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EDITOR'S NOTE

Two aspects of this issue of the Bulletin are new and require some explanation. The first is that all the articles focus around a particular topic, in this case the sites and material culture of the Late Archaic. In a way, this just happened. Several of the articles submitted for publication explored various aspects of the Late or Transitional Archaic and each seemed to provide additional information or perspective on the others. For example, Johnson’s discussion of how Native people modified their environment as well as their stone tools is echoed in Donta’s article on the Oak Knoll site. This discussion of an Orient campsite, in turn, provides a solid example for a broader discussion of the Orient phase by Gage as well as Mahlstedt and Davis. The roles of specific materials including red ocher, as discussed by Leveillee, and soapstone, as discussed by Wall, crosscut the broader Late Archaic discussion. Taken together, these articles are more than the sum of their individual parts. This does not mean that all future issues of the Bulletin will be thematic. The Bulletin’s content reflects the interests and contributions of the Society’s membership and those are diverse. However, when the opportunity for a thematic issue arises, I will pursue it.

The second feature is the chance for readers to comment on articles previously published in the Bulletin, and for the original author(s) to respond. When I received Gage’s thoughtful Observations on Caddy Park, I felt this was the kind of comment that continued the discussion of this complex, yet undated site in an appropriate way. In their Reply, Mahlstedt and Davis keep the conversation going by adding new comparative information as well as their own most recent thinking. I believe the Bulletin serves us best not only as a vehicle for publication but as forum for this kind of positive, information-based discussion. My thanks to all the authors for their contributions as well as to my faithful proofreaders, Shirley Blancke and Kathy Fairbanks, for their corrections.

A final note. By now, many of you know about the passing of Betty Little, past President of the Massachusetts Archaeological Society and editor of the Bulletin, in August. Betty was a remarkable individual, one whose contributions to the MAS can never really be measured. For me, as for many others, she was an inspiration, a colleague and a friend. Betty’s family has requested that donations in her memory may be made to the Massachusetts Archaeological Society, P.O. Box 700, Middleboro, MA 02324. A more detailed remembrance of Betty Little will be published in the next issue of the Bulletin.

James W. Bradley
Introduction

Archaeology as environmental history has come of age in northeastern North America as it has around the world. Here in the Northeast, the past 30 years have seen a new world of information on past environments and on ancient human cultures. With, and at least partially from, this wealth of new data has emerged an important new perspective, that of a human ecology. The environment is no longer seen as a backdrop, a limiting or enabling mosaic of resources to which ‘prehistoric’ people (Native Americans) mechanically adapted. Nor is the environment seen as a passive collection of resources which ‘modern’ people (Euroamericans) relentlessly exploited. Instead, the inter-relationships between all people and their environments are seen to be complex, creative, and endlessly variable, a view more fitting to people as we know ourselves, and the natural world of which we are a part.

Aside from farming, perhaps the best known and most problematic example of the complex, creative interrelationship between people and their environments in the ancient, or precontact, Northeast is the deliberate use of fire to modify the environment. That people practiced forest management by fire in the remote past has been hypothesized and inferred from historical accounts, ethnographic analogy, and archaeological as well as paleo-environmental studies (Patterson and Sassaman 1988).

Ethnohistoric data reflect the extensive manipulation of New England’s forest environments by the region’s Native American farmers. Early European travelers and colonists described the use of fire by the Indian people of the Northeast to alter forest composition. For example, Thomas Morton, in his New English Canaan (1637:172) wrote of the native people of eastern Massachusetts: "[They] are accustomed to set fire of the Country in all places where they come, and to burn it twice a yeare, viz: at the Spring, and the fall of the leafe." Around the same time, William Wood, who was most familiar with the native people of northeastern Massachusetts wrote in his book New England’s Prospect (1634:38): "...it being the custom of the Indians to burn the wood in November when the grass is withered and leaves dried, it consumes all the underwood and rubbish which otherwise would spoil their much affected hunting."

By burning areas of the forest understory, Indian people encouraged new growth that attracted deer and other animals, which could be harvested in large-scale communal game drives, such as one depicted by Samuel de Champlain. This practice of forest management has been noted and discussed by anthropologists and historians, most notably Day (1954), Martin (1973), Russell (1983), and Cronon (1983). Although these scholars may disagree on the scale, extent, or significance of such management, none question the existence of the practice or its ecological importance at least in proximity to settlement centers. Cronon’s (1983) study pointed to burning, in concert with farming, as the major factor in promoting a mosaic environment, rich in ‘ecotones’ (places where two or more different environments meet, such as the edge between a meadow and a forest), and supporting artificially high populations of important food animals. As Cronon notes “In an important sense, they were harvesting a foodstuff which they had consciously been instrumental in creating” (1983:51). This is tantamount to farming the forest; certainly it is a form of forest management as intensive as any practiced by Euroamericans until very recently.

If we agree that 17th century Native Americans of the Northeast practiced forest management and large-scale animal harvest, we might ask, how far back in time do such practices go? Do they begin with maize farming about 1,000 years ago? Are they more ancient? What kinds of archaeological and paleo-environmental evidence might be suggestive of forest management and harvest similar to that
described by Europeans in the 1600s?

Recent excavations at two sites near Kampoosa Bog, an upland bog in Stockbridge, Berkshire County, Massachusetts, and sediment cores extracted from it, have yielded evidence that suggests that forest management through understory burning may have been practiced as early as the fourth millennium B.P. The remainder of this article illustrates and discusses this evidence and some of its implications.

The Sites

The two archaeological sites were located on either side of the Massachusetts Turnpike in Stockbridge (Figure 1). Before the sites were destroyed by the expansion of the adjacent Tennessee Gas Pipeline, they were excavated by a team of archaeologists from the University of Massachusetts Archaeological Services under contract with the Tennessee Gas Pipeline Company. Excavation took place during May, June, and July 1993 under the direction of the author. The technical report on this project (Johnson 1994) and a subsequent popular report (Johnson 1996) are on file at the Massachusetts Historical Commission and at University of Massachusetts Archaeological Services.

One site (19-BK-141) was a habitation located next to a small stream. This site contained features typical of habitation areas such as hearths and many small refuse deposits. It also contained stone tools, lithic debitage, and ceramics. It appeared to have been used most intensively during the fifth, fourth, and second millennia B.P. or between 5,000 to 3,000 and 2,000 to 1,000 years ago.

The other site (19-BK-143) was a work area located near the margin of Kampoosa Bog. This site showed no evidence of habitation such as hearth features, but did contain a large quantity of lithic debitage, a cache of bifaces of the Snook Kill variety (similar to the Atlantic points of eastern Massachusetts), and many piercing, scraping, and cutting tools, suggesting that this was an area where people butchered and processed animals. The work area appears to date from the fourth millennium B.P. (4,000 to 3,000 years ago).

Near the work area, a sediment core was taken from Kampoosa Bog. This core, one of several taken, was judged to reflect local environmental conditions. The cores were extracted and analyzed by Charles Laing, then of the Department of Forestry and Wildlife Management at the University of Massachusetts-Amherst. Together, the cores contain sediments, pollen, and plant and animal parts that reflect changes in local and regional environments over a 12,000 year period. Evidence from the cores points to periods of intentional forest understory burning during the fourth and second millennia B.P.

Site Formation Processes

Both sites consisted of shallow soils overlying bedrock, which outcropped in some places and in others was more than 1 meter below surface. However, bedrock was almost never found more than 1 meter below surface except in some outlying areas around the two sites. Soils and sediments appeared consistent with glacial lake shores and shallows, probably reflecting a one-time higher outlet for the bog.

Neither site contained clearly stratified artifact deposits and both appeared to have received little or no addition of sediments to their postglacial sedimentary matrices, apart from possible slopewash in some areas. It seemed
more likely that erosion associated with recent activities such as lumbering and charcoal making had removed soils and underlying sediments from portions of the sites. As a result, vertical separation, if it had ever been present, could not now be discerned.

Although neither site had been plowed (a rare occurrence in Massachusetts), both sites showed considerable evidence of intensive disturbance through bioturbation. Tree roots, some of them very thick, were ubiquitous. Animal burrows were observed, as were animals that burrow or nest in the earth (e.g., earthworms, spotted salamanders, chipmunks, and snapping turtles). Most prominent among the biological causes of disturbance were tree roots. The combination of forest and shallow soils over bedrock meant that both sites were densely packed with tree roots. Thousands of years of tree root growth would have likely moved many materials from the point of their original deposition.

The archaeological consequences of bioturbation were serious. Although the habitation area contained numerous features, such as hearths and lenses of refuse, most of these had been disturbed. Hearth structure had been obliterated, and earlier and later materials had been introduced. Because of these disturbances, radiocarbon dating was problematic. It was uncertain whether charcoal from within a feature was introduced from outside, or whether the other materials in the feature were introduced. The most intact feature encountered was a Late Woodland hearth (Feature 142) at the habitation site. This exhibited a clear structure, presumably because it had been subjected to a shorter period of bioturbation than had the earlier hearths. It contained thin-walled, fine mineral-tempered incised ceramic sherds (Figure 2E), and charcoal, two samples of which yielded radiocarbon dates of 470±60 (Beta-69967) and 610±60 (Beta-69968) radiocarbon years B.P. The calibrated results at two sigma standard deviation (95% probability) for these samples are A.D. 1400-1510 and A.D. 1590-1620 for Beta-69967 and A.D. 1280-1430 for Beta-69968. These dates were the only ones that could be tied to specific features with confidence.

Archaeological Evidence for Forest Management

Although bioturbation limited the research potential of the sites, we were still able to acquire evidence that, combined with the paleo-environmental data from the sediment cores, indicated forest management through understory burning during the fourth and second millennia B.P. This evidence consisted of chronological data in the form of diagnostic artifacts that enabled us to assign dates of occupation to the sites, behavioral data in the form of tools and features that allowed us to infer some of the activities that people carried out at the sites, and indirect evidence for burning in the form of thermally altered artifacts.

The two sites yielded three lines of evidence that, combined with the evidence from the
sediment cores, are suggestive of forest management through understory burning and large-scale harvest of forest animals. First, the sites provided chronological data in the form of temporally diagnostic artifacts. The habitation yielded ceramic sherds from at least 33 vessels; none were encountered at the work area. Ceramics were grouped into vessel lots—groups of sherds sharing physical and decorative characteristics such that they could have come from the same vessel. Except for one thin-walled (3-5 mm), fine mineral tempered, incised vessel lot, probably related to the Late Woodland occupation at the site and found in and around the Late Woodland hearth feature, the vessels tended to be thick walled (up to 14 mm) and tempered with coarse mineral fragments including pieces of Hudson Valley chert (present in four vessel lots). Thirteen vessel lots exhibited dentate or rocker dentate stamping decorative surface treatments. These attributes suggest a Middle Woodland or second millennium B.P. date for most of the ceramics (Chilton 1994). No vessel lots exhibited attributes corresponding to Vinette 1 Early Woodland pottery. A sample of pottery from the habitation is illustrated in Figure 2.

The habitation also contained several varieties of projectile points, including Otter Creek, Small Stemmed points similar to Lamoka or Sylvian Stemmed, Susquehanna Broad, Greene, and Levanna. Together these suggest that the site was used as early as the seventh millennium B.P. and as late as the Late Woodland period. Stemmed bifaces of the Snook Kill variety, which date from the fourth millennium B.P., were particularly abundant at both the habitation and the work area. The work area contained a cache of nine Snook Kill blades, all in a nearly finished condition (Figure 3). These finds suggest that the sites were most...
intensively used during the fourth and second millennia B.P., periods that coincide with the periods of understory burning indicated by the data from the sediment core.

In addition to chronological data, the sites provided information on activities related to the large-scale harvesting of forest animals. The contents of the work area were particularly interesting in this regard. Here, in the absence of hearths or refuse pits, was found a large quantity of debitage (more than 6,500 pieces) thirteen scraping tools, seven piercing tools, and dozens of knives, cutting tools, and multipurpose tools including retouched flakes. As seen from the examples in Figure 4, many of the tools clearly were made from Snook Kill forms similar to those that had been cached at the site. These finds are suggestive of large-scale processing of meat and hides: butchering, skinning, piercing hides for stretching on frames for scraping, and scraping. All these activities had taken place at a location somewhat removed from the habitation. This would be expected with a communal hunt; the animals might have been driven into the bog, and almost certainly to a place that was not too close to the habitation area.

The artifacts from the work area also provided indirect evidence of understory burning. Some of the lithic flakes from the area exhibited potlid scars on their ventral surfaces, evidence that they had been heated after they had been detached from cores (Figure 5). Since they had been heated after they were struck, it does not appear that the heating was related to lithic reduction techniques, as was sometimes practiced with some raw materials (Luedtke 1987). Usually such flakes are produced when debitage falls into or is otherwise incorporated into cooking hearths. Since there were no hearths in the work area, it seems most likely that the flakes were heated by forest burning.

To summarize, the archaeological evidence suggested that the sites were used extensively during the fourth and second millennia B.P., that the work area was used for butchering at a relatively large scale, and that forest burning occurred at the work area at some point.

Evidence from Bog Sediments

The sediment cores yielded three pieces of evidence that suggest forest management through forest understory burning. All three lines of evidence point to periods of understory burning that coincide with the periods during which the habitation area was occupied and the work area was used. Figure 6 (next page) diagrams the results of Charles Laings' painstaking analysis of the contents of the
The sediment core nearest the work area. The left-hand column shows where sections of the bog sediments, which are rich in organic matter, have been radiocarbon dated. These dates give the diagram a chronological framework. The next set of columns represents the relative frequencies of various kinds of plants including trees, shrubs, herbs, and ferns. To the right is a bar-graph column that illustrates the abundance of microscopic pieces of charcoal, measured as a ratio of charcoal to pollen. The charcoal exhibits repeated peaks during two periods: the fourth and second millennia B.P. These correspond to the periods during which the archaeological sites were used most intensively, which is illustrated in the far right columns of the diagram.

The sediment cores also revealed increases in the spores of monolete ferns during the same time spans. These increases are also illustrated in the diagram. Monolete ferns colonize burned-over areas. They sprout from rhizomes that would be destroyed in large forest conflagrations, but would be likely to survive low-intensity understory fires.

Finally, the diagram also illustrates rising frequencies of chestnut pollen during these same periods. Chestnut is a species that is promoted by repeated understory fires. The first rise in the abundance of chestnut pollen begins during the later part of the fourth millennium B.P. This date is unusually early for chestnut. Elsewhere in the Northeast, sediment core studies date the immigration of chestnut to the later half of the third millennium B.P. The Kampoosa Bog core also indicates that chestnut pollen percentages rise again during the later part of the second millennium B.P. These periods of increasing chestnut correspond to the periods of intensive use of the archaeological sites, although not as closely as the monolete fern and charcoal peaks. Changes in forest composition would occur much more gradually after repeated understory burnings over a period of years, whereas the monolete ferns would peak shortly after the burning and charcoal would be produced at the time of the burning.

**Discussion**

It is difficult, if not impossible, to prove that the fires that burned around Kampoosa Bog in the fourth and second millennia B.P. were set intentionally by the people who lived and worked by the bog's shores during that period. The evidence recounted above is offered as a suggestion rather than as conclusive proof. We must pursue more evidence of forest conditions.
management by considering what such evidence might look like and how we might recover, evaluate, and interpret it. For example, we should attempt finer-grained analysis of ancient environments, looking at shorter increments of time and more localized environments. We should also continue to apply useful new analytical measures like charcoal to pollen ratios.

This earliest evidence of forest management in New England suggests that Indian people in the Northeast had been managing their forest environment long before they adopted maize farming (about 1,000 years ago). However, it should be no surprise that the Native people here managed their forest environment as early as the fourth millennium B.P. This appears to have been a time when population increased, subsistence practices intensified, and people in other parts of the eastern Woodlands began experimenting with plant cultivation. Our interpretations of Northeast prehistory should be open to the likelihood that the region's ancient inhabitants were actively enhancing their environments rather than simply reacting to external environmental changes.

Some early English settlers thought of New England as a 'howling wilderness' even as they settled on lands cleared, cultivated, and managed by the Native people they were dispossessing. But this so-called wilderness was more like a garden, created and maintained through the skill, knowledge, and labor of many generations of Indian people. Archaeology, environmental science, and human ecology are important keys to exploring the depth, complexity, and creativity of the interactions between people and their environments here in Massachusetts.

Acknowledgements

The excavation of these sites and the analysis and curation of the large quantities of material recovered in that excavation was an enormous undertaking, requiring the dedicated efforts of many individuals. Mitchell Mulholland, Director of University of Massachusetts Archaeological Services, deserves special credit for making this research possible. Tim Barker served ably as Crew Chief. Many individuals participated in the fieldwork, laboratory processing and analysis, data management, and administration for this project. They included Marne Ausèc, Hilary Barber, Chen Wei, Elizabeth Chilton, Margareta Chmiel, George Claxton, Theresa Doyle, Robert Hasenstab, Victoria Jacobson, Erik Jonsberg, Stacie King, Janet Kreda Tonya Largy, Patricia Mangan, Maureen Manning-Bernatsky, John Murray, Robert Paine, Marlys Pearson, Rita Reineke, David Schaefer, Robin Shulman, Angela Smith, Michael Volmar, Elizabeth West, and Mark Will.

Other individuals gave freely of their own knowledge, expertise, and time to this project. They include Claire Carlson, Ellen Cesarski, Elizabeth Chilton, Ed Curtin, Dena Dincauze, John Pretola, and Michael Volmar. Robert Chassell, the owner of one of the sites, was invariably supportive and informative. Ed Bell of the Massachusetts Historical Commission helped guide the complex regulatory aspects of the project, made me aware of helpful relevant publications, and made excellent suggestions for creating a popular report on the research.

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Evidence of Red Ocher as a Processed Commodity from Millbury and Charlton, MA.

Alan Leveillee

Abstract

One apparent constant in 50,000 years of human history is an almost universal use of red ocher in past peoples' mortuary practices. Sometimes by diffusion, but mostly through independent social processes, different peoples in different places and times have adopted red ocher for ceremonial expression of blood as life's vital ingredient. The use of red ocher by indigenous Native Americans is well documented in the archaeological record. Two cultural resource management studies conducted by PAL in eastern Massachusetts provide examples of 'caked' and 'palette' red ocher, supporting a hypothesis that between 4,000 and 2,500 years ago, hematite was processed for ceremony and was likely traded as a commodity.

Millbury

Small amounts of terra cotta-colored hematite or red ocher were intermittently observed during archaeological excavation of the Millbury III cremation complex in Millbury, Massachusetts, during data recovery excavation under my direction in 1990 and 1991. Ocher deposits described as 'smears' were dispersed within secondary cremation features across this Transitional Archaic secondary burial ground. One 3.1g fragment of finely textured terra-cotta-colored ocher from Feature 20 was singularly noteworthy (Figure 1). It was recognized as retaining characteristics of its original 'cake', implying processing of raw hematite into a usable product and form (Leveillee 2002). Three surfaces of the Millbury 'cake' fragment appeared to retain evidence of short-term firing with some black, fused patination (Leveillee 2002: 90). Charcoal fragments from Feature 20 yielded uncalibrated radiocarbon dates of 3,250±80 (Beta 53426) and 2,870±150 (Beta 53427). The recovery of this piece of ocher 'cake', in association with 1,771 calcined bone fragments in recognized clusters and 98 chipped and ground stone tool fragments left little doubt that it was an intended grave good.

Charlton

PAL investigations under the direction of Paul Russo at the Blue Heron Site in Charlton, Massachusetts in 1994, resulted in the recovery of multiple ocher fragments of differing sizes and colors (Figure 2). Cross-mending some of these fragments resulted in the identification of processed 'pallets'. One was a monochrome yellowish-brown, and the second was polychrome with one side yellowish-brown and the other yellowish-red. The polychrome pallet
fragment cross-mended in 5 pieces revealing that the original artifact was a geometric polygon with three remnant sides represented in the reconstructed specimen. In describing these pallets, Russo (1994:113) noted that parallel, incised lines in groups of three are evident along the rim of the polychrome ‘pallet’. The recovery of an Atlantic projectile point indicated a Transitional Archaic Period chronology for the Blue Heron Site, a non-mortuary encampment.

Discussion

The recognition of hematite as a processed material is not unique to our observations on Millbury III and the Blue Heron sites. Dincauze (1968:39) cites Temple’s reference (1887:55) to Native Americans molding ocher into elongated cakes in her discussion of a pigment stone recovered from the secondary cremation Mansion Inn site in Wayland. She notes that hematite was plentiful at Mansion Inn and from several different sources. One “terra-cotta-colored specimen appeared to be artificially molded to a loaf shape, 5.0 x 2.6 x 1.5cm” (Dincauze 1968:39).

While the number of examples of processed ocher discussed here is small and careful analyses are lacking, I offer that there are sufficient data to verify that the Susquehanna Tradition peoples, who occupied today’s eastern Massachusetts during the Transitional Archaic Period, were indeed processing red ocher-based pigments and utilizing them in complex mortuary ceremonies, perhaps for body decoration. The recovery of processed ocher from non-mortuary sites, like Blue Heron, may indicate that ocher ‘palettes’, ‘cakes’, and ‘loaves’ were made and traded as a commodity, outside as well as within the ceremonial sphere.

The variation in the forms of processed ocher within such a small sample is noteworthy. Whether different forms reflect temporal variation, degrees of manufacturing formality, a lack of craft specialization for this class of artifact, cultural geography, or oscillating lines between the secular and the sacred, all remain to be explored.

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The Oak Knoll Site;
An Orient Campsite in Lincoln, MA

Christopher L. Donta

Abstract

Archaeological Services at the University of Massachusetts, Amherst, investigated the Oak Knoll prehistoric site (19-MD-835) in Lincoln, Massachusetts as part of a road reconstruction project. A site locational survey identified a Native American component, and a subsequent site examination recovered a large number of artifacts in association with features related to a single component Orient phase site. The site represents the remains of a camp dating to the Early Woodland Period, and consists of a dense artifact scatter centered around a hearth. A large number of lithics were recovered in association with 11 Orient Fishtail projectile point fragments and other tools. This site provides new information on the function of Orient bifaces, and raises questions regarding the nature of inland Orient components.

Site Location and Description

The Oak Knoll site is located in the northern part of Lincoln, Massachusetts, on the south side of Route 2, east of the intersection with Route 2A. The site lies at an elevation of 72.5m, on a flat terrace to the west of a drumlin ridge. The terrace is bounded to the north by a swamp that, before modern alterations, formed the headwaters of Mill Brook and flowed to the north and then east into Bedford. A seasonal drainage flows north into the wetlands, 130m to the west of the site. Farther to the west and southwest lie wetlands associated with Sandy Pond. The Oak Knoll site is currently located in a residential neighborhood that is partially wooded in oak and pine trees.

Site History and Excavations

The Oak Knoll site was unknown until found during an archaeological locational survey conducted for MassHighway in October of 1998 (Donta et al. 1999), part of a proposed road project associated with the intersection of Routes 2 and 2A, known as Crosby Corner, in Lincoln and Concord, Massachusetts. The initial survey in 1998 identified 12 archaeological sites, nine of which were prehistoric. The Oak Knoll site was identified as one of three recommended for site examination surveys. Site examination surveys were conducted from December 1999 to July 2000 (Donta 2001). The total area excavated at the site was 25 square meters.

One of four initial test pits produced nine flakes of dark gray rhyolite and one flake of quartzite, found in both the plow horizon and the underlying subsoil. A grid of shovel test pits was then excavated at 4m intervals, and a concentration of artifacts and features was identified. The concentration was further investigated via the larger type excavation units. Native American artifacts were recovered from 12 of the shovel test pits, and all 13 of the larger excavation units. All 25 of these locations are contiguous with one another, forming a discrete site boundary. The site measures 9m in diameter, and appears to be roughly circular in shape. The northeastern boundary is the least certain, as this area has been covered with fill related to road construction. Within the site, a smaller feature complex was found, measuring 4 to 6m in diameter. The feature complex is centered on a hearth.

Stratigraphy

The soil at the Oak Knoll site is a stony sandy loam that formed in till deposits (Latimer and Lamphear 1924:17-21). The excavations in general revealed a stratigraphic profile that is fairly simple and consistent across the site. The soil profile in the area surrounding the site consists of a plow zone, 10 to 15cm thick, of brown silty loam. This is underlain by a subsoil of yellow-brown silty sand, grading to light yellow-brown sand lower in the profile. However, at the Oak Knoll site itself, the plow zone is separated from the subsoil by a cultural horizon. This consists of a living surface and
other associated cultural features. The cultural soils were in general darker, and/or reddened in comparison to the surrounding plow zone and subsoil.

**Features**

The Oak Knoll site is centered on a rock-lined hearth around which is a complex of other associated features (Figure 1). This hearth (Feature 5) consisted of a semi-circular 75cm diameter ring of cobbles, below the plow zone, at top depths of approximately 12 to 20cm below the surface. Nineteen fire-cracked rocks of varying sizes were mapped in situ, which were easily differentiated from the surrounding soils, as there were very few cobbles found in the topsoil or subsoil in the remainder of this site. Within the center of the semi-circle was a greasy black silt containing charcoal, and a dense concentration of artifacts. The silt level was thickest in the center of the rock semi-circle, measuring 30cm, and thinned toward its outer edges. There were 135 artifacts found in Feature 5, concentrated in the top 6cm of the black silt, which averaged 18 to 24cm below the surface. This total consists of 114 lithic flakes, one edge tool, one biface, and the fire-cracked rock.

The hearth was bisected, and found to continue to a maximum depth of 44 cm below the surface, with the feature soils becoming lighter in color with increasing depth (Figure 2). A charcoal sample weighing 21 grams was collected from depths of 27 to 31cm below the surface, and submitted for radiocarbon analysis. The charcoal was mixed with small rhyolite finishing flakes. The resulting date is 2850+/-60 B.P. (Beta 143014). The one-sigma date range is 3155 to 2795 B.P., a date that correlates well with other dated Orient sites in the region.

**Figure 1.** Feature complex at the Oak Knoll sit, Lincoln, MA.
Surrounding the hearth, and extending for several meters in every direction, was a thin, black, fine sandy silt layer, generally 4 to 10 cm in thickness, containing charcoal-stained soils and a high density of dark gray rhyolite flakes. This was the living surface (Feature 4) formed by the tracking of charcoal around the hearth, the manufacture of stone tools, and other activities. This living surface was found at the base of the plow zone, at an average depth of 21 cm below the ground surface, and was darker in color than the overlying brown plowed soil. The feature extends across approximately 11 square meters, with the eastern edge truncated by the road. In addition to its color and texture, the living surface was recognizable by the dense concentration of lithic artifacts found on its surface. Excavations produced 1,972 artifacts from Feature 4 in 11 excavation units, including large numbers of small finishing flakes, and a number of broken Orient Fishtail projectile points. In contrast, few artifacts were recovered from the overlying plow zone.

Other features found at the site included:

An ash dump (Feature 6), southeast of the hearth, consisting of solid black loam with lots of small charcoal fragments, 15 to 21 cm below the ground surface, and containing 64 lithic flakes.

A pit feature (Feature 1), northwest of the hearth, 23 to 26 cm below the ground surface. The feature measured 50 x 100 cm in size. No fire-cracked rocks or charcoal were found in the area of Feature 1, indicating that it was not primarily a heat-related feature, despite reddening of the lower feature soils. The feature contained 53 artifacts, consisting of rhyolite debitage.

A pit feature (Feature 2), north of the hearth, and similar in size and nature to pit feature 1. This feature was found between 21 and 39 cm below the ground surface, and was 50 x 90 cm in diameter. Sixty-nine pieces of rhyolite debitage, were found in this pit feature. A very small charcoal sample (less than 1 gram in size) taken from the upper portion of Feature 2 (21 to 30 cm) was submitted for radiocarbon dating and returned a date of 340+/ - 40 years (Beta 139112). The association of this date with the feature is questionable, due to the small size of the sample and its location in the uppermost portion of the feature soils. No evidence of a late prehistoric occupation was observed.

A post mold (Feature 8), was identified at the base of Feature 4, 26 to 27 cm below the ground surface, and was comprised of a circular area of dark brown loam, darker than the surrounding yellow-brown subsoil, 5 cm in diameter.

A portion of a pit feature (Feature 9), southeast of the hearth, at the edge of the excavation, 24 to 30 cm below the ground surface. This pit contained one rhyolite flake, but no evidence of burning.

A pit feature (Feature 10), east of the hearth, 30 to 36 cm below the ground surface. This pit was 58 cm in diameter and contained one rhyolite flake. No evidence of burning was visible.

A pit feature (Feature 11), northeast of the hearth, 26 to 33 cm below the ground surface. This bowl-shaped pit was partially disturbed by a rodent burrow. Eleven flakes of rhyolite...
were collected from the feature soils. As was the case with the other pit features, the function of this pit is unknown.

A pit feature (Feature 12), east of the hearth, was partially excavated, 15 to 36cm below the ground surface. The soil in the pit consists of a greasy, black silty loam, darker than the overlying living surface (Feature 4). This pit was larger, measuring 110cm in length east to west, and of unknown north to south dimension. Three rhyolite flakes were found in the pit, but no charcoal or fire-cracked rock.

In summary, the feature complex consists of a hearth, surrounded by a charcoal-stained living surface, interspersed with six pit features, one post mold, and an ash lens. Artifacts were concentrated on the living surface, but were also found in the other features.

**Artifacts**

The excavations at the Oak Knoll site yielded a total of 3,047 prehistoric artifacts, all of which are stone tools or lithic waste. Of the 3,047 artifacts, 14 are bifacially worked tools traditionally identified as projectile points, while eight are other bifaces, one is an edge tool, 2,972 are lithic flakes, 23 are pieces of lithic shatter, and 29 are pieces of fire-cracked rock. No ground stone artifacts or pottery was found.

**Raw Materials** - The predominant raw material utilized for stone tools at the Oak Knoll site is a porphyritic rhyolite (99.3%), with only a small representation of quartz (0.5%), and other lithic types (0.2%). The rhyolite found at the site is mostly comprised of a dark gray material (97.8%), with white phenocrysts. A smaller percentage (2.2%) of dark brown-purple rhyolite was also present, exhibiting the same white phenocrysts. In the immediate area, the dark gray rhyolite predominant at the site was also found at several other sites in Lincoln and Concord that were investigated during the same and other recent projects. These include: site 19-MD-837 (just 175m to the west of the Oak Knoll site), site 19-MD-833 (650m west of the Oak Knoll site), site 19-MD-399 (2km west of the Oak Knoll site), and the Meriam’s Corner site (2.5km to the northwest), a site that contains diagnostic Late Archaic artifacts. Farther afield, this material has been reported from sites to the south in Wayland, to the north in Bedford at site 19-MD-600, and at Shattuck Farm in Andover. Outcrop sources for this material have been found in Marblehead, where both the dark gray and dark purple colors of porphyritic rhyolite have been observed, as well as at a newly discovered quarry site in Saugus (Donta 2002), and other locations.

**Projectile Points** - The most important finding at the site was the collection of bifacially worked tools. Fourteen bifaces or projectile points were found at the Oak Knoll site. Two are whole, while 12 are fragments. Eleven of the fourteen points are identified as portions of Orient Fishtail-style projectile points. This includes both of the whole specimens, five bases, and four tips. All of the four tips cross-mend with four of the bases, bringing the total number of complete Orient Fishtail points found at the site to six (Figure 3). Two other point tips and the single midsection are not classifiable as to style.

![Figure 3. Orient bifaces from the Oak Knoll site.](image)
Manufacturing techniques appear to be remarkably similar among all of the specimens present. The points are delicate, with long narrow lanceolate blades, straight to slightly concave bases with expanding sides, and shallow side notches. The side notches appear to have been struck with a single blow, producing the final curvature. The complete projectile points range from 48 to 79mm in length, with maximum widths generally less than 25mm. The seven specimens with bases range from 13 to 20mm in basel width, and from 8 to 11mm in thickness. One of the two whole specimens has a base with minimally expanding sides (13mm in width), making the piece look slightly outside the range of what might usually be considered the Orient Fishtail type. However, this piece exhibits the same manufacturing techniques, same basal treatment, same blade shape, and same material type. It is likely that the differences are due to a slight variation in the manufacturing process, rather than a purposeful stylistic differentiation. A parallel case was documented in Rhode Island where several Orient Fishtail points were found in contexts with similarly made points that had smaller, minimally expanding bases. The latter type was described as 'Orient Stemmed' (Leveillee and Waller 1999).

All 14 projectile point fragments are made of porphyritic rhyolite, 11 of which are dark gray in color, and three of which are dark purple. Both colors of rhyolite include white quartz phenocrysts of the same type and concentrations. Based on the similarity of the rock composition, it appears likely that the dark gray and purple rhyolites came from the same source area.

Of the 12 specimens with fractures, all eight are transverse fractures across the midsection; that is, above the base and stem, but below the point, running perpendicular across the narrow width of the tool. On the four complete but fractured specimens, the total point lengths are 77, 78, 79, and 79mm, and the fractures occurred 39, 40, 41, and 50mm from the base, averaging 54.3 percent of the distance from the base to the tip. One of the points has a fracture that runs partway across the midsection, but then hits a grain in the rock and follows the grain down toward the base of the point.

An examination of the basal treatment of the points does not indicate any basal thinning. There is, however, crushing and grinding strongly evident in the notches of four of the seven projectile point bases. One of the other bases shows some minor crushing and grinding, while two others do not exhibit this type of modification. The interpretation is that at least four of the points were hafted, while a fifth was probably still in the manufacturing process when it broke.

Use-wear analysis of the points identified bifacial rounding and mat polish along the edges of four of the tools, but little evidence of striations. No such wear was observed on the other two complete points or the remaining base. The presence of rounding abrasion - as opposed to roughening or grinding - can be produced when working a wide variety of materials, generally of medium hardness, such as leather, rather than soft, such as meat or organs. Working of harder materials such as bone, wood, or stone often produces striations along the tool edges. The location of the use wear bifacially along the length of the tool edges is an indication of a cutting or sawing motion. Mat polish - as opposed to bright, silicate, or chlorite polish - is attributed to the working of animal remains rather than vegetal or inorganic materials.

Based on the similarity in fracture types, basal treatments, and use-wear across the sample of projectile points, it appears that these tools were all used in the same manner. The archaeological literature indicates that transverse medial fractures are generally considered the result of the use of bifaces as knives (Ahler 1971; Custer 1991). Fractures across the midsection are the result of torque pressures produced with a sawing or cutting motion. This contrasts with impact fractures, which are seen closer to the tip, and tend to run diagonally from the tip toward the base (see Whittaker 1994 among others). The use-wear, specifically the rounding and matting along the tool edges, further supports the contention that these 'projectile points' were actually used as knives. These types of wear and polish also indicate that the tools were probably utilized as knives in cutting soft or medium animal tissues, such as hides or fish (Shea 1992), and not for working bone, wood or stone.
Other Bifaces - Aside from the 14 'projectile points', eight other bifaces were collected from the Oak Knoll site. These can be classified as in three forms: rounded types with one flat end (of which there are two), pointed types fractured across the midsection (of which there are three), and three other unique tool forms.

The two rounded forms are both dark gray porphyritic rhyolite, the same material as in the projectile points. Both have a flat proximal end where they appear to have been taken off of a larger rock as large, thick flakes. The sides and distal end of each piece have been bifacially worked. The distal ends of both pieces are rounded. The pieces measure 45 and 62mm in length, and 13 and 18mm in thickness. Both pieces exhibit mat polish along the bifacial edges.

The three bifaces that were worked into points are also made of the same dark gray porphyritic rhyolite. All three were also snapped transverse across the midsection, similar to the projectile points described above. The three bifaces measure 37, 38, and 40mm in length, and 10, 12, and 14mm in thickness. Two of the three pointed bifaces are heavily retouched on both sides, but not as finely worked and not as thinned as the finished Orient Fishtail points. The third pointed biface was retouched bifacially on only one edge, and thinned on only one side. It appears to have snapped early in the manufacturing process.

The three unique bifaces are all gray porphyritic rhyolite, 28 to 51mm in length. One is shaped similarly in outline to the bases of the Orient Fishtail points, although it is only crudely worked, and is snapped transverse across the midsection. It exhibits some step fractures and grinding along the base and hinge and step fractures along the blade that indicate cutting or sawing use. Another biface has been retouched on two sides and thinned; its use is not known. The third unique biface is triangular in shape with two edges bifacially worked. It may be a fragment of a projectile point.

Edge Tools - One lithic piece was found that was not bifacially worked. This edge tool was manufactured from dark gray porphyritic rhyolite, and measures 43mm in length and 19mm in maximum width. It is a long flake with the striking platform still visible and the distal portion of the flake ending in a step fracture.

Debitage - The excavations at the Oak Knoll site produced 2,972 pieces of lithic debitage for which a strike platform was observable. Another 23 pieces with no visible flake scar were classified as lithic shatter. The flakes range in size from 1mm to 68mm with the highest percentage in the 11 to 15mm range (35.5%). The 16 to 20mm size (24.3%) and 6 to 10mm (17.1%) were also high in frequency. The small size of flakes points to the later stages of tool manufacture. This is corroborated by a low (7%) frequency of cortex on the flakes indicating that tool production at the Oak Knoll site was beginning with the stone already reduced.

Distribution - The distribution of flakes and tools within the central, feature complex portion of the site reflects a concentrated area of tool manufacture. The highest frequency of flakes was recovered from EU 4, with 562 specimens. Adjacent units EU 3 (473 specimens), EU 7 (452 specimens), EU 10 (430 specimens), and EU 8 (307 specimens) had the highest concentrations following EU 4. This high concentration is situated around the hearth (Feature 5), mostly to the north, but also east and west. To the south of the hearth, in the southern portions of EU 7 and EU 8, as well as EU 9 and 12, a higher concentration of purple rhyolite was observed. It is notable that the two finished tool fragments of a purple color were also found in this area, in EU 12. The two pieces cross-mend, forming one of the complete Orient type projectile points. It is likely that the retouching or resharpening of this tool took place on the south side of the hearth, producing the scatter of purple rhyolite observed.

Discussion

Site History - The cultural chronology of the Oak Knoll site is based on one accepted radiocarbon date from the site and diagnostic artifacts similar to others from dated contexts in the region. These data indicate that the Oak Knoll site was occupied only once, approximately 2,850 years ago, for a relatively short period of time. Eleven projectile point
fragments recovered from the site are classified as Orient Fishtail in style. Ten of these are ‘typical’ for this type, while one has a straighter base than is commonly seen among the range of Orient bifaces. No Susquehanna, Small-Stemmed, or Laurentian artifacts were found at this site. This is of interest as a review of the site data base for both Middlesex and Essex Counties reveals no other single-component Orient sites. At other sites, most Orient artifacts are mixed with other styles dating to the Middle Archaic to the Late Woodland periods, and are therefore difficult to assess with regard to function. According to one database (Mulholland 1984), there were 289 Orient components in all of southern New England out of a total number of components of 8,533. Thus Orient components make up only 3.4% of all components identified in the region.

Site Functions and Activities - Based on the types of features and artifacts present, a number of activities can be hypothesized for the Oak Knoll site. One of the activities occurring at the site was the reworking of lithic tools. Close to 3,000 lithic flakes were recovered from a relatively small area at the site, clustered around the hearth. The relatively small size of the flakes, general lack of cortex, and limited number of material types all seem to indicate that tools were being modified and reworked from preforms. Bifaces, flakes, and tiny finishing flakes were recovered at the site, documenting the full production process.

The presence of finished, but broken, tools indicates that not only were the tools being produced here, they were also utilized. The fractured Orient Fishtail projectile points were all broken in the same manner: transverse across the medial portion. This is traditionally interpreted by archaeologists as indicating use as knives. No evidence of impact fractures was found. Use-wear analysis supports the contention that these points and other bifaces were actually utilized as knives.

Other features at the site document additional activities. Six pit features of unknown function were present at the site. Assuming that the occupants were using the blades to cut, perhaps the pits were used to store or dispose of whatever organic material was being cut. The presence of a large ash dump (Feature 6) indicates that the hearth was cleaned at least once during its use. There is no evidence of a structure at this site. Only one post mold was found, despite a specific focus on identifying any such features. The single post mold was small, approximately 7cm (3 inches) in diameter, and was somewhat centrally located, within 20cm (8 inches) of the hearth. The function of this post is uncertain. This is also consistent with findings across the greater Northeast in which Orient sites have not produced evidence of house forms (Snow 1980:249).

To review, one or more people must have arrived at the site carrying several rhyolite bifaces or finished tools. A hearth was constructed and surrounded by cobbles that show evidence of heating. The bifaces were then used to produce a number of Orient Fishtail points, or, alternatively, completed Orient tools were resharpened, resulting in a dense scatter of rhyolite flakes around the area of the hearth. The finished tools were utilized as knives, resulting in several transverse medial fractures and use-wear evidence of cutting. Cut items or waste products were possibly then stored or disposed of in the several pits observed around the hearth. Unfortunately, due to the poor preservation conditions, there is little information on animal refuse at the site. In sum, the range of artifacts and features suggests a temporary habitation site. This appears to have been a single-use site, occupied for probably only a few days. The limited types of lithic materials and style of tools present at the site help to document that this site was probably used only once.

Settlement Patterns and Land Use - In the 1960s Orient phase sites were considered a coastal phenomenon. The type site was found at Orient Point on the eastern tip of Long Island (Ritchie 1959). However, in recent years Orient sites have been shown to be present in many environments. When all of southern New England is considered, Orient sites are over-represented on the coastal plain, but are not common in comparison to other site types (Mulholland 1984). A look at the distribution of Orient components in northeastern Massachusetts indicates that these sites are, in fact, located inland and cluster along drainages and wetlands, as do sites of other time periods (Figure 4, see page 20).
The Oak Knoll site was a small, temporary camp. A small group of one or several persons could have easily deposited the materials recovered at the Oak Knoll site in a day or two. The primary activity consisted of production, use, and reworking of lithic tools for processing of animal remains. There was no evidence of steatite or ceramics, which generally imply longer-term occupation.

The interpretation of settlement patterns in the Late Archaic and Early Woodland periods is largely based on models derived from ethnohistoric and ethnographic studies, but it is also supported by archaeological data. Spring activities focused on the harvesting of anadromous fish such as shad, herring, and salmon, that ran up rivers and streams to spawn. Sites are expected at convenient fishing locales such as falls and narrows where harvesting would have been efficient. Summer may have involved use of coastal resources, such as shellfish and sea mammals, and the harvesting of numerous wild plants and berries. Fall and winter hunting may have focused on wetlands and uplands, where waterfowl and terrestrial mammals could have been taken. The Oak Knoll site is most likely associated with the headwaters of Mill Brook, located immediately to the north. However, the site is very close to Sandy Pond and the Hobbs Brook wetlands as well. It is not possible to know whether the site was located to take advantage of bird migration and use of the wetlands in the fall or winter, or the fish species which once may have run up Mill Brook to Sandy Pond. These wetlands undoubtedly harbored a number of useful plants as well.

The Oak Knoll site is one of several known prehistoric sites located in the immediate area, along Mill Brook and Hobbs Brook. Unfortunately, little is known about any of these other sites. The closest sites, UMass findspots I and J, lie within 200m (656 feet) of the Oak Knoll site, to the east and west. A cluster of five sites is known from the north side of the Hobbs Brook drainage, approximately 1.5km (4,920 feet) to the northeast. Farther to the west is UMass site D, north of the drainage that flows out of Sandy Pond, and a cluster of sites located to the east of Crosby Pond. Only one of these sites, the Root Farm site (19-MD-118), is known to contain Orient phase materials. The largest known sites in the vicinity lie concentrated to the northwest, approximately 5km (3.1 miles) away, around the Great Meadows wetlands in Concord at the junction of the Sudbury, Assabet, and Concord Rivers. This area includes sites with large, dense lithic scatters, multiple tool types and components, large middens, and many other features, dating from Paleo-Indian times to the Contact period. These are the most likely locations for village or longer term occupation sites from which the inhabitants of nearby camp sites may have come for their particular resource procurement needs. The Oak Knoll site could have been easily reached from this vicinity within an hour or two of travel.

The lithic materials at the Oak Knoll site consist overwhelmingly of a single type of rhyolite. This dark gray to black porphyritic rhyolite has been observed at a number of other eastern Massachusetts sites, and appears to have been derived from the Marblehead or Lynn volcanic outcrop. This lies approximately 30km (18.5 miles) to the east. Another possible source is the Boston Basin, specifically the Blue Hills (DeNatale 1980:12). The use of rhyolite to make Orient points has been demonstrated at other sites in the area (Blancke 1995a). These findings are of interest, because it has been stated that Orient points tend to be made of quartz or quartzite, as were earlier narrow stemmed forms and later Lagoon and Rossville projectile points (Snow 1980:251). In contrast, Dincauze (1975:27) says that Susquehanna tools tend to show an orientation toward fine-grained igneous, slates, and other argillaceous stones. Does the use of certain types of stone at Orient sites show geographic clustering? Does the type of material utilized indicate anything regarding the relationship of Orient tool-makers to Susquehanna or Small-Stemmed tool-makers?

Conclusions

Oak Knoll represents a unique example of a well-preserved, single-occupation, a lithic manufacturing and use site of the Orient phase of the Early Woodland period. UMass excavated approximately 70% of the estimated high-density portion of the Oak Knoll site and 39% of the projected overall site. The site yielded a large feature complex that consisted
of a stone-lined hearth radiocarbon dated to 2,850 years ago, surrounded by a charcoal-stained living surface 9m in diameter. Several pit features were found in association with the hearth and living surface. The site contained a large volume of lithic materials, nearly all a
regionally available dark gray rhyolite. The lithics included 14 projectile point fragments, 11 of which are of the Orient Fishtail type, fragments of eight other bifaces, and one edge tool. Examination of the tools indicates that they were predominantly used as knives in the processing of animal remains. Only the final manufacturing and reworking stages of tool production were completed at the site. The Oak Knoll site is part of the large core of settlement situated at the junction of the Assabet, Sudbury, and Concord Rivers. The site lies within 4km of this cluster of sites, and was probably a food processing station utilized by residents of this core area. The site provides important new information on how Orient tools were made and utilized in the context of an inland location.

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Some Observations on Caddy Park

Mary E. Gage

Introduction

In 1999, archaeologists Thomas Mahlstedt and Margo Muhl Davis excavated a Native American feature (now called the Moshup site) at Caddy Park in Quincy, MA. A detailed report on the site was featured in the Bulletin of the Massachusetts Archaeological Society (Mahlstedt and Davis 2002). The 1m x 2m feature contained four discernible tight groupings of artifacts (caches A, B, C, and D), four plummets arranged in a pattern suggestive of a net, a whale effigy, and a variety of other artifacts scattered throughout the feature. The artifacts were placed on a layer of red ocher, and an additional layer of red ocher was sprinkled on the top of the artifacts. Several dense areas of red ocher suggest that bags of ocher were also interred. Caddy Park was interpreted as representing a maritime procurement culture. The feature itself may have been a burial, cenotaph, cache, or ceremonial offering.

Caddy Park bears a remarkable resemblance, in terms of its use of groups (clusters or caches) of tools and organized tool kits, to Burial G1 at the West Ferry site, Rhode Island. In turn, Burial G1 has been compared to the Orient phase on Long Island. The Orient phase is noted for the consistent inclusion of organized tool kits in its burials. Although the Orient phase is similar to Caddy Park in terms of the interment of tool kits, it lacks several other diagnostic characteristics of the Caddy Park site. In particular the Orient phase burials had no bags of red ochre, pressure flaked bifaces or large caches of tool/preforms. These three characteristics are documented in the Meadowood phase burials in New York State. The Meadowood phase existed contemporaneously with the Orient phase. Although the Meadowood phase was largely confined to New York, two caches of Meadowood mortuary 'blades' were found in Connecticut, and a few have been surface collected on Martha's Vineyard.

This article is exploratory in nature. It examines the possibility that Caddy Park was influenced by the Orient phase culture of Long Island, and to a lesser extent by the Meadowood phase from New York State. Secondly, having presented evidence that Caddy Park was influenced by the Meadowood and Orient phases, it suggests a date range for the site.

Terminology

For the purposes of this article, the following terminology is used to denote specific arrangements of tools and/or artifacts. These terms are italicized in the main text:

Group - consists of artifacts tightly gathered together. The group must show some physical separation from the rest of the artifacts in the feature. The tools can be all the same, unrelated, related or a mixture. The quantity per group is unlimited.

Small Tool Kit - is made up of two or more types of related tools. An example is three gouges and one sharpening stone that combined form a small tool kit. These tools can be placed together in a group, scattered throughout the feature, or a combination of both.

Overall Tool Kit - consists of the majority of tools and artifacts in a feature that relate to the day to day subsistence activities. It may or may not contain smaller units such as group(s) or small tool kit(s). For an example, the Caddy Park feature's tools and artifacts were interpreted as reflecting a 'maritime procurement culture'. The majority of tools and artifacts were related to subsistence activities associated with food procurement, boat building, and other maritime-related activities.

Methodology

The methodology used was a standard comparison of the Caddy Park diagnostic artifacts and features to other sites along the coast of New England and New York State.
The literature review was limited to major published works on these geographical regions. The review focused on sites from 6,000 B.P. to 1,700 B.P., the date range given for the Caddy Park site. This search, although far from exhaustive in nature, yielded several sites and archaeological phases with comparable diagnostic traits. The diagnostic traits used in these comparisons include the three specific tool and artifact arrangements defined in the terminology section above, as well as pressure-flaked bifaces, interment of large quantities of tool/preforms, and interment of bags of red ocher.

Caddy Park, Quincy, MA

Caddy Park contained all six of the diagnostic traits used in these comparisons. This section describes those traits in greater detail. See Mahlstedt and Davis (2002) for additional information.

Groups - Four caches of tightly clustered tools and artifacts were found in the Caddy Park feature. They were labeled caches A, B, C, and D. Cache A had three adzes, one adz/gouge, an oval core, a pebble and 65 edge tool/preforms. Cache B had two long bifaces, a quartz core, and 42 edge tool/preforms. Cache C had five small stemmed points and 24 edge tool/preforms. Cache D had one biface, an oval disk, and seven edge tools/preforms. Each is a group formed by several artifacts tightly grouped together and separated from the greater whole of artifacts.

Small Tool Kits - Within Cache D there was a small tool kit called a stone polishing kit made up "...of two flat ovoid-shaped pieces of stone, possibly used to polish the adz tips, and a fine polishing tool" (Mahlstedt and Davis 2002:18).

Overall Tool Kits - Caddy Park's overall tool kit was interpreted as representative of a maritime procurement culture. The major artifacts of this overall tool kit include: a gouge formed into a whale effigy, partially surrounded by four plummets (net sinkers) that were probably attached to a net, four adzes indicating woodworking and boat building, small stem points and an atlatl indicating hunting, and four large bifaces indicating possible ceremonial activity.

Pressure-Flaked Bifaces - Four large, finely pressure flaked bifaces were recovered.

Large Quantities of Tool/Preforms - A total of 185 artifacts classified as 'edge tool/preforms' were recovered from this feature.

Bagged Red Ocher - Two caches had dense concentrations of red ocher and were interpreted as 'bags of red ocher' interred with the other artifacts.

Wapanucket Site, Middleboro, MA

The first definitive tool arrangements that show up in southeastern Massachusetts were found at the Wapanucket site in Middleboro, Massachusetts. This site has a date range of 4,700 B.P. to 3,550 B.P. At Wapanucket, twenty-two burials were excavated; eleven were inside an ossuary. Within the ossuary, two related tools kept appearing, a gouge accompanied by a sharpening stone. According to archaeologist Maurice Robbins, "Gouges with their sharpening stones were conspicuous among the grave goods from this feature [ossuary]" (Robbins 1968:63). The ossuary is dated to 4,290 B.P. Six of the eleven ossuary burials had the combination gouge and sharpening stone. Seven of the ossuary burials had gouges and more were found in the general pit. Of the eleven other burials, three more had gouges and two contained a small tool kit. The small tool kits from Wapanucket are made up of gouge(s) and sharpening stone(s), and in one case, an ulu and sharpening stone. No adzes, tightly packed groups or overall tool kits were found (Robbins 1968).

West Ferry Site, Narragansett Bay, RI

Conanicut Island is located off the southeastern edge of Rhode Island in Narragansett Bay. At the place called West Ferry (named after the old ferry) Native American Indian graves were found between 1936 and 1937. The site was closed from 1937 until a formal excavation by William Simmons was conducted in 1966 and 1967.
This cemetery was located on a sandy knoll on the Watson farm and was placed on the topmost portion of the knoll seventy feet above sea level in sandy, rock-free soil. All the graves were shallow, occurring within 30 to 55 inches below the surface. Most of the burials postdated European contact, however, a few graves were found that dated to a much earlier time period, the Transitional Archaic period. Two have $^{14}$C dates: burial A-33 (with no artifacts) was dated 3,380 B.P., burial G-1 (which contained steatite vessels) was dated 3,280 B.P. and 3,225 B.P. (Simmons 1970:16,21). Altogether seven cremation burials were found. They had tools manufactured by percussion flaking, pecking, and polishing techniques. All the burials had charcoal, however none had powdered red ocher (Simmons 1970: 3-34). With the exception of burial G-1, none had an overall tool kit.

Burial G-1, rich in grave goods, was unique at the West Ferry site although two other burials with similar grave goods were found in nearby Charlestown, RI. Of all the southeastern coastal burials, G-1 at the West Ferry site comes closest in overall structure and quantity of contents to the Caddy Park feature. Although it has characteristics in common with Caddy Park, it has no direct artifact associations. Burial G-1 has a tightly grouped set of objects that include: two complete steatite bowls arranged one inside the other, a small grooved ax placed on the rim of one bowl, and four spear points underneath (The bowls did not rest on the points). Near the bowl group was 'a clutch of four black pigment stones of graphite' (Simmons 1970: 17) making up a second small group. The other objects in the burial included: fragmentary human remains (from one child and one adult), a large steatite kettle (complete), a long pestle, 21 projectile points, a naturally perforated black stone, an adz, a gouge fragment, a drill, a flake, two gorget fragments, a steatite amulet, a tablet, several tiny lumps of red ocher, and a red pigment stone. Several natural stones were recovered from the top level of pit. The heaviest concentration of objects occurred in the mid to lower level near the north wall. Other objects were scattered throughout the pit (Simmons 1970: 16-21).

Taken as a whole, the artifacts from burial G-1 form an overall tool kit providing for cooking and eating, woodworking, hunting, personal adornment and cosmetic needs. Within this overall tool kit are several small tool kits. There is a food preparation and eating small tool kit composed of the two bowls, the kettle, and pestle. There is a personal adornment small tool kit formed by an amulet, gorget, and the red and black pigment stones. As previously described, there are two artifact groups in the burial. Burial G-1 contains all three tool organizations: groups, small tool kits, and overall tool kit.

Caddy Park and West Ferry G-1 burial share three traits in common: groups, small tool kits, and an overall tool kit. The two sites also have some distinct differences. Caddy Park's four large bifaces are pressure flaked whereas West Ferry's projectile points were percussion flaked. Caddy Park also has large quantities of edge tool/preforms and powdered red ocher. Burial G-1 has neither of these traits. William Simmons links the West Ferry site with the Orient phase of Long Island, NY (Simmons 1970: 11).

**Orient Phase**

Archaeologist William Ritchie discusses the Orient phase burials in detail (Ritchie 1994:164-178). These cemeteries contain two types of burials: individual and large communal burial pits. The communal burial pits all contain "...features having one or more directly associated 'caches' of burial offerings. The latter in nearly every case included a fire-making kit, a number of projectile points, one or more 'killed' stone vessels, a hammerstone, and a paintstone, and they frequently included an adz or celt" (Ritchie 1994: 177).

This common feature of Orient phase communal pit burials constitutes an overall tool kit. As Ritchie states:

"The typical basic grave lot therefore provided for hunting game, kindling fire, and cooking food with a cosmetic kit thrown in" (Ritchie 1994, 176-7).

Within the overall tool kit was a small tool kit: a fire-making kit. It consisted of iron pyrite and a quartz or flint striker (Ritchie 1994: 167). Some burials had powdered red ocher at the base of the pit. No pressure flaked tools were reported; all chipped stone tools seem to have been made by percussion (Ritchie 1994:171). Orient sites
have a date range of 2,993 B.P. to 2,713 B.P. and are a component of the Transitional Archaic period (Ritchie 1994: 165). In sum, Orient phase communal pit burials contain small tool kits and overall tool kits. They lack bagged red ocher, pressure flaked tools, and large caches of tool/preforms. It is unclear if they had any artifact or tool groups.

**Meadowood Phase**

Caddy Park has three characteristics not found in the Orient phase. For these characteristics, we look to the Meadowood phase of inland New York dated to 2,948 B.P. and 2,513 B.P. (Ritchie 1994:181). These traits are pressure flaking, large quantities of edge tools/preforms, and bagged red ocher. During the Meadowood phase, large quantities of mortuary 'blades', an average of 100 to 250 per burial, were included in graves. (It is unclear if these large quantities of mortuary 'blades' were in groups or not.)

"These points, ranging in length from about one and five eighths to three and a half inches, are extremely thin and very skillfully made by a well-controlled pressure-flaking technique. It is not certain if these basic triangular shaped blades are finished blades or blanks/preforms" (Ritchie 1994: 183). Red ocher has been found in all but one cemetery.

"In all save one cemetery (Oberlander No. 2), use was made of powdered hematite or red ocher, which was sprinkled or more liberally poured over the grave contents, human and artifactual, or included in a bag or pouch in certain of the graves" (Ritchie 1994: 198).

Like the Orient phase, Meadowood phase burials generally contain a fire making kit composed of iron pyrite and flint strike-a-light. The Meadowood fire making kits were contained in a small pouch or rolled up in bark (Ritchie 1994: 199). The fire making kit, as previously discussed, constitutes a small tool kit. Meadowood burials also contained large quantities of mortuary 'blades', and some burials contained food remains and other artifacts. The available information suggests that Meadowood burials for the most part lacked an organized overall tool kit.

Caddy Park and the Meadowood phase have four traits in common, three of which are not found in the Orient phase: the presence of pressure flaked bifaces, bagged red ocher, and large quantities of tool/preforms. The fourth trait that both phases have in common is small tool kits. The four large pressure flaked bifaces found at Caddy Park have no real equivalent in the Meadowood assemblage in terms of shape and form. However, they were created by the same technique and demonstrate a high level of skill. As Mahlstedt and Davis (2002:13) note "the large size and thinness of the blade [33cm], coupled with a quartz vein that runs through the middle of the piece attest to skill of the knapper".

The technique, high level of skill, and the thinness of these bifaces sound very similar to Ritchie's description of Meadowood 'blades.' In addition, Caddy Park contains several 'caches' with significant quantities of 'edge tool/preforms'. This trait resembles the large quantities of mortuary 'blades' found in Meadowood burials and caches. Ritchie speculates that the mortuary 'blades' may have been preforms (Ritchie 1994: 183). Finally, the interment of bags of red ocher is documented in the Meadowood phase. Several high concentrations of red ocher in the Caddy Park feature were interpreted as having been placed in bags. Taken together, the evidence suggests the culture that created Caddy Park was influenced by the cultural ideas of the Meadowood phase. Secondly, the creators of Caddy Park may have learned the technique of pressure flaking from the Meadowood phase.

**Conclusion**

Three of the six diagnostic traits used to compare the Caddy Park site to various other sites and archaeological phases involve intentional arrangements of tools and artifacts in a buried feature (whether a grave or cache). These intentional arrangements of tools and artifacts represent cultural traditions, practices, and behaviors. It is a well accepted fact that cultural ideas are transmitted from generation to generation, and even from one culture to another. The evidence suggests that the culture that created the Caddy Park feature was an amalgam of a number of cultural ideas taken from its predecessors and its neighbors.
The Wapanucket site in Middleboro, MA is one of the earliest sites in southeastern Massachusetts that contains a definitive arrangement of tools, in this case a small tool kit. The small tool kit was composed of a simple arrangement of a gouge and sharpening stone. Caddy Park contains a somewhat similar small tool kit, three stone polishing tools ‘possibly used to polish the adz tips’ (Mahlstedt and Davis 2002:18). Caddy Park contained four adzes. One of the polishing stones was found in direct association with a broken pendant suggesting an intentional arrangement between the two artifacts.

Caddy Park and Wapanucket share a common theme in small tool kits - a tool/artifact accompanied by a tool used to create or sharpen it. There is definitively a time difference between the two sites. Also, Wapanucket contained only gouges and no adzes. In comparison, Caddy Park contained four adzes, and one gouge. While the shift from gouges to adzes as the predominant woodworking tool may indicate a substantial passage of time, the continuity in small tool kits suggests that Caddy Park had some ancestral ties to the culture that created the Wapanucket feature.

The small tool kits of the ossuary feature at Wapanucket date to 4,290 B.P. The practice of placing small tool kits in burial features is documented one thousand years later at the burial G-1 (3,234 B.P.) at the West Ferry site. In addition, burial G-1 contained an overall tool kit, and a group of tightly clustered artifacts. The tool arrangements in burial G-1 were far more sophisticated than the simple tool arrangement associations found at Wapanucket. This suggests a potential elaboration of the burial practices. Granted, burial G-1 was unusual compared to other contemporary graves at the site. However, it does testify to the presence of these cultural ideas or practices during that time period. Caddy Park has far more in common with burial G-1 than with Wapanucket. Both have small tool kits, an overall tool kit, and one or more groups of tools. Burial G-1 and the West Ferry site in general lacked red ocher, pressure flaked tools, and large quantities of tool/preforms. Burial G-1 is arguably closer in time with Caddy Park than the Wapanucket site, however, the differences suggest they were not contemporary.

Dincauze has argued that the Coburn site on Cape Cod was a direct ancestor of the Orient phase on Long Island (Ritchie 1969:222). Simmons links the cremation burial ceremonialism of the West Ferry site with the Hawes site in Lakeville, the Coburn site, and Orient phase burials of Long Island. These ties and relationships between southeastern New England sites and the Orient phase are important.

All six of the Caddy Park traits analyzed in this article are found in either the Orient phase or its neighbor the Meadowood phase. Both of these phases were contemporaneous with each other. Neither phase by itself contained all of the traits that are present at Caddy Park. The Orient phase burials show a consistent use of small tool kits and overall tool kits. The Orient phase burials lack the interment of bags of red ocher, pressure flaked tools, and large quantities of tool/preforms. The Meadowood phase burials contain all three of the traits lacking in the Orient phase. This evidence suggests that Caddy Park was influenced by both the Orient and Meadowood phases.

Having established parallels between Caddy Park and both the Orient and Meadowood phases, it is possible to make an educated guess as to the earliest possible date for Caddy Park. Ritchie dates the Orient phase from 2,993 to 2,713 B.P., and the Meadowood phase from 2,948 to 2,513 B.P. (Ritchie 1994: 165, 181). Caddy Park shows traits of both phases, therefore its earliest possible date could be 2,948 B.P. when both phases were contemporaneous with each other. The Orient and Meadowood phases are contemporaneous with each other till 2,713 B.P. This may represent the potential terminus date of Caddy Park. In sum, a possible date range for Caddy Park is circa 2,950 to 2,710 B.P.

Both the Meadowood and Orient phases were notable for being part of an elaborate mortuary ceremonialism found in the Northeast during this time period. The Caddy Park feature, whether a burial, cenotaph, or offering, speaks strongly of ceremonialism. Caddy Park is therefore arguably an example and microcosm of the elaboration in ceremonialism that was sweeping through the Northeast.
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A Reply to Gage

Thomas Mahlstedt and Margo Muhl Davis

Mary Gage’s article (this volume) presents an interesting attempt at dating the Moshup Site from Caddy Park, Quincy without the benefit of absolute dating techniques. She employs several relative dating techniques, some that we believe are inappropriate, with varying degrees of success. Although we agree that the site most likely dates from somewhere at the end of the Late Archaic/ Transitional Archaic and possibly Early Woodland periods, we have many points of disagreement with Gage’s approach and conclusions.

Gage attempts to date the site from Caddy Park by comparing what she terms ‘diagnostic characteristics’ from the site with other dated sites. These diagnostic characteristics include pressure-flaked points, the interment of large quantities of tool/perform as well as bags of ocher, and the organization of tools into tool kits and groups. Although these characteristics are found at the Moshup Site, none can be considered diagnostic. All of these traits can be found in many archaeologically defined cultural groups in New England dating to many different periods, and the comparison of artifact groups, with less regard for artifact style and type, encourages false comparisons. For example, pressure flaking is part of the implement manufacturing process from Paleo to Late Woodland times. Additionally, the comparison of the caches of quartz edge tools at Caddy Park with Meadowood preform caches is dubious since these tool types lack any formal stylistic or technological characteristics, and the associated artifacts are quite different. Caching artifacts for storage or ritual is practiced by cultures all over the world and over a great span of time. There is no reason to believe that the people at Caddy Park were influenced by outside cultures in a direct cause and effect manner when they dug a pit and buried their artifacts, deposited red ocher, or manufactured and retouched their stone tools.

We suggest that the best way to understand and date this feature is to analyze the assemblage as a whole, including artifact placement, manufacturing techniques and the artifacts as types and classes. In this way, the atlatl weight, the crescent pendant, the net weights, small stemmed points, large implement blades (bifaces) and ground stone tools would all be considered individually and together as a related assemblage. These artifacts, while not having tightly circumscribed dates, are much more diagnostic than the clustering of artifacts that Gage employs, and it is these artifacts that point to a probable Late or Transitional Archaic, and possible Early Woodland, date for the feature. Indeed, when analyzing all the artifacts as an assemblage, the Moshup Site looks much less similar to the Orient or the Meadowood phases, both of which have distinctive specialized artifact forms, such as gorgets, specialized point types and raw materials that are not found at Moshup, and more like a manifestation of local ideas.

Rather than relying on outside influences as the primary motivation for culture change in southern New England, we believe that the people at Caddy Park were as creative and selective in their development and adaptation of new ideas and technologies as any other group. Although our argument is still in the preliminary stages, it is clear that the Moshup Site, while innovative in some characteristics, such as the large implement blades (bifaces), draws on a long local tradition of caching artifacts with red ocher and similar artifacts. We argue that the influences that are manifest at Moshup are those which evolved in-situ, as well as over considerable distances and through time, and do not bear the mark of any single influence and/or culture. Significantly, part of this evolving adaptation relates to maritime activities and resources, which would have played little role in the Meadowood Phase, which is largely an interior cultural component and is only a very minor component on the coastal plain of eastern Massachusetts. Gage rightly notes some similarities between artifact type and the use of ocher at the Wapanucket sites and the Moshup Site. At Wapanucket, however, at least some of the activities may be much older than 4,500 years in light of Robinson’s (2001) recent re-dating of the ossuary at Wapanucket #8 (feature 206) to circa

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8,600 B.P. Although not all Wapanucket features are that old, this re-dating clearly indicates that there was a long tradition of local use of ocher and caching behavior, at least in association with burial features, in southern New England.

The Bear Swamp and Bear Swamp II sites from Berkley, MA, also provide good local comparisons to the Moshup Site. Bear Swamp revealed a bed of red ocher with gouges and winged atlatl weights similar to that from Caddy Park, as well as caches of small stemmed points (Greene 1942). Although interpreted as a grave, this site, like Moshup, failed to produce any skeletal or cremation remains. This site lacks net weights and the unusually large implement blades (bifaces) found at Caddy Park, but artifacts from the nearby Bear Swamp II site included net weights, graphite, and possible sandstone choppers, which resemble the possible polishing stones from Caddy Park (Barnes 1972). These, unfortunately were not found in as tight a context as those at Caddy Park.

Gage also mentions the Coburn and Hawes sites in passing as possible precursors to the Orient phase. Although she does not expand upon this point, we too believe that these are important sites to consider when understanding the archaeology of Caddy Park. The large implement blades (bifaces) from the Moshup site have at least a superficial resemblance to those at Coburn and Hawes (we have not yet been able to compare the technologies in person). Dincauze (1968) and others have suggested that the Orient phase may have evolved out of a merging of the Susquehanna and Small Stemmed traditions. If this is the case, then the people at Caddy Park may have been helping to forge this tradition in southern New England through adaptation, experimentation, borrowing, and adding onto a set of local beliefs mixed with outside ideas. This is not to say that they were consciously setting about to start a new technological tradition, but rather that they were an active part of a dynamic period when new and old ideas were mixing as never before. Exactly where the Moshup Site fits on the continuum of culture change from the Late and Transitional Archaic to the Early Woodland is one of many fascinating topics that needs further research, and we applaud Gage’s effort in that direction.

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Aboriginal Soapstone Workshops
at the Skug River II Site, Essex County, MA

Suzanne Wall

Abstract
Soapstone (steatite) is known to have been quarried historcally in Essex County, in particular, the Jenkins Quarry in Andover exploited an outcrop of dark bluish gray soapstone during the 1830s and 1840s. Although soapstone artifacts are well known in local collections, no prehistoric quarrying of local soapstone has been reported. Recently, a prehistoric quarry and related workshops have been identified at the Skug River II Site. Native American cultural material included bowl blanks and flakes. Some small boulders have been utilized as bowl preforms. Additionally, many blocks and/or bowl blanks had been removed from boulders, reduced and processed. The suite of marks and grooves observed at the site is distinctly different from tool marks attributed to stone cutting and dressing in the 1840s quarry.

Introduction
While soapstone (steatite) was quarried in Essex County during the nineteenth century, no evidence of prehistoric workshops or quarrying has been reported to date. Soapstone objects, including bowl fragments, pipes and atlatl weights are well represented in collections from the region. Until now it was assumed that these objects had been imported from the well known prehistoric soapstone quarries located in Central and Western Massachusetts as well as Connecticut and Rhode Island.

This article discusses the recently discovered Skug River II site and the evidence for the aboriginal quarrying of soapstone. The site was located through a geological reconnaissance survey of the greater Andover area in an effort to identify possible local sources of soapstone. A green soapstone frequently observed in local collections was of particular interest. During the survey, several outcrops of soapstone were found. These included sources for dark bluish gray and black varieties as well as ledge and glacially-derived boulder field deposits of green soapstone. Previous assessments of aboriginal soapstone quarrying have indicated that both ledge and boulder sources were exploited (Bullen 1940; Fowler 1942; Dunn 1945; Dixon 1987). In addition to outcrops, a workshop area with partially completed bowls, blanks and flaking debris of green soapstone was observed adjacent to the boulder field deposit. These cultural materials were noted as surface scatter; no excavation or formal mapping has yet been done.

Geology
Soapstone is often referred to as steatite in archaeological literature, however in current geologic usage, steatite is considered a form of talc. Its texture can be massive, flaky, foliated or fibrous, and have a soft slippery feel. Soapstone is a metamorphic rock comprised of varying amounts of altered amphibole, chlorite, micas, talc and pyroxenes and can range in composition from talc to serpentine. The green soapstone of Essex County lies in the serpentine family and is harder and denser than the talc-like soapstones of southern New England. Petrographic (thin section) analysis is currently underway to determine the composition of the green soapstone and establish its relationship to the Sharpners Pond Diorite with which it is associated.

Three varieties of soapstone have been observed as outcrops in the greater Andover area. They are described as follows:

1) The dark bluish gray soapstone has a massive texture (absence of layering, foliation or cleavage). In boulders, the weathered surfaces are powdery. The Jenkins Quarry produced this variety.

2) The green soapstone exhibits two textures, foliated and massive. The foliated form varies from a pearly moss green to a dark green stone with many platy partings forming thin layers. The massive green soapstone tends to be greener and darker than the foliated stone and is texturally similar to the dark bluish gray and black.
The black soapstone is distinctly different from the other varieties and is frequently brittle. It appears black on weathered faces, although it is a very dark gray on fresh faces. It often has altered feldspar crystals. Hepburn (1999) indicates it may have originated as a settlement of ferromagnesian (black iron bearing) mineral crystals from the magma that formed the Sharpners Pond Diorite.

Historic Quarrying

Many names have been used to describe the soapstone quarried historically in Essex County. William Jenkins referred to the gray soapstone he cut as ‘Blue Freestone’ in his Indenture of 1834. Sears (1905) called it a ‘Biotite Mica Peridotite’ indicating he recognized its ferromagnesian composition. Goldsmith (1932) described it as ‘Old Blue Soapstone’ and refers to Hitchcock’s 1841 Reports on the Geology of Massachusetts which lists the Jenkins Quarry under ‘Steatite or Soapstone’. The Jenkins Quarry, listed as Hill’s Quarry by Ripley Bullen (1949), is the only known historic soapstone quarrying site in the area. Jenkins quarried this dark bluish gray massive soapstone with open partings on nearly vertical cleavage, hence the name ‘Blue Freestone’. According to the terminology of the time, freestone referred to any stone that broke freely and could be cut and dressed without splitting. There is a great deal of evidence for historic quarrying in the area. A large outcrop of granite gneiss, located a half mile southeast, has also been quarried and exhibits many of the same tool marks evident at the Jenkins Quarry.

Aboriginal Workshops at the Skug River II Site

This paper focuses on the green soapstone boulder field and related workshops at the Skug River II site. A boulder field is a glacial deposition feature where boulders comprise a major part of the land form. They are often the product of frost wedging and glacial plucking of the rock ledge. Howes (1944), states that the quarried boulder pits in Wilbraham are within an area 350 feet by 200 feet. At the Skug River II site, some of the boulders have been disturbed by gravelling operations while others remain in-situ. Immediately outside the graveled area, the remnants of aboriginal workshops cover several hundred square meters. These contain numerous worked boulders, bowl blanks, abundant small soapstone flakes and dust, as well as small pit features.

The most striking cultural feature in the boulder field is the removal of blocks of soapstone from the boulders. These removals are characterized by pecked grooves, often in arcs rather than straight lines. The grooves are shallow and u-shaped, and often end in v-shaped notches along the boulder’s edge. Nearly all the grooves run along natural cracks that have been expanded through pecking. This method of block removal to create bowl preforms has not been described previously. In addition to block removals, smaller cobble-sized stones (20 to 60 cm) were also split and utilized as preforms. The splitting of cobbles and small boulders to produce bowl blanks has likewise not been addressed in the literature.

At the Jenkins quarry, the visible tool marks are almost all linear, only slightly weathered, and consistent with those described by Gage (2002). These include scored lines made with a chisel, holes cut with a star drill, the use of feathers and wedges to split off sections of rock, and some evidence of sawing. All these quarry marks are sharp and clear in contrast to the marks that occur on native worked surfaces. Any evidence of prehistoric use of these outcrops was probably destroyed by the historic quarrying operations.

Tool marks from historic quarrying are not found in the boulder field except in one location that may have been prospected. Here, the marks are clear, fresh, and linear. These contrast sharply with weathered pecking and pick marks visible on most of the boulders. It is important to note that the pecked grooves observed on the green soapstone boulders are not glacial striations. Glacial striations are shallow, linear and unidirectional. They do not intersect the boulder edges, terminate in v-shaped notches, or follow cracks in the sides of the stone.
Large Boulders. Within the boulder field and workshop area, a few dozen large boulders remain in place. At least five show evidence of extensive block removal and the enlargement of natural cracks. Dust, smoothing stones, and chips were also noted beneath the leaf duff at this location. Two of these boulders are discussed in greater detail below:

1) The largest stone is one meter tall and two by three meters square (Figure 1). The top surface has two sets of nested pecked grooves that exceed one meter in length. These grooves are three to four cm wide and one cm deep. The grooves appear to be enlargements of natural fractures in the stone. Dixon (1987) describes two 50 cm bowl removals from the rock face at Johnston, RI. A similar size removal (20 cm) is visible on the boulder face as shown in Figure 1. At the edge of the stone, five of the grooves become pecked notches. One notch is v-shaped, four to eight cm deep, eight cm wide at the top, and tapers back towards the groove. Over the side, the grooves continue off plumb along the crack. The faint C-shaped marks in the rims of the grooves are similar to the marks noted in flakes, cobbles and other boulders in the workshop area. On the south side of the stone, deep grooves have been cut along fractures and small blocks were removed.

2) The remarkable boulder shown in Figure 2 is flat and has a arcing groove pecked into its surface. A 10 cm long groove has been cut 2cm deep at the edge of the boulder. Four small (0.5cm) C-shaped holes were picked to create the groove and are identical to the small holes observed at other locations. If the worker had completed this pecked groove, a 30cm wide bowl blank would have been cleaved from the stone. To illustrate this point, note that the left corner has already been removed by the same method.

Utilized Small Boulders - Ripley Bullen (1940) reports boulders ranging from 11 to 34kg were utilized at the Dolly Bond Quarry in Millbury, Massachusetts. This size range matches the utilized and pecked green soapstone boulders observed at the Skug River II site. These small (25 to 60cm) boulders are also a strong visual match to an incomplete green soapstone bowl recently found in Andover and currently on loan to the Robert S. Peabody Museum of Archaeology. Based on the presence and depth
of weathering rinds, it is apparent that complete small boulders were pecked into bowls. Some small boulders also appear to have been split to create bowl blanks with flat tops and bases. This technique has not been described previously.

One example of how small boulders were processed into bowl preforms is illustrated in Figure 3. Here spalls have been knocked off a small boulder along shear planes to produce a bowl blank with a relatively flat top (35 cm across) and base (20 cm across). The boulder’s sides and top retain a deep weathering rind. A second example is shown in Figure 4 (see next page). In this case, the interior of the bowl has been partially picked out from a boulder approximately 10kg in weight and 40cm long. The bottom and sides are deeply weathered indicating it was made from a whole boulder. Note that, although one side has been fractured along a vertical cleavage plane, a portion of the rim remains. Unidirectional pick marks run along a center cleavage plane forming a step. A 12 cm circle of light pecking on the right of the top surface may represent a salvage attempt after the break. This piece closely resembles examples from the Dolly Bond Quarry (Bullen 1940).

Tools and Flakes - Tools are represented as surface scatter at Skug River II and include picks, grinders, smoothing stones, hammers, and abraders. Two utilized feldspar crystals 6cm in length were noted. These crystals were fractured on cleavage planes to produce a ‘ww’ washboard-like surface. The observed tools
were made from locally available materials including Sharpners Pond Diorite, Merrimack Quartzite, vein quartz, and Andover Granite.

**Small Pit Features** - Numerous small depressions (one to two meters in diameter and 0.5 meters deep) have been observed in this area. Similar features were noted by both Bullen (1940) and Howes (1944). Howes also described the Wilbraham quarry as having “…several surface depressions marking former sites of boulders that had been transported by glacial ice from an outcropping far to the north…”.

He speculated that the boulders were 1.5 to 6.6 meters long and 1 to 2 meters deep and noted that the workshop area was located around the rim of the boulders. Dust chips and debris characterize these areas and were also noted by Bullen as lenses of powder and soapstone chips (1940).

**Discussion and Conclusions**

While evidence of Native American soapstone use at the Skug River II site is abundant, the principal focus of quarrying appears to have been boulders and not ledge. This is in contrast to other known quarrying localities with the exception of Wilbraham. Although ledge is close to the surface at Skug River II, it is composed largely of diorite or granite. The evidence for soapstone working includes: bowl blanks with and without lugs, removal scars on boulders, pecked grooves and notches on boulders, block removals from boulders, parallel lines and single lines of holes on boulders and cobbles, and pit features. The following discussion focuses on two topics: a comparison of Skug River II site quarrying features with those of other Native and historic quarries, and a comparison of the green soapstone found at Skug River II with soapstone artifacts from Late Archaic sites in the greater Andover area.
Comparison of Quarry/Workshop Features - In comparison with the historic quarry, the green soapstone boulder field and associated workshops contain a distinct and separate set of tool markings. The large and small boulders and workshop areas of the Skug River II site show the pick marks, grinding, grooves, notches, holes, cavities, dust and flakes one would expect to see in areas where blocks of soapstone were removed, hammered, spalled and reduced into bowl preforms and/or bowls. In addition to block removal and reduction, several small bowl blanks were observed; one of these has a lug handle and two have partial rims.

In contrast to the block removal technique used at the Skug River II site, the removal of nearly completed bowls from a rock face is widely documented. For example, at the Dolly Bond Quarry, Bullen (1940) noted that the most complete bowl remaining on the outcrop was 

"...12 x 9 inches [in diameter], oval with a 5 inch groove [cut] 2 to 3 inches deep around it. This groove is undercut as much as 1 1/2 inches. When the Indians tried to break off the blank, the break followed a cleavage plane at an angle so that only the very top came off".

Although the techniques for removal and reduction of blocks and/or bowl preforms from boulders have not been previously described at other prehistoric soapstone quarries, the wide spread occurrence of this technique at Skug River II implies a long term, organized use of the site by Native American people. All block removals were non-linear, following irregular slicken-sided fractures in contrast to known historic cutting methods. Tool marks in the historic quarry do not include arc-shaped, pecked grooves. In fact, the arcing cleavage pattern and tendency to produce thick curviform spalls that made these boulders attractive to Native Americans would have made them undesirable for historic quarrying.

Comparisons with Collections - Collections from several sites in the Andover area were studied to determine if the local soapstone varieties were represented. Strong visual similarities were observed between the green and black soapstone and artifacts, primarily bowl fragments, from Late Archaic sites in the Tyzzer and Shellnut collections at the Robert S. Peabody Museum of Archaeology.

Two sites from the E. E. Tyzzer collection, Stowell's Field (19-MD-428) and the Town Farm site (19-MD-423), showed similarities with the soapstone varieties observed in the field. Of the dozens of bowl fragments from Stowell's Field, approximately half were a soft, vesicular soapstone that resembles the varieties from the known quarries in southern New England and was not observed in Essex County outcrops. The remaining bowl fragments were mostly a hard gray soapstone. Based on their texture, they are probably local in origin, although they do not match the dark blue gray soapstone of Jenkins Quarry. At least one bowl fragment was a visual match for the massive black soapstone observed along the contact with the Sharpners Pond Diorite. From the Town Farm site, one fragment of green soapstone (#262/3766) was visually consistent with that observed in the green boulder field.

Materials from the Murphy Farm site in the John Shellnut collection include several dozen finely worked bowl fragments. Among these are several gray examples like those from Stowell's Field, a massive black example, and two green soapstone fragments that visually match the green soapstone of the Skug River II site. One green fragment had a finely pecked interior and is grooved along the interior rim; the other has a finely pecked and ground interior. Tools from the Murphy Farm site include picks of Sharpners Pond Diorite and Merrimack Quartzite, very similar to those observed at the Skug River II workshop site.

Since this is a preliminary report, several follow-up studies are recommended. An archaeological survey of the green soapstone boulder field and associated workshop areas should be conducted to document its characteristics and extent more thoroughly, and to determine its age. Field observations from this and other localities imply long term use of the soapstone resources in the greater Andover area. Therefore, additional geological research and survey should be done, especially to determine the relationship of these soapstone deposits to the Sharpner's Pond Diorite. Additional comparisons between local soapstone varieties and artifacts from regional collections are also important. Finally, since aboriginal use of Essex County soapstone has
not been reported previously, other known collections and quarries should be re-evaluated for the presence of Essex County soapstone artifacts and evidence of the quarrying techniques used at the Skug River II site.

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