Projectile Point Fragments

Testing recovered 53 projectile point fragments, mostly tip and midsections **(Figure 1**) (Table 1). These could not be identified to particular point types but three categories are present: broad

Table 1. Projectile point fragments

Location	Broad	Narrow	Triangular	Unknown
L1H				2R
L1S		1R		2R
L2H			2Q	1Qz
L4H	4R	1R	2Q	
L4S	1R, 1 ARF	2Q, 1R, 1Qz	9Q, 1R	2R
L5H		1Q	1Q, 1R	1R, 1Q, 1C
L6H	1R		3Q	1Q
L6S	1R			1Q
L7HN			1Q	1R
L7SN				1Q, 1R
L8H	1R		2Q	
Total	**9**	**7**	**22**	**16**

R- Rhyolite Q- Quartz Qz- Quartzite ARF- Attleboro Red Felsite C- Chert

bladed, narrow bladed, and triangular. Testing recovered point fragments from across the site and from a variety of materials. Most point fragments exhibited perverse manufacturing fractures indicating breakage during manufacture versus use. Testing found concentrations of fragments in Lot 4, where archaeologists recovered most of the Late Archaic Susquehanna, Small Stemmed Tradition, and Levanna points. The recovery of in process points correlates well with the recovery of processing waste (cores, debitage, discarded points).

Projectile Points

Excavation recovered 234 complete or fragmentary stylistically identifiable projectile points during the data recovery excavations (Table 2). Testing recovered Early Archaic points from

Table 2. Temporally diagnostic projectile points

	L1H	L1HN	L1S	L1SN	L2H	L2S	L4H	L4S	L5H	L6H	L6S	L7H	L7HN	L7SN	L8H
Early Archaic															
Bifurcate										2					
Middle Archaic															
Neville					10		1	1	1						
Stark					8		2	6	3	1					
Late Archaic															
Brewerton	1							1							

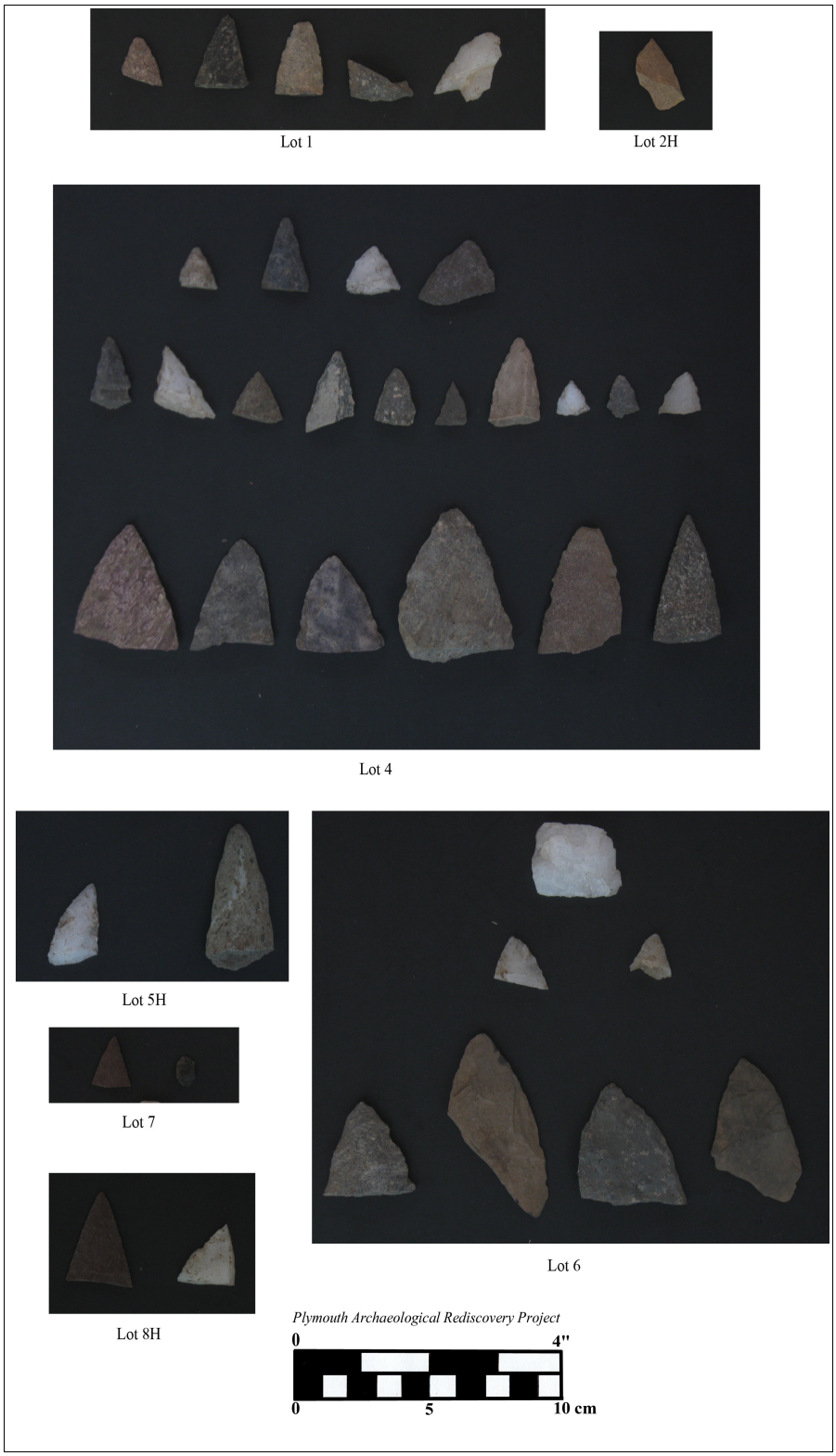

Figure 1. Projectile Point Tips and midsections

Figure 1. (Cont.)

Lot 1 and 2
Top Row Left to Right:
Lot 1- L1S-C N302 E217 0-30 cm, L1H-A N310 E176 20 cm, L1H-PZ N314 E178 0-20 cm, L1H-PZ N312 E170 0-20 cm, L1HN-A N302 E182 0-28 cm, Lot 2- L2H-A N270 E215 50-55 cm

Lot 4
Top Row Left to Right:
L4S-C N144 E148 0-38 cm, L4S-C N145.5 E148 0-42 cm, L4S-C N145 E145 0-40 cm, L4H-PZ N142 E126 0-36 cm
Middle Row Left to Right:
L4S-A N146 E145.3 30-35 cm S1/2, L4H-Stripping, L4S-C N144 E145 0-30 cm, L4S-A N149.1 E149.7 35-45 cm, L4H-A N156.65 E149.6 35-40 cm S1/2, L4S-A N148.1 E144.7 45-50 cm W1/2, L4S-C N147 E146 0-36 cm, L4S-PZ N150 E130 0-30 cm, L4S-C N146 E148.5 0-40 cm, L4S-SQ N145 E149 40-45 cm NW
Bottom Row Left to Right:
L4H-A N156.7 E124.1 45-50 cm, L4H-PZ N142 e132 0-28 cm, L4H-C N144.5 E130 0-30 cm, L4H-A N156.25 E128.1 30-35 cm E1/2, L4S-C N140 E142.5 0-36 cm, L4S-C N141.5 E146 0-45 cm

Lot 5
Left to Right: L5H-C N134 E128.5 0-35 cm, L5H-C N134 E125.5 0-40 cm

Lot 6
Top Row:
L6S-PZ N112 e250 0-32 cm
Middle Row Left to Right:
L6H-A N103.7 E225.1 40-45 cm W 1/2, L6H-A N103.6 E238.75 45-50 cm N 1/2
Bottom Row Left to Right:
L6H-C N104 E236.5 0-35 cm, L6S-EU N113 E253 35-40 cm, L6S-EU N114 E252 35-40 cm, L6S-PZ N112 E250 0-32 cm

Lot 7
Left to Right:
L7SN-A N74.5 E257.5 45-50 cm N1/2 W. Stain, L7H N65.5 E257.4 35-40 cm W1/2

Lot 8
Left to Right:
L8H-Stripping NE corner, L8H-PZ N80 E304 0-20 cm

Table 2. (Cont.)

	L1H	L1HN	L1S	L1SN	L2H	L2S	L4H	L4S	L5H	L6H	L6S	L7H	L7HN	L7SN	L8H
Trans. Archaic															
Perkiomen									1						
Susquehanna Broad					1								1		
Wayland Notched-Dudley							2	3		1	1				
Wayland Notched-Coburn							1	2		3		1			1
Wayland?					1				1		2				
Mansion Inn								1							
Boats							1		3						
Orient Fishtail					1		1	2							
Small Stemmed															
Small Stemmed-Bare Island					1		2	2	2	1		1	1		
Squibnocket Stemmed	2					1	1	3	1	3					
Wading River	1		1				1	5		2					
Small Stemmed?	1				1		2								
Squibnocket- Long		4					5	8		1	1	2			
Squibnocket- Squat			2		2		1	13	2			1		1	
Squibnocket?		2			1		1	9	1	2					
Early Woodland															
Rossville					2			2							
Middle Woodland															
Fox Creek							2	1			1				
Jack's Reef									1						
Greene							2	1	2	2	1				
Late Woodland															
Levanna-Deep Based	1	1			2				2	1	2	1	1	2	
Levanna- Shallow Based	1	3			1		6	1	1	3	1	2	2	3	2
Levanna?				1	2		4	2	1	2	1	1		2	
Total	7	10	3	1	33	1	35	63	22	24	10	9	5	8	3

L6H. Excavation identified a Middle Archaic camp in L2H, and recovered Middle Archaic points from L4H and S and L5H. Transitional Archaic Susquehanna complex points were well represented in Lot 4 and to a lesser extent in lots 5 and 6. Small Stemmed points were common in Lots 4 and 6 and to a lesser extent in Lot 5. Squibnocket Triangle points were very common in L4S, where archaeologists identified a possible lithic concentration that probably represents a refuse from Squibnocket Triangle production, as well as in L4H and L1HN. Testing recovered Early Woodland Rossville points from L2H and L4S and found Middle Woodland points in L4H, L5H, and L6H. Late Woodland Levanna points were widely dispersed in much the same way that the Squibnocket points were, but testing found them concentrated in L4H and L7SN.

Early Archaic- Bifurcate-Base point (n=2)

The Early Archaic period (10,000-8,000 BP) is still somehow elusive, which has prompted theories as to the possibility that the changes in artifacts used to define this period may represent continuity of Paleo-Indian populations. Dincauze (1990) used the common term pioneers for Paleo-Indian and Early Archaic populations (pioneers and late pioneers, respectively). Snow (1980:171) considered that there was continuity from the Paleo-Indian Period into the Early Archaic Period, with "restricted wandering" of groups within territories during the Early Archaic. As the physical environment began to stabilize (i.e., changed less quickly and became more predictable), evolving into a closed boreal environment dominated by spruce, fir and birch, human groups grew less generalized in adaptation and settled into more restricted foraging territories. Small groups of Early Archaic populations may still have traveled across large areas for most of the year (Braun and Braun 1994). The few sites identified from this period present limitations of our understanding of seasonal movements and group dynamics.

Early Archaic diagnostic points include Bifurcate-Base points and Kirk Stemmed and Kirk Corner-Notched points. Overlapping dates for the late Paleo-Indian and Early Archaic as well as the small number of Early Archaic sites in the Northeast still challenge this research issue; the latter may reflect low population numbers during the Early Archaic (Salwen 1978), the combined outcome of site destruction and meager or inadequate surveys, or our inability to recognize the entire range of artifact types for the period (Dincauze and Mulholland 1977). Researchers have noted a significant use of quartz and lack of diagnostic points at one site in southern New England dating from the Early Archaic period (Forrest 2000). Rising sea levels or river alluvium undoubtedly buried and destroyed some Early Archaic sites (Dincauze and Meyer 1977). Subsequent collections research has found a wider range of sites with bifurcate base points present than previously recognized (Johnson 1984). This may reflect a wider range of food resources being exploited.

Archaeologist have discovered most Early Archaic Period sites in southern New England and in coastal areas. These small groups did not camp together in larger numbers as did the earlier Paleo-Indians, resulting in fewer recognized sites with sparse evidence of their presence. Sites from the Early Archaic period are perhaps best known in southeastern Massachusetts, especially in the Taunton River drainage, for example the Titicut/ Fort Hill/ Taylor Farm in south Bridgewater and North Middleborough, and the Plymouth Street site in North Bridgewater (Dincauze and Mulholland 1977; Thorbahn 1982; Taylor 1976). Collectors recovered bifurcates in Middleborough from small sites near headwater streams and ponds (Hoffman 1991). A cache of pre-forms from the Double P site in southwestern Bridgewater, yielded a radiocarbon date of 8555+200 BP (GX-7508) (Thorbahn 1982). The Titicut site is the largest identified from the Early Archaic period. Archaeologists interpreted this as a base camp for several

families. A number of Early Archaic sites identified in Massachusetts contained evidence that suggests that small hunting groups returned to camps with seasonal regularity. Archaeologists discovered deep pit features, possibly used for storage but more likely as pit houses, in the Taunton and Shawsheen River drainages (Harrison and McCormack 1990, Glover and Doucette 1992). These sites contained stone tools diagnostic of the Early Archaic Period, radiocarbon age determinations, or both. Another site had deep pit features, interpreted as pit houses, with an abundance of charred hazelnut shells (Forrest 2000).

During the Paleo-Indian and Early Archaic periods, knappers made most diagnostic tools in southeastern Massachusetts out of non-local or exotic stone, a pattern that generally is predominant throughout southern New England. However, it has recently been argued that until archaeologists excavate more Paleo-Indian and Early Archaic components and they achieve better microscopic identifications of stone types and their origins, this pattern may be artificial, reflecting biases in sample size and archaeological recovery history (Moeller 1999:72-73).

Generally it has been found that the large hilltop sites favored by the Paleo-Indian hunters were no longer as important with smaller sites appearing more frequently. This likely indicates that the "large band" was not the social unit used by people to identify themselves. A smaller localized population that used local lithic resources appears to have developed during this period. Tool types remained uniform across the Northeast though, indicating a widespread pan-Eastern Woodland culture with localized focus (Braun and Braun 1994:29-31).

Archaeologists consider the bifurcate-base projectile point type fossil of the Early Archaic period in southern New England and their widespread distribution indicates a wide but thinly dispersed population (Dincauze and Mulholland 1977). This point type has an expanding stem, corner-notched form with shoulders varying from 90 degrees severely acute angles. They have been found to range in length from three to seven centimeters with blades between two and four and one-half centimeters wide (MHC 1984: 66). The common materials used were local volcanics and cherts and much variation occurs in the length, width, shoulder and basal shape (MHC 1984: 67). This variation may represent different varieties of bifurcate-base points as identified in other areas of the country. Varieties may include Kanawha Stemmed, LeCroy, and St. Albans side notched. Johnson (1993) surveyed the information then known regarding bifurcate-base point recoveries in southeastern and Central Massachusetts. General trends that he observed included a decrease to 23% for the reliance on exotic lithics versus the earlier Paleo-Indian period, a trend which continued into the Middle Archaic where knappers made only 5% of the points from exotic lithic (Johnson 1993:50). Johnson also observed that Early Archaic populations tended to favor important regional riverine locations, especially those near the confluences of water features and a co-occurrence of Early Archaic occupations and occupations from later periods (Johnson 1993:49, 46). Long time avocational collector William Taylor, in 2005, updated his own survey of bifurcate-base points recovered from a 1.5 mile section of the Taunton River in the Titicut area (Taylor 2005). He noted that in this section alone, 122 bifurcate-base points are known from nine sites. These points have been tentatively identified as a variation of the Le Croy type of bifurcate from Tennessee, but were wider and longer with more pronounced basal notches. His survey produced results similar to Johnson's earlier study with regards to preferred raw material: 107 rhyolite; 4 hornfels; 5 chert; 1 quartz; 2 quartzite; 1 Saugus jasper; 2 argillite (Taylor 2005:3).

Excavations recovered two bifurcate-base points from the data recovery excavations **(Figure 2).** Both

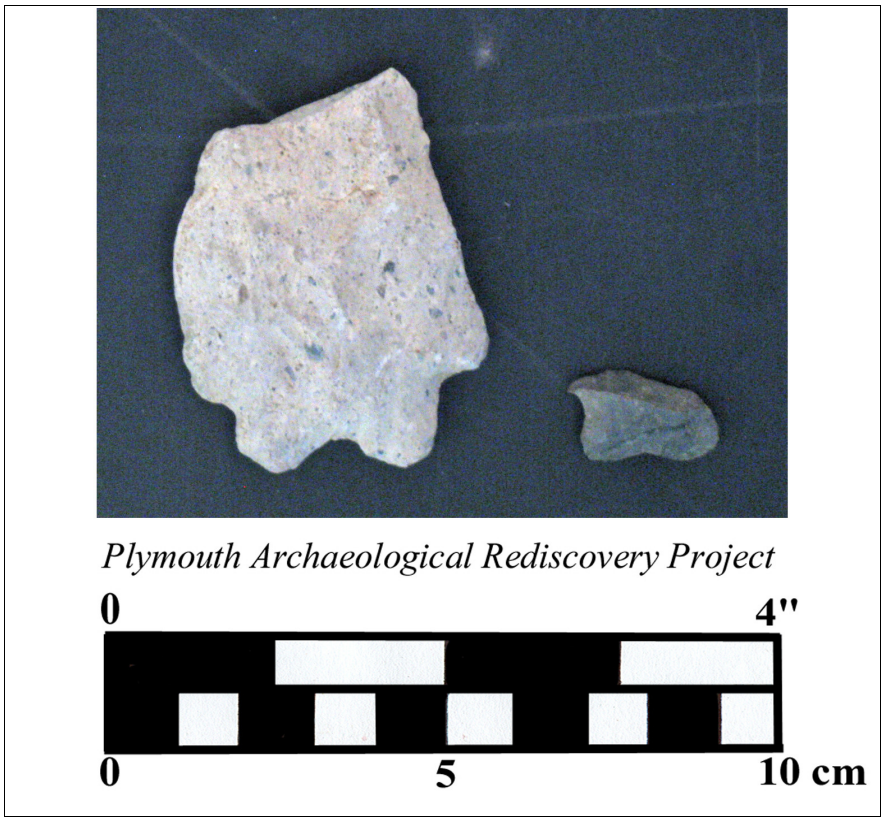

Figure 2. Bifurcate points
(Left to Right: L6H-C N106 E235.5 0-30 cm, L6H-A N104.5 E243 45-50 cm S1/2)

were found in the Lot 6 House impact area. One point consisted of a base and midsection made of gray rhyolite. Excavation recovered this point from plowzone soils in cruciform test pit N106 E235.5. This point weighed 10.4 g and exhibited evidence of in-haft resharpening above a three centimeter high haft. The midsection showed evidence of an impact fracture that removed the upper midsection and tip, leaving a deep flake scar extending past the midsection towards the base. Overall the point was four centimeters long, three centimeters wide and .6 cm thick. The form appeared similar to Taylor's points from Titicut and similar to Le Croy style bifurcate- base points. The second bifurcate-base point was made of dark gray chert and was by a lower portion of the stem and bifurcated-base fragment. Archaeologists recovered this point from a Late Woodland deep storage pit. This point fragment may have accidentally entered the pit during backfilling. This base was .9 cm long, 1.4 cm wide and .5 cm thick. The break above the base is a bending/ impact fracture resulting from the shock wave from an impact traveling through and flexing the blade to the point of failure, in this case just above the base. These projectile points indicate that Early Archaic people made little use of the area, possibly as a resting place during at least one hunting episode. These points appeared to represent discarded points broken during the hunt and were likely replaced with complete points before the hunters left the area.

Middle Archaic Neville (n=13) and Stark (n=8) points

Throughout southern New England, human occupation becomes more evident and more complex during the Middle Archaic. In southern New England, a mixed pine-oak forest was established and expanding north by 8500 BP, followed by an oak-hemlock forest in southern New England by about 6000 BP (Dincauze 1976:119). The greater number of sites from this time relate to a presumed increase in population density, while the greater disparity in size and differentiation of individual sites suggests a more complexly ordered social landscape than previously found. Stemmed bifacial points, atlatls (spear-thrower weights), pecked, ground and polished woodworking tools such as axes, adzes and celts, and plant processing tools such as mortars, pestles, grinding stones and nutting stones are new tool forms in use during this time. The cultural traditions of the Middle Archaic complexes, as seen at the Neville site, reveal a close relationship to the Atlantic seaboard (Mid-Atlantic) and piedmont (Southeast) regions during the Middle Archaic period (Dincauze 1976:124).

Dincauze and Mulholland (1977) have suggested that effective integration of seasonally available resources into a single adaptive schedule appeared during this period, while maintenance of territorial boundaries between groups intensified in consequence of this emergent adaptation; this response may have been a consequence of more stable regional environments. The predominant settlement pattern would be one of small sites oriented toward seasonally abundant resources, including spring fish runs. The earliest documented or inferred harvesting of anadromous fish during spring runs up the Connecticut (Thomas 1980) and the Merrimack rivers (e.g., Dincauze 1976, Barber 1980) marks both a fundamental adaptation to foraging possibilities and a seasonal determinant of site location, i.e. spring occupations at rapids, falls and constrictions on larger river courses. Exploitation of anadromous fish would continue throughout the rest of regional prehistory as a principal component of aboriginal economies. On the Mashantucket Pequot Reservation in southeastern Connecticut, the Great Cedar Swamp was important in seasonal subsistence rounds during the Neville phase from 8000 to 7000 BP. Several settlement models for New England "suggest that subsistence activities became more intensively focused on the valley floors of the major river drainages with the onset of the Hypsithermal after about 7500 radiocarbon years ago" (Jones 1999:120).

Archaeologists find sites dating from the Middle Archaic period in a wide variety of environmental settings, including the margins of bogs, swamps, rivers, lakes and ponds, with differentiation of sites based on size and apparent function. This may reflect the incipient seasonal rounds or scheduled subsistence activities, possibly related to a growing territoriality within drainage areas (Dincauze and Mulholland 1977). Site types include semipermanent base camps along rivers, streams or wetlands, special-purpose camps in uplands or near wetlands, rock shelters, stone quarries, and workshop areas (Bussey et al. 1992).

Evidence of site differentiation and a more complexly ordered social landscape can be extrapolated on the basis of a number of large Middle Archaic sites containing a variety of features. Archaeologists identified 119 cultural features at the Annasnappet Pond site in the Taunton River drainage, with three of nine loci forming a nearly continuous distribution of Middle Archaic and Late Archaic material over nearly 14,000 sq. m. area. A mortuary feature containing calcined human cranial fragments, winged atlatl weights and Neville points at this site was radiocarbon-dated to 7570 $\pm$ 150 BP (Cross 1999). It is the only known human burial associated with Neville points in the Northeast. The presence of the

mortuary feature indicates an increasingly complex view of the afterlife and the importance of mortuary ceremonialism associated with the body and spirit's journey to it.

Archaeologists recognize three major projectile point styles as diagnostic of the Middle Archaic period. Dincauze defined these points on the basis of excavations at the Neville site (Dincauze 1976). The points are the Neville point, dating from approximately 8000-7000 BP; the Stark, from around 7700-7200 BP; and the Merrimack, from close to 7200 BP to the end of the period. In central Massachusetts, archaeologists have identified at least twenty-two sites containing these diagnostic types (Johnson and Mahlstedt 1985:31). Other artifacts used during this time include atlatls or throwing sticks, knives, perforators, axes, adzes, scrapers, abraders, ulus (semi-lunar ground stone knives), gouges, and harpoons.

Cross (1999), examining the distinction between the Neville and Stark point types, has demonstrated differences in production technology and functional qualities of Neville and Stark points at the Annasnappet Pond site that imply differences in use (Neville points being used on atlatl darts while Stark points may have used on thrusting spears). Cross posits that, based on the functional and technological differences, the two kinds of bifaces may be contemporary (Cross 1999:72). Dincauze (1976) has argued for temporal overlap, with Starks becoming more common over time, and the data recovered from the current data recovery excavations supports this interpretation.

Excavations at the Muttock-Pauwating site recovered 13 Neville points or point fragments from three of the lots tested (L2H, L4H, L4S, L5H) **(Figure 3).** Archaeologists recovered most of the Neville points from the deeply buried Middle Archaic occupation deposit in L2H. The remainder were lightly scattered in the south half of the project area. Argillite, used in six of the recovered points, appears to have been the preferred raw material. Rhyolite (n=4), quartzite (n=2) and Attleboro red felsite (n-=1) followed argillite in percentage of occurrence. Neville points from L2H predominantly show breaks that occurred during production. One impact break that occurred during use was also present. The production breaks occurred at the midpoint of one argillite point, caused by imperfections in the stone, at the stem shoulder juncture of one rhyolite and one quartzite point and a double perverse break was present on the Attleboro red felsite point. The perverse fractures appear to have occurred during the pressure flaking stage of production

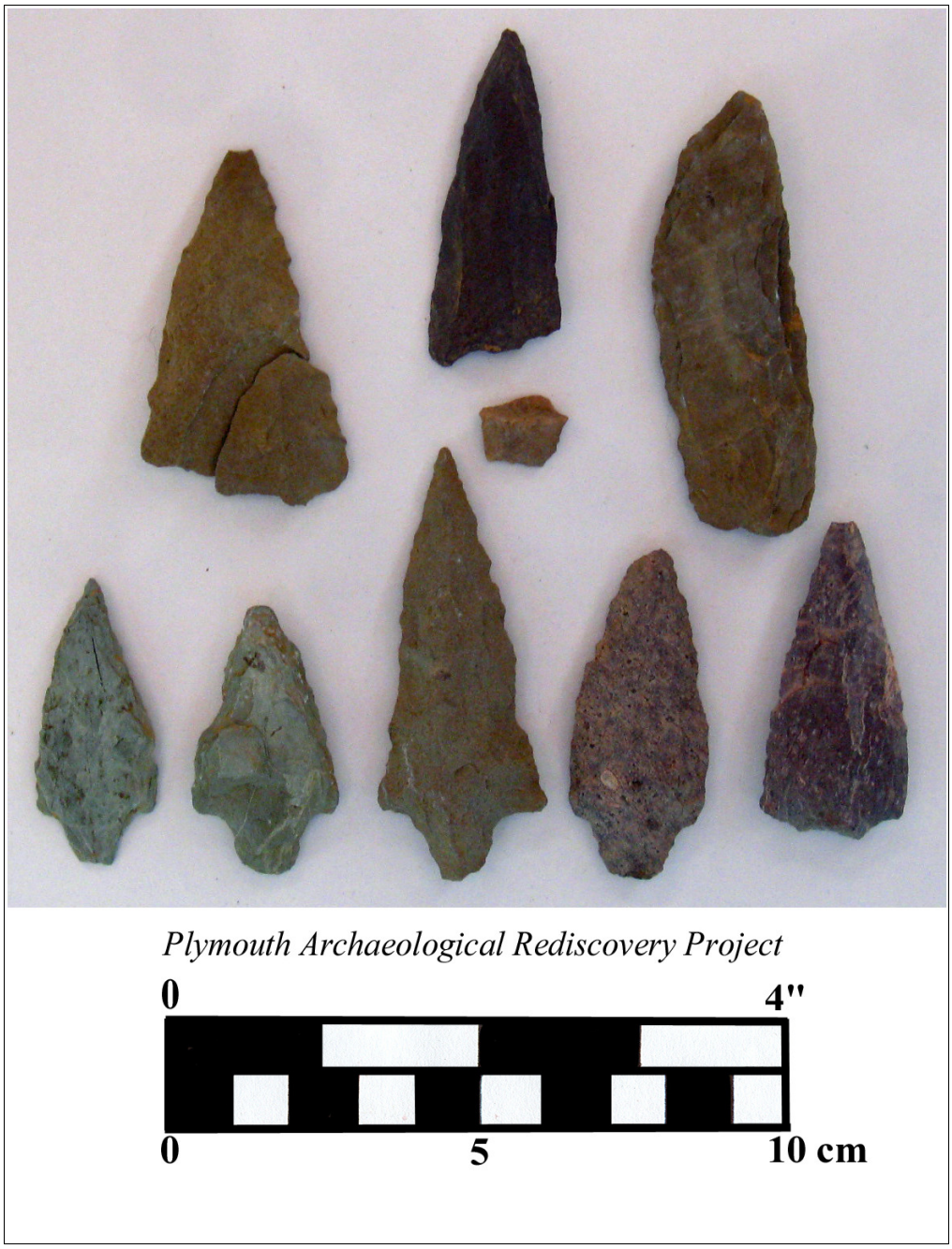

Figure 3. Neville points
Top Row Left to Right: L2H-B N271 E217 65-70 cm and L2H-B1 N270 E217 65-70 cm [one point], L2H-A N270 E214 55-60 cm, L2H-B1 N270 E215 65-70 cm
Middle: L2H-A n268.1 E214.25 55-60 cm N1.2 [point base]
Bottom Row Left to Right: l2H-B1 N272 E213 60-65 cm, L2H-B1 N271 E216 70-75 cm, L2H-A N270 E213 55 cm, L2H-B1 N271 E213 50-55 cm, L2H-B1 N272 E216 70-75 cm W1/2

(Table 3). Perverse fractures occur when a knapper applies pressure to both the dorsal and

Table 3. Neville Points

Location	Material	Portion	Length/Width/Thick	Weight	Haft Ht	Break Type
L2H-Sq-N270 E214	Argillite	Tip/Midsection	5.5/ 2.2/.5 cm	6.6 g		Imperfection
L2H-A-N268.1 E214.25	Quartzite	Base	1.4/ 1.1/ .5 cm	.8 g		Impact
L2H-Sq-N271 E213	Rhyolite	Complete	5.2/ 2.2/ .7 cm	9.4 g	2.9 cm	
L2H-Sq-N270 E215	AR Felsite	Midsection	3/ 2.1/ .9 cm	4.4 g		Double Perverse
L2H-Sq-N271 E217	Quartzite	Tip/ Shoulder	5.2/ 2.4/ .7 cm	11.8 g		Imperfection
L2H-Sq-N271 E213	Argillite	Complete	4.6/ 1.8/ .5 cm	3.8 g	1.5 cm	
L2H-Sq-N272 E213	Argillite	Complete	4.5/ 2.1/ .35 cm	3.3 g		
L2H-Sq-N270 E213	Rhyolite	Complete	6.7/ 2.8/ .9 cm	12.6 g	2.5 cm	
L2H-Sq-N271 E216	Argillite	Complete	4.2/ 2.4/ .7 cm	7.1 g		
L2H-Sq-N272 E216	Rhyolite	Tip/ Shoulder	4.9/ 2.4/ .8 cm	10.4 g		Perverse
L4H-Stripping	Rhyolite	Complete	5.5/ 3.2/ .8 cm	14.5 g		
L4S-C-N147 E148	Argillite	Complete	4.9/ 1.5/ .5 cm	3.8 g	1.5 cm	
L5H-C-N134 E175.5	Argillite	Tip/Midsection	4.2/ 2.1/ .8 cm	7.5 g		Impact

ventral surfaces of the piece being worked during the twisting of pressure flaking. Analysis found one impact break at the junction of the stem with the shoulder. This break was the result of the shock wave from an impact traveling through and flexing the blade to the point of failure, in this case just above the base. This was the same type of break present on the bifurcate-base point described above. Following the break, the broken shoulder to tip section was left where it broke and the hunter retrieved the shaft with the base attached and then discarded the base when the he replaced the broken point.

One of the argillite Nevilles is very thin and is defined as a Neville only by shape and not by craftsmanship. The point (L2H-N272 E213 60-65 cmb) is flat and thin with minimal finishing. It appears to be a non-functional point perhaps created in a whimsical moment, with no intent of it ever being used.

Only four of the complete points bore evidence of in-haft resharpening and thus evidence of the haft height. Haft heights for the two narrow bladed possible drills or perforators was found to be 1.5 cm in both cases. Haft heights for triangular-bladed points was found to be 2.5 and 2.9 cm. Point weights varied depending on material and size. The one argillite point that may have been a functional point (L2H-Sq-N272 E216) was found to weigh 7.1 g and was 4.2 cm long. The three complete rhyolite points weighed 9.4, 10.4 and 12.6 g with their corresponding lengths being 5.2, 4.9, and 6.7 cm. Two of

these points showed evidence of in haft resharpening, indicating that they were functional points and not discards, making 11g the average point weight for Nevilles.

Excavation recovered eight Stark points from five of the testing locations (L2H, L4S, L5H) (**Figure 4**).

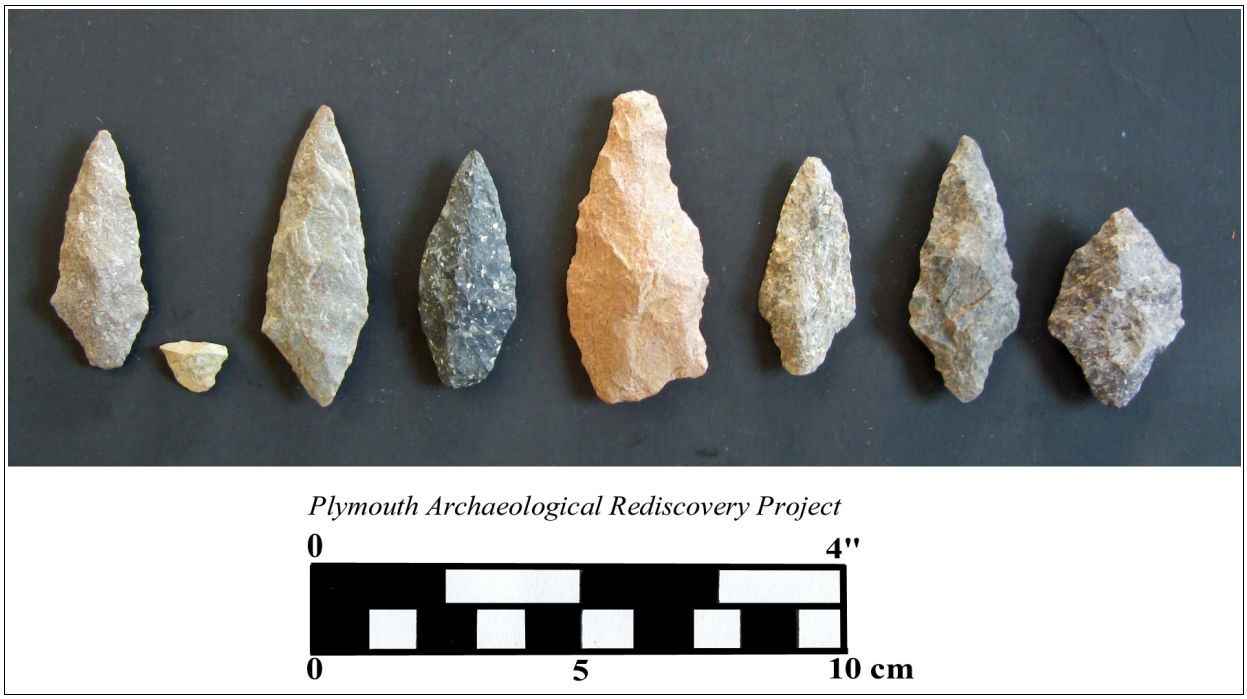

Figure 4. Stark points
Left to Right: L2H-Stp N268 E216 0-40 cm, L2H-Sq N270 E215 55-60 cm, L2H-Sq N270 E211 0-40 cm, L2H-Sq N268 E217 65-70 cm, L2H-Sq N275.5 E208.5, L4S-C N147 E142 0-30 cm, L4S-C N146.5 E142 0-28 cm, L5H-C N131.5 E180 30-60 cm

These are same locations where Neville points were also recovered. Eighty-eight percent of the points recovered were complete, which is significantly higher than the 54% of the Neville points that were complete. Forty-four percent of the complete Stark points showed signs of in-haft resharpening while 57% of the complete Nevilles showed signs of in-haft resharpening and thus by implication, active use as projectiles. Of the broken Stark points, 11% showed evidence of impact breaks while 33.3% of the fractures present on the Neville points were the results of impacts. The disparities identified between the Neville and Stark points may indicate that the site saw more production of Neville than Stark points but that Middle Archaic populations used Stark points in such a way as to result in fewer impact breaks. This interpretation supports Cross' (1999) hypothesis that people used Stark points in thrusting spears while using Neville points with atlatls as true projectiles.

A Middle Archaic knapper abandoned one of the Stark point of Attleboro red felsite during production. The Nevilles from the L2H concentration also overwhelmingly exhibited perverse/ manufacturing fractures. The L2H area obviously was a location where the manufacture of new projectile points occurred versus the southern half of the project area where replacement of points broken during the hunt was the main focus of activities with no evidence of replacement manufacture being found. It is likely that the points replaced in the southern half of the project area were from a complete stock carried with the hunters. This may indicate that occupation in the southern half of the project area was more transitory and of a shorter duration than the occupation at L2H. The points in the southern half also showed a greater preference for rhyolite versus quartzite.

Complete point weights ranged from 4.3 to 26 g with the average being 9.2 g for all the complete points (Table 4). The range for the complete points that also bore evidence of in-haft

Table 4. Stark points

Location	Material	Portion	Length/Width/ Thickness	Weight	Haft Ht	Break Type
L2H-Sq N268 E217	Rhyolite	Complete	4.6/ 2.9/. 7 cm	6.9 g	1.8 cm	
L2H-Sq N270 E211	Quartzite	Complete	6/ 2/ .7 cm	8.7 g		
L2H-Sq N270 E215	Rhyolite	Base	1.5/ 1/ .6 cm	.7 g		Impact
L2H-Sq N275.5 E208.5	AR Felsite	Complete	6/ 2.5/ 1.1 cm	16.8 g		
L2H-Stp N268 E216	Quartzite	Complete	4.8/ 1.9/ 1 cm	7.1 g	1.5 cm	
L4S-C N146.5 E142	Rhyolite	Complete	5.2/ 2.2/ .75 cm	9.3 g	2 cm	
L4S-C N147 E142	Rhyolite	Complete	4.2/ 1.8/.75 cm	5 g	1.8 cm	
L5H-C N131.5 E180	Rhyolite	Complete	3.9/ 2.5/ 1.1 cm	8.2 g	2.9 cm	

resharpening, was 4.3 to 12.9 g with the average being 7.7 g. The range for the Neville points was between 9.4 to 12.6 with the average being 11 g. The Stark points appear to have a wider range of sizes but overall were generally lighter than the Nevilles. The haft heights for the points from L2H ranged between 1.5 and 1.8 cm with the average being 1.65 cm. The haft heights from the southern half of the project area ranged between 1.7 and 3.3 cm with the average being 2.3 cm. The haft heights for the Neville points was opposite that of the Starks with the points from L2H having a higher haft height than those from the southern half of the project area.

Up to three contemporaneous varieties of projectile points were found that could be attributed to the Middle Archaic period occupation of the project area. Neville and Stark points were found to occur together in the single occurrence occupation in L2H and both forms were also found in the southern lots. Additionally, two argillite narrow bladed tools, conventionally identified as drills or perforators but which the present study posits are another form of projectile point similar in form to "bodkin" type points. These points may bridge the gap between narrow-bladed late Paleo-Indian Eden points and Late Archaic Small Stemmed points, but more work needs to be done to investigate this hypothesis. Suffice to say that argillite would be a poor choice for a drill or perforator due to its platy and relatively soft nature, but may have fulfilled the need for a light, expendable, quickly manufactured point that could produce a definite puncture would in its target.

Late Archaic

Brewerton (n=2), Small Stemmed (n=35), Squibnocket Triangle (n= 59)

Late Archaic Period (6000-3000 BP) consists of three identified cultural traditions based on certain artifacts: the Laurentian, Susquehanna, and Small-Stemmed. Unfortunately the relationship between the three traditions remains unclear (Ritchie 1997; Dincauze 1974, 1975). Laurentian materials are more numerous in the central and western parts of the state, possibly indicating that this tradition is an interior, upland adaptation. Alternately, some researchers suggest that the Laurentian represents some form of ethnic identity, representing population movement from the Great Lakes region after 4,500 BP

William Ritchie defined the Laurentian Tradition basing his definition on findings from excavations at the Brewerton and Oberlander 2 sites in New York where he identified three phases of the tradition: Vergennes, Brewerton and Vosburg (Ritchie 1965: 83-87). The Vergennes Phase, characterized by Otter Creek style and ground slate projectile points, plummets and ulus while the Vosburg Phase lacks the ground slate points and the copper tools that characterize the Brewerton Phase. Brewerton Phase sites often contain copper tools and Brewerton style projectile points. Brewerton Phase artifacts date from 5,500 to 4,000 BP and Ritchie characterized the phase by a focus on hunting as the primary subsistence activity with four varieties of projectile points (Brewerton Side-Notched, Brewerton Corner-Notched, Brewerton Eared-Notched and Brewerton Eared-Triangle) being represented at sites of this period (Ritchie 1965:93). Other tools recovered from sites of this phase include fish hooks, stone pestles, mullers and mortars, adzes, and bone awls and needles (Ritchie 1965: 94). Settlement patterns in New York appear to have followed a seasonal cycle with camps being located near large swamps and the waterways emptying them. The use of native copper on Brewerton Phase sites indicates long distance trade connections with the Great Lakes and the recovery of Pennsylvania jasper artifacts from sites of this phase in New York State indicates trade to the south as well as north.

Archaeologists recovered two Brewerton style projectile points during the data recovery excavations **(Figure 5).** Testing found one Brewerton Eared Triangle made of tan quartzite from L1H-STP N312 E170 0-20 cm. This point was bore an impact break just below the tip. The blade of this point bore extensive in-haft resharpening, resulting in a steep-sided triangular shape. The point was likely discarded when it had been resharpened to the point of being too short for practical use. The second point was a Brewerton Side-Notched point base and midsection recovered from L4S-A N145 E144 30-35 cm. The point bore fine retouch along the edges and had snapped at the midpoint as a result of an impact with a hard object during use. The Eared Triangle point weighed 6.9 g while the Side-Notched point weighed 7 g. Hafting height was 1.2 cm for the Eared Triangle and 1 cm for the Side-Notched point. The recovery of these projectile points indicates the continued use of the area as a very short-term stopping location for hunters to replace broken and exhausted projectile point. Archaeologists did not recover any other artifacts diagnostic to this phase from the project area.

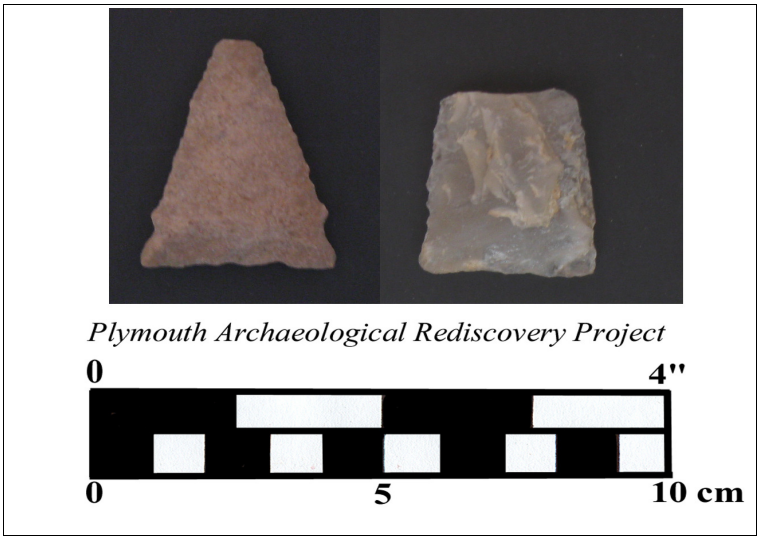

Figure 5. Brewerton points
Left to right: L1H—PZ N312 E170 0-20 cm, L4S-A N145 E144 30-35 cm S1/2

Small Stemmed/ Squibnocket Triangle

Small Stemmed and Squibnocket Triangle points are temporally diagnostic of the Late Archaic period in New England prehistory. Archaeologists working in the 1980s pushed back the earliest dates for Small Stemmed points to the second or third millennium before present (Thorbahn 1982, 1983). Researchers characterize Small Stemmed points into four varieties (termed Small Stemmed I-IV in the MHC Guide to Prehistoric Site Files and Artifact Classification System [1984]) which are grouped together into two categories- squared to rectangular stems and rounded stems.

The first category includes Small Stemmed I and II. Researchers characterize these as point possessing narrow isosceles triangular blades, a steeply angled cross-section with hard hammer percussion flaking, a short roughly rectangular to square stem that is wide in relation to the maximum blade width (1:1.5) and length to width ratios of 1.5:1 to 3:1 (MHC 1984: 86-91). These generally date from 6000-3000 BP. New York and Pennsylvania archaeologists call MHC's Small Stemmed I points Bare Island points and those working in New Hampshire call them Merrimack points. Ritchie described Bare Island points as "medium to large, finely flaked, symmetrical points" ranging from 3 to 9.7 cm in length (Ritchie 1997: 14). The blade is oval and relatively thick in cross-section and of a slender to narrow-bladed shape. Knappers rounded and tapered the shoulders and made them sharply angled at times, often forming an obtuse angle between the shoulders and the narrower stem. Stems are square to rectangular and bases are generally straight to slightly convex. Ritchie identified similarities between the Bare Island points in New York and the possible antecedent forms that occur at the Accokeek Creek site south of Washington, D.C. (Ritchie 1997: 15).

Small Stemmed II points were originally termed Wading River points in New York and Massachusetts. Ritchie described Wading River points as "small, narrow, stemmed points" (Ritchie 1997:131). They range in size from 2.5 to 5 cm in length being about 2 to 21/4 times as long as wide. Blades are triangular in outline and biconvex in cross-section with weak to moderately well pronounced shoulders merging obliquely to a long squarish stem (Ritchie 1997:131). The base is straight but appears thick and unfinished, often bearing the striking platform from the initial removal of the flake that knappers used to manufacture the point. Archaeologist have found these points distributed in eastern and southern New York into southern New England and south through eastern Pennsylvania into the Mid-Atlantic states (Ritchie 1997: 132). Researchers distinguish Wading River points, which blend into the Bare Island types, from Bare Island points by size and the rough nature of the base, which is similar to New York State Lamoka points (Ritchie 1997:132).

The second category includes Small Stemmed III and IV. Archaeologists characterize them as narrow isosceles triangular blades, with a steeply angled cross-section with hard hammer percussion flaking, a bluntly pointed to rounded base that may be thinned, ground or rubbed and length to width ratios of 2.5:1 to 4:1 (MHC 1984: 92-95). These have been roughly dated from 5000-3000 years BP Small Stemmed III and IV points were originally termed Squibnocket Stemmed points by Ritchie as a result of his work on Martha's Vineyard (Ritchie 1969). Ritchie described Squibnocket Stemmed points as "Small, thick, very narrow, drill-like points, with markedly tapered stems." (Ritchie 1997: 126). They range in size from 2.2 to 5 cm in length and are up to .8cm thick and 2.5 to 3 times as long as wide (Ritchie 1997:126). On Martha's Vineyard Ritchie found these points associated with Wading River and Squibnocket Triangle points with an associated radiocarbon date of 4190 +/- 100 years BP (Ritchie 1969).

The predominant raw material for all of these points is locally available quartz gathered in cobble form from the coast, river edges and glacial drift. The second most common material is argillite either originating in the Taunton River drainage or from glacial drift cobbles. Research has found that knappers used a wider variety of materials to the north and west of the Boston Basin where rhyolite and argillites were the predominate local materials.

Some researchers see Small Stemmed points as a backwards extension of the Orient and Susquehanna Broadspear traditions into early 5th millennium essentially making them an early intrusive element of this tradition (Hoffman 1985: 59; Ritchie 1969:214; Snow 1980:228). Ritchie sees this as "unquestionably happening" as he believed this quartz pebble-based technology move into New England from somewhere to the south, probably the Mid-Atlantic, along coastal plains and via large river valleys. Snow states that this tradition may have been intrusive from the lower Susquehanna into southern and eastern New York, New Jersey and New England. Dincauze feels that this may have happened but favors an indigenous development in southern New England that evolved out of the Neville/ Stark/ Merrimack sequence (Dincauze 1975, 1976). The later is likely as the Small Stemmed of the points appear to generally resemble these antecedent forms. Small-Stemmed, or Narrow-Point tradition artifacts, should be viewed as a pan-Northeastern phenomenon, deriving from the northeastern Middle Archaic. Recently, Boudreau, suggested that the Small Stemmed point was not a projectile point at all and that the bifaces recovered from sites and labeled "Small Stemmed" are in fact rejected points and drills (Boudreau 2008). Boudreau states several of his assumptions regarding projectile point requirements including what he sees as the need to "maintain predictable missile flight paths virtually, broken points had to be replaced with points virtually identical in haft element and weight" (Boudreau 2008: 12). As the study of the points in this chapter has shown, points of the same recognized style came in a range of sizes and weights and it would be virtually impossible for a knapper, especially one relying on quartz and rhyolite, to replicate each consecutive point exactly each time. There must have existed a range of sizes and weights that were acceptable and suitable for use with the available propulsion technology. He notes the presence of what on the surface appears to be their use as gravers and drills of several points, evidence he feels that they were not projectiles at all (Boudreau 2008:12). It would in fact be more surprising to find that a point style was not used for other purposes than just as a projectile, as archaeologists often find reworked projectile points and points that people used for multiple purposes such as cutting, drilling or scraping.

The earliest dates for Small Stemmed Points are from the Bear Swamp 1 site (4600-4500 BP) on the Taunton River estuary and the Kirby Brook site (4400-4000 BP) in the middle Shepaug (Hoffman 1985:59). Many sites in southeastern Massachusetts have a higher number of these points than anywhere else in the state which lead Dincauze to speculate that the Narragansett drainage basin was an important focus for this tradition (Dincauze 1975). These points remained very popular and widespread in the Late Archaic, eventually declining in occurrence from 3800 BP forward. The most recent most recent dates for them are 955 +/- 155 BP from the Black Bear site (PAL 1982b) and 850 +/-205 BP from the G. B. Crane site Taunton (Thorbahn 1983). Current research indicates that these points continued in use after the Late Archaic and well into the Early Woodland and possibly Middle Woodland (Mahlstedt 1986:9; Moffet 1957; McBride 1983; Thobahn 1982, 1983 PAL 1982b, American Antiquity Current Research 1981: 696).

Archaeologists recovered 35 Small Stemmed points of three varieties from data recovery excavations. They are the most widespread point type across the entire project area, mirroring their widespread distribution in the Northeast. Small Stemmed points were concentrated in the southern lots, L4H, L4S, L5H, L6H with minor occurrences in L1H and S and L7H and HN. Bare Island style Small Stemmed points were thinly scattered with the highest concentrations (n=2) in L4H, L4S and L5H. Squibnocket Stemmed and Wading River points were both concentrated in L4S and L6H (Table 5).

Table 5. Small Stemmed points

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L1H-B1-N310 E172	SS	Quartz	Complete	2.8/ 1.4/ 0.5 cm	2 g	1.4 cm	
L1H-C-N310 E176.5	SS	Quartz	Complete	2.5/ 1.3/ 0.8 cm	2.4 g		
L1H-Scraping	WR	Rhyolite	Complete	4.1/ 2.1/ 0.85 cm	7.7 g		
L1H-Pz-N314 E178	?	Rhyolite	Tip/ Mids	2.2/ 1.5/ 0.5 cm	2 g		Perverse
L1S-Pz-N298.5 E190	WR	Rhyolite	Complete	3.6/ 1.4/ 1.6 cm	3.2 g		
L2H-A-N270.5 E217.5	BI	Quartz	Base/ Mids	1.9/ 1.9/ 0.7 cm	3.5 g	1.7 cm	Impact
L2H-Sq-N271 E215		Rhyolite	Tip/ Shoulders	3.1/ 1.4/ 0.9 cm	3.6 g	1.5 cm	Impact
L2S-C-N292 E214.5	SS	Quartz	Complete	2.5/ 1.2/ 0.6 cm	1.7 g	.8 cm	
L4H-A-N141.75 E129.75	WR	Chert	Complete	3.8/ 2.1/ 0.7 cm	6.1 g		
L4H-C-N144 E125.5		Quartz	Complete	3.6/ 1.8/ 1.2 cm	8.4 g		
L4H-Pz-N144 E126	BI	Rhyolite	Complete	4.5/ 1.8/ 1.2 cm	10.3 g		
L4H-Pz-N146 E128		Quartz	Base/ Mids	2.4/ 2.1/ 1 cm	7.3 g		Crystal
L4H-Strip	SS	Quartz	Complete	3.2/ 1.3/ 0.5 cm	2.1 g		
L4H-Strip	BI	Quartz	Base/ Mids	2.9/ 2.1/ 0.8 cm	6.1 g	2.6 cm	Impact
L4S-C-N146.5 E146	WR	Rhyolite	Complete	5/ 2.1/ 0.8 cm	9.1 g		
L4S--C-N144 E146.5	WR	Quartz	Base	1.3/ 1.5/ 0.7 cm	1.6 g		Impact
L4S-C-N144 E147	WR	Rhyolite	Complete	4.8/ 2/ 1 cm	9.8 g	2.5 cm	
L4S-C-N144 E147	SS	Quartz	Complete	2.7/ 1.3/ 0.7 cm	2.7 g		
L4S-C-N150.5 E142	SS	Rhyolite	Tip/ Shoulders	4.3/ 1.7/ 0.75 cm	6.3 g		Perverse
L4S-C-N144 E149	WR	Rhyolite	Base	2.1/ 1.7/ 0.5 cm	1.7 g		Impact
L4S-C-N144.5 E146	SS	Quartz	Base/ Mids	2.1/ 1.3/ 0.6 cm	2 g		Impact
L4S-Pz-N144 E148	BI	Rhyolite	Base	1.2/ 1.5/ 0.6 cm	1.3 g		Impact
L4S-Strip	WR	Quartz	Complete	3.2/ 1.5/ 0.6 cm	3.2 g	1.8 cm	
L4S-Strip	BI	Mudstone	Midsection	3.7/ 2.4/ 0.9 cm	10.2 g		Impact
L5H-C-N133 E190	SS	Quartz	Base/ Mids	1.5/ 1.5/ 0.6 cm	4 g		Perverse
L5H-C-N131.5 E184	BI	Rhyolite	Base/ Mids	4/ 2.1/ 0.7 cm	7.9 g	2.3 cm	Impact
L5H-Pz-N132 E186	BI	Rhyolite	Base	1.2/ 1.6/ 0.7 cm	1.7 g		Impact
L6H-A-N103.6 E238.75	WR	Quartz	Complete	2.5/ 1.4/ 0.6 cm	2.8 g	1.5 cm	
L6H-A-N103.8 E244	SS	Quartz	Complete	2.7/ 1.3/ 0.5 cm	2.1 g		

Table 5 (Cont.)

Location	Type	Material	Portion	Length/Width/ Thickness	Weight	Haft Ht	Break Type
L6H-C-N102 E234.5	SS	Quartz	Complete	2.5/ 1.1/ 0.5 cm	2 g		
L6H-C-N102 E233.5	SS	Quartz	Base	0.8/ 1/ 0.5 cm	.6 g		Impact
L6H-Pz-N106 E228	WR	Quartz	Complete	2.5/ 1.6/ 0.4 cm	1.9 g		
L6H-Pz-N108 E226	BI	Argillite	Base/ Mids	4.2/ 2/ 1 cm	8.9 g		Impact
L7H-Pz-N68 E262	BI	Rhyolite	Base/ Mids	2.8/ 1.8/ 0.7 cm	5.2 g	2.2 cm	Impact
L7HN-Strip	BI	Rhyolite	Complete	5.6/ 2.1/ 0.7 cm	11.6 g	2.2 cm	

Analysis found approximately half of the Small Stemmed points manufactured from quartz, 40% from rhyolite, and .9% from other materials (chert, argillite, mudstone) (Table 6) **(Figure 6)**. The materials used to manufacture each type of point showed distinct differences in preference by point type.

Table.88. Small Stemmed raw material use

Style	Quartz	Rhyolite	Argillite/ Mudstone	Chert	Total
Bare Island	2	6	2		10
Squibnocket Stemmed	10	1			11
Wading River	4	5		1	10
Small Stemmed	2	2			4

Bare Island points were overwhelmingly manufactured from rhyolite or siliceous stones with only 20% being manufactured from quartz. Squibnocket Stemmed points showed the opposite pattern with most (90%) being manufactured from quartz with rhyolite being used for only one point. Raw material use for the Wading River style points was between the other two with 40% being manufactured from quartz, 50% from rhyolite and 10% from chert. The distribution of raw materials to Small Stemmed styles may represent the use of local materials in a local style (Squibnocket Stemmed) versus the use of a wider variety of raw materials for styles that originated elsewhere. While the point styles are generally contemporary, the Squibnocket Stemmed style is slightly later than the other forms. The preference of quartz for Squibnocket Stemmed points may reflect this slight temporal variation as well. Alternately knappers may have used quartz for more expendable points.

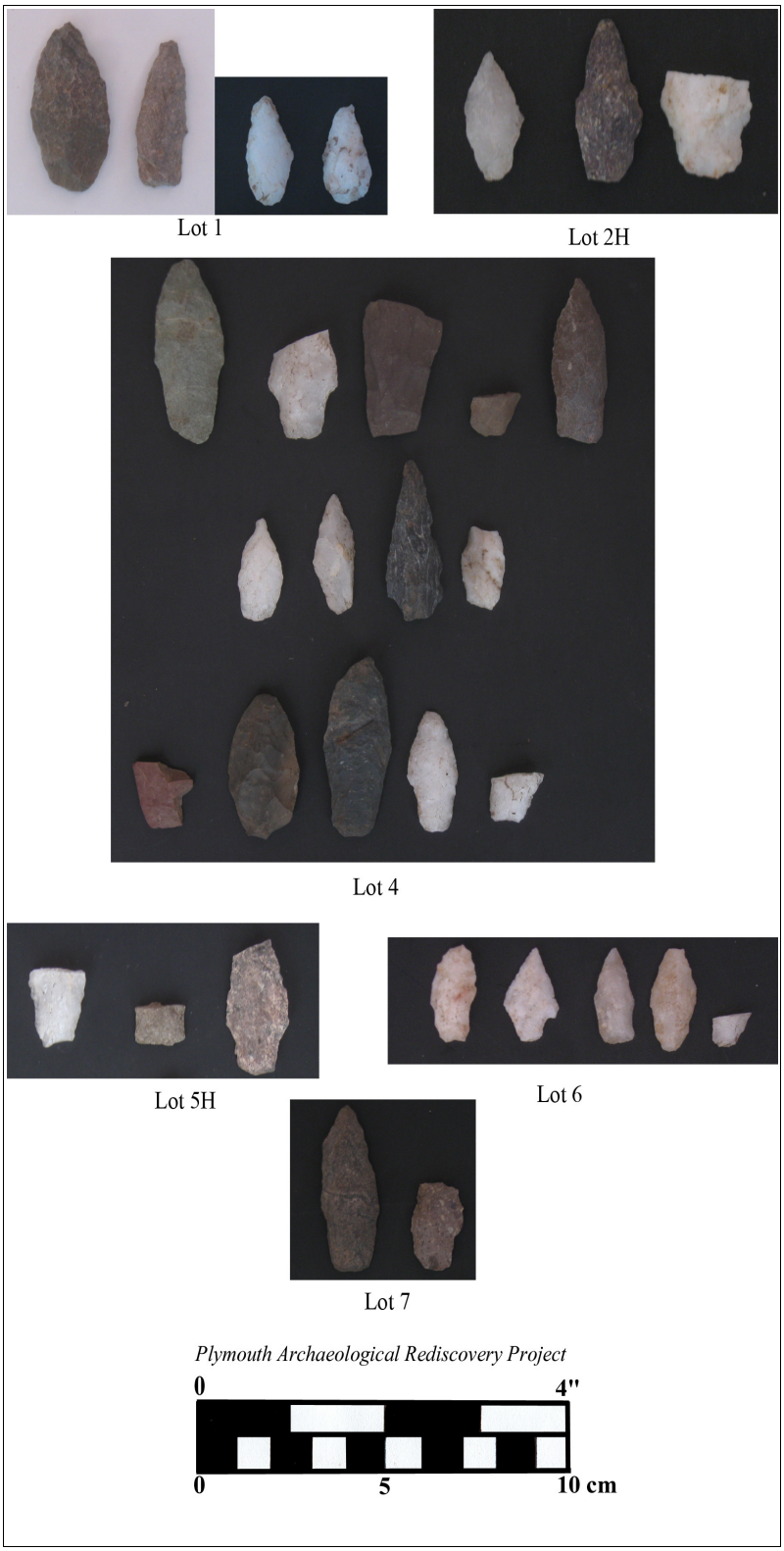

Figure 6. Small Stemmed points

Figure 6. (Cont.)
Lot 1
Left to Right: L1H- Scraping SW corner, L1S-C N298.5 E190 0-20 cm, L1H-B1 N310 E172 20-30 cm, L1H-C N310 E176.5 0-20 cm

Lot 2H
Left to Right: L2S-C N292 E214.5 0-30 cm, L2H-B1 N271 E215 35-40 cm, L2H-A M270.5 E217.5 75-80 cm E1/2

Lot 4
Top Row Left to Right: L4S-C M146.5 E146 0-35 cm, L4H-Stripping 11.4 m E 4 m S of NW, L4S-Stripping SW, L4S-PZ N144 E148 0-36 cm, L4H-PZ N144 E126 0-32 cm
Middle Row Left to Right: L4S-C N144 E147 0-37 cm, L4H-Stripping, L4S-C N150.5 E142 0-27 cm, L4S-C N144.5 E146 0-40 cm
Bottom Row Left to Right: L4S-C N144 E149 0-40 cm, L4H-A N141.75 E129.75 40-45 cm E1/2, L4S-C N144 E147 0-37 cm, L4-Stripping 4M n 1.8M w of SE, L4S-C N144 E146.5 0-40 cm

Lot 5H
Left to Right: L5H-C N133 E190 30-35 cm, L5H-PZ N132 E186 0-53 cm, L5H-C N131.5 E184 30-50 cm

Lot 6
Left to Right: L6H-PZ N106 E228 0-35 cm, L6H-A N103.6 E238.75 45-50 cm W1/2, L6H-C N102 E234.5 0-40 cm, L6H-A N103.8 E244 70-75 cm, L6H-C N102 E233.5 0-40 cm

Lot 7
Left to Right: L7H- Stripping, L7H-PZ N68 E262 0-16 cm

Table 7. shows the lengths of the complete Small Stemmed points and illustrates the longer size

Table 7. Small Stemmed point lengths

Length	Bare Island	Squibnocket Stemmed	Wading River
2.5 cm		3	2
2.7 cm		2	
2.8 cm		1	
3.2 cm		1	1
3.6 cm			1
3.8 cm			1
4.1 cm			1
4.5 cm	1		
4.8 cm			1
5 cm			1
5.6 cm	1		

commonly associated with Bare Island points versus the wider range of sizes seen in Wading River points. Squibnocket Stemmed points appear to concentrate towards the lower end of the size range. Haft heights correlate well with the point sizes with the larger Bare Island points having higher haft heights (1.7-2.6 cm average 2.1 cm) versus the shorter Squibnocket Stemmed points (.8-1.4 cm average 1.1 cm) as compared to the Wading River points, which had an overall wider size range (1.5-2.5 average 1.9 cm).

Analysis identified manufacture and use evidence on 23 of the Small Stemmed points and found four points (two Squibnocket Stemmed and three Wading River) that exhibited extensive in-haft resharpening. A knapper carried out resharpening to the extent that the points could no longer efficiently function as projectiles and their owners abandoned them. Testing recovered one of the Squibnocket Stemmed points that had been extensively resharpened and abandoned from Lot 1 while another, which showed evidence of having a mid blade break that someone reworked, was from lot 4. Artisans had manufactured both from quartz. Archaeologists recovered the three quartz Wading River points from Lots 4 and 6. Two points, both identified as Bare Island variety, were abandoned during the manufacturing process (L4H, L7HN). Three point fragments, one midsection to base and two midsection to tip fragments, bore perverse fractures, indicating that the points had broken in manufacture versus in use. Two of these were Squibnocket stemmed points while the third was of an unknown variety. Point fragments bearing evidence of impact breaks were much more common (n=13). Eight of these fragments were of the Bare Island variety, two were Wading River, two were Squibnocket Stemmed and one was of an unidentifiable variety (Table 8).

Table 8. Small Stemmed manufacturing and use evidence

Location	Type	Material	Portion	Length/Width/ Thick	Break Type
Exten. Reworked and Abandoned					
L1H-B1-N310 E172	SS	Quartz	Complete	2.8/ 1.4/ 0.5 cm	Reworked to too short and abandoned
L4S-C-N144 E147	SS	Quartz	Complete	2.7/ 1.3/ 0.7 cm	Reworked mid blade break
L4S-Strip	WR	Quartz	Complete	3.2/ 1.5/ 0.6 cm	Reworked to too short and abandoned
L6H-A-N103.6 E238.75	WR	Quartz	Complete	2.5/ 1.4/ 0.6 cm	Reworked to too short and abandoned
L6H-Pz-N106 E228	WR	Quartz	Complete	2.5/ 1.6/ 0.4 cm	Reworked to too short and abandoned
Aband. in Process					
L7HN-Strip	BI	Rhyolite	Complete	5.6/ 2.1/ 0.7 cm	Asymmetrical, lopsided, poor finishing- abandoned
L4H-Pz-N144 E126	BI	Rhyolite	Complete	4.5/ 1.8/ 1.2 cm	Too thick- abandoned
Manu. Breaks					
L4S-C-N150.5 E142	SS	Rhyolite	Tip/ Shoulders	4.3/ 1.7/ 0.75 cm	Perverse Fracture
L1H-Pz-N314 E178	?	Rhyolite	Tip/ Mids	2.2/ 1.5/ 0.5 cm	Perverse Fracture
L5H-C-N133 E190	SS	Quartz	Base/ Mids	1.5/ 1.5/ 0.6 cm	Perverse Fracture
Impact Breaks					
L4S-Pz-N144 E148	BI	Rhyolite	Base	1.2/ 1.5/ 0.6 cm	Impact Fracture
L4H-Strip	BI	Quartz	Base/ Mids	2.9/ 2.1/ 0.8 cm	Impact Fracture
L2H-A-N270.5 E217.5	BI	Quartz	Base/ Mids	1.9/ 1.9/ 0.7 cm	Impact Fracture
L4S-Strip	BI	Mudstone	Mids	3.7/ 2.4/ 0.9 cm	Impact Fracture
L5H-C-N131.5 E184	BI	Rhyolite	Base/ Mids	4/ 2.1/ 0.7 cm	Impact Fracture
L5H-Pz-N132 E186	BI	Rhyolite	Base	1.2/ 1.6/ 0.7 cm	Impact Fracture
L6H-Pz-N108 E226	BI	Argillite	Base/ Mids	4.2/ 2/ 1 cm	Impact Fracture
L7H-Pz-N68 E262	BI	Rhyolite	Base/ Mids	2.8/ 1.8/ 0.7 cm	Impact Fracture
L4S--C-N144 E146.5	WR	Quartz	Base	1.3/ 1.5/ 0.7 cm	Impact Fracture
L4S-C-N144 E149	WR	Rhyolite	Base	2.1/ 1.7/ 0.5 cm	Impact Fractures- Three
L4S-C-N144.5 E146	SS	Quartz	Base/ Mids	2.1/ 1.3/ 0.6 cm	Impact Fracture
L6H-C-N102 E233.5	SS	Quartz	Base	0.8/ 1/ 0.5 cm	Impact Fracture
L2H-Sq-N271 E215	?	Rhyolite	Tip/ Shoulders	3.1/ 1.4/ 0.9 cm	Impact Fracture

Archaeologists recovered three varieties of Small Stemmed points and all three occurred in almost identical frequencies. Bare Island points, the largest variety, consisted of numerous point fragments that bore evidence of impact breaks and two examples that were very thick and which a knapper had abandoned during manufacture. Knappers manufactured most of the Bare Island points from rhyolite. Archaeologists recovered these predominantly from the Lot 4 impact areas. It appears that the people using the Bare Island points used the southern half of the project area for short-term occupations where hunters replaced projectile points broken during the hunt. Wading River variety Small Stemmed points occurred in a wider range of sizes with most being under 4.1 cm long. Quartz and rhyolite were the favored raw materials, both occurring in almost equal amounts. Chert was also used to a limited extent. Testing found Wading River points concentrated in the L4S and L6H impact areas. Knappers abandoned three Wading River points after they had been severely resharpened. Two other points bore evidence of impact fractures and being discarded during replacement. Native artisans fashioned the Squibnocket Stemmed points using mostly quartz as a raw material. These points were consistently the smallest Small Stemmed points recovered. Analysis found that knappers abandoned two after they were extensively resharpened, two showed perverse fractures, indicating that they had broken in manufacture, and two that bore impact fractures. The pattern for Squibnocket Stemmed points appears significantly dissimilar to that seen in the Bare Island and Wading River points, possibly indicating a separate occupation from those others.

Also occurring with Small Stemmed points are small cordiform triangular points generally called Small Triangles or more commonly Squibnocket Triangles. Squibnocket Triangles have bases that are usually concave but occasionally straight with and equilateral to isosceles triangle blade. Width ranges from 1.3-2.5 centimeters and length ranges from 2-4 centimeters with a length to width ration of 1:1 to 2.5:1 (MHC 1984: 98-99). The temporal range for these points is generally the same as the second category of Small Stemmed points, 5000-3000 years BP The most common materials for these points is the same as for Small Stemmed, quartz and argillite with some quartzite and volcanics being used. Ritchie named these points after their type site on Martha's Vineyard where he found them associated with materials radiocarbon dated to 4190 +/- 100 BP at the Vincent site (Ritchie 1969: 244). He also noted their occurrence at the Wading River site on Long Island with Wading River Small Stemmed points (Ritchie 1959). Ritchie noted several subtypes occurring in Massachusetts, but he found no evidence that these variations on these "variations on a basic form have either cultural or temporal significance." (Ritchie 1997: 127). A similarity to the Beekman Triangle points, temporally associated with the Laurentian Tradition, of the Hudson Valley was also noted, possibly providing an antecedent form for the New England Squibnocket Triangle (Ritchie 1997:128).

Two varieties of Squibnocket Triangles were identified- elongated and truncated varieties **(Figure 7).** These two forms do not appear to represent distinct and separate projectile point styles, but merely not resharpened or moderately resharpened versus heavily resharpened pieces. Taylor speculated in 2001 that the points that called elongated Squibnockets in this report, are a previously unrecognized form of late Paleo-Indian point similar to a Dalton point. Unfortunately the examples he provided to support this claim came from surface collections and thus have limited value. He feels that too often archaeologists in southeastern Massachusetts identify this form of point as a Levanna when in fact, he sees them as being part of a continuum from Clovis points and bearing many of the same traits such as concave bases with ears, short thinning flakes struck from the base upward, some basal smoothing or grinding with thin, sharp edges with serrations often present (Taylor 2001: 5). Taylor records the

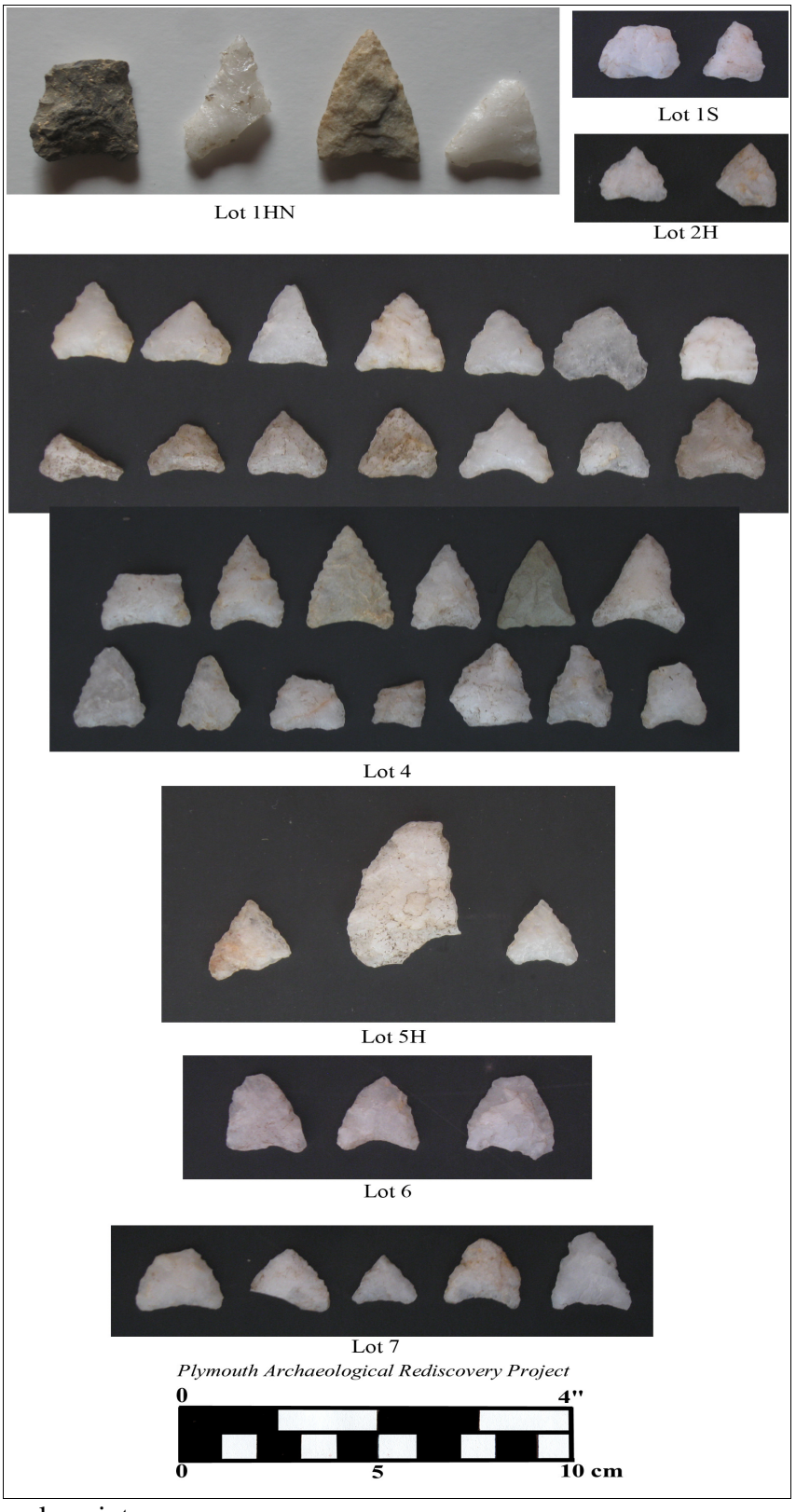

Figure 7. Small triangle points

Figure 7. (Cont.)
Location information
Lot 1HN Elongated Triangles
Left to Right: L1HN-PZ N302 E182 0-28 cm, L1HN-Stripping 10.5m W 3.5m S of NE, L1HN-B1 N302.4 E170 30 cm, L1HN-A N300 E183.65 30 cm

Lot 1S Squat Triangle
Left to Right: L1S-C N302.5 E196 0-30 cm, L1S-PZ N300 E196 0-20 cm

Lot 2H Squat Triangle
Left to Right: L2H-C N272 E216.5 0-35 cm, L2H-C N278 E218.5 0-35 cm

Lot 4
First Row: Left to Right: Squat Triangles- L4S-SQ N148 E148 30 cm, L4S-A N145.15 E 146 55-60 cm N1/2, L4S-C N146 E146.5 0-38 cm, L4S-C N144 E149 0-40 cm, L4S-C N145 E146 0-36 cm, L4S-B1 N148.6 E143 30-35 cm W1/2
Second Row: Left to Right: Squat Triangles- L4S-C N144 E134.5 0-33 cm, L4S-C N142 E 145 0-44 cm, L4S-PZ N144 E148 0-36 cm, L4S-C N145.5 E148 0-42 CM, L4S-C N146 E141.5 0-28 cm, L4S-C N144 E146.5 0-40 cm, L4H-PZ N140 E126 0-45 cm
Third Row: Left to Right: Elongated Triangles- L4S-C N145.5 E146 0-34 cm, L4H-C N152 E130.5 0-32 cm, L4S-SQ N146 E149 45-50 cm SE, L4S-SQ N145 E151 40-45 cm, L4S-SQ N145 E151 40-45 cm, L4S-Stripping 4M e 50 cm S of NW, L4H-Stripping
Fourth Row: Left to Right: Elongated Triangles- L4H-PZ N146 E124 0-38 cm, L4S-A N145.15 E146 50-55 cm W1/2, L4H-PZ N142 E126 0-36 cm, L4S-C N144 E144.5 0-30 cm, L4S-C N144 E145.5 0-32 cm, L4S-A N141.5 E146.2 35 cm

Lot 5H Squat Triangle
Left to Right: L5H-A N133.7 E177 40-45 cm, L5H-A N130.7 E176.7 40-45 cm S1/2, L5H-PM N129.18 E138.95 40-48 cm E1/2

Lot 6
Left to Right: Elongated: L6S-A N114.3 E248.2 30 cm W1/2, L6H-A N104 E241.6 40-45 cm S1/2, Squat-L6H-CN107.5 E240 0-35 cm

Lot 7
Left to Right: Squat- L7SN-Stripping 3.1 M s 1.7M W of NW, L7SN-Stripping 1.8m E 40 cm N of SW, L7H-PZ N68 E256 0-25 cm, Elongated- L7H-Stripping SW, L7H-Stripping

dimensions of these points as follows: basal width 2.2 to 2.9 cm, length 4.8 to 5.4 cm and thickness .64 to .79 cm (Taylor 2001: 10). Materials were definitely biased to quartz with some rhyolite, argillite and Saugus jasper examples present (Taylor 2001:15). Noticeably absent were any examples made from exotic lithics. The dimensions were larger than the examples from the Muttock-Pauwating site but length to width ratios and raw material usage is very similar.

Analysis found that the overwhelming majority of the Squibnocket Triangle points recovered from the Muttock-Pauwating site were made from quartz flakes (n=54/ 90%). Inhabitants also made limited use of rhyolite (n=4/ 6.7%) and quartzite (n=2/ 3.3%) as a raw material for Squibnocket Triangle points. Excavation recovered rhyolite Squibnocket Triangle points from the Lot 1HN impact area (n=1) and from the Lot 4S impact area (n=3). The Lot 1HN and one of the Lot 4S points were of the elongated form. The other two points from Lot 4S were tips bearing perverse manufacturing breaks. Both quartzite points were of the elongated form. Testing recovered one from the Lot 1HN impact area and the other from the Lot 4S impact area. The quartzite pints are very similar in size (L= 3.1 and 3.2 cm; W=2.1 and 2 cm; T= .5 and .4 cm), both made of light tan quartzite and bore slightly serrated edges, the latter more of an effect of the fine, regular pressure flaking along the edge. The points show enough similarity to possibly infer that the same knapper made them, providing a possible spatial and temporal link between occupations in L1HN and L4S.

Testing recovered elongated Squibnocket Triangles (n=21) from impact areas 1HN, 4H, 4S, 6H, 6S and 7H with the highest occurrences in 1HN (n=4), 4H (n=5) and 4S (n=8) (Table 9). Their

Table 9. Small triangle points

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L1HN-Strip	E	Quartz	Tip/ Mids	3/ 1.7/ 0.4 cm	1.7 g	1.2 cm	Impact
L1HN-Pz-N300 E180		Quartz	one half	2.2/ 1.2/ 0.6 cm	2.4 g		Perverse
L1HN-A-N300 E183.65	E	Quartz	Complete	2.2/ 1.9/ 0.3 cm	1.7 g		
L1HN-Scraping		Quartz	One half	2.1/ 1.6/ 0.6 cm	2.5 g		Perverse
L1HN-Pz-N302 E182	E	Rhyolite	Base/ Mids	2.5/ 2.1/ 0.6 cm	4.3 g	1.5 cm	
L1HN-Scraping	E	Quartzite	Complete	3.2/ 2/ 0.5 cm	3.3 g	1.2 cm	
L1S-Pz-N300 E196	T	Quartz	Complete	1.9/ 1.6/ 0.4 cm	1.4 g	.6 cm	
L1S-C-N302.5 E196	T	Quartz	Base/ Mids	1.7/ 2/ 0.6 cm	3 g	1.2 cm	Perverse
L2H-Sq-N272 E216		Quartz	Tip	1.7/ 1.4/ 0.3 cm	.9 g		Crystal
L2H-C-N272 E216.5	T	Quartz	Complete	1.6/ 1.6/ 0.4 cm	1.1 g	1.1 cm	
L2H-C-N272 E218.5	T	Quartz	1 ear miss	1.7/ 1.6/ 0.2 cm	1.1 g		Impact
L4H-Striping	E	Quartz	Complete	3/ 2.3/ 1 cm	4.4 g	1 cm	
L4H-Pz-N140 E126	T	Quartz	Complete	2.1/ 1.9/ 0.5 cm	1.9 g	.9 cm	
L4H-Pz-N142 E126	E	Quartz	Base/ Mids	1.4/ 1.3/ 0.35 cm	.8 g	1.2 cm	Impact
L4H-Pz-N142 E126	E	Quartz	Base/ Mids	1.6/ 1.8/ 0.5 cm	1.7 g	1 cm	Impact
L4H-Pz-N146 E124	E	Quartz	Complete	2.5/ 1.7/ 0.5 cm	2.3 g	.8 cm	
L4H-Pz-N150 E130		Quartz	Tip	1/ 1/ 0.3 cm	.3 g		Perverse

Table 9. (Cont.)

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L4H-C-N152 E130.5	E	Quartz	Complete	3/ 1.7/ 0.5 cm	2.2 g	1 cm	
L4S-Striping		Quartz	Base	3.8/ 3.8/ 1.2 cm	2.3 g		Crystal
L4S-Striping	E	Rhyolite	Complete	2.7/ 1.9/ 0.4 cm	2.1 g	.7 cm	
L4S-A-N141.5 E146.2	E	Quartz	Base/ Mids	2/ 1.6/ 0.5 cm	1.7 g	1 cm	Impact
L4S-C-N142 E145	T	Quartz	Complete	1.5/ 1.2/ 0.35 cm	.8 g	.6 cm	
L4S-C-N144 E134.5	T	Quartz	Base	1.1/ 1.7/ 0.5 cm	.8 g	1.2 cm	Impact
L4S-C-N144 E134.5		Quartz	Complete	2.5/ 2.5/ 0.9 cm	6.8 g		
L4S-C-N144 E144.5	E	Quartz	Tip/ Mids	2.5/ 2.1/ 0.7 cm	3.7 g		Impact
L4S-C-N144 E145		Rhyolite	Tip	1.5/ 1.5/ 0.4 cm	.8 g		Perverse
L4S-C-N144 E145.5	E	Quartz	Complete	2.5/ 1.5/ 0.5 cm	2.6 g	1 cm	
L4S-C-N144 E146.5	T	Quartz	Complete	1.7/ 1.6/ 0.4 cm	1.3 g	1 cm	
L4S-Pz-N144 E148	T	Quartz	Complete	1.7/ 1.6/ 0.5 cm	1.3 g	.9 cm	
L4S-C-N144 E149	T	Quartz	Complete	2/ 2/ 0.5 cm	2 g	1 cm	
L4S-A-N144.5 E145.5		Quartz	Complete	2.6/ 1.9/ 0.6 cm	3.8 g		
L4S-C-N144.5 E148		Quartz	Tip/ Mids	1.1/ 1.2/ 0.4 cm	.6 g		Perverse
L4S-C-N145 E145		Quartz	Ear/ Mids	1.4/ 1.6/ 0.4 cm	1 g		Perverse
L4S-C-N145 E146	T	Quartz	Complete	1.9/ 2/ 0.5 cm	1.4 g	1.1 cm	
L4S-Sq-N145 E148		Quartz	Tip/ Mids	1.2/ 1.3/ 0.3 cm	.6 g		Perverse
L4S-Sq-N145 E151	E	Quartz	Complete	2.6/ 1.7/ 0.5 cm	2.3 g	1.3 cm	
L4S-A-N145.15 E146	E	Quartz	Complete	2.3/ 1.5/ 0.5 cm	1.8 g	1 cm	
L4S-A-N145.15 E146	T	Quartz	Complete	1.65/ 1.9/ 0.5 cm	1.6 g	1 cm	
L4S-C-N145.5 E146	E	Quartz	Base/ Mids	1.5/ 2.2/ 0.4 cm	2.5 g	1.2 cm	Impact
L4S-C-N145.5 E146	T	Quartz	Complete	1.8/ 1.7/ 0.5 cm	1.4 g	.9 cm	
L4S-C-N146 E141.5	T	Quartz	Complete	1.5/ 1.5/ 0.5 cm	1.1 g	1 cm	
L4S-C-N146 E146.5	T	Quartz	One half	2.2/ 1.5/ 0.7 cm	1.9 g		Impact
L4S-C-N146 E146.5	T	Quartz	Complete	2/ 1.8/ 0.4 cm	1.5 g	.9 cm	
L4S-Sq-N146 E149	E	Quartzite	Complete	3.1/ 2.1/ 0.4 cm	2.8 g	.9 cm	
L4S-Pz-N148 E142		Quartz	Complete	2.5/ 2.3/ 0.7 cm	5.2 g		
L4S-Sq-N148 E148	T	Quartz	Complete	2.1/ 1.7/ 0.5 cm	1.6 g	1 cm	
L4S-B1-N148.6 E143	T	Quartz	Complete	1.7/ 1.6/ 0.4 cm	1.5 g	1.2 cm	
L4S-A-N149.1 E144.7		Rhyolite	Tip	1.2/ 1/ 0.4 cm	.5 g		Perverse
L5H-A-N129.15 E188.95	T	Quartz	Complete	1.9/ 1.7/ 0.5 cm	1.3 g	1 cm	
L5H-A-N130.7 E178.7		Quartz	One Half	4.2/ 2.5/ 1.3 cm	14.3 g		
L5H-A-N133.7 E177	T	Quartz	Complete	2.2/ 2/ 0.5 cm	1.9 g	1.1 cm	Crystal

Table 9. (Cont.)

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L6H-A-N103.7 E225.1		Quartz	Tip/ Midse	1.3/ 1.6/ 0.5 cm	1.1 g		Perverse
L6H-A-N104 E241.6	E	Quartz	Complete	2.2/ 2/ 0.5 cm	2.1 g	1.2 cm	
L6H-C-N107.5 E240		Quartz	Complete	2.5/ 2.1/ 0.6 cm	3.8 g		
L6S-A-N114.3 E248.2	E	Quartz	Complete	2.4/ 2/ 0.5 cm	2.9 g	1.2 cm	
L7H-Pz-N68 E256	T	Quartz	Complete	1.5/ 1.6/ 0.5 cm	1.2 g	1 cm	
L7H-Striping	E	Quartz	Complete	2.4/ 2/ 0.7 cm	2.9 g	1 cm	
L7H-Striping	E	Quartz	Complete	2.1/ 2/ 0.5 cm	2.6 g	1.3 cm	
L7SN-Striping	T	Quartz	Base/ Mids	1.8/ 2.2/ 0.4 cm	2.2 g	1.1 cm	Impact
L7SN-Striping	T	Quartz	1 ear missing	2/ 2.1/ 0.4 cm	1.6 g	.8 cm	Crystal

length ranged from 2.1 to 3.2 cm with the average length being 2.6 cm. The weight of individual points ranged from 1.7 to 4.4 g with the average being 2.6 g. Haft heights ranged from .7 to 1.5 cm with most being 1 an 1.2 cm in height. The average haft height was 1.1 cm. Seven points showed evidence of impact breaks and none of the points bore evidence of breakage during manufacture.

Archaeologists recovered Truncated/ Squat Squibnocket Triangles (n=22) from impact areas 1S, 2H, 4H, 4S, 5H, 7H, and 7SN. The highest occurrences of these were in 4S (n=13). Their length ranged from 1.5 to 2.1cm with the average length being 1.8 cm. The weight of individual points ranged from .8 to 2 g with the average being 1.4g. Haft heights ranged from .6 to 1.2 cm with most being 1 to 1.2 cm in height. The average haft height was .99 cm. Four points bore evidence of impact fractures, one bore a perverse manufacturing fracture and two showed crystal planer fractures that may have occurred during manufacture or on impact.

Method of manufacture appears similar in the case of both the elongated and truncated Squibnocket Triangles. Most of both types bore evidence of the striking platform from the original flake to produce the preform for the point. Knappers consistently located Striking platforms at the outer edge of one ear of the triangles. Several examples of both types showed evidence of extensive in haft resharpening, reducing blades in a number of examples to fine points above a broad body. Evidence for occasional either purposeful serration or serration that was the natural result of pressure flaking the edges to even them out, was also encountered on examples of both types of points. While the two point types look different at first glance, comparison of their morphological traits show that they are just two ends on one continuum of projectile point use life **(Figure 8).**

Other tools used by this culture were rough and ground stone choppers, plummets, unpitted hammerstones, plano-convex adzes, shallow-groove adzes, polished splinter awls, barbed antler harpoon heads and graphite and hematite paint stones but apparently not many scrapers, drills or knives (Ritchie 1969:215). Pestles and weirs also appear in the tool kits for the first time. These tools indicate that the Small Stemmed (or Mast Forest tradition as Snow (1980) identified them) used a wide variety of resources. In fact, sites associated with the Small Stemmed Tradition occur in micro-environments that show great diversity in their hunting and gathering strategies. Coastal shell middens, estuarine fish

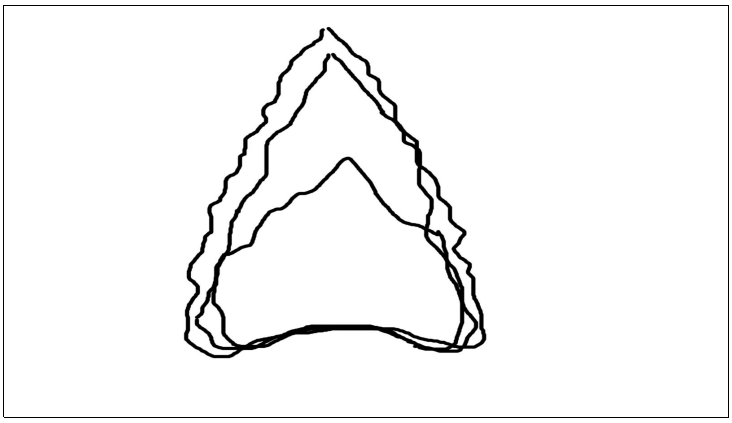

Figure 8. Comparison of representative examples of Elongated and Squat Small Triangle point silhouettes

weirs, estuarine shore sites, and sites on lakes, ponds, springs, streams, brooks, river shores and quarries all show how wide their procurement strategies reached. Natives fished by hand with hooks, lines and stone plummets as well as weirs such as the Boylston Street Fish weir(s) which has been directly associated with the Small Stemmed Tradition (Dincauze 1974: 48). It has been found that the inhabitants of southern New England at this time utilized more of the lower links on the food chain at this time as well such as shellfish, seeds, nuts, and small game, all resources that were not used to the same extent by their predecessors (Dincauze 1974: 48). This may have been a response to an increased population in the area at this time. As a way of coping with a higher population, populations exploited a wider variety of more marginal resources to feed the greater number of people. This led to a well-balanced adaptation by a people who were very familiar with their surroundings.

Researchers hypothesize that people were living in small open communities of only a few families on or near the sea-coast in the spring to fall, moving to more permanent lakeside communities which formed the core of their territorial identity in the fall and winter (Ritchie 1969:219; Dincauze 1974: 48.) They may have had a river basin territoriality with a focus that thus would have constrained their communication and trade networks by being so watershed focused. This interpretation is similar to Snow's and Pagoulatos' who see the Small Stemmed traditions resource utilization system as a central based wandering one with winter camps in the back country or uplands and summer camps on the coast. Sites in this sort of system would not be large but they would be numerous and occurring in a wide variety of settings with a broad range of fish, mammals, birds, plants and mast producing trees being exploited (Snow 1980:230; Pagoulatos 1988). Pagoulatos sees the Small Stemmed Tradition, called the Tinkam Phase in Connecticut, as having a resource systems like the Micmac that was essentially mobile. He sees them as always moving to specific resource zones at specific times of year. This results in a high number of residential camps and locations and few task camps. Residential camps are found away from the Connecticut River in areas of high wetland potential such as the interior swamps, marshes and lakes (Pagoulatos 1988: 85). This interpretation appears somewhat different than that for southeastern Massachusetts where Small Stemmed populations exploited the coast and inland. It is also interesting to note that it was at this time that shellfish were first exploited in much of the northeast. Ritchie viewed the exploitation of quahog and oysters over soft shell clams in

the Late Archaic as evidence of immigrants moving into an area, being unfamiliar with shellfishing and basically collecting what they could see, the oysters and quahogs, and not what lay below the mud, the clams (Snow 1980:229).

Transitional Archaic
Perkiomen (n=1), Susquehanna Broad (n=2), Mansion Inn (n=1), Wayland Notched (n=19), Boats (n=4), Orient Fishtail (n=4)

It appears that by 3700 BP the cultural system of the people who were using Small Stemmed points in southern New England had begun to change. This period, from 3700-2700 B.P, has variously been called the Terminal or Transitional Archaic. During this time there appears to have been an immigration into southern New England from the south of people using tools of the Broadspear or Susquehanna tradition. Projectile points of the Susquehanna style characterize the early part of this period while those of the Orient Fishtail style, a possible merging of indigenous Small Stemmed and Susquehanna styles, dominate the latter half (Snow 1980:237; Dincauze 1975: 27). The Orient point tradition appears to have remained in New England and eventually evolved into the Rossville and Lagoon points of the Early Woodland Period. The technological precedents for Susquehanna tools are found in the southeastern United States, ultimately deriving from Middle Archaic stemmed biface types in this region. It is probable that Small-Stemmed and Susquehanna artifacts in a single site represents some combination of technological exchange and population mixture, varying depending on the location (Ritchie 1969; Dincauze 1976; Snow 1980; Custer 1984; Bourque 1995). Points of the Susquehanna/ Broadspear style include the Susquehanna Broad, Wayland Notched, and Atlantic points, and Mansion Inn and Boats blades.

Perkiomen Broad Point (n=1)
Perkiomen points were originally identified by Witthoft who described them as a very broad spear point of a semi-lozenge shape with exaggerated shoulders (Witthoft 1953: 16). Researchers classify Perkiomen points as broadspears and research has been conducted in the Mid-Atlantic region to determine if they in fact served as projectiles or as knives (Truncer 1990). The final determination was that fracture patterns present on the points indicate that they functioned as both (Truncer 1990). The range in size from five to eight centimeters, in width four to five centimeters and in thickness six to eight tenths of a centimeter. The blade shape is close to an asymmetrical equilateral triangle with rounded shoulders to an often off-center stem. Researchers believe that these points originated in the Schuylkill Valley, Pennsylvania, and the distribution is to northern and central New Jersey and into the Mohawk, Seneca, and Genesee Valleys of New York (Ritchie 1997: 43). The MHC guide to prehistoric site files dates them at 4,000 to 3,000 BP and Ritchie and Witthoft state that they may be antecedent to Susquehanna Broad points (MHC 1984: 103; Ritchie 1997:43). The raw material commonly used appear to reflect the most commonly used raw materials from the areas where the points were found: in Pennsylvania tends to be Pennsylvania Jasper and rhyolite, in New York, cherts and rarely argillite and quartzite. The preference for the production of this point in the locally preferred raw material may indicate a diffusion of the cognitive model of the Perkiomen point versus the actual trading of points from distant locales. They are rarely encountered in New England. Unfortunately in both New England and elsewhere, Perkiomen points are rarely recovered from any stratified sites and researchers describe most Perkiomen components as "small with little stratigraphic depth and interpret them as representing ephemeral campsites" (Truncer 1990: 11).

Testing recovered one possible Perkiomen point shoulder to tip fragment from L5H during stripping **(Figure 9).** A knapper manufactured this point from rhyolite and someone later burned it. The blade measures 4.2 cm long and is 2.4 cm wide and .5 cm thick, is an equilateral triangle with rounded shoulders.

Susquehanna Broad (n=2)

Susquehanna Broad points are a corner notched point what has diamond-shaped blade and shoulders with obtuse shoulder angles and generally strait or concave bases with a basal width less than the maximum blade width. The bases often show basal grinding or rubbing and the cross-section is flat with soft hammer percussion flaking evident. These points can range from 2.5 to 20 centimeters long, making them a generally large point with a length to width ration of 2:1 to 3:1 (MHC 1984:108-109). Knappers produced these points from 4000-3500 years BP Unlike the Small Stemmed points, these are often made of exotic cherts and local volcanics with quartz, quartzite and argillite rarely used.

Excavation recovered two Susquehanna Broad style points, both of rhyolite **(Figure 10).** The Native knapper discarded one, a heavily reworked example from L2H, after it had become too short for practical use. Testing recovered a second example from L7H. This point showed slight retouch to blade above haft. The blade edges were still crisp and sharp, but an impact break above the haft, possibly soon after manufacture, led to a short use life and discard possibly as a result of it being too short for practical reuse. The presence of these two points which had been discarded out of haft, indicates short term use of the project area possibly by hunters replacing points.

Mansion Inn Blade (n=1)

Dincauze named the Wayland Notched points and Mansion Inn and Boats blades after her work on cremation cemeteries in Eastern Massachusetts (1968). She defined Mansion Inn blades as being the "basic small tool of the people who made them... they were also the blank form for other implements...they became notched...knives and spear points, or drills and awls." (Dincauze 1968: 17). Knapper produced these blades by the bifacial reduction of a large flake of rhyolite, quartzite, slate, shale, or chert to produce what is essentially a Stage II to III biface which could be used without further modification. The blade outline is predominantly excurvate with some examples being recurved, straight, or convex, but these later forms are in the minority. Below the blade the broad stem is concave to contracting or straight to contracting with an obtuse shoulder angle (Dincauze 1968: 17). The size range of these blades can range from small projectile point to large blades, 4.3 to 16.3 cm (Dincauze 1968:17).

Dincauze identified three varieties within her Mansion Inn and Wayland Notched forms- Watertown, Dudley, and Coburn. These varieties took their names from the sites where they were encountered: Watertown from the Watertown Arsenal in Watertown, Massachusetts; Dudley a variant also present in the Mansion Inn collection in Wayland, Massachusetts; and Coburn site on Barly Neck in East Orleans, Massachusetts. Dincauze found that the length: width ratio and surface relief proved most useful in defining these varieties (Dincauze 1968: 18). Watertown variety blades were found to show the finest and most refined flaking techniques with large flake scars, thin cross-section and thin, sharp, regular edges (Dincauze 1968:20). Dincauze named Dudley variety blades after a small pond near the Mansion Inn site, often bear traces of the flake that served as the blank for the point. Flake scars are shallower than on the Watertown variety and the surface relief is higher. Dincauze commented that this gave the

Figure 9. Atlantic, Mansion Inn, Boats, and Perkiomen points

Figure 9. (Cont.)
Lot 4H
Left to Right: Boats Blade: L4H-Stripping 7.6m E 3.6m S of NW, Mansion Inn Blade: L4H-C N146 E148.5 0-40 cm, Atlantic Point: L4H-Stripping 1.3m S of FCR concentration

Lot 5H
Top Row Left to Right: Boats Blades: L5H-Stripping 8m E 3.5m S of SW, L5H-C N133.5 E190 30-60 cm, L5H-Stripping 4.3m N 4.5m E of SW
Bottom Row: Left to Right: Perkiomen Point: L5H-Stripping 5.4m E 3m S of NW, Chert Point Tip: L5H-C N132.5 E188 50-55 cm

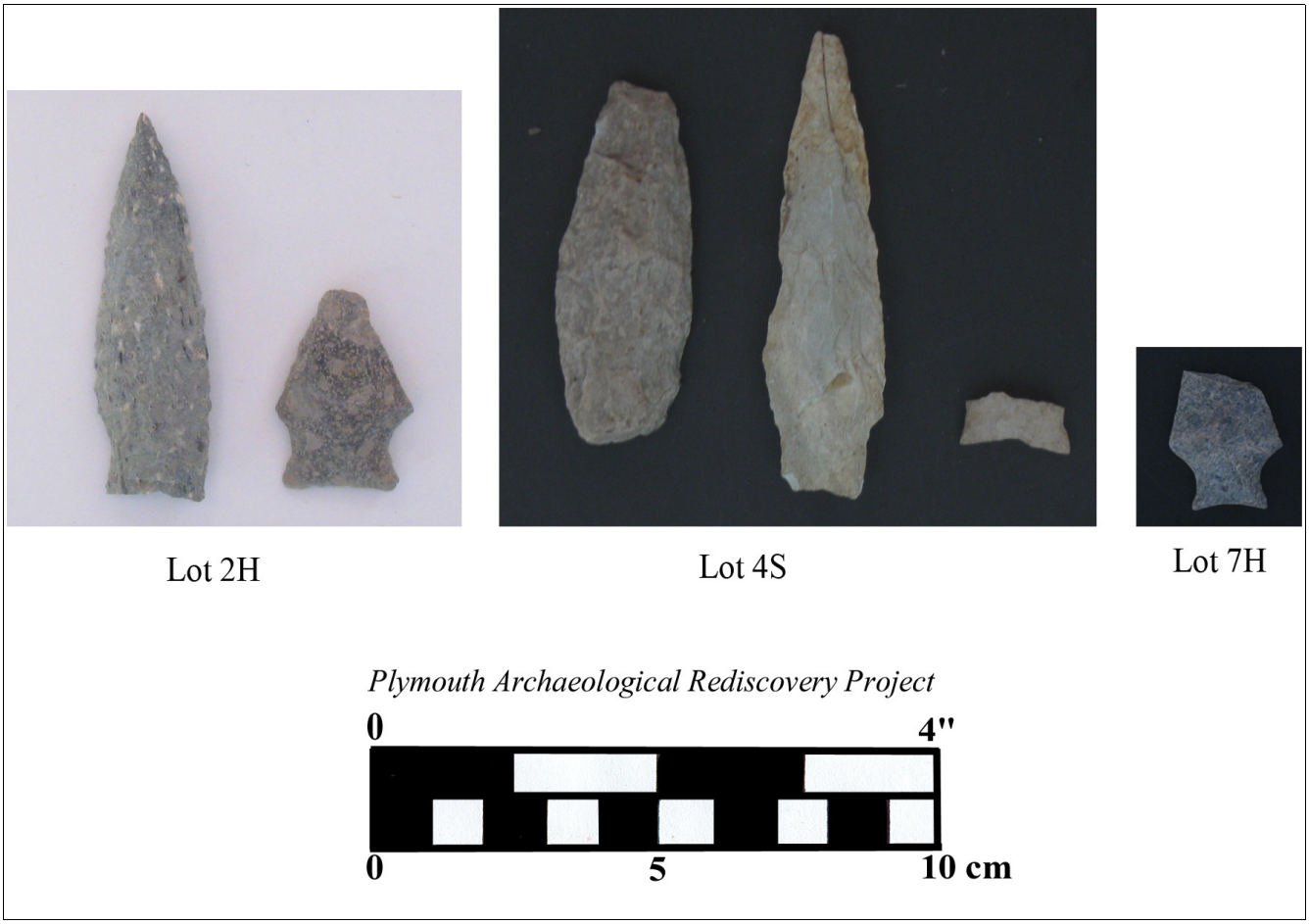

Figure 10. Susquehanna Broad and Orient Fishtail points

Lot 2H Left to Right: Orient Fishtail: L2H-B1 N271.7 E215.4 40 cm, Susquehanna Broad: L2H-B1 N274 E219 35 cm
Lot 4S Left to Right: Orient Fishtail: L4S-C N145 E145 0-40 cm, L4H-PZ N158 E124 0-30 cm, L4S-A N147.6 E147.4 30-35 cm E1/2
Lot 7H Susquehanna Broad: L7H-Backdirt N1/2

Dudley variety "...in general a coarser surface and less regular section" than the former variety (Dincauze 1968: 20). Dudley variety blades are generally excurvate to the shoulder with a concave-contracting stem and straight to slightly concave base (Dincauze 1968: 20-21). Length: width ratios are similar to Watertown variety blades but the width: thickness ratio is lower. This variety was most common at the Mansion Inn site but was not found at the other sites. Coburn variety blades can be termed "stemmed" blades versus slightly notched blades like the Watertown and Dudley varieties. The blades are more slender than the preceding varieties and as a result the flakes are shorter but deep (Dincauze 1968:22). Most blades are convex from tip to base and are widest just below the mid-point with straight to slightly concave bases (Dincauze 1968:23). Archaeologists recovered examples of these blades from the Mansion Inn and Coburn sites.

Testing at the Muttock-Pauwating site recovered one Mansion Inn blade of green gray rhyolite was recovered from L4S in the plowzone **(Figure 10)**. This blade was of the Watertown variety and broken laterally from one edge to the midpoint of the base. The break is a perverse manufacturing fracture. The blade is 7.6 cm long, 3.3 cm wide and .7 cm thick. It is well-flaked and thin.

Boats Blades (n=4)

Dincauze named Boats blades after the Boats site in South Dighton, Massachusetts where they were first identified (Dincauze 1968: 26). The manufacturing technique is the same as that used for the Mansion Inn blades, but these blades bear a thick point as opposed to a thin, straight base as in the case of the Mansion Inn blades (Dincauze 1968: 26). The overall shape of these blades is lenticular with broad angular shoulders and excurvate edges. These blades were rarely notched and overall the blades were large. They were commonly recovered from the Mansion Inn site and to a lesser degree from the Watertown Arsenal, Coburn and Vincent sites.

Excavations recovered four bifaces identified as possibly being Boats blades from the southern half of the project area (Table 10, Figure 10). Knappers manufactured all four from rhyolite. The example

Table 10. Boats blades

Location	Material	Portion	Length/Width/ Thickness	Weight	Break Type
L4H-Strip	Rhyolite	Complete	7.2/ 3.2/ 1.7 cm	36 g	
L5H-Strip	Rhyolite	Complete	7.1/ 2.9/ 1 cm	21.4 g	
L5H Strip	Rhyolite	Tip/ Midsection	6.6/ 4/ 1.2 cm	31.9 g	Perverse
L5H-C-N132.5 E188	Rhyolite	Base/ Midsection	6 / 2.5/ 1 cm	19.9 g	Impact

from L4 was an unfinished stage II biface in a Boats blade shape while one of the L5H examples was a tip and midsection bearing a perverse manufacturing fracture. One other example from L5 was complete while the final L5 example was a base and midsection bearing an impact fracture at the break. The occurrence of the majority of these blades in L5, away from the concentrations of Transitional Archaic Wayland Notched points in L4 and L6, may indicate a separate occupation from the other areas or separate type of activity area.

Wayland Notched (n=19)

Wayland Notched points are a side-notched point that has a triangular-shaped blade with a straight to slightly concave base that is often less than the maximum blade width. The bases often show basal grinding or rubbing and the cross-section is flat with soft hammer percussion flaking evident. These points can range from 3.5 to 11 centimeters long, making them a medium-sized point with a length to width ration of 2:1 to 3:1 (MHC 1984:110-111). Knappers produced these points from 3600-3000 years BP Local volcanics are common with chert and argillite also used.

Dincauze interpreted Wayland Notched variety points as having been made from the Mansion Inn blade biface. She named this point type for the town in which the Mansion Inn site is located, and identified three varietiesl, complimenting the Mansion Inn blade varieties: Watertown, Dudley and Coburn. Watertown variety points are large, broad and frequently asymmetrical in the blade shape (Dincauze 1968:24). Bases are straight or concave and never convex and the blade profile is excurvate to recurvate with a lenticular cross-section (Dincauze 1968: 24). These were common at the Watertown Arsenal and Mansion Inn sites, with only a minor occurrence at the Coburn site. Dudley variety points have straight to excurvate symmetrical blade edges with a lenticular cross-section (Dincauze 1968: 24). Archaeologists recovered these from the Watertown Arsenal and at the Boats site in South Dighton, Massachusetts. Coburn variety points were the predominant point style at the Coburn site and only minimally represented in the Mansion Inn assemblage (Dincauze 1968: 25). Dincauze described these points as "relatively rough-surfaced and carelessly finished" with crushed versus carefully pressure-flaked notches (Dincauze 1968: 25). The blade shape is the same as the other varieties as in the base shape. Dincauze noted the blade section as lense or lozenge-shaped versus lenticular with a more acute tip (Dincauze 1968: 25).

Testing recovered 19 Wayland Notched points with most being found in lots 4 (n=8) and 6 (n=7) **(Figure 11, Table 11)**. Archaeologists recovered tip and midsection fragments from lots

Table 11. Wayland Notched points

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L2H-C-N276E212.5		Chert	Tip/ Mids	2.6/ 2.5/ 1.5 cm	3.6 g		Perverse
L4H-A-N155.7 E127.6	D	Rhyolite	Complete	3.5/ 2.1/ .7 cm	5.4 g	1.9 cm	
L4H-Strip	D	Chert	Complete	4.4/ 2.5/ .5 cm	7 g	1.5 cm	
L4H-Pz-N142 E130	C	Rhyolite	Base/ Mids	3.7/ 2.2/ .6 cm	5.5 g		Impact
L4S-C-N144.5 E148	C	Rhyolite	Base/ Mids	3.7/ 1.9/ .5 cm	4.8 g	2 cm	Impact
L4S-C-N147.5 E142	D	Rhyolite	Complete	5.6/ 2.6/ 1.05 cm	8.4 g		
L4S-Sq-N148 E148	C	Rhyolite	Base/ Mids	4.9/ 2.2/ .8 cm	9 g	2 cm	Impact
L4S-A-N149.7 E142.6	D	Rhyolite	Complete	4.1/ 2.1/ .6 cm	6.7 g	1.5 cm	
L4S-Strip-N149.8 E143.6	D	Rhyolite	Complete	3.8/ 2.7/ .7 cm	8.5 g	1.7 cm	
L5H-C-N133.5 E190		Chert	Tip/ Mids		5.2 g		Perverse
L6H-Pz-N102 E234	D	Rhyolite	Complete	3.8/ 2/ .7 cm	6.4 g	1.9 cm	
L6H-Pz-N102 E242	C	Rhyolite	Complete	4.5/ 2.1/ .8 cm	9.5 g	1.5 cm	Impact
L6H-A-N103.8 E244	C	Rhyolite	Complete	3/ 1.6/ .7 cm	4.2 g		

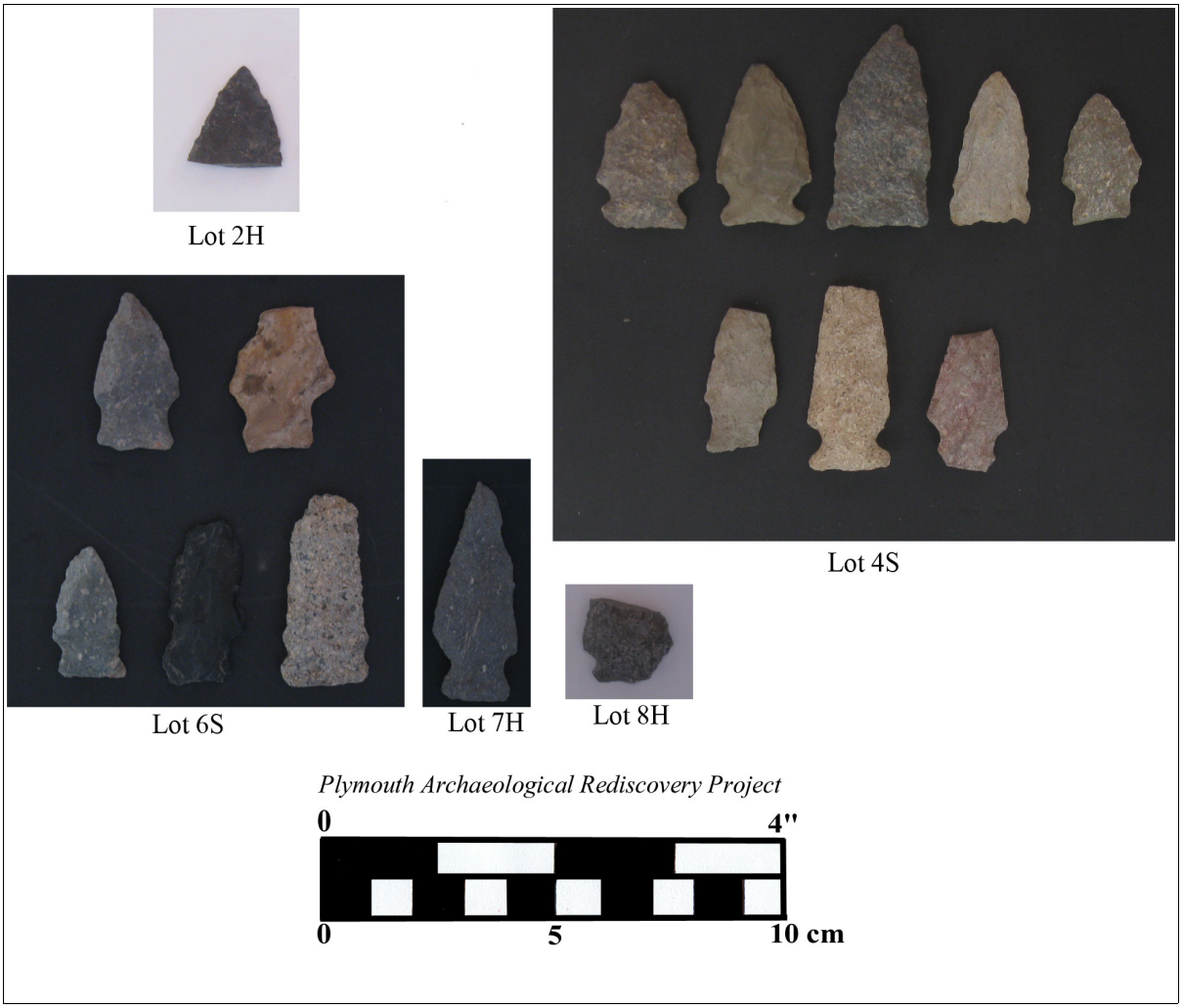

Figure 11. Wayland Notched points
Lot 2H L2H-C-N276 E212.5 0-35 cm
Lot 4S Top Row Left to Right: Dudley Variety: L4S-B1 N144.8 E143.6 30 cm, L4H-Stripping near FCR concentration, L4S-C N147.5 E142 0-28 cm, L4S-A n149.7 E142.6 45-50 cm W 1/2, L4H-A N155.7 E127.6 40-45 cm N1/2
Bottom Row Left to Right: Coburn Variety: L4S-C N144.5 E148 0-38 cm, L4S-C N148 E148 , L4H-PZ N142 E130 0-30 cm
Lot 6S Top Row Left to Right: Dudley Variety: L6H-PZ N102 E234 0-35 cm, L6S-EU N113 E253 35-40 cm
Bottom Row Left to Right: Coburn Variety: L6H-A N103.8 E244 50-55 cm S1/2, L6H-PZ N102 E242 0-35 cm, L6H-C N106.5 E236 0-35 cm
Lot 7H Coburn Variety: L7H-Stripping
Lot 8H Coburn Variety: L8H-PZ N84 E316 0-16 cm

Table 11. (Cont.)

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L6H-C-N106.5 E236	C	Hornfels	Complete	4/ 1.8/ .7 cm	4.8 g		
L6S-Pz-N112 E250		Argillite	Tip/ Mids	4.1/ 2.9/ .4 cm	4.7 g		Planer
L6S-EU-N113 E253		Argillite	Tip/ Mids	5.2/ 2.5/ .5 cm	7 g		Perverse
L6S-EU-N113 E253	D	S. Jasper	Base/ Mids	3.5/ 2.5/ 2.6 cm	6.4 g	2.3 cm	Impact
L7H-Strip	C	Rhyolite	Complete	5/ 2/ .6 cm	7 g	1.7 cm	
L8H-Pz-N84 E316	C	Rhyolite	Base/ Mids	3/ 1.85/ .5 cm	2.1 g		Impact

Dudley variety points were slightly larger, heavier and had slightly higher haft heights than Coburn variety points (Table 12). Both Dudley and Coburn variety points were most commonly

Table 12. Comparison of Dudley and Coburn Variety Wayland Notched points

Variety	Length Range/ Average	Weight Range/ Average	Haft Height Range/ Average
Dudley	3.5-5.6/ 4.2 cm	5.4-8.5/ 6.8 g	1.5-2.3/ 1.8 cm
Coburn	3-5/ 4.1 cm	4.2- 9.5/ 6.4 g	1.5-1.7/ 1.6 cm

made from rhyolite, exotic lithics, consisting of chert and Saugus Jasper, were also used on two examples of the Dudley variety. Knappers used hornfels for one of the Coburn variety points. Dincauze's study of the Wayland Notched points from the cremation cemeteries in eastern Massachusetts also found rhyolite being the principal lithic raw material, with chert occasionally sued for Dudley variety points, but not for Coburn variety (Dincauze 1968: 24-25). Dincauze did find argillite being used for the Coburn points secondarily to rhyolite (Dincauze 1968:25). The recovery of two argillite tip and midsections that have been tentatively identified as Wayland Notched points from L6S, an area with a higher occurrence of Coburn points, may support Dincauze's findings.

The Susquehanna Tradition created a sharp change in the archaeological continuity of the Small Stemmed Tradition as far north as Maine (Dincauze 1975:27). This is probably the result of an infiltration or migration of peoples from the southwest. There appears a distinct difference in cultural and industrial traditions from the indigenous populations but no evidence of assimilation of populations. Various researchers have attempted to determine if there was a large migration of people associated with the Susquehanna Tradition or if it was merely a small influx with a new specialized tool, the Broadspear, that Natives used as an adaptation by local populations to exploit marine fish resources (Turnbaugh 1975: 57).

David Sanger used six criteria to examine the Susquehanna Tradition and determine if it met these criteria for migration. The criteria were 1) identify the migrating people as an intrusive unit in the region it has penetrated, 2) trace this unit back to a homeland, 3) determine that all occurrences of this unit are contemporaneous, 4) establish the existence of favorable conditions for migration, 5) demonstrate that some other hypothesis, such as independent invention or diffusion of traits, does not better fit the facts of the situation, 6) establish the presence of all cultural subsystems and not an isolated one such as the mortuary subsystem (Snow 1980:245). Sanger concluded that all of these

criteria were met in Northern New England, thus lending support to an immigration hypothesis. Work by Pagoulatos (1988) reached much the same conclusion about the Susquehanna in the Connecticut River Valley. He looked at the chronological setting, site types and settlement patterns and determined that the users of the Susquehanna tools represented a complete cultural system focused on the riverine areas that displaced the local Small Stemmed populations (Pagoulatos 1988: 85). Small Stemmed populations practiced different subsistence and procurement strategies than the Susquehanna users and thus allowed two different cultural systems to coexist.

Susquehanna populations in the Connecticut River Valley had relatively stable residences that allowed the exploitation of specific resource zones throughout much of the year. Organized task groups left a central base camp to establish temporary fishing and hunting camps, thus they moved less frequently, had a lower number of large residential camps and a high number of field camps (Pagoulatos 1988:86-89). Susquehanna populations appear to have practiced a resource procurement strategy similar to what Binford found for stable hunter-gatherer groups. Binford found communities situated along the river courses for much of the year with the organized task groups leaving the camp to procure and process mammal resources by setting up temporary field camps. In this case aggregation would be expected on the riverine and terrace locations with smaller field camps in the uplands. The few larger residential camps found within a territory would show high intrasite and low intersite variability (Binford 1980:18) Basically many of the tasks, stone knapping, skin processing, cooking, plant processing, etc., would be done at this central residential base camp and the structure and evidence of activities would not vary much between different residential camps.

Orient Fishtail (n=4)

People who used tools associated with the Orient Fishtail Point Tradition dominated the later half of the Transitional Archaic. This appears to have been a time of great change in New England with new technologies appearing and by 3000 years BP an interrelated series of climatic, environmental, cultural and social changes dismantling the "finely balanced Archaic adaptive systems" (Dincauze 1974). Environmental changes included climate cooling with a possible regression of marine shorelines, a cessation of marine transgression, a change in the forest composition from oak and hickory to chestnut and by 2000 years BP a breakdown of reliable trade networks (Ritchie 1969:164; Dincauze 1974: 49). Work on the I-495 corridor in the by the Public Archaeology Laboratory, Inc. in the 1980s suggests a reduction of favorable habitats at this time due to a lower availability of open water. As a result, the margins of the largest and deepest wetlands were extensively used as well as an intensification of the use of riparian locations (Thorbahn 1982, PAL 1982b). Orient Tradition sites are thus often found near the seashore or on major rivers, an occurrence that Dincauze attributes partially at least to the dissolution of trade networks, usually in locations that protected from the prevailing winds possibly with a move to interior camps in the winter, although again, Dincauze sees year round coastal settlement by Orient Tradition peoples (Dincauze 1974:49). Interior sites along major wetland margins, such as those identified by the I-495 work may represent these winter quarters or were the locations of special purpose resource procurement locations. Funk (1976) proposed that people occupied camps on bluffs in the winter while riverside sites probably represent spring to fall fishing sites where they collected anadromous species such as alewife, herring and shad with weirs. There appears a clear separation of activities by season and site location, possibly a result of a change in settlement and procurement strategies similar to what Pagoulatos (1988) found in the Connecticut River Valley. By the end of the Orient phase, the elaborate burial ceremonialism that characterized the

Susquehanna phase also appears to have come to an end (Dincauze 1974:49). The ultimate cause of all these changes and the general Transitional Archaic cultural readaptation are unknown or unrecognized but it may related to the climatic deterioration and the changing forest composition that could have led to a lessening of the reliance on inland sites (Dincauze 1974: 49).

Trade during the Orient Tradition Phase of the Transitional Archaic saw a resurgence in the acquisition and use of non-local cherts and jaspers from New York and Pennsylvania (Ritchie and Leveilee 1982) as well as the use of steatite for bowls. The pattern of long-distance exchange suggests a reestablishment of expanded exchange system that contrasts with the earlier Late Archaic system (MHC 1982: 25). The Orient Tradition was first identified by Ritchie on Long Island close to Orient New York and was initially characterized by the burial of dead upon high knolls. This led some to speculate that the Orient Tradition was nothing but a mortuary cult for from New England (Ritchie 1963: 196). This was later proved not be the case as archaeologists later identified habitation sites.

Orient Fishtail points are a side-notched point with a narrow lanceolate blade shape reminiscent of Small Stemmed points. The stem is expanding and the base is usually straight to concave and occasionally angled with a basal width less than or equal to the maximum blade width. The points posses rounded shoulders that are often poorly defined with an obtuse shoulder angle. In cross-section these points range from flat to steeply angled and evidence of soft to hard hammer percussion is present. These points range from 2.5 to 10 centimeters long with a length to width ratio of 2.5:1 to 4:1 (MHC 1984: 112-113). Knappers produced these points from 3000-2000 years BP Common raw materials include local volcanics quartz and quartzite. The blade shape, poorly defined shoulders and raw material choice hints that these points are a blending of Susquehanna and Small Stemmed traditions.

Testing recovered four Orient Fishtail points, one from L2H and three from Lot 4 (Table 14,

Table 14. Orient Fishtail points

Location	Material	Portion	Weight	Haft Ht	Break Type
L2H-Scraping-N271.7 E215.4	Rhyolite	Tip/ Shoulder	6.9 g		Hinged
L4H-Pz-N158 E124	Argillite	Complete	7.7 g	1.7 cm	
L4S-C-N145 E145 0-40	Quartzite	Tip/ Shoulder	10.4 g		Hinged
L4S-A-N147.6 E147.4	Chert	Base	.4 g		Hinged

Figure 10). Two of the points had the bases broken off at mid-stem, a third was just a base, also broken at mid-stem, while the final point was complete. The breaks on the three incomplete point were all hinged and are manufacturing breaks that occurred during the thinning of the stem. The complete point bore a deep flake scar on one edge and a hafting height of 1.7 cm. All of the points except for the chert example, were green gray to light green gray in color. The chert point was gray and it that the knappers engaged in manufacturing the points on site, possibly indicating a longer period of habitation than in earlier periods.

Early Woodland
Rossville/ Lagoon (n= 7/ 9)

Following the Transitional Archaic is an ill-defined time labeled the Early Woodland by New England archaeologists. In the face of the date for the start of pottery production being back into the Late to Transitional Archaic and the absence of horticulture possibly until after 1000 A.D, some archaeologists, like Snow, do not view the designation of Early Woodland as a valid one (1980). They see no real change occurring that could be used to differentiate the Transitional Archaic and the next 1000 years. They merely see a continuation of tumultuous times that began after 3000 to 4000 years ago. In the words of Filios "... the chronological picture (for the Early Woodland) is more murky than previously suspected. ...the horizon markers (of this period) need to be reevaluated." (Filios 1989:87). Traditional horizon markers for the Early Woodland have included Vinette I pottery, shown to have seen production before the Early Woodland, an absence of Small Stemmed points, which have been shown to have continued in use into the Early Woodland, and increased sedentism, which appears to have begun before the Early Woodland, and horticulture, which in New England was not intensively practiced until after 1000 A.D.

What we are left with are a few new projectile point styles, the Adena, Meadowood, Lagoon and Rossville, and a number of trends that began in the Transitional Archaic such as a possible drop in New England population, increasing shoreline stabilization, possible cultural fragmentation, and environmental change. Adena points may have been antecedent to the slightly later Rossville and Lagoon points commonly found in coastal areas of New England and New York. Archaeologists define these points as lanceolate to triangular bladed stemmed points with lobate or rounded stems and a convex base whose basal width is greater than or equal to 1:1.5. The shoulders are well-defined and approach a 90-degree angle. These points can range from 4.5 to 12.5 centimeters long, making them a moderately large point with a length to width ratio of 2:1 to 3:1 (MHC 1984:118-119). Knappers produced these points from 2800-1200 years BP Exotic cherts were commonly used and are extremely rare in eastern Massachusetts. They are part of a culture complex often associated with mortuary ritual containing chlorite tubular pipes, copper and exotic lithics. They probably represent either an immigration of people from the southeast or a large-scale import of materials and ideas.

Rossville points are diamond-shaped bladed contracting stem points with a convex to often pointed base. The shoulders are weakly defined or nonexistent. These points can range from 3 to 6.5 centimeters long, making them a smallish point with a length to width ration of 1.5:1 to 2.5:1 (MHC 1984:116-117). Native knappers produced these points from 2450 to 1600 years BP (Fiedel 2001:108). Quartz and quartzite are common raw materials, but local volcanics were also used. These points are not considered common in eastern Massachusetts. Cape Cod examples are finer made than those of other areas, possibly showing a reliance on this technology in this area. They also tend to be longer and thinner than other examples with quartzite being the raw material most frequently used (MHC 1984:117). The under-representation of these point types in collections may be the result of examples being identified as other projectile point styles such as Starks and possibly Small Stemmed IV. They can be distinguished from Starks on the basis of their steeply angled cross-section and maximum blade width being located at the midpoint and from the Small Stemmed by their weak shoulders.

Testing recovered seven Rossville points , two from L2H, four from L4S, and one from L5H **(Figure 12, Table 15).** Three of the points bore evidence of impact fractures while the fourth,

Table 15. Rossville points

Location	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L2H-A- N268.5 E216	Rhyolite	Midsection	3.5/ 2.6/ .7 cm	9.1 g		Perverse
L2H-PZ- N284 E208	Rhyolite	Base/ Midsection	2.8/ 2.4/ .8 cm	6. 1g		Impact
L4S-C- N142 E145	Rhyolite	Base/ Midsection	4.4/ 3/ 1.1 cm	14.5 g		Impact
L4S-C- N144 E146.5	Rhyolite	Midsection	1.7/ 2.3/ .9 cm	3.8 g		Impact
L4S-B1 N148.3 E146.65	Rhyolite	Complete	4.3/ 2.2/ 1 cm	8.1 g	2 cm	
L4S-C N149 E146	Rhyolite	Complete	4/ 2.1/ .7 cm	6.5 g		
L5H-C N132 E181	Quartzite	Complete	3.4/ 1.6/ .7 cm	4.3 g	1.7 cm	

from 2H, had evidence of a perverse/ manufacturing fracture. All four points were of rhyolite. The presence of impact fractures indicates the use of the site as at least a short-term habitation location where the replacement of points broken during the hunt took place.

Ritchie identified Lagoon points during his work on Martha's Vineyard (1969) and they became part of what he identified as a Lagoon complex. These points are a narrow, thick, and rather crudely made lobate stemmed points of medium to large size. they range in length from 4.8 to 7.6 centimeters and have an average thickness of .95 cm. The length to width proportion of Lagoon points is 2.5:1 to 3:1. The blade shape is trianguloid in outline, biconvex in cross-section with straight or slightly excurvate edges. The shoulders are weak, rarely moderately well-defined, merging into contracting medium long to long lobate in outline stem that has a convex to slightly squarish base. No basal or stem grinding is present (Ritchie 1969: 245). These points have approximately the same date range as Rossville points, 2450 to 1600 years BP (Fiedel 2001:108). Ritchie stated that they are fairly common and widely distributed over southern New England, but before his Martha's Vineyard work, had not previously been described or culturally attributed. Similarly shaped points have also been recovered from eastern and southern New York where they occur in Early Woodland contexts on sites in the Hudson Valley and Long Island. The common raw materials used were volcanics and quartzites on Martha's Vineyard, but quartz and chert were also used further west. This point type is not widely identified in Eastern Massachusetts perhaps due to its similarity in shape to Stark points. Based on the available information it is difficult to easily distinguish the two but it has been found that the basal tangs are longer in Lagoon point than in Starks and this study used this characteristic as the principle distinguishing factor.

Excavation recovered nine Lagoon points from the project area with most coming from the Lot 2H and Lot 4 impact areas **(Figure 13, Table 16)**. The Lagoon points from the L2H impact area all bore

Figure 12. Rossville points

Top Row Left to Right: L2H-PZ N284 E208 0-27 cm, L2H-A N268.5 E216 30-40 cm
Middle Row Left to Right: l4S-B1 N149.3 E146.65 35 cm, L4S-C N142 E145 0-44 cm, L4S-C N144 E146.5 0-40 cm, L4S-C N149 E146 0-35 cm
Bottom Row: L5H-C N132 E181 30-55 cm

Figure 13. Lagoon points
Top Row Left to Right: L2H-C N276 E211 0-35 cm, L2H-Sq N270 E215 50 cm, L2H-Sq N271 E214 55-60 cm
Middle Row Left to Right: L4H-Strip S1/2, L4H-C N148 E125.5 0-38 cm, L4S-C N144 E134.5 0-33 cm, L4S-A N144.5 E145.5 30 cm N1/2
Bottom Row left to Right: L5H-A N131 E181 60-65 cm, L6H-Strip 6.5m E 50 cm N of SW

Table 16. Lagoon points

Location	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L2H-C N276 E211	Rhyolite	Base and midsection	4.8/ 2.4/ 1.2 cm	13.8 g		Perverse
L2H-Sq N270 E215	Rhyolite	Base and midsection	4.2/ 2.4/ 1.1 cm	10.1 g		Perverse
L2H-Sq N271 E214	Rhyolite	Base	1.9/ 1.7/ .8 cm	2.2 g		Perverse
L4H-Strip	Rhyolite	Complete	4.1/ 2.2/ .8 cm	7.4 g	2.1 cm	
L4H-C N148 E125.5	Rhyolite	Base and midsection	4.7/ 2.7/ .9 cm	12.9 g	3.3 cm	Impact
L4S-C N144 E134.5	Quartzite	Base and midsection	2.8/ 2/ .6 cm	5.8 g		Impact- Double
L4S-A N144.5 E145.5	Rhyolite	Complete	4.3/ 2/ 1 cm	7.3 g	2.5 cm	Impact- Reworked
L5H-A N131 E181	Quartzite	Complete	5.8/ 3.5/ 1.7 cm	26 g		
L6H-Strip	Argillite	Tip to shoulder	4.1/ 1.9/ .9 cm	7.3 g		Impact-Hinged bs

perverse/ manufacturing breaks while most of those from the southern half of the project area bore impact breaks indicative of having broken in haft during use.

Archaeological excavations at the Carns site in Eastham on Cape Cod, at the Fox Run 3 site in Mashpee, and at the Agawam Site in Wareham, hint at the possibility that Rossville/ Lagoon pints continue in use into at least the Middle Woodland period (Bradley 2005; Shaw 2000; Chartier 2007). Archaeologists recovered Rossville and Lagoon points at Locus 2 of the Carns site in direct spatial association with anomalies that were radiocarbon dated at 850+/- 80 YA and in association with Middle Woodland Fox Creek points (Bradley 2005: 33). They recovered over one dozen Rossville and Lagoon points from the lower levels of this locus as well with no pottery being recovered from the deepest levels, indicating the possibility of intermixing of lower and upper levels as a result of bioturbation of slow soil development. Locus 10 yielded two Small Stemmed points, five Lagoon points, 23 Fox Creek and Greene points, three felsite triangular points, and a radiocarbon date of 2400-2300 BP as well as cord marked Middle Woodland like pottery. Stratigraphy at this locus was less clear than at the others. The Early Woodland was represented by radiocarbon dates for a hearth and post mold as well as the recovery of Lagoon points but no pottery. The Middle Woodland was the most widely represented at this locus with two features (hearths) producing RC dates of 1610 and 1540 BP. These were complemented by the recovery of Fox Creek points and a small assemblage of Middle Woodland pottery. The Late Woodland was poorly represented with a few Levanna points and a radiocarbon date of 570 BP from one feature.

Overall the Early Woodland period is the first well-represented at the site. The fact that soils had not yet formed during the Late Archaic is good evidence of why earlier occupations are only very scarcely represented. It also provides a good argument against the co-existence of Small Stemmed and Squibnocket Triangle points with later occupations. Archaeologists obtained four radiocarbon dates from this period. The Middle woodland period is the best represented at these three loci. Eight radiocarbon dates were obtained for this period and diagnostic artifacts included Fox Creek and Greene points with the possibility that Lagoon and Rossville points continued in use as well. Ceramics are also more visible with rocker stamping being the most common decorative technique.

Shaw found at the Fox Run 3 site, a possible association of Squibnocket, Rossville, and Stark-like points (possible Rossville variants but probably the same Lagoon like points identified at the Muttock-Pauwating site), in Middle Woodland contexts (Shaw 2000:54). Occupation was most intense at the site during the latter half of the Middle Woodland to early Late Woodland periods at this site and within these contexts Shaw found that 1) the use of Rossville bifaces (generally diagnostic of the Early Woodland Period) appeared to be used into the Middle Woodland; 2) shouldered bifaces similar in morphology to Middle Archaic Starks appear to have been used in the Middle Woodland Period; 3) Fox Creek Lanceolate points appear to represent a point style diffused from New York State and incorporated into a preexisting local artifact complex; 4) large triangular biface (Levannas) use was well established by the later half of the Middle Woodland; 5) small triangular quartz bifaces, reminiscent of Late Archaic Squibnocket Triangle points, were found in clear Middle Woodland contexts (Shaw 2000:54).

Rossville points were found in clear Early Woodland contexts at the site as well, but two were found in, and one was found above, a layer radiocarbon dated to 1040+/-60, a clear late Middle Woodland context (Shaw 2000:55). Two Stark-like points were found in the lowest levels of a non-stratified Middle Woodland midden associated with the same levels as the above cited Rossvilles (Shaw 2000:55). Shaw did not dismiss the possibility that they may be out of context Middle Archaic Stark points and do not actually date to the Middle Woodland Period, but favors the idea that they actually represent a previously unidentified variation of the Rossville Point, which researchers identified as the Lagoon point in the present study.

Chartier found at the Agawam site in Wareham, a quartzite Lagoon point was found in close spatial association with a small refuse deposit of bone and oyster shell that was radiocarbon dated to 440 +/-40 years BP, placing the feature within the late Late Woodland or Contact Period (Chartier 2007). Evidence of Middle Woodland occupation was found close to this feature as well evidence of Late Archaic occupation in the form of steatite fragments and Squibnocket Triangles.

Middle Woodland

Settlement and subsistence are similar to those of Early Woodland period, with the main difference being lengthened stays at large sites along waterways and a continuation of the use of upland areas for short-term resource procurement. Settlement and subsistence are similar to those of Early Woodland period, but sedentism increases. Stays at large sites along waterways increase in duration, with upland areas used on a short-term basis for procurement. Long-distance communication and exchange appear to cease by the end of the period.

During this period there is a marked decrease in the number of exotic finished goods, and changes in mortuary practice to an increase in secondary interments and less use of ocher. Ceramics vary more in decoration and form with more occurrences of smoothed surfaces and the beginning of the use of shell temper. The decrease in the variety of projectile points may be evidence that these were now less important in the tool kit although this point is still being studied. Typical projectile points include Fox Creek, Greene and Steubenville points and in the later Middle Woodland, Jack's Reef points. While the amount of exotic finished goods decreased, the amount of exotic raw lithic materials increased, with Jack's Reef points often being made of non-local chert (Shaw 1996: 92-93). Some projectile point

types, such as Rossville and Small Stemmed may also have continued in use into the Middle Woodland (Shaw 1996:90; Hasenstab et al. 1990).

In the Taunton River drainage, Middle Woodland diagnostics such as dentate stamped pottery and the projectile point styles discussed above, are not common. At the Plymouth Street site several Small Triangle points possibly stylistically intermediate between Squibnocket Triangles and Levannas, were recovered associated with a radiocarbon date of 1740+60 BP (Hallaren 1988). This supports a possibility that small triangle, Squibnocket-like points, may have a longer period of use than previously thought.

Greene (n=7)

Ritchie described the Greene point as a lanceolate to tapered-stem point of medium breadth with straight or slightly rounded bases (Ritchie 1997:122). The differ from Boats blades in the fineness of the flaking and the basal shapes. They bear similarities in shape to Fox Creek Stemmed and Fox Creek Lanceolate points, which are often found associated with Greenes. The contracting stem of the Fox Creek Lanceolate distinguishes it from the Greene point. Unfinished preforms are often classified as Greene points, but a careful comparison of the basal shape, being concave or straight, the contracting stem and symmetrical lanceolate blade with its greatest width at or just below the midpoint, serves to distinguish the Greene point. Greene points range in length from 3 to 10 cm, in width from 2 to 3 cm with a 1.5:1 to 3:1 length to width ratio (MHC 1984:120). The basal shape of the Greene point is very similar to that of the Jack's Reef Pentagonal point, raising the possibility that pentagonal points are just reworked or significantly reduced Greene points. Funk identifies these points as being Late Middle Woodland in context from eastern New York, making their first appearance associated with Fox Creek points (circa A.D. 360-450) and lasting until approximately A.D. 800 (Ritchie 1997:122). Archaeologists have recovered them from the Cunningham site on Marta's Vineyard and at the Carns site in Eastham (Bradley 2005).

Testing recovered eight points identified as Greene or potentially Greene points **(Table 17, Figure 14)**. Knappers used a wide variety of raw materials in the manufacture of these points

Table 17. Greene points

Location	Material	Portion	Length/Width/ Thick	Weight	Break Type
L4H-Pz N142 E126	P. Jasper	Base	1.6/ 1.8/ .6 cm	1.9 g	Impact
L4H-Pz N150 E128	Rhyolite	Base/ Midsection	4.2/ 2.8/ .7 cm	13.1 g	Perverse
L4S-Pz N142 E146	Chert	Base	2.2 / 2.5/ .6 cm	4.8 g	Perverse
L5H-Strip	Rhyolite	Base/ Midsection	5.1/ 2.9/ 1 cm	16.6 g	Perverse
L5H-C N131.5 E184	Argillite	Complete	6.6/ 2.5/ .9 cm	15.5 g	
L6H-Strip	Rhyolite	Base	1.5/ 1.8/ .8 cm	2.7 g	Impact
L6H-Pz N108 E224	Rhyolite	Base	2.8/ 2.7/ .7 cm	6.9 g	Perverse
L6S-C-N112.5 E252	Chert	Base/ Midsection	3/ 3.1/ .6 cm	9 g	Perverse

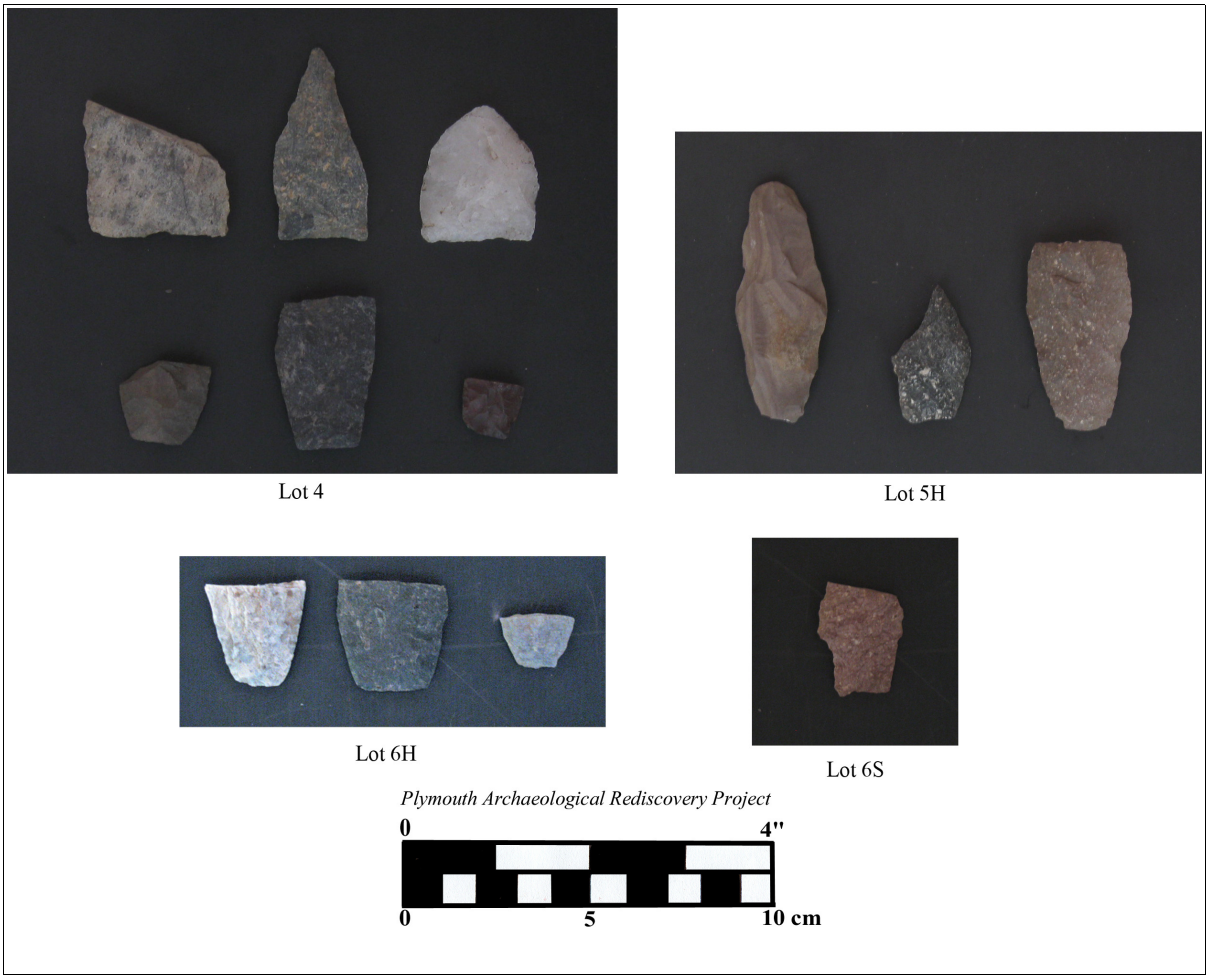

Figure 14. Middle Woodland points

Lot 4

Top Row Left to Right: Fox Creek Lanceolate: L4S-A N148.8 E144.4 35 cm, L4H-Stripping 3.3m N 2.3m E of SE, L4H-C-N154 E128

Bottom Row left to Right: Greene Points: L4S-PZ N142 E146 0-45 cm, L4H-PZ N150 E128 0-42 cm, L4H-PZ N142 E126 0-36 cm

Lot 5H

Left to Right: Greene Point: L5H-C N151.8 E134 40-45 cm; Jack's Reef Pentagonal: L5H-Stripping near turkey coop wall; Greene Point: L5H-Stripping 4.2m N 4.5m E of SW

Lot 6H

Left to Right: Greene: L6H-PZ N108 E234 0-30 cm, L6S-C N112.5 E252 0-30 cm, L6H-Stripping S1/2

Lot 6S

Fox Creek: L6S-EU N115 E254 36-40 cm SW

with exotics such as chert and Pennsylvania Jasper intimating that these points originated from the west in New York State where they occur more frequently. Excavation recovered only one complete point, an argillite example from L5H measuring 6.6 cm long and weighing 15.5 g. Analysis identified the remainder of the points by base and base to midsection fragments, all except two showing evidence of perverse manufacturing fractures. The presence of perverse fractures indicates on site manufacturing of the points versus replacement of points broken during the hunt, as was more common in the earlier point styles recovered. The increase in on site manufacture, first evidenced in the southern half of the project area for the Late Archaic Small Stemmed tradition, and now evident in the Middle Woodland indicates an increase in sedentism occurring at the site.

Fox Creek Stemmed (n=4)

Archaeologists recovered four Fox Creek Stemmed points from the south half of the project area (Table 18, Figure 14). Archaeologists found three of these in Lot 4 and one from the Lot 6 septic

Table 18. Fox Creek Stemmed points

Location	Material	Portion	Length/Width/ Thickness	Weight	Haft Ht	Break Type
L4H-Strip	Rhyolite	Complete	5.5/ 2.6/ .7 cm	12.1 g	2 cm	
L4H-C-N154 E128	Quartz	Complete	3.7/ 3.3/ 1.1 cm	15.9 g	2 cm	
L4S-C- N149 E146	Rhyolite	Base/ Midsection	3.7/ 4/ .9 cm	14.3 g		Perverse
L6S-A N115 E254	Rhyolite	Base/ Midsection	2.7/ 2.1/ .6 cm	3.8 g	2.2 cm	Impact

area. Two of the fox Creek points are complete. Knappers made them from local lithics- rhyolite and quartz- and they measured 5.5 and 3.7 cm long respectively. Both of the points from the L4H area had been extremely resharpened above haft. The asymmetrical triangular blades were curved in profile, the result of having been manufactured from a flake. A knapper reduced the quartz point to a point that it closely resembled a Jack's Reef pentagonal point. The point fragment from L4S was a large blade that broke during production while the point from L6S had broken as a result of an impact fracture during use. Haft heights appeared fairly consistent at 2 to 2.2 cm.

Fox Creek points, called Steubenville points in Ohio and New York, are generally broad heavy points of medium to large size with slightly concave bases and weak shoulders. They range in size from 5 to 11 cm and in width from 2 to 3.5 cm with a length to width ratio of 1.2: 1 to 3: 1 (MHC 1984:122). Their temporal range is from 1,800 to 1,300 BP. The MHC describes them as being fairly common and widely distributed in eastern Massachusetts. These points are diagnostic of the Middle Woodland Period, occurring from AD 400-700, and they are often found on multi-component sites and areas associated with the growing of corn and decorated ceramics. On Martha's Vineyard, they have been found associated with post molds outlining an oval-shaped house measuring 16' in diameter (Towle 1986: 30). Archaeologists consider other projectile point styles, such as Greene points, as being used contemporaneously with Fox Creek points in the earlier period of their use while Jack's Reef points and Levannas occurred in the later half of the Middle Woodland. Archaeologists believe that the people who used the Fox Creek points were seasonally migrational, spending the summers on the coast and the winters further inland, and they show many of the cultural characteristics evident with southeastern Massachusetts' Native people at the time of Contact. Other types of artifacts commonly found

associated with Fox Creek points include exotic lithics like New York state cherts and Pennsylvania jaspers, Saugus jasper, Blue Hills hornfels and Great lakes' copper.

Jack's Reef Pentagonal (n=1)

Jack's Reef Pentagonal points are a Middle Woodland point type that is generally considered rare in eastern Massachusetts. The diagnostic characteristics of this point are the triangular upper and parallel lower blade edges, the lack of a stem. and the straight or concave base (MHC 1984:128). They range in length from 2 to 7 cm, in width from 1 to 4 cm and have a 1.5:1 to 2:1 length to width ratio. Knappers manufactured Jack's Reef points from 1,600 to 1, 100 BP often being made of local volcanics. There has been speculation that this point may represent an early stage in the manufacture of Jack's Reef Corner Notched points (MHC 1984:129). Alternately it may represent a heavily reworked Greene point.

Strauss studied the types of raw materials used to produce Jack's Reef corner Notched points and whether this point type was found to cluster in any particular areas or geographical settings in New England (Strauss 1992). Strauss found that Jack's reef points were most commonly manufactured from hornfels and rhyolite in eastern Massachusetts with chert and Pennsylvania Jasper also being utilized (Strauss 1992: 340). he also found that Jack's Reef points were most commonly recovered from coastal settings or from larger river valleys such as the Taunton River, indicating a possible focus on aquatic resource exploitation and citing Ritchie's 1969 hypothesis that water travel facilitated Jack's Reef dissemination(Strauss 1992: 345; Ritchie 1969: 235). Strauss also noted the co-occurrence of artifactual elements of the Hopewell culture, crystals, graphite, hematite, slate pendents, and gorgets with Jack's Reef points at several Massachusetts' sites (Strauss 1992:347). Archaeologists believe that Ohio is the homeland of both the Jack's Reef points and the Hopewell culture and the co occurrence of these artifacts at New England sites may indicate direct connections with people from that region (Strauss 1992: 347).

Testing recovered one Jack's Reef Pentagonal point made of dark purple gray rhyolite from L5H during stripping **(Figure 14).** The point bore evidence of having been fashioned from a flake and bore an impact break on the midsection of the blade. Strauss noted that while Jack's Reef Corner Notched points manufactured from cherts and jasper were most often finely made, those manufactured from local materials such as rhyolite were often cruder in form being "lumpish local copies" of the non-local examples (Dincauze 1974: 51 quoted in Strauss 1992: 347).

Late Woodland

The decrease in projectile point styles and the increase in the reliance on horticultural crops, may be attributed to increasing numbers and densities of population at larger sites. While the occurrence of the "village" in southeastern Massachusetts continues to be debated, the effect of an increased reliance on corn, beans, squash and to a lesser degree gourds, sunflowers and tobacco, definitely led to a degree of sedentism not seen prior to this time (Hasenstab 1999; Kerber 1988; Luedtke 1988; Thorbahn 1988).

Levanna (n=55)

Levanna points are large triangular-shaped points produced in the Late Middle Woodland period. By the Late Woodland period, 1,300-400 B.P, these were the only form of projectile point being produced until the Madison point (a narrower Levanna variant) circa A.D. 1350. Madison points occur primarily

in New York State and have not been recognized as a significant point in eastern Massachusetts assemblages. The blade shape of the Levanna points approaches an equilateral triangle and the bases are concave to straight and often have asymmetrical ears. Blade length ranges from 2.2 to 7.5 cm, width ranges from 2.5 to 7.5 cm and the length to width ration ranges from 1: 1 to 1.5: 1 (MHC 1984:131). Ritchie found that approximately 70% of those he examined were equilateral triangles with the remainder be defined as broad isosceles triangles (Ritchie 1997: 31). He also found that nearly 80% had a basal concavity that was nearly V-shaped, often with prominent corner ears which were occasionally asymmetric, while the rest had straight bases (Ritchie 1997:31).

Testing recovered 55 Levanna points during Data Recovery excavations at the Muttock-Pauwating site **(Figure 15, Table 19)** making this the second most common projectile point

Table 19. Levanna points

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L1H-Scrape	S	Quartz	Complete	1.8/ 1.6/ .3 cm	1 g		Impact-Ear
L1H-C-N310.5 E180	D	Mudstone	Missing Ear	2.7/ 2.8/ .5 cm	2.8 g	1.1 cm	Impact-Ear
L1HN-A-N297.2 E187.2	S	Quartz	Tip/ Mids	2.4/ 2.5/ .7 cm	3.6 g		Perverse
L1HN-Scrape	S	Rhyolite	Tip/ Mids	3.5/ 1.7/ .5 cm	3.1 g		Perverse
L1HN-A N300 E178	D	Rhyolite	Base/ Mids	2.5/ 3.2/ .5 cm	4.7 g	1.2 cm	Impact
L1HN-A N300 E178	S	Rhyolite	Base/ Mids	2.6/ 1.7/ .3 cm	1.4 g		Impact-Ear
L1SN-Pz-N312 E190		Quartz	Tip/ Mids	1.7/ 1/ .5 cm	.9 g		Perverse
L2H-Pz-N268 E216		Quartzite	Tip/ Mids	2.5/ 1.4/ .35 cm	1 g		Impact
L2H-A-N268.2 E214.2	D	Chert	Base/ Mids	2.1/ 3.2/ .3 cm	2.5 g	1.8 cm	Impact
L2H-B1-N270-272 E216-218		Quartz	One Half	2.5/ 2.7/ .6 cm	4.2 g		Perverse
L2H-A-N271.9 E214.8	D	Rhyolite	Base/ Mids	2/ 2.9/ .4 cm	2.5 g		Impact
L2H-Pz-N278 E216	S	Quartz	Mids		4.4 g		Perverse
L4H-Strip	S	Quartz	Base/ Mids	2/ 2.2/ .6 cm	6.1 g		
L4H-Strip	S	Quartz	Missing Ear	2.7/ 2.5/ 1.1 cm	5.2 g	1.5 cm	Impact-ear
L4H-Strip		Quartz	Tip/ Mids	3.1/ 3.1/ .5 cm	2.6 g		Crystal
L4H-Pz-N142 E130	S	Quartz	Complete	2.6/ 2.8/ .75 cm	6.2 g		
L4H-Pz-N142 E134		Quartzite	One half	3.5/ 2.1/ .6 cm	3.8 g		Perverse
L4H-C-N148 E125.5	S	Rhyolite	Base/ Mids	3/ 2.1/ .4 cm	2.3 g		Perverse
L4H-C-N148 E125.5		Quartz	Tip	1.4/ 1.4/ .6 cm	1.1 g		Perverse
L4H-Pz-N150 E126	S	Quartz	Missing Ear	2.7/ 2.2/ .6 cm	3.7 g		Crystal
L4H-C-N152 E128	S	Hornfels	Complete	2/ 2.2/ .4 cm	1.6 g		
L4H-C-N152 E128.5		Rhyolite	Complete	5/ 3.4/ 1 cm	16.3 g		
L4S-Strip		Quartz	Complete	4.9/ 3/ 1.3 cm	16.7 g		
L4S-C-N144.5 E148		Quartz	Complete	1.9/ 2.1/ .6 cm	2.3 g		

Table 19. (Cont.)

Location	Type	Material	Portion	Length/Width/ Thick	Weight	Haft Ht	Break Type
L4S-A-N147.8 E147.4	S	Quartz	Base/ Mids	1.7/ 1.1/ .4 cm	1 g		Impact-Tip
L5H-C-N130 E180.5	D	Quartz	Complete	2.4/ 2.2/ .6 cm	2.4 g	.5 cm	
L5H-C-N131 E188	D	Rhyolite	Complete	3/ 3.2/ .4 cm	3 g	1.2 cm	
L5H-C-N133 E186	S	Quartz	Base/ Mids	2.5/ 1.6/ .5 cm	1.6 g		Perverse
L5H-C-N135.5 E176		Quartz	Complete	4.4/ 3.2/ 1.5 cm	14.4 g		
L6H-Strip		Quartzite	Complete	2.5/ 2.8/ .4 cm	3.2 g	1.5 cm	Impact
L6H-PZ-N102 E244		Quartz	Tip	1.2/ 1.2/ .2 cm	.4 g		Perverse
L6H-A-N103.6 E238.75	S	Chert	Base/ Mids	2.2/ 2.3/ .5 cm	3.8 g		Impact
L6H-Pz-N104 E240	S	Quartz	Base/ Mids	2.6/ 2.3/ .4 cm	2.7 g		Impact
L6H-C-N106 E236.5	D	Rhyolite	Base/ Mids	1.9/ 2.6/ .7 cm	2.7 g	1.2 cm	Impact
L6H-B1-Strip	S	Quartz	Base/ Mids	2.4/ 2.7/ .4 cm	3.6 g		Impact-Tip
L6S-Pz-N112 E250		Rhyolite	Base/ Mids	2.1/ 2/7/ .9 cm	6.5 g		Crystal
L6S-C-N112 E251	D	Quartz	Base/ Mids	1.6/ 3.6/ .6 cm	4.7 g	1.6 cm	Impact
L6S-A-N113.15 E250.8	D	Quartz	Complete	2.6/ 2.3/ .3 cm	1.9 g		Impact
L6S-C-N114 E253	S	Chert	Base/ Mids	2.4/ 2.1/ .4 cm	1.5 g		
L7H-Pz-N66 E254	D	Quartz	Missing Ear	2/ 2.1/ .3 cm	1.5 g	1.5 cm	Impact-Ear
L7H-A-N68.9 E262.8	S	Quartz	Tip	1.2/ 2/ .6 cm	1.4 g		Impact-Ear
L7H-Strip	S	Quartz	Complete	2.4/ 2.2/ .5 cm	2.5 g	1.2 cm	Perverse
L7H-Strip		Quartz	Tip	2.5/ 1.8/ .6 cm	2.6 g		
L7HN-Strip	S	Quartz	Missing Ear	2/ 2.1/ .5 cm	2.3 g		Perverse
L7HN-Strip	S	Quartz	Base/ Mids	2.1/ 3.4/ .5 cm	5.3 g		Impact-Ear
L7HN-Strip	D	Rhyolite	Base/ Mids	2.9/ 1.3/ .5 cm	2.7 g		
L7SN-A-N72 E253	D	Quartz	Base/ Mids	3.5/ 4.2/ .6 cm	12.5 g		Impact
L7SN-A-N72 E253		Quartzite	Complete	5/ 4.1/ 2 cm	39.5 g		Impact
L7SN-B1-N74 E262	S	Quartz	One Half	2.6/ 1.6/ .4 cm	1.8 g		Impact
L7SN-A-N74.5 E257.5		Quartz	Tip/ Mids	1.8/ 1.5/ .3 cm	.7 g		
L7SN-A-N74.5 E257.5	S	Rhyolite	One half	3.2/ 2.1/ .5 cm	3.9 g		Perverse
L7SN-A-N75 E258.75	S	Rhyolite	Complete	2.7/ 2.7/ .5 cm	3.5 g		Perverse
L7SN-A-N75.7 E257.1	D	Quartz	Base/ Mids	2.2/ 3.3/ .5 cm	4.3 g	1.5 cm	Impact-Tip and ear
L8H-Pz-N72 E304	S	Quartz	Ear	1.5/ 1.2/ .3 cm	.9 g		
L8H-Strip	S	Rhyolite	Miss. Ear	2.7/ 2/ .7 cm	3.5 g		Impact-Ear

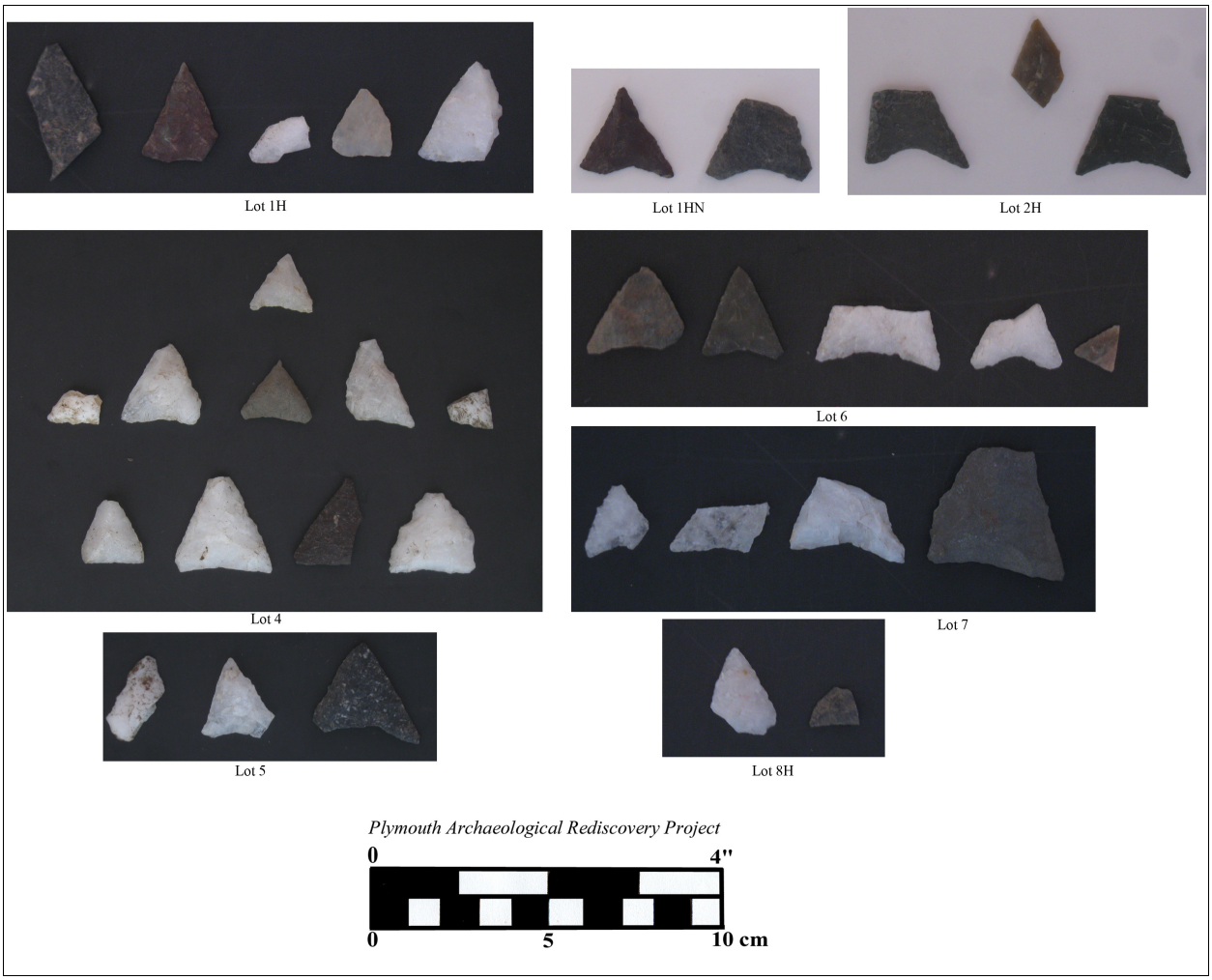

Figure 15. Levanna points

Figure 15. (Cont.)
Lot 1H
Left to Right: L1HN-B1 N297.7 E178 30 cm, L1HN-A-N300 E178 Sq N300 E175 30-35 cm, L1S-PZ N312 E190 0-20 cm, L1H-Stripping 4.8 m N 1.2m E from SW, L1HN-A N297.2E187.2 30-35 cm

Lot 1HN
Left to Right: L1H-C N310.5 E180 0-20 cm, L1HN-A N300 E178 Sq N299 E178 FDIII

Lot 2H
Left to Right: L2H-A-N271.9 E214.8 70-75 cm, L2H-Pz-N278 E216 0-40 cm, L2H-A-N268.2 E214.2 60-65 cm

Lot 4
Top: L4S-C-N144.5 E148 0-40 cm
Middle Left to Right: L4H-Stripping 5.4 m E 4.3 m S of NW, L4H-Stripping 5m E 1m S of NW, L4H-C-N148 E125.5 0-38 cm, L4H-Pz-N142 E130, L4H-C-N148 E125.5 0-38 cm
Bottom Left to Right: L4S-A-N147.8 E147.4 30-35 cm W1/2, L4H-Stripping 2m N 8.6m E of SW, L4H-C-N152 E128 0-40 cm, L4H-Pz-N150 E126 0-34 cm

Lot 5
Left to Right: L5H-C-N133 E186 20-65 cm, L5H-C-N130 E180.5 30-60 cm, L5H-C-N131 E188 30-55 cm

Lot 6
Left to Right: L6H-Stripping 23m W 50 cm S of NE, L6S-A-N113.15 E250.8 40-45 cm SW1/2, L6S-C-N112 E251 0-30 cm, L6H-C-N106 E236.5 0-35 cm, L6H-PZ-N102 E244 0-35 cm

Lot 7
Left to Right: L7H-Pz-N66 E254 0-18 cm, L7H-Stripping, L7SN-A-N75.7E257.130-35 cm S1/2, L7SN-A-N72 E253 35-40 cm E 1/2 N. stain

Lot 8
Left to Right:L8H-Backdirt NW, L8H-Pz-N72 E304 0-15 cm

form recovered. Archaeologists recovered most of these points from Lot 4H (associated with the longhouse), Lot 6H, associated with the numerous storage pits, and in Lot 7SN, associated with house forms and pits.

Recovered Levanna points took two forms, one with a deeply concave base and one with a shallow basal concavity. Points with deeply concave bases often bore asymmetric ears, a result of one ear having been broken during use, presumably during impact, and subsequently being resharpened to a shorter ear on one side of the point. The deep versus shallow basal shape appears as a valid distinction between these points as evidenced in their occurrences across the site. The difference in basal shapes may be a temporal or functional distinction.

Excavation recovered 13 deeply concave based Levannas, occurring in relatively low numbers from across the entire project area (Table 20). There is a noticeable lack of deep based Levannas in lot

Table 20. Occurrence of deep based versus shallow based Levannas

Location	Deep Basal Concavity	Shallow Basal Concavity
L1H	1/ 7.7%	1/ 3.8%
L1HN	1/ 7.7%	3/ 11.5%
L2H	2/ 15.4%	1/ 3.8%
L4H		6/ 23%
L4S		1/ 3.8%
L5H	2/ 15.4%	1/ 3.8%
L6H	1/ 7.7%	3/ 11.5%
L6S	2/ 15.4%	1/ 3.8%
L7H	1/ 7.7 %	2/ 7.7%
L7HN	1/ 7.7 %	2/ 7.7%
L7SN	2/ 15.4 %	3/ 11.5%
L8H		2/ 7.7%

4 and Lot 8. In lots where archaeologists recovered both forms, their occurrences were often inversely related, when one was high the other was often low. Only Lot 7H and HN showed an even occurrence of both forms and Lot7SN was also close to but not exactly equal.

Shallow-based points averaged shorter than the deep-based variety, were heavier on average, had a higher haft height but were on average the same thickness as the deep-based variety (Table 21).

Table 21. Comparison of deep versus shallow-based varieties of Levannas

Levanna Type	Length	Thickness	Weight	Haft Height
Shallow-Based	1.2-3 cm/ 2.1 cm	.2-.9 cm/ .5 cm	1-6.2 g/ 3.3 g	1.2-1.5 cm/ 1.4 cm
Deep-Based	1.7-3.1 cm/ 2.5 cm	.4-.75 cm/ .5 cm	1.5-3 g/ 2.3 g	1.1-1.6 cm/ 1.3 cm

There also appears a distinction in the raw materials used to produce that two varieties (Table 22). Knappers manufactured Levannas with deep basal concavities predominantly from quartz

Table 22. Levanna point raw material usage

Material	Deep Basal Concavity	Shallow Basal Concavity	Levanna	Total
Quartz	6	17	10	**33**
Rhyolite	3	8	2	**13**
Chert	2		1	**3**
Mudstone	1			**1**
Hornfels	0	1		**1**
Quartzite	1		3	**4**
Total	**13**	**26**	**16**	**55**

but also used New York chert, mudstone, and quartzite. The presence of chert in the assemblage may indicate that the deep basal concavity form is earlier than the shallower form. Knappers manufactured the shallower basal concavity form principally from quartz and rhyolite with the only other material represented being hornfels. The presence of chert for the deep variety and hornfels for the shallow variety may exemplify changing trade and interaction patterns over time, if a temporal distinction exists for the points. Duncan Ritchie found that Levanna raw material preference may reflect community or tribal boundaries and interactions between communities living in different areas in Massachusetts (Ritchie 2002). Ritchie found that in southeastern Massachusetts, that the most intensive use of hornfels was during the Middle to Late Woodland period from 1,600 to 1,000 BP (Ritchie 2002: 120). After 1,000 BP , a period when Late Woodland community and pan-community (tribe) territories may have become more formalized, tangible and defended, people favored local lithics over more exotic ones (Dincauze 1974 as cited by Ritchie 2002). A pattern similar to the hornfels distribution is seen with the use of chert as a raw material. Chert appears more common for Levanna points in the late Middle Woodland to early Late Woodland period (Ritchie 2002:121). This would support the difference in Levanna point varieties evident at the Muttock-Pauwating site- shallow-based Levannas dating to the late Middle Woodland to early Late Woodland and deep-based Levannas dating from the middle to late Late Woodland.

Shallow-based Levannas showed a wider variety of fracture types present on the incomplete pieces (Table 23). Both shallow and deep-based Levannas showed a predominance of impact

Table 23. Levanna breakage patterns

Levanna Type	Perverse	Impact	Crystal Planer	Totals
Levanna	7	2	2	**11**
Deep-Based		9		**9**
Shallow Based	8	12	1	**21**
Totals	**15**	**23**	**3**	

fractures, indicating that projectiles broken during use were frequently replaced at the site, and that especially in the case of the shallow-based Levannas, points that knappers produced and broke in production, resulting in perverse fractures. The difference in the occurrence of perverse fractures for the deep versus the shallow-based Levannas may reflect the changing presence of men at the site. If the shallow-based Levannas do date earlier than the deep-based ones, then people would have used them when horticulture was just beginning to be utilized by people in eastern Massachusetts. This may mean that the site served a more general function as a base camp similar to the function it appears to have served in the Late Archaic period. Once horticulture was established and the site became a seasonal planting location as well as a base camp, the site may have become more of the domain of the women of the community, a much of the foodways focus appears to have shifted towards maize, beans and squash cultivation by the later Late Woodland period. Men may have spent more time away from the planting fields and thus they may have produced and broken points during production, elsewhere. Only one deep-based Levanna from L7SN was abandoned during manufacture, whereas 14 shallow-based Levannas show traits associated with in-manufacture abandonment (thick Stage II-IV bifaces and perverse breaks).

Preforms

Testing recovered 16 complete or fragmentary projectile point preforms **(Figures 76 and 77).** Most of the preforms were Stage II or III preforms which were either abandoned whole or broke with perverse fractures during manufacture. Archaeologists found the rhyolite and argillite preforms from L2H associated with the Middle Archaic occupation. Analysis assumed that the triangular bifaces were the result of either with the Squibnocket Triangle or Levanna production. The remaining points are likely associated with the Small Stemmed points due to their shape and projected outcome. Three of the preforms, two oval and one tear drop-shaped, bore prominent striking platforms on their bases, reminiscent of the platforms seen on some of the Small Stemmed points and often associated with quartz pebble reduction as defined by Ritchie (Ritchie 1969). The highest concentrations of abandoned preforms correlates well with the impact areas that had the highest concentrations of cores, lithic debitage, and projectile points associated with the Late Archaic (Squibnocket Triangle and Small Stemmed) and Late Woodland (Levanna) quartz reliant occupations (Table 24).

Table 24. Recovered preforms

Location	Material	Shape	Portion	Stage	Fracture
L1H	Quartz	Triangle	Complete	II	
L1S	Quartz	Oval	Complete	II	
L2H	Rhyolite	Blade	Base/ Mids	II	Perverse
L2H	Rhyolite	Blade	Tip/ Mids	III	Perverse
L2H	Quartz	Teardrop	Complete	II	
L2H	Rhyolite	Triangle	Complete	II	
L2H	Argillite	Blade	Tip/ Mids	II	Perverse
L2H	Rhyolite	Blade	Complete	IV	
L2H	Rhyolite	Blade	Base/ Mids	III	Perverse
L4H	Quartz	Blade	Tip/Mids	III	Perverse

Table 24. (Cont.)

Location	Material	Shape	Portion	Stage	Fracture
L4H	Quartz	Triangle	Complete	II	
L4S	Quartz	Oval	Complete	II	
L4S	Quartz	Elongated Oval	Complete	III	
L4S	Quartz	Rounded Base	Base/ Mids	III	Perverse/ Crystal
L4S	Quartz	Triangle	Complete	II	
L7H	Quartz	Triangle	Complete	III	

Lithic samples were analyzed by Dr. Barbara Calogero and Dr. Anthony Potts. Ten samples of projectile points and bifaces, most from feature contexts, were submitted for analysis. Analysis by Calogero proceeded as follows: Thin section preparation begins with a slice of rock removed from the specimen, glued to a glass microscope slide using petropoxy cement, heated and cooled, and then ground thin enough (30 microns) to permit light to pass through rock slice. When viewed under a petrographic microscope, most rock can be identified in this way by the crystalline structure of the groundmass and inclusions in it. Some extremely fine grained rock may require additional analytical techniques. Thin section preparation and general identification will be followed up by consultation with geologist Anthony Philpotts, Emeritus, University of Connecticut. The complete analysis and followup by Philpotts is presented in Appendix D.

Unfortunately there did not appear to be anything distinctive about the samples and they did not appear to conform to any known quarry. Dr. Calogero concluded that they were likely from the Boston area sources (primarily because of their proximity to Plymouth) however they are not typical of the ones that she had seen. She concluded that prospecting toolknappers may have found particular outcrops not commonly used or may have used glacially derived cobbles. One interesting finding was the identification of hornfels for the Middle Archaic Neville point. This material is not commonly associated with Nevilles and the identification of it as such, from a definite Middle Archaic workshop context, indicates the utilization of hornfels, most likely from a quarry location in the Blue Hills, at an earlier date than commonly assumed.

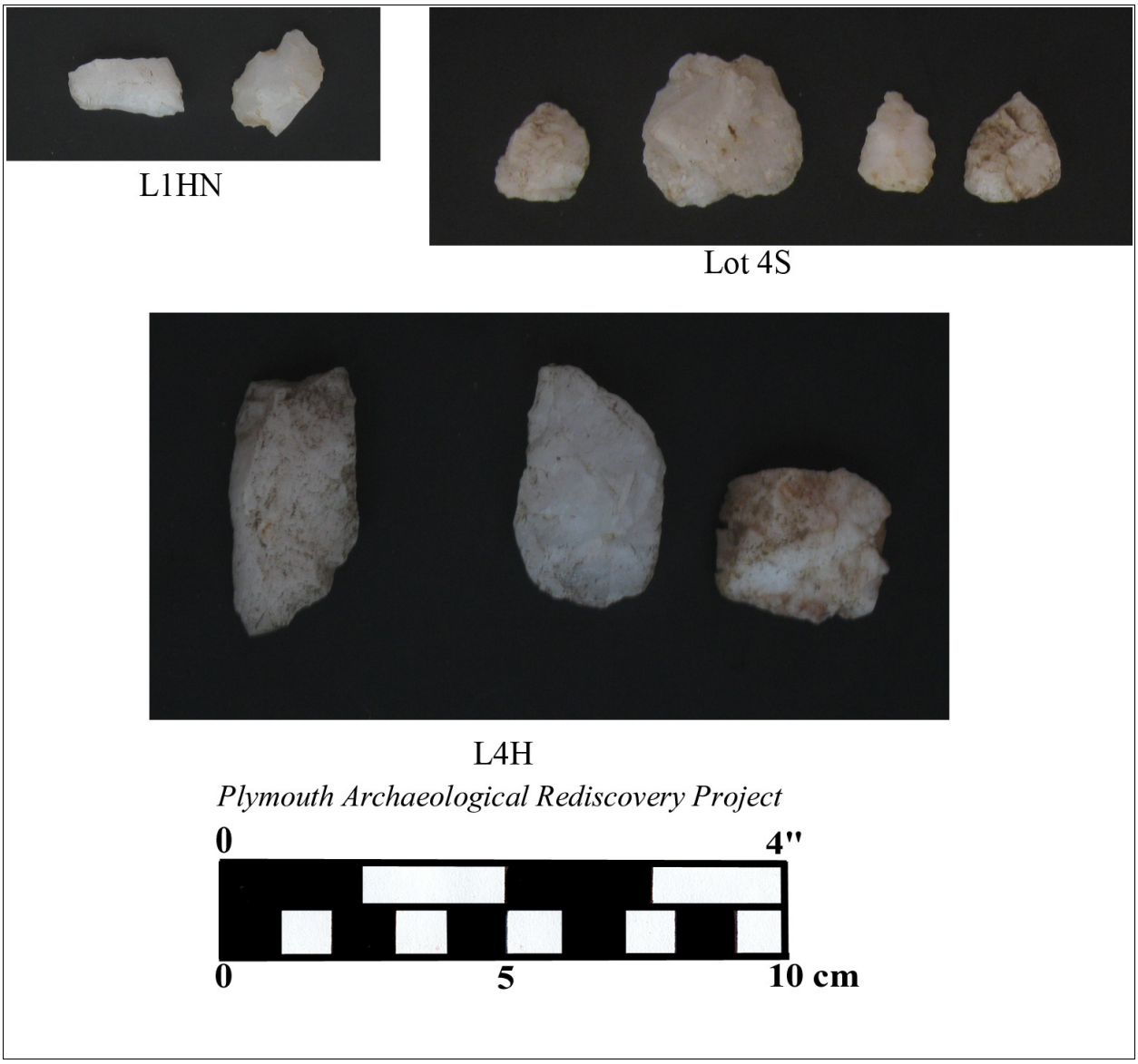

Figure 16. Squibnocket Triangle and Small Stemmed preforms

Lot 1HN Left to Right: L1HN-PZ N300 E180 0-36 cm, L1HN-A N300 E188.7

Lot 4S Left to Right: L4S-PZ N148 E142 0-30 cm, L4S-Stripping 2.3 m N 2.3m E of SW, L4S-A N144.5 E140 55-60 cm N1/2, L4S-C N144 E134.5 0-33 cm

Lot 4H Left to Right: L4H-C N144 E125.5 0-40 cm, L4H-PZ N146 E128 0-34 cm

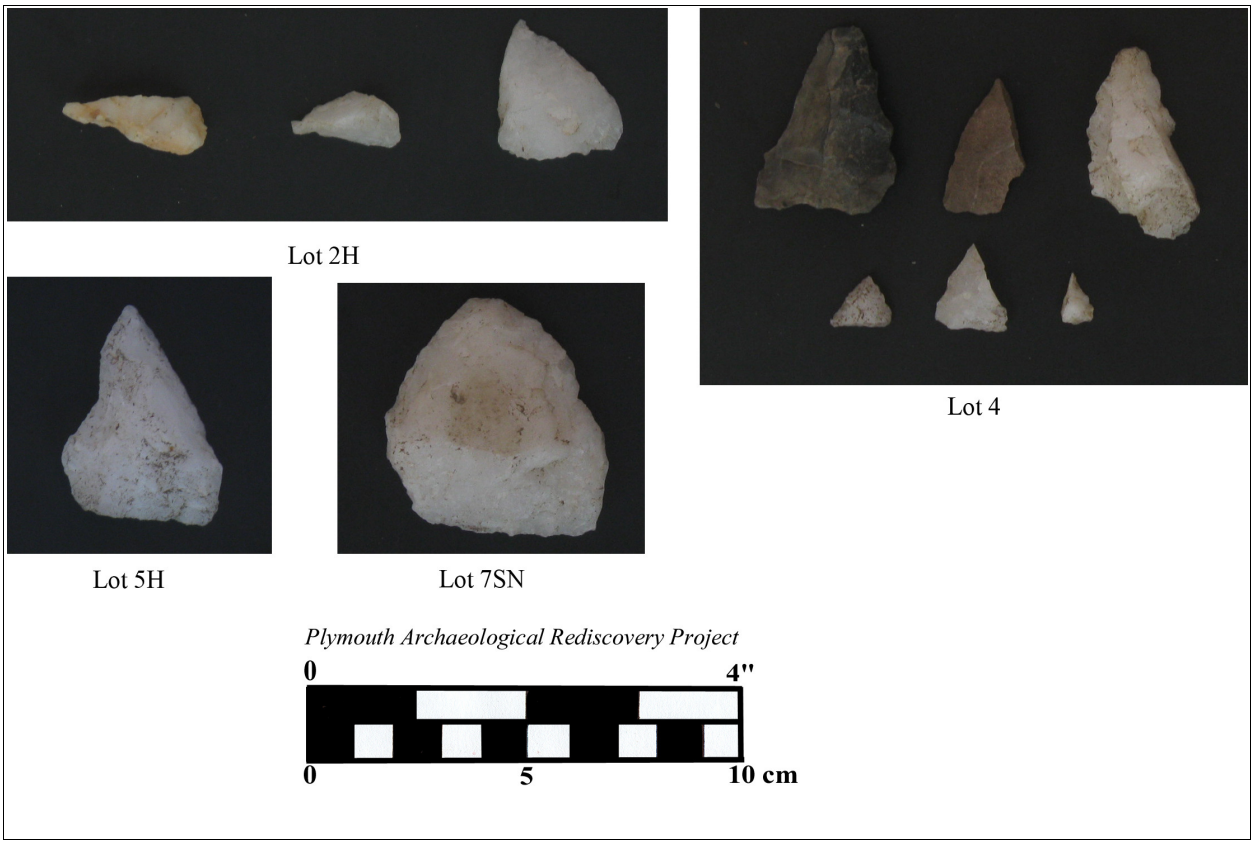

Figure 17. Levanna Preforms

Lot 2H left to Right: L2H-B1 N211 E215 65-70 cm, L2H-Backdirt, L2H-B1 N210-272, E216-218

Lot 4 Top Row Left to Right: L4S-Stripping 2.9m N of SW, L4H-PZ n142 E134 0-25 cm, L4H-C N152 E128.5 0-30 cm
Bottom Row Left to Right: L4S-C N144 E147 0-37 cm, L4H-Stripping 4m N 10 cm E of SW, L4S-C N146 E145.5 0-35 cm

Lot 5H: L5H-C N135.5 E176 30-60 cm

Lot7SN: L7SN-A N72 E253 35-40 cm S. Stain W1/2