Spring 1996

**Bulletin of the Massachusetts Archaeological Society, Vol. 57, No. 1**

Massachusetts Archaeological Society

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The BULLETIN OF THE MASSACHUSETTS ARCHAEOLOGICAL SOCIETY is published semiannually, with a spring volume 1 and a fall volume 2. Institutional subscriptions are $25; individual memberships in the Society are $18 and include the Bulletin. Information on special rates for family members, seniors, students, etc., and requests for back issues of the Bulletin should be addressed to the Museum Office Director, Thomas Lux, Massachusetts Archaeological Society, P. O. Box 700, Middleborough, MA 02346 (508-947-9005). Manuscripts and communications for the Bulletin may be sent to the assistant editor, James Garman, c/o The Public Archaeology Laboratory, 210 Lonsdale Ave., Pawtucket RI 02860.
EDITOR’S NOTE

Putting this issue together has given me great pleasure. For their wonderful contributions I thank the authors: Dena Dincauze, Russell Gardner, Brent Handley, and Barbara Luedtke. I am especially glad to have the spirited letters to the editor from Gerry Biron and George Horner in response to George’s (1995) article (BMAS 56:20-22). These pertain to historical questions about Massasoit’s family tree, a subject that is alive and well in Massachusetts in 1996! As usual, I acknowledge with gratitude the Bulletin proof readers, Kathy Fairbanks and Bill Moody, who, over the years, have straightened me out on a number of grammatical and stylistic issues. Kathy helped look up some references for this issue. To Kathy and Bill: my heart-felt thanks.

As announced at the fall meeting two years ago, I am retiring as editor of the Bulletin of the Massachusetts Archaeological Society in the fall of 1996. Thus, this Bulletin issue will be the last of my 10 years as editor. I have enjoyed the job immensely, and am grateful to my authors for making it both challenging and fun! Any papers sent to me and not yet published have been sent to the assistant editor, James Garman, c/o PAL, Inc., 210 Lonsdale Ave., Pawtucket, RI 02860. Jim will be taking over the editorship with the fall issue, and all future papers and editorial correspondence should be addressed to him. My plans are to finish some of my numerous research projects, two long-delayed books, and to enjoy my grandchildren.

Betty Little

CONTRIBUTORS

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BARBARA E. LUEDTKE is Professor of Anthropology at the University of Massachusetts/Boston and on the Advisory Board of the Robbins Museum. She is also the MAS representative on the Massachusetts Historical Commission.
Letters to the Editor

To the Editor: The subject of Metacom’s relationship to Massasoit (Horner 1995) has intrigued me ever since Maurice Robbins brought it to my attention many years ago. Besides the 1675 L’Estrange publication that Professor Horner cited, there is at least one other contemporary account that refers to Metacom as Massasoit’s grandson.

The Roytelet now of the Pocanokes, that is the Plimouth-Indians, is Prince Philip alias Metacom, the Grandson of Massasoit (Josselyn [1672] 1865: 113).

I’m not suggesting that this proves the claim of parentage but rather only adds confusion to it. The likelihood that two early writers were mistaken regarding the family relationship of Metacom and Massasoit seems less plausible. Unlike Professor Horner, I’m not so certain that the unknown Boston Merchant erred about Metacom’s ancestry. He quotes Hubbard among others as saying these records should leave no doubt about the sachem’s parentage. While we are obligated to resort, in large measure, to the works of Hubbard, Mather, and Church for our facts, the beauty of all of them is sadly marred, the first two by the narrowness and spleen of the writers and the last by the spirit of self-aggrandizement that permeates it. A case could be made that the cited accounts are no more accurate in this regard than that reported in the L’Estrange publication. Unfortunately, history is not an exact science.

Gerry Biron, Saxtons River, Vermont

References:

Response: If Mr Biron implies that the historical references cited in my article "are no more accurate in this regard than that reported in the L’Estrange publication," I certainly take issue with him. Surely he acknowledges that Court Orders/Records are the most accurate, unbiased, published sources available to historians, being based upon a community-recognized and accepted legal system. In the case of the Pilgrims it was British Common Law.

On March 30, 1668/9, Philip stood before the Court of Assistants to report a land sale in Rehoboth. He swore:

That I, Phillip, Sachem, son, heire and successor to the said Osamequin [Massasoit]....

The document was signed by Philip and Josiah Winslow, Assistant, Court of Assistants (DPL 1668/9 III:116).

Let’s bring speculation to an end: Massasoit had two sons: Wamsutta and Metacom.

George R. Horner, Abington, Massachusetts

Reference:
(DPL) Plymouth Court of Assistants, Deeds.
LARGE PALEOINDIAN SITES IN THE NORTHEAST: PIONEERS' MARSHALLING CAMPS?

Dena F. Dincauze

Paleoindian settlement patterns and economic strategies should exhibit considerable diversity within the Northeast and across the American continents. Differences between the first explorer pioneers and their successor generations should be especially well marked in the range of site types and in the specialization of tool kits. I offer an argument for a unique function for the unusual large northeastern Paleoindian sites, beginning with the hypothesis that each of those sites might have been occupied by a singular group of people at one time only, and thereafter abandoned. I model a set of behaviors appropriate for high-risk environmental and social conditions unique to the eleventh millennium BP, a time of climatic reversal during the late-glacial warming.

The first people to see northeastern North America, so far as we know now, left their signatures on the late Pleistocene landscape in the form of fluted spear points. Those were the true pioneers, the first human eyes to see these hills and rivers, the first to name them and to domesticate them. To this day we remain unfamiliar with the conditions of their lives.

Traditional thinking about Paleoindians imagines them as hunters of big game on treeless plains. Recently, archaeologists have reluctantly relaxed their insistence that all Paleoindians hunted megafauna all the time, exclusively. In the Northeast it is particularly timely to reconsider the lives of the Paleoindians who first lived in late glacial forests on this continent, who rarely if ever saw a mammoth, and for whom even reindeer meat was not an everyday event. I offer an argument for a unique function for the large northeastern Paleoindian sites (Figure 1), unusual on the continent. I begin with the hypothesis that each of those sites might have been occupied by a singular group of people at one time, and afterward abandoned forever. The big northeastern residential sites with enough information to support preliminary discussion are the six large non-quarry sites: Bull Brook, Debert, Vail, Gainey, Nobles Pond, and Shoop. Except for Shoop, all are within the area glaciated by the Laurentide ice sheet. All ages are given in 14C years.

SITE DESCRIPTIONS

The Bull Brook site in northeastern Massachusetts (Grimes 1979; Jordan 1960) had at least 42 discrete artifact concentrations in a roughly circular configuration over an area estimated at 20 acres. The count of artifacts reputedly exceeds 8,000, although no final tally has been published. The source or sources of the lithic raw materials remain uncertain. On the basis of his extensive familiarity with the artifacts, John Grimes leans toward origins in the Hathaway formation in northwestern Vermont, 240-300 km to the northwest, and in the Munsungan Lake silicates of north-central Maine, ca. 400 km north-northwest (Curran and Grimes 1989:68).

Debert, in central Nova Scotia, has long served as the archetype of the big sites. The total area, again, is estimated at about 20 acres.
Eleven separate artifact clusters were mapped in the 1960s (MacDonald 1968); more could have been present prior to extensive damage to the site. The 140 fluted points recovered show a distinctive deep basal concavity. The dominant raw material is from bedrock now underwater in the Minas Basin of the Bay of Fundy, 67.5 km WSW of the site. The assemblages from nine of the separate clusters are interpreted as domestic debris; the remaining two have specialized manufacturing or processing debris.

The Vail site in west-central Maine produced essentially the same style of basally concave fluted points as Debert (Gramly 1982). Within a river valley among mountains, the site as mapped has a maximum area of about 3 acres. Eight discrete clusters of artifacts were recovered from eroded surfaces near the shore of an artificial lake. There may have been more, but erosion and the resultant scatter of artifacts lowers the precision for any estimates of site area or configuration. The excavator
thinks that the raw material comes from the "Ledge Ridge" outcrops 30 km to the north of the site; others claim that significant amounts of raw materials have been derived from the Hathaway formation in Vermont, 180 km to the southwest (Spiess and Wilson 1987:38).

The Shoop site in a narrow valley in the central Pennsylvania mountains is also estimated at over 20 acres in size. Eleven discrete clusters of artifacts were found on minor elevated areas (Witthoft 1952). The projectile points fall within the normal variation of the earliest stylistic cluster of eastern Paleoindian armaments (Bull Brook-Gainey, see below), possibly slightly earlier than Bull Brook.

In northeastern Ohio, the Nobles Pond site lies on a glacial outwash plain near a kettle pond. Estimates of the area approach 22 acres. Plowing and collecting have reduced the site's integrity, but in one season of fieldwork investigators mapped over 11 discrete clusters of artifacts. The lithic materials at the site derive from the Vanport (Flint Ridge) and Upper Mercer formations, respectively 115 and 75 km SSW of the site (Seeman 1994).

The Gainey site in central Michigan has been under investigation since 1978. In the present company it is a small site, on a hilltop area estimated at three acres, comparable to Vail. Within those bounds, six or more discrete clusters have been recorded, with perhaps one ("Area 2") representing two periods of use. The lithics are overwhelmingly from the Upper Mercer formation of Ohio, 400 km SE of the site (Simons et al. 1984).

CHRONOLOGY

The elusiveness of chronology for all northeastern Paleoindian sites has been a source of frustration. The radiocarbon ages available are too general to permit estimates of relative site ages within the eleventh millennium (Levine 1990). Variation in time has become visible only recently, with the definition of stylistic sequences among the fluted points. Most researchers accept a binary division of earlier and later fluted points; in some areas that has been extended to a tripartite sequence (Deller and Ellis 1988). Fluted points with parallel or slightly convex sides, resembling generic Clovis styles, are considered the earliest; these include the Bull Brook and Shoop assemblages and the Gainey style of the northern Midwest. The Barnes style, with a long flute and "waisted" or fishtail base is considered the successor style; it is apparently a regional equivalent to the Cumberland style of the greater Ohio and Tennessee valleys. Probably later than all these is the rounded Crowfield or "pumpkinseed" type seen at the Reagen and Plenge sites. The sequence is not contradicted by information currently in hand, although the situation appears more complex at the regional scale. While I judge the Debert-style points with deeply concave bases in the far Northeast to represent a late modification of the Gainey technique or style, others see them as later, perhaps contemporaries of the Crowfield style (Ellis 1993:606).

COMPARISONS

Nothing like these large northeastern Paleoindian sites is known in the herd-hunting areas of the Great Plains, either archaeologically or ethnologically. The Paleoindian Lindenmeier site of similar age in Colorado is different in many significant structural and social attributes (Wilmsen and Roberts 1978). In contrast to the eastern sites, Lindenmeier lacks both the spatially separate artifact clusters and the predominance of a single lithic source. Wilmsen interprets the site as having been...
reoccupied "on more than one occasion," showing "a great deal of areal overlap among the majority of the units." Moreover, the Lindenmeier occupants appeared to have had ready access to bedrock quarries, since all stages of lithic reduction were represented on site, and the material is not exotic.

The large fluted point sites in the Southeast such as Williamson in Virginia and Wells Creek in Tennessee are equally distinct. They are typically quarry and lithic-workshop sites, which have accumulation patterns and interior structures different from those of the northeastern sites. The large non-quarry sites of the Northeast, apparently residential in function, stand in sharp contrast against the background of the growing numbers of small Paleoindian sites throughout eastern North America.

The very large Fisher site in Ontario, although at present only summarily published, seems to be later in time and also different in kind. The site contrasts in significant respects with the six large sites discussed here. It is characterized by a later style of fluted point, the Barnes type. It has significant lithic workshop activity based on quarry blocks. And it has several artifact concentrations devoted to special activities (cf. Debert). For these reasons, and because Peter Storck (1983) makes a good case for the site being a recurrently occupied anchor of a seasonal round in a band territory, Fisher is not included in the model presented here. By this argument, the entire Parkhill complex is considered later than the sites interpreted here.

**INTERPRETATIONS**

Early interpretations of the large northeastern sites tended to see them as accumulations of many separate visits rather than one large one. Both the Debert and Shoop sites were originally interpreted as the remains of repeated visits over time (MacDonald 1968; Witthoft 1952). More recently, the Vail site is argued to be a compilation of many visits by small groups of caribou hunters (Gramly 1984). As anthropological studies matured, attention focussed on the discreteness of artifact clusters on all the sites and the circular arrangement of clusters at Bull Brook. To some investigators, these imply simultaneous occupation. At least four different functional interpretations of the sites have been presented; all are based on some version of the assumption that the large sites are accumulations of individual small sites--either by aggregation or sequential visits.

**The episodic reuse interpretation.** At many eastern Paleoindian sites, both large and small, observers emphasized the relative elevation of the artifact scatters above surrounding terrain. Paired with the assumption of a treeless tundra environment, these observations long dominated explanations for site function: elevated lookouts and camps for big game hunters. Strongly influenced by this convention, archaeologists interpreted the big sites as accumulations of sequential visits at places favored for intercepting migrating caribou (Funk 1973; MacDonald 1971; Witthoft 1952).

**The seasonal hunting aggregation interpretation.** The first of the aggregation models was the concept of a seasonal aggregation for communal herd hunting. This interpretation gains support from the increasing evidence for caribou among the prey represented by calcined bone at a few sites. Caribou bone has been identified at Bull Brook and smaller sites (Spiess, Curran and Grimes 1985). Ethnographic analogies are frequently cited in support of this hunting interpretation, often based on early-historic period seasonal caribou hunters in the subarctic and arctic Barren Grounds (e.g., Funk 1972; Gramly 1988).
The macroband camp interpretation. Impressed by the reported densities of fluted points in the East and inspired by the discovery of the Vail site, MacDonald (1982:xi) suggested that the large sites could have been camps of very large bands of hunters, evidence of population growth "in eastern North America where environmental factors were more amenable to greater group size than on the Plains." Fitting (1977) had earlier argued for large populations and "tribal" social complexity, and the initial investigations at the Gainey site led to thoughts about a base camp (Simons et al. 1984:270).

The social aggregation interpretation. The most anthropologically informed interpretations of the large sites see them as areas for the seasonal reunion of otherwise dispersed groups gathering for information sharing, mate selection, and exploitation of seasonally abundant resources (Curran 1987; Curran & Grimes 1989). This interpretation goes well beyond the aggregated hunting camp model, to include the satisfaction of a range of basic human needs. Among otherwise dispersed social groups, periodic aggregations can facilitate information exchange, scheduling and locating decisions, and mate selection (Moore 1981). Planning for such aggregations might include considerations of intercepting migrating game, but would not require that. The aggregations could continue as long as local resources could support a high density of humans.

CRITIQUES

None of these contending interpretations is securely established. There are many reasons for this, but the overriding ones are three: (1) none of the large sites was investigated prior to being seriously damaged, (2) none has been fully excavated, and (3) none is fully analyzed and published. Interpretations are based on comparisons to late-Holocene high-latitude hunters, which should make us cautious, because mid-latitude late-glacial environmental and social conditions are not replicated in modern high latitudes. Cluster assemblages at the large sites that have been studied and interpreted appear to represent typical domestic debris resulting from diverse processing, manufacturing, maintenance and repair activities. Interpreting them as either repeated or singular occupations controlled by special attractions of the locales makes the large sites indistinguishable from the smaller Paleoindian sites. Responsible investigation of beginnings, of pioneering and colonization behaviors, demands that the concept of "Paleoindian" be subdivided scrupulously and that the chronological and spatial units be rigorously discriminated.

The hypothesis of specialization on caribou hunting, a variant of the Big Game Hunters model of Paleoindians, is under reconsideration. The early-historic Barren Ground caribou adaptation with large herds and seasonal latitudinal range changes has been the analog of choice for this. This adaptation required minimally the development of extensive Barren Grounds, a high-latitude phenomenon of the late Holocene. The tundra of the eleventh millennium was not a classic Barren Ground; it may have been even less hospitable to humans, since the northeastern fluted-point users were apparently unaccustomed to tundra hunting. Their sites do not extend into the tundra of their time immediately south of the Champlain Sea (Dincauze 1988). The caribou that were hunted by northeastern Paleoindians likely were adapted to open woodlands--small herds with relatively short seasonal moves that were mainly altitudinal shifts between winter and summer grounds. It is unlikely that reliance on such prey could have supported large numbers of
humans in one place. It is equally apparent that hunters could easily have exterminated local resident populations of woodland caribou and been forced to relocate.

Known caribou-hunting camps on the Barren Grounds and subarctic Labrador are not like the large Paleoindian sites; we have neither archaeological nor ethnographic analogs for the latter. New research in Labrador indicates that the large interior caribou hunts developed only after the introduction of firearms and the institution of trade with Europeans; furthermore, the interior caribou-hunt camps of the 19th century were inhabited for brief periods of time and are not comparable in artifact richness to the large residential sites of the northeastern Paleoindians (Loring 1992). Instead of conflating all northeastern Paleoindian sites of whatever size into a category of "hunting camps," we are justified in separating the large sites analytically from the smaller. Doing so, we can isolate some potentially significant characteristics of the large sites. In addition to their sizes and high artifact numbers, the big sites share attributes that may be informative about their functions. I present seven crucial characteristics of the large sites.

(1) They are widely dispersed in the Northeast, with never more than one in an area the size of a state or province.

(2) They are rare in contrast to small sites, despite their high archaeological visibility and the prestige conferred on finders.

(3) They all have the earliest fluted point style in their respective areas—not have Barnes, Cumberland, or later styles.

(4) They display assemblages dominated by one or two lithic materials, typically from bedrock sources 30 to 400 km away, and they lack quarry debris.

(5) They all include discrete artifact clusters that do not overlap (with possible exceptions at Vail and Gainey, the smallest in area).

(6) They have notable richness of artifact assemblages in each cluster, with more, and more diverse, items than are characteristic of the small sites.

(7) The artifact styles are consistent in techniques and materials within each site.

With these seven criteria in mind, we can demonstrate significant weaknesses in the existing functional hypotheses.

If the big sites were in fact episodic accumulations, then the dominance of one or two lithic materials (#4) should not be definitive of them all. It is unlikely to the point of strain to imagine people importing major amounts of lithic raw materials several hundreds of kilometers from the same direction every time they arrived to hunt. Instead, there should be significant amounts of materials indicative of arrival from several directions, as would be likely for episodic reuse of a location in an unstable environment. The northernmost sites, Debert and Vail, apparently show use of raw materials from less than 100 km distant, bringing them closer than any others to meeting the criteria for episodically used camps within a single band territory. The discreteness of the artifact clusters at all the sites (#5) has been a major problem for this latter interpretation from the beginning. Why should there be perfect avoidance of all previous campsites if an area was used over a period of years? In contrast to the large residential sites at issue here, eastern quarry and workshop sites such as West Athens Hill, Thunderbird, and Williamson seem to be true palimpsests, with few discrete clusters and obvious constant economic attractions (Funk 1973; Gardner 1977; Peck 1985). The episodic reuse argument loses much of its force anyway with the recognition that treeless tundra was not the immediate habitat of any northeastern
Paleoindian group, although tundra may have been in the neighborhood of Debert and Vail. Shoop, especially, was well forested by the time the fluted point users peered after game there.

The hypothesis for seasonal herd hunting suffers, as we have seen, from the absence of archaeological analogs. In the western plains and prairies, where herds of large game were hunted throughout prehistory, there are no comparable residential sites of any age. However, we can model some hypothetical characteristics. Aggregations of otherwise small dispersed bands at single special places should leave archaeological traces of derivation from more than one direction--separate band hunting ranges. The debris should include lithics from many directions, as well as many exhausted tools made from exotic lithics. The exhausted tools at the big Paleoindian sites, however, are typically made from a single dominant lithic material, more rarely two. We would expect a range of technical and stylistic variation among the tools accumulated at an aggregation of dispersed bands. That expectation is opposed by the stylistic and technical uniformity within each site, so far as is reported (#3 and #7). Furthermore, if Debert is the remains of a summer hunting camp that had a southerly winter counterpart, we should see Debert-style points with deeply indented bases in the south.

The macroband camps model requires a demonstration of a supportive demographic density. Although the frequencies of reported fluted points in the East are increasing, they remain well below the frequencies of any later style of weapon tip, so that their numbers cannot support claims for high population densities for their makers (cf. Ellis 1993). Macroband camps that represent an established settlement pattern of a large population should appear at territorial intervals on the regional landscape (Hayden 1980). The rarity and wide dispersal of the sites considered here (#1 and #2) refute that expectation.

The social aggregation model of site formation is supported by the discrete artifact clusters and richness of assemblages (#5 and 6) at the large sites, but not by the dispersal and rarity of the sites, the exclusively earliest style of weapon, or the domination by exotic lithics (#1-4). Also, the stylistic uniformity of artifacts (#7) implies not regularly scheduled activities serving regionally dispersed populations, but rather activities characteristic of short-term pioneering social groups, derived from denser populations with well defined artifact conventions.

PALEOENVIRONMENTS

These six unusual Late Pleistocene sites in the Northeast must be evaluated with awareness of their unique environments. All but Shoop were in deglaciated areas undergoing vegetative succession; only Debert and Vail were at all close to tundra environments in Paleoindian times. The environments of the Northeast during Late Glacial time were unlike anything currently observable. Those were times of high variability in climate as well as flora and fauna, the latter two dependent in large measure on climate. The period of ice melt, as the climate changed from full-glacial to interglacial conditions, was one of exaggerated seasonal contrasts (Kutzbach 1987). Because at the time the northern hemisphere was farthest from the sun during winter, winters were especially severe. With the sun closest during the summer, increased solar radiation tempered the chilling effects of the continental glaciers near the international boundary. Weather patterns were erratic as the jet stream shifted northward. Habitats were stressed by rapid changes in living conditions for flora and fauna...
Some megafauna were on the verge of extinction; others were changing their ranges (Graham and Lundelius 1984). Sea level was rising along the Atlantic coast, while inland seas and proglacial lakes were draining.

In the early eleventh millennium BP, people in the Northeast faced additional environmental uncertainty. The Younger Dryas climatic reversal, strongly manifested around the North Atlantic, intensified the instability of late Pleistocene biota nearby. Vegetation ranges, expanding in the Late Glacial warming climates and developing soils, shrank again during the early eleventh millennium (Peteet et al. 1990). Tree lines retreated from higher altitudes and latitudes and in some areas spruce replaced incoming hardwoods, triggering changes in animal ranges and behavior.

Paleoindians first appeared in the Northeast during the Younger Dryas period, moving into the teeth (so to speak) of the climate reversal. If we assume that they were moving northeastward and northwestward from the Ohio valley and its major tributaries, which seems to be the case on the basis of lithic raw material distributions (Figure 2), special adaptations were required of the human groups involved. At the very least they must have reverted to adaptations not practiced since they arrived south of the Laurentide ice. Summer occupations in the Northeast likely posed few special challenges, but the Younger Dryas winter was not the time to try anything new or risky.

THE PIONEERING MODEL

Given this state of affairs, I propose that the large northeastern sites were marshalling areas for people who had just crossed their perceived frontier—e.g., focal places used for the gathering, arranging, and allocating of resources and information, preparatory to dispersing in smaller groups. Marshalling sites are each the remains of unique circumstances. They represent the first human groups considering settlement in their respective areas.

The first pioneers moving into terrain uninhabited by other humans are a very special class of human explorers (Storck 1991). Information constraints are likely to be their greatest stressors—nothing is so fearsome as the unknown. Communication links are stretched by low population densities and the distances and areas involved. Risks are exaggerated by lack of information, by unfamiliar space, and by distance to social support.

Absolute newcomers in a place even lack the referential vocabulary to discuss spatial relationships and distance to resources or to other people. Behind the pioneers lay the territories of their birth, their families of origin, the familiar terrain of their myths. Ahead lay lands known only from adventurous forays, uninhabited by people and thus unmapped except for the information scouts had established in anticipation of the move [Dincauze 1993:52].

The dynamic environments of the Northeast in the eleventh millennium, with their strong seasonality, Younger Dryas climatic reversal, and ecotonal shifts, should have evoked unique adaptive strategies from pioneers. Thus, the absence of sites comparable to these in other parts of the continent may reflect lower levels of environmental contrast and uncertainty for pioneers expanding their ranges. We should expect some pioneer aggregation sites near the ecotone between prairie and forest, but I know of none in Wisconsin, Iowa, or similar places.

Among their many advantages, human
aggregations establish conditions in which high-risk activities may be mitigated by the support available from other members of the group, who benefit in turn from the information gained by risk-takers. Margaret Conkey’s (1980) discussion of risk abatement in Paleolithic aggregations suggests how appropriate such behavior would have been for pioneers, even if they never again in their lifetimes congregated in such high densities. The duration of aggregations would be limited ultimately by available resources, but there would be a premium on relatively long-term residence in one place while the hinterlands were scouted and evaluated. Long-term, in the late Pleistocene, might mean only a few months. The duration could be extended by initiating settlement in late spring, as bird and fish migrations peak, and continuing into the summer or even later in hospitable environments. For foragers, such relatively long duration of residence would mean verging toward a so-called "logistical" strategy of
resource collection at central places (Binford 1980): bringing resources from many places to a central camp for use. At the settlement this behavior would result in diverse activities, and thus diverse archaeological remains. In the absence of evidence for storage facilities at the big sites, there is nothing to indicate that such collecting strategies were of more than seasonal duration.

The collecting strategies posited for marshalling sites could not likely be maintained in the dynamic, uncertain environments of the latest Pleistocene. The basic economic unit for northeastern Paleoindians was likely the extended family, utilizing small, dispersed residential sites. After the initial aggregation, people probably dispersed to family ranges, moving as foragers from small site to small site. Family ranges were likely to be finite so that they abutted others, as was required by the need to maintain effective contacts with social support networks. The frequent moves of forager mobility patterns seem appropriate norms for the family bands, and suit well the typical small Paleoindian sites that are seen all over the Northeast. Some of the small sites were apparently repeatedly visited (e.g., Michaud); others may have seen more than one family group involved at a time. Because thin population densities require considerable effort from people to maintain information and mating networks, small aggregations for information exchange might be expected. But if so, small aggregation sites should be fairly numerous (annual or semi-annual gatherings), increasingly more closely spaced, and located near crucial raw materials such as quarries, food, and water. They should also show some diversity in technostylistic attributes of artifacts, be of different sizes because of varying personnel, and occur at landscape nodes to facilitate planning. In other words, they should resemble Lindenmeier.

In order to understand this better, I ask that you place yourself among Paleoindian people settled in the Ohio-Kentucky area among excellent chert sources and diverse cool-temperate flora and fauna. The population density was relatively low and resource stress was negligible. Nevertheless, at some point a restless subset of the population decided to move out beyond the established ranges. Young adults burdened with few children, who were in the best position to move into the unknown, decided to explore opportunities; scouts went out, collected information, and reported back. Leaders enlisted personnel from several family sets and planned a move. Responding to the scouts’ concerns about the relative scarcity of good lithic sources to the east and north, the volunteers first provisioned themselves with several months’ supply of raw material in portable forms. In the spring they moved out to the campsite selected by scouts, probably chosen for its diverse and dependable resources. They traveled relatively lightly burdened, carrying basic equipment and essential lithic raw materials, intending to spend time and effort equipping themselves more fully during the warm months to come. Their mobility was unhindered by either socially defined space or other resident people (cf. Anthony 1990:12). They settled into the base camp and sent out scouting parties in all directions to evaluate resources and habitats. During the summer months of relative abundance they maintained themselves, collected resources, and prepared equipment for winter family camps. They established a referential vocabulary for mental maps of the region around them. By the end of the summer they were ready to disperse into family ranges for winter and the following years. The family ranges would have been extensive and diverse enough to support small groups exploiting the resources within them and sharing information with neighbors during
regular resource-collecting moves. The expedition group of pioneers need never again aggregate on the original terms.

This scenario is not dependent on any particular view of Paleoindian demographics. I personally favor the likelihood that Paleoindian mobility was the only significant constraint on birth rate, although I don’t know how that translates into numbers in any particular area of the continent. I accept that populations derived from Eurasia benefitted from reduced sickness after successfully passing the arctic filter, losing thereby many parasitic and endemic diseases. Paleoindian technology was demonstrably adequate to the demands of North American resources. Many modelers have assumed a relatively rapid population expansion, rather than resource scarcity, driving people quickly across the continent (e.g., Beaton 1991; Mosimann and Martin 1975). The potential for rapid growth of a thin, dispersed population free from resource competition, territorial limitations, or infectious diseases leaves open the possibility of a short chronology for Paleoindian dispersal across the continent, well within a millennium of first entry. (Recent developments in radiocarbon calibration may soon force a reconsideration of this conclusion, by imposing a longer chronology.)

IMPLICATIONS OF THE PIONEERING MODEL

Each large site resulting from behavior as modeled here should have assemblages dominated by stone from the direction of origin and transported in biface form as a result of intentional provisioning. Lithics should derive from one direction or one source near the previous occupation area, generally west or south. This condition is met in the Northeast, but not exclusively in the largest sites; some small sites also show the same provisioning behavior. A marshalling site should be located on or near a major biological or physiographic ecotone if the leaders were maximizing resource quantity and diversity for the long stay. Bull Brook, Debert, Vail, and probably Gainey are so located, and the others may be. Marshalling sites should be located at significantly large distances from any other such sites, as these seem to be. Tool refuse should display high diversity, such as would result from an extended stay. Each site should have been used collectively only once, so that cluster overlaps are rare to absent. The activity areas in each site should be not only spatially distinct, but also mostly repetitious in inventory and functions. They should represent many residential activities. The most highly styled artifacts, the fluted points, should be the earliest in each area, stylistically consistent within the site, and contrastive in some particulars with those normal in other areas.

The seven characteristics of the large sites that I presented to justify the integrity of the set meet the implications of this model. However, it would be tautological to claim that they support the model, since they have partly defined it. Here, I simply recapitulate for a preliminary evaluation of the model’s reality and testability.

(1) The requirement that marshalling sites be widely spaced is met; this set shows only one for each state-sized area. We may be missing one in New York. New discoveries at closer intervals will weaken the case made here.

(2) The argument requires that the number of large sites known not increase dramatically as data accumulate. This asserts that the information at hand now is not seriously underrepresented, with the exception noted for New York. Again, discovery of more large
sites will weaken the case.

(3) For me, it is especially telling that these largest sites each have the earliest point style in their respective areas. Small sites in the several areas have a variety of styles, early and later, although the different styles are rarely found together. To test these suggestions, thorough analyses of technological and stylistic variation in northeastern Paleoindian artifacts are needed.

(4) Marshalling sites of pioneers, as distinguished from aggregation for other reasons, will necessarily have a restricted variety of lithic materials predominantly from distant sources in single directions, most likely radial directions from the central Midwest. This is because the exploration that would reveal local lithic resources was undertaken only after occupation of the marshalling site by people who brought provisions with them. On the basis of this criterion, the Vail site may ultimately fall out of this set, since it may have major amounts of lithic materials from both west and north. Further progress on this issue will require more precise lithic sourcing studies.

(5) If the activity areas within each site were used at the same time, each artifact cluster on marshalling sites should be spatially discrete. This condition is met on all the sites with the possible exception of the smallest two--Gainey and Vail; each of these has one apparently double cluster. Cross-matches of broken artifacts show at least pairs of loci to be synchronous at Vail, Nobles Pond, and Bull Brook; more such studies are needed (Gramly 1982; Seeman 1994; Grimes 1979).

(6) Within marshalling sites the artifacts should be of more different functional kinds than at smaller sites, because of the longer duration of occupation (Spiess 1984), the logistical strategies employed (Shott 1989), the high local population density, and the diverse risk-reducing behaviors characteristic of them (Conkey 1980; Wilmsen 1973). If reasonably comparable information becomes available for both large and small northeastern sites, this criterion should prove a strong test of expectations.

(7) Within large marshalling sites artifact styles should be much more similar within each class than those observed in samples of equivalent size compiled from smaller sites beyond. This derives from the expectations that the founding group was relatively homogeneous socially and that the site was occupied for a single span of time, probably less than a full year. To the extent that site reports and artifact studies address this issue for the sites considered, the criterion holds. The episodic founder effect--a distinct style introduced to each new territory--could explain the many sub-regional differences in fluted point styles that are being noticed in the eastern Paleoindian record.

CONCLUSIONS

Beginnings have their own dynamics. Paleoindian settlement patterns and economic strategies should exhibit considerable diversity in the Northeast and across the American continents. Differences between the first explorers and their successor generations should be especially well marked in the range of site types and in the specialization of tool kits. Instantaneous establishment of fully developed adaptive strategies is highly unlikely. Therefore, the expectation is for evidence of experimentation and even occasional failure. The model for pioneering aggregation suggested here distinguishes the largest sites from the more numerous smaller ones; it also separates the earliest sites from those formed later. It hypothesizes a set of behaviors appropriate for high-risk environmental and social conditions never seen again. If archaeologists are ever to find evi-
dence of innovation, risk-taking, and shortlived, imperfectly successful adaptive strategies, they must seek them among the Paleoindian sites of North America where, once upon a time, everything was new.

Acknowledgements: This report is a lightly modified version of a talk given to the MAS at the Spring Meeting in Greenfield, 1994. That was in turn derived from a 1993 published chapter, where the argument is more fully presented and referenced (Dincauze 1993).

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This paper will trace the genealogy of the Massachusetts sachem, Chickataubut, to the present. The Native American group called the Massachusetts occupied the coastal plain of southeastern Massachusetts from Salem and possibly the Merrimac River on the north, southward to Duxbury and inland to Concord and Bridgewater. This domain included the site of Boston, the basins of the Charles, Neponset, and North Rivers, and the Mattakesetts Ponds of Pembroke. Prior to the plague of 1617, the number of inhabitants has been estimated at about three thousand. A few hundred, at best, survived this decimation (Bureau of American Ethnology 1907:816,817). The Pokanokets just southwest of the Massachusetts suffered also, and probably for mutual protection a weak alliance seems to have existed thereafter with the Pokanoket sachem Ousamequin (Massasoit) at its head.

Though it may not be exactly a parallel designation to equate the local Indian sachemry with European royalty, the early English saw here what they described as a caste system and baronial form of land tenure (T. Mayhew in Banks 1911, vol. I:38,39; Speck 1928:16). There is also evidence that a form of royalty was recognized and revered and that family dynasties, long established, following patriarchal blood lines, were common and could include women in certain circumstances. There were three principal sachemships and seven dukedoms of the Massachusetts. The southern third of this territory was ruled by the descendancy treated here. Because of its importance and long tenure, we identify the Massachusetts sachem called Chickataubut, or Thankful Fire, and his subsequent descendancy as the last royal dynasty of the Massachusetts.

The genealogical record presented here is more complete than ever before published. It includes a ten generation genealogical chart, many formerly unpublished documents and photos, and even some archaeological recoveries (Gardner 1962,1987).

Many are the fanciful, romanticized legends relating to this descendancy, but none can match the documented historical record presented here. The earliest record of the Massachusetts sachem, Chickataubut, is his signing of the Treaty of Amity with Plymouth in September, 1621. This remarkable document was signed by eight other sachems representing Pokanoket, Massachusetts, Nauset, Nipmuck, and Noe-pe, or Martha's Vineyard. The principal signer was Ousamequin, sachem of Pokanoket. Of special significance is the portion of that treaty which stated: "and all this by friendly usage, love and peace, just and honest carriage, good council, and so forth" (Morton 1669). By these words, the Indians indicated a sharing of their country with the newcomers, not a giving up of all use and rights to their lands forever.

It was Chickataubut who treated with John Winthrop to found the Colony of Massachusetts Bay at Boston. From 1631 Winthrop mentions him frequently in his journal (Hosmer 1908). He records that Chickataubut refused to eat with him until he had said grace, and desired a suit of English clothes from Winthrop's tailor (Hosmer 1908). The suit was supplied...
but the sachem did not long enjoy it, for he was dead by November of 1633, and suspicion has lingered that mortal germs of smallpox may have accompanied the gift suit of clothes (Bryant 1823-1878).

Chickataubut is believed to have maintained a wigwam at both Moswetuset in Squantum and at Titticut on the Taunton River at the present Bridgewater-Middleboro line (Speck 1928:40). His descendants are indicated in Figure 1. His wife, whose name is unknown, was given a Christian burial by one John Leavitt of Hingham, for which her son Josias (or Josiah) Wampatuck, or White Deer, gave Leavitt’s son Josiah ten acres at Turkey Hill (Bryant 1912). Curiously, it seems that Chickataubut and his wife were inclined toward acceptance of English customs and the trappings of Christianity long before the advent of John Eliot, the missionary.

With the selling away of the lands about Boston and Braintree southward (Speck 1928:97), Josias Wampatuck removed about 1647 to the Mattakeesett Ponds and planting fields of Pembroke, Figure 2, building his wigwam on the point of land on Furnace Pond, thereafter called Sachem’s Point. In 1662 he sold a tract to Josiah Winslow of Marshfield, "... provided that it include not the Thousand Acres given to my son and George Wampy" (Plymouth Colony Deeds 4:138). This lay in the present Pembroke and Hanson. In 1664 he deeded lands along the Taunton river called Cotunticut, a three mile long parcel (Plymouth Colony Records 1:235,236). On August 16, 1664 he and his wife sold land (the "Little Lot Mens Purchase") at Nemasket (Weston 1906).

In the year 1669 Wampatuck led a contingent to the Mohawk War, where he lost his life. On August 7, 1673, Sachamus of Satucket testified before the General Court about what he heard Josias say regarding some land given to Charles Pompumunit, "...before he went to the Moquus Country, from which place he returned no more" (Bryant 1912:15; Hubbard 1851). His children, Charles Josiah and Abigail, speak of "Namumpam, our mother" (Winslow Papers 1668; Bryant 1912:15). In the 1664 Little Lot Mens Purchase, Wampatuck’s wife is called Wachtamaske, Squaw Sachem of Nemasket, a title meaning "she who has a husband" (Weston 1906).

Josias Wampatuck’s daughter Abigail married Jeremiah Momentaug of Punkapaug, which was a plantation of 6000 acres. In 1685 Robert Momentaug, as proprietor of Punkapaug, testified that he was "...formerly of the council of Josiah Wampatuck the sachem," who in 1667 had confirmed the deed of Punkapaug Plantation unto Momentaug (Bryant 1912:15). In 1748 Isaac Royall and others of Stoughton testified that the Momentaugs were "an ancient family allied by marriage to King Josiah’s family" (Pattee 1878:48). From 1693 Jeremiah and Abigail sold off portions of her ancestral lands, first from the Thousand Acres about the Ponds, then in 1704 the one hundred acres at Poor Meadows that was retained by Wampatuck from the 1649-50 Bridgewater Purchase settlement (Litchfield 1909: 110). Their wigwam stood just west of Nobottom Pond (Fig. 2), said to have been created by the earthquake of 1755 (Bryant 1912:15). In 1713 Judge Samuel Sewall visited them there, in his words, "at a pleasant situation by the great ponds" (Bryant 1912:15).

The daughter of Jeremiah and Abigail Momentaug was Queen Patience, also called Skuup and Kewop (Tillson Papers 1985; Smith 1912). She had her cabin close by Queen’s Brook near Furnace Pond (Fig. 2) on the remaining 20 acres of the Thousand Acres, which were reduced to seven acres by the year of her death in 1788. She married at least three times; first Tobias Comes, second Joseph Thomas of Titticut, and third a Quason, probably from the
Figure 1. A Ten Generation Lineal Genealogy of the Family of the Sachem Wampatuck.

1st Generation
- Chickataubut, d. 1633
- Kitchamkin of Ponkapog
- Cato of Concord

2nd Gen.
- Josias Wampatuck, d. 1669
  - Wife: Namumpam (Wachtamaske)
- George Wampy
- Daniel Sachem Scummuck

3rd Gen.
- Abigail m. Jeremiah Momentaug of Punkapog
  - Charles Josiah

4th Gen.
- Patience Kewop or Skuup
  - m. [1st Tobias Coomes]
  - m. [2nd Joseph Peter, alias Thomas, of Titticut]
  - m. 3rd a Quason of Cape Cod

5th Gen.
- Abigail Quason, d. 1788
  - m. 1st Peter Brand
  - m. (1756) 2nd Richard Osgood

6th Gen.
- Caleb Brand (alias Comes) m. 1729 Damaris James
  - Violet m. 1786
  - Dinah m. 1788
  - Sukey or Susannah Osgood d. 1835
  - Puffer Loudon m. Richard Hite 1786
  - Joseph Warrick (Hoyitt or Hyatt)

7th Gen.
- James Brand 1732-1761 m. Deborah
  - Caleb
  - Peter
  - Joshua
  - Jane Hoyitt 1787-1878
  - Joseph Williams Hoyitt 1805-1884
    - m. Abigail Chummucks 1809-1894, m: 1840

8th Gen.
- James Brand 1754-1793
  - m. 1st Hannah Ned 1782
  - m. 2nd Betty Sepit in Plymouth 1785
- Isaiah J. Hoyitt 1839-1866
- Joseph Williams Hoyitt 1842-1884
- Susan Jane Hoyitt 1845-1912; m. Parker
- Warren P. Hoyitt (Wampy), b. 1857
- Henry Clay Hoyitt 1848-1916
  - m. Sophie Peterson

(to next page)
Figure 2. Map showing approximate sites of wigwams (Bryant 1823-78), cabins, and/or houses in Pembroke, MA, on an enlarged section of a 1879 Map of Pembroke, MA.
1. Josias Wampatuck wigwam
2. Jeremiah and Abigail Momentaug wigwam
3. Queen Patience Quason wigwam
4. Abigail (Quason) Brand Osgood wigwam
5. Joseph Williams Hyatt cabin (see Fig.4).
6. Susan Jane (Hyatt) Parker’s house
x: wigwams
Cape Cod family of Mattaquason, the sachem of Monomoyick (Plymouth Colony Records 5:174,207,223). By Quason she had a daughter, Abigail (Fig. 2), who married twice. Her first marriage to Peter Brand, resulted in a descendancy of but four generations. The second marriage was to Richard Osgood, a servant of Thomas Josselyn, on September 9, 1756. Their daughter Susannah, or Suky as she was called, married Richard Hite in 1786 and lived in a cabin on the Josselyn place (Fig. 2) at Pembroke Center (Pembroke Vital Records; Pembroke Maps from 1830). The name was spelled Hoyitt or Hyatt by the family.

Their son Joseph Williams Hoyitt married Abigail Chummucks, Figure 3, a Mashpee, in 1840, and built their cabin, Figure 4, on the westerly side of Hobomock Pond (Fig. 2). Joseph’s sister Jane, who never married, remained with Suky until their cabin burned down (R. H. Gardner, oral tradition). From this generation the family was listed as Mattakeesetts in the State Report of Indians in the Commonwealth by Commissioner John Milton Earle, who described them as "capable, intelligent, and moral" (Earle 1861). Joseph Hoyitt is said to have refused to pay his highway tax, which he considered an unfair tax on a native, thereby forcing him to work it out on the town roads. Evidently he was very aware of his heritage.

The Hoyitt-Hyatt family Bible (1871), now in the author’s possession, was a gift from the family. From this original source the remaining record of this remarkable descendancy is excerpted. The earliest date therein is the birth of Jane Hoyitt on July 27, 1787. This is the same Jane who...
Figure 4. The Joseph W. Hoyitt cabin at Hobomock Pond, Pembroke, MA, c. 1890, with Henry Clay Hoyitt/Hyatt sitting on the doorstep (R. H. Gardner collection).

had remained with her mother, Suky. Suky, called "Suky Joslyn, colored woman" (Pembroke Vital Records), died December 2, 1835. Pembroke almshouse records reveal that these women supplied home-made washing soap to that facility for many years. Jane died November 12, 1878, aged 91 years, 3 months, 15 days. Thus this record was kept during her lifetime.

Suky’s son, Joseph Williams Hoyitt, Sr., born April 4, 1805 and died November 8, 1884, aged 79 years, 6 months, 11 days, and his wife Abigail, born 1809 and died September 29, 1894, aged 85 years, 5 months, 24 days, had altogether five children. Isaiah J. Hoyitt was born December 7, 1839, and died May 12, 1866 aged 26 years, 5 months, 5 days; Joseph W. Hoyitt, Jr., was born February 8, 1842 and died November 29, 1884, aged 42 years, 9 months, 21 days; Susan Jane Hoyitt was born February 22, 1845, married a negro servant of Captain Little named Parker, had no children, and died August 9, 1912, aged 67 years, 6 months, 14 days; Henry Clay Hoyitt (Fig. 4), Figure 5, was born March 1, 1848, married Abigail Sophia Peterson, date unknown, and had one child Abigail Sophia, Figure 6, born August 2, 1904. Henry Clay Hoyitt was noted locally for his expertise in the digging of cellars and slaughtering, all of which he accomplished barefoot. He and his then nine year old daughter represented the last of the Mattakeesetts on a float in the Pembroke 200th Anniversary parade in 1912. This was repeated by daughter Abby on a similar Pembroke Historical Society float in Pembroke’s 250th Anniversary parade in 1962. The last child of Joseph Williams Hoyitt, Sr., and Abigail was Warren P. Hoyitt, born March 3, 1857. He was nicknamed Wampy, doubtless for his ancestor Wampatuck,
and is recalled as always wearing white gloves to church services.

Henry Clay Hoyitt died April 9, 1916, aged 68 years, 1 month, 19 days, and his wife remarried a Charles Leslie Moore of Hanson, MA. Moore’s ancestor Theodosius Moore had purchased the Poor Meadows from Jeremiah and Abigail Momentaug in 1704. Henry Clay Hoyitt’s daughter Abigail Sophie Hyatt (Fig. 6), though unmarried, at the age of nineteen gave birth to a son, William Carl Hyatt (Fig. 7), on February 4, 1925. He was placed by the state with a family named Jones, but all attempts to trace him have been unsuccessful. Thus he remains the last known descendant of the Dynasty of the Massachusetts, from Chickataubut and Wampatuck. His mother Abby later in life married a man named Ash. Widowed, she lived for a time with the author’s family, and in 1961 accompanied him in a lecture at the Bronson Museum of the Massachusetts Archaeological Society in Attleboro, MA. She died on Thanksgiving Day of 1969 at Monponsett Pond, Halifax, MA.

In the 1960’s as they were threatened with imminent destruction by development, the author investigated, photographed, and in a limited way excavated all three cabin sites: Queen Patience’s, Abigail (Quason) Brand Hoyitt’s, and Joseph Williams Hoyitt’s. At that time only the cellar holes and Sukey’s pear tree remained. No artifacts were found at the Queen’s site. At the Quason-Brand-Hoyitt site, fragments of blue and white chinaware, broken kaolin pipes, and a large amount of molten window glass was in evidence, a strong indication that the cabin had burned. The Joseph Williams Hoyitt site produced but a single dinner fork. All these items were given to the Pembroke Historical Society. Subsequently, these sites have all been destroyed by housing development.

The author of this paper offers a final comment in regard to the importance and special nature of the material herein. Two principal native leaders dealt with the first European colonists in Massachusetts: Ousamequin, Massasoit of the Wampanoag, and Chickataubut, Sachem of the Massachusetts. Their sons had a profound influence on the establishment of these first settlements and thus the initial beginnings of the United States of America as we know it. They were the Washingtons and Lincolns of their people and their age, and their lineages are every bit as important to history, and of interest to us today. This remarkable record of descendancy from the Royal Dynasty of the Massachusetts deserves to take its proper place in the annals of our native
Indian history and genealogy. It also illustrates the important interdependence of the disciplines of history, genealogy, anthropology, and archaeology in interpreting this type of material. May this contribution serve to preserve this precious legacy.

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Bureau of American Ethnology
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 57:749-770 (1992). Radiocarbon ages should be reported as radiocarbon years ± sigma B.P. Please state whether δ13C-corrected (give δ13C) or uncorrected and what material was assayed. If you calibrate ages, please cite source of calibration. Authors with MAC and IBM-PC compatibles are encouraged to mail floppy disks with files in WordPerfect 5.1 or ASCII to the editor. High density disks are preferred and disks can be returned. Additional instructions for authors may be found in the Bulletin of the Massachusetts Archaeological Society 55(2):26 (1994).
 ROLE OF THE SHARK IN SOUTHERN NEW ENGLAND’S PREHISTORY: DEITY OR DINNER? 

Brent M. Handley

This research shows that different shark species occupied different roles in the southern New England region during prehistoric times. Four species have been recovered in shell refuse deposits, while only two species have had their teeth identified as a grave good. This differentiation of shark species, as well as body part, could be an indicator for subsistence as well as ceremonial use in southern New England.

INTRODUCTION

The questions I ask in this paper are: what was the role of the shark in the cognitive landscape of prehistoric southern New England? Was this predator caught for food, a source of raw material, or was the very act of catching the shark symbolic to the cultures of coastal New England? The concept of cognitive landscape, which is applied in this research, is the perception of the surrounding environment by native peoples.

The idea for this paper started with our unexpected discovery of shark remains on an archaeological project conducted by The Public Archaeology Laboratory, Inc. The discovery inspired us to go back and research faunal assemblages from other projects, those ongoing as well as those already completed. The result is a laundry list of sites with a small, but impressive, list of sharks represented in these sites.

The paper will proceed first with a brief description of techniques used in the identification of sharks, as well as the type of remains that survive. Secondly, a discussion of the sites that have had shark remains will follow. This will include the cultural tradition and the species of shark that occurred.

Hunting strategies, the uses of sharks, as well as a discussion on how Native Americans may have viewed sharks in southern New England will conclude this analysis. The result will hopefully shed light on a subject that has had little attention in this region.

IDENTIFICATION OF SHARK REMAINS

Primary research into the identification of shark remains from archaeological sites has been carried out by Laura Kozuch and Cherry Fitzgerald in Florida (1989). They have defined ways of identifying shark centra, the calcified central portions of the vertebrae, from archaeological sites, and set the ground work for this research in the Northeast.

Since sharks are a cartilaginous fish, it has been thought that some species do not have any hard parts that would survive in the archaeological record (Andrews 1986:44). However, teeth, vertebral centra, and dermal denticles, which are bony protrusions on the skin, have been recovered (Kozuch and Fitzgerald 1989). Dorsal spines from the Spiny Dogfish have also occurred in sites (Leveillee and Harrison, personal communication 1994).

Individual sharks can have up to several hundred teeth positioned in a conveyor belt
Figure 1. L to R, upper and lower teeth from the Great White, Sand Tiger, Shortfin Mako, Tiger Shark, and the Spiny Dogfish.

Figure 2. Example of septate (left) and aseptate (right) centra from the Sand Tiger and Dusky Sharks.

...fashion. Different species of sharks have different types of teeth, which are an adaptation to specific predatory life-styles (see Figure 1). Dermal denticles vary interspecifically and are generally recovered in light fractions of flotation samples due to their small size. Dorsal spines are upward projections off of the dorsal surface of the shark in front of the two dorsal fins.

The identification of species using the vertebral centra calls for a high degree of caution because of minor variations within families that are a possible source of misidentification. Centra are the most frequently occurring and most easily overlooked remains. Centra are identified as to genus and species (Figure 2) through measurements that include the cranio-caudal length, medio-lateral breadth, and dorso-ventral height. The determination of septae opposed to aseptae centra, the shape of the foramina, as well as the presence, or absence, of pores are also used in the identification process (Kozuch and Fitzgerald 1989).

PHYSICAL EVIDENCE

Seven major species of shark have been identified from the archaeological record of the Northeast to date, six of them identified from southern New England sites (Table 1; Figure 3). These include the Spiny Dogfish (Squalus acanthias), Smooth Dogfish (Mustelus canis), Sand Tiger Shark (Odontaspis taurus), Dusky Shark (Carcharhinus obscurus), Blue Shark (Prionace glauca), Shortfin Mako Shark (Isurus oxyrhynchus), and the Great White Shark (Carcharodon carcharias). This list makes up less than half of the available shark species in New England at present time (Boschung 1993).

The Spiny Dogfish, Smooth Dogfish and the Dusky have been identified from vertebral centras. The Sand Tiger shark is the only species in this region to have had centra and teeth recovered, while the Blue, the Shortfin Mako, and the Great White have been identified only by their teeth. The pattern of the remains showed species preference, availability, and significance throughout prehistory. This was determined by cultural tradition, and distributions of the remains within sites.

Five out of the seven shark species that have been identified to date are represented in the Middle to Late Woodland traditions. This information comes from three Rhode Island sites in the Narragansett Bay region, including Lambert Farm, Hoskins Park, and Peckham...
Table 1. Southern New England sites with shark remains, organized by cultural tradition.

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<td>Hoskins Park</td>
<td>CENTRA</td>
<td>SAND TIGER</td>
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<td>SHELL FEATURE</td>
</tr>
<tr>
<td>(RI 1007)</td>
<td></td>
<td>DOGFISH</td>
<td></td>
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<tr>
<td>Lambert Farm</td>
<td>TEETH, CENTRA</td>
<td>SAND TIGER</td>
<td>LATE WOODLAND</td>
<td>SHELL FEATURE</td>
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<tr>
<td>(RI 269)</td>
<td></td>
<td>DOGFISH</td>
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<tr>
<td>Peckham Farm</td>
<td>TEETH, SPINE,</td>
<td>SAND TIGER</td>
<td>LATE WOODLAND</td>
<td>SHELL FEATURE</td>
</tr>
<tr>
<td></td>
<td>CENTRA</td>
<td>DUSKY DOGFISH</td>
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<td></td>
</tr>
<tr>
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<td>SHORTFIN</td>
<td>MID TO LATE WOODLAND</td>
<td>BURIAL</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>TOOTH</td>
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<td>GREAT WHITE</td>
<td>UNCERTAIN</td>
<td>BURIAL</td>
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<tr>
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<td>GREAT WHITE</td>
<td>UNCERTAIN</td>
<td>BURIAL</td>
</tr>
<tr>
<td>South Windsor</td>
<td>TOOTH</td>
<td>GREAT WHITE</td>
<td>UNCERTAIN</td>
<td>NO PROVENIENCE</td>
</tr>
<tr>
<td>Southington</td>
<td>TOOTH</td>
<td>GREAT WHITE</td>
<td>UNCERTAIN</td>
<td>NO PROVENIENCE</td>
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Farm (Kerber 1994; A. Leveillee and B. Harrison, personal communication 1994; Leveillee and Van Coughyen 1990). Four Massachusetts sites have also yielded shark remains including the Taylor Hill site located on Cape Cod, Ram Pasture, Quaise and Quidnet sites on Nantucket (Torrey and Bullen 1946; Medaglia, Little, and Schoeninger 1990; Carlson 1990).

Upon the second examination of the Lambert Farm faunal assemblage we discovered several teeth and vertebral centra of the Sand Tiger Shark. The same species was identified at the Ram Pasture and Hoskins Park sites, but for the latter, a greater number and the possible addition of the Smooth and Spiny Dogfish centra were recovered. The Spiny Dogfish was the only species of shark recovered from the Nantucket sites of Quaise and Quidnet. The Peckham Farm site revealed a larger variety of shark species. These include the Spiny Dogfish, Smooth Dogfish, Sand Tiger Shark, and the Dusky Shark. All of these sites are recognized as Late Woodland, and all the remains were located in shell features.

The Taylor Hill site, located in Wellfleet, Massachusetts, was designated as a Mid-
Figure 3. Southern New England sites that have yielded shark remains.

Figure 3. Southern New England sites that have yielded shark remains.

1. South Windsor
2. Southington
3. Joyner
4. Hoskins Park
5. Lambert Farm
6. Burr's Hill
7. Peckham Farm
8. Seaver Farm
9. Titicut
10. Taylor Hill
11. Ram Pasture
12. Quaine
13. Quidnet
in a shell feature (A. Leveillee, personal communication 1994). This feature is thought to be Late Archaic due to an associated small stem projectile point. Two other teeth were recovered in Southington, and South Windsor, Connecticut (N. Ballentoni, personal communication 1994). These sites are inland, and as at the burial sites, no proveniences were assignable to the teeth.

Another cultural tradition that has yielded Great White shark remains during excavation is the Hopewell culture (Griffin 1952). A site in Ohio contained perforated Great White teeth in burials, indicating long distance trading from coastal regions to the mid-west.

Sharks do not seem to be represented in effigy form. The only abstract representation of a shark found in southern New England is a ground stone artifact in the shape of a Great White Shark tooth. No provenience was determined for this find from the Noris Bull collection recovered in South Windsor, Connecticut (N. Ballentoni, personal communication 1994). The first impression of this artifact is that of a Great White’s tooth ground into a projectile point, and then burnt. However, upon closer analysis slate becomes a possible material identification.

HUNTING SHARKS

Due to the recovery of shark remains in archaeological sites it can be surmised that some sort of hunting of sharks occurred in prehistoric times. Hunting as opposed to scavenging is suggested because of the shark’s peculiarity of sinking upon death (Budker 1971:29; Kozuch and Fitzgerald 1989:147). This would limit the possibility of remains washing ashore.

According to a shark fishing-tackle guide, a 15-20 foot (4 to 6 m) stainless steel leader of 3/64 inch (~ .5 cm) wire is needed to successfully catch a shark. However, research conducted in Florida and the Pacific Ocean showed that the more practical prehistoric hunters used bait, hooks, nooses, and rattles along with canoes or outriggers (Kozuch 1993). Research conducted in the Northeast on hunting swordfish has suggested the use of toggle harpoons lashed to floats and small canoes (Strauss 1987). It is possible that Native Americans incorporated similar techniques in their shark hunting technology.

USES OF SHARKS

There are four products from the shark that can be used: the skin, flesh, liver, and teeth. The skin, or hide, has long been noted for its abrasive quality, which results from thousands of tiny placoid scales, or dermal denticles, embedded in the skin. This is a sandpaper-like product called shagreen and may have been used to smooth arrow shafts or other wood tools or ornaments (Kozuch 1993).

Shark flesh has recently been shown to have antibiotic properties that help protect people from disease. The antibiotic squalamine has been found in Spiny Dogfish tissue, and is said to contribute to the shark’s hardiness (Glausiuz 1994). Archaeologically, Dogfish has been found in many refuse deposits in the Northeast. It appears to be one of the most widely caught species of fish.

The liver of the shark is rich in oil, vitamins A and D. While Native Americans may not have known or been concerned with vitamins, this is weighed against the fact that they did know about oils and greases. These were used in cooking and were rubbed onto the skin and hair for personal adornment. This was noted by almost all contact period observers including Verrazano, Hudson, and Cabot. Oil protects the skin against the cold and wet weather of the north (Smith 1960). The liver oil from the Spiny Dogfish was also used as fuel for lamps (Speck and Dexter 1948).

Shark teeth were of major importance to native peoples. The teeth could have been set into wood and used as tools, as was observed among Native Americans in Florida and the Caribbean
(Kozuch and Fitzgerald 1989:146; Kozuch 1993:32). Also the possible use of larger teeth as projectile points has been raised (Taylor 1970:7). Teeth could also be drilled to be hung on clothing or around the neck, or be sewn on clothing as decoration with no modification (Tuck 1976; Griffin 1952: fig.33).

Teeth used as trading goods have also been researched. Not only to Ohio as already mentioned, but to the Fort Center site in Florida, Sand Tiger and Bull Shark teeth were presumably traded inland (Kozuch 1993). This activity implies the use of shark teeth as a commodity. Fossilized shark teeth have been discovered in Connecticut, and on Martha’s Vineyard where a local source is thought to exist (Ballentoni, personal communication 1994; Waters 1962).

A suggestion for bone bead manufacturing from centra of large bony fish has also been researched (Eteson 1982). These ornaments are described as having "peripheral grinding and central perforation," but that also describes the vertebral centra of sharks with no modification. I do not dispute these findings, but suggest a possible alternative.

**COGNITIVE ASPECTS**

An outcome of this research is the finding that sharks in the archaeological record are, more than just a food resource, a totemic figure. To demonstrate this several theories on the development of totemism will be applied. Malinowski’s work on the position of the totem among prehistoric peoples seems applicable to what we see as the possible totemic aspects of sharks. To Malinowski, the creation of totems is related to stress and anxiety felt by people over their food resources. "The species pursued form the nucleus around which interests, emotions and the impulses of the tribe crystallize" (Malinowski 1954:45). Animals were seen by societies as the link between themselves and the natural world in which they lived and were affected. This concept of linkage becomes more apparent when discussing the use of sea resources, resources belonging to a vast, but stratified, landscape in which sharks dominate the natural order. Sharks may have been essential in accessing the "power" of the ocean. With the ritual control of the shark came a certain control over nature. Radcliffe-Brown formulated a more danger-centered hypothesis for the origin of totemism. Magic and ritual would give a sense of confidence to a person in the face of real or imagined danger (Strauss 1987:125).

The shark was undoubtedly a source of real danger, and surrounded sea foragers in the exploitation of their environment. Extending this into the prehistoric past, a group of people who were exploiting marine resources must have come in contact with dangerous animals, such as the shark, when fishing. This may have resulted in the desire to specifically hunt for sharks as is done among many Pacific islands (Kozuch 1993).

Strauss applies the concept of developing magic and rituals in response to dangerous activities. Among prehistoric peoples, especially those of the Maritime Archaic culture in northern New England, swordfish were hunted by piloting a boat several miles into the open ocean and spearing them on the surface (1987). Strauss also states that swordfish move slower when surfacing allowing for an easier target, however still inspiring the taking of a trophy to signify the accomplishment of the task. For a swordfish this would be the Rostra, or sword, and in the case of the shark, its teeth.

**CONCLUSIONS**

This research has demonstrated several aspects in regard to shark remains. First is the existence of shark in the archaeological record, where previously it had been thought not to have survived. Secondly, and probably the most interesting, is the distribution of species in relation to its function.

What the distributions of shark remains may indicate is that different shark species occu-
pied different positions in the Native American cultures. Dogfish seems to have been primarily used for food and utilitarian purposes while all others, except the Great White, may have been used as food, a raw material source, as well as ceremonial media. The Great White, known from its occurrence primarily as a grave good, may have been held exclusively as a spiritual entity, which functioned in reinforcing the precarious and dangerous aspects of the sea as part of the cognitive landscape.

Faunal remains on archaeological sites have always been considered food resources. However, when applying native peoples’ perception of their surroundings, these resources might appear as more than just subsistence. In regards to the shark’s role in the culture, its tooth probably depicts its role in the landscape, or seascape, as a dangerous prey and predator.

A suggestion for further research would be to continue to identify shark remains with hopes of determining cultural affiliation especially for the Great White remains.

Acknowledgements: I would like to acknowledge the staff of The Public Archaeology Laboratory, Inc., Nick Ballentoni, Jim Bradley, and Marieta Head for their help and support. I would especially like to thank Jim Garman and Paul Russo for their help, as well as including this research in a cognitive landscape symposium at the 1994 NEAA conference. Also special thanks to Jason Barrett for the graphics, and to Craig S. Chartier for assisting with research, the NEAA presentation and identification.

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Reviewed by Barbara E. Luedtke

The Turner Farm site is a large (2,300 square meters), deep (up to 1.5 meters) stratified shell midden on North Haven Island in Penobscot Bay, Maine, excavated by Bruce Bourque primarily from 1971 through 1975. While a number of articles and preliminary reports have been written about this site, this book is the first major synthesis to be published. This appears to be an increasingly familiar trend in archaeology; big and complex archaeological sites simply take a long time to analyze and prepare for publication. Sometimes this delay also provides useful perspective, as a site’s significance may become clearer in the context of subsequent excavations at other sites. This is certainly true of Turner Farm, where the 398 square meters excavated produced a great deal of information of many kinds, some of which appeared anomalous in the early 1970s. A wide variety of technical analyses have been undertaken on Turner Farm materials in the years since, and Bourque’s synthesis of these studies and of data from numerous other Gulf of Maine sites results in a book that will surely give archaeologists in the Northeast much to think about.

The first three chapters of this book introduce the site and describe the excavation methods, which were similar to those used by William Ritchie for shell middens on Martha’s Vineyard. The site produced three clearly discernible Archaic occupations, and a chapter is devoted to each with descriptions of the stratigraphy, dating, lithic and bone artifacts, features, faunal remains, and activity patterning. Occupations of the Ceramic period (equivalent to the Woodland period in southern New England) were more difficult to separate vertically and horizontally, so they are discussed as a group in one chapter, with emphasis on changing trends through time. The last chapter is a stimulating discussion of the implications of this site for our understanding of the prehistory of Eastern North America. At the end of the book are a series of appendices, many by contributing specialists, which present useful information on shell midden volumes, radiocarbon dates, burial feature contents, charcoal identifications, the geoarchaeology of the area around the site, sources of the lithic materials used, analyses of the human burials, and analyses of faunal remains.

For many readers, the heart of the book will be the chapters on the Late Archaic components. The first and most limited of these was Occupation 1, which dates to about 5000 radiocarbon years BP. Though much of this occupation may have been lost to erosion, it still produced three features with some of earliest evidence in New England for use of marine resources, including shellfish, sea urchin, swordfish, and cod. The lithic tool assemblage consists primarily of Small Stemmed Points, which had not been reported previously from Maine.

Occupation 2 represents a habitation site of the Moorehead phase, formerly known primarily from burial sites (and colloquially referred to as the "Red Paint" people). This extensive occupation produced numerous features including hearths, cooking pits, trash pits, caches, and six dog burials. Artifacts included long, thick, narrow-stemmed points, numerous pecking stones, adzes and gouges, a wide variety of plummetts, and an extraordinary assemblage of bone tools including "bayonets," blades, barbed points, harpoons, beaver incisor tools, foreshafts, fish hooks, needles, a whistle, and a bird head effigy. This assemblage is a poignant reminder of how much of the rich
material culture of the Late Archaic has undoubtedly been lost to the acidity of our New England soils. Bourque makes a convincing case for a strong marine orientation, including exploitation of swordfish. In a later chapter he argues that the marine orientation, burial ceremonialism, and use of ground slate tools typical of the Moorehead phase developed locally from Middle Archaic antecedents, rather than having diffused from the north as others have previously suggested. He also believes this was a relatively short-lived phenomenon which developed about 4500 BP and ended around 3800 BP, partly as a result of climatic and ocean changes that caused warm-water species such as swordfish to disappear from the Gulf of Maine.

Occupation 3 relates to the Susquehanna tradition, and is unique in that it has both cemetery and habitation areas that are apparently contemporaneous. The habitation areas produced a wide range of stone tools, including several varieties of Broadpoints, and both faunal remains and human bone chemistry indicate less emphasis on marine resources than in the previous period. Bone tools are less abundant and varied than in Occupation 2, but many are well-made and decorated. Excavations in a small part of the cemetery area produced remains of 70 individuals showing a range of treatments including primary inhumation, secondary inhumation, and cremation, all with associated tools and faunal remains. Numerous radiocarbon dates suggest the site was used for a brief period from about 3,800 to 3,500 radiocarbon years BP. Bourque points out many similarities between Turner Farm and sites as far away as Indian Knoll in Kentucky and Stallings Island in South Carolina, and argues that the Susquehanna tradition in Maine represents a relatively short-lived intrusion of people from the south who then left the area, resulting in a brief hiatus before ceramic-using people arrived. He notes that such population movements may have occurred during later periods as well.

This book provides an enormous amount of fascinating data, but there are a few gaps. Quantities of debitage are not given, so it is impossible to know what role the manufacture of stone tools played at this site. Also, some interpretations as to diet and seasonality rest on data in unpublished reports, and are therefore not well supported here. For example, on the basis of the data presented here one could make an argument that Occupation 2 was primarily a winter camp with occasional visits other times of the year, rather than a year-round habitation as Bourque concludes. The former interpretation would also agree better with the quite specialized lithic assemblage reported here, which is overwhelmingly dominated by pecking stones, plummets, and stemmed points. There are also problems with the radiocarbon dates, though this is not Bourque's fault. A total of 57 dates were obtained from several different labs, one of which did not provide information on what component of the bone was dated, on carbon 13 correction, or apparently on sample preparation procedures, causing serious problems with the interpretations of the dates on shell and bone from that lab. The dates on charcoal are generally in good agreement, though, and the site chronology is primarily based on these.

At several points Bourque alludes to new types of analysis that have recently been initiated on Turner Farm materials, and it is clear that this site will continue to produce information even though no additional excavation is planned. In archaeology there is no such thing as "the last word" on a site. Our interpretations and conclusions shift and change continually in the light of new data or new ways of thinking about old data. This book demonstrates the diversity and complexity of Maine's past, and also the diversity and complexity of archaeological research itself. Not all New England archaeologists will agree with everything in this book, but it will surely have an important impact on our thinking, our discussions, and our writing for years to come.