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CONTENTS:

Editor's Note. ................................................................. 45

The Turners Falls Site: An Early PaleoIndian Presence in the Connecticut River Valley. ........................................ 46  
Timothy L. Binzen

A Re-examination of the Deerfield Industrial Park Survey. ................................................................. 58  
Elizabeth Chilton, Thomas Ulrich and Niels Rinehart

Debating Bull Brook, 1965 to 1972 ........................................ 67  
Brian S. Robinson and William Eldridge

The Neponset Site, Locus 4: More Evidence of a Michaud-Neponset Phase Occupation ........................................ 76  
Christopher Donta

Contributors ................................................................. 88
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This issue of the *Bulletin* focuses on sites of the PaleoIndian period, that time of great environmental change at the end of the Pleistocene and beginning of the Holocene era. Dating roughly from 13,000 to 10,000 years ago, this is when modern humans first came into the landscape we now call New England. For many people, it is one of the most interesting and exciting parts of Massachusetts’ long and complex past. As these four articles demonstrate, we are just beginning to understand how complex this first chapter of the story was. These articles are based on presentations made at the Spring 2005 semi-annual meeting of the MAS held in Amherst. In a session organized by Elizabeth Chilton, the authors provided important information on several known but not well documented sites. With this issue, that information is now available to a much wider audience.

I have chosen to present these sites in what I believe to be chronological order. Tim Binzen begins with a discussion of the Turners Falls site. With its high percentage of exotic lithic material and Gainey-style fluted points, Turners Falls is an excellent candidate for the kind of pioneering site made by the region’s earliest occupants. Chilton et al report on another important early PaleoIndian site in the Connecticut Valley. Although found in 1978, this is the first published report on the DEDIC site. Bull Brook is probably Massachusetts’ best known early PaleoIndian site, however, much of its story has yet to be told. In this article, Brian Robinson and Bill Eldridge recount some of the early issues and controversies surrounding this site. Finally, Chris Donta summarizes past work at the Neponset site and provides new information on this significant mid-PaleoIndian site located southwest of Boston.

Those who attended the Spring meeting will also remember the excellent presentation given that afternoon by Dr. Jim Petersen, chair of Anthropology at the University of Vermont and a longtime member of the Massachusetts Archaeology Society. Jim’s talk reviewed what we know about late Paleo-Indian sites in New England, sites where partially fluted or unfluted points predominate. Based on his re-examination of the Reagan site collection and excavation of the Varney Farm site in Maine, this was a subject Jim knew well. As usual, Jim gave a terrific talk. For many of us, it was also the last time we were to see him. Jim was killed, tragically, this past summer while during fieldwork in the upper Amazon, another part of the world that he loved.

Jim Petersen was a great friend and colleague. He was also deeply knowledgeable, generous and funny - an essential part of the archaeological community in New England over the past twenty-five years. While it is impossible to fill the void left by Jim’s passing, we can honor his memory and his outstanding contributions to New England archaeology. In that spirit, I am pleased to dedicate this issue of the *Bulletin* to Jim Petersen.

James W. Bradley, Editor
The Turners Falls Site: An Early PaleoIndian Presence in the Connecticut River Valley

Timothy L. Binzen

Introduction

The Turners Falls site (19-FR-324), previously cited in the literature as the Hannemann Site, is an important source of new data concerning PaleoIndian settlement in Massachusetts during the Bull Brook phase (Hasenstab 1987, Bradley 1998, Spiess et al. 1998). Originally identified by an artifact collector, and recorded during a cultural resource management (CRM) survey at the Turners Falls Airport in the 1980s, the site recently has been the subject of investigations for a runway reconstruction project. Four loci of PaleoIndian material have been defined. Diagnostic artifacts include fragments of Gainey-like points, channel flakes, a side scraper and a unifacial end scraper. The lithic assemblage is dominated by jasper in yellow, red and brown hues. Many of the artifacts exhibit signs of thermal alteration, which in some instances occurred after discard of the artifact. In this article, the empirical attributes of the site and assemblage are presented, and consideration is given to avenues of inquiry to which future analysis of the site may contribute.

Location and Setting of the Archaeological Site

The Turners Falls site is located in the Connecticut River Valley of western Massachusetts within the community of Turners Falls in the Town of Montague in Franklin County (Figure 1). The PaleoIndian section of the site occupies a low sandy ridge on the property of the Turners Falls Municipal Airport. This part of the site has an elevation of 360 feet (109 m) above sea level, and is located less than a mile from the Connecticut River. Formed at a margin between ground moraine and glacial deltaic outwash sand (Curran 2003:154), which was later mantled with windblown sand, the ridge has a very gradual southern exposure, and is lightly vegetated in medium-sized pitch pines, scrub oak, tall grass and mosses. Areas of sandy erosion are visible on the steep slope below the

Figure 1. Location of the Turners Falls site, Connecticut River valley, MA

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northeast crest of the ridge, and on the gradual southwest-facing slope of the ridge.

The PaleoIndian section of the site offers a view to the northeast across a low, flat, grassy swale formed from deltaic outwash, beyond which lies an open, sandy hillside formed from a ground moraine remnant (Curran 2003:154). In combination, the sandy ridge of the site, the low swale, and the opposing hillside form a topographic bottleneck that is only 200 feet (60 m) wide. This constriction forms a passage between the expansive northern and southern sections of plain called the Montague Delta, and offers access to the Connecticut River (on the north) from the southern portion of the plain. In theory, during the Bull Brook phase (approximately 12,000 years ago), this bottleneck could have served as a constricted migration route for herds of land animals, such as caribou, that were passing through the vicinity. PaleoIndians who occupied the sandy ridge could have hunted these animals. The low swale below the site may have contained a small wetland in the ancient past, constituting an additional source of floral and faunal subsistence resources.

During the historic period, Euro-American agricultural activities occurred on the flatland near the Connecticut River that presently contains the main runway of the airport. Construction of the airport and nearby Millers Falls Road did impact the landscape adjacent to the site. However, the sandy ridge occupied by the site itself has never been plowed, and sandy subsurface deposits have been stable for millennia, resulting in the preservation of PaleoIndian evidence.

Research History of the Archaeological Site

The existence of PaleoIndian artifacts from this site was first reported to the Massachusetts Historical Commission (MHC) in the mid-1980s after Paul Hannemann (an artifact collector and former resident of the Town of Gill) visited the archaeology laboratory at the Department of Anthropology at the University of Massachusetts-Amherst. Mr. Hannemann brought in a boxful of PaleoIndian artifacts, which by his account had all been found at one location at the Turners Falls Airport. The Hannemann collection (which is still in the possession of Mr. Hannemann and has been viewed by the author and other archaeologists on multiple occasions) includes multiple Gainey-like fluted points and point fragments, one miniature fluted point, end scrapers, side scrapers, gravers, edge tools, pieces esquillees and a high volume of debitage (Figures 2 and 3). Virtually all the artifacts are made of jasper, which occurs in hues of yellow, red and brown. Mr. Hannemann has previously indicated to the author that the PaleoIndian artifacts were mainly surface finds. It is evident, however, that

**Figure 2.** Fluted points, cutting tools and gravers from the Hannemann Collection (reproduced from Hasenstab 1987, Figure 8A).
at least one undocumented excavation was conducted at the archaeological site during the mid-1980s. It is probable that one or more high-density loci within the site were excavated at that time.

The PaleoIndian assemblage in the Hannemann collection inspired the interest of Robert Hasenstab, then a graduate student at the University of Massachusetts. Not long after, Hasenstab directed a CRM survey at the Turners Falls Airport, testing multiple areas that were under consideration for possible development (Hasenstab 1987). The low swale area below the sandy ridge was tested (and a low volume of Late Archaic materials was identified in the swale). At this point the site was officially entered into the state site files as 19-FR-324. The original site form listed the PaleoIndian artifacts in the Hannemann collection. Notably, the 1987 survey did not include testing of the reputed source locale for those PaleoIndian artifacts, because at the time no development actions were proposed for the sandy ridge.

For a number of years, the CRM report from the survey (Hasenstab 1987) was the only documentary source of information about the site. Spiess et al. referred to the Hanneman [sic] site in an analysis of PaleoIndian occupation in the New England-Maritimes region, observing that the site had “been known for some time” but was “poorly published” (1998:211). In an overview of PaleoIndian culture in New England, Bradley (1998:14) listed the site (along with the DEDIC site in Massachusetts, the Whipple site in New Hampshire, and the Spiller, Point Sebago and Searsmont sites in Maine) among examples of the Bull Brook phase.

In 1998, a CRM survey for a security perimeter fence at the Turners Falls Airport passed near the site. However, the testing did not encounter any PaleoIndian evidence (Donta 1999). In 1999, CRM archaeologists conducted a brief investigation of a reported hearth feature that Mr. Hannemann said was visibly eroding at the site. Surface sands were systematically fine-screened in the area of a gray surface stain, and a low volume of small jasper flakes was recovered. Ultimately, the purported feature was interpreted as a smear of organic matter and charcoal that had resulted from tree-burns that occurred during the Modern period (Binzen et al. 2003, Appendix D).

In 1999, the airport master plan update found that the runway and taxiway were in poor condition, and their reconstruction and extension was recommended as part of the airport’s capital improvement plan. A Phase 1
An intensive CRM survey was conducted within the area of potential effect of the runway project. The MHC requested the testing to identify and evaluate any archaeological resources present within the proposed project limits. The 2001 survey included the first systematic testing of the sandy ridge (Binzen et al. 2003). Within an area measuring approximately 25 by 65 m, the testing tentatively identified four concentrations of jasper chipping debris. Significantly, a PaleoIndian side scraper of yellow jasper was recovered from one test pit that also produced a high volume of jasper flakes. In terms of the lithic materials and the general appearance of the artifacts, the assemblage from the testing was consistent with the PaleoIndian artifact assemblage in the Hannemann collection, which had been sourced to the same general locale. As it was based on systematic testing, this corroboration offered support to the contention that at least one occupation by PaleoIndians had in fact taken place.

Referring to these findings, the MHC requested that a Phase 2 site examination survey be conducted. The eligibility of the site for listing in the National Register of Historic Places had been established after it was initially reported as the source of the Hannemann collection. Thus, the main objectives of the site examination were to determine the horizontal and vertical dimensions of the PaleoIndian artifact concentrations identified within the site and investigate the integrity of the remaining archaeological deposits. The site examination survey was conducted in late 2004 (Binzen et al., in preparation).

**Archaeological Survey Methodology**

The methodology for both the intensive survey and the site examination survey involved the use of 50 x 50 cm shovel test pits. During the intensive survey, test pits were placed at intervals of 25 feet (7.5 m) along parallel linear transects that were laid out across the survey area. During the subsequent site examination survey, a metric site grid was established that incorporated the original transects (Figure 4). Each test pit was designated according to the Cartesian coordinates of its southwest corner. The interval between test pits was reduced during the site examination in order to bracket the PaleoIndian artifact concentrations identified within the site.

![Figure 4. Map of the 50 x 50 cm test units excavated during the cultural resource management surveys at the Turners Falls site, showing the four concentrations of PaleoIndian artifacts.](image-url)
test pits that had previously produced lithic artifacts, and to further refine the presence/absence data in order to better define the boundaries of artifact concentrations. The test pits were excavated in arbitrary 10 cm increments to an average depth of 70 cm, or at least to a depth that was >20 cm below the last level to have produced cultural materials. During both surveys, all excavated soils were fine-screened through 1/8-inch mesh.

The exclusive use of 50 x 50 cm units and fine screening during archaeological survey has resulted in systematic coverage of the PaleoIndian section of the site within the area of potential effect. The augmented presence/absence testing of the site examination served to: a. confirm the existence of four discrete jasper concentrations, or loci; b. define the horizontal dimensions of each concentration; and c. indicate the comparative artifact density in different parts of the site. All the CRM test units that have been excavated at the site (including those from the 1999 “hearth feature” investigation) have been entered into a site database according to their coordinates on the master site grid. This has enabled a high degree of resolution for the analysis of spatial patterning.

While no open block excavations have been conducted at the site, the site examination did include a pair of linear, .50 x 5 m trenches (numbered 1 and 2) that formed a ‘T’ pattern within in the highest-density artifact concentration. To ensure consistency with the test pits, both trenches were excavated and recorded in 50 x 50-cm segments. Given the small size of many of the lithic artifacts, the decision to fine-screen during both phases of testing proved crucial to the recovery of artifacts and the definition of the boundaries of artifact concentrations. To date, 148 50 x 50 cm test units (including shovel test pits, contiguous units, and trench segments) have been excavated within the PaleoIndian section of the site, including the areas of artifact concentration and the zones that appear to be culturally sterile.

**PaleoIndian Artifact Concentrations**

The four discrete concentrations of PaleoIndian artifacts identified at the site are designated as Loci A, B, C and D. The individual loci vary in size from 40 m² to 90 m², and are contained within an overall area of approximately 1,700 m². If the apparent location of a fifth locus (that was subject to undocumented excavation in the 1980s) were factored in, the overall known area containing PaleoIndian loci would double at this site. The presence of additional PaleoIndian loci in untested areas near the known part of the site cannot be ruled out.

Loci A-D consist of concentrations of small jasper flakes resulting from the manufacture, modification and/or use of tools and points, which also have been recovered from the site. More than 1,800 artifacts have been recovered from the four loci. Approximately 97% of the assemblage, and all but two of the diagnostic artifacts (a chalcedony channel flake and a rhyolite side scraper) are made of jasper. A cryptocrystalline material, jasper is a fine-grained, glossy variety of chert that can range in color from mustard (or golden, or honey) yellow to bright red to brown (Luedtke 1987:37). At the Turners Falls site, jasper occurs in hues of yellow (Munsell color value 10YR 4/6), red (2.5YR 3/4) and brown/olive brown (2.5Y 4/4). The other 3% of the PaleoIndian assemblage consists of flakes of chert, rhyolite, chalcedony and crystal quartz.

Gainey-style fluted points were first defined in the Great Lakes region. Their analogue in the New England region has been termed the “Bull Brook style.” The majority of these Early PaleoIndian points are large and parallel-sided, with short flutes and lateral grinding (Bradley 1998:14). They tend to be 6-8 cm in length, with flutes that only reach 1/2 to 1/3 the total length of the point (Bradley 1998:10). The basal attributes of the single fluted point base fragment recovered from Locus A (Figure SA) had a basal width of 22.5 mm; a depth of basal concavity of 3.5 mm; and a width: depth ratio of 6.4 to 1.
Figure 5. Selected PaleoIndian artifacts from the Turners Falls site, Locus A. These are made of jasper, except Artifact D from Locus C which is of rhyolite. A. fluted point base from N105.5 E157, #04; B. fluted point base corner fragment from N105 E158, #02; C. flake/biface fragment with multiple plunging flake scars from N108 E158.5, #03. The distal portion of this flake is a section of bifacial margin; D. side scraper from N97 E120, #02; E. side scraper from N107.25 E157.75, #04; F. unifacial end scraper from N110 E153, #01.

Other surveys conducted in and near the Turners Falls Airport have reported evidence of Native American activities from the Middle and Late Archaic periods as well as Woodland period. Not surprisingly, isolated surface finds of Archaic and Woodland points near the PaleoIndian section of the site show that Native people visited the sandy ridge thousands of years after the PaleoIndian occupation. However, it is noteworthy that no post-PaleoIndian archaeological deposits (i.e., later temporal components) have been identified within the 'PaleoIndian section' of the site. This contrasts with many PaleoIndian sites in southern New England, which Spiess et al. observe "remained attractive to Early and Middle Archaic peoples, if not later populations", but is in accord with a pattern seen in northern New England and the Maritimes Provinces, where "fluted point PaleoIndian sites are almost never coincident with later (Archaic or Woodland) occupation" (1998:230). Often in the southern New England cases, post-PaleoIndian cultural strata overlie (and may be partially intermixed with) the PaleoIndian strata, making it more of a challenge to discern the PaleoIndian assemblages clearly. Because the lithic assemblage at the Turners Falls site is dominated by jasper, and because most of the non-jasper artifacts on the sandy ridge share the spatial distributions and stratigraphic contexts of the jasper, it may be inferred with confidence that both the Jasper artifacts and the majority of non-jasper artifacts were created and deposited at the same time. To illustrate this point further, a diagnostic PaleoIndian channel flake fragment of white chalcedony was recovered from the highest-density jasper locus (Figure 6G, next page).

Locus A. The easternmost of the four concentrations, Locus A measures 9 m north-south and 5 m east-west (45 m²). Locus A produced the highest density of jasper chipping debris among the four concentrations. Preliminary analysis suggests an average density of 170 artifacts per square meter, with a very high density in imputed activity areas and a much lower density closer to the periphery of the locus. Two Gainey-like fluted point basal fragments, twenty-three channel flake fragments, one side scraper, and one unifacial end scraper have been recovered from Locus A (Figures 5 and 6). The end scraper was the sole artifact recovered from a test pit located on the periphery of the artifact concentration. Multiple jasper flakes with a small amount of cortex were recovered, further indicating that multiple stages of lithic tool manufacturing (and not just re-sharpening) occurred in the locus. More than 1,600 jasper...
flakes were recovered from Locus A. Some of the artifacts in the locus were made from jasper that may have been heat-treated prior to the manufacturing process, but many were subject to thermal alteration after breakage or discard. 'Pot lid' scars indicative of heat exposure are present on one of the fluted point fragments (Figure 5B), and on the ventral (interior) surface of one channel flake (Figure 6J). This indicates that the flake was subject to heat after it was removed from a biface. Of the twenty-two channel flake fragments made from jasper, nine show signs of heat alteration. However, despite the widespread evidence of the heat alteration, no hearths or clearly cultural burn features have yet been identified within Locus A, or within the other PaleoIndian loci.

**Locus B.** This locus measures approximately 11 m north-south and 8 m east-west (88 m²). Preliminary analysis suggests an average density of 22 artifacts per square meter, with the density decreasing markedly with increased distance from imputed activity areas within the locus.

**Locus C.** This locus extends beyond the area of potential effect of the runway project. As currently defined, it measures approximately 18 m north-south and 5 m east-west (>90 m²), with an average density of 11 artifacts per square meter. One rhyolite side scraper was recovered from a test pit in the southern part of the locus. No areas of particularly high artifact density have been identified.

**Locus D.** The westernmost of the four concentrations, Locus D measures approximately 8 m north-south and 5 m east-west (40 m²), with an average density of 6 artifacts per square meter. It contains no areas of particularly high artifact density.

### Site Stratigraphy and Site Formation Processes

Recent geological research (Rittenour 1999) and geoarchaeological analysis (Curran 2003) in the Turners Falls area allows a tentative reconstruction of the sequence of events that formed the sandy ridge occupied by PaleoIndians. The landform has been referred to simply as a 'dune', but its geological history is actually quite complex and involves both alluvial and aeolian episodes of sand deposition.
The ridge was formed at a margin between ground moraine and glacial deltaic outwash sand (Curran 2003:154). Glacial Lake Hitchcock deposited massive amounts of sand that formed the Montague Delta to the north and south of the site. Rittenour suggests that, in the Turners Falls area, glacial Lake Hitchcock drained ca. 13,700 ± 1,100 cal. yr BP (1999:91). Immediately, the lake bottom sediments were exposed, and westerly winds picked up and blew these sediments into transverse and parabolic sand dunes on adjacent deltas, the exposed lake bottom, and on the oldest river terraces (Rittenour 1999:29). The sandy ridge at the site is an echo dune that was formed on the Montague Delta (Rittenour 1999:88). Wind action and the narrowness of the space between moraine features may have formed the topography of the low swale or ‘bottleneck’ below the site which would have allowed passage between the southern Montague Delta and the Connecticut River during PaleoIndian times. It should be noted that wind transport of silt continued into the Middle Archaic period, several millennia after the PaleoIndian occupation (Curran 2003:159). Powerful sandstorms polished boulders near the site, further blanketing existing landforms.

The typical stratigraphic soil profile at the Turners Falls site exhibits a shallow topsoil stratum (A-Horizon) of dark brown sand with fibrous roots to a depth of 15 cm below the ground surface. Beneath this, a subsoil stratum (B-Horizon) of yellow-brown sand is visible to a depth of 60 cm. Underlying the subsoil is a substratum (C-Horizon) of coarse, pale yellow sand that has been documented to a depth of at least 130 cm below the ground surface. This substratum, the underlying material of the landform, has been interpreted as deltaic outwash sand. Ongoing analysis will attempt to determine whether it is actually alluvial in origin, or is a deeper aeolian dune deposit. The soil horizons are generally free of gravel and rocks. The topsoil horizon likely was formed from Holocene (post-PaleoIndian) windblown sand, while the underlying subsoil (B-Horizon) may represent an older, Late Pleistocene dune event that formed the ground surface that was occupied by PaleoIndians. Since this typical stratigraphic profile was present in most of the test units excavated across the site, soil disturbances and other variations from the norm were quickly recognized. In general, the preservation of PaleoIndian deposits is good, with most disturbances confined to the modern ground surface or attributable to minor root activity.

Most of the jasper artifacts were recovered from the subsoil stratum (B-Horizon) and from depths greater than 30 cm below the ground surface. It was observed during the excavations in Locus A that jasper flakes were recovered in ‘micro-concentrations’, even within a single 50 x 50 cm unit. Great variability in artifact volume was seen between test units that were only 1 m apart in Locus A. This may indicate that several highly localized, single-person areas of PaleoIndian activity are present within the locus. The presence of micro-concentrations, in combination with the lack of weathering of artifacts, also suggests that the lithics have undergone little (if any) lateral displacement since being deposited.

The coarse sand typically encountered at depths of >60 cm below the ground surface was designated as a substratum (C-Horizon). This horizon was generally found to be culturally sterile, with the exception of single artifacts recovered from the B-Horizon/C-Horizon interface in single test pits in Loci C and D, and (more notably) from the northern part of Trench 1 in Locus A, an area of high artifact concentration. Here, jasper flakes were recovered from what appeared to be substratum sand, at depths of >60 cm. No anomaly in sand coloration or texture could be discerned visually. The clear impression is that PaleoIndian activities took place on this lower soil horizon, or penetrated into it.

Implications of Recent Findings

The new data from the Turners Falls site enhances our understanding of PaleoIndian culture in the Northeast during the Bull Brook phase in a number of ways. As observed by
Spiess et al., the guiding theoretical frameworks for regional PaleoIndian studies are the culture-historical approach, the functional/cultural ecological approach, and the processual approach. Within these frameworks, contributing research themes include environment; settlement pattern; chronology, style and dating; lithic material use; and regionalization (1998:220-222). Preliminary observations from the Turners Falls site are offered here, with the hope of contributing to the debate and discussion.

**Environment.** PaleoIndians evidently occupied the Turners Falls site during the Bull Brook phase, and thus it is among the earliest known examples of human occupation in southern New England. Environmental conditions at that time were challenging to human settlement, and climatic fluctuations occurred both before and after the PaleoIndian occupation of the site. The course of the Connecticut River itself had not fully stabilized during this period. Temperature fluctuations affected vegetation regimes as well as the combinations of faunal species that contributed to human subsistence. Reconstruction of the paleoenvironmental conditions and vegetation that prevailed at the site during the Bull Brook phase is ongoing.

**Settlement Pattern.** In regard to locational attributes, the site demonstrates the same preference as many other PaleoIndian sites in the region, location on sandy, well-drained soil. Other PaleoIndian sites in the Connecticut River valley have been identified as being on proglacial outwash sand (Spiess et al. 1998:230). This site is on a dune formation adjacent to an outwash delta. It is also located near the Connecticut River, a major regional travel corridor. An apparent habitation site, Turners Falls appears to represent what Spiess et al. (in reference to the Michaud site) call “a functional complex with internally differentiated activity areas” (1998:213). At Turners Falls, lithic material was subject to heat alteration, points and tools were manufactured, and implements were used, rejuvenated and/or discarded. It is not clear which faunal and floral resources were used by the PaleoIndians who occupied the site. No biological residues have been identified yet. It is possible, however, that the landform offered access to a relatively wide range of subsistence species during the Bull Brook phase, compared to other locations in the Turners Falls vicinity.

The internal patterns of artifact distribution identified at Turners Falls share certain attributes with other PaleoIndian sites in the Northeast. For example, the site exhibits an internal settlement pattern of non-overlapping concentrations or loci (Spiess et al. 1998:204). Some preliminary patterns are suggested by the size and relative spatial arrangement of Loci A-D. First, the areas of artifact concentration are discrete, separated by intervening zones that are apparently devoid of PaleoIndian material. Second, each locus is centered about 15 m from the center of its nearest neighbor. Third, the central points of the four loci form a roughly linear axis that is parallel to the contour of the landform, overlooking the swale below. Finally, in terms of area, the two central loci (B and C) are twice as large as the outer ones (A and D). However, Locus A has produced the highest absolute and comparative volumes of PaleoIndian material, as well as the diagnostic points, channel flakes, and all but one of the tools. Among the four loci, Locus A evidently witnessed the widest and most concentrated range of lithic-related activities.

Spiess et al. observe that “internal patterning at each site which contains more than one locus consists of concentrations of stone tools and debitage of limited size, usually about 4-8 m in diameter, separated by what appears to be sterile space”. They also note that Bull Brook contained forty-two loci, Debert eleven loci, Vail and Michaud eight loci each, and Bull Brook II six loci (1998:228). The four known loci at Turners Falls have an average diameter of 8.6 m.

In a discussion of hypothetical Late Pleistocene resource base types and their corresponding settlement types, Jones (1998:139-41) suggests a resource base that was “predictable, dispersed
and of rich quality” would likely produce a form of settlement characterized by “medium-term (one week to one season) residential camps with 2 to 4 artifact loci representing individual residence locations, a high number and diversity of artifacts, numerous nearby foraging locations” and “tool rejuvenation locations with debitage and discards”. Preliminary analysis suggests that the Turners Falls site may fit this pattern, but further investigations into the resource base, seasonality and the full range of activities conducted at the site will be necessary to refine this interpretation.

Chronology, Style and Dating. Like most of the excavated, multi-locus sites in the region, Turners Falls exhibits what may be called a “limited range of fluted-point stylistic variation” (Spiess et al. 1998:204), an indication that the site was not repeatedly occupied by PaleoIndians over a long span of time. The diagnostic points from the site are Gainey-like, indicating that site occupation occurred during the Bull Brook phase. No subsurface features or materials suitable for carbon dating have yet been identified in association with the PaleoIndian artifact concentrations at the site.

Lithic Material Use. In their regional synthesis of PaleoIndian site patterns, Spiess et al. noted that the assemblage then associated with the Turner Falls site consisted of >70% jasper (1998:241), and that the site “is dominated by yellow jasper and has the highest percentage of that material of any site in the region” (1998:242). Subsequent systematic investigations at the site have shown that 97% of the PaleoIndian assemblage is composed of jasper. Also noteworthy is the variety among the lithic materials that make up the remaining 3% of the assemblage. Flakes of white chalcedony (including one channel flake), chert, rhyolite, and crystal quartz have been recovered in clear contextual association with loci of jasper concentration. While the site appears unique with this high percentage of jasper, it is not uncommon for Gainey-related sites to be dominated by one lithic material. Gainey sites in Ontario are seemingly dominated (>80% of the assemblage) by material from a single source, and that source is usually over 200 km from a given site (Spiess et al. 1998:244).

The jasper from Turners Falls occurs in hues of yellow, red and brown. Although the source(s) of the material await determination, it is clear that these materials were not locally available. The recovery of multiple channel flakes confirms that fluted points were manufactured at the site. However, only a very low percentage of the jasper flakes bear cortex, and there are no large corticulated flakes. This suggests either that the jasper was imported to the site as partially worked performs or cores, or that the primary reduction of the jasper took place at a different part of the site or at a site yet to be identified.

Many of the jasper artifacts in the assemblage exhibit signs of thermal alteration. When exposed to temperatures above 400 degrees Celsius, yellow jasper will turn red (Schindler et al. 1982, cited by Luedtke 197:37). Some of the larger flakes from the site grade from yellow into red, with the red portion indicating the ‘outer’ part of the jasper core or biface that was subject to thermal alteration. Whether the pre-reduction thermal alteration of the jasper took place on-site or elsewhere is not yet clear. The general term ‘thermal alteration’ is used here rather than ‘heat treatment’ because, while some of the larger flakes may have been removed from bifaces made of jasper that had been heat-treated to be more lustrous and easier to flake, other jasper artifacts from the site (e.g., one fluted point base, one channel flake) bear pot-lid scars that indicate they were exposed to a high degree of heat subsequent to their discard. This exposure almost certainly occurred on-site although no hearth or burn features have been located.

The implications to be drawn from the combination of lithic raw materials used by PaleoIndians at Turners Falls are numerous in regard to tracing the routes of travel, transport and exchange that resulted in the presence of this assemblage on a sandy ridge in the Connecticut River valley. Identification of the sources of these lithic materials is a high priority
for the ongoing analysis of the assemblage.

Regionalization. PaleoIndian sites of the Bull Brook phase that are comparable to Turners Falls include the DEDIC/Sugarloaf Site in Deerfield, Massachusetts (located southwest and downriver); the Whipple Site in New Hampshire (located northeast and upriver); and the Spiller, Point Sebago and Searsmont sites in Maine (Bradley 1998:14). To the west, the Swale and Kings Road sites located in the mid-Hudson Valley have similar assemblages with Gainey-related points and significant percentages of exotic jasper and chalcedony (Funk 2004:106-7).

Still, Turners Falls remains unique among these sites for both the preponderance of jasper, and for having a single lithic raw material that so completely dominates the assemblage. Hatch and Maxham suggest that Pennsylvania sites with anomalously high concentrations of jasper are possible examples of the phenomenon of hoarding, in which scarce resources were massed intentionally at or beyond the perimeter of regional zones of exchange (1995:243). Citing Ericson (1984), Hatch and Maxham indicate “the social and economic underpinnings of the transport and exchange of jasper from sites of procurement to sites of deposition are best considered after detailed examinations of thedebitage categories present in each site’s assemblage. Such analyses could distinguish between patterns of direct procurement by groups with these quarries in their foraging range versus indirect procurement by groups dependent on exchange opportunities” (1995:243; original emphasis). Ongoing analysis of the assemblage from Turners Falls will refine the debitage categories in order to better understand why this location was chosen for the manufacture of points and other jasper implements.

Conclusion

The Turners Falls site is a remarkable part of the archaeological record of New England, and adds a crucial piece to the puzzle of PaleoIndian studies in the New England - Maritimes region. The site is unique among regional PaleoIndian sites for the degree to which its lithic assemblage is dominated by jasper. The presence of Gainey-like fluted points, in combination with the geology of the landform where the site is located, strongly suggests that this was a pioneering site of the Bull Brook phase during the Early PaleoIndian period. If so, the location was occupied by people who were among the first to venture along the Connecticut River corridor following the draining of glacial Lake Hitchcock.

PaleoIndians evidently conducted a wide range of activities at the Turners Falls site. It is clear that fluted jasper points were manufactured there, and that multiple channel flakes were removed to create the final flutes on points. During the point manufacturing process, multiple striking platforms were carefully formed on single point bases to enable the controlled removal of long, narrow channel flakes. The lithic assemblage indicates that secondary, tertiary and completion stages of fluted point production occurred at the site. In addition, the presence of a suite of diagnostic PaleoIndian tools, including end scrapers, side scrapers, and gravers, provides evidence that a range of processing activities were carried out at the site after hunting forays had been conducted.

The complexity of the PaleoIndian culture in the New England - Maritimes region is increasingly evident because of patterns of inter-site similarity that cannot be explained solely (or even mainly) on the basis of human ecological adaptation (Spiess et al. 1998:252). The ongoing analysis of evidence from the Turners Falls site promises to advance the understanding not only of regional patterns of lithic material procurement and travel at the end of the Pleistocene, but also of the broad range of activities that PaleoIndians conducted at specific locations such as the Turners Falls site. Systematic testing strategies recently applied to this site have enabled the creation of a detailed spatial database that is likely to yield further insights into the way of life and cultural processes experienced by the people of the PaleoIndian period.
Acknowledgments

The author would like to thank those who have contributed to research and interpretation at the Turners Falls Site, and to the preparation of this article. Kerry Lynch supervised the lithic analysis. Kit Curran produced the graphics. Additional thanks are extended to Tim Barker, Dick Boisvert, Jim Bradley, Bill Burns, Elizabeth Chilton, Dena Dincauze, Chris Donta, Armand Dufresne, Jennifer Fairlie, Dan Forrest, Paul Hannemann, Bob Hasenstab, Nick Heath, Brian Jones, Steve Lakatos, Tony Medina, Mitch Mulholland, Art Spiess, Terry Stigers, Mike Sweeney, Marcus Tate, Melissa Wales, and Jennifer Wendt.

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Jones, Brian

Luedtke, Barbara

Rittenour, Tammy

Schindler, Debra, James Hatch, Conran Hay and Richard Bradt

Spiess, Arthur, Deborah Wilson and James Bradley
Introduction

The information presented in this article is based almost entirely on information presented by Tom Ulrich in a 1978 report on file at the University of Massachusetts Amherst (UMass). Although the title says 're-examination', this is really a retelling of Ulrich’s initial examination. We are only at the beginning of the reanalysis process, and in this article we discuss our plans for future research.

In 1978, under the auspices of the Environmental Institute at UMass Amherst, and permit #252 issued by the Massachusetts Historical Commission (MHC), Tom Ulrich undertook a reconnaissance and locational survey for the Deerfield Economic and Industrial Commission (DEDIC) industrial park in South Deerfield, Massachusetts (Figure 1). Ulrich conducted this project before the formation of UMass Archaeological Services. He carried out background and field studies as well as surveyed selected portions of the industrial park that appeared to have a high potential for archaeological sites. The conclusions drawn from these surveys were that parts of the project area contained archaeological resources, including a prominent sand dune in the center of the project area. Ulrich concluded that the archaeological component on the sand dune was disturbed, but that a significant PaleoIndian component was located about 50 meters to the southeast of the dune. The PaleoIndian component of the DEDIC site was determined to be eligible for the National Register and Ulrich recommended in the 1978 report that the site be covered with “3 to 5 feet of earth” for its protection and preservation. In this article we summarize the field-testing strategy, methodology, and preliminary results of Ulrich’s survey, as well as discuss plans for future research.

Site Background

The South Deerfield industrial park is located at the southern edge of the Town of Deerfield, MA (Figure 2) and covers approximately 70 acres. The construction of a building and attendant facilities associated with a tool company was already well underway in the center of the project area in 1978 at the time of the archaeological survey. However, the construction of these buildings apparently did not significantly infringe on any archaeological resources.

The project area includes aeolian or windblown deposits of fine, sandy loam. These fine sands were deposited by predominant northwesterly winds acting on lake bottom soils from Glacial Lake Hitchcock, soon after its drainage approximately 12,000
years ago. These processes produced a well-defined sand dune at the center of the industrial park as well as a series of smaller sand dunes oriented north-south at the tip of the western portion of the project area. Topographically, the project area is primarily located on the flat, lake bottom surface.

A small stream, Sugarloaf Brook, runs through the project area and several small pools are located in the ravine cut by this stream, indicating the presence of springs. At the southeast corner of the project area is a margin of a former floodplain of the Connecticut River that today flows 500 meters further to the southeast. A prominent topographic feature, Mount Sugarloaf, is within view of the industrial park, about 1 km away, and the eastern edge of the Berkshire Hills lies about 3.5 km to the west.

Field Research Methods

The research design for this project had two major components: (1) a Phase I survey sampling strategy designed to indicate the presence of any culture resources that might exist in the project area, and (2) a Phase II intensive survey designed to evaluate any cultural resources found in the course of the initial investigation.

For the Phase I, Ulrich broke up the project area into seven areas, designated A through G (Figure 2). He then assessed each of these areas through a series of walkovers and surface collections. As a result of the surface examination, Ulrich conducted subsurface examinations in five of the survey areas. These subsurface examinations included soil samples taken with a 1" soil core, and 40 cm square shovel test pits (STPs), dug at regular intervals along several transects. The results of the Phase I for each survey area are presented in Table 1.

Results of the Phase I survey indicated the

<table>
<thead>
<tr>
<th>Area</th>
<th>Testing</th>
<th>Artifacts</th>
<th>Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Surface collection, soil cores, and STPs</td>
<td>none</td>
<td>Not eligible</td>
</tr>
<tr>
<td>B</td>
<td>No testing since disturbed</td>
<td>none</td>
<td>Not eligible</td>
</tr>
<tr>
<td>C</td>
<td>Surface collection, soil cores, and STPs</td>
<td>Few flakes in plow zone</td>
<td>Not eligible</td>
</tr>
<tr>
<td>D</td>
<td>See discussion in text</td>
<td>See discussion in text</td>
<td>Nominated to the NR</td>
</tr>
<tr>
<td>E</td>
<td>Surface collection, soil cores, and STPs</td>
<td>none</td>
<td>Not eligible</td>
</tr>
<tr>
<td>F</td>
<td>Surface collection</td>
<td>none</td>
<td>Not eligible</td>
</tr>
<tr>
<td>G</td>
<td>Surface collection, soil cores, and STPs</td>
<td>Pre-Contact artifacts</td>
<td>Not eligible</td>
</tr>
</tbody>
</table>
STPs were excavated at different intervals along several transects. The meter square units, however, were dug both at intervals along transects as well as at selected locations within a 70 X 70 meter square area that Ulrich placed in subsection D3b. He divided the 70 X 70 m square into squares 10 X 10 m producing 49 units at 100 square meters each. Each of these units was then further subdivided into 100 one-meter units from which 25 units were selected for excavation. Ulrich excavated two 1 X 1 m units in addition to these 25.

Area D

Area D is roughly 3.25 hectares or 8 acres. Soils encountered in this area were fine, sandy loams of aeolian and sedimentary origin. The topography was flat except for a large sand dune, which rose about 7 meters above the surrounding terrain. The southern half of the site had been in shade tobacco until as recently as a year prior to the survey. At the time of the survey, this portion of Area D was in rye, a cover crop. Several varieties of wild grasses and low shrubs covered the sand dune in the northern half of Area D.

Several disturbances were apparent in Area D. First, there was a 20 to 25 cm thick plowzone across the area, including the sand dune. Second, a bulldozer had cut through the center of the sand dune to a depth of about 3 meters. Third, extensive pot hunting during the 1930s severely impacted aspects of the sand dune. Reports by several local farmers indicated that many people would come to the site to dig on weekends. Thus, the surface of the dune had been completely disturbed.

Vertical controls of excavations within Area D included the removal of the plowzone as a natural level, and the excavation of the B-horizon by 5 and 10 cm arbitrary levels. The C-horizon was assumed to be sterile and occurred at depths ranging from 20 to 80 cm below the surface. The similarity of the B- and C-horizons often made the distinction between the two difficult. The examination of the 100-meter long trench cut by a bulldozer through the sand dune, and the excavation of two backhoe trenches aided the inspection and description of soils within the survey area.

The initial walkover of Area D indicated the presence of a large and complex site. Surface collections of the sand dune (section D1) and the immediately adjacent section D2 produced flaking debris of several lithic materials including quartz, quartzite, rhyolite, argillite,
and an occasional chert flake. Although Ulrich excavated STPs along various transects in sections D1 and D2, he recovered little subsurface material from these sections.

During surface collections in section D3, Ulrich found numerous pieces of gray-black banded chert, including several chert end scrapers. The discovery of gray-black banded chert debitage and end scrapers prompted Ulrich to excavate additional STPs and meter square units in section D3. As discussed previously, a 70-meter grid was laid out in this location and 27, 1 X 1 meter units were excavated. Ulrich then randomly selected the location of these units within alternate 10-meter square units within the grid. Three concentrations of flaking debris were initially identified. The assemblage from one of the units was sufficiently dense (152 flakes) to warrant the opening of another meter square adjacent to it. This second unit contained 1,279 lithic artifacts, almost all of which were gray-black banded chert. Among the several finds from this unit were a nearly complete biface, several end scrapers, several large side scrapers, and fragments of two fluted points (Figure 4 and 5). Ulrich (1978) interprets the apparent parallel siding on these fragments as evidence that these artifacts might be medial fragments of Gainey (Bull Brook) style points. If so, these artifacts might date the DEDIC site to the earliest period of PaleoIndian occupation dating possibly to between 10,800 and 10,500 B.P. (Spiess et al. 1998:238).

As a result of these finds, a series of transects was laid out in various directions, with the result that four additional concentrations of flaking debris and artifacts were identified. In total, six concentrations were located, two of which were labeled definite concentrations, two probable concentrations, and two possible concentrations.

Figure 5. A sample of artifacts from site 19-FR-157b.
In conclusion, it would appear that the sand dune once held the remains of a multi-component site, but that the actions of wind and people essentially obliterated it. On the other hand, Ulrich argued that the single component PaleoIndian locus in section D3 was sufficiently undisturbed to warrant preservation.

Artifacts

Ulrich recovered over 1,000 flakes in sections D1 and D2. Twenty-one tools or tool fragments were also identified, including three complete points, four diagnostic portions of points, eight non-diagnostic biface fragments, three unidentified worked lithics, one portion of an atlatl weight, and two potsherds.

Figure 6. A sample of artifacts from site 19-FR-157a.

Of the several diagnostic points, five were identified as Neville or Stark points dating to the Middle Archaic, and two were identified as Late Archaic (a Brewerton side-notched and a Squibnocket triangle; Figure 6). Of the eight non-diagnostic tool fragments, four are point tips (one blue quartzite, two white quartzite, and one rhyolite). The other four pieces are point midsections made of quartzite, quartz, and rhyolite. The artifacts suggest that people utilized the sand dune area from the Middle Archaic through the Middle Woodland periods. It is difficult to draw conclusions because of the serious disturbance to the site. For record keeping this survey area was designated as MHC site #19-FR-157a.

Area D3 was just to the south of the sand dune. A total of 1,968 artifacts were recovered from this survey unit, 18 of which were identified as formal tools. The remainder included flakes, some of which were retouched. A complete analysis of the lithics has not yet been carried out.

A preliminary analysis indicates that the vast majority is a gray-black banded chert (1,614). Other materials include rhyolite (272), quartz (38), quartzite (19), and other materials (25). Fifteen of the 18 tools were made of gray-black chert; two are made of very fine gray or greenish gray chert, and one of light gray rhyolite.

The most frequent tool type from D3 was identified as a small, steeply retouched end scraper made of gray-black banded chert, of which there are five (Figure 5, Table 2). Three of these were surface finds, and two were recovered in situ beneath the plowzone in the B-horizon. Four of these end scrapers were made from flakes and are unifacial, and one was made from a biface, perhaps from a discarded point. This latter piece is also noteworthy because it has a graving point on one corner. One of the scrapers recovered in situ in the B-horizon is somewhat longer and narrower than the others, and has small removals on either side of the end opposite the scraping end. Ulrich thought this end was possibly made for hafting. In addition
Table 2. Tool Types from Section D3

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Quantity</th>
<th>Raw Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endscraper</td>
<td>5</td>
<td>Gray-black banded chert</td>
</tr>
<tr>
<td>Endscraper</td>
<td>1</td>
<td>Grayish-green chert</td>
</tr>
<tr>
<td>Sidescraper</td>
<td>4</td>
<td>Gray-black banded chert</td>
</tr>
<tr>
<td>Retouched flake</td>
<td>2</td>
<td>Gray-black banded chert</td>
</tr>
<tr>
<td>Retouched flake</td>
<td>1</td>
<td>Grayish-green chert</td>
</tr>
<tr>
<td>Fluted point fragments</td>
<td>2</td>
<td>Gray-black banded chert</td>
</tr>
<tr>
<td>Awl/punching tool</td>
<td>1</td>
<td>Rhyolite</td>
</tr>
<tr>
<td>Pièce esquilée</td>
<td>1</td>
<td>Gray-black banded chert</td>
</tr>
<tr>
<td>Biface</td>
<td>1</td>
<td>Gray-black banded chert</td>
</tr>
</tbody>
</table>

* The grayish-green chert also bears reddish stains across the surface.
** This artifact is glassy and possibly heat-treated.

Four large sidescrapers were recovered, all made from thick chunky flakes of gray-black banded chert. All of the side scrapers carry signs of secondary retouch and use. One was a surface find, two were from the plowzone, and one was from the B-horizon. Three large flakes showing signs of retouch and use were also recovered from the surface and plowzone, two of gray-black banded chert and one of gray-green chert. The latter also has reddish stains similar to the end scraper previously mentioned.

Fragments of two fluted points were recovered in situ in the B-horizon. Both of the point fragments were made of gray-black banded chert and are about 3 cm wide and 1.5-2 cm long. They both carry the scar of a channel flake that was removed on one side and both appear to be midsections. Ulrich estimated that the complete points would have been about 10 cm long. One broken light gray rhyolite awl or punching tool was recovered, as was one small blade-like pièce esquilée. The latter object was made of gray-black banded chert although it differed from other artifacts in that it was very glassy and appeared to have been heat-treated.

Finally a nearly complete biface about 4 cm wide, also of gray-black chert, was recovered in situ from the B-horizon. If it had been complete, Ulrich estimated that it would have been about 10 cm long. It is important to point out that the biface, bifacial end scraper, awl, and two fluted point fragments were all recovered in situ from the B-horizon in the same single meter unit that produced 1,279 flakes.

Based on the concentrations of lithic materials in section D3, the excavators designated the approximately 2 acres (0.8 hectares) area containing the PaleoIndian component as MHC site #19-FR-157b. Of the 1,351 artifacts Ulrich recovered from the 27, meter-square excavation units, 1,140 (84%) were found below the plowzone in the B-horizon. It is unclear at this point how many of the 627 artifacts from the STPs were found in the plowzone or the B-horizon. Thus, the excavators concluded that a good potion of the site was undisturbed below the plowzone. Two features Ulrich interpreted as hearths were found during the subsurface testing of section D3. Although these features produced little lithic material, charcoal samples were recovered from both features.

The several lithic concentrations described earlier indicate that this site contains structural characteristics similar to other PaleoIndian sites in the Northeast, such as: Bull Brook (Byers 1954, 1955, Grimes 1979), Debert (MacDonald 1985), Whipple (Curran 1984), and Wapanucket #8 (Robbins 1980). Ulrich (1978) concluded that the PaleoIndian component from the DEDIC Site was eligible for the National Register. According to the National Register website (National Park Service 2005), the site was listed on the National Register on July 16, 1980.

Conclusions and Future Research

Ulrich (1978) outlined several avenues of future research for the site. First more research needs to be done on the lithic remains and their
locations and groupings. Two hearths were identified within the project area, but the relationships between these and the lithics were not clear. The site's environmental/geological setting is also an important research area. For example, one could examine the relationship between the cultural materials and the post-glacial deposit, with an eye toward environmental reconstruction (see Curran and Dincauze 1977). It is also possible that hearths identified in the future may have adequate charcoal for dating. As part of his dissertation research, Rinehart plans to obtain radiocarbon dates for the two hearths excavated in Area D3.

In 1978 one would have needed about 20+ g of carbon for a standard radiocarbon date, whereas today you need only about .1 g for an AMS date. Another priority is to determine the source of the lithic materials. As discussed previously, Ulrich (1978) believes the gray-black banded chert was similar to material found at the Reagan Site in northern Vermont, although he noted that it should be compared to Hudson Valley sources. During the Massachusetts Archaeological Society Annual Meeting this May, specimens from the DEDIC collection were compared to materials brought to Amherst by Matthew Boulanger and Allen Hathaway from the Brooks Farm Quarry (VT-FR-2) in St. Albans, Vermont (see Boulanger et al. 2005). To the naked eye, the DEDIC artifacts and the materials from the Brooks Farm Quarry appeared to be similar, but this needs to be tested further.

At the end of Ulrich's (1978) report he recommends that the site be preserved by covering the PaleoIndian component with three to five feet of soil and that any further subsurface impacts on the site be avoided. A large portion of the site was subsequently buried and DEDIC established a protective covenant to protect the area.

According to Robert Funk (1998:3) this site "is a major PaleoIndian encampment that could potentially yield as much information as Bull Brook and certain other localities in the Northeast." He based this conclusion in part on results of amateur fieldwork conducted to the south of area D3 in 1995 (Gramly 1998), outside of the DEDIC project area. While this was private land at the time of Gramly's excavation, it is now owned by the Massachusetts Department of Conservation and Recreation (former the Department of Environmental Management). There has not been a professional survey of this portion of the site, so its extent and integrity to the south of the DEDIC project area remain unknown. However, much can be done with the existing collection from this important PaleoIndian site.

For his dissertation research, Niels Rinehart will conduct an analysis of the DEDIC collection as well as obtain dates for charcoal samples recovered from the two features excavated by Ulrich. Rinehart's analysis of the DEDIC assemblage will be part of a larger analysis comparing loci from other PaleoIndian sites in the region. The goal of Rinehart's research is to examine intra and inter-site variation at PaleoIndian sites through the investigation of differences and similarities in the production and utilization of lithics. Following this approach, he will consider lithics as entire assemblages that together form the patterned remains of dynamic processes (Rinehart 2006). To investigate these processes, Rinehart will incorporate the theories and methods of Technological Organization, Technological Style, and chaîne opératoire (e.g. Chilton 1998, Lechtman 1977, Lemonier 1986, 1990, 1992, 1993, Nelson 1991, Stark 1999), emphasizing the process—rather than only the product—of the artifact production sequence. Utilizing these perspectives, he will seek to identify choices made in the production of lithic materials, primarily through an analysis of debitage, a class of artifact that often receives little attention in final conclusions. Also, through the use of microwear analysis and lithic sourcing, Rinehart will investigate how function and raw material type relate to lithic production. In this analysis, the DEDIC site will play a crucial role in helping to create a more nuanced picture of PaleoIndian lives and in indicating directions for future research.

Acknowledgements
The authors wish to thank Kathryn Curran for drawing Figures 1 and 3, and for her help over the years in insuring the proper curation of the artifacts and documents from this important site. Mitch Mulholland and the staff of UMass Archaeological Services were also very helpful in gaining access to the records and collections. We also wish to thank Jim Bradley for putting this issue of the Bulletin together and for the invitation to publish this paper. Of course, any errors are the responsibility of the authors.

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Editor’s Note

Much has happened in the DEDIC site area since Ulrich’s initial testing in 1978. Newspaper reports quickly attracted the attention of local collectors. In an effort to protect the site, a decision was made to cover it with clean fill once fieldwork was finished. However, amateur digging continued. Gramly summarizes the material found by one collector, Dana Racine (Gramly 1998:12-14). In 1984 the Sanderson family purchased 112 acres, known as the Fairview Farm, from the Consolidated Cigar Corporation. Although several portions of the farm were conveyed to other owners, the Sandersons chose to retain slightly more than 28 acres adjacent to the DEDIC parcel. In 1995, Richard Michael Gramly, who had seen Racine’s collection from this area, approached Alan Sanderson, Sr. and asked to conduct test excavations on his property. Permission was given and Gramly excavated four test units that summer. The results of this fieldwork, as well as Gramly’s observations on the artifacts collected by Racine and others, were published in 1998 under the title The Sugarloaf Site (Gramly 1998).

In 1996 the Massachusetts Department of Environmental Management (DEM) expressed an interest in acquiring some land south of the DEDIC site and incorporating it into its system as an ‘archaeological research site’. While DEM’s interest was spurred by several factors, two were most significant - encouragement from the Massachusetts Historical Commission (MHC), which called the site “the most significant intact Paleo site in the state”, and the very real threat when the Town of Whately proposed that a new industrial facility be built on the parcel. Shortly thereafter, the 28.7 acre parcel was purchased by the DEM from the Sanderson family for $406,000. The property is currently managed by DEM’s successor, the Department of Conservation and Recreation (DCR).

It is clear from both Ulrich’s and Gramly’s investigations that the DEDIC/Sugarloaf site is a substantial and important early PaleoIndian site. Re-analysis of Ulrich’s findings is a good first step towards understanding the role of this site but additional steps need to be taken. The highest priority is development of a long term research and protection plan for the site, one based of a clearer sense of its horizontal and vertical boundaries and that outlines research and testing strategies appropriate for reconciling Ulrich’s and Gramly’s findings. My thanks to Thomas Mahlstedt, senior staff archaeologist at the DCR for his assistance in bringing the story of this site up to date.
Debating Bull Brook, 1965 to 1972

Brian S. Robinson and William Eldridge

The Bull Brook PaleoIndian site in Ipswich, Massachusetts was discovered fifty-five years ago and excavated over the following decade before the site was hauled away by sand and gravel operations. It was excavated almost entirely by seven avocational archaeologists in cooperation with researchers at the Robert S. Peabody Foundation (RSPF) and a Harvard graduate student, among other volunteers (Byers 1954, 1955; Eldridge and Vaccaro 1952; Jordan 1960; Wormington 1957). As work progressed, the site grew so large that it challenged the theories of archaeologists in the 1950s, just as it does now. In order to understand Bull Brook it is important to document how ideas have changed and how this influenced the way that the site was originally reported. The avocational archaeologists and the professionals all contributed critical aspects of the research, but there were

Figure 1. Map of the circular pattern of artifact concentrations at the Bull Brook site. This is the first copy of the plan ever published (Grimes 1979). This plan was, in turn, a copy of the one produced at the RSPF about 1960 and referred to by Bill Eldridge in his letter to William Fowler.
also ongoing debates that were never published. Here we present a series of letters dated between 1965 and 1972 that characterize a long-standing debate between the excavators and Douglas Byers (RSPF), among other archaeologists.

As early as 1953 the excavators recognized an arc-shaped pattern that eventually developed into a large ring-shaped arrangement of 42 loci (Figure 1), suggesting to them that the site may represent a large spatially organized event. If true, Bull Brook would be the largest organized settlement plan from the Pleistocene in North America. The most valuable summary of the full set of loci is recorded in Douglas Jordan’s (1960) dissertation on Bull Brook. While the importance of the discrete artifact concentrations was widely recognized, the ring-like pattern was thought to be coincidental by most archaeologists, the product of accumulated occupations over many years (Byers 1956:257; Jordan 1960:199). The site plan remained unpublished for 20 years (Grimes 1979) after which the idea of a large event was more seriously considered (Curran 1984; Dincauze 1993; Grimes et al. 1984; Spiess 1984).

Little was published on Bull Brook for 20 years after the early publications of Douglas Byers, at which time only half the site had been excavated. Douglas Jordan’s unpublished dissertation provides a crucial history of excavations including descriptions of all of the loci compiled up until the time when excavations were drawing to a close in 1960 (not including later excavations at Bull Brook II, a separate site). A new round of research on Bull Brook was initiated in 1979 with John Grime’s paper “A New Look at Bull Brook.” In between those years the debates continued in meetings of the Massachusetts Archaeological Society and in correspondence.

The current effort is necessarily based on the earliest records, maps and photographs by the excavators, aided by aerial photography and more recent developments in digital photography and GIS technology. The artifact collection was generously donated by the excavators to the Peabody Essex Museum in Salem, Massachusetts, which has served as a base of research for the past 25 years. The authors began compiling all extant records in 1992, stamping original records with catalog numbers having the prefix “BBR,” an acronym for Bull Brook. At this time we have cataloged 2,364 pages of field notes, letters, newspaper clippings, color slides and movie clips, mostly from the 1950s and 1960s (cataloged with the prefix BBR). Most of the records are those of the second author, but they also include Douglas Jordan’s original field journal and photographs. Newly discovered sources are being added continuously.

Part of the problem has been to collate the records, matching field records with color slides and sorting correspondence. The familiar locus numbers were not assigned until about 1960, when Jordan worked with the excavators to compile the evidence into a uniform system (Jordan 1960). Previous to this time the loci or “hotspots” were recorded by names of distinctive characteristics, such as the “Cache of Knives” (Locus 6), “Bill’s Deep Firepit” (Locus 11), and “Gus’ Bones” (Locus 32). It is therefore necessary to correlate the original names (and variations thereon) with the later number system throughout the records. It is among the letters and field records that the ongoing debates are most clearly recorded.

Here we present transcriptions of several letters, almost in their entirety, deleting a few lines of extraneous or personal text, editing punctuation, but otherwise presenting the original text and intentions of the authors. Additions to the text are placed in square brackets. We recognize that the correspondence was intended to address problems between individuals, often expressing frustrations of the time that were not intended for publication. At the same time, the dated letters provide candid accounts that bear directly on published
accounts of the time. For those of us saturated with the unpublished records of Bull Brook as well as changing theoretical perspectives, the following letters are loaded with meaningful statements on a wide variety of issues. They represent, in effect, a culmination of thought from the 1960s through 1972.

William Fowler, editor of the *Bulletin of the Massachusetts Archaeological Society*, initiated the following exchange of letters. Fowler was soliciting articles on the Bull Brook site for publication, recognizing the site's importance. To some degree he was addressing some of the same problems that we have today, the ongoing need for full publication of the Bull Brook site. Bill Fowler wrote the following letter to Bill Eldridge requesting information for the Bulletin, dated May 17, 1965 [BBR 783].

Dear Bill [Eldridge]

Have you had a chance to give that matter of a Bull Brook report further thought? Hope you have, and have started to make plans for a report on the site for our Bulletin, that will include information in past reports by Byers, myself, and others, plus new evidence as produced by your continued digging of the site.

There is a real good chance here for a most informative and much needed report of your unusual Paleo site which would be something our readers should have a chance to study.

As I promised I will illustrate whatever artifacts you can provide me of a representative collection of points, knives, drill, etc. (including the somewhat curved knife 'flake' found when I was at the site). Please drop me a line when you can about your progress.

Sincerely, Bill
William S. Fowler (Editor)

Fowler wrote a letter seven years later, dated February 1, 1972 (not extant), indicating that he had put together a report on Bull Brook that he wanted to publish in the Bulletin. Fowler's report eventually came out in 1972, "Bull Brook: A Paleo Complex Site," with a submission date of April 11, 1971. Eldridge was apologetic for the fact that they had not supplied an article for the Bulletin after Fowler's requests, but he and the Vaccaro's were not necessarily pleased about Fowler writing a report on the site himself. Eldridge wrote a letter to Fowler, detailing some of the current interpretations and debates, things that Fowler could not know about. The letter was in part a frustrated response, but also a detailed account of the issues at a time when Eldridge and the Vaccaro brothers were deeply involved in the interpretation of Bull Brook. As noted below, Eldridge never sent the letter to Fowler, but rather sent it to Douglas Byers, inquiring whether Byers thought it an appropriate response. Byers responded to Eldridge with a relatively concise account of his own views, perhaps because the debate might influence Fowler's proposed article. The draft letter from Eldridge is undated, but must have been written in February or the first few days of March 1972.

Dear Doug [Byers],

Since you have a stake in what happens to or about Bull Brook, I thought it fair to pass along the latest. I received a letter from Bill Fowler saying that the M.A.S. was coming out with a Paleo issue in October. And since I had not passed on any information about the site, all these many times he's asked for a report, he has or will write a lead article on Bull Brook from the 2 days he spent at the site in 53(?) and sketches and photographs the M.A.S. has on file.

I've written the following in reply but still can't make up my mind whether to say it all.... We'd like to have your view of the subject if you have a minute. Phone or write. [BBR 446-447]

Following is a draft of the letter from Eldridge, addressed to Fowler, but sent to Douglas Byers for his consideration [BBR 448-465].
Dear Bill [Fowler],

I’ve read your letter of February 1. First let me apologize for the long delays in forwarding you any information about the site all these many times you have asked for a report. It always seemed to me that the site was not at a state that conclusions could be drawn. And time to write even notes on the events that have tip-toed by in the last 20 years have always been a problem.

Yet all the diggers and I do want Bull Brook to be in the best possible light. It would be a crime against archaeology not to give the site a fair shake.

You mentioned that you can or have written the lead article in the Paleo issue, from your memories of the 2 days you spent with us and the sketches of points and photographs. I admire your writing skill, perhaps I am too personally involved in the site. But quite frankly this is like the Fore River Shipyard building an Air Craft Carrier from a pictograph of Rameses punting on the Nile.

You can’t begin to realize the amount of information we’ve uncovered or that I’ve stored up waiting, waiting for what I don’t know at times. But at other times I’ve been so glad I didn’t say or write this or that, that’s been on the tip of my tongue and be dead wrong or hurt someone’s feelings.

There are so many facets to Bull Brook. Four or five diggers have spun away 20 years of their lives around the site and no doubt spent far more time there than the people who chipped the tools and camped there. There are so many things that must come under consideration. The time is long past when we can just count coup on fluted points. What queer twist of fate brought us together in the beginning: they from Europe and me with one foot always in American History. And there’s a case for E.S.P. ten years before we dreamed of fluted points, a spirit medium told us we would find or discover something about Indians that would be known worldwide.

Our finding of the site and the Gilt Edged permission from the cooperative Vitalies (gravel pit) owners to recover those thousands on thousands of artifacts that lay under the sand, just as they were left, some still polished with a thumb or forefinger.

Our surface hunting, knowledge and digging experience up to that time only qualified us to be bird dogs to flush out an unusual site. Why- when the site was made known a year before the first mention in the M.A.S. bulletin, didn’t some one with more “Paleo Knowledge” test hole as we had to do, and realize that the largest Early Man site lay only a few inches under the sod, and preserve it with society or museum or government funds and expert diggers? We stepped back into Bull Brook at the last minute to salvage what we could before bulldozing disturbed the site.

With coaching from interested parties and Rip Bullin’s “keep copious notes” and our M.A.S. knowledge we kept order among the artifacts and Hot Spots that began to turn up. So 20 years later and 43 hot spots later, tool counts and workmanship can be studied for years to come on the chipping variation or stone used from house site to house site. Information from our measurements, maps and photographs has been combined and refined by us and Doug Jordan and Doug Byers into what may well be the only record ever of a Paleo Village. It’s quite a wonderful piece of cooperative work [This refers to the plan in Figure 1].

The pattern of these Hot Spots brings up an argument that’s been near and dear to me for many years.

There they are, 42 or 43, each with a fire pit, in roughly an oval 200 yards by 300 yards. How do you suppose those Paleo People could come back to Bull Brook for a yearly Caribou roast for as long as the variation in the C-14 tests would have us believe, and never camp on the same spot?
Collecting the C-14 samples was a very interesting phase of digging at the site and there are some samples unprocessed. But I never could see averaging the dates in the first place when every spare hour we could spend we were digging Hot Spot after Hot Spot all with the same tool types at the same level (more or less) made of the same stone. Some times pieces of the tools matched or were reused after being broken.

Those people, the whole lot of them, were there at one time and then vanished into the wilderness. And their game seems to have been security in numbers. Quite probably everyone stayed close to or in the camp circle except well armed hunting parties. The water table being much higher then, a spring ran off of one edge of the camp circle and into Bull Brook, accounting for the streak of clay and iron oxide that was so evident when the site was finally bulldozed away.

We've all become interested in the exotic stone while digging at the site and the lack of surplus material lying about. Three years ago a lucky find 15 miles from the site turned up a fluted point and 3 scrapers (Bull Brook style) all of Saugus Jasper (a blood red porphyry) which has only one source (a fly speck on the map of Essex County), yet the Bull Brookers knew of this stone. Some Hot Spots contain scrapers and gravers of it. Last year Nick and I matched a couple of fragments of it at Bull Brook #2. I'll bet you never heard of #2. Well last year it produced four fluted points and fragments along with dozens of scrapers and gravers, but no drills have been found. Which brings to mind that I exhibited drills at the Salem meeting [October 12, 1952] and again at another M.A.S meeting and tried to explain about their use. But people looked at them and couldn't get it through their heads that the sharp end or tang was made to slip into a hole in a haft of some sort and the blunt end did the cutting, predating by several thousand years the modern Morse tapered drill and chuck.

We have several other drill shapes now, helping to prove what was only a theory then. Before we dismiss drills let me say that I think some day they will be more important as a common denominator than fluted points, because they are so rare, (just name one site that has produced three types of twist drills).... Sites where they are or are not found could mean that we've been comparing sites not only thousands of miles apart but thousands of years apart. I've put a whole chapter together on drills. And those hammer stones and their fragments that we've saved and pieced together after they were broken while flakes were being made thousands of years ago, are well worth a study in themselves.

These things I've hastily mentioned are just a thumbnail sketch of the material that must go into the Bull Brook Saga. Page on page could be devoted to plastic reproductions and the way Nick Vaccaro has been able to duplicate the Paleo Style of chipping so skillfully, that Mr. Byers carried some of his work to a chipping conference in France. Mr. Byers since his retirement has been trying to make a study of all the chipped material the site has produced. (This Fall his house burned and luckily the material he had borrowed from us and the cross file system of tools he set up, were not damaged because they were stored in a special place in a chimney base he used for the safe keeping of our material).

And then there's evidence of "tool groups" or survival kits or grave goods that we have found too many times to be happenstance and might well be the earliest graves in New England. We have been stingy with the material left lying around at the site and worn out cars traveling to and from Bull Brook. The miles on miles of running and hours of digging in all kinds of weather to check or collect or record another Hot Spot, another scraper or a flake so tiny we call them fish scales. But it's been worth the effort. The evidence we've recovered and
pieced together so far has been a crutch for nearly every New England archaeologist to lean on since Joe found the first fluted point. And about once a year someone delivers a paper about some stage of the receding ice sheet and is sure to include large ice free areas around Bull Brook and even single fluted points. (Fluted points have melted miles of ice). But I can't help thinking of a blind old maid feeling an elephant trunk.

No matter what one person or another agrees about the glaciers or the migrations we have to come back to the concrete evidence, the wonderful tools every one a gem. They show a tool making inventiveness and chipping skill that is unsurpassed anywhere in the world. And as part of the American heritage everyone should become aware of them. They are art treasures and deserve as much attention as any of the great masterpieces or the Declaration of Independence or the Liberty Bell. Yet they would have been scattered by sand spreaders over Essex County’s notoriously slippery roads if we hadn’t dug at Bull Brook. [End of letter]

As noted above, Eldridge sent a copy of this letter to Douglas Byers for his opinion. Following is Byers’ interesting response to Eldridge, mailed on stationary from Andover, Massachusetts, dated March 6, 1972 [BBR 784].

Dear Bill:

Thank you for letting me see your letter to Bill Fowler. I agree completely with your point of view, and don’t think that Fowler should say anything about Bull Brook.... He just doesn’t have the information.

I don’t agree with everything you’ve said, but there is no great argument here. It seems to me that it would be much more likely that each hotspot represents a year’s occupation by a relatively small group—such as an extended family, or possibly two of them. They may have come back to the same hotspot for a number of seasons, and only after the leader of the band had died moved to another hotspot. This would make the site a center for occupation over a term of maybe 500 years or more.

In the first place I don’t believe there were enough paleo-Indians to occupy a camp with 43 fires. If you count eight or ten people in a band this would mean about 400 to 500 people in the entire group, and it would take a lot of game to feed that many people. We all know that the Sioux gathered in groups like that, and so did the Blackfoot, but these people were eating buffalo and there is a lot more food on one buffalo than there is on just one caribou.

In the second place there is great variation from hot spot to hot spot. As you know, some hotspots lack fluted points, others lack drills, others lack gravers, but all of them have side scrapers and end scrapers. There is a very great proportionate difference between Bull Brook and the Plains paleo-Indian sites—in the plains the proportion of fluted points runs to 25% or more of the specimens in a collection. If we exclude the utilized flakes from the Bull Brook site, but use everything else as counting the total tools, we find that fluted points average out at about 2% or less. To my way of thinking there is no way to account for this difference other than by a change in ways of living brought about by a passage of time. I have not found a single burin in the collection—other paleo-Indian sites have produced burins, or so their discoverers say.

The great majority of the stone used at Bull Brook came from the Hudson Valley, and possibly from the Athens Hill site, west of Hudson, N.Y. Some of the pieces are made from volcanic tuff, the source for which is not known. It is now known that there are very large paleo-Indian sites in the Shenandoah Valley in Virginia, and there is good reason to believe that these sites represent a long period of development south of the farthest limits of glacial ice.
This makes it appear quite likely that the people who lived at Bull Brook are derived from the southern part of the United States and the crossing from Siberia was made long before the paleo-Indian culture as we know it was developed. All I know is that there is no trace of it in Siberia, and that the work of some of the younger Russian archaeologists has demonstrated that the work of some of the earlier archaeologists in Russia is as full of errors as the work of our own older men. There is evidence of pole-walled structures at a site in the Shenandoah Valley, and the concentration of workshop debris is outside the shelter in one case, at least. I have no recollection that you were able to say whether the evidence of a wall stopping chips was along the inner side of the wall, towards the hot spots, or away from the hot spots.

If Fowler knows all this stuff, I'm still not certain that he would be able to write a good objective account of Bull Brook.

Yours, Doug.

For the record, Eldridge did not send his letter to Fowler, and ultimately gave Fowler tacit approval to publish his article. The following note was appended to the draft of the letter to Fowler.

I had this letter to Bill [Fowler] with me at Cohasset but approached Bill and asked if he would send me a copy of what he intended to put in the Paleo Issue which he promptly did. It leaves a lot to be desired but who am I to say the Bull Brook People didn’t beach their dug out canoes just below the scales shack and- oh well, remember we used to have some fun with word roots. Well, it’s no mere chance that this word—situation—the first part of which we got to be familiar with at the site describes the site and us quite well. Because we’ll never duplicate time, place, opportunity, energy, etc. again to cause that situation that we had at Bull Brook. [BBR 466]

In the early 1970s, William Fowler, as editor of the Bulletin of the Massachusetts Archaeological Society, was putting pressure on the archaeologists to publish on Bull Brook. William Eldridge and the Vaccaros were still excavating Bull Brook II, pursuing different ways to understand the many facets of Bull Brook, and defending their own observations about the large oval pattern of hot spots. Douglas Byers was actively analyzing the Bull Brook artifacts for a chapter on Bull Brook, to complement the recent work on the Debert site (MacDonald 1968). The manuscript was never published (Byers nd). The letter reprinted here summarizes his latest opinions about the Bull Brook settlement pattern, emphasizing archaeological models that were prevalent at the time.

Bill Eldridge’s letter to Fowler records a large number of variables that were being considered to interpret the pattern of the Hot Spots, “an argument that’s been near and dear to me for many years.” His early field notes and letters document the first recognition of the arc-like pattern of loci. The excavator’s persistent claim that the large oval pattern represented a short term event was based on their own excavations, an effort to explain the pattern of non-overlapping occupation areas, the similarity of tool types and materials, and problems with the radiocarbon dates. Whether their explanation for the proposed event, “security in numbers,” is necessary to explain the large gathering is questionable, but the large circular pattern is typical of periodic gatherings among hunter-gatherers with a variety of motives (Yellen 1977), including those of caribou hunting people of the Subarctic (Slobodin 1981:Figure 7; Spiess 1984). Although a detailed description and analysis of the circular pattern at Bull Brook remains to be published, it was the early recognition of a possible pattern that led the excavators to document the spatial patterning.

The letter from Byers states his case that the ring-shaped pattern at Bull Brook does not likely represent a single large event or a brief period of time. However, it now appears that neither of the limiting factors proposed by Byers would render the occurrence of a large
PaleoIndian event impossible, or even unlikely. Byers first point, that the large pattern of artifact concentrations probably represented an accumulation of material over many years, was the dominant interpretation of large PaleoIndian sites by archaeologists at the time (Dincauze 1993:49). Large groups of people do need large amounts of food, a point that is still being investigated. We now know that caribou were being hunted in proximity to Bull Brook (Spiess et al. 1985; Spiess et al. 1998) and we are exploring ways in which a large population of caribou might have been supported by the local environment and exploited at Bull Brook (Pelletier and Robinson 2005).

The second factor discussed by Byers, based on the variable proportions of tools in different loci at Bull Brook, would now be rejected as a case supporting change over time. The argument is representative of culture history interpretations of the 1950s and 60s, when it was often assumed that stone tool assemblages represented “complete cultures” and that variations must represent change through time or distinct cultural patterns, rather than simply the different activities of individuals and families within the same group (Binford 1983; Curran 1984). Indeed, we are now investigating the variation in tool proportions as one source of evidence to evaluate the possible contemporaneity of loci within the ring-shaped pattern.

With changing perspectives in archaeology, it has become more feasible that Bull Brook could represent a large gathering of people, possibly representing a single event, and a concerted effort is now being directed at precisely this problem. The archaeology of Bull Brook, and the active debates from the 1970s, hold clues to understanding early PaleoIndian culture in Northeast North America. There are now many more PaleoIndian sites with which to investigate these issues, but none yet so large or well patterned, and it remains to be seen whether we will ever “duplicate time, place, opportunity, energy, etc... that we had at Bull Brook” (BBR 466).

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Spiess, A. E.


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Wormington, H.M.


Yellen, J.E.

The Neponset Site, Locus 4:
More Evidence of a Michaud-Neponset Phase Occupation

Christopher Donta

Introduction

In 2002-2003, Archaeological Services at the University of Massachusetts (UMass) conducted a data recovery survey for a proposed office building located within the boundaries of the Neponset site (19-NF-70). The goal of the project was to assess the impacts of the proposed building, looking specifically as to whether any intact archaeological deposits remained within the proposed impact areas, and if so, how they relate to any earlier archaeological finds from the site. Of specific concern was the potential for a PaleoIndian component, and whether it was associated with PaleoIndian activity areas documented during earlier surveys. The UMass project was designed to have two parts. The first was to see if any intact remains existed in this part of the site. If so, the objective was to excavate a sample of those archaeological deposits. The purpose of this paper is to provide both an outline of the results of the excavations by UMass, and an update on what is now known about the Neponset site. The report begins with a brief review of work previously conducted at the site, and a summary of the different loci defined during these projects. Next, some of the significant findings of the UMass fieldwork, and their implications for the site, are presented.

Site History

The Neponset site is located in the western part of Canton, Massachusetts, on what was once a peninsula surrounded by the Fowl Meadow...
wetlands, part of the Neponset River drainage. During the 20th century, portions of the wetlands were filled in, including to the north of the site, along the east side of the river, and to the west of the site, for the Norwood airport.

The Neponset site was probably first identified during the 1930s, when the Neponset Valley sewer was installed and an access road was constructed running south from Dedham Street to the Canton airport, across the peninsula. Construction of the sewer line undoubtedly turned up artifacts, which were first reportedly found by Stanley Buzarewicz, a local trapper. Other MAS members also are known to have collected in the area (Bradley 1996). Other impacts to the site included a WW II era radio beacon on top of Signal Hill and the re-channeling of portions of the river, to the south of the site, by the Army Corps.

The contents of the site became of greater interest in the 1960s, when Route 95 was bulldozed directly across the site. It is uncertain how much of the site was impacted by the road, as no survey was done prior to the construction. To make matters even worse, additional portions of the site were stripped and leveled for use as a staging area; the topsoil was piled for post-construction replanting. Several MAS members collected artifacts from the exposed staging areas in the late 1960s, providing the most complete idea of the site contents up to that time (Carty 1984).

Beginning in 1977, the first excavations took place at the Neponset site, conducted by Buzarewicz, Frederick Carty, and other members of the MAS. Their efforts were focused first on 'Locus 111', which contained mostly Archaic materials, but then moved to the 'Locus 112', which was subdivided into lettered loci: A, B, C, and D. The first fluted points were found in this area in May of 1979, and work continued at Loci A, B, and C well into the 1980s (Carty and Spiess 1992). Smaller excavations continued at '111', and testing was conducted at loci '211' and '212' (Figure 1).

During the 1980s and 1990s, a large number of artifacts were recovered from the site. Table 1 summarizes the archaeological testing that took place at the Neponset site from 1977 to 2000.

<table>
<thead>
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<th>Years</th>
<th>Loci Involved</th>
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<td>1977-82</td>
<td>X X X</td>
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<td>1984</td>
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<td>Ritchie site exam</td>
<td>1989</td>
<td>X X X X X X X X</td>
<td>Ritchie and Feighner 1990</td>
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<td>Ritchie data recovery</td>
<td>1992</td>
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Table 2. Cultural components from loci at the Neponset site.

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<td>Carty and Spiess 1992</td>
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<td>C 112</td>
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<td>4 112</td>
<td>Paleo, Archaic, Woodland</td>
<td>Ritchie and Feighner 1990, This paper</td>
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<td>Ritchie and Feighner 1990</td>
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<td>H 113</td>
<td>Paleo, Archaic, Woodland</td>
<td>Chandler 2001</td>
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<td>E 113</td>
<td>Archaic, mostly Late Woodland</td>
<td>Ritchie 1989</td>
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<td>F 113</td>
<td>Archaic, Woodland</td>
<td>MacPherson 1998</td>
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<td>G 113</td>
<td>Archaic, Woodland</td>
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projects were conducted at the site, including 'Locus 113,' on the northwest side of Signal Hill, Locii F and G on the crest of the hill, and the various lettered sub-loci within '112' (Table 1). As part of more sewer work, survey was conducted at Locus D, and the numbered Locii 1-5 within '112' were also designated (Ritchie and Feighner 1990). In 1992 a Data Recovery project was conducted at Locus D, which found PaleoIndian channel flakes, one unifacial scraper, bifaces, and a feature that was radiocarbon dated to 10,210 ± 60 years (Ritchie 1994). Also, around 1989, a group of MAS members began excavations in the area of Locus H, between Locii B and D, which included a portion of Locus 3, where PaleoIndian artifacts and features were found.

During these excavations, PaleoIndian artifacts were recovered from six loci, five of which lie within 'Locus 112' (Table 2). The most common raw material found in the PaleoIndian component was a light olive-gray to yellowish-gray rhyolite with dark gray inclusions. This material was first referred to as 'Neponset rhyolite' and was of an unknown origin. This held true at Locus D, where PAL research found a large amount of this same rhyolite. Later analysis of this rhyolite (Spiess, Wilson, and Bradley 1998) showed that it has a bedrock origin in a volcanic dike on top of Mt. Jasper in Berlin, New Hampshire.

Work for the proposed office building project began in 1999, when a Phase 1 survey was conducted by PAL (Begley and Ritchie 2000). This included testing in Locii 3, 4 and 5. The survey did not identify any PaleoIndian materials, but recommended avoidance or further survey because of the presence of intact Archaic and Woodland components.

2002-03 Testing Plan

The UMass portion of the project began with an initial round of testing to assess whether any significant intact materials remained in Locii A and B, and 3 and 4. Loci A, B, and 3 had all produced PaleoIndian artifacts, but Locus 4 was defined as Late Archaic and Woodland period only. No testing was conducted in Locus H since this area was under excavation by MAS members, but no work occurred while the UMass survey was conducted.

During the initial testing, one 15 meter long trench was excavated in Locus 3. This documented disturbance throughout the entire width of the locus. Therefore, the remaining three trenches were placed in Locus 4. Ten test pits were also excavated in and around Loci 3, Locus B, and Locus 4 to document the nature of the soils (Figure 2). The area of Loci A and B also was found to be entirely disturbed. However, testing in Locus 4 found, not only intact soils with Woodland and Archaic components, but an earlier PaleoIndian component as well. The testing also expanded the edge of Locus 4 further to the west.

As a result, the second part of the project did take place, during which a block of 28 square meters was excavated, surrounded by 14 shovel test pits, in order to remove as much of the concentration of PaleoIndian materials as
possible (Figure 3). Excavations in the block were conducted in 5 cm vertical levels, except for the plowed, upper portions of the profile. Soils were screened through 1/8 inch mesh, except for a 10 percent sample, which was taken back to the laboratory and wet-screened through 1/16 inch mesh to assess the number of micro-flakes not being collected during field screening.

**Testing Results**

The excavations in Locus 4 resulted in the collection of 3,022 artifacts. This included
Archaic and Woodland period artifacts as well as PaleoIndian. Mixing was evident in the uppermost soils, which had been plowed. However, the majority of the artifacts came from the subsoil.

As measured by the Mt. Jasper rhyolite, the most prevalent PaleoIndian raw material at the site, the PaleoIndian component was concentrated in the subsoil, between 25-40 cm below the ground surface. The depth distribution of other materials at the site shows the small amount of jasper was concentrated in the same levels, and quartzite was concentrated at a depth of between 20-35 cm. There was also a dark gray to black, coarse-grained rhyolite found at the site. It was associated with the later components, and concentrated in the upper portion of the profile at depths of 10-30 cm. The horizontal distribution showed a concentration of PaleoIndian raw materials and artifacts in the area just west of the intersection of Trenches A and B. The Mt. Jasper concentration is echoed by the small amount of actual jasper, and to a lesser degree, by quartzite. The distribution of quartz and argillite shows a second concentration that overlaps the earlier one, but is centered more to the southwest.

**PaleoIndian component.**

Within the deeper levels of the site, a number of PaleoIndian artifacts were found. This includes three fluted point fragments, all of Mt. Jasper rhyolite (Figure 4). The most complete is a full basal fragment, 26 mm wide, and snapped 24 mm from the base (Figure 4, top). It is of the Michaud-Neponset style, or from the Middle PaleoIndian phase, exhibiting the flaring base, similar to the Barnes points of the Parkhill phase in the Great Lakes area. Also typical of this phase are so-called ‘miniature points’, of which one example was found (Figure 4, bottom). The point was reworked into a miniature version after a longitudinal fracture, with a retooling of the base, and a new channel flake was removed. The tip of the reworked point also broke.

There are six flakes that show characteristics of being channel flakes. These are long, straight flakes with parallel sides and a central ridge across one side showing the presence of thinning flakes perpendicular to the long axis of the flake. Three are broken, and the others range between 10-27 mm in length. Five of the six channel flakes were found within the central to northeastern part of the excavation block, within the highest density portions of the Mt. Jasper

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**Figure 4.** Drawing of fluted point fragments from Locus 4.
A single small, wedge-shaped core of Mt. Jasper rhyolite was recovered from the southern part of the excavation block. The piece measures 29 mm in maximum length, and has five flake scars around the smaller end. It has a flat upper surface that shows some evidence of crushing, and may have been used as a wedge, although the smaller end, which would have been the ‘business end of the wedge’, does not show the same wear. This artifact may simply be a small
exhausted core. In total, 1,039 artifacts were found made of Mt. Jasper rhyolite, jasper and chert that relate to the PaleoIndian component.

Later components. Artifacts from Locus 4 also include two Neville Variant, or Arnoskeag type projectile points, both made of quartzite; four Small Triangle points, two of the dark gray, porphyritic rhyolite common at the site, and two of argillite; and a brass triangular point. A number of flakes, flake tools, bifaces, cores, and other tools were found associated with the later components. Based on the artifact types, Middle Archaic, Late Archaic to Early Woodland, and Late Woodland components were also present within Locus 4.

Four features were found that relate to the later components. A pit hearth was present in the northeastern part of the excavation block, which was radiocarbon dated to 2,430 ± 60 years (Beta-206454). A large pit was found in the west-central part of the excavation block, measuring 1.6 m in diameter, and 60 cm in depth. The upper portions probably had been truncated by the plow zone. Artifacts from the feature consist of mainly quartz flakes and fire-cracked rock. Several possible postmolds were associated with this pit feature. A second pit hearth was found in the southwestern area of the excavation, consisting of a dark charcoal-stained soil, ca. 55 cm in diameter. A charcoal sample from this feature was dated to 4010 ± 70 years (Beta-206453). The final feature found was a small charcoal lens in the west-central part of the excavations, to the north of the large pit feature, with no associated artifacts.

Interpretations

Neponset PaleoIndian Loci. At the outset of the survey, it was uncertain as to what components were present in the proposed impact areas in Loci 3 and 4, and the area to the west of Locus B and north of Locus H. As documented, nothing intact was found in the Loci A and B area. Previous excavations, followed by grading, had removed all of the natural soil deposits. Locus 3 was in only slightly better condition, with a single small piece of substratum identified in

Figure 6. Known PaleoIndian loci at the Neponset site.
one end of Trench C. The area to the west of Locus B and north of Locus H had also been destroyed and was devoid of artifacts. The only portion of the site explored in this survey with intact cultural deposits was Locus 4.

The interpretations of archaeological findings from previous surveys indicated that Locus 4 contained only Late Archaic and Woodland period components. However, the extensive testing conducted during this project identified Middle Archaic and PaleoIndian components in addition to those previously documented. Some confusion also existed in the identification of lithics. Unknown ‘felsites’, local rhyolites, and some of the ‘Neponset rhyolite’ appear to have been considered a type of chert or fine-grained quartzite. This made the identification of components from these previous surveys difficult.

Since Locus 4 has now been demonstrated to have a PaleoIndian component, the question is whether the artifacts recovered represent a single occupation or multiple reoccupations, and what time periods are represented? The three temporally diagnostic fluted point fragments from Locus 4 all show traits of the Michaud-Neponset type, which include slightly flaring bases, small size, and thinness. Sites of the Michaud-Neponset or Middle PaleoIndian phase have been dated consistently to around 10,200 B.P., which equates to a range of between 12,100 and 11,800 calendar years ago (Fiedel 2002). Based on the distribution of Mt. Jasper rhyolite, jasper, and chert, the PaleoIndian occupation of Locus 4 appears to be based around a single lithic reduction area, centered in the eastern portion of the excavation block. Therefore, it is interpreted that the Locus 4 PaleoIndian occupation is a single component dating from ca. 12,100-11,800 B.P. (Figure 6).

Other fluted points from the Neponset site are similar in form to those from Locus 4. While no fluted points were found by PAL during their fieldwork, one was recovered from Locus D prior to their excavations (Carty and Spiess 1992: 25). Loci A, B, and C contained twenty-three fluted point fragments, while Locus E reportedly produced two fluted points. The Loci A, B, and C specimens illustrated in Carty and Spiess (1992) include several with the same flaring bases as those from Locus 4, while others are less clearly associated with this style. Several of the Loci A, B, and C specimens have straight to slightly inward curving sides that do not flare at all. Straight sides with deep basal concavities are traits of the earlier Bull Brook phase, which can be seen in the points from the Vail, Debert, Whipple, and Bull Brook sites. However, later Nicholas phase points also do not flare, but are straight to slightly inward curving toward the base, with shallower basal concavities. Based on form, it appears that the PaleoIndian fluted points from Loci A, B, and C are close in type to those from Locus 4, but may include some that were either not finished. Conversely, they may date slightly earlier or later.

Based on the artifact types and radiocarbon date, it is interpreted that the Locus 4 PaleoIndian occupation was contemporaneous with at least some of the occupations of Loci A, B, C, and D. It is not clear whether these loci represent different occupations by the same group of people over a number of years or decades, each time returning but sometimes to a slightly different spot, or a single occupation by a number of family or hunting groups, accumulating debris in multiple locations but all at one time. The former explanation might explain the possible presence of both Middle and Late PaleoIndian phase point types. In this case, one or more of the loci would be expected to post-date the occupation at Locus 4. If the latter explanation is correct, the variation in points may be due to individual preference and/or experience in point manufacture. In either case, it remains uncertain how the material from Loci H, E and Z relate to these occupations. Of these, Locus H seems to have a substantial amount of PaleoIndian material, and probably equates with another activity area or occupation locus similar in size to those at Loci A, B, C, D and 4. Unfortunately, there is no published information on this locus, and attempts to look at the Locus H collection for this research were not successful. The other two
loci, E and Z, reportedly produced only isolated points and may be the products of forays from the main loci.

Other questions posed at the outset of the project were whether any connections could be established between the different site loci, and whether any indications of function could be identified for each locus. The highest percentage of raw materials associated with the PaleoIndian occupation at Locus 4 is Mt. Jasper rhyolite, as is also the case at Locus D (Ritchie 1994), and Loci A, B, and C (Carty and Spiess 1992). Therefore, all five of these loci show a similar connection to northern New Hampshire, the origin of this raw material (Bradley 1998:22). Small amounts of other materials, such as chert, were also present in each locus but the specific material types have yet to be sourced. Each of the five loci also included fluted points, unifacial tools, bifacial tools, edge tools, and channel flakes. This suggests that each locus acted as an individual occupation area with multiple tool types being produced and utilized, and multiple functions performed, rather than each locus serving as a specialized work area.

**PaleoIndian Relationships.** With the identification of an additional PaleoIndian locus, at least six loci of PaleoIndian activity are now known at the Neponset site. This raises the larger question of what relationship, if any, existed between the Neponset site and other small PaleoIndian sites such as Wapanucket, and the larger sites known in the region, such as Bull Brook? Based on lithic material identification, could hypotheses be made about connections between large 'core' sites and smaller ones on the peripheries?

The clearest connection at present is between the Neponset site and sites of the Jefferson area of northern New Hampshire. The majority of the lithics from the Neponset site are visually identical to the Mt. Jasper rhyolite in Berlin, New Hampshire. The four sites of the Israel River Complex (Boisvert 1998, 1999; Boisvert and Puseman 2001; Bouras and Bock 1997) are all dominated by a similar rhyolite obtained from both glacial till cobbles (which are closely related if not indistinguishable from the quarry material from Mt. Jasper) and from the rhyolite dike at Mt. Jasper (Boisvert 1998: 102; 1999: 165-166). As at the Neponset site, crystal quartz and Munsungun chert are also present on sites of the Israel River Complex, but as a small minority of the raw material.

In addition to material types, the Israel River sites contain fluted point fragments that are similar in style to those from Neponset. The Jefferson I, II, and IV sites have each yielded at least one fluted point of the Barnes type that would date from the Middle PaleoIndian, or Michaud-Neponset phase. Based on the presence of Munsungun chert in the Jefferson area and Neponset, then there is also a connection with north-central Maine. The Israel River sites contain some points that look more like the earlier Gainey type, from the Bull Brook phase, as do some of the loci from Neponset. This may imply a connection that lasts longer than for just a portion of the time period from ca. 12,100-11,800 B.P., but may have originated earlier, sometime after ca. 12,400 years ago, when the Israel River area had opened up from the grip of glacial ice (Thompson et al. 1996: 229).

The Wapanucket site, approximately 42 km to the south of Neponset, also has Barnes type points (Robbins and Agogino 1964; Robbins 1980: 273), but these are made of mostly northern New England cherts, including Munsungun (Spiess et al. 1998: 209). Thus there is a connection in time frame, but not in lithic materials.

Bull Brook is the largest known site in the region during the Early PaleoIndian phase. The dominant materials at Bull Brook are cherts from the Champlain but also included substantial amounts of Munsungun chert are also present Valley (Spiess et al. 1998:204). Some of the Bull Brook points exhibit slight flaring, which may be an indication of stylistic change toward the Barnes types. It is not clear if the Bull Brook site continued to be the largest, or core, site during the time Neponset was
occupied, or if there was another core location that has not been discovered or has been destroyed.

Based on the available information, the Neponset site is more directly tied to northern New Hampshire, whereas the Wapanucket site seems to be tied to sources of northern cherts, possibly via Bull Brook. Other, lesser known sites in the region echo some of these patterns. Shattuck Farm, for instance, has produced fluted points of Mt. Jasper and Munsungun chert. The Hidden Creek site in southeastern Connecticut contains high percentages of cherts that may be from either the Champlain valley or the Hudson valley (Jones 1997). The Michaud and Lamoreau sites in Maine are relatively evenly split between Champlain Valley chert, Munsungun chert, and Mt. Jasper rhyolite. The Vail site contains Munsungun chert and also Champlain Valley cherts. If raw materials can be used as a way to trace the settlement routes of site occupants, then the patterns presented by sites in southern New England clearly point back to the north. The people of the Neponset site got most of their raw material from northern New Hampshire, while those of Bull Brook and Wapanucket got their materials from Maine and northern Vermont. Sites in northern New England include local sources, and sources to the west, such as the Champlain Valley.

A number of hypotheses have been presented regarding the initial settlement of New England (Anderson and Gillam 2000). Bradley has proposed a series of three corridors into the New England-Maritimes Region. These include one along the exposed coastal lowlands and terminal moraine into southern New England, a second from the Delaware Valley through the Wallkill corridor to the mid-Hudson, and a third following the Onondaga Escarpment across Central New York to the east side of the Hudson and Champlain Sea. Within the region, the major rivers (Connecticut, Merrimack, Androscoggin, and Kennebec) appear to have served as primary north-south corridors (Bradley 1998). Dincauze and Jacobsen have recently argued that the Hudson Trench would have served as a barrier to entering New England in the late Pleistocene, and the likely settlement routes would have been through northern New York and northwestern Vermont, along the shores of the Champlain Sea. Travel would have continued across northern Vermont and New Hampshire into Maine. The large and numerous wetlands along this corridor would have been plentiful with birds, fish, and marine mammals (Dincauze and Jacobsen 2001:122). A similar focus on waterfowl and the importance of dogs to PaleoIndian life has been put forth for the western part of the continent as well (Fiedel 2005).

The northern entry into New England fits well with the material found at the Neponset site, and with the distribution of raw material types at other sites in the region. In this model, Early and Middle PaleoIndian sites are expected to have very high percentages of northern raw materials, with Late PaleoIndian sites beginning to show more use of local lithic sources, continuing into the Early Archaic. Sourcing of raw materials offers the hope of more directly showing routes of travel and/or trade, and deciphering the relationships between large and small PaleoIndian sites.

Conclusions

The identification of an additional locus of PaleoIndian activity at the Neponset site shows that there were a number of closely-spaced loci to the southeast of Signal Hill. These include Loci A, B, and C, excavated in the 1970s, Locus H, and Locus 4. Just to the southeast of this cluster was Locus D. A few isolated PaleoIndian artifacts have also been found at other locations around the hill. The presence of multiple components in Locus 4 make isolation of PaleoIndian artifacts difficult, and these identifications were mostly tied to raw material type. Our information from the Neponset site would be aided by access to other collections from the site, including the recently obtained artifacts from Locus H. Other important information can be gained from additional lithic analysis, with an aim of obtaining more specific
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