Lithic Tool Recoveries
Drills/ Perforators

Two of the Neville points (L2H-Sq-N271 E213 45-50 cm; L4S-C-N147 E148 0-40 cm) are Neville points that have been reworked into what are traditionally identified as drills or perforators **(Figure 1).** Both are exactly the same weight, made from the same green gray argillite and are very close to the same size. For all intensive purposes they seem identical raising the possibility that the same knapper made them or that they represent a specific tool type. The blades are relatively flat with rounded tips, possibly the result of use. While argillite, due to its platy and relatively soft character, was not a raw material that lends itself to its use as a perforator, the rhyolite used for these drills rated a 5 on the Mohs scale of hardness, making it as hard as tooth enamel. It is possible that these were in fact not

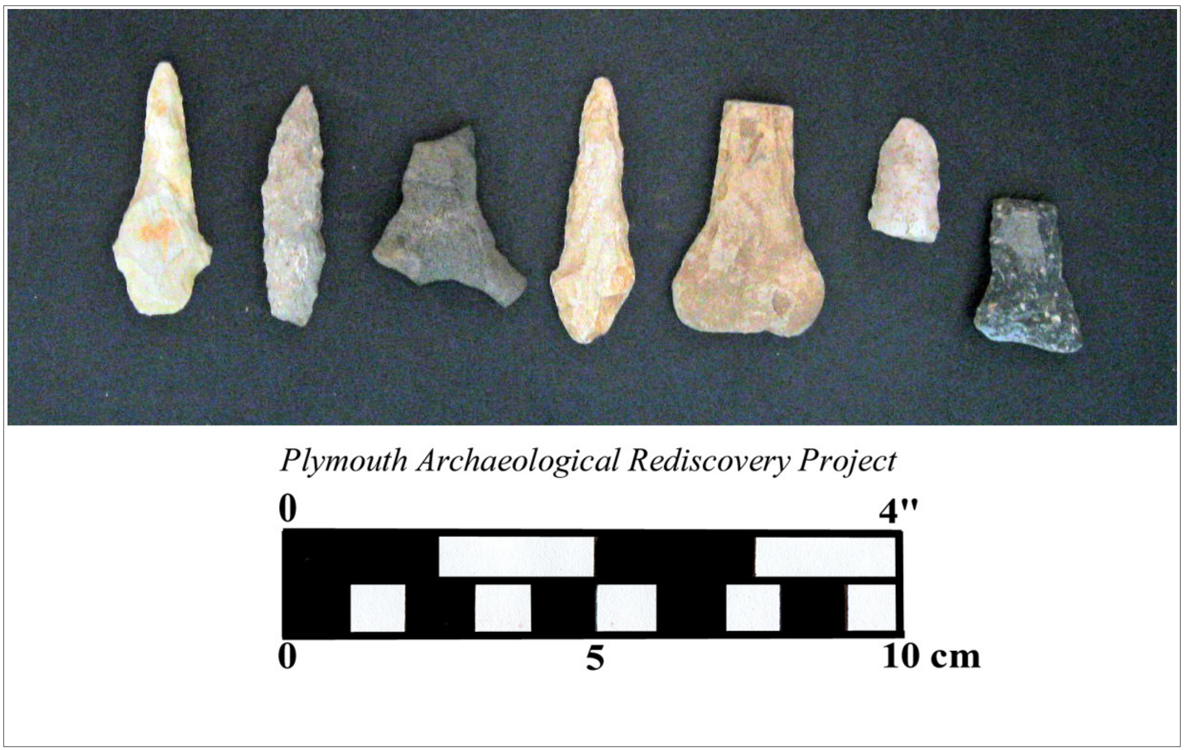

Figure 1. Perforators
(Left to right: L2H-B1 N271 E213 45-50 cm, L4S-PZ N150 E144 0-34 cm, L4H-STRIP 7m E 0m S, L4S-C N147 E148 0-40 cm, L4H-C N152 E130 0-37cm, L4S-SQ N145 E149 40-45 cm, L5H-C N128 E184.5 30-50 cm)

drills or perforators but specialized projectiles, possibly similar to bodkin points. Bodkin points are narrow points with a flat cross-section that theoretically could have provided better or longer flight and may have been cheaper to produce. The term bodkin point is generally associated with iron arrowheads, but there is no reason to assume that knappers produced stone spear points in a narrow form for the same reasons associated with iron ones. Hodge (1907: 90) illustrates an artifact that would be typically classified as a "drill" embedded in a human skull from an Illinois mound.

Excavation at Locus 9 at Annasnappett Pond recovered drills and drill fragments from the Middle Archaic assemblage, including one manufactured from argillite (Doucette and Cross 1997:203).

Dincauze identified several argillite "drills" or "perforators" in her study of cremation cemeteries in eastern Massachusetts (Dincauze 1968). She reported six of argillite, six of rhyolite and three of chert. Wear was rarely observed on the specimens. Dincauze attributes this to the lack of complete specimens and the decomposed surfaces on the argillite (Dincauze 1968: 28). She observed that one tool had worn facets attributed to drill rotation while another bore a polished surface at the tip, interpreted as indicative of use as a perforator versus a drill (Dincauze 1968: 29). Unfortunately Dincauze did not record any information describing their thickness or cross-section shape- characteristics which would prove useful in determining their function.

The argillite drills from the Muttock-Pauwating site are .7 cm wide at their working ends, matching the diameter of the hole in the stone gorget recovered from the site. Excavations recovered the midsection and distal end of another drill from L4H-C-N152 E130. It appears made of rhyolite but is of another form. In this case the base is flat and spatulate and the blade is .5 cm thick and 1.5 cm wide (a 1:3 ratio of thickness to width). This tool has a hinge fracture on one side. The thickness to width ratio makes it difficult to see how effective this drill would be for drilling as it is thin and wide, making it prone to breakage without any observable advantage to its ratio. The drill from L5H has snapped at the midsection, but someone reworked the end into a scraper and the butt end of the base as a scraper. Both surfaces bear wear and polish consistent with scraper use. The drill from the L4H stripping appears is a multi-drill made from a Levanna point. Use resulted in all three drill bits being broken in their midsections (Table 1). Two bits bear hinge fractures. Hinge fractures are the result of the

Table 1. Recovered perforator attributes

Location	**Material**	**Length**	**Width**	**Thickness**	**Thickness to width ratio**
L2H-Sq-N271 E213	Argillite	4.6 cm	1.8 cm	.5 cm	1:3.6
L4S-Pz-N150 E149	Rhyolite	4.4 cm	1.1 cm	.6 cm	1:1.8
L4S-Sq-N145 E149	Quartz	2.2 cm	1.1 cm	.6 cm	1:1.8
L4S-C-N147 E148	Argillite	4.9 cm	1.5 cm	.5 cm	1:3
L4H-Strip	Hornfels	3.4 cm	.6 cm	.2 cm	1:2
			1 cm	.6 cm	1:1.7
			1 cm	.4 cm	1:2.5
L4H-C-N152 E130	Rhyolite	4.2 cm	1.5 cm	.5 cm	1:3
L5H-C-N128 E184.5	Rhyolite	2.7 cm	2.1 cm	.6 cm	1:3.5

force applied to the tool rolling away from it causing the hinge (Andrefsky 1998:86). This is consistent with its as a drill. Overall the recovered drills had width to thickness ratios ranging from 1:1.8 to 1:3.6 with the average being 1:2.5.

Researchers have recently suggested that Small Stemmed points may have also been used as drill and perforators based on wear patterns. Looking at their length to thickness ratios (range 1:1.6-1:4; average

1:2.1) they do not seem consistent with the recovered drills. Most (n=28) of the 32 recovered Small Stemmed points had ratios that fell between the range of 1:1.9-1:3, where the drills were less consistent in their ratio ranges and only two falling in this range. The pattern that emerges is that the Small Stemmed points were a specific style type with specific parameters of ratios whereas the drills had much more variability, possibly related to the size of the hole desired, the material it used on and the period produced. Drills and perforators appear to be a much less standardized but more flexible tool type.

Hammerstones

Hammerstones are used in percussion flaking to remove flakes from a core using a technique called direct hard-percussion. Hammerstones impart large amounts of force that is often difficult to control and are best utilized for early stage reduction.

Testing recovered six hammerstones and one core with extensive battering on one edge **(Figure 2).** Four of the hammerstones were found in L2H. These consisted of one schist, one quartz, one argillite and one rhyolite cobble, all roughly rounded to oval in shape (Table 2).

Table 2. Recovered hammerstone attributes

Location	Material	Length	Width	Thickness	Weight
L2H-A-N274.4 E210.3	Schist	9.5 cm	6 cm	2.5 cm	187.9 g
L2H-C-N270 E215	Quartz	5.4 cm	5.3 cm	4.5 cm	147.3 g
L2H-Strip	Argillite	7.7 cm	5.6 cm	2 cm	139.8 g
***L2H-B1-N272 E212**	Rhyolite	9.2 cm	7 cm	4 cm	205.4 g
L5H-A-N132 E184.5	Rhyolite	6.7 cm	5 cm	2.4 cm	129.9 g
L7SN-Strip	Schist	10.1 cm	6.3 cm	3.7 cm	365 g
****L8S-A-N92E321.1**	Schist	12 cm	6 cm	2.6 cm	349.1 g

* This piece is also included in the core tabulation
** This piece is also included in the abrader discussion

The rhyolite hammerstone (L2H-Sq-N272 E212) apparently was an opportunistic hammerstone. Its main purpose was as a core and raw material associated with Middle Archaic tools but one edge bear extensive battering. This was possibly the result of it being used to reduce other pieces of rhyolite. The hammerstone from Lot 8S was a multi-tool. It bears a V-shaped abrasion on one end, a result of it being used to sharpen the edge of stone cutting tools like axes, adzes or celts. The hammerstones from lots 7 and 8 are larger, heavier, and bear less crushing than the remaining hammerstones. This may indicate a distinct use for these hammerstones, possibly for use on materials other than stone or possibly more for pecking versus hammering. The overall paucity of hammerstones reflects the limited amount of primary reduction that occurred in the project area as well as the preference for quartz as a raw

Figure 2. Hammerstones (Left to right: Top Row: L2H-C-N270 E215 0-40 cm, L2H-Strip SE, L7SN-Strip Overall, Bottom Row: L2H-A-N274.4 E210.3 55-60 cm W1/2, L2H-Sq-N272 E212, L5H-A-N132 E184.5 40-45 cm W1/2)

material. Personal experience has shown that, due to it tendency to fracture along crystal planes and faults, quartz is more suited to reduction by soft-percussion. Soft-percussion utilizes billets made from bone, antler or wood to remove flakes from cores or bifaces.

Unmodified Curated Lithics and Mineral Pigments (Fulgurites, Crystals, Mica, Hematite, Graphite,)

Small fragments of graphite, mica, hematite, quartz crystals, and fulgurites were found across the project area but excavators recovered most pieces in all classes from impact areas L4S to L6H (Table 3).

Table 3. Unmodified curated lithics and mineral pigments

Location	Graphite	Hematite	Mica	Crystals	Fulgurite
L1H		2		2	
L1HN				1	
L1S		1		1	
L2H	1				
L4H	1				

Table 3. (Cont.)

Location	Graphite	Hematite	Mica	Crystals	Fulgurite
L4S	8	1		1	
L5H	18	1		1	
L6H	3	3	2	3	
L6S	1				
L7H	1				
L7HN	2			1	
L7SN	2	2			
L8HN	7				2
Totals	**44**	**11**	**2**	**10**	**2**

Graphite

Native people used graphite and hematite as "paint stones", being ground and mixed with grease and applied to the body creating the stereotypical "war paint" often associated with Native warriors as well as the more everyday body and mourning paint. Painting the face and body may have actually been a major form of artistic expression. Minerals used to create body paints include graphite (also called black lead or plumbago), hematite and limonite (red and yellow ocher). Williams reported other materials used to create body paints: charcoal, clays, and the inner bark of the red pine tree (Williams 1971: 206). These pigments were ground into fine powders using small mortars and pestles. People applied grease to their bodies and the paints went onto the grease with the fingers. Women often painted their faces on an everyday basis and blackened their hair. Men painted their faces when going to war or playing the traditional ball game. William Wood interpreted the painting of their faces during the ball game as a way to disguise themselves and prevent mischief or repercussions on individuals due to injuries or slights during the game (Wood 1977: 104). While it is unknown if certain colors always held certain significance to Native people, it is known that they used black in times of mourning, and red during rejoicing (Lechford 1867:116). Recorded face painting patterns included spottting, painting halves of the face separate colors, a black stripe down the center of the face, crosses, and the painting of the hollows of the eyes and nose (Johnson 1867:116).

One source for graphite is in western Massachusetts in the Sturbridge area, but the small size of the fragments and their generally natural shape, makes it possible that they are natural and were not transported here by human hands. A closer source of graphite is on Conanicut Island in Narragansett Bay (Ritchie 1980:45). Graphite is commonly recovered from Late Archaic and Woodland contexts. Small Stem culture assemblages often contain graphite and hematite paint stones (Ritchie 1969:215). When first describing Orient Fishtail cultural assemblages, he noted that they included high concentrations of graphite and hematite paint stones, co-occurring with and steatite bowls and some of the earliest occurrences of locally made pottery (Ritchie 1969:170). Graphite likely served a ceremonial role in the culture and mourners included it in Transitional Archaic burial assemblages. Simmons reported such an example from Jamestown, Rhode Island where a grave contained a clutch of graphite pebbles as well as lumps of red ocher and a red pigment stone (Simmons 1970: 17-27). Worked graphite pieces were also present in the assemblage from the Burr's Hill site (Ritchie 1980:45). Ocher is often associated with burials, where it was oftentimes spread over the body from Late Archaic to the Contact Period, but it was also used for paint.

Testing found graphite concentrated in lots 4 through 6 and 8 especially in L4S, L5H, L6H, and L8HN, the latter being the same lot that produced the fulgurites. Graphite fragments ranged in size from .7-5.6 cm in length and up to 22.5 g. Excavators recovered over half of the graphite fragments (n=26) from anomalies (Table 4). The anomalies in the southwestern portion of the project area that yielded

Table 4. Graphite fragment recoveries

Location	Anomaly Type	Count
L2H-A-N267.7 E215.5	MMP	1
L4S-A-N144.5 E145.5	LDP	1
L4S-A-N147.55 E140.4	MMP	2
L4S-A-N148.3 E141.25	MMP	1
L4S-A-N149.7 E142.6	LMP	1
L5H-A-N127 E181.7	MMP	2
L5H-A-N131 E181	MMP	1
L5H-A-N132.2 E180.1	Natural	2
L5H-A-N133.8 E176.2		1
L5H-A-N135 E186.5	LDP	2
L6H-A-N103.7 E231	MMP	1
L6H-A-N108.8 E235.7	Natural	1
L7H-A-N69 E259	Hearth?	1
L7HN-A-N56.6 E277	Hearth	2
L7SN-A-N72.3 E255.5	Hearth Dump	1
L7SN-A-N72 E253	LMB	1
L8HN-A-N63.9A E310A	SMP	1
L8HN-A-N63.9B E310B	SMP	2
L4H-Pz-N154 E122		1
L4S-C-N142 E146.5		1
L4S-C-N143 E146		1
L4S-C-N143.5 E148		1
L5H-C-N128.5 E184		1
L5H-C-N130 E185.5		1

Table 4. (Cont.)

Location	Anomaly Type	Count
L5H-C-N130.5 E184		1
L5H-C-N131 E188		1
L5H-C-N131 E192		1
L5H-C-N132 E183.5		1
L5H-C-N132 E187.5		1
L5H-C-N132.5 E176		1
L6H-Pz-N112 E228		1
L6S-Pz-N116 E250		1
L8HN-Pz-N66 E310		2
L8HN-Pz-N70 E316		1
L8HN-Pz-N74E318		1
Total		**44**

graphite fragments were medium and large-size medium depth pits (n=7 anomalies), one large deep storage pit and one natural anomaly that received refuse in the past. Anomalies in the southeastern and eastern quarters of the project area that yielded graphite were hearths and hearth dumps, one large medium depth basin and two small medium depth pits.

Excavations recovered 10 fragments of possible hematite from lots 1, 4, 5, 6 and 7 (Table 5).

Table 5. Hematite recoveries

Location	Anomaly Type	Count
L1H-Scraping		1
L1H-Scraping		1
L1S-Scraping		1
L4S-C-N143.5 E148		1
L5H-A- N131 E181	MSB	1
L6H-A-N100.6 E237.2	MSP	1
L6H-A-N103.8 E244	LDP	1
L6H-A-N104.5 E243	LDP	1
L7SN-A- N72.3 E255.5	MMP/ Hearth	2
Total		**10**

The pieces from Lot 1 all measured 6.2 to 6.3 cm in length and were unmodified small cobbles of possible hematite. Excavations at the Wapanucket Site recovered larger pieces of hematite with abrasions, several of which were fire-cracked (Erb 1970:22). Erb postulated that Native people heated large pieces of hematite in fires to made them more friable and easier to grind or crush and to heighten to red color of the mineral (Erb 1970:21, 23). The recovery of hematite from the hearth in L7SN may indicate this while the lumps from L1H and S are raw hematite.

Crystals

Crystals recovered from archaeological sites in Massachusetts have been given a spiritual or "magic" connotation in recent analysis. William Fowler was the first to attempt to give crystals and other "magic stones" (gastroliths, crystal quartz discs, quartz and other banded and brightly colored pebbles), a religious association (Fowler 1975). He reviewed a number of unmodified or slightly modified attractive stones recovered from grave contexts from the Late Archaic to Contact periods and concluded that they represented items placed in the graves by "shamans" during burial rites in the case of the earlier recoveries, and a personal possession in the case of the Contact period recovery (Fowler 1975). In the latter case, be determined that he recovery of an eight-crystal quartz cluster from a bark envelope container indicated the decline of the importance of "magic stones" as items associated with medicine people, with the stones assuming a more secular role reflective of the presumed decline in Native culture following European arrival (Fowler 1975: 14-15). Fowler reviewed ten burials from West Brookfield and southeastern Massachusetts and Cape Cod, noting the recovery of various "magic stones" in the graves.

Fowler reports the recovery of quartz crystals from four of the graves- two from the Crow site, North Chatham, one from Rich Site in North Truro (Late Archaic) and one from the Titicut site in Bridgewater (Fowler 1975: 13-14). One burial at the Rich site contained an amethyst double terminated crystal and a ferrous stained quartz crystal (Fowler 1975:14). It is unknown if this "ferrous stained" crystal was red brown in color naturally or possibly as a result of contact with decomposing iron pyrite. Fowler noted that one of the Crow point burials had a "flint fire striker" in it as well as "a large quartz crystal with a worked base" (Fowler 1975:12). It is unknown what the degree of working was to the base and if the working could have been the result of its use as a strike-a-light.

More recently, Murphy has interpreted the recovery of a number of natural quartz crystals in and around a historic period cellar hole in Ashland, Massachusetts, as evidence of the utilization of crystals by Native people at the historic period Magunco Praying Indian community (Murphy 2002). The site, which consists only of a stone lined cellar hole, has been (tenuously) interpreted as being associated with the Magunco community meetinghouse. Archaeological excavation by the University of Massachusetts, Boston, resulted in the recovery of several worked and unworked clear and smoky quartz pieces, including several crystals. The crystals were formed in the voids (vugs), or quartz veins and were liberated as a result of human agency. Six true crystals were recovered- three partial (with at least one face present), one amethysts, one classic crystal and one small crystal as well as several pieces of unworked smoky quartz which Murphy attributed possible spiritual significance based merely on their presence at the site (Murphy 2002:36). No interpretation is given why Native deposited these crystals, presumed by Murphy as important shamanistic artifacts. Murphy quotes Brady and Prufer who state that "all of the ethnographic sources tie the use of crystals very specifically to shamanism" (Murphy 2002: 41). Two sources that discuss the use of crystals in the historic period (Archer and Brereton as discussed below) do not.

Dr. Curtis Hoffman has interpreted the recovery of crystals from his ongoing excavations at the Little League Site in Middleborough, Massachusetts, in much the same religious or ceremonial way. Excavations recovered many crystals at the site- 44 clear, 9 white, 2 rose and 1 smoky- with some of the larger ones showing wear on the edges (Hoffman 2004:63). Excavators recovered 19 of these from topsoil (including nine recovered "on the surface"), four were in disturbed soils, two were in the subsoil and 28 were in feature soils (Hoffman 2004:66). The crystals ranged in length from 12 to 126 mm (average 40.2 mm), in width from .7 to 117 mm (average 30.3 mm) and in weight from 1 to 117.6 g (average 90 g) (Hoffman 2004: 66). Hoffman interpreted them as having been freed from larger pieces of quartz that bore crystal containing vugs during lithic reduction. Twelve biterminated crystals, interpreted as "Herkimer diamonds", were also recovered (Hoffman 2004:66). The recovery of such a large number of crystals at the site, in non-ceremonial contexts, begs the question regarding their presumed ceremonial nature. The presence of wear on several of the larger crystals may contribute to the interpretation of their use in fire-starting sets versus being part of ceremonial assemblages.

Bartholomew Gosnold explored New England in 1605, with one of his claims to fame being his naming of Cape Cod as such. Gosnold's associates Gabriel Archer and John Brereton, who traveled with him in 1605, noted the use of crystals and pyrite by the Natives in the area to start fire. Archer recorded that they asked a Native man to start a fire for them

"...which with an Emerald stone (such as the Glasiers use, to cut glass) he did. [I] take it to be the very same that in Latine is called Smiris [emery], for striking therewith upon Touch-wood that of purpose hee had, by meane of a mynerall stone used therein sparkles proceeded and forth with kindled with making of flame." (Quinn 1983:136).

Brereton may have seen the same display by the Native for he records that

"They strike fire in this manner; every one carrieth about him in a purse of tewed leather, a Minerall stone (which I take to be their copper) and with a flat Emerie stone (wherewith Glasiers cut glasse and Cutlers glase blades) tied fast to the end of a little sticke, gently he striketh upon the Minerall stone, and within a stroke or two, a sparke falleth upon a piece of Touchwood...and with the least sparke he maketh a fire presently." (Quinn 1983: 136).

Roger Williams and Thomas Morton reported that Natives obtained their "Minerall stones", likely iron pyrites, through trade from the Pequots (Piquenteenes) (Williams 1971: 100,131, 150; Morton 1972: 112). Iron pyrites also outcrops in the Blue Hills south of Boston. Archaeologists recovered pyrite fire starting sets from archaeological sites in New England (Willoughby 1973:18, 78-79). Along with the mineral stone, a striker is necessary. This would have been the "Emerald" or emerie stone mentioned in the accounts above which would have consisted of a quartz crystal hafted on the end of a "little sticke".

Excavations recovered 10 crystals or crystal fragments (Table 6). Archaeologists recovered most

Table 6. Crystal recoveries

Location	Notes	Anomaly Type	Length	Width	Thickness
L1H-A-N313.55 E172.5		Natural	2.3 cm	.55 cm	.55 cm
L1H-Pz-N312 E178	3 facets		2.5 cm	1.5 cm	1.2 cm
L1HN-A-N298 E187.7	Gray	Natural	1.6 cm	.8 cm	.8 cm
L1S-Pz-N298 E190	2 facets		1 cm	.4 cm	.4 cm
L4S-A-N148.2 E139.6		MMP	.8 cm	.4 cm	.4 cm
L5H-A-N132 E184.5		MSB	1.4 cm	.7 cm	.6 cm
L5H-N138 E180	Biface fragment		1.2 cm	1.9 cm	1.2 cm
L6H-A-N103.8 E244	6 facets, chipping on tip	LDP	1.1 cm	.5 cm	.6 cm
L6H-A-N100.6 E237.2	Triple pillar	MSB	1 cm		
L6H-A-N108.3 E241.6	6 facets	Natural	1.1 cm	.6 cm	.7 cm
L7HN-Strip	4 facets		2.1 cm	1.5 cm	1 cm

of the crystals from anomalies, interpreted as both natural and cultural **(Figure 3).** Excavation

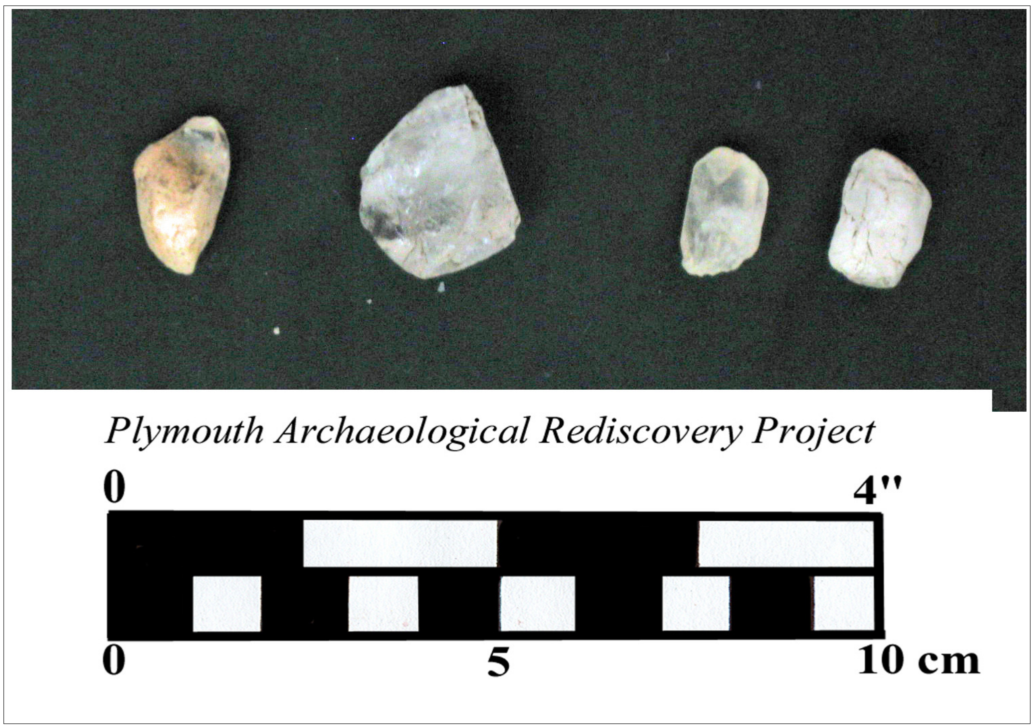

Figure 3. Crystals recovered
(Left to right: L5H-A-N132 E184.5 40-45 cm E1/2, L5H-N138 E180 0-30 cm, L6H-A-N103.8 E244 105-110 cm N1/2, L6H-A-N108.3 E241.6 35-40 cm S1/2)

recovered crystals from one medium-sized medium depth cache pit, two medium-sized shallow basins and one large deep pit. In all cases the crystal appeared as inclusions within refuse deposited in the anomalies. Excavations recovered one large quartz cobble from the subsoil of the site in L7SN. This cobble bore a vug that contained several smaller crystals. This indicates that Native people could have liberated the crystals from cobbles found at the site during reduction. The Native people may have viewed the crystals as curiosities but their deposition with other refuse may indicate that they had no special status. One crystal, from L6H large deep pit, bore chipping on the tip, possibly indicating that it was as part of a fire-starting set. Luedtke analyzed quartz shatter recovered from a late seventeenth century deposit at the Ezra Perry II (a.k.a. the Aptucxet Trading Post Museum) site in Bourne, Massachusetts (Luedtke 1998b). She discovered that pieces of quartz shatter showed evidence of having been struck against metal in much the same way, and leaving the same type of metallic residue on the surfaces, as the flint strike-a-lights and gunflints from the site (Luedtke 1998b: 44-45). Native-made quartz gunflints are known from Long Island and Pennsylvania (Luedtke 1998b: 45), so the use of quartz, even quartz crystals, as part of a fire starting kit is a plausible alternative to more metaphysical interpretations of the presence of quartz crystals at Native sites.

Fulgurites

Excavations in L8HN recovered two fulgurites in anomaly N65.1 E307.5 from 35 to 40 and 45 to 50 cmbs in the north and south halves **(Figure 4)**. Lightning strikes form fulgurites in quartz-

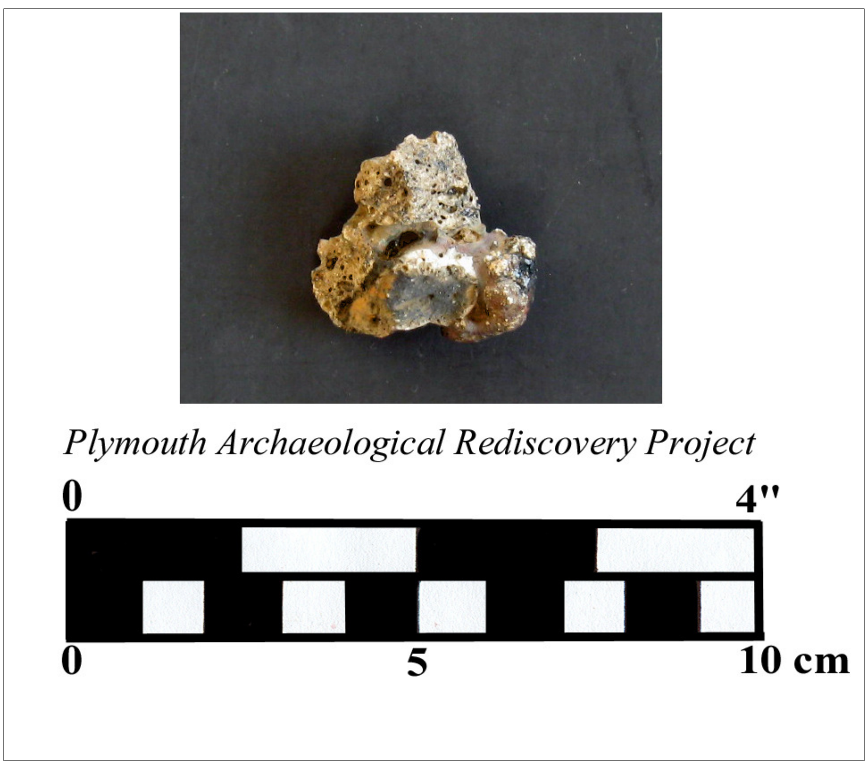

Figure 4. Fulgurite (L8HN-A- N65.1 E307.5 35-40 cm)

bearing soils when the strike fuses the sand into quartz-glass. The lightning forms the glass in the space of approximately one second when it heats the sand to a temperature of over 1800° C (3,270° F). Roger

Williams noted that the Natives considered the fulgurites special or precious "I have seen them keep as a precious stone a piece of Thunderbolt, which is like unto a crystall, which they dig out of the ground from under some tree, Thunder-smitten" (Williams 1971: 195. Murphy (2002) attributed Williams quote as referring to the keeping of crystals (such as quartz crystals) but clearly Williams is speaking of fulgurites. Recovered in association with the fulgurites were a quartz core, a quartz flake fragment, two pieces of quartz shatter, fire-cracked rock, charcoal, and a Pennsylvania jasper flake. The fulgurites in this anomaly were not created here but collected as subsequently deposited here either purposefully or accidentally. The paucity of artifacts in this anomaly suggests that the occupants of the site knew they disposed of or deposited into the pit. It is unknown of course how the occupants of the site regarded the fulgurites- as curiosities or as special items.

The fulgurite was analyzed by Russ Kempton of New England Meteoritical Services (NEMS) in Mendon, Massachusetts. He identified it as a Type I fulgurite. Type I fulgurites are fused sand with thin, glasslike, walls. Analysis of the sample showed fusing of the silicates with exposed rounded walled vacuoles that are the result of the outgassing through rapid cooling from a melt. The texture of the sample indicated very high and brief temperature exposure in the range of 10,000-15,000 K. All these attributes are consistent with the production by means of a lightning strike, thus confirming this as a fulgurite. Kempton's complete analysis is presented in Appendix D.

Hoes

Roger Williams reported that the natives used stone for hoe blades “Obs. Whence they call the English-men Chauquaquock, that is knive men, stone formerly being to them in stead of knives, awle-blades, hatchets, and howes.” (Williams 1971: 66). He also states that hoes were commonly made of perishable materials as well “The Indian women to this daye (notwithstanding our Howes) doe use their naturall howes of shell and wood.” (Williams 1971: 124). Southern New England Native people called a pre-Contact hoe an “ Anaskhig” (translated as “the tool used to work the ground”). Colonists and explorers traded metal hoes of two varieties; a hoe used for the initial breaking up of ground, called an “Anaskhomwautowin” (translated as “an English tool used to work the ground), and a hoe for weeding, a broad hoe, called a “Monaskunnummautowwin” (translated as “a great English tool used to work the ground”) (original words recorded by Roger Williams 1971: 124, translations by the present author).

Excavations recovered six hoes from lots 4, 5, 7SN, 7H, and 8HN **(Figure 5)**. A Native person reworked one hoe from an adze fragment. Archaeologists recovered this hoe from L7H during machine stripping of the plowzone at N67.2 E 257.8, just outside of a round house form. The adze fragment consists of the butt end and lower portion of the midsection of gray argillite. The overall shape of the adze is a long tapered triangle with squared sides and a wide bit. It appears that someone had broken the tool in use when the bit end and upper portion of the midsection split off along a natural bedding plane in the stone. The remaining exterior surface of the adze shows evidence of pecking and grinding, which the was the technique used to shape the it. Adzes of this plano-convex shape date to the archaic period. A complete adze was either reworked into a narrow hoe, or a broken adze was found by the Late Woodland inhabitants of the site and one of them reworked it into a hoe.

Testing uncovered another fragment of a more parallel sided narrow hoe from L4S during machine stripping of the plowzone. This hoe fragment is of gray green rhyolite and measures 8 cm long by 5.7 cm wide and 2.7 cm thick. It appears to have been an oval cobble which was then reduced to create an

Figure 5. Hoes
(Left side Left to right: L7SN-N67.2 E 257.8-Stripping-30 cm, L4H-Stripping 9.7m E 2m S of NE corner; Center top: L5H-Stripping NE 1/2, Bottom: L4S-Stripping; Right side Left to Right: L8HN-A-N64.5E307.8 50cm W1/2, L7SN-A N74.5 E257.5 30-35 cm E. Stain S1/2)

elliptical shaped blade while retaining the cobble cortex on one side. Excavation recovered two almost identical argillite hoe from L7SN and L8HN. Each bear a single half-circular chipped out area on one edge as the only modification to the natural tablet. The argillite appears to be from the same source as both pieces are the same color and texture and appear identical to each other. Table 7 shows a comparison of the pieces.

Table 7. Comparison of the two argillite hoes

Location	**Length**	**Width**	**Thickness**	**Notch diameter**	**Weight**
L7SN-A N74.5 E257.5	11.2 cm	7.7 cm	1.3 cm	2.1 cm	197.6 g
L8HN-A-N64.5E307.8	17.5 cm	6.5 cm	1.1 cm	2.7 cm	166.5 g

Both were also discarded in identical contexts- medium-sized medium depth cache pits within house forms.

One triangular-shaped piece of schist bearing a limited amount of reduction evidence analysis interpreted it as a possible stone hoe. Two sides of the triangle are relatively straight, one naturally so and the other bearing limited knapping, while the third, presumably the working edge, rounded in a half-moon shape. Archaeologists recovered this tool from the Lot 5H impact area during machine stripping of the plowzone. It measures 9.6 cm long by 7.7 cm wide, 2.5 cm thick and weighs 216.9 grams. This hoe could be described as a relatively broad hoe and a native woman would have used it for weeding versus breaking up the ground.

Testing recovered a second well-shaped hoe from within the longhouse in Lot 4H. This is a narrow hoe made from quartzite. A knapper formed it into a narrow elongated triangular shape. One surface is very flat and well-formed for hafting against a flat handle probably made from a natural crotch of a branch into a tree trunk. This tool is 16.5 cm long, 5.4 cm wide at its widest end and 2.5 cm wide at the narrowest, 2.5 cm thick, and 330.6 g in weight. These tools have also been described as corn-planters (Fowler 1963:25). Fowler states that these are simple stones six to seven inches long that have a stubby end and a broader hafting end (Fowler 1963:5) For use in planting hafting would be with the blade parallel with the handle. A Native person, most probably a woman, would use it to make the planting holes. The edges of the recovered tool show wear in the form of moderate and fine chipping on the end and lower edges. Analysis interpreted this as the result of the actual use as a hoe where the wielder encountered an occasional stone chipped it. Chipping appears most often as having originated from the rear to the front, which would be expected if the owner hafted the tool at an angle and used it for hoeing versus planting.

Cores

A core is defined as "an objective piece that has had flakes removed from its surface" (Andrefsky 2005:80). Cores may serve as the source of flakes that are used as flake tools reduced to artifacts that could be placed into recognized categories (scrapers, points, knives). Cores can also be used as tools themselves most commonly serving as choppers, or reused as hammerstones. As a knapper removes flakes, the core gets smaller and smaller, eventually reaching the point where it ceases to possess a mass that can produce usable flakes. At this point the core is exhausted and often discarded. Archaeologists call cores with flakes removed in one direction unidirectional or blade cores. They call cores with flakes taken off in multiple directions from several flat striking platform surfaces multi-directional cores.

Excavation recovered 60 cores from across the project area (**Figure 6, Table 8).** The

Table 8. Cores

Location	**Quartz**	**Rhyolite**	**Quartzite**	**Saugus Jasper**
L1H	4			
L1S	1			
L1HN	2			
L1SN			1	
L2H	6	4		

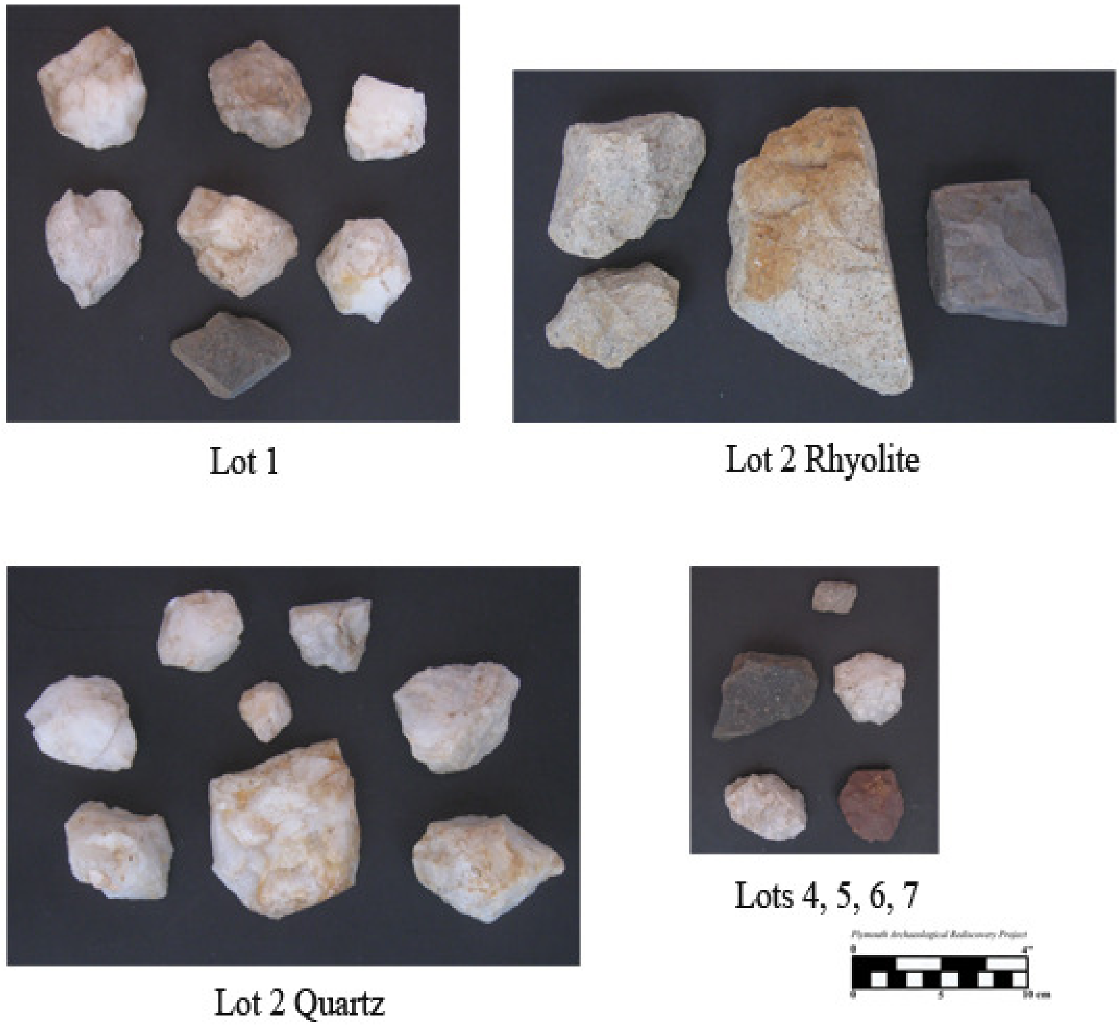

Figure 6. Cores

Figure 6. (Cont.)
Lot 1
Top Row Left to Right: L1HN-A N300 E178 SQ N299 E178 70-75 cm, L1S-Stripping, L1HN-A N300 E178 SQ N299 E178 35-40 cm
Middle Row Left to Right: L1H-Scraping 4.8 m N 3.4 m E, L1H-Stripping NW, L1H-PZ N310 E180 0-30 cm
Bottom Row: L1SN-PZ N310 E192 0-20 cm

Lot 2 Rhyolite
Left to Right: L2H-B1 N272 E211 40-45 cm (2 left pieces), L2H-B1 N272 E210 35-40 cm, L2H-B1 N272 E213 45-50 cm

Lot 2 Quartz
Top Row Left to Right: L2H-B1 N271 E215 50-55 cm, L2H-PZ N271 E212, L2H-C N270 E214 0-35 cm
Middle: L2H-B1 N272 E211 40-45 cm
Bottom Row left to Right: L2H-PZ N274 E220 0-40 cm, L2S-PZ N292 E214 0-37 cm, L2H-Backdirt

Lots 4, 5, 6, 7
Top: L4H-PZ M144 E142 0-34 cm
Middle Row Left to Right: L5H-Stripping SW 1/4, L5H-C N132 E165 30-55 cm
Bottom Row Left to Right: L6H-A N108.3 E241.6, L7HN-Stripping

Table 8. (Cont.)

Location	Quartz	Rhyolite	Quartzite	Saugus Jasper
L2S	1			
L4H	8	1		
L4S	8	3		
L5H	1	3		1
L6H	3			
L6S	1	1		
L7H	4			
L7HN	2			1
L7SN	3			
L8HN	1			
Total	**45**	**12**	**1**	**2**

majority of these are of quartz, with rhyolite being the next most common raw material used. Quartzite and Saugus Jasper also rarely occur. Squibnocket Triangles and Small Stemmed points showed definite evidence of having used cores in their production. This took the form of intact striking platforms on completed points. Native artisans manufactured Levanna points from flakes but were these points were more carefully and fully reduced, resulting in only slight traces of flake curvature and no striking platforms. High occurrences of quartz cores correspond with high occurrences of quartz Late Archaic and Late Woodland points (Table 9). Knappers removed flakes from two cores, one from L6H and one

Table 9. Core recovery versus Levanna and Squibnocket Triangle recovery locations

Location	Squibnocket	Small Stemmed	Levanna	Core
L1H		2	1	4
L1HN	4		1	2
L1S	2			1
L1SN			1	1
L2H	3	1	2	6
L2S		1		1
L4H	7	4	6	8
L4S	26	4	3	8
L5H	3	1	3	1
L6H	3	5	2	3
L6S	1		3	1
L7H	3		4	4
L7HN			2	2

Table 9. (Cont.)

Location	Squibnocket	Small Stemmed	Levanna	Core
L7SN	2		4	3
L8H			1	
L8HN				1

from L7SN. These flakes were long and blade-like flakes versus irregularly-shaped. They may date to the Late Woodland period based on where their recovery location (Table 9) making it likely that Native people used them for producing formal tools such as these point types and bifacial scrapers, as well as informal tools such as utilized flakes and unifaces. This probably indicates a more sedentary lifestyle versus a mobile one. Quartz cores ranged in size from 2.7 to 16 cm with the average being 6.2 cm. Many of the quartz cores were oval to round. This likely reflects their origin as rounded glacial cobbles. The postulated origin of the quartz raw material is supported by the well-weathered cortex on several cores.

Testing recovered 12 rhyolite cores with L2H having the highest occurrence or cores. Archaeologists found the L2H cores associated with the Middle Archaic occupation of the site. Coordinating the colors of the rhyolite cores with the colors of the recovered projectile points indicates a high correlation between core colors and projectile point colors by location (Table 10).

Table 10. Rhyolite core recoveries with associated point types

Location	Color	Count	Corresponding Point Type
L2H	Light Grey Green	1	Neville, Stark
	Purple Grey	1	Stark
L4H	Light and Dark Grey Mottled	1	Wayland*
L4S	Grey	2	Wayland, Fox Creek, Small Stemmed
	Very Dark Grey	1	Squibnocket triangle
L5H	Dark Grey	1	No Corresponding Point
	Green Grey	1	Boats
L6S	Purple Grey	1	No Corresponding Point

*Point was found in L4S but is same material

Unlike the quartz cores,the rhyolite cores were irregularly-shaped, possibly indicating the removal of larger pieces for further reduction versus the removal of flakes. Cores from L2H, L4S, and L5H bore cortex on their surface indicating their original source as glacial cobbles. One core from L6S appears to have had long blade-like flakes removed from it. No corresponding points or tools could be correlated with this core possibly indicating its use for blade production versus point production. Lithic analysis found that knappers used purple rhyolite to produce a Stark point recovered in L2H. Excavation recovered one tip and midsection fragment from a broad bladed point from L6H the same lot with the purple rhyolite core. Rhyolite cores ranged in size from 2.5 to 11 cm with the average being 6.6 cm long, very similar to the quartz core average of 6.2 cm.

Testing recovered one quartzite core fragment from L1SN. The core fragment measured 4 cm long and was gray No corresponding tools made of this material were found in this lot but three Stark points were found in the project area made from gray quartzite.

Excavation recovered two Saugus jasper cores, one from L5H and one from L7HN. No Saugus jasper tools were found in these areas, but archaeologists found one Saugus Jasper Wayland Notched point in L6S. The cores were 2.2 cm 4.5 cm long. Recovery of cores of Saugus Jasper indicate that knappers acquired raw material and not just finished points from quarry sources to the north.

Bifaces

Excavation recovered 75 bifaces and biface fragments from across the project area (Table 11).

Table 11. Recovered bifaces

Location	Quartz	Rhyolite	Chert	Attleboro Red Felsite	Penn. Jasper	Saugus Jasper	Argillite	Quartzite
L1H	2		1					
L1HN	3	1						1
L1S	1							
L2H	5	4		1				
L4H	9	5					1	
L4S	16	1			1			
L5H	8	2	2					
L6H	2					1		
L6S	1	1						
L7H			1					
L7HN	1	1						
L8H		1	1					
L8HN		1						
Total	**48**	**17**	**5**	**1**	**1**	**1**	**1**	**1**

These represent tools abandoned during manufacture as a result of breaks or due to poor reduction. The distribution of biface and biface fragments corresponded with other lithic reduction evidence, especially in the case of Lot 4. Knappers manufactured most of the complete bifaces and biface fragments from quartz with rhyolite being next common. Bifaces present represented stage II to IV in the bifacial reduction sequence with most being Stage II and III and several showing perverse manufacturing breaks **(Figures 47-49).** Biface shapes included irregular, round, oval and teardrop (Table 12). It is believed that the oval to teardrop shaped

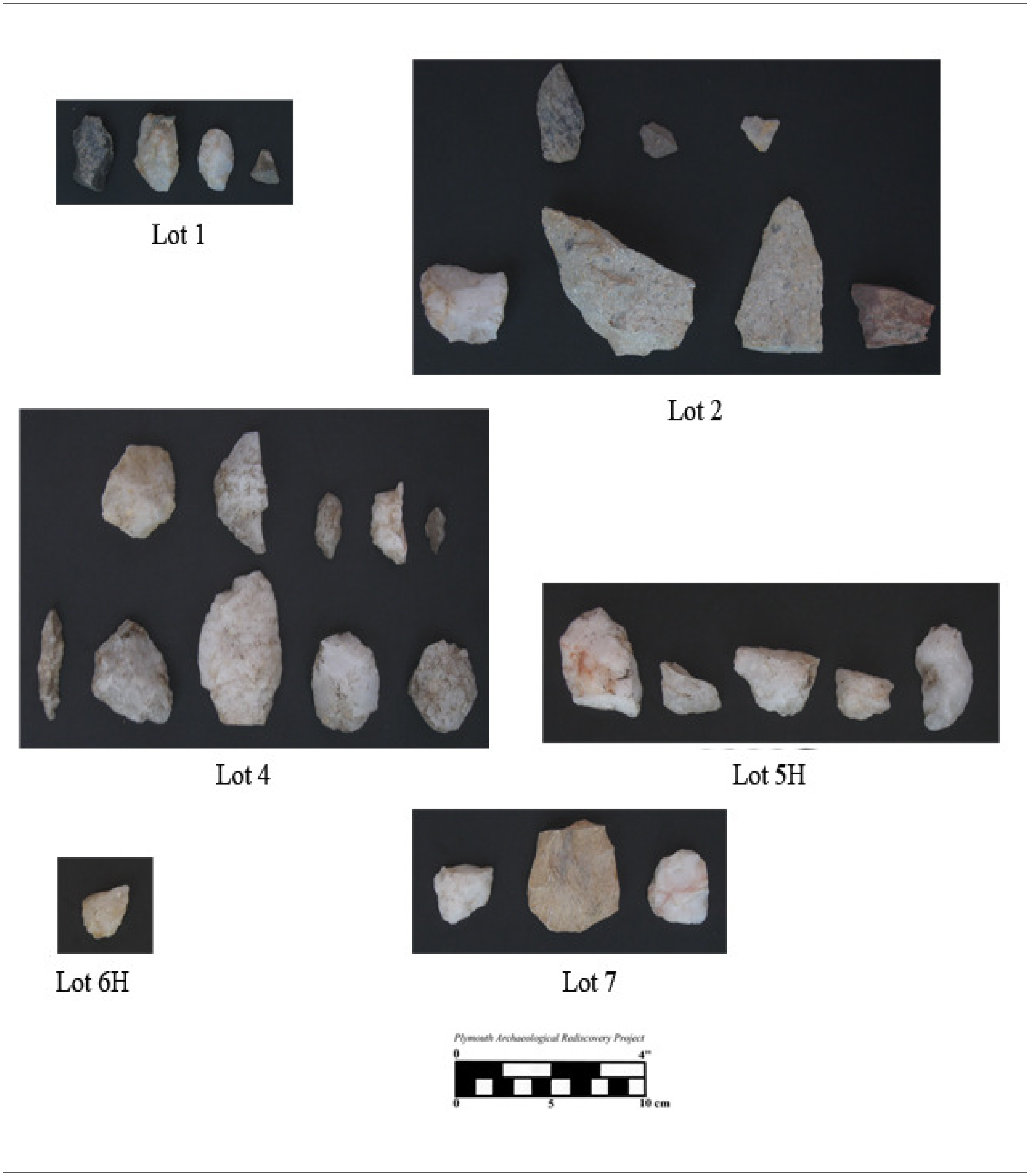

Figure 7. Stage I bifaces

Figure 7. (continued- locations)

(Lot 1 Left to Right: L1H-PZ N300 E180, L1H-B1 N314 E176 20-30 cm, L1S-PZ N298 E196 0-20 cm, L1HN-A N300 E178 sq N301 E179 60-65 cm Fill 3

Lot 2 Top Row Left to Right: L2H-B1 N270 E216 60-65 cm, L2H-C N274 E219 0-30 cm, L2H-B1 N268 E217 65-70 cm W1/2, Bottom Row Left to Right: L2H-C N269 E214 0-30 cm, L2H-B1 N272 E212 45-50 cm, L2H-B1 N271 E215 70-75 cm, L2H-C N268.5 E214 0-40 cm

Lot 4 Top Row Left to Right: L4S-SQ N145 E149 40-45 cm SW, L4S-PZ n144 E142 0-34 cm, L4S-C N144 E147.5 0-37 cm, L4S-SQ N145 E151 40-45 cm NW, L4H-PZ N140 E126 0-45 cm, Bottom Row Left to Right: L4H-PZ N150 E124 0-36 cm, L4H-PZ N142 E134 0-25 cm, L4S-C N146 E146.5 0-40 cm, L4S-C N148 E146.5 0-40 cm, L4H-PZ N142 E132 0-28 cm

Lot 5 Left to Right: L5H-C N134 E190.5 30-50 cm, L5H-A N129 E184.7 45-50 cm E1/2, L5H-C N130 E191.2 20-30 cm, L5H-PZ N132 E186 0-35 cm, L5H-C N130 E191.5 40-60 cm

Lot 6 L6H-B1 N108 E234 0-30 cm

Lot 7 Left to Right: L7SN-Stripping, L7HN-Stripping, l7H-A N68 E260 30-35 cm N1/2)

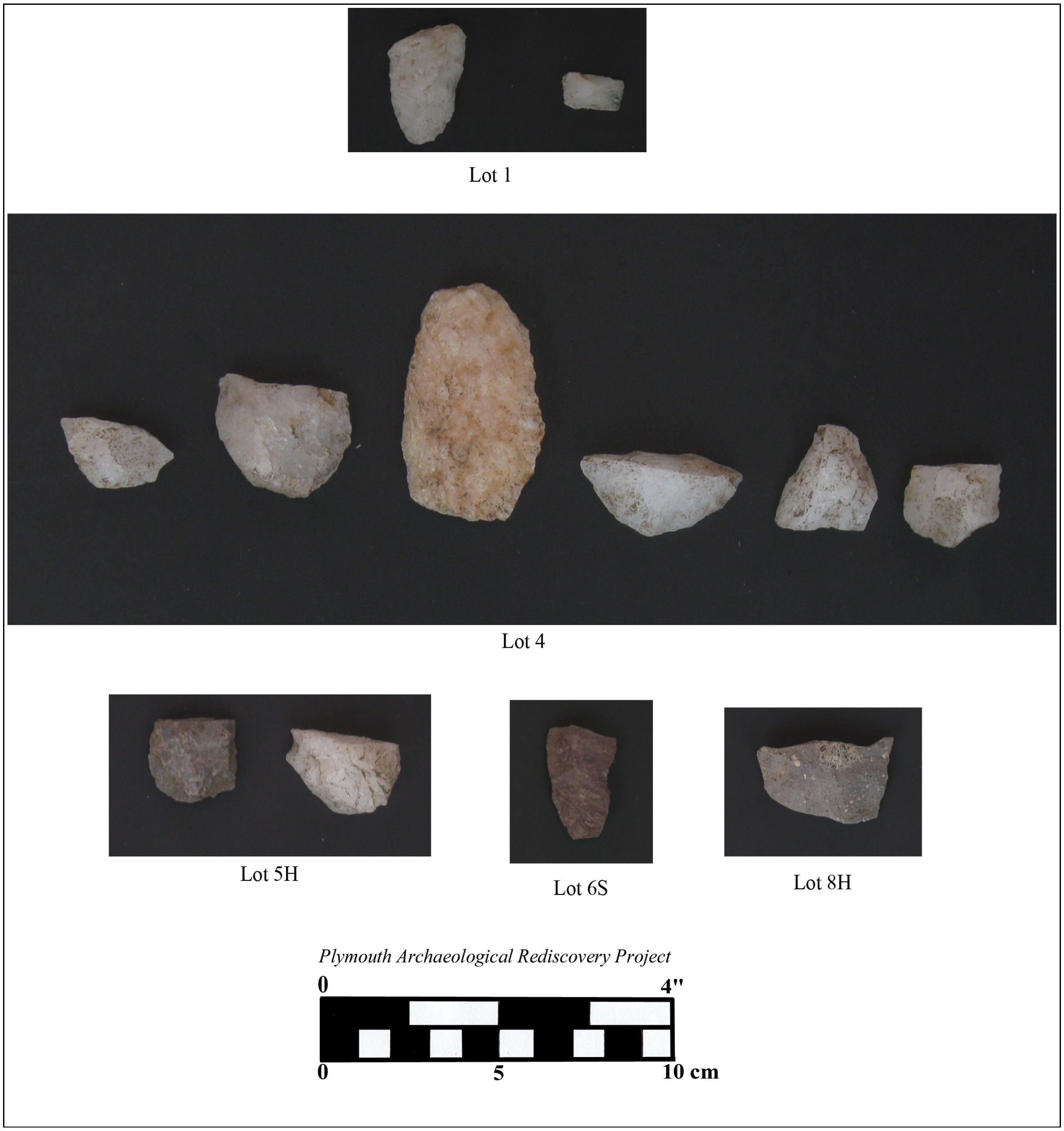

Figure 8. Stage II bifaces

(Lot 1 Left to Right: L1S-PZ N296 E192 0-20 cm, L1HN-PZ N302 E180 0-30 cm
Lot 4 Left to Right: L4S-SQ N145 E148 40-45 cm NE, L4S-C N146 E147 0-38 cm, L4S-C N146 E145.5 0-35 cm, L4S-C N144 E147.5 0-37 cm, L4S-A N148 E146.1 30-35 cm W1/2 N. Stain, L4S-C N145 E148 40-45 cm SE
Lot 5 Left to Right: L5H-C N132 E183.5 30-50 cm, L5H-PZ N134 E190 30-60 cm
Lot 6: L6S-C N112 E250.5 0-30 cm
Lot 8: L8H-Stripping)

Lot 2H

Lot 1H

Lot 4

Lot 5H

Lot 6s

Lot 8HN

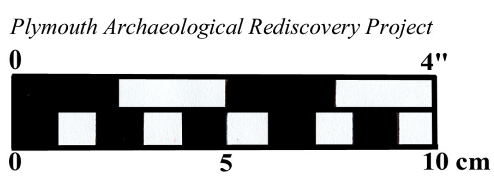

Figure 9. Stage III bifaces

Figure 9 (Cont.)

Lot 1: L1HN-PZ N302 E180 0-30 cm

Lot 2: Top Row- L2H-C N216 E214.5 0-35 cm, Bottom Row Left to Right- L2H-PZ N268 E211 0-15 cm, L2H-A N267.7 E215.5 50-55 cm, L2H-B1 N272 E211 45-50 cm, L2H-C N270 E215.5 0-40 cm, L2H-C N270 E204 0-35 cm

Lot 4: Left to Right- L4H-Stripping, L4H-PZ N146 E132 0-30 cm

Lot 5: Left to Right- L5H-C N131 E180 30-50 cm, L5H-A N130 E181.6 40-65 cm E1/2

Lot 6: L6S-C N114 E251.5 0-30 cm

Lot 8- L8HN-A N64.5 E309.8 55-60 cm W1/2

Table 12. Biface shapes

Location	Material	Shape
L1H	Quartz	Oval
L1HN	Rhyolite	Irregular
L1S	Quartz	Oval
L2H	Quartz	Diamond
L2H	Quartz	Triangular
L4H	Quartz	Lenticular
L4H	Quartz	Oval
L4H	Rhyolite	Oval
L4H	Quartz	Rectangular
L4H	Quartz	Round
L4H	Quartz	Round Base
L4H	Quartz	Round Base
L4H	Quartz	Round Base
L4H	Quartz	Round Edge
L4H	Rhyolite	Teardrop
L4H	Quartz	Triangular
L4S	Quartz	Triangular
L4S	Quartz	Oval-Round
L4S	Quartz	Oval-Round
L4S	Quartz	Oval
L4S	Quartz	Oval
L4S	Quartz	Round Base
L4S	Pennsylvania Jasper	Round Base
L4S	Quartz	Round Base
L4S	Quartz	Round Edge
L4S	Quartz	Round Edge
L4S	Quartz	Round Edge
L4S	Quartz	Round Edge
L4S	Quartz	Triangular
L5H	Rhyolite	Oval
L5H	Rhyolite	Round Base
L5H	Quartz	Squared Base
L5H	Quartz	Triangle

Table 12. (Cont.)

Location	Material	Shape
L6H	Quartz	Round
L6H	Quartz	Round Base
L6S	Rhyolite	Lenticular

bifaces, and possibly the round, were preforms for the manufacture of Small Stemmed points. The distribution of biface fragments coincides with that of other forms of reduction waste.

Unifaces

Archaeologists use the terms unifaces and utilized flakes interchangeably in the archaeological literature. They consider both expedient, informal tools which show use only on one face. Unifaces are a slightly more formal category of tool, as these are pieces that were purposefully shaped by pressure flaking, but only on one face. Utilized flakes on the other hand often show flaking or polishing as a result of use and not as a result of intentional shaping to make a specifically shaped tool. Utilized flakes are often flakes that have convenient shapes to their edges that facilitates ease of use for cutting or scraping. Parry and Kelly (1987) postulated that assemblages that contained expedient tools were the result of a more sedentary lifestyle versus a reliance on bifacial tools. For a group of people on the move, the energy investment used to create bifacial tools pays off in the long run with a tool that will keep a cutting edge longer and which is rejuvenated when dulled. Unifaces and utilized flakes are made and used in the moment of need and discarded just as quickly, resulting in a low initial energy input, a short use life, and a high rate of disposal.

Excavation recovered 47 unifaces from across the project area. They were principally made from quartz but with rhyolite, argillite, hornfels and chert flakes also being used **(Figure 10)**. All the unifaces were made from flakes struck from cores. Only one uniface from L6S had cortex remaining on a surface. Unifaces took three forms: end scrapers, serrated edge tools, and edged tools. Unifaces identified as end scrapers bore evidence of purposeful micro-flake removal at one rounded end with the opposite end being unworked. Serrated edge tools bore evidence of purposeful pressure flaking to create a serrated cutting edge on the tool. Edge tools bore evidence of purposeful and use resultant micro-flake removal from more than one edge of the tool. Table 13 shows the locations for the various types of unifaces recovered..

Table 13. Unifaces

Location	End scraper	Serrated tool	Edged Tool	Total
L1H	2Q*			2
L1HN	1Q			1
L1S			1H, 1R	2
L2H			3A, 4R, 6Q	13
L4H	1Q		1Q	2

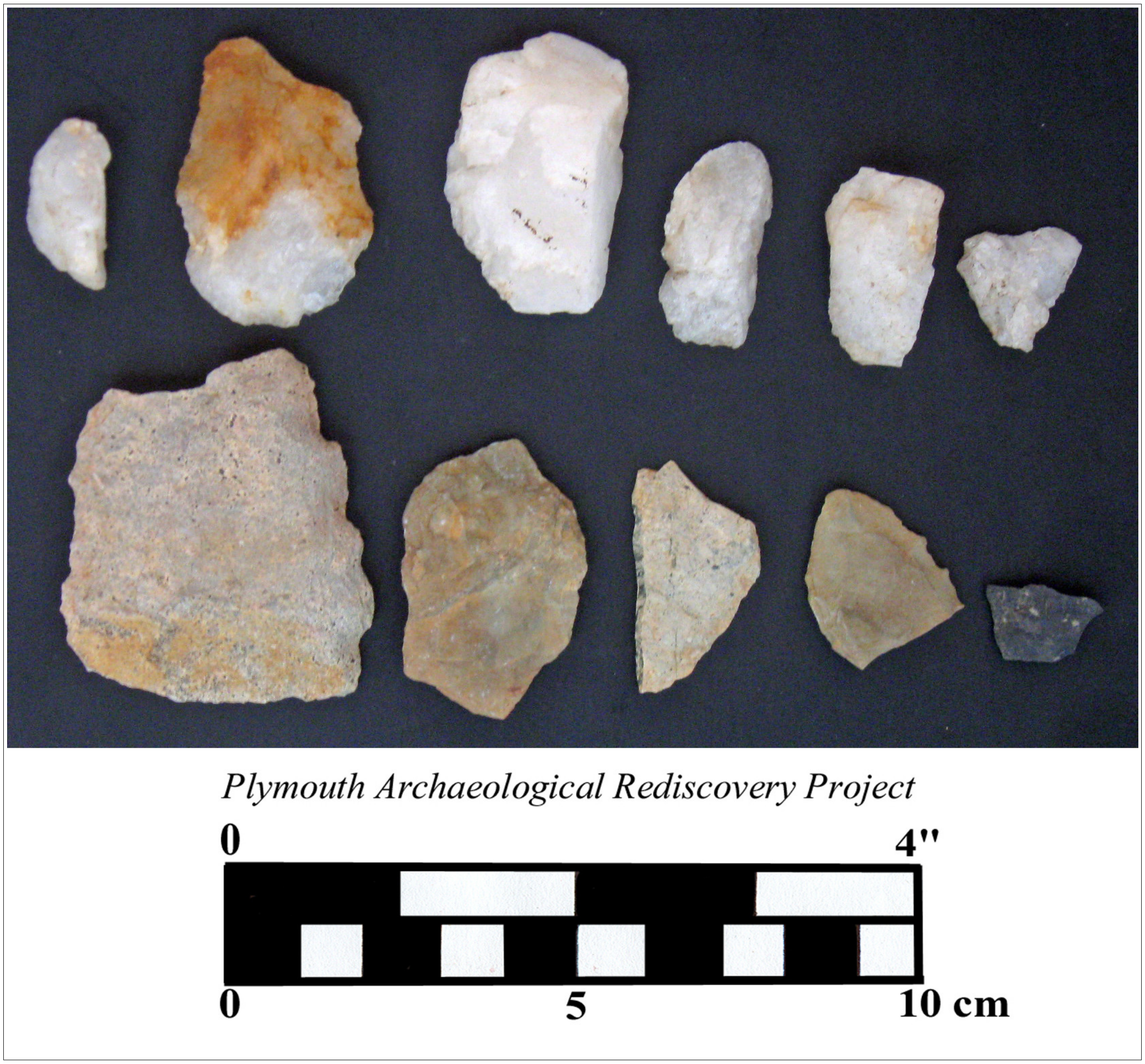

Figure 10. Unifaces from Lot 2
Top Row Left to Right- L2H-C N277 E212 0-35 cm, L2H-A N270 E218 40 cm, L2H-C N273.5 E220 0-30 cm, L2H-C N273.5 E220 0-30 cm, L2H-C N270 E217 40-45 cm, L2H-C N271.5 E216 0-35 cm
Bottom Row Left to Right- L2H-B1 N268 E217 70-75 cm, L2H-A N268.7 E214.2 60-65 cm, L2H-B1 N271 E218 45-50 cm, L2H-B1 N268.5 E217 55-60 cm, L2H-C N268.5 E214 0-40 cm

Table 13. (Cont.)

Location	End scraper	Serrated tool	Edged Tool	Total
L4S	3Q	1R	1Q	5
L5H	1C	1A, 1Q	3Q	6
L6H	6Q, 1C, 1SJ		1Q	9
L6S	1R		2Q, 1C	4
L7H	1Q			1
L7HN	1Q			1
L7SN			1R	1
Totals	**19**	**3**	**25**	**47**

*Q- Quartz, R- Rhyolite, C-Chert, SJ- Saugus Jasper, A- Argillite

End scrapers ranged in length from 1.5 to 4 cm with the average being 2.5 cm. Testing found that the argillite and one of the rhyolite unifaces from L2H associated with the Middle Archaic occupation of this lot. L6H, which had the second highest occurrence of unifaces and the highest occurrence of end scrapers, was the location of several storage pits. The presence of numerous scrapers may indicate that processing of hides or something that required the use of scrapers was occurring at the time that these pits were in use or generally just when the occupation in this impact area occurred. Excavation failed to recover any of these unifaces from within anomalies, indicating that their use may have preceded or occurred after the filling of these pits with refuse, which was in the spring to summer.

Bifacial End scrapers

Bifacial end scrapers are bifacially worked formal tools that have one edge rounded and flaked to specifically create a steep-edge end scraper. Analysis assumes that Native people used scrapers such as these to scrape animal hides. Testing recovered 10 bifacially worked end scrapers **(Figure 11).** Knappers favored quartz and rhyolite for these scrapers (Table 14).

Table 14. Bifacial end scrapers

Location	Count and Material	Total
L1H	1Q	1
L4H	1C	1
L4S	4Q, 1R	5
L6S	1Q	1
L7SN	1Q, 1R	2
Totals	**7Q, 1C, 2R**	**10**

The chert end scraper recovered from L4H was a reworked broad-bladed projectile point midsection to tip fragment. Someone reworked the distal midsection break to create a steep edged end scraper These scrapers ranged in size from 1.1 to 3.7 cm with the average being 2.3 cm and were .3 to 1.5 cm averaging .7cm thick.

Figure 11. Bifacial end scrapers
(Top Row Left to Right- L1S-C N298.5 E196 0-20 cm, L1S-C N307 E195 0-40 cm, L1H-PZ N314 E174 0-20 cm, L1HN-PZ N298 E178 0-25 cm, L1H-A N312.15 E173.55 30-35 cm N1/2
Middle Row left to Right- L4S-C N140 R145.5 0-36 cm, l4H-C N144 E126.5 0-30 cm
Bottom Row left to Right- L4H-PZ N154 E128 0-35 cm, L4S-C N146 E145.5 0-35 cm, L4S-C N142.5 E146 0-44 cm

Abraders

Excavations recovered seven abraders or sharpening stones from across the project area **(Figures 52 and 53)**. Native people used abraders or sharpening stones to prepare platforms during lithic reduction, for sharpening woodworking tool bits, for shaping ornaments such as stone pendants and shell beads, and for sharpening bone tools. Ritchie recovered an elongated sandstone abrader from the Cunningham site on Martha's Vineyard (Ritchie 1969: 103). Abrading and whetstones are also common on New York State sites dating from Archaic through Woodland periods, being recovered from male and female graves (Ritchie 1965).

The recovered abrading stones came from lots 2, 4, 7 and 8 (Tabel 15). Native people made these

Tabel 15. Abraders

Location	Material	Shape	Length	Width	Thickness
L2H-Sq-N272 E216	Sandstone	Irregular	22.5 cm	7.7 cm	5.5 cm
L4H-A- N142.65 E131.4	Argillite	Oval	4.1 cm	2.3 cm	1.2 cm
L4S-A- N146 E145.3	Sandstone	Oval	26.5 cm	17.7 cm	6.8 cm
L4S-A- N148.2 E139.6	Schist	Round	18 cm	8.8 cm	3.3 cm
L7H-Strip	Schist	Triangular	9 cm	3.1 cm	1.1 cm
L7HN-A-N68 E266.8	Schist	Beveled Cobble	10.1 cm	5.8 cm	2 cm
L8S-A-N92 E321.1	Schist	Oval	12 cm	6 cm	2.6 cm

abraders from sandstone, schist and argillite. Testing recovered an irregular-shaped sandstone abrading stone from L2H. It is triangular in cross-section and has one face that bears numerous linear striations, the result of running possible tool edged along the length of it. In L4H anomaly N142.65 E131.4, a natural rodent burrow, contained a small abrader made from an oval-shaped pebble. One surface was very flat with only a few fine striations randomly located across the surface. A Native may have used this abrader for fine sharpening of tool edges or for smoothing slate ornaments or tools. Testing recovered the largest abrader from L4S in anomaly N146 E145.3, a large shallow basin also containing Native pottery. The upper surface is the natural cortex of the large cobble that the artisan had fashioned the abrading stone from while the lower half has been split away. One end of the upper surface had also been removed either naturally or purposefully. Abrasion on the upper surface consists of a 1.2 cm wide by .3 cm deep by 12 cm long rounded edged furrow along the length of the stone. It appears that the stone was a convenient piece used to water smooth a narrow rounded tool. No other scrapes or abrasions were present on the stone. Excavation recovered one other abrasion stone from L4S. A very flat piece of sandstone recovered from the bottom of anomaly N148.2 E139.6, medium-size medium depth pit containing most of a clay pot. The slab bears a slight amount of abrasion linear abrasion on one surface. This was possibly the result of its use as a grinding surface or a surface that saw slight abrasion. The abrasion is 2 cm wide, .1 cm deep, 9 cm long and oriented to the length of the stone. It is similar to the abrasion on the other large abrading stone. and may have seen similar use. Machine-stripping uncovered a small piece of gray schist in L7H that bears a narrow linear abrasion similar to that seen on the other two larger abrading stones. The abrasion is 1.4 cm wide, .3 cm deep and 6.5 cm long. The abrading stone from L8S was found in anomaly N92 E321.1, a large amorphous shaped stain containing cultural material. It has also been described under the section of this report on

Figure 12. Abraders
(Top Row left to Right- L7H-Stripping, L4H-A N142.65 E131.4 30-35 cm E1/2, Bottom Row Left to Right- L8S-A N92 E321.1 30-35 cm E1/2, L5H-A N135.5 E178.4 40-45 cm)

Figure 13. Large abraders
(Top Row Left to Right- L4S-A- N148.2 E139.6 40-45 cm W1/2, L4S-A N146 E145.3 30 cm S1/2; Bottom L2H-B1 N272 E216 40-45 cm)

hammerstones. Abrasion on this stone consists of a deep V-shaped abrasion at one end of the cobble and extending half way down one face in a narrow abrasion. This pattern of abrasion appears the result of holding the stone in one hand and sharpening the bit of a bladed woodworking tool by a honing motion across the blade, much in the same way that a person would sharpen a steel blade on a modern whetstone. No other abrasions were present and the person who used it may have done so for a specific purpose or on a specific tool type for long enough to result in a 1. cm deep V.

The final abrader is a Transitional Archaic beveled cobble abrader. Dincauze recorded similar beveled cobbles as being found at the Watertown Arsenal, Mansion Inn and Vincent sites in Susquehanna Tradition cremation burial contexts (Dincauze 1968:36). Dincauze describes them as carefully selected marine cobbles of flattened elliptical shape (Dincauze 1968:36). Native artisans fashioned Dincauze's abraders from diorite, felsite, sandstone, slate, quartzite, granite, basalt and gneiss with diorite being most common. All but a few bore artificial bevels produced by two different use processes of the tool (Dincauze 1968:37). They have also been found in later Orient phase burials from Long Island (Ritchie 1959:60). Two cobble abraders were present in the assemblage from the Burr's Hill burial ground in Warren, Rhode Island (Ritchie 1980:39). The length of the beveled abrader from Burr's Hill was 11 cm long and 6 cm wide which is consistent with Dincauze's dimensions for abraders in the collections she analyzed (average 11.7 cm long and 7 cm wide) (Ritchie 1980:39; Dincauze 1968: 36-37).

The abrader from the Muttock-Pauwating site was 10.1 cm long, 5.8 cm wide and 2 cm thick, weighing 222.3 g and has a large flake removed from one edge and had a large piece split off from the edge opposite **(Figure 14)**. One end showed evidence of use as a pecking stone. Archaeologists recovered this beveled cobble abrader from anomaly L7HN-N68 E266.8 which was a medium-sized cache pit in the direct center of an oval-shaped house form. Excavation recovered the abrader from near the top of the anomaly in a fire-cracked rock deposit that may represent the use of this anomaly as a hearth as well as a refuse pit and originally as a cache pit. One surface of the abrader bears a thin incised line 2.5cm down from the narrower end towards the wider end. The line runs laterally from one edge to the other with a series of five triangles extending down from the line towards the wider end. A series of incised hatch lines extends from the lateral line up the broken edge towards the narrow end, with half of the series having broken off when that edge broke off. The decoration appears similar to Late Woodland triangular designs found on pottery The stone bears evidence of having been in the fire but it is unknown if it was purposefully placed in the fire or was just a convenient stone that was part of the hearth. Other artifacts from this anomaly included grit-tempered pottery and quartz shatter. It appears that this Transitional Archaic artifact was either purposefully or accidentally deposited in a Late Woodland context.

Goodby posits that the Late Woodland to Contact Period Native people felt a connection with people of the Susquehanna Tradition (Goodby 1994:214). The Susquehanna Tradition, which originated in Pennsylvania, presence in New England represents a sudden disjunction in the local cultural traditions approximately 4,000 BP Goodby interpreted this disjunction as marking the arrival of ideas associated with the Susquehanna people as well as the coming of the people themselves (Goodby 1994:214). That thousands of years later, that the Late Woodland to Contact period populations of southern New England may have retained a memory, possibly maintained through oral tradition in the form of histories and stories, is no harder to believe than the passing down of the story of the Iliad for thousands of years after the actual events of the Trojan War.

Figure 14. Beveled cobble abrader with incised decoration (L7HN-N68 E266.8 35-40 cm N1/2) (Lower Right picture shows incised decoration outlined in red)

Goodby believed that the Susquehanna and their influences were still visible in New England in the Late Woodland period. In support of this hypothesis he present s several tantalizing pieces of evidence: the presence of a "corn" motif on an atlatl weight from the Wapanucket site in Middleborough(a site with a prominent Late Archaic component) and the presence of a very similar "corn" motif on Late Woodland period pottery; the possible copying in clay in the Late Woodland period of a lug handled Transitional Archaic steatite pot form from the Green River site in Rhode Island; and the situating of the West Ferry burial ground in Jamestown, Rhode Island adjacent to an earlier Transitional Archaic Susquehanna Tradition cremation burial site (Goodby 1994: 214-216). The presence retention and modification of this beveled cobble abrader in the Late Woodland period and its subsequent deposition, possibly ceremonially into a hearth fire, appears as another example of a possible connection between the Late Archaic and Late Woodland peoples.

Bouck and Richardson report a similar etched engraver from Vineyard Haven on Martha's Vineyard (Bouck and Richardson 2007: 16.) The Vineyard Haven beveled cobble abrader (identified as a hammerstone in the Bouck and Richardson article) bore three inscribed “X figures” interpreted as possibly representing the Thunderbird.

Ax

Stone axes are heavy woodworking tools used with fire to chip away at wood to reduce its mass. These tools were often used to make dug out boats and bowls or to fell trees. Excavation in the L2H impact area recovered a Middle to Late Woodland ax blade made from gray green schist from the subsoil at N271 E215. It bears a curved bit and is celt-like in form measuring 12 cm long, 5.7 cm wide and 4.2 cm thick **(Figure 15).** The head weight 660 g. The complete ax would have been almost one thirds to twice as long as the surviving piece (16 to 24 cm long in total). The distal portion is missing and the working bit bears small chips as a result of use. Native people mounted axes such as this in wooden handles by means of wedging and gluing the shaft through a tapered hole burned through a wooden handle. It is possible that the shaft broke during use and the tool was discarded. An artisan shaped the entire ax by pecking, with traces of this still present on the shaft, and grinding to form the blade.

Atlatl Weight

The atlatl (a.k.a. spear thrower) is a tool that uses leverage to increase the accuracy, power and speed of a spear or dart. The hunter affixes the atlatl weight onto the shaft of the spear thrower which is held in the hand and effectively increases the length of the thrower's arm and, through the flexibility of the shaft, stores energy and imparts it on the spear on release. Hunters can use atlatls without weights, but the addition of a weight, generally weighing between 60 and 80 grams, to the midsection of the shaft, may add weight (which increases resistance and thus results in more force applied to the throw, or may add balance (resulting in a more accurate throw). Modern atlatl darts are between 1.2 and 4.7 meters long, 9 to 16 mm in diameter, and can reach speeds of 150 km/hr and accurately travel over 100 meters.

Excavations recovered two atlatl weight fragments from L4S, the impact area that had the highest occurrence of Late Archaic projectile points. Testing recovered one half of a bar-style atlatl weight from L4S-C-N146 E142.5 from the plowzone **(Figure 16)**. The weight is made of gray slate and is 5.9 cm long and 4.2 cm wide. The remaining portion is 1.2 cm high and originally was approximately 2.5 cm high. The present weight is 41.6 g and the original weight is estimated at over 80 g. The bore of the weight, which was also the diameter of the spear thrower, is 1.3 cm.

Figure 15. Ax head (L2H-A/B N271 E215 40-45 cm)

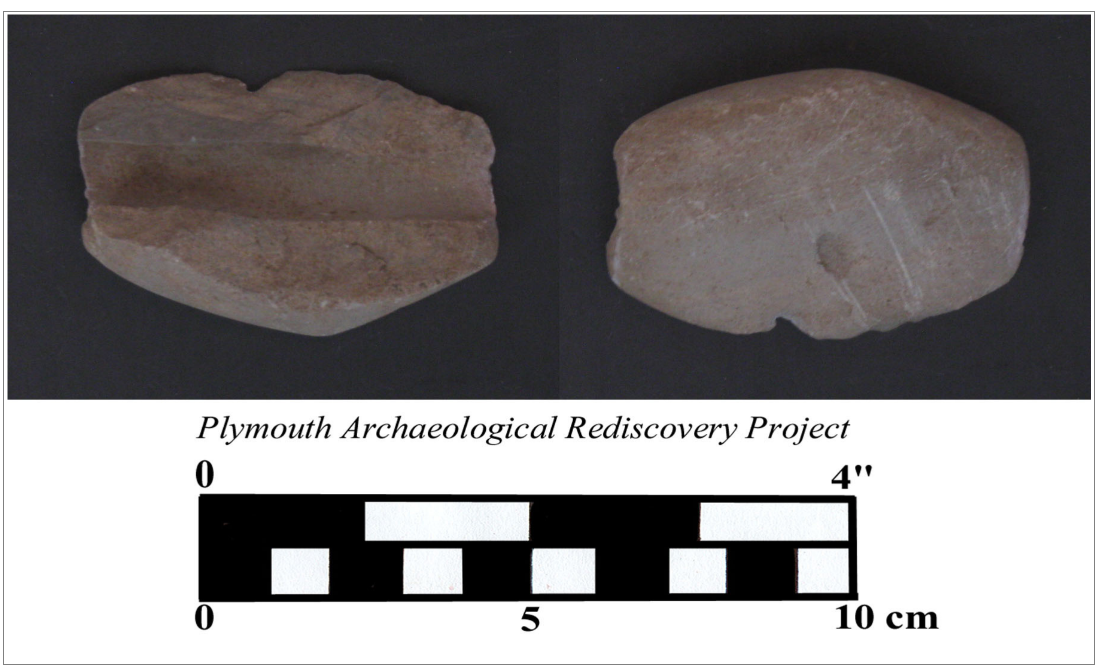

Figure 16. Interior and exterior views of atlatl weight (L4S-C-N146 E142.5 0-20 cm)
The second atlatl weight fragment was also recovered from L4S during plowzone stripping. It is also made from slate and appears to represent a flake with a 55° striking platform angle and a ground outer surface, that someone struck off the original weight. It appears an artisan reduced a broken atlatl weight into another tool type. Doucette and Cross noted a similar reduction of an atlatl weight from the Annasnappett Pond site (Doucette and Cross 1997). Doucette and Cross estimated that the atlatl dart shafts from Feature 6 at the Annasnappett Pond site, were 1.25 to 1.35 m long (Doucette and Cross 1997:283). Cross (1998) theorized that atlatl technology developed to hunt woodland deer, resulting in a need for a system that would deliver a spear or dart over a relatively short distance with a high degree of accuracy.

Steatite (Bowl, Pipe)
Steatite (a.k.a. soapstone) vessels are one of the hallmarks of the later half of the Transitional Archaic in New England. These vessels are oval, rectangular, nearly circular, or trough-like, generally with rounded corners, rims and bases with slightly out sloping to vertical walls and squarish lobate lugs on the exterior. The range in size from 14 to 46 centimeters long and 5 to 8 centimeters high and are sometimes found smoke-stained and soot-encrusted, possibly indicating direct use on fires for cooking. Their general shape suggests that they were originally modeled on wooden bowl prototypes. This technology does not seem to represent an independent invention in New England, but appears to have spread north from the as far south as the Virginia to North Carolina Piedmont area, eventually splitting with one northern production center being in Pennsylvania (possibly associated with the Broadpoint/ Susquehanna Tradition) and another in New England (possibly associated with the Small Stemmed Tradition) (Ritchie 1963: 170). Native people exploited few sources for soapstone bowls in New England with the known locales being in Rhode Island, Connecticut and central Massachusetts. Soapstone bowls are generally found at camp sites along major streams and not in remote inland sites where the lack of canoe transport made moving the heavy objects more difficult (Snow 1980:240). Alternately, Funk (1976) sees the presence of steatite more often on the coast as a result of seasonality.
Steatite vessels represent the first imperishable vessel form in the northeast. They do not appear in New England before 4000 years BP with earliest date reported by Hoffman being 3655 +/- 85 years BP (Hoffman 1998:48). Steatite may have been found at the Wapanucket 6 site in association with Squibnocket Triangles and radiocarbon dated at 4355+/- 185 years BP possibly making this the earliest occurrence in New England (Fiedel 2001:104). Steatite achieved its chief popularity between 3000-2500 years BP and disappeared after 2500 years BP There does not seem to have been a clear transgression from steatite to clay pottery and their occurrences appear to overlap at some sites. This may indicate separate but complimentary uses for these vessels.

Excavations recovered one steatite bowl fragment from L1HN-A-N300 E178 **(Figure 17).** Archaeologists recovered the piece from cobble fill used to fill a historic cellar hole in the early nineteenth century. It is unknown where this bowl fragment was originally found. Archaeologists conjectured that the cobble fill is the result of field picking agricultural fields. Farmers may have piled the stones at the edge of the field and then used for purposes such as this. The steatite bowl fragment represents approximately one-quarter of a complete bowl and is made of light gray steatite. Numerous small pits on the surface where mineral inclusions had leached out. It bears a small lug handle and is 1.2 cm thick at the rim, 2.3 cm thick at the base and estimated as having been just over 6 cm high.

Figure 17. Native artifacts from nineteenth century cellar hole fill (Top and Bottom views)
(Left to Right- L1HN-A N300 E178 E-W Trench 38 cm, L1HN-A N300 e178 Sq N301 E179 40 cm, L1HN-A N300 E178 Sq N300 E178 30 cm)

Testing recovered one steatite tobacco pipe blank from L4S-C-N143 E146 from the plowzone **(Figure 18).** The form is a short-stemmed pipe with a bowl located at a right angle to the stem. The bowl had broken off from the stem at the juncture and the pipe was subsequently abandoned The surface of the preform bears extensive evidence of pecking and overall the stem is square in shape. The stem hole had not been drilled yet, obviously a later step in the process, and it does not appear that a great deal of time had been spent on the manufacture of the pipe. The pipe is made of a gray fine-grained steatite. It measures a total of 9.5 cm long by 4 cm high and is 3.5 cm thick, weighing 204.4 g. The form is a common Late Woodland form and is similar to examples recovered from the Burr's Hill burial ground in Warren, Rhode Island (Ritchie 1980:42). The unfinished examples from Burr's Hill bear evidence of sawing and cutting as the way of reducing the pipe blank, reflective of seventeenth century post-Contact technology. The example from the Muttock-Pauwating site in contrast has been reduced through pecking.

Gorget, Pendant

Personal items of ornamentation are rarely recovered. This is not to imply that people did not have ornaments and ornamentation, but just that ornaments may have more often been manufactured of bone or other perishable material and thus do not survive well archaeologically. William Wood in 1634 described the epitome of Native leader fashion when he said that "...a sagmore with a humbird in his ear for a pendant, a black hawk on his occiput for his plume, mowhacheis for his gold chain, good store of wampompeag begirting his loins, his bow in his hand, his quiver at his back...thinks himself little inferior to the great Cham" (Wood 1977: 85). Little of this leaders ornamentation would survive archaeologically.

Forgets are tabular stone items with a number of holes drilled into them. Hole count can vary from two to six with two being the most common number. Researchers have put forward a wide variety of explanations over the past 100 years to explain their function. Gorgets, bracers for bow and arrow use, and ornaments are the three most common interpretations (Beauchamp1897: 79). Gorgets are usually symmetrical with each hole being drilled from both sides to a center point. The holes often show signs of having been worn into an oval shape as a result of having had a cord pass through them. Often they are left unfinished and may have served as backing for ornaments suspended on the front of them, effectively hiding the gorget itself. They show no rough usage and the use as ornaments themselves or as backs for other ornaments appears the most suitable interpretation. The raw material is most commonly various colored and banded slates and shales. They are commonly between 8 and 12 mm thick and an artisan produced them by grinding and polishing. Broken gorget were often redrilled and repaired or reworked. They date to the Transitional Archaic to Early Woodland period and are found throughout the Eastern Woodlands. Archaeologists believe them to be part of the diffusion of ideas and artifacts associated with the Adena mortuary system (Snow 1980:270). Often it appears that Adena related items acquired local forms as the ideas and possibly rituals associated with the complex diffused eastward. An example of this local manifestation is the replacement of traditional Adena spool-shaped gorgets with rectangular gorgets in New England (Wright 1999:595).

Excavation recovered two items of personal adornment,a gorget and a pendant (**Figure 18)**. Testing recovered the gorget from L5H-C at test pit N134 E128.5 in a plowzone context. It is of gray slate and is three-quarters intact with the two centrally placed drill holes present. The shape is rectilinear and measures 7.4 cm long, 3.5 cm wide and .8 cm thick. The drill holes measured .7 cm in diameter and

Figure 18. Pendant, gorget, and steatite pipe blank
(Top to Bottom- L2H-A N270.5 E217.5 50-55 cm, L5H-C M134 E128.5 0-35 cm, L4S-C N143 E146 0-36 cm)

were .4 cm deep with a smooth surface bearing some random scrapes present. It appears to have broken during the drilling of one of the holes when the lower end of the gorget spalled off.

The second artifact is a small trianguloid single-hole pendant. Excavators recovered it from a Late Woodland storage pit in L2H (N270.5 E217.5) at the 50-55 cmbs level. It is made of gray schist and measures 3.8 cm long by 2 cm wide and .1 cm thick with a .25 cm diameter oval-shaped perforation at the widest end of the triangle. The hole shows evidence of having been worn from a circular to oval shape due to wear caused by the cord used for suspension. It may have been accidentally lost during the filling of the storage pit.

Mortar, Pestle, Nutting Stone

Archaeologists recovered several lithic items used to process food: a small mortar (Togguhwhonck; Tacukck: Wiskunck), four pestles (Quinahsin) used to grind corn, seeds and nuts, a possible mano for grinding seeds and a nutting stone **(Figures 19 and 20)**. Native women shelled nuts and dried out the meat for winter storage. The nuts most commonly used were Acorns, Beechnuts, Black Walnuts (which were not too common in our area), Butternuts, Chestnuts and Hickory. Native people shelled and processed the nuts immediately after collection. Native women may have dried the hickory nuts whole with the shells on with the whole nut, shell and all, then crushed in a mortar and placed in boiling water with the shells falling to the bottom. In other cases, women would remove the shells with a nutting stone. This is a flat stone with a shallow depression in it to hold the nut in place while it was split. Once the women removed the meat, they crushed it in a wooden bowl and threw it into boiling water, skimming off the oil and removing and drying the meat (Parker 1968: 101).

Acorns needed special boiling in lye to remove the oils (Williams 1971: 168). Following the removal of the oil, women parched the acorns on the hot coals of the fire and then either stored or ground in a mortar and used (Parker 1968: 101: De Bry 1588:19). women placed parched acorns in baskets and stored in storage pits, for use in the winter. This is what the colonists discovered on Cape Cod in 1620 (Young 1974: 145). Native people crushed strawberries (Wuttahimneash) in a mortar and mixed with corn meal to make bread (Williams 1971: 169).

People collected seeds and either used them fresh or dried and later processed into flour. Bulrush and cattail roots and bulrush shoots can still be collected during the summer, and bulrush seeds are ready for harvest, drying, and grinding into flour in August and September. Cattail pollen is collected in late July and eaten raw, cooked in soup, or roasted and the seeds ground into flour. Among the Iroquois,women collected, dried, pulverized or pounded Arrowhead, Indian Turnip (Jack in the Pulpit), Solomon's Seal and Skunk Cabbage roots and tubers for consumption (Parker 1968: 107).

Excavation recovered one nutting stone from L1HN N300 E180 historic cellar hole **(Figure 17)**. Archaeologists recovered the nutting stoned from the cobble fill layer deposited from a separate location to fill the cellar hole. As a result the original location where it was found is unknown. The nutting stone is an oval-shaped cobble of granite with shallow roughly round depressions on the upper and lower surfaces. It measures 10.8 cm long, 8.2 cm wide and 5.5 cm high. The edges of the stone also show evidence of crushing as a result of it being used as a pounding stone.

Figure 19. Pestles and muller

(Top: L4H-Stripping 5.4 m N 50 cm E of SW corner; Bottom Row Left to Right: L1S-C N298.5 E146 0-20 cm, L1HN-PZ N308 E186.3 30 cm, L1HN-PZ 2.5 m S 2.5 m E of NW, L5H-B1 N133.1 E178.7 40 cm)

A small granite mortar was also recovered from the L1HN cellar hole cobble fill layer **(Figure 17)**. It has a well-formed rounded depression on the upper surface but is otherwise unmodified. The depression is 4.8cm in diameter and 1.5 cm deep. The stone is 10.7 cm long, 9.8 cm wide and 5.6 cm high. A small mortar such as this would be poorly suited for processing maize, but women may have used it to process seeds or to grind pigments.

Stripping recovered a possible mano or muller for grinding seeds from the plowzone in L1HN (**Figure 19**). A woman would have used it with a stone or wood metate. The tool is made from gray tan quartzite and is roughly triangular is shape. It measures 12.9 cm long, 8 cm wide and 4.1 cm high. Use has worn the lower surface smooth and it is curved in shape as a result of its use in a rocking motion during grinding. Linear striations are present running parallel with the length of mano indicating dragging as well as rocking and supporting its use on a stone versus wooden surface. Ritchie recovered Similar manos and metates from Late Archaic contexts in New York State beginning in the Late Archaic with the Lamoka culture (Ritchie 1965:62).

Testing recovered four pestles or pestle fragments **(Figure 19)**. A smoothed and rounded piece of banded schist is a fragment of a finely made pestle. The craftsman worked the schist so that he was able to orient the natural bands in the schist along the length of the pestle shaft. Archaeologists recovered this pestle fragment from L1HN at N300 E178 on top of the B1 horizon during stripping of the plowzone. The fragment measured 6.5 cm long, 4.2 cm wide and 1.1 cm thick. Excavation recovered a pestle midsection made of schist from L5H from anomaly N135.5 E178.4, a rodent run anomaly. The pestle measured 10.7 cm long, 5.5 cm wide and 3 cm thick. The shaft shape is a narrow oval.

Testing in L1S-C recovered a small pestle in the plowzone at N298.5 E196. The pestle is barrel-shaped and made of granite. It is 8.7 cm long, 4.9 cm wide, and 4 cm thick with crushing on both ends, indicating a possible secondary use as a hammerstone. Cross (1956) reported that among the Iroquois pestles were often employed for secondary uses and that several bore battering on the ends and pits on the surface, a result of their secondary use as hammerstones (Cross 1956:93). In association with this pestle was a component dating to the Late Archaic Small Stemmed occupation of the project area. Native people made use of pestles such as this for processing roots, tubers, seeds or mineral pigments.

Shovel scraping in L4H encountered an almost complete very finely made effigy pestle on top of the B1 subsoil just to the southwest of the longhouse identified in this lot **(Figure 20)**. The pestle is made of granite and is completely symmetrical in all aspects. The effigy on the end of the pestle is a bear head with one ear having broken off in the past. The working end of the pestle is smooth and unpitted, indicating its use for grinding or a combination of crushing and grinding versus simply crushing, as seen on the small pestle from L1S described above. This pestle was probably used to process maize. It is oval in cross-section at the working end, tapering and becoming round at the opposite end of the shaft. It measures 5.4 x 4.2 cm at the working end and 3.1 cm at the top of the neck just before the effigy. The total length of the pestle is 19.2 cm. An artisan had pecked a depression for the eye on one side, but the opposite side was broken away with the missing ear, and he also carved a Y-shaped incision at the end of the muzzle- indicating the nose and mouth. Excavation at Burr's Hill burial ground in Warren, Rhode Island resulted in the recovery of a similar pestle, very close in shape and decoration (Ritchie 1980:41). The Burr's hill pestle is made of fine-grained gray slate or argillite and bears similar wear on the working end. It measured 51 cm long and 7.5 cm wide (Gibson 1980:128). Ritchie reported on other bear effigy pestles recovered from New York State (Ritchie 1965:130) associated with the Late Archaic Laurentian culture and Willoughby reported on pestles recovered from eastern New England from Maine to Rhode Island (Willoughby 1935: 150-151). Volmar found that effigy pestles in eastern Massachusetts often date from the Contact Period and are often included in the

Figure 20. Bear head effigy pestle (Bottom row left to Right: Profile and profile with eye marked, Frontal view, Frontal View with vertical snout line marked)

graves of women (Volmar 1994:15). his main premise was that effigy pestles were different from the typical pestle. The inclusion of the effigy was, in his view, imbued the pestle with a perceived spiritual power (Volmar 1994:17).