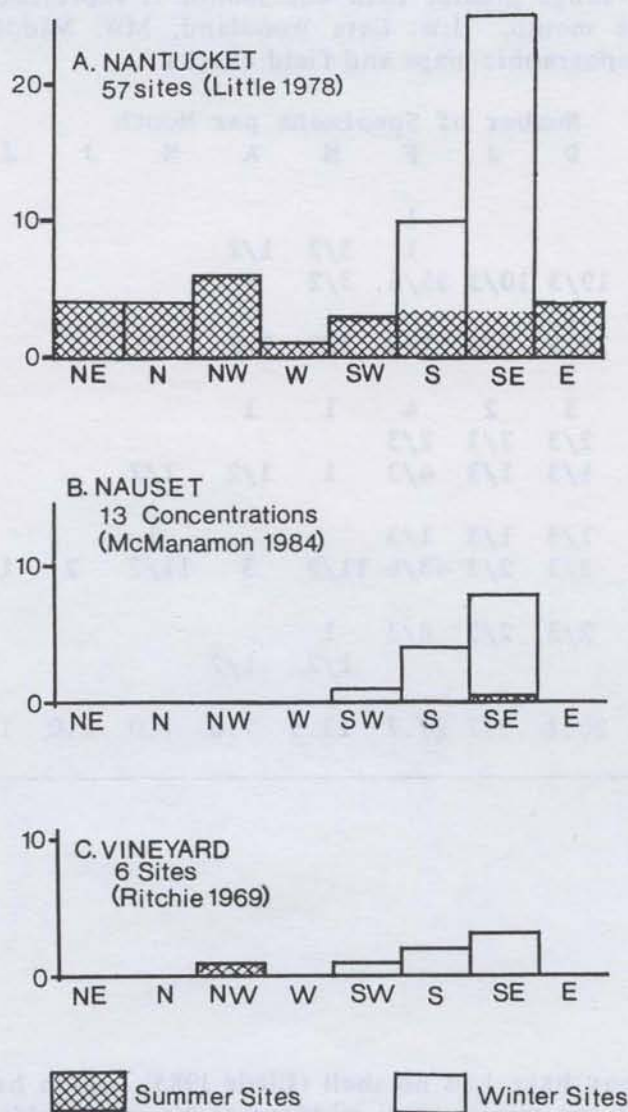


Figure 3. Aspect distribution of 57 shell middens at Nantucket (Little 1985), 13 shell concentrations at Nauset, Cape Cod (Table 1; McManamon 1984), and 6 sites (one has two aspects) at Martha's Vineyard (Ritchie 1969). Distribution of winter and summer sites is hypothetical (winter winds) at Nantucket, determined by shell season of collection at Nauset, and all seasons by resource availability, or, as shown, by hypothesis (winter winds and winter shell) at the Vineyard.

his data supports the hypothesis that, if it's a winter site, it has protection from the NW. The time depth at these sites indicates a rich resource, shellfish, and a rare resource, winter wind protection.

TABLE 1. SEASONALITY INFORMATION FOR CAPE COD SITES BASED UPON ASPECTS AND SHELL ANALYSIS (after McManamon 1984:391). A *Mercenaria mercenaria* shell with a possible collection date range greater than one month is represented by one/range (in months) for each possible month. LW: Late Woodland; MW: Middle Woodland. Little determined aspects from topographic maps and field checks.

Period	Concentration	Aspect	Number of Specimens per Month													
			D	J	F	M	A	M	J	J	A	S	O	N		
LW	308.11	SE			1											
LW	.33	SE			1	3/2	1/2									
LW	.42	S	19/3	10/3	35/6	3/2	1									
LW	323.21	SE	1													
LW	.22	SE	17/3	5/3	11/3	3/2	1/2									
LW	.23	SE	2													
LW	288.42	S	3	2	4	1	1									
LW	.52	S	2/3	2/3	2/3											
LW	410.00	S	1/3	1/3	4/3	1	1/2	1/2								
MW/LW	308.71	SE	1/3	1/3	1/3			1								
MW/LW	341.21	SE	2/3	2/3	43/6	11/2	3	11/2	2	1	3/2					
MW	390.33	SW	2/3	2/3	8/3	1										
MW	274.12	SE				1/2	1/2									
Grand Total:			20.7	9.7	27.7	13.5	7.0	7.0	2.0	1.0	1.5					

Summer Site Locations.

Some summer sites may have had no shell (Little 1985), which has also been proposed for summer components of the winter shell middens at Nauset (McManamon 1984: Chapter 16). Summer sites might have had random aspects, especially N, NW, NE, W, NE, and E (Fig. 3), which are unsuitable for winter sites, but maximize access to fishing places, shellfish beds, horticultural land, landing places and insect dispelling breezes. Summer sites, even with shell, would tend to have lower visibility than winter sites because summer locations, unconstrained by wind direction, could have been smaller and more dispersed (Binford 1980:7).

Except for June/July/August shell at one winter Middle Woodland site at Nauset (Table 1), few summer sites have been identified. At Ritchie's six Vineyard shell midden sites bones of scup, sturgeon, striped bass and bluefish, which are available only in the "summer" half of the year, between May 1 and mid-November (Ritchie 1969; Andrews 1973), are present in nearly every component between 1565 A.D. and 2270 B.C. If the shell in middens at Martha's Vineyard was collected between December and May 1, as the Nauset findings and the southerly site aspects suggest (Fig. 3), then these sites may have been occupied in both halves of the year for a considerable time in the past.

DISCUSSION.

Because of the lack of summer breezes at shell midden sites in amphitheatres at Marthas's Vineyard and Nantucket, I doubt that sites like Hornblower II and Vincent (Ritchie 1969) were summer sites. Indeed, there is another hypothesis that fits the ethnohistoric data more closely. Scup, bluefish, tautog, cunner, striped bass and sturgeon were indeed caught in the summer (May-October) from beaches or boats, but part of the catch was preserved for winter use, an ethnohistorically well-documented activity (Black and Whitehead 1988). Preservation requires removal of the internal organs and drying. If the fish were filleted, there would be no bones, but if steaks were cut perpendicular to the backbone or if the fish were cleaned as codfish are by removal of some of the bones, each portion of fish would have some bones (J. Clinton Andrews, personal communication 1988). According to Wood [1635](1865: 101), fish (he names "Basse") and lobsters, cut thin, were dried on scaffolds in the hot sunshine over smokey fires for winter use. Gookin in 1674 reported (1970:15) that dried fish, cut in pieces, bones and all, were boiled in stews. "I have wondered many times that they were not in danger of being choked with fish bones: but they are so dexterous to separate the bones from the fish in their eating thereof, that they are in no hazard" (Gookin 1970:15). By this argument, the winter shell midden sites on the Cape and Islands we have been discussing may well be only winter sites, with bones of dried summer fish. The incomplete skeletal remains of fish in shell middens (Ritchie 1969; Little 1984) supports this proposal.

Whether these winter sites were used all winter or for short term foraging or for collecting and preserving shellfish for use elsewhere (Binford 1980; Black and Whitehead 1988; Crevecoeur 1971: 106), are unresolved questions.

Since shell middens are found only on the borders of shellfish habitat (Little 1983), if southerly facing shell midden concentrations indicate winter sites in other coastal areas of Massachusetts (Little 1986; see also Claassen 1986 and Erlandson 1988), then the distribution of shellfish beds in 1909 (Figure 1) shows where winter shell middens of Late Woodland sachemships or towns could be expected. Derived from Nauset, Nantucket and Vineyard shell midden data (and Dincauze 1974:53), this hypothesis needs testing for other estuaries. Note that, while we approach an understanding of historic sachemships or Indian towns, and of prehistoric seasonal use of coastal resources, the word village on the Cape and Islands has misleading connotations for a study of Late Woodland settlement patterns.

CONCLUSIONS.

Fred Dunford has presented a model for Woodland settlement patterns that vary through time in response to environmental, cultural and social changes. George Stillson has pointed out variations of settlement patterns in space which could result from social and economic interactions. Both of these contributions indicate testable archaeological hypotheses.

Frank McManamon has provided archaeologists with data with which to test hypotheses. Although most Woodland shell concentrations at Nauset have been identified only as winter sites, floral and faunal evidence as well as the social implications of the ossuary lead him to propose a model for dispersed sites at estuaries occupied year round in the Late Woodland. Elizabeth Little has tested a Nantucket hypothesis, that all winter shell midden sites are south of hillsides, against McManamon's Nauset data and it has survived the test. She proposes that the bones of summer fish in a shell midden may reflect preserved fish eaten during winter, so that summer sites are still unlocated.

While the approaches of these four people all differ, they do not so much conflict with Model I, II or III, as suggest hypotheses, new data requirements, and new tests of hypotheses. Only the small summer shell scatters of Model I would be expected on the north shore sites of Cape Cod and the Islands, as, for example, the Nantucket Field Station (Luedtke 1980); this needs testing. Model II, winters in sheltered valleys, summers dispersed at their planting fields, and various seasons (for various people) at hunting, fishing, shellfishing and/or fowling camps, is a robust ethnohistoric model. However, at Cape Cod and the Islands, winter shellfishing sites in sheltered valleys are the chief sites that have been studied and the only Woodland sites for which the season of collection has been determined. We have not yet established the seasonality of large interior sites without shell midden. We still need to test McManamon's hypothesis for year-round residence at sites dispersed around estuaries, Model III, against a model in which shell midden components were produced by sporadic or seasonal visits. Such studies of settlement patterns in time and in space as suggested by Dunford and Stillson will require close chronological control.

In the summer (late July) and from the east, Nauset houses in 1605 were prominent (Figure 2), but winter houses with NW wind protection would have been invisible from the north. In a visit to Nauset from the northwest in December 1620, the Pilgrims passed planting fields, the frames of unused Indian houses and food storage pits, but, "through snow or otherwise, we saw no houses, yet we were in the midst of them" (Mourt's Relation [1622] 1986:71). We are not the first to have problems finding a Woodland village on the Cape and Islands!

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RADIOCARBON AGE REPORTS (see Little, 1988 BMAS 49:1).

1988: Charlestown Meadows Site, Charlestown, MAS # M22SW16; MHC #19WR268.

Sample: Charcoal from Feature #134, a red earth filled feature containing a Brewerton Side-Notched point of quartzite. No $\delta^{13}\text{C}$ measurement or correction. Carbon-14 half-life: 5568 years. Sample age (radiocarbon years before 1950 \pm sigma): 4750 \pm 130 B.P. (Beta-23655). An Atlantic point found in the feature was probably a later intrusion (Curtiss Hoffman, Ekblaw Chapter, MAS Matching Funds Application, 1987).

1988: Plymouth Street Site, Bridgewater, MHC #19PL540.

Sample: Charcoal from Unit S03E16A, which also contained a cache of Bifurcate Base points and blanks, and chert/agate steep-edged scrapers. $\delta^{13}\text{C} = -26.7$ o/oo (95% NBS Oxalic Acid standard). Carbon-14 half-life: 5568 years. Carbon-13 corrected sample age (radiocarbon years before 1950 \pm sigma): 2400 \pm 120 B.P. (Beta-23654). The age was younger than expected, although in retrospect small stemmed Rossville-like points have been found at the site (Curtiss Hoffman, North River Chapter, MAS Matching Funds Application, 1987).

A BRIEF NOTE TO CONTRIBUTORS

The Editor solicits for publication original contributions related to the archaeology of Massachusetts. Manuscripts should be sent to the Editor for evaluation and comment. Authors of articles submitted to the Bulletin of the Massachusetts Archaeological Society are requested to follow the style guide for American Antiquity 48:429-442 (1983), a copy of which is available at the Robbins Museum. Additional instructions for authors may be found in the Bulletin of the Massachusetts Archaeological Society, Volume 49, Number 1 (1988).

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