**Plymouth Archaeological Rediscovery Project (PARP)**
**Specialist Studies**
**Pottery Analysis from the Agawam Prehistoric Site Wareham, MA**
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## Theory

### Late Archaic to Early Woodland Research Design

In order to understand the importance of the Agawam site one needs to view it in the context of the current state of research regarding the Late Archaic, Transitional Archaic and Early Woodland periods in southeastern Massachusetts. To accomplish this, a literature search was made for all the relevant sources related to these periods. After the sources were reviewed, the most important research questions were identified and the research topics that can be investigated at this site were outlined. This section begins with an outline of what is known and not known about these periods with regards to technology, foodways, settlement and current research topics. It then goes on to outline what the Agawam site has to offer to some of these topics.

Small Stemmed and Squibnocket Triangle points have often been considered to be temporally diagnostic of the Late Archaic period in New England prehistory. The earliest dates for the presence of Small Stemmed points have been pushed back into the second or third millennium before present by work in the 1980s (PAL 1982 a, 1982b, 1983). Small Stemmed points have been characterized by four varieties (Small Stemmed I-IV) which can be lumped together into two categories- squared to rectangular stems and rounded stems. The first category includes Small Stemmed I and II. These are characterized by 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 B.P. The second category includes Small Stemmed III and IV. These are characterized by narrow isosceles triangular blades, 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 B.P. The predominant raw material used to produce 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. A wider variety of materials was utilized 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 Broad spear 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 may be likely as the Small Stemmed of the points appear to generally resemble these antecedent forms.

The earliest dates for Small Stemmed Points are from the Bear Swamp 1 site (4600-4500 BP) located on the Taunton River estuary and the Kirby Brook site (4400-4000 BP) located in middle Shepaug (Hoffman 1985:59). Many sites in southeastern Massachusetts have a higher number of these points than anywhere else in the state which has 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 latest 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 (PAL 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; PAL 1982a, 1982b, 1983, American Antiquity Current Research 1981: 696).

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 ratio 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 B.P. The most common materials for these points is the same as for Small Stemmed, quartz and argillite with some quartzite and volcanics being used.

Other tools utilized 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) utilized 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 weirs, estuarine shore sites, and sites on lakes, ponds, springs, streams, brooks, river shores and quarries all show how wide their procurement strategies reached. Fishing was accomplished 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, a wider variety of more marginal resources had to be exploited to feed the greater number of people. This led to a well-balanced adaptation by a people who were very familiar with their surroundings.

Possibly, at this time, 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 appear to have exploited the coast and inlands. 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 initial 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).

It appears that by 3700 B.P. 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 Transitional or Transitional Archaic. During this time there appears to have been an immigration into southern New England of people using tools of the Broad spear 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.

Points of the Susquehanna/ Broad spear style include the Susquehanna Broad, Wayland Notched and Atlantic points. Susquehanna Broad points are a corner notched point that has diamond-shaped blade and shoulders with obtuse shoulder angles and generally straight 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 ratio of 2:1 to 3:1 (MHC 1984:108-109). These points were produced from 4000-3500 years B.P. Unlike the Small Stemmed points, these are often made of exotic cherts and local

volcanics with quartz, quartzite and argillite rarely used.
Atlantic points are triangular bladed stemmed points with strait-bottomed parallel-sided squared bases whose basal width is greater than or equal to 1.5 cm. The shoulders are well defined and approach a 90-degree angle with the stem the junction of which is formed by indirect percussion with a punch. These points can range from 5 to 15 centimeters long, making them another large point with a length to width ratio of 1.5:1 to 2:1 (MHC 1984:106-107). These points were produced from 4100-3600 years B.P. Local volcanics are common as raw materials with quartzites, argillites and cherts also used. Quartz is a raw material for Atlantic points, again, like the Susquehanna Broad, showing a sharp break in technology from the Small Stemmed Tradition.

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 ratio of 2:1 to 3:1 (MHC 1984:110-111). These points were produced from 3600-3000 years B.P. Local volcanics are common with chert and argillite also used.

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 shoulders are rounded and 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). These points were produced from 3000-2000 years B.P. 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.

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 to be 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 Broad spear, that was adapted 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 (Sanger 1975). 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. In Binford's work he found that communities were 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.

The later half of the Transitional Archaic was dominated by people who used the Orient Fishtail Point Tradition. This appears to have been a time of great change in New England with new technologies appearing and by 3000 years B.P. an interrelated series of climatic, environmental, cultural and social changes that is seen as 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 B.P. 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 that favorable habitats were reduced 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 (PAL 1982, 1982a). 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 are 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 camps located on bluffs were occupied in the winter while riverside sites probably represent spring to fall fishing sites where anadromous species such as alewife, herring and shad were collected through the use of weirs. There appears to be 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 be 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).

The Orient Tradition is characterized by 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 to not be the case as habitation sites were identified.

Foods used by Orient Tradition users appear to possibly include an appreciable amount of shellfish and fish as well as deer, turtle, turkey and duck species, and small mammals such as woodchuck, gray fox, and mink. Features associated with the processing of these resources include earth ovens where foods were baked, stone platforms for roasting and the use of boiling stones. The tool kit of the Orient Tradition is characterized by the Orient Fishtail point, which make up about 88% of the point type used, and many of the same tools used earlier in the period such as atl atl weights, full-grooved axes, rectangular celts, plano-convex and grooved back adzes, small gouges, ovate and triangular knives, strait, stemmed and fishtail point drills of quartz and chert with few scrapers and anvil stones (Ritchie 1969:170). Also included in this inventory are ellipsoidal and rectanguloid stone gorgets, lots of graphite and hematite paint stones and steatite bowls and some of the earliest occurrences of locally made pottery.

Steatite (a.k.a. soapstone) vessels have come to be one of the hallmarks of the later half of the Transitional Archaic in New England. These vessels are oval, rectangular or 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). Few sources appear to have been exploited for soapstone bowls in New England with the known ones 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. It does not appear in New England before 4000 years B.P. with earliest date reported by Hoffman being 3655 +/- 85 years B.P. (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 B.P. possibly making this the earliest occurrence in New England (Fiedel 2001:104). Steatite achieved its chief popularity between 3000-2500 years B.P. and disappeared after 2500 years B.P. 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.

The original reason why any sort of imperishable vessel was made or used in New England may lay in the social changes occurring in the Transitional Archaic. These reasons include an indigenous response to the increasing population densities in floodplain environs with durable vessels being a way to process resources more efficiently (Pagoulatos 1988: 85-91). These resources may have included chenopodium and wetland grass seeds. The environmental changes that were occurring at the time that may have changed the available resources and led to an increase in reliance on anadromous fish (Turnbaugh 1975). Finally a diffusion or migration of peoples or ideas from the southeast (Snow 1980: 242; Tuck 1978).

Steatite may have had a more ceremonial place in Transitional Archaic culture as well. The makers of the steatite vessels are assumed to have been men, possibly ones who were engaged in ceremonial exchange with the steatite being the exchanged item (Snow 1980: 250). This may account for more centralized distribution of steatite and the mortuary associations of it. Sites where steatite occur may be central ceremonial sites where males gathered for inter and intra regional trade or to participate in mortuary ceremonies (Hoffman 1998: 52). This may be related to the use recorded ethnographically from the southeast of large vessels by males for the consumption of ritual "black drink" (Sassaman 1993:170, Klein 1997: 146). This ceremony may have been similar to that recorded in southeastern Massachusetts where young men undergoing ritual purification in preparation to become pneiseuk consumed a drink of white hellabore. Edward Winslow, prominent Plymouth Colony settler, described the pnieseuk as

"men of great courage and wisdom, and to these also the Devil appeareth more familiarly then to others, and as we conceive maketh covenant with them to preserve them from death, by wounds, with arrows, knives, hatchets, etc. or at least both themselves and especially the people think themselves to be freed from the same. And though against their batters all of them by painting disfigure themselves, yet they are known by their cottage and boldness, by reason whereof one of them will chase almost an hundred men, for they account it death for whomsoever stand in their way. These are highly esteemed of all sorts of people, and are of the Sachems Council, without whom they will not war or undertake any weighty business. In war their Sachems for their more safety go in the midst of them. They are commonly men of the greatest stature and strength, and such as will endure most hardness, and yet are more discreet, courteous, and humane in their carriages then any amongst them scorning theft, lying, and the like base dealings, and stand as much upon their reputation as any men.

And to the end they may have store of these, they train up the most forward and likeliest boys from their childhood in great hardness, and make them abstain from dainty meat, observing divers orders prescribed, *to the end that when they are of age the Devil may appear to them, causing to drink the juice of Sentry and other bitter herbs till they cast, which they must disgorge into the platter, and drink again, and again,* till at length through extraordinary oppressing of nature it will seem to be all blood, and this the boys will do with eagerness at the first, and so continue till by

reason of faintness they can scarce stand on their legs, and then must go forth into the cold: also they beat their shins with sticks, and cause them to run through bushes, stumps, and brambles, to make them hardy and acceptable to the Devil, that in time he may appear unto them. " (Italics mine) (Young 1974: 340)

This ceremony that helped to create the pniese may be a descended from an earlier one in the Transitional Archaic that utilized the steatite vessels. The rise of the elite fighting class of the pniese may have been a response to increased population pressure in the area and a need to defend resources. If steatite bowls were associated with males and male ceremonies, one would expect to find them in male graves as opposed to female ones. Unfortunately, the majority of the graves of he Transitional Archaic consist of cremation burials that have produced bone that was in such a fragmented and calcined state that assignment of sex was impossible. One Transitional Archaic burial and two possible burial caches from Jamestown, Rhode Island again could not be assigned to sex, but the items included may point towards male having been interred in the grave that contained steatite bowls and the other internments being assignable to male tool kits. In the single grave that contained calcined bone as well as steatite, other objects interred with the individual included a small grooved axe blade, a perforated black pebble, a clutch of graphite pebbles, a slate drill blade, a chert flake, six projectile points including one of Pennsylvania Jasper, lumps of red ocher a red pigment stone and a 35.5 cm long pestle, a perforated and incised steatite pendant, a flat incised stone "tablet" and an incised quahog shell fragment (Simmons 1970: 17-27). The caches containing steatite also had graphite pebbles, a rhyolite drill, two side-notched points of slate, a chert Orient Fishtail point, two "crude" pebble choppers a side-notched rhyolite point and two small quartz pebbles (Simmons 1970:27-32). Unfortunately it is difficult to assign sex of a burial based on grave goods alone due to the fact that grave contents may not reflect items actually used by the person interred there. They may be items placed in the grave by friends and relatives of either sex as gifts to them and thus a mixture of male items may be in a female grave or female items in a male grave. This could be a topic that needs to be researched more in the future.

After steatite bowls ceased to be present in the archaeological record, other vessels such as wood may have taken the place of the stone vessels. The use of a wooden vessel as opposed to a pottery one may have continued the association of a male created vessel used for a strictly male ceremony. Steatite bowls exclusively used by males may also have been replaced by chlorite and later steatite and pottery smoking pipes and pipe ceremony that went along with them. This too seemed to have been an almost exclusively male pursuit with some ritual significance. Pipes first make their appearance after steatite bowls ceased to be found archaeologically in New England. Like the association of steatite with male graves, the decline of the steatite bowl industry and rise of the smoking pipe and smoking ceremony is another avenue of future research.

Other research questions related to steatite were proposed by Sassaman (1999). These include the following: Did soapstone vessel production and exchange in southern New England emerge in the context of the expanding broadpoint cultural front as one of several means of alliance building with central New York groups? Did successful ties with such groups efficiently preclude or thwart assimilation between indigenous and immigrant populations in southern New England? Was the burial ceremonialism of southern New England a context of mediating ethnic distinctions between indigenous and immigrant populations as suggested by Dincauze (1975b:31)? Did the growing

technological contrasts in the third millennium B.P.-notably the exclusive use of Vinette I by Meadowood groups of New York and the coexistence of both soapstone and pottery in Orient contexts of southern New England and Long Island-signify an end to traditional alliances?

Most researchers see the use of steatite as being antecedent to the use of clay pottery, although Hoffman has attempted to make the case for pottery having been used prior to the introduction of steatite (Hoffman 1998). The shift from steatite to pottery probably occurred gradually over time with both technologies being in use for at the same time. Funk (1976) sees the coeval existence of pottery and steatite and their relative occurrence in inland and coastal sites as being a result of seasonality. In this situation, steatite was used on the coast in the spring to early fall and pottery was used at inland winter sites. Pottery dates as far back as 3600 years B.P. in southeastern New England and 3300 to 3100 years B.P. in southern New Hampshire (Sassaman 1999: 75). The eventual usurping of pottery over steatite may be related to a decreasing need in the Transitional Archaic for far-flung alliances (Fiedel 2001:106). Early pottery has been termed Vinette I and it is generally believed that at least the gross technological ideas of pottery production spread to the north from the south, possibly from the same general areas as steatite bowl production. This pottery type has been recovered in Connecticut in association with Susquehanna points (Levin 1984:15; McBride 1984:123; Pfeiffer 1984;79). The earliest pots were straight sided with pointed, concoidal bases and some archaeologists believe that these resemble basket styles common in these earlier periods (Braun 1994:63). This type was first identified in New York State but it is not confined to there. Vinette I pottery has been recovered from all of New England, New York and New Jersey. This type of pottery can be identified by its thick, straight wall and the use of abundant grit and grit as a tempering medium. Walls of Vinette I pottery range from .6-1.1 cm (Luedtke 240). The exterior and interior of Transitional Archaic to Early Woodland ceramics were commonly cord marked, a possible decorative technique resulting from the patting of the vessel with a cord wrapped paddle to help bond the coils together. Some smooth surfaces may also occur in some vessels either intentionally or accidentally.

Barbera Luedtke, in her work on the ceramics from the Shattuck Farm site, found that the Early Woodland vessels that have been recovered from Eastern Massachusetts have the characteristics (Luedtke 227):

Table 1. Early Woodland vessels characteristics

| Vessel | Height | Max Diameter | Mouth Diameter | Max d/ht |
|---|---|---|---|---|
| 1 | 22.9 cm | 25.4 cm | 25.4 cm | 1.11 cm |
| 2 | 26.7 cm | 22.9 cm | 22.9 cm | .86 cm |

Vinette I pottery has been found to be heavily tempered with grit composed of coarse, poorly-sorted crushed-rock and sands with a general decrease in the size of the grit over time (Bunker 208; Luedtke 229). Native pottery may also be shell tempered and although this is generally believed to be a temper used in the Middle Woodland to Contact periods, Lavin, in her work on Cape Cod ceramics postulates that the type of temper may not be temporally related but may be more closely linked to where the vessel was made. Temper type on coastal sites may more often be shell tempered while those on inland sites may be more often grit tempered. This has to do with the temper resources available to Native potters. Rim shapes for Vinette I ceramics are round, with some decoration consisting of incised lines possibly being present (Luedtke 244).

Decoration of the vessel itself takes the form of the cord marking, which was applied in a horizontal direction on interior and multiple directions on exterior and some incised lines (Bunker 208). The similarity of Vinette I pottery throughout the Northeast suggests a local center of invention or adoption from which the technology spread out. Ozker sees this similarity in form and structure as reflecting a similarity in function. He sees these vessels as only being used in a fall context and were not in daily use (Ozker 1982: 210).

The adoption of ceramics as well as soapstone is suggestive of changing cultural conditions at the time of their introduction. Pottery is difficult to transport without breaking, and while some mobile cultures that carry their pottery with them do exist, it is more common for pottery to be associated with an increase in sedentism. The use of sturdy vessels also may be indicative of an increase in the need to boil foods. Pottery is useful for simmering and slow boiling of nuts, tubers, seeds, gastropods, fat and marrow, and bones to either release their oils or to make them softer and more palatable (Fiedel 2001: 103). Ozker postulated that pottery was initially produced on site for the boiling of nutmeats to release their oils and subsequently for storing that oil (Ozker 1982). This technique may have been similar to that noted among the Micmac in the seventeenth century. It was noted that when a moose was killed " they collected all the bones of the moose, pounded them with rocks upon another of larger size, reduced them to a powder; then they placed them in their kettle, and made them boil well. This brought out a grease that rose to the top of the water, and they collected it with a wooden spoon. They kept the bones boiling until they yielded nothing more, and with such success that from the bones of one moose, without counting the marrow, they obtained 5-6 pounds of grease as white as snow, and firm as wax. It was this they used as their entire provision for living when they went hunting. We call it Moose butter..." (Denys 1969:118). Pottery could also be used to boil foods to feed to infants, thus decreasing the age of weaning and possibly leading to population growth (Fiedel 2001: 103).

Unlike steatite Vinette I pottery is generally not recovered from mortuary contexts in New England. The exception to this is at Boucher site in Vermont where seven ceramic vessels were recovered from six burials (Heckenberger et al 1990: 120). One of these vessels is decorated with a incised triangular motif near the rim. Similarly decorated vessels are known from Maine , New Brunswick (Trumbull 1986) and Vermont (Loring 1985). The burials from this site are associated with Adena related artifacts and appear to represent somewhat anomalous event in New England prehistory.

As women are assumed to have been the producers of pottery, their role as producer may have been enhanced in Transitional Archaic due to the increased use of wild plants and shellfish and pottery production (Feidel 2001: 103). The shift to pottery production may also reflect a societal shift in gender roles in the Transitional Archaic. Wood and soapstone carving are assumed to have been men's roles whereas pottery production and gathering were women's. Fiedel postulated that due to an increased reliance on shellfish and wild plants and perhaps the production of ritual feasts women were held in higher esteem (Fiedel 2001:106). The production of pottery may have indirectly fostered some of the population growth seen in the Transitional Archaic through the causative pathways of being a more efficient food processing technology, enhancing the status of women, and being an adjunct to sedentism (Fiedel 2001:106).

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, which has been shown to have been produced 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. These points are defined 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). These points were produced from 2800-1200 years B.P. Exotic cherts were commonly used and these are considered 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 ratio of 1.5:1 to 2.5:1 (MHC 1984:116-117). These points were produced from 2450 to 1600 years B.P. (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.

Lagoon points were identified by Ritchie in 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 seen (Ritchie 1969: 245). These points have approximately the same date range as Rossville points, 2450 to 1600 years B.P. (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.

Meadowood points are isosceles triangular bladed expanding stem side-notched points with a straight to convex base whose width is greater than or equal to the maximum blade width. The shoulders are well defined and approach a 90-degree angle with the stem the junction of which is formed by indirect percussion with a punch. These points can range from 4.5 to 9 centimeters long, making them a moderate sized point with a length to width ratio of 2.5:1 to 3:1 (MHC 1984:114-115). These points were produced from 3000-2500 years B.P. Exotic cherts were most commonly used and local volcanics are less common. These points are considered rare but widely distributed in eastern Massachusetts and are more common in New York, Pennsylvania and Ontario.

Some of the trends identified above, the decreased population and fragmentation, are based on the small number of Early Woodland sites that have been identified. This may be more a product of the criteria used to identify the sites, such as the presence of pottery and absence of Small Stemmed points, and number of Early Woodland sites may not be as small as thought. If one includes sites yielding Small Stemmed points but no pottery, as these may represent special purpose floral or faunal resource procurement task camps and not residential locations, the number of sites *possibly* attributable to the Early Woodland increases. Due to the increasingly long temporal use range for Small Stemmed points, their presence or absence can no longer be used as valid "datable" criteria to assign the site to one period or another. What is needed is more radiocarbon dates associated with specific materials. Until this occurs the Early Woodland will remain obscure and ill defined.

A dramatic population collapse has traditionally been one of the defining characteristics of the Early Woodland and while Hoffman (1985) does not see evidence of any break. Filios (1989) came to a similar conclusion although her data shows a break in radiocarbon dates from 2700-2400 years B.P. possibly showing a population decline after 3800 years B.P. and a greater decline after 2800 years B.P. (Fiedel 2001: 117). If there was in fact a population collapse, reasons for it have included climatic and environmental change, epidemics, the effects of plant and animal die-offs and socio-cultural factors (Fiedel 2001: 118). One of the main causes may have been if nut bearing trees, already in decline in the Transitional Archaic, were hit hard by plant disease or environmental change, then this may have caused a population reliant on this resource to die off.

This would account for the drop in inland sites in the period. Alternately the populations living on the coast that focused their procurement strategies on river valley, estuarine and inshore resources may have remained relatively unscathed. These would be the Rossville and Lagoon point users, point styles that show a high concentration in coastal areas especially Cape Cod.

The Late Archaic to Early Woodland Periods provide one of the most fascinating and controversial research areas of New England prehistory. Some of the research questions that need to be investigated concerning this time have been outlined by the MHC (1984:30). These include the following:

-The examination of Late Archaic adaptations to severe environmental conditions, including detailed understanding of the relationships between Laurentian, Susquehanna and Small Stemmed Traditions.

-The analysis of the southeast Massachusetts quartz industry. Collections in this area generally include a larger percentage of quartz particularly Squibnocket, Small Stemmed and Levanna related materials. Definition of quartz quarrying strategies, manufacturing techniques and patterns of workshops sites across space and time. Study of Small Stemmed Tradition , its chronological range and spatial relationship

-The analysis of the Transitional Archaic/ Woodland transition. Examination of changing adaptive strategies including the establishment of swidden agriculture. Information on site seasonality and distribution critical for this.

-The current state of knowledge is strongly weighted towards interior sites. Survey is needed in the coastal zones, especially along Buzzards Bay. This would allow for comparisons between coastal and interior settlement patterns.

-Finally, to what extent does varied site size and internal composition reflect change in social organization as opposed to site function or seasonality?

From the review of the current state of research on the Late Archaic, Transitional Archaic and Early Woodland, the following areas of research can be added.

-How was the culture using Small Stemmed points affected by the appearance of the Broad spear technology?

-Was the appearance of Broad spear points the result of migration of technological diffusion?

-What was the subsistence strategy of the Small Stemmed users and how did it change or adapt in the face of the Susquehanna/ Broad spear appearance? Was there competition for resources or quiet coexistence?

-What was the settlement pattern of the users of the Small Stemmed points in southeastern Massachusetts at the beginning of the Transitional Archaic? Was it similar to what Pagoulatos found in Connecticut or was it more sedentary? Why?

-How do Orient Fishtail point fit into the chronological framework? Were they a merging of Broad spear and Small Stemmed traditions and if so what does this say about the culture at the time?

-What is the importance of long distance trade in the Transitional Archaic to Early Woodland?

-How does steatite fit into the cultural system in southeastern Massachusetts and why did this vessel form disappear? Is there a male versus female dichotomy involved in end of the steatite bowl industry and the rise of the pottery industry?

-Why was pottery technology accepted/ practiced in southeastern Massachusetts? How did it fit in to the cultural system?

-What is the Early Woodland? Was their population collapse of have sites just been misidentified? Most researchers see the use of steatite as being antecedent to the use of clay pottery, although Hoffman has attempted to make the case for pottery having been used prior to the introduction of steatite (Hoffman 1998). The shift from steatite to pottery probably occurred gradually over time with both technologies being in use for at the same time. Funk (1976) sees the coeval existence of pottery and steatite and their relative occurrence in inland and coastal sites as being a result of seasonality. In this situation, steatite was used on the coast in the spring to early fall and pottery was used at inland winter sites. Pottery dates as far back as 3600 years B.P. in southeastern New England and 3300 to 3100 years B.P. in southern New Hampshire (Sassaman 1999: 75). The eventual usurping of pottery over steatite may be related to a decreasing need in the Transitional Archaic for far-flung alliances (Fiedel 2001:106). Early pottery has been termed Vinette I and it is generally believed that at least the gross technological ideas of pottery production spread to the north from the south, possibly from the same general areas as steatite bowl production. This pottery type has been recovered in Connecticut in association with Susquehanna points (Levin 1984:15; McBride 1984:123; Pfeiffer 1984;79). The earliest pots were straight sided with pointed, concoidal bases and some archaeologists believe that these resemble basket styles common in these earlier periods (Braun 1994:63). This type was first identified in New York State but it is not confined to there. Vinette I pottery has been recovered from all of New England, New York and New Jersey. This type of pottery can be identified by its thick, strait wall and the use of abundant grit and grit as a tempering medium. Walls of Vinette I pottery range from .6-1.1 cm (Luedtke 240). The exterior and interior of Transitional Archaic to Early Woodland ceramics were commonly cord marked, a possible decorative technique resulting from the patting of the vessel with a cord wrapped paddle to help bond the coils together. Some smooth surfaces may also occur in some vessels either intentionally or accidentally.

Vinette I pottery has been found to be heavily tempered with grit composed of coarse, poorly-sorted crushed-rock and sands with a general decrease in the size of the grit over time (Bunker 208; Luedtke 229). Native pottery may also be shell tempered and although this is generally believed to be a temper used in the Middle Woodland to Contact periods, Lavin, in her work on Cape Cod ceramics postulates that the type of temper may not be temporally related but may be more closely linked to where the vessel was made. Temper type on coastal sites may more often be shell tempered while those on inland sites may be more often grit tempered. This has to do with the temper resources available to Native potters. Rim shapes for Vinette I ceramics are round, with some decoration consisting of incised lines possibly being present (Luedtke 244). Decoration of the vessel it self takes the form of the cord marking, which was applied in a horizontal direction on interior and multiple directions on exterior and some incised lines (Bunker 208). The similarity of Vinette I pottery throughout the Northeast suggests a local center of invention or adoption from which the technology spread out. Ozker sees this similarity in form and structure as reflecting a similarity in function. He sees these vessels as only being used in a fall context and were not in daily use (Ozker 1982: 210).

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tubers, seeds, gastropods, fat and marrow, and bones to either release their oils or to make them softer and more palatable (Fiedel 2001: 103). Ozker postulated that pottery was initially produced on site for the boiling of nutmeats to release their oils and subsequently for storing that oil (Ozker 1982). This technique may have been similar to that noted among the Micmac in the seventeenth century. It was noted that when a moose was killed " they collected all the bones of the moose, pounded them with rocks upon another of larger size, reduced them to a powder; then they placed them in their kettle, and made them boil well. This brought out a grease that rose to the top of the water, and they collected it with a wooden spoon. They kept the bones boiling until they yielded nothing more, and with such success that from the bones of one moose, without counting the marrow, they obtained 5-6 pounds of grease as white as snow, and firm as wax. It was this they used as their entire provision for living when they went hunting. We call it Moose butter..." (Denys 1908:118). Pottery could also be used to boil foods to feed to infants, thus decreasing the age of weaning and possibly leading to population growth (Fiedel 2001: 103).

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**Method**

The pottery from the site was examined using a multi-variant attribute form of analysis similar to that proposed by Chilton (1999) and carried out by Bunker (2002). It was decided that attribute analysis would be used due to Chilton's findings that the decorative analysis classification systems that have been used in the past may in fact have little usefulness in New England ceramic research (Chilton 1999: 97-101). Analysis in the past has focused too much attention on attributes that easiest to identify, decoration and rim shape, but which have been found to be the very ones that vary too much through time and across distances. Past analysis has also focused too much attention on the presumption that New England ceramics "evolved" over time from thick, crude, undecorated vessels in the Transitional Archaic to Early Woodland, to thinner, finer and more highly decorated Contact Period examples (Chilton 1999: 98.). The goal of multi-variant attribute analysis is to look for both variation and covariation within and between objects, not to formulate

typologies (Chilton 1999: 102). By identifying the attributes of vessels, research is freed of the rigid typologies of the past and may expand and feel free to investigate the utilitarian reasons behind the choices of temper, thickness and surface treatment in themselves and not as part of "type" of ware. The reasons for the production of pottery bearing specific use characteristics is thus related to the needs of the society in relation to their subsistence pattern and degree of mobility as well as availability of raw materials and degree of social interaction with other groups.

The pottery remains were sorted into vessel lots that were based on the surface treatment and decoration on both the interior and exterior of the vessel, the kind, size, and density of the temper and the color, texture, and hardness of paste. These lots were analyzed in four different dimensions as outlined by Child (1981: 154). These include morphology- the diameter of the rim, the rim angles and the lip and rim profile; decoration- the location of decoration, technique of decoration, and motif used; technology- the interior and exterior surface treatment, technique of manufacture, temper inclusions, minimum and maximum temper size, density, paste, texture, wall thickness, and rim and lip thickness; and function- which is basically the identification of any carbon residue. It has been shown by Chilton that many of these attributes are related to how well a vessel works for specific tasks and can reveal production and use evidence.

The likelihood of thermal shock can be reduced by changing the clay composition, the wall thickness, the vessel size and shape, the firing temperatures and the surface treatment. If shell tempered pottery was a technological improvement on grit tempered pottery and not just the result of the availability of raw materials (as suggested by), then the use of shell temper may also be congruent with a decrease in wall thickness, a change in vessel size, differential use of surface treatment and possibly different firing temperatures. All of these variables were examined trough attribute analysis of the assemblage from the site. Wall thickness was measured using standard metric calipers with the probable original location of the fragment on the vessel being identified when possible. Vessel size was measured using a standard circumference chart to determine the diameter.

Production techniques were also investigated by examining the surfaces of the vessels for cracks that occurred during the course of firing. Rye determined that four different types of cracks could occur as a result of heating and cooling: fire cracks which are a network of fine cracks that occur when a vessel is heated to rapidly, star-shaped cracks that radiate from common center seldom exceeding 1 cm. These occur mainly on the exterior and have a piece of quartz in the center and are the result of the quartz tendency to expand quicker than the clay. Spalling, which is when the vessel is heated too quickly and the moisture in walls expands and causes cracks. Finally dunting cracks, which occur when the vessel is cooled very rapidly, and the heat is lost mostly from the rim. Dunting causes a series of concentric checks around vessel (Rye 1981: 111). The occurrence of these different types of cracks shows the level of skill of the potter and conditions that the vessels were fired under.

## Results of Analysis

A minimum number of 16 pottery vessels were identified from field work at the Agawam River Site. Vessel lots were determined by examining the location where the fragments were recovered, the physical attributes (temper, color, thickness, temper characteristics)of the fragments and the characteristics of the vessels that they originated from (diameter, decoration, surface treatment). The vessel lots generated for this report represent a cautious estimation of the minimum number of vessels present. The interpretation of the pottery remains will proceed from a general discussion of the distribution of fragments of shell and grit-tempered fragments in the northern, central and southern portions of the site, to a more specific discussion of the vessel lots.

### Grit tempered pottery

#### Distribution

Fragments of grit-tempered pottery were fairly evenly distributed across the site with a total of 30 fragments and one mostly complete pot being recovered from the southern portion and 46 fragments from the northern portion. Grit tempered pottery fragments were recovered from Features 1, 4, 5, 8 and 9. Feature 1 was a elongated possible refuse pit dating to the Transitional Archaic to Early Woodland, Feature 4 was a small pit feature near Feature 1, Feature 5 was a small pit containing an almost complete mis-fired pot, Feature 8 was a small amorphous shaped pit containing oyster shells and herring bones that was radiocarbon dated to the Contact period, and Feature 9 which was a pit filled with shellfish and faunal remains that was radiocarbon dated to the Middle Woodland period.

#### Thickness

The grit tempered pottery fragments from the northern portion of the site had an average thickness of .68 cm with a range of .3-1cm. while those from the southern portion ranged from .7-1.4 cm (average .99cm). The southern section was associated with a Transitional Archaic/ Early Woodland feature (Feature 1) that contained thick ceramics as well as a Late Woodland feature (Feature 5). Transitional Archaic/ Early Woodland ceramics have been found to be thicker than later ceramics. This appears to be confirmed by other findings from this site. Thicker ceramics were found associated with the early feature while thinner ceramics were found in the northern portion of the site, associated with the Middle Woodland feature (Feature 9).

#### Color

Differences in firing techniques and production techniques used by the potters at the site were examined by looking at the color of the shards and any evidence of mis-firing evident on the pieces. The color of the interior, exterior and center of the pottery shards was recorded using the Munsell color charts. Shards that are buff, light red, yellow or brown have been shown to have been the result of firing under oxidizing conditions in an open fire while those that are grey to black were fired under reducing conditions either in a pit or under some sort of covering such as a bark or piled grasses (Luedtke 1985:245). The type and degree of firing is also observable in the cross-sections or firing cores of the pottery shards as reported by Rye (1981). Rye stated that

pottery cores will show the following range:

1) Vessels fired under fully oxidizing conditions will have a uniform cross section;
2) when they are fired in an oxidizing atmosphere but there is organic material present in the clay the vessel will have a grey to black core;
3) when they are fired in a reducing or neutral atmosphere and there are no organics present the result is pottery that is black on the exterior and interior but with a core that is reddish;
4) when they are fired under a reducing atmosphere and organic material is present the resulting pieces are grey to black throughout although the core may be lighter grey (Rye (1981:115).

It is generally believed that New England pottery was never fired under reducing atmosphere conditions due to the high temperatures, in excess of 900 degrees Celsius, needed to create such a situation (Child 1981: 182).

Overall, grit-tempered fragments from all portions of the site were red to brown on the exterior, interior and body with a smaller percentage being in the grey to dark grey range, primarily on the interior (Table 2) This indicates that for the most part, the pottery was fired with an oxidizing.

Table 2. Grit tempered pottery distribution

| | **Concentration 2** | **Concentration 1** |
|---|---|---|
| **Interior** | | |
| **Red/ brown** | **5/ 9.8%** | **6/ 17.7%** |
| **Gray** | **4/ 7.8%** | **3/ 8.8%** |
| **Body** | | |
| **Red/ Brown** | **21/ 41.2%** | **15/ 44.1%** |
| **Gray** | **18/ 35.3%** | **5/ 14.7%** |
| **Exterior** | | |
| **Red/ Brown** | **3/ 5.9%** | **4/ 7.4%** |
| **Gray** | **0** | **1/ 1.9%** |

atmosphere on the exterior and a reducing atmosphere on the interior. The presence of an oxidizing or reducing atmosphere on the interior surface appears to be more variable than the exterior surface, possibly indicating a variety of positions that the vessel could be placed in during firing.

### Surface Treatment

The surface treatment found on the shards was also looked at to see if differences existed between shell-tempered and grit-tempered wares. It has been found that vessels with textured exteriors did not spall as often as smooth exterior vessels (Sachiffer et al 1994:209). This is due to the amount of surface area that is being heated and the amount of heat and the speed at which that heat

reaches the water inside the walls of the pot. Interior smoothing or texturing did not seem to have any effect on the degree of spalling or cracking of these vessels. Analysis of the pottery from the site looked for evidence of differences in interior and exterior surfaces between the shell and grit tempered vessels.

The surface treatment on the interiors of the vessels in the northern section was split between wiped/ smoothed (76.5%) and cord-marked (25.8%). There does not appear to be any correlation between thinner fragments and surface treatment with both thin and thicker fragments being smoothed/ wiped and cord-wrapped. The exteriors of the fragments were split between smoothed (25%) and cord-wrapped (29.2%) fragments.

In the southern section, the majority of the fragments had smooth interiors (63.1%), with cord-marking being next commonest at 36.8%. Exteriors were most commonly cord-marked, just as in the northern sections (91.7%) with a significantly smaller proportion being smoothed (8.3%).

**Vessel Lots**

One fragment of **Vessel 1**, which may date to the Middle Woodland period based on its location on site and the wall thickness, was recovered from test pit D5-40 (n=1) (Figure 1). The rim has

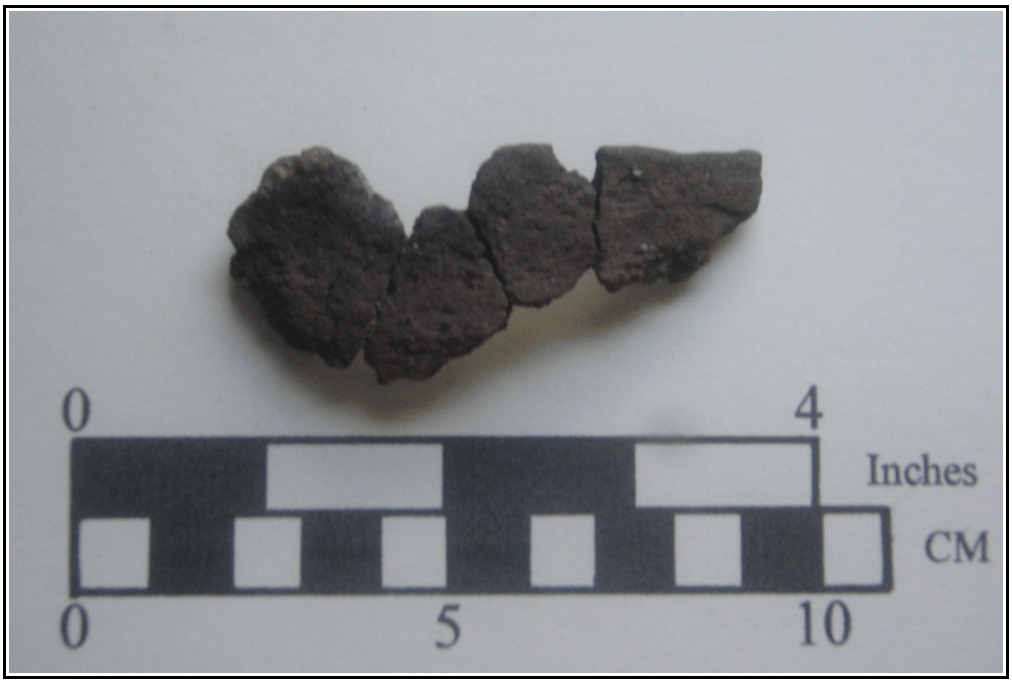


Figure 1. Rim and neck of Vessel 1 D5 30-40 cm

an exterior diameter of 24 cm is rounded in profile. The exterior and interior of the vessel near the rim is dark grey to very dark grey (7.5YR 4/1 to 7.5YR 3/1) while on the exterior 2.8 cm down from the rim, ranges from brown to pink grey (7.5YR 4/2 to 7.5YR 6/2 ). The remainder of the interior ranges from red brown to light brown (7.5YR 5/2 to 7.5YR 6/4). The colors indicate that this vessel was fired upside down with the rim buried up to at least 2.8 cm in ash, creating a reducing atmosphere for this portion of the vessel. The interior has been smoothed while the exterior bears some traces of possible cord-marking. The temper consisted of very coarse crushed quartz and granite fragments ranging from .1 to .5 cm in diameter. This temper made up 50% of the proportion of clay to temper. Wall thickness ranged from .6 to .75 cm.

Two fragments of **Vessel 2** were recovered from EU 2 (n=1), and test pits G2 (n=1) and H4 (n=5). This vessel had a smooth interior and possible cord-marked exterior, that, based on thickness, location on site and surface treatment, may date to the Early or more likely, the Middle Woodland period. The interior surface of the vessel ranges in color from light brown to very dark grey (7.5YR 6/4 to 7.5YR 3/1) while the exterior was light brown (7.5YR 6/4). The combination of colors indicates that the exterior was fired in a slightly oxidizing atmosphere while the interior was fired in an oxidizing to reducing atmosphere. This may have taken place if the vessel was fired rim side down in an open hearth. The vessel was tempered with quartz and feldspar, likely derived from burned granite rock. Temper ranged in size from .1 to .4 cm in diameter and was moderately to very coarse, making up 25 to 50% of the proportion of clay to temper. The walls of the vessel were fairly thick, from .9 to over 1 cm thick. The combination of thick walls and coarse temper makes it possible that this vessel dates to the early to Middle Woodland periods.

One fragment of **Vessel 3** was identified from EU 3 Feature 9 (n=1) which was radiocarbon dated to the Middle Woodland Period (Geochron 1440 +/-140 years before present) . This vessel had an exterior rim diameter of 19 cm, a smoothed interior surface and a cord-marked exterior. The exterior, interior and body of the vessel were all red yellow in color (5YR 6/6) possibly indicating completely oxidizing conditions in a controlled firing environment such as a pit fire. As this vessel is represented by only one fragment, it could also mean that this one area of the pot was fired by chance in an oxidizing atmosphere and that it is not representative of the entire vessel. Temper in Vessel 3 consisted on .1 to .2 cm diameter moderately coarse quartz and feldspar fragments, likely from burned granite, that made up approximately 10% of the proportion of temper to clay. This vessel was relatively thin with the rounded and slightly flaring rim measuring .4 cm thick and the body .6 cm. Overall this appears to be a finer vessel than some of the others present at the site.

Two fragments of **Vessel 4** were recovered from test pit G4 (n=2). This vessel was decorated with a dentate stamped design on the exterior near rim. This form of pottery decoration is commonly attributed to the Middle Woodland Period. The interior surface of the vessel was smoothed and was of a brown (7.5YR 4/2) color. The exterior was also smoothed and was yellow red in color (5YR 5/6). The clay used to make this vessel had been tempered with very coarse quartz and feldspar. The temper had an average diameter of .1 to .4 cm and made up approximately 30% of the proportion of clay yo temper in the vessel. Wall thickness averaged .5 to .6 cm. It is estimated

that this vessel had an overall height of approximately 25 cm and an exterior rim diameter of approximately the same. The rim was rounded and slightly excurvate. This vessel is believed to date to the Middle Woodland Period.

**Vessel 5** had smooth interior and exterior surfaces and was recovered from EU 1 (n=1). The interior, exterior and body were all light red brown(5YR 6/4) in color. This indicates that this vessel was fired in an oxidizing atmosphere, possibly upright in a pit. The temper consisted of moderately coarse quartz with particle sizes ranging from .2 to .4 cm in diameter. Temper accounted for up to 10% of the total body of the vessel. This vessel had an exterior rim diameter of 28 cm and an average wall thickness of .8 cm. This appears to be a finer vessel similar to Vessel 3, and it may date to the middle Woodland period.

Ten fragments of **Vessel 6** were recovered from EU 3 (n=5) and 4 (n=5). The vessel had a smooth interior and exterior surface finish. The color of the interior ranged from dark grey to very dark grey (7.5YR 3/1 to 7.5YR 4/1) while the exterior color ranged from brown to light red brown to dark grey (7.5YR 4/2 to 5YR 6/4 to 7.5YR 4/1). When viewed in cross-section the body of these shards ranged in color from brown to very dark grey (7.5YR 4/2 to 7.5YR 3/1). Temper was composed of very coarse fragments quartz and feldspar that made up 30-40% of the body and were .1 to .4 cm in diameter. The exterior squared rim diameter was 19 cm and the conjectured height of the vessel was estimated at approximately 20 cm. Vessel thickness ranged from .3cm at the rounded rim to .8cm on the body. The exterior of the rim may have been decorated with an incised linear decoration. This vessel is believed to date to the Middle woodland period.

One fragment of **Vessel 7** was recovered from test pit H-1 (n=1). This vessel bore cord- marking on the interior and exterior. One the exterior, the cord appears to have been an S-twist thread with 2 .3 cm-wide twists per centimeter. The interior was black (5YR 5/1) while the exterior was red (2.5Y 5/6). This indicates that the interior was subjected to a reducing atmosphere while the exterior was in an oxidizing atmosphere showing that the vessel was likely fired rim side down in an open fire. The temper was a very coarse quartz and feldspar, likely from burned granite, with unsorted particles ranging from .1 to .5 cm in diameter. Approximately 40% of the vessel consisted of temper and the walls were 1 cm thick. Due to the thickness of the walls and the presence of cord marking on the interior and exterior, this vessel was likely made during the Early Woodland Period.

Thirteen fragments, all of which joined together into one large fragment, of **Vessel 8** were recovered from Feature 1 in EU 1 (n=13) (Figure 2). This feature was radiocarbon dated between


Figure 2. Early Woodland pottery, fragment on right decorated EU 1 F1 35cmbs

2610 +/-30 and 2170 +/- 30 years BP giving it an Early Woodland date. It was cord-marked on the interior and exterior and had a design consisting of cross-hatched incised lines either on the rim or on the shoulders. The exterior color was red brown (5YR 5/3), the body was grey (5YR 6/1) while the interior was dark grey (5YR 4/1). The dark grey interior and red exterior indicates that this vessel was fired with a reducing atmosphere on the interior and an oxidizing atmosphere on the exterior. The vessel was likely fired rim down in an open hearth. The temper of this vessel consisted of fairly coarse quartz and feldspar with particle sizes of .2 to .4 cm, making up 15% of the proportion of the body. The height of the vessel is unknown but the body diameter is 17 cm. The wall thickness ranged from 1.3 to 1.4 cm. The vessel was very low fired, with the interior feeling like lightly fired raw clay when it was found. It is likely that this vessel represent a production waster or misfired pot, part of which was discarded in Feature 1.

Five fragments of **Vessel 9** were recovered from EU 1E (n=5). It bore cord-marking on the interior and possibly the exterior. The exterior surface color ranged from brown to yellow red to dark grey (7.5YR 4/2 to 5YR 5/6 to 7.5YR 4/1) while the interior surface was predominantly brown and light red brown (7.5YR 5/3 and 5YR 6/4). The darker color of the exterior and the predominance of browns on the interior indicate that the vessel was fired either in an atmosphere that was oxidizing

on the interior and exterior, such as being fired standing upright in a pit or one that was reducing on the exterior and oxidizing on the interior. The temper consisted of moderately coarse quartz fragments with particle sizes ranging from .1 to .3 cm and which made up 10-25% of the body. The walls ranged from .7 to 1 cm thick and the rim shape was rounded. The exterior cord-marking was created with an .15 cm wide S-twisted cord bearing 3 twists per centimeter. This vessel is believed to date to the Early Woodland period based on its thickness, cord marking and location on site.

One fragment of **Vessel 10** was recovered from EU 1N in Feature 4 (n=1). It bore cord- marking on the interior and exterior. The interior, the exterior and the body were all light red brown (5YR 6/4) in color. The very coarse quartz temper ranged in size from .1 to 1 cm in diameter and made up 30% of the body. The walls of the vessel were 1.3 cm thick, making it the thickest vessel recovered. This vessel is believed to date to the Early Woodland Period.

Five fragments of **Vessel 11** was recovered from EU 3 and from Feature 9 (n=5), which was radiocarbon dated at 1440+/- 440 years before present. Both the interior and exterior surfaces were smooth. The interior surface ranged in color from light red brown to very dark grey (5YR 6/4 to 5YR 3/1) while the exterior was light red brown (5YR 6/4). The very dark grey on the interior and the light red brown on the exterior indicates that this vessel was fired with a reducing atmosphere on the interior and an oxidizing atmosphere on the exterior. This may have occurred if the vessel was fired rim down in an open hearth. The temper consisted of a moderate to very coarse quartz and feldspar fragments ranging in size from .1 to .3 cm in diameter. Temper accounted for 10-20% of the body of the vessel. This vessel had a 26 cm exterior body diameter and a pointed rim. The body thickness ranged from .4 cm at the rim to .9 cm on the body. This vessel is believed to date to the Middle Woodland Period.

Two fragments of **Vessel 12** were recovered from Feature 9 in EU 3 (n=2). This vessel bore a wiped interior surface and a smooth exterior. The interior surface color ranged from light red brown to red yellow (5YR 6/4 to 5YR 6/6) and the exterior was light red brown to red grey (5YR 6/4 to 5YR 5/2). This indicates that the vessel may have been fired in an oxidizing atmosphere. Temper consisted of fairly coarse quartz feldspar particles ranging in size from .1 to .3 cm in diameter and making up 20% of the body. The walls of this vessel ranged from .7 to 1 cm thick. This vessel is believed to date to the Middle woodland Period.

**Vessel 13** consisted of an almost complete pot that had been dropped into a pit following firing. It apparently was a misfired piece as it collapsed onto its side when dropped and did not shatter (Figure 3). The exterior of the vessel appears to have been cord-marked and due to the misfired state of the interior it was impossible to determine the interior surface treatment. The exterior was brown (7.5YR 5/3) in color, possibly indicating that this vessel was fired in an oxidizing atmosphere. The temper consisted of a fairly coarse quartz and feldspar with particle sizes from .1 to .3 cm in diameter and accounting for 15-20% of the total body composition. The rim of the vessel was missing, the remaining height of the vessel was 25 cm. The diameter at the top of the remaining portion was 25 cm as well. The thickness of the vessel could not be accurately determined due to the lack of a interior surface.

Figure 39. Feature 5 pot

**Rim Shapes**

Fragments bearing intact and identifiable rim edges were recovered from test pits D-5 and G-4 and from EUs 1E, 3 and 4. All rim fragments were identified as having come from grit-tempered vessels (Figure 4). The rim styles and the vessel characteristics of each are shown in Table 3.

Table 3. Grit tempered pottery rim styles and vessel characteristics

| Location | Style | Vessel Description |
|---|---|---|
| EU3-40 | Squared | Vessel 6 19 cm rim diameter, .8 cm thick walls, I/E- cord-marked, incised line decoration |
| EU1E-10 | Rounded | Vessel 9 .7-1 cm thick walls, I/E- cord-marked |
| D5-40 | Rounded | Vessel 1, 24 cm rim diameter, .6-.75 cm thick walls, I-Smooth, E-cord-marked |
| EU3-35-F9 | Rounded | Vessel 3 19 cm rim diameter, .4 cm thick walls, I-smooth, E- cord-marked |
| G4-30 | Rounded | Vessel 4 25 cm rim diameter, .5-.6 cm thick walls, I/E smooth |
| EU3-30-F9 | Pointed | Vessel 11, 26 cm body diameter, .6 cm wall thickness, I/E smooth |


Figure 4. Pottery rim fragments Top row Left to right: EU 34 30-40 cm, D5 30-40cm
Bottom row Left to right: EU 3 F9 30-35 cm, G4 20-30 cm

As can be seen there is no real correlation between vessel thickness, surface treatment, rim diameter and rim shape. Vessels with only exterior cord-marking or with smoothed exterior and interior, appear to be slightly larger than vessels with interior and exterior cord-marking, except in the case of Vessel 3. A squared rim was associated with a thick-walled vessel with interior and exterior cord-marking. Rounded rims were associated with vessels with cord-marked interior and exteriors, smooth interiors and either smooth or cord-marked exteriors. A pointed rim was only associated with a vessel with smooth interior and exterior surfaces. This may indicate that Early Woodland vessels more commonly had square rims while Late Woodland vessels had pointed rims. Rounded rims may have been more of a catch all finish, being the most common style for any period.

### Decoration

Decorative techniques used on pottery has been extensively cited as a way to identify the period of manufacture for that piece. Following Chilton's lead, decorative technique carried less weight in our analysis that other attributes of the pieces, but the decoration was recorded and compared with what is generally been found to be trends in pottery analysis. These trends include the use of exterior and interior cord marking, incised decoration and dentate stamping towards the end of the Early Woodland Period (Fowler 1966:53). The use of a wide variety of decorative techniques in the Middle Woodland Period including linear dentate stamping, rocker dentate, punctate, cord wrapped stick and incising. The limited use of cord-marked exteriors and decorative elements such as dentate stamping and interiors that are often extensively scraped during the Late Woodland Period.

Four fragments were recovered bearing evidence of decoration. One fragment was recovered from EU 1 Feature 1, an Early Woodland feature, bearing an incised line decoration on the exterior. This decoration consisted of shallow thin lines in a checkerboard pattern. One fragment from G4-30 showed three rows of linear dentate stamping on the exterior near the rim. This decoration is common on Middle Woodland period vessels. Two fragments from EU 3, EU 3-20 and 40, bore deeply incised lines on the exterior at the rim. These fragments appear to have come from separate vessels, one with a smooth interior and exterior and one with a cordmarked exterior and smooth interior. These vessels are believed to date from the Middle Woodland period.

### Cordage Impressions

A few pieces of shell tempered and many pieces of grit tempered pottery were covered with impressions from the cord wrapped sticks that were used to form and possibly decorate their surfaces. When these impressions are present, the surface is typically described as cord-marked, cord-impressed, cord malleated, or fabric impressed. These marks are the result of the cord wrapped paddles that were used to gently paddle the coils of the pots together as they were being formed, thus ensuring a tighter fit, joining of the coils, eliminating air pockets that could explode during firing, helping to align the temper in the clay so that it lies more uniformly in the body and helping to give the vessel a textured surface. A total of nine fragments bore impressions that were clear enough to discern the some information about the characteristics of the cord used (Table 4).

Table 4. Cordage characteristics from impressions on pottery

| Location | Vessel # | Twist | Cordage Width | Twists per 1 cm |
|---|---|---|---|---|
| **E2-30** | **No vessel** | **Z** | **3mm** | **2** |
| **G2-40** | **2** | **Z** | **2mm** | **3** |
| **H1-20** | **7** | **Z** | **2mm** | **3** |
| **EU1-F1-35** | **8** | **Z** | **3mm** | **2** |
| **EU1E-10** | **9** | **Z** | **1.5mm** | **3** |
| **EU3-NW-30** | **11** | **Z** | **1mm** | **3** |
| **EU3-F9-SW-30** | **12** | **S** | **1mm** | **3** |
| **EU3-NE-40** | **6** | **Z** | **2mm** | **3** |

In plant cells, parallel bundles of cellulose molecules form small fibrils that are laid down in successive layers as the plant grows. These layers of fibrils trace a spiral inside each plant cell, thus making the plant cells predisposed to spinning and cordage making. The direction of the twist is constant for any plant species with twists going from right to left or right to left. These twists are said to correspond to the diagonal bars in the letters Z (right to left) or S (left to right). Plants like milkweed, flax, ramie and Indian hemp have S-twists while hemp, jute, sisal and yucca have Z twists (Buchanan 1987:10). The observation of the natural twists in plants may have first led people to create cordage possibly over 30, 000 years ago. Cordage has been found to be stronger and smoother if it is spun in the direction of the natural twist of the plant. Since we know that Contact Period natives made use of milkweed and Indian hemp (Apocaynon) for making cordage, we may expect to find S-twisted cordage patterns on pottery fragments if in fact they were spinning this cordage in the direction of the fibers.

The patterns from the pottery fragments from the Agawam Site show the opposite pattern, they are predominately of a Z-twist. The twist was identified by looking at the impressions on the pottery with a hand lens and then identifying the twist as S if it went right to left on the impression and Z if it went left to right. This was done because the impression is the mirror image of the original cordage spin. It would appear that if the inhabitants were spinning cordage in the direction of the natural fiber twists, then they must have been using some plant other than milkweed or Indian hemp to do so. The author conducted replicative experiments on cordage production and found that a right handed person spinning the cordage on their leg by rolling it away from the body will always produce a Z-twist strand while a left handed person will always produce an S-twist with the same motions. A right-handed person will produce S-twist cordage and a left handed person Z twist, when the roll the fibers towards the body, a more awkward and less efficient method but one that worked nonetheless. It is likely that the persons who created the cordage used on the pottery were predominantly right-handed and thus produced mostly Z twist cordage with the twist having less to do with the natural fiber twist and more to do with handedness and ease and speed of manufacture.

The cordage that was presumably wrapped around the paddles that were used appears to have generally thicker, 2-3mm, on most of the examples with some thinner impressions being evident in EU1E and 3 and in Feature 9 where they were 1-1.5mm thick. The cordage appears to have been loosely wrapped around the paddle with the result being that there were less twists per cm that there potentially could have been had the cordage been wrapped very tightly.

Vessels that were cord-marked on the interior and exterior tended to have been fired in oxidizing atmospheres on the exterior and reducing to oxidizing atmospheres on the interior. Vessels with smooth interior and exterior surfaces appear to have been fired in oxidizing atmospheres on the interior and exterior, except for Vessels 6 and 11 which were subject to at least a partial reducing atmosphere on their interiors. Overall, most vessels except Vessel 1 and possibly 9, were subject to oxidizing atmospheres on their exterior surfaces. This supports Child's supposition that the temperatures necessary to create reducing atmosphere firing on the exterior of vessels, was not possible during the prehistoric period in the Northeast. Half of the vessels with either cord-marked or smoothed/ wiped exterior surfaces, bore evidence of reducing atmospheres on their interior surfaces, while the other half appeared to be colored more as one would expect from being subject to oxidizing conditions. This may indicate that the techniques used to fire the vessels did not change greatly from the Early Woodland to Contact Periods, or else that the techniques used to fire the vessels were inconsistent enough to produce a 50/50 chance of the interior being a reducing or oxidizing atmosphere during any firing.

Vessel thickness appears to be correlated with the surface treatment. Vessels with cord-marked interior and exterior surfaces had an average thickness of 1.14 cm while those with smooth/ wiped interior and exterior surfaces had an average thickness of .68 cm. Falling between these two were vessels with smooth/ wiped interiors and cord-marked exteriors. These vessels had an average thickness of .72 cm. Vessel thickness has been correlated with refinement of pottery technique over time, with Early Woodland vessels generally being thicker than Late Woodland/ Contact period vessels. If this trend is true, then a seriation of decorative techniques can be seen here at the Agawam site: the earliest vessels were cord-marked on the interior and exterior, the more recent vessels had smooth interior and exterior surfaces and vessels with smooth interiors and cord-marked exteriors were transitional between the two. The change in surface treatment and thickness may be related to changing uses of ceramics from storage vessels or vessels used for processing of nuts to more everyday cooking vessels. This possible change may also be evident in the size of the ceramic vessels. Vessels that were cord-marked on the interior and exterior measured 17 cm in diameter at the rim. Those that had smooth/ wiped interiors and cord-marked exteriors ranged in size from 19-24 cm while those that were smooth/ wiped on the interior and exterior ranged in size from 19 to 28 cm. A possible gradual increase in vessel volume, or at least in mouth size, appears to have occurred simultaneously with a decrease in thickness and a change in surface finish.

### Temper

The temper that was used at the site was investigated by looking at the type of temper, its coarseness and particle size, and the proportion clay to temper. Temper type was identified using a 10 power magnifying glass to determine if it was composed mainly of quartz or not. When

possible the temper was identified to mineral level.

Temper was identified as fine or coarse using Bronitsky and Hamer's definitions of fine (<.5 mm) and coarse (>.1 mm) (Bronitsky and Hamer 1985:90). Bronitsky and Hamer's study of tempering materials found that pottery tempered with a variety of temper types withstood various types of stresses to varying degrees. Burned shell tempered pottery was more resilient to general breaking that sand or unburned shell tempered pottery. It was also more resilient to crack initiation from thermal shock, more shatter resistant and more resistant to stress caused by initial cracking than either of the others (Bronitsky and Hamer 1985:94). Fine sand tempered pottery was found to be more impact resistant than coarse tempered pottery as well as being more resistant to thermal shock (Bronitsky and Hamer 1985:96). In general it can be said that shell-tempered pottered pottery was better for cooking in as the use of shell appears to have made pottery more resistant to overall to cracking and especially to cracking caused by the use of the pottery on a fire for boiling

The temper used in all of the grit-tempered vessels was identified as quartz and feldspar, likely having come from crushed burned granite. Temper is used as a way to counteract the effects of thermal stress caused during both the firing process and the use of the pottery for cooking. It will dilute the clay and reduce the thermal mis-match in the body of the vessel. The effects of thermal stress can be alleviated through the production of vessels with thinner walls which will lessen the thermal gradient, through the building of vessels with rounded shapes which would allow thermal stress to be dissipated over a greater surface, and through the sue of specific materials over others as temper (Rice 1987: 229). Tempers with coefficients similar or less than clay are the ideal materials. This includes burned shell, talc and feldspar. The Early Woodland use of ground steatite, a type of massive talc, and feldspar, as well as the later use of burned shell, may be ways that Native potters adapted their temper to the effects of thermal shock. The shape of early Woodland vessels, rounded walls, a wide mouth and a pointed bottom would be another way to help reduce thermal shock and make a vessel that was well-suited for cooking. By the Late Woodland and Contact periods, vessels were described as having rounded bottoms and archaeologically they have been found to have thinner walls and a predominance of shell-temper. The shape and use of shell may indicate a greater reliance on pottery for cooking than occurred at earlier times. This may possibly have been the result of an increase reliance the horticultural reliance on corn and beans and their preparations as soups, stews and mashes.

Chilton found that the optimal inclusion types in the temper should be such that during firing and use, it expands at the same rate or less than the clay itself. These types of tempers include grog (old pottery ground up), calcite, crushed or burned shell, feldspar and hornblende. Pottery tempered with these inclusions will be better suited to be used for cooking than ones tempered with quartz. This is due to quartz's tendency to expand quicker than the surrounding clay. A vessel tempered with quartz is not well suited for cooking as it has a low resistance to thermal shock, but would work better for storage or transport due to its high resistance to mechanical stress (Chilton 1999:110).

Thus sites with assemblages of thick quartz tempered pottery may bear witness to the use of that

pottery for purposes other than the traditional assumed use of cooking. Surface treatment also affects the performance making vessels more resistant to thermal shock or more water resistant. Chilton found that Iroquoian and Algonquin pottery differed in a number of technological characterizes that were probably the result of their use for differing tasks. Thin-walled Iroquoian pottery that was not tempered with quartz served better for cooking while the often thick walled quartz tempered Algonquian pottery was better for storage and transport. Different temper types also would show that vessels might have been used for different purposes. The hypothesis that the grit-tempered pottery and the shell-tempered pottery were used for different purposes is one of the areas that the analysis examine.

The grit-tempered vessels from the Agawam site show a predominance for the use of crushed feldspar and quartz for all the fragments recovered. Average temper particle size for each vessel is shown in Table 5. The vessels in Table 51 were grouped together by surface treatment. Vessels

Table 5. Average grit temper sizes by vessel

| **Vessel #** | **I/E finish** | **Average Temper Size** |
|---|---|---|
| **Grit-Temp.** | | |
| **7** | Cm/ Cm | .3 cm |
| **8** | Cm/ Cm | .3 cm |
| **9** | Cm/ Cm | .2 cm |
| **10** | Cm/ Cm | .5 cm |
| **Average** | | **.33 cm** |
| **1** | S/ Cm | .3 cm |
| **2** | S/ Cm | .25 cm |
| **3** | S/ Cm | .15 cm |
| **Average** | | **.23 cm** |
| **13** | ?/ Cm | .2 cm |
| **Average** | | **.2 cm** |
| **4** | S/ S | .25 cm |
| **5** | S/ S | .3 cm |
| **6** | S/ S | ..25 cm |
| **11** | S/S | .35 cm |
| **12** | W/ S | .2 cm |
| **Average** | | **.27 cm** |

with cord-marked interiors and exteriors, vessels which were generally believed to date to the Early Woodland, were found to have the largest average temper sizes, ranging from .3 to .5 cm with the overall average being .33 cm. Vessels with smooth interior and exterior surfaces had the second largest average temper size, .2 to .35 cm with the average being .27 cm. Vessels with cord-marked exteriors and smooth interiors had temper sizes ranging from .15 to .3 cm with the overall average being .23 cm, a difference that was not significantly different from the vessels with smooth interiors and exteriors.

The use of crushed granite with feldspar may indicate a cooking use of the pottery from all time periods. It is assumed but not known for sure that the Early Woodland pottery vessels from the site had pointed bottoms and it is known that they had wide mouths**.** These characteristics, along with the use of feldspar, likely indicates that, even though their temper contained quartz, their primary use was probably for something that required them to be subjected to thermal stress. The burning of the granite before crushing may have helped to lessen the effect of the expansion of the quartz during later firing. The vessels were probably not used just as storage vessels as has been suggested by Chilton (1999). Their relatively small size, one was measurable at 17 cm, limits the amount of substance they could hold. They may have been used for a slow simmer processing of oils such as Ozker (1982) has suggested or for processing medicinal plants or other small-batch items.

**Hardness**

The level of firing of the pots was investigated using a Moh's hardness scratch test on the exterior and interior of each fragment. The values used were the standard ones shown below:

1 talc
2 gypsum
2.5 fingernail
3 copper penny calcite
4 flourite
copper wire
4-5 ductile iron
window glass
5 apatite
5.5-6 knife blade
plate glass
6.5-7 steel file
7 quartz
8 topaz
9 corundum
10 diamond

If a piece could be scratched with one mineral or item but not one further down on the scale it was given a value range. For example if it could be scratched with a copper penny but not a fingernail it was given a value of +2.5 to –3. Luedtke found that the pottery from the Shattuck Farm site had

a hardness value of 3-4 on the scale indicating moderately fired vessels (Luedtke 1985:248).

Using the Mohrs scale, the hardness of each fragment of pottery was recorded. The testing procedure that is used with the Mohrs scale, the scraping of the pottery fragment with materials of various known hardness, is considered to be analogous to the scraping action that occurs on vessels during their use lives (Rice 1987: 356). In general, Rice found that non-kiln fired pottery commonly ranges between 3 and 5 on the Mohrs scale but values as low as 2 and as high as 7 are not uncommon (Rice 1987: 356). While Mohrs hardness testing is a simple, quick and inexpensive way to study the hardness of pottery, caution must be taken due to the fact that over the surface of one vessel, a range of Mohrs hardness may occur (Rice 1987: 356).

Table 6 shows the hardness associated with the vessel lots from the site. Generally it can be

Table 6. Vessel hardness

| **Vessel #** | **I/E finish** | **Hardness** |
|---|---|---|
| **Grit-Temp.** | | |
| **7** | Cm/ Cm | 3-4 |
| **8** | Cm/ Cm | I: 1-2, E: 2-3 |
| **9** | Cm/ Cm | I: 2-3, E: 3-4 |
| **10** | Cm/ Cm | 2-3 |
| | | |
| **1** | S/ Cm | 3-4 |
| **2** | S/ Cm | 2-3 |
| **3** | S/ Cm | 2-3 |
| | | |
| **13** | ?/ Cm | 2-4 |
| | | |
| **4** | S/ S | 2-3 |
| **5** | S/ S | 2-3 |
| **6** | S/ S | 2-4 |
| **11** | S/S | 2-4 |
| **12** | W/ S | 2-3 |

seen that vessels with any surface finish, had hardness of between 2 and 4, moderately fired, making them consistent with Luedtke's and Rice's findings. Fragments from Vessel 8, the Early Woodland vessel found in Feature 1, showed that the interior of the vessel was only fired to between 1 and 2 on the Mohrs scale while the exterior was fired to between 2 and 3. It appears that

the vessel had been fired, or mis-fired as the case may be, in such a way that the interior did not receive the amount of heat needed to harden it enough, while the exterior did. This vessel may have been fired rim down in an open fire. Vessel 9 also had intact interior and exterior surfaces present, allowing an examination of the interior versus the exterior surface hardness. This vessel also had a slightly less hard interior but not to the degree that it may have precluded its use. The lack of any other fragments from the site with surfaces as soft as that of Vessel 8 may indicate either that the fragments did not survive if they were not buried as Vessel 8 was, or that a significant amount of pottery production did not take place at the site. Unfortunately Vessel 13, the complete pot from Feature 5, did not have an intact interior surface, possibly indicating that this surface was soft and washed away before the vessel was completely buried.

## Shell Tempered

### Distribution and Thickness

Shell tempered pottery was recovered from both portions of the site. Concentration 1 yielded eleven fragments from excavation units 1, 1E and 1N. The average thickness was .7 cm with a range between .5 and .85 cm, the interior surface was finished by smoothing (79.5%) or less commonly by wiping (20.6%) while the exterior was either smoothed (25%), cord marked (75%) or possibly a combination of the two on one vessel.

Eight fragments were recovered from Concentration 2 portion of the project area with three of them coming from the Middle Woodland Feature 9 (Geochron 1440+/-40). The average thickness from this area is .9 cm based on one fragment retaining both interior and exterior surfaces. Surface treatment was limited to smoothing on the interior surfaces (100%) and exterior (100%).

These fragments follow the same trends observed for the fragments from Concentration 1. If these are all from the same vessel it would date from the Middle Woodland Period as Feature 9 does.

Overall, the majority of the shell-tempered pottery was found in Concentration 1 (n=21), with a smaller amount being recovered from Concentration 2 (n=8). The average thickness was less in Concentration 1 (.6 cm) and generally increased to Concentration 2 (.9 cm). This may be a temporal distribution associated with increasing use of the southern portion during the Late Woodland period when shell-tempered pottery was more commonly in use, as opposed to a Middle Woodland occupation in the northern portion.

### Surface Treatment

Surface treatments consisted most commonly of smoothing (n=17) or wiping (n=3) on the interiors in both concentrations. The exterior surfaces were finished with smoothing (n=2) and cord-marking (n=3) in both concentrations.

### Color

Interior colors were commonly in the brown to red range in the Concentration 2 (n=6) with brown to red (n=3) and grays to dark grays (n=6) occurring in the Concentration 1. Exterior color was most commonly in the red to brown range in both sections, with only Concentration 2 showing any surfaces in the grey range. The color distribution may indicate that the interiors of the vessels in both were exposed to an oxidizing atmosphere, a possible result of being fired right side up or upside down but supported so that heat and oxygen was available to the interior of the vessel. The interior of the fragments in Concentration 1 were more commonly exposed to a reducing atmosphere, possibly as a result of being fired upside down. Exterior surfaces showed a trend that the vessels were exposed to a generally oxidizing atmosphere in both areas, indicating that the exterior of the vessel was exposed during firing.

### Vessel Lots

Five fragments from what was identified as shell tempered **Vessel 1** were recovered from Concentration 1. The fragments identified as having come from Vessel 1 bore no intact exterior and interior surfaces on any one fragment, so as a result the thickness of the vessel could not be determined. The interior of the vessel appears to have had a wiped to smooth surface finish and was dark to very dark grey in color. The color indicates that the interior was fired in a reducing atmosphere, possibly upside down in a brush fire. The shell particle sizes ranged from .1-.4 cm in length and were fairly coarse in nature, making up 15-30% of the paste composition. Based on the temper type, this vessel likely dates from the Middle to Late Woodland period.

Three fragments of shell-tempered **Vessel 2** were recovered from EU 3, EU 4 and test pit F-2. One fragment bore intact interior and exterior surfaces on the same fragment, making a wall thickness of .9 cm measurable. The interior and exterior surfaces were both smoothed. The exterior color was light red brown (5YR 6/4) and the interior was gray (5YR 5/1) to very dark grey (7.5YR 3/1) indicating that the exterior was fired in an oxidizing atmosphere while the interior was fired in a reducing one, possibly indicative of the pot being fired upside down in a brush or open fire. One fragment from EU 3 bore a possible incised linear design on the exterior. Shell temper size was fairly coarse and was between .1 and .3 cm in length, making up 10 to 25% of the body. This vessel may date to the Middle to Late Woodland period. It's occurrence near Feature 9, which was dated to the Middle Woodland, also supports this.

Thirteen fragments from shell-tempered **Vessel 3** were recovered from EU 1, 1E and 2. Fragments with intact interior and exterior walls had measurable thicknesses of .5 to .7cm, the thinnest vessel at the site. The interior surface of the vessel ranged in color from brown (7.5YR 4/2) to yellow red (5YR 5/6) to dark grey or grey red (7.5YR 4/1, 4/2), with the majority being light red brown (5YR 6/3). The exterior surface color ranged from red brown (5YR 5/4) to light red brown (5YR 6/4). These colors indicate that the interior and exterior surfaces were both exposed to primarily oxidizing atmospheres, possibly as a result of being fired on rocks which would allow air and heat to get onto the inside as well as the outside of the pot during firing. The shell temper was moderately coarse with particle sizes ranging from .05 to .7 cm in diameter with the majority being

under .5cm in length, making up 10-25% of the body. The exterior of the vessel bore evidence of cord marking on one fragment and the interior appears to have been smoothed. This vessel had an exterior rim diameter of 19 cm and one fragment (EU 1 20-30 cm NE quad) was decorated with incised lines on exterior in an arrow shape horizontal to the rim. The similarity of fragments from EU 1 and EU 2 makes it a possibility that they all came from the same pot or at least from pots that were made temporally close in time to each other. EU 2 contained Feature 8 which was radiocarbon dated to the Late Woodland to Contact periods. Late Woodland points and a complete pot, Feature 5, that was radiocarbon dated to the Late Woodland indicate that occupation occurred in both the northern and southern sections of the site during this period.

### Comparison of Grit versus Shell Tempered Pottery

#### Vessel Lots

Vessel lots were created by comparing the physical characteristics of the fragments recovered. Table 7 shows the vessel lots identified, their possible temporal associations and their spatial distributions across the site.

Table 7. Vessel lots and temporal affiliations

| Vessel # | I/E finish | Temporal Affiliation | Distribution |
|---|---|---|---|
| Grit-Temp. | | | |
| 1 | S/ Cm | ? | D5-40 |
| 2 | S/ Cm | ? | EU2, G2, H4 |
| 3 | S/ Cm | Middle Woodland | EU3-Feature 9 |
| 4 | S/ S | Middle Woodland | G4 |
| 5 | S/ S | ? | EU 1 |
| 6 | S/ S | ? | EU 3, EU 4 |
| 7 | Cm/ Cm | Early Woodland | H1 |
| 8 | Cm/ Cm | Early Woodland | EU 1-Feature 1 |
| 9 | Cm/ Cm | Early Woodland | EU 1E |
| 10 | Cm/ Cm | Early Woodland | EU 1N-Feature 4 |
| 11 | S/S | Middle Woodland | EU 3, EU 3-Feature 9 |
| 12 | W/ S | Middle Woodland | EU 3-Feature 9 |
| 13 | ?/ Cm | Late Woodland | EU 1E-Feature 5 |
| Shell-Temp | | | |
| 1 | W/? | ? | D3, G2, H5 |
| 2 | S/S | Middle Woodland | EU 3-Feature 9, EU 4, F2 |
| 3 | S/ Cm | Late Woodland? | EU 1, EU 1E, EU 2 |

Early Woodland grit-tempered vessels with cord-wrapped interior and exterior surfaces were concentrated around EU 1, EU 1E and 1N in features 1 and 4 with one other vessel identified around test pit H1. Middle Woodland grit-tempered vessels with smooth interiors and either smooth or cord-marked exterior surfaces were identified from EU3 Feature 9 and test pit G4. They may also have occurred as any of the other vessels with those characteristics where there was no definite radiocarbon date associated with them, such as Vessels 1, 2, 5 and 6. One Middle Woodland shell-tempered vessel with smoothed interior and exterior surfaces was identified from Feature 9. One definite Late Woodland vessel was identified from EU 1E Feature 5 and one suspected Late Woodland shell-tempered vessel was identified from EU 1, 1E and EU 2.

Table 8 shows a comparison of the vessel lots that were identified during the analysis phase of this project. Comparison of the vessel lots gives a better idea of the differences between various attributes.

Table 8. Comparison of vessel lot attributes

| **Vessel #** | **I/E finish** | **Atmosph. I/ E** | **Thick** | **Dia** | **Rim** | **Decoration** |
|---|---|---|---|---|---|---|
| Grit-Temp. | | | | | | |
| 1 | S/ Cm | R/R | .65-.75 cm | 24 cm | Round | |
| 2 | S/ Cm | R/O | .9-1 cm | | | |
| 3 | S/ Cm | O/O | .4-.6 cm | 19 cm | Round | |
| 4 | S/ S | O/O | .5-.6 cm | 25 cm | Round | Dentate |
| 5 | S/ S | O/O | .8 cm | 28 cm | | |
| 6 | S/ S | R/O | .3-.8 cm | 19 cm | Square | Incised |
| 7 | Cm/ Cm | R/O | 1 cm | | | |
| 8 | Cm/ Cm | R/O | 1.4 cm | 17 cm | | Incised |
| 9 | Cm/ Cm | O/ R-O | .7-1 cm | | Round | |
| 10 | Cm/ Cm | O/O | 1.3 cm | | | |
| 11 | S/S | R/O | .4- 9 cm | 26 cm | Pointed | |
| 12 | W/ S | O/O | .7-1 cm | | | |
| 13 | ?/ Cm | ?/O | ? | 25 cm | | |
| Shell-Temp | | | | | | |
| 1 | W/? | R/? | ? | | | |
| 2 | S/S | R/O | .9 cm | | | Incised |
| 3 | S/ Cm | O/O | .5-.7 cm | | | Incised |

### Distribution

Fragments of grit and shell-tempered pottery were fairly evenly distributed across the Agawam site. A total of 30 fragments (39.5%) of grit -tempered pottery and one mostly complete pot were recovered from Concentration 1 and 46 fragments (60.5%) from Concentration 2. Grit tempered pottery fragments were recovered from Features 1 (Transitional Archaic to Early Woodland period), 4 (unknown), 5 (Late Woodland period), 8 (Contact period) and 9 (Middle Woodland period).

Shell-tempered pottery fragments were recovered from Concentration 1 (n=21/ 72.4%) and Concentration 2 (n=8/ 27.6%). Fragments were recovered only from Feature 9, the Middle Woodland refuse pit but were found in association with Feature 8, a Late Woodland to Contact Period refuse area.

The distribution of grit and shell-tempered pottery fragments was fairly comparable between the two concentrations (Table 9). Concentration 2 yielded the highest occurrence of grit tempered

Table 9. Gross distribution of shell and grit-tempered pottery fragments by site portion

| | **Concentration 1** | **Concentration 2** |
|---|---|---|
| **Grit-Tempered** | 39.5% | 60.5% |
| **Shell-Tempered** | 72.4% | 27.6% |

while Concentration1 had the highest occurrence of shell-tempered pottery. Concentration 1 saw both early and late Woodland occupation in the form of pottery waster dumps (Feature 1 and Feature 5). It is possible that this area possessed some characteristics such as protection from breezes or proximity to resources that led people to make pottery here more often than in the remainder of the site. This may have led to a deposition of more fragments at this location. Concentration 2 saw more evidence of Middle Woodland occupation as well as one Contact period feature. It is possible that during the Middle Woodland, grit-tempered pottery was used more often than shell-tempered and as a result, more grit-tempered pottery fragments were deposited here.

### Thickness

The average thickness of the grit-tempered pottery fragments from both sections of the site ranged from .64cm in Concentration 2 to .99 in Concentration 1. The average thickness for grit-tempered fragments was .83 cm. Shell-tempered fragments averaged thinner than grit-tempered. Fragments from Concentration 2 had an average thickness of .9 cm while in Concentration 1 they averaged .55 cm. Comparing the averages for the two concentrations, it can be seen that the average size in inversely proportional. Grit- tempered fragments were thicker in Concentration 1 but shell tempered fragments were thicker in Concentration 2. This likely is the result of the Early and Late Woodland occupations in Concentration 1 resulting in thicker grit-tempered Early Woodland ceramics and thinner shell-tempered Late Woodland fragments. Concentration 2 was a location of Middle Woodland occupation and as a result the thinner ceramics may be the result of this occupation which saw a thinning of grit-tempered pottery and an introduction of relatively thick shell tempered pottery.

### Surface Treatment

Figure 5 shows a graph of the interior and exterior surface treatments recorded for the fragments from the site. Smooth interior and exterior surfaces were most commonly encountered on shell-

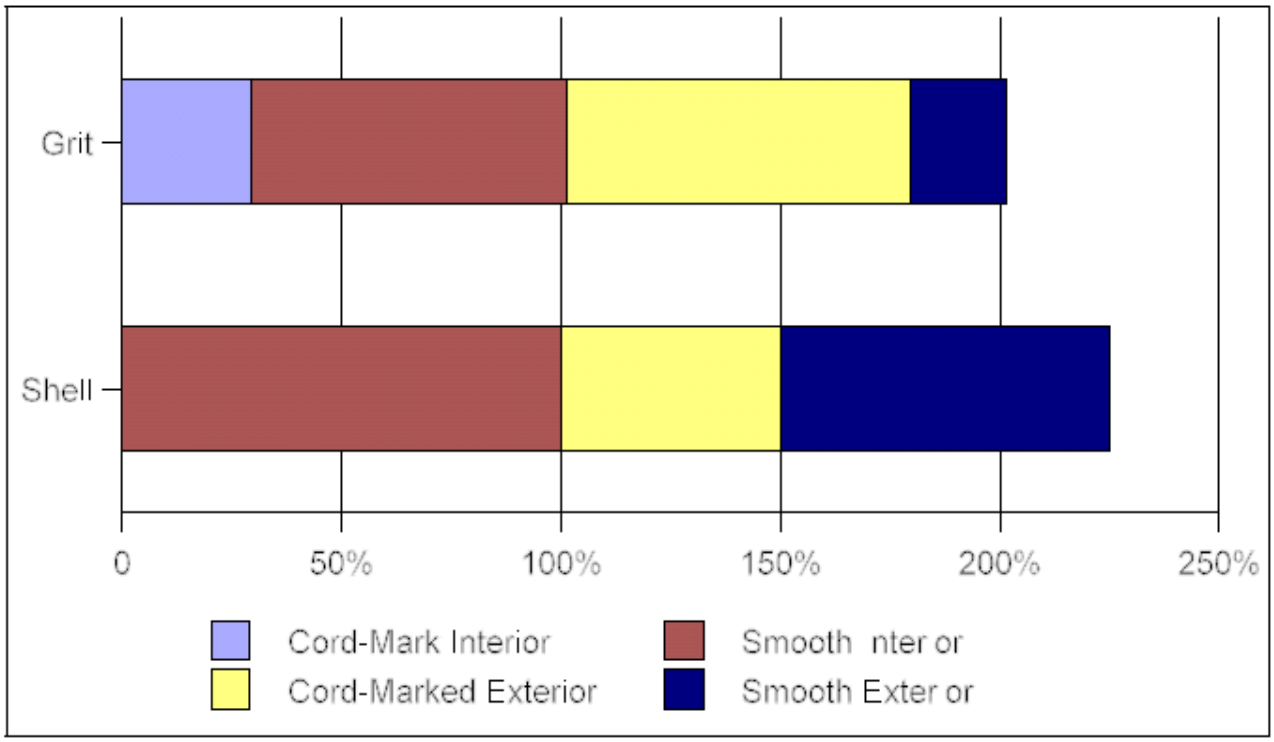


Figure 5. Comparison of surface treatments between grit and shell tempered pottery

tempered fragments, whereas smooth interiors and cord-marked exteriors were most commonly encountered on grit-tempered fragments. Cord-marked interiors, a characteristic associated with early Woodland ceramics, was encountered on grit-tempered fragments, but not on any of the shell-tempered ones. This lends support to the hypothesis that this was an early pottery trait that eventually was replaced with smooth or wiped interior treatment. While most of these surface treatments occurred interchangeably, cord-marked interiors were only found with cord-marked exteriors.

### Hardness

Fragments from the Agawam Site showed a clustering in the harder than 2 but softer than 3 range for all three portions of the site (Table 10). This clustering was common in both the grit and shell-

Table 10. Comparison of Grit and shell tempered vessel hardness

| | Concentration 2 | Concentration 1 | Totals |
|---|---|---|---|
| **Grit** | **20** | **28** | **48** |
| 2-3 | 10/ 50% | 17/ 60.7% | 27 |
| 3-4 | 4/ 20% | 1/ 3.6% | 5 |
| 4-5.5 | 6/ 30% | 10/ 35.7% | 16 |
| **Shell** | **6** | **7** | **20** |
| 2-3 | 5/ 83.3% | 14/ 100% | 19 |
| 3-4 | 1/ 16.7% | | 1 |

tempered fragments with shell-tempered fragments almost exclusively being clustered here. Both shell and grit-tempered fragments were in the 2-3 hardness range with smaller percentages falling outside of this. This likely indicates a consistency of firing technique and technology over time. The occurrence of a range of degrees of hardness between the two concentrations indicates that there is a good possibility that pottery was produced at the site throughout its occupation.

## RESEARCH QUESTIONS

**What are the similarities and differences between the shell-tempered and the grit tempered pottery from the site? Do enough differences exist to show a differential use of the two types of pottery?**

The similarities and differences between the grit and shell tempered pottery was discussed above in section c. Shell tempered shards occurred less frequently at the site and a greater number of fragments were recovered from the Concentration 1, the southern half of the site. Overall they were thinner and had smooth interior and exterior surfaces more often than cord marked ones. It can not be definitely said that enough differences exist to show differential use of grit tempered versus shell tempered pottery vessels. The use of shell, the thinning of the body and the smoothing of the surfaces may all be indicative of an increased use of pottery for extended boiling versus storage or simmering.

**What is the relationship of the pottery shards recovered from the radiocarbon-dated features to those recovered from the rest of the site? Does the distribution of fragments that are similar to the feature pottery support an interpretation of only a small number of occupations at the site?**

Three features were radiocarbon dated, Feature 1 (2610 +/-30 to 2170 +/-30 years BP), Feature 8 (440 +/- 40 years BP) and Feature 9 (1540 +/- 40 years BP). Feature 1 yielded Early Woodland pottery that was thick, cord marked on the exterior and decorated with incised lines. Both Feature 8 and 9 yielded shell tempered and grit tempered pottery. The shell tempered fragment from Feature 9 was only a possible shell tempered fragment. It appears that the shell tempered pottery is likely

more closely associated with the Late Woodland to Contact Periods while the grit tempered is associated with all periods.

Distribution of pottery from across the site showed that shell tempered pottery and thick grit tempered pottery was associated most closely with Late Woodland and Early Woodland respectively, occupations in the southern half. This may indicate foci of occupations in the southern half during the Early and Late Woodlands and the northern half in the Middle Woodland. Occupations during all the periods represented appear to have taken place across the project area, but was focused in different areas at different times.

**Do the complete pot and the pottery fragments recovered from Features 1 and 5 represent ceramic waters or misfired pieces? Is there evidence from other pieces from the site of over or under firing? Does this support an on site production hypothesis for these pieces?**

The pottery fragments from Feature 1 and the complete pot from Feature 5 both appear to be under fired. The inner surface of the Feature 1 pottery was soft when it was recovered while the interior of the Feature 5 pot appeared to be missing, which was likely the result of it being under fired as well. Several fragments were found to be of relatively the same hardness, 2-3, as the exterior of the Feature 1 and Feature 5 vessels, but no other fragments were found to be as soft, 1-2, as the interior as the Feature 1 vessel. It is likely that pottery production was one of the activities that was consistently carried out at the site, but extensive evidence aside from these two vessels was not identified.

**How does the type of pottery represented at the site reflect both the subsistence pattern suggested by the shellfish, faunal remains and lithics and the degree of mobility suggested by the lithic reduction analysis? How does this relate to the common interpretation of Transitional Archaic to Early Woodland patterns observed elsewhere?**

The presence of pottery fragments from a variety of vessels indicates extended occupation of the site, likely for multiple months of the year, supporting the idea that the site represent s logistical or base camp for Late Archaic and Woodland populations. Due to its relatively fragile nature, the production and use of the pottery at the site may indicate that a semi-sedentary population remained at the site, utilizing the resources from the river and surrounding woodlands for a significant portion of the year.

Early Woodland populations have been interpreted as extremely mobile groups that were exploiting resources and returning to a separate base camp. Their tool assemblages reflect this, being composed of bifaces and preforms without much core reduction. The Late Woodland seasonal base camps appear to have been occupied by small family groups tending crops near a main village while the logistical camps were used for the procurement and processing of game and other forest resources to be transported away from the sites (Cowan 1999:605). If these interpretations are true, then the Agawam Site appears to represent the base camp for the Transitional Archaic to Contact

period populations in this section of Wareham. They appear to have exploited a wide range of faunal remains and likely used the pottery to process and prepare some of these resources for storage and consumption.

## CONCLUSION

Pottery fragments were recovered from both concentrations. Fragments of grit-tempered pottery were fairly evenly distributed across the site with a total of 30 fragments and one mostly complete pot being recovered from the Concentration 2 and 46 fragments from Concentration 1 portion. Grit tempered pottery fragments were recovered from Features 1, 4, 5, 8 and 9.

Shell tempered pottery was recovered from both concentrations as well Concentration 1 yielded eleven fragments from excavation units 1, 1E and 1N. The average thickness was .7 cm with a range between .5 and .85 cm, the interior surface was finished by smoothing (79.5%) or less commonly by wiping (20.6%) while the exterior was either smoothed (25%), cord marked (75%) or possibly a combination of the two on one vessel. Eight fragments were recovered from Concentration 2, with three of them coming from the Middle Woodland Feature 9. The average thickness from this area is .9 cm based on one fragment retaining both interior and exterior surfaces. Surface treatment was limited to smoothing on the interior surfaces (100%) and exterior (100%).

Concentration 1 had more fragments of thicker pottery, likely that dating to the early woodland period, as well as more fragments of shell tempered pottery, likely dating to the Late Woodland Period. This supports the findings from the lithic analysis.

A total of 13 vessel lots were identified for the grit tempered fragments, while only three shell tempered vessels were identified. Of these 16 vessels, four were assigned to the Early Woodland period based on the presence of cord-marked interior and exterior surfaces, five were assigned to the Middle Woodland Period (four gravel tempered and one shell tempered) based on their associations with Feature 9, the presence of dentate stamping on the exterior and smoothed interior and smooth or cord-wrapped exterior surfaces. Two vessels were assigned to the Late Woodland Period based on their associations with features. Five vessels were not assignable to any specific time period.

Decorations on the vessels was found to consist of linear incised lines and checkerboard patterns on one Early Woodland vessel and dentate stamping on one Middle Woodland Period vessel. Rim shapes consisted of squared, rounded and pointed shapes. Pottery from both concentrations was found to have been fired in a reducing or oxidizing atmosphere on their interior surfaces and a consistently oxidizing atmosphere on the exterior. Pottery hardness was found to consistently be between 2 and 4 on the Mohs scale. Pottery production technology did not appear to have changed significantly from the Early to Late Woodland periods with the exception of the grit temper becoming somewhat finer, the vessels becoming somewhat thinner and the increased use of shell as a temper.

The shift from grit tempered pottery to shell tempered, a shift that appears to have begun in the Middle Woodland Period but one which never resulted in the complete disappearence of grit

tempered pottery, may have been related to an increased use of pottery for cooking. The thick, burned granite grit tempered vessels of the early and Middle Woodland periods may have been used for low heat simmering or storage of materials such as oils or grease. Thinner pottery vessels that were tempered with shell have been found to be better for aggressive boiling whereas the thicker, grit tempered vessels were likely better for low heat simmering and storage of products. The possible shift from simmer/ storage to boil may be related to and increased reliance on foods that needed to be boiled, such as corn and beans, as opposed to raw materials that were processed, stored, and possibly reheated in the same vessel, such as fat and nuts that were rendered to produce oils and grease.

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# Appendix . Artifacts from the Agawam/ Car-Tracks Site

**Transect A**

A-1

10-20 cm

2 quahog shell fragments .8g
5 railroad cinder .4g
1 (2 frags) possible grit-tempered pottery .3g, small

20-30 cm

1 quahog shell fragment .6g
1 whelk columnella 2.5g
5 railroad cinder .6g
1 coal fragment 1g
1 translucent very fine-grained grey green quartzite trim flake .7cm
1 translucent very fine-grained mottled grey green and maroon quartzite secondary flake 2cm
2 very dark grey rhyolite secondary flakes 1cm
1 dark brown grey rhyolite secondary flake 1.5cm
1 tan rhyolite secondary flake .5cm

30-40 cm

1 possible granite with a quartz vein FCR fragment 61.7g 6cm
1 quartz shatter probably natural from above FCR 2 cm
1 railroad cinder .1g

A-2

0-10 cm

3 light green bottle glass machine made body fragments
1 railroad cinder <.1g

20-30 cm

2 railroad cinder .3g
1 dark purple rhyolite secondary flake 2.5cm

A-3

10-20 cm

1 iron nail or wire fragment 4.5cm

20-30 cm

1 iron nail or wire fragment 3cm
1 light purple rhyolite secondary flake 1.5cm
1 green grey rhyolite secondary flake 1.5cm

A-4

0-10 cm

1 cupreous nail with "26" stamped on head telegraph pole nail 3.3cm
2 railroad cinder 19.5g
1 light aqua blue vessel glass fragment machine made
1 coal fragment 3.6g

10-20 cm

2 light aqua blue vessel glass fragment machine made, one with "-ing" embossed on outside
1 white quartz possible shatter 3cm
1 wire nail 6cm

2 railroad cinder .3g

20-30 cm

1 light aqua blue vessel glass fragment machine made

1 railroad cinder <.1g

**Transect B**

B-1

0-10 cm

1 clear liquor bottleneck and shoulders machine made "FRANKFORT DISTILLERIES/ LOUISVILLE/ KY/ BALTIMORE/ MD/ INCORPORATED" embossed on top of aluminum cap

10-20 cm

73 oyster shell fragments 50.7g

15 left (in) oyster shell hinges 22.7g

7 right (out) oyster shell hinges 15.3g

3 quahog shell fragments 8.3g

1 whelk columnella 1.3g

1 light green machine made vessel glass body frag

B-2

0-10 cm

6 quahog shell fragments 2.8g

1 railroad cinder .2g

1 tan quartzite trim flake 1cm

10-20 cm

13 quahog shell fragments 1 hinge 20.9g

7 oyster shell fragments 1.9g

4 soft shell clam fragments .9g

1 white quartz decortification shatter 2.4cm

1 calcined white small mammal scapula fragment .1g

20-30 cm

32 quahog shell fragments 47.2g

17 oyster shell fragment 2.2g

1 maroon and tan banded Saugus jasper secondary flake 2cm

1 dark purple grey rhyolite secondary flake 1.5cm

1 light pink purple rhyolite secondary flake .8cm

30-40 cm

2 oyster shell fragments .1g

B-3

0-10 cm

1 quahog shell fragment .7g

1 steatite bowl body fragment .3" thick 3.5 x 2.5cm

10-20 cm

1 brick fragment 2.8g

1 whelk columnella .1g

1 granite FCR 273.3g 2.5"

20-30 cm
- 4 quahog shell fragments 3.6g
- 1 whelk shell columnella 1.1g
- 1 green very fine grained quartzite secondary flake 1.3cm
- 1 white quartz secondary flake 1.3cm
- 1 steatite bowl fragment .3" thick 2.5 x 2cm

30-40 cm
- 11 quahog shell fragments 12.1 g
- 1 oyster shell fragment <.1g
- 1 graphite fragment .1g
- 1 clear quartz trim flake .7cm
- 1 quartz secondary flake 4.2cm
- 1 black rhyolite secondary flake 1.5cm

40-50 cm
- 1 quahog shell fragment .2g
- 1 green grey rhyolite trim flake 1cm

B-4

10-20 cm
- 3 quahog shell fragments 6.2g
- 1 oyster shell fragment <.1g
- 1 Saugus jasper secondary flake 2.3cm
- 1 white quartz secondary shatter 1.3cm

20-30 cm
- 3 quahog shell frags, 1 hinge 1.9g
- 1 white quartz secondary shatter 1.6cm

B-5

10-20 cm
- 1 quahog shell fragment .6g
- 1 smoky quartz secondary shatter .8cm
- 1 white quartz secondary shatter 1.55cm

20-30 cm
- 1 hand wrought nail bent into ?-shape 7cm
- 1 quartz secondary flake 1.5cm
- 1 quartz secondary shatter 1.3cm

30-40 cm
- 1 quartzite FCR 39.2g 4.5 cm

B-6

0-10 cm
- 1 coal fragment .8g
- 1 white quartz secondary shatter 2cm

10-20 cm
- 1 quartz thick secondary flake 4cm

20-30 cm
- 1 coal fragment 4g

**Transect C**

C-1

0-10 cm

2 quahog shell fragments 2.2g
3 oyster shell fragments 1 left (in) hinge 3.2g

10-20 cm

4 quahog shell fragments 4.2g
2 oyster shell fragments <.1g
1 whelk columnella .9g

20-30 cm

2 quahog shell fragments 1.8g
1 white quartz secondary shatter 1cm

C-2

0-10 cm

5 quahog shell fragments 2g
1 whelk columnella 1.3g

10-20 cm

12 quahog shell fragments 9.2g
1 Hornfels with tan cortex and grey spots secondary decortification flake 3cm
1 dark maroon Saugus jasper secondary flake 2.1cm

20-30 cm

1 whelk columnella 2.3g

C-3

10-20 cm

4 quahog shell fragments 3.4g
3 railroad cinder .4g
1 grey chert secondary flake 1.4cm
1 Hornfels secondary shatter 2.4cm
1 purple grey rhyolite trim flake 1.1cm
1 granite FCR 3.5 cm 12.4 g

20-30 cm

5 quahog shell fragments 1.4g
1 whelk columnella 1.2g
1 graphite fragment .5g
1 railroad cinder <.1g
1 flat aqua glass frag
1 undecorated pearlware frag
2 granite FCR fragments 28.4g 1.4, 4 cm
1 purple rhyolite trim flake .8cm

C-4
0-10 cm
4 quahog shell fragments 2.2g
1 granite FCR 74.5g 7.3 cm
10-20 cm
1 whelk columnella 2.2g
1 grey purple rhyolite secondary flake 2.4cm
20-30 cm
1 quahog shell hinge 2.1g
1 unidentified shell fragment .1g
1 grey rhyolite secondary flake 1.4cm
C-5
20-30 cm
1 quahog shell fragment .9g
1 graphite fragment 2.1g
3 quartz shatter fragments 1, 1.5, 1.5cm
1 banded grey and dark grey rhyolite trim flake 1.3cm
1 green grey rhyolite secondary flake .7cm
30-40 cm
1 quartz secondary flake 1cm
1 quartz shatter 2cm thick

**Transect D**
D-1
0-10 cm
1 graphite fragment .3g
2 quahog shell fragments 1.6g
1 very dark grey rhyolite secondary shatter fragment 1.4cm
10-20 cm
1 quahog shell fragment .2g
30-40 cm
1 white quartz secondary flake 1cm
D-2
0-10 cm
5 quahog shell fragments 1.1g
1 granite FCR 9.3g 3.5 cm
1 dark grey rhyolite secondary flake 1.3cm
10-20 cm
1 quahog shell fragment .7g
1 granite FCR 1.3g 1 cm
20-30 cm
4 quahog shell fragments 2.8g
1 whelk columnella .2g

2 granite FCR 6.9g 1, 1.5cm
1 quartz secondary shatter 1.4cm
1 grey brown rhyolite trim flake 1cm

30-40 cm
3 charcoal fragments .6g
1 whelk shell fragment .2g
1 quahog shell fragment .2g
1 blocky quartz shatter 1.5cm

D-3

0-10 cm
2 quahog shell fragments 2.5g
1 dark grey rhyolite secondary cd 1.5cm

10-20 cm
6 quahog shell fragments 9.2g
1 shell-tempered pottery fragment 1cm
1 grey rhyolite decortification flake 2cm

20-30 cm
8 quahog shell fragments 3.4g
1 maroon purple rhyolite secondary cd 1.4cm
1 dark grey rhyolite secondary cd 2.3cm

30-40 cm
10 quahog shell fragments 2.6g
1 dark grey rhyolite secondary shatter 1.5cm
1 possible shell-tempered pottery fragment 1cm

40-50 cm
6 quahog shell fragments 1.6g
1 granite FCR 3g 1.5 cm
1 white quartz secondary flake, thick 4.5cm possible vein quartz

D-4

0-10 cm
2 quahog shell fragments 1.1g
1 quartz decortification shatter 1.5cm
1 dark grey rhyolite decortification shatter 1cm
1 dark grey rhyolite secondary flake 2cm
1 black Hornfels trim flake 1cm
1 shell-tempered pottery fragment 1cm

10-20 cm
10 quahog shell fragments 8.4g
1 granite FCR fragment 1cm, 1g
1 quartz secondary shatter 2.5cm
1 redware vessel fragment glaze missing

20-30 cm
1 quahog shell fragment .2g
1 granite FCR fragment 10.1g, 4.2cm
30-40 cm
1 quahog shell fragment .3g

D-5
0-10 cm
1 railroad cinder .1g
1 purple tan rhyolite secondary flake 1cm
10-20 cm
1 grey rhyolite secondary flake 2.7cm
30-40 cm
2 graphite fragment 4.7g, 3.3cm, .5cm
1 granite FCR 66.2g 5.5 cm
6 heavy grit-tempered pottery fragments 1 rim
2 grey rhyolite secondary flakes 1.5cm
1 clear quartz secondary flake 1.3cm
D-6
20-30 cm
1 green grey very fine grained quartzite secondary flake 1.5cm
D-7
10-20cm
1 undecorated pearlware vessel body frag

**Transect E**
E-1
0-10 cm
1 quahog shell fragment .2g
1 whelk shell columnella 1.2g
10-20 cm
3 granite FCR 61.7g, 3.7, 4.5, 4.4cm
1 unidentified shell fragment .1g
1 dark maroon purple rhyolite secondary flake 2cm
20-30 cm
1 whelk shell columnella 1g
2 granite FCR fragments 265.5g 6, 7.2cm
E-2
0-10 cm
1 white quartz secondary flake 1.8cm
1 steatite bowl rim shard .375" thick 3.5cm long
10-20 cm
2 quartzite FCR fragments 44.4g 3.5, 3.7cm

1 granite FCR fragment 4.3g 2cm
20-30 cm
1 graphite fragment 1.3g, 1.3cm
1 charcoal fragment .1g1 white quartz secondary shatter 1cm
1 grit-tempered pottery fragment with exterior paddle marks 1.8cm
1 rhyolite FCR fragment 187.7g 8.3cm
1 white quartz FCR fragment 73.3g 6.2cm

E-3
20-30 cm
1 possible quahog shell fragment .2g
1 very dark grey rhyolite secondary flake 1.3cm
30-40 cm
1 quahog shell fragment .2g
E-4
10-20 cm
1 graphite fragment with brown cortex .4g 1.1cm
1 unidentified shell fragment .1g
1 black Hornfels secondary decortification flake 1.45cm
1 dark grey rhyolite secondary flake 2.3cm
20-30 cm
1 graphite fragment .1g with brown cortex .7cm
1 quartz secondary flake .8cm
1 grey rhyolite secondary flake 1cm
30-40 cm
1 grit-tempered pottery fragment .5cm
E-5
20-30 cm
1 white quartz trim flake .6cm
30-40 cm
2 quahog shell fragments 1.7g
1 grey rhyolite secondary flake 2cm
E-6
20-30 cm
1 possible quahog shell fragment .1g
1 coal fragment 1cm .6g
1 green grey rhyolite secondary cd 1.7cm
30-40 cm
1 charcoal fragment <.1g
1 copper or brass scrap. cut triangular shaped 2.2 x 1cm
E-7
10-20 cm
1 graphite fragment 1.5g 2cm

30-40 cm
3 quahog shell fragments 1.2g
1 steatite bowl body fragment .32" thick 1.7cm
1 dark maroon purple rhyolite secondary flake 2.6cm
E-8
0-10 cm
1 dark grey and grey banded rhyolite secondary flake 1.2cm
20-30 cm
1 grey rhyolite trim flake .5cm

**Transect F**
F-1
0-10 cm
2 charcoal fragments .1g
1 quartz secondary flake 1g
1 very dark grey rhyolite secondary flake 1cm
10-20 cm
4 fragments FCR 15.7g
1 shell fragment unidentified .1g
20-30 cm
1 quartzite FCR 108.3g 6 cm
3 granite FCR 110.8g 1, 4.5, 5.1cm
2 unidentified shell fragments .3g
1 whelk shell columnella 1.2g
1 charcoal fragment <.1g
1 white quartz decortification shatter 1.5cm
1 steatite body fragment 1.1cm
1 dark maroon rhyolite secondary flake 1.5cm
1 grey green rhyolite decortification flake 1.3cm
30-40 cm
1 granite FCR fragment 23.2g
F-2
0-10 cm
3 quahog shell fragments .6g
1 quartz secondary flake 1cm
1 quartz secondary flake 1.7cm
1 quartz Levanna 3 cm long, 2 cm high, tip broken off, .5cm thick
10-20 cm
2 granite FCR 45.2g 1.5, 4.6cm
1 grey chert? secondary flake 1cm
1 charcoal .1g
1 green grey rhyolite secondary flake 1cm
2 quartz secondary flakes .5, .7cm

20-30 cm
1 whelk columnella 1.1g
1 grey green rhyolite cd 1cm
1 shell-tempered pottery frag
F-3
0-10 cm
1 quahog shell fragment .2g
10-20 cm
2 quahog shell fragments 3g
F-4
30-40 cm
1 quahog shell fragment .1g

F-5
0-10 cm
3 fragments clear modern vessel glass body frags

F-7
10-20 cm
2 quahog shell fragments .8g
1 grey rhyolite trim flake .7cm
20-30 cm
1 quahog shell fragment 2.8g
30-40 cm
3 quahog shell fragments 1g
1 whelk shell fragment .1g
2 unidentified shell fragments .3g

**Transect G**
G-1
0-10 cm
1 quahog shell fragment 1g
1 quartz secondary flake 1cm
1 mottled purple pink rhyolite secondary flake 1cm
1 very dark grey quartzite secondary flake .8cm
1 green chert secondary flake utilized on one edge, rounded 1.5cm
10-20 cm
3 whelk frags, 1 columnella 3.3g
4 quahog fragments 1.5g 1 hinge
2 unidentified shell fragments .3g
1 quartz shatter fragment 1cm
1 mottled purple and pink rhyolite trim flake .7cm

20-30 cm

1 unidentified shell fragment .2g
1 quartz shatter .5cm
1 quartz secondary flake 1cm
1 grey with very dark grey spots rhyolite secondary flake 2.1cm

30-40 cm

1 granite FCR 162.9g 7.2 cm
1 tan quartzite secondary flake 1.3cm

G-2

0-10 cm

1 charcoal fragment .1g
1 whelk columnella 2.3g
1 quahog shell fragment 1.9g
1 quartz secondary flake 2cm
1 quartz secondary shatter 1.5cm
1 dark grey rhyolite trim flake 1cm
1 grey green quartzite secondary flake 1.2cm
1 maroon brown rhyolite secondary flake 1.1cm

10-20 cm

1 possible quahog shell fragment .1g
1 dark grey possible mudstone secondary flake 1 cm
1 dark grey rhyolite trim flake .5cm
1 quartz decortification shatter 1cm

20-30 cm

1 piece granite FCR 7.5g
2 shell f rags unidentified .1g
1 grey green rhyolite secondary cd 1.3cm
1 purple rhyolite decortification cd 1.5cm
1 grey quartzite secondary cd 1 cm
1 black rhyolite trim flake 1.1cm
1 quartz secondary shatter 3.5cm
1 shell-tempered pottery interior fragment
1 grit-tempered pottery body frag

30-40 cm

5 shell-tempered pottery fragments
4 graphite fragments 1.2g 1, 1.2, 1.3, 1.4cm
3 black rhyolite secondary flakes 1, 1.5, 1.5cm
1 green grey rhyolite secondary shatter 1.6cm
1 very dark grey rhyolite secondary flake 1.6cm
1 granite FCR .9 cm
1 calcined medium mammal longbone frag

G-3
0-10 cm
4 charcoal fragments .5g
1 possible oyster shell fragment <.1g
10-20 cm
1 quartz secondary shatter 4cm
1 white quartz secondary flake .6cm
1 green grey rhyolite trim flake 1cm

G-4
0-10 cm
1 clear modern vessel glass body fragment
10-20 cm
1 quartz secondary flake/ blade struck from core 3.2cm long
1 quartz secondary flake 1.5cm
1 quartz secondary shatter 1cm
20-30 cm
1 granite FCR 23.8g 5 cm
2 fragments grit-tempered pottery rim shard
2 fragments shell-tempered pottery
1 charcoal fragment .1g
1 quartz secondary flake 1.2cm
1 purple grey rhyolite decortification flake 2.7cm
1 green grey rhyolite secondary flake 1.7cm

**Transect H**
H-1
10-20 cm
1 very rusted nail 5.5cm long no head
1 graphite fragment .5cm .2g
1 black possible rhyolite secondary flake 1cm no phenocrysts visible
1 dark maroon rhyolite secondary flake 1.5cm
1 light grey purple rhyolite secondary flake
1 grit-tempered pottery fragment paddle marked exterior black possible paddle marked interior 1cm thick
20-30 cm
2 quahog shell fragments 2.4g
1 graphite fragment .7g 1.5cm
1 granite FCR 2.5 cm 4.4g
1 very dark grey rhyolite secondary flake .7cm
1 quartz shatter with cortex 3cm no crushing evident
1 possible quartz FCR 1.5 cm 3.5g
1 possible quartz flake .6cm

H-2
0-10 cm
1 quahog shell fragment .5g
1 graphite fragment .9g 1.4cm
1 iron square nut 2cm
1 quartz decortification flake 3cm
1 tan siltstone secondary flake 1.3cm
1 grey rhyolite secondary flake 1.4cm
10-20 cm
5 quahog shell fragments 7.6g
1 grey quartzite secondary flake 1.5cm
1 green grey rhyolite secondary flake 1cm
1 dark purple grey rhyolite secondary flake 1.6cm
1 dark grey rhyolite secondary flake 1.2cm
20-30 cm
7 quahog shell fragments 4.9g
1 grit-tempered pottery fragment 1.1cm
1 very dark grey rhyolite secondary flake 1cm
30-40 cm
1 quahog shell fragment 2.6g
1 white quartz decortifcation flake 1.8cm
1 grey possible chert decortification flake 2.4cm
1 grey green quartzite secondary flake 1cm

H-3
0-10 cm
1 quahog shell fragment .2g
10-20 cm
1 charcoal fragment .1g
20-30 cm
1 quahog shell fragment .4g
1 graphite fragments 1.3g 1, 1.5cm
1 calcined flatbone fragment 1g
1 grey rhyolite secondary flake 4cm
1 dark grey purple very fine grained rhyolite secondary flake 1cm
1 dark grey rhyolite secondary flake 1.2cm
30-40 cm
1 shell-tempered pottery fragment 1
1 very dark grey rhyolite secondary flake 1.3cm
H-4
0-10 cm
7 charcoal fragments .5g
1 granite FCR fragment 3.4g 2.3cm

1 redware fragment with brown glaze
1 unidentified shell fragment .1g
5 grit-tempered pottery frags
1 shell-tempered pottery frag

H-5
0-10 cm
1 white quartz secondary flake 1.4cm
10-20 cm
2 quahog shell fragments .5g
1 shell-tempered pottery frag
20-30 cm
2 quahog shell fragments 3.9g
1 unidentified shell fragment .1g
30-40 cm
1 grey quartzite secondary flake 2cm

H-6
0-10 cm
3 granite FCR fragments 204g 3, 6, 8.3cm
1 calcined medium mammal bone fragment .1g
10-20 cm
1 (3 frags) calcined medium mammal flatbone fragment .1g

**Transect I**

I-1
0-10 cm
2 charcoal fragments .1g
4 quahog shell fragments 5.5g 1 hinge
10-20 cm
6 quahog shell fragments 5.8g
1 oyster shell fragment .2g
4 grey rhyolite secondary flakes .5, .5, .6, 1.5cm
1 granite FCR fragment 36.8g 4cm

I-2
10-20 cm
1 quahog shell fragment .2g
1 granite FCR 2.4g 2 cm
1 weathered light purple rhyolite trim flake .7cm
1 quartz trim flake .8cm
1 light grey quartzite secondary flake 1.5cm
20-30 cm
1 dark grey rhyolite secondary flake .7cm
30-40 cm
1 charcoal fragment .2g

2 graphite fragments .9g 1, 1.7g
1 dark green machine made bottle glass fragment body
1 quartz secondary shatter 1.4cm vein quartz
1 white quartz secondary flake 1.4cm
1 quartz secondary shatter 2.7cm vein quartz?
1 quartz secondary shatter 5.3cm vein quartz?

I-3
0-10 cm
8 charcoal fragments 8.5g recent
4 scallop shell fragments 1.4g recent

10-20 cm
3 charcoal fragments 1.3g
1 graphite fragment .3g 1cm
1 scallop shell fragment .1g
1 white quartz secondary flake .8cm
1 dark grey rhyolite secondary flake 2.7cm

20-30 cm
2 scallop shell fragments .4g

I-4
10-20 cm
1 brown machine made vessel glass body frag
1 dark purple grey rhyolite trim flake 1cm
1 unidentified shell fragment .1g

**Transect J**

J-1
0-10 cm
1 quartz Levanna 1 corner broken 1.8 x 2cm .4cm thick
2 quahog shell fragments , 1 hinge 1.8g
1 quartz biface fragment possibly Levanna corner 1.5cm long .5cm thick

10-20 cm
2 quahog shell fragments 1 hinge 1.1g
1 possible ground stone tool or pestle fragment 2.7cm rounded

J-2
0-10 cm
1 quartz secondary flake 1.5cm

10-20 cm
1 graphite fragment .4g 1.3cm
1 white crypto crystalline secondary flake with grey veins 1.55cm
1 grey rhyolite trim flake 1cm
1 light grey rhyolite secondary flake 1.4cm

20-30 cm
1 very dark grey chert drill tip 1.1cm

J-3
10-20 cm
1 quahog shell fragment 2.5g
3 dark grey rhyolite secondary flakes .5, 1, 1.4cm
J-4
0-10 cm
2 asphalt roof shingle fragments .4g
1 iron wire nail 4cm
1 graphite fragment 3.7g 2.3cm
10-20 cm
1 quartz secondary shatter 1cm
1 grey rhyolite secondary flake 1cm
20-30 cm
2 quahog shell fragments 3.3g

**Excavation Units**

**EU 1**

0-10 cm

NE

13 machine made solarized alcohol bottle glass fragments "WAR.." on one fragment (WARRANTED)

NW

1 quahog shell fragment .8g
1 graphite fragment .2g 1cm
1 grey brown rhyolite secondary flake 2.2cm
1 dark maroon purple rhyolite secondary flake 2.4cm

SW

1 quahog shell fragment hinge .8g
1 very dark grey rhyolite secondary flake 1.6cm

10-20 cm

NE

20 quahog shell fragments 10.2g
1 whelk columnella .6g
4 charcoal fragments .4g
1 graphite fragment .6g 1.8cm
2 granite FCR fragments 10.2g 2.4cm
1 aqua flat glass fragment probable window glass
3 machine made solarized alcohol bottle glass frags
1 shell-tempered pottery frag
1 white quartz decortification flake 2.7cm
1 white/ clear quartz secondary flake 1cm
1 tan mudstone decortification flake 3.5cm
1 grey argillite decortification flake 1.8cm
1 dark grey rhyolite secondary flake 1.5cm
1 very light grey rhyolite secondary flake 1.2cm

NW

11 quahog shell fragments 11.4g
1 whelk columnella .7g
1 granite FCR 450g 7 cm
2 white quartz shatter fragments 1.7, 1.8cm
1 smoky quartz core 5x5.8cm
1 black rhyolite secondary flake 1.2cm
1 blue willow pattern decorated whiteware fragment
1 grit-tempered pottery fragment

SE

5 granite FCR fragments 1.5, 1.5 ,3, 4.2, 5.8cm
1 grit-tempered pottery fragment
12 quahog shell fragments 1 hinge 15.6g

1 oyster shell fragment .2g
1 whelk columnella .7g
1 graphite fragment .3g 1.3cm
1 grey rhyolite secondary flake 1cm
1 light grey rhyolite secondary flake .9cm
SW
8 quahog shell fragments 13.2g
1 unidentified shell fragment .1g
2 charcoal fragment .2g
1 grey normanskill chert secondary flake .7cm
2 very dark grey rhyolite secondary flakes 1, 1.1cm
1 dark grey rhyolite secondary flake 1cm
1 clear quartz secondary flake .8cm
1 black normanskill chert secondary flake 1.3cm
1 shell-tempered pottery frag
30cmbs
2 granite FCR fragments 16.4g 1.9, 2.8cm
1 grey argillite secondary flake 1.3cm
4 charcoal fragments .2g
30cmbs Feature 1 NE west half
1 grey chert Orient Fishtail point unfinished 3.3cm long 1.4cm wide body, 1.2cm
wide base,
.7cm thick body
20-30 cm
NE
6 charcoal fragments .5g
5 graphite fragments 2.1g 1, 1.4, 1.4, 1.6, 1.2cm
9 quahog shell fragments 8g
1 calcined mammal longbone fragment .1g
1 granite FCR fragment 334.1g 8.2cm
1 sandstone FCR fragment 210.5g 6.3cm
1 dark grey Normanskill chert secondary flake 2.1cm
1 white quartz biface fragment 1.4cm
1 white quartz secondary flake 1cm
2 very dark grey rhyolite secondary flakes 1, 1.1cm
1 grey rhyolite secondary flake 1.1cm
3 shell-tempered pottery frags
NW
1 granite FCR fragment 76.3g 5.8cm
2 quahog shell fragments 1.6g
2 whelk columnella fragments .7g
1 graphite fragment .1g .9cm
1 grit-tempered pottery fragment

SE
7 granite FCR fragments 188.8g 1.5, 1.8, 1.2, 2, 2.3, 5.3, 5.3cm
6 charcoal fragments .5g
1 rust fragment
4 graphite fragments 8.2g 1.6, 2.1, 2.2, 2.4cm
1 grey rhyolite secondary shatter 1.9cm
1 grey rhyolite secondary flake 1.1cm
1 white quartz secondary shatter 1.1cm blocky
1 white quartz decortification shatter 2.1cm
1 shell-tempered pottery fragment
SW
5 quahog shell fragments 6.2g
1 white quartz secondary shatter 2.1cm
1 grey green argillite secondary flake 2.4cm
30-35 cm Feature 1 east half
NE
2 granite FCR fragments 18.3g 2.4, 2.8cm
2 graphite fragments 2.3g 1.3, 3.1cm
2 charcoal fragments .3g
4 calcined mammal bone fragments .1g
2 grey clear quartz secondary flakes 1, 1.4cm
1 dark grey rhyolite secondary flake 1.3cm
1 very dark grey rhyolite secondary shatter 2.3cm
1 grit-tempered pottery frag
Soil Sample 30-35 cm Feature 1 east half
NE
52 charcoal fragments .9g
1 FCR fragment granite .8g 1,5cm
2 graphite fragments .1g .7, .8cm
1 clear quartz secondary flake .5cm
1 black cert trim flake .5cm
28 grit-tempered pottery frags
30-35 cm Feature 1 west half
NE
1 graphite fragment 3.2g 2.8cm
4 charcoal fragments .7g
35cmbd Feature 1 East half
NE
1 (9frags) grit-tempered pottery low fired
35-40 cm Feature 1 East half
NE
2 charcoal fragments .2g
Soil Sample NE E ½
65 charcoal fragments 1g

20 grit-tempered pottery frags
1 graphite fragment .2g 1.4cm
2 calcined mammal flatbone fragments .1g
1 very dark purple rhyolite secondary flake 1.7cm
1 clear quartz secondary flakes .7, 1cm
SE
1 dark purple grey rhyolite Small Stemmed point point complete 4.3 cm long, 1.8cm wide body, 1.5cm wide base .9cm thick
35-40 cm Feature 1 West half
NE
2 graphite fragments .5g 1, 1.4cm
1 very dark grey rhyolite secondary flake 1.4cm
2 grit-tempered pottery fragments
1 calcined mammal flatbone fragment .1g
40-45 cm Feature 1 East half
SE
1 granite FCR 83.9g 5 cm
1 graphite fragment .2g 1cm
4 charcoal fragments .4g
3 white/ clear quartz secondary flakes 1.2, 1.5, 2cm
NE Soil Sample
18 charcoal fragments .4g
3 granite FCR fragments 16.5g 1.2, 1, 3.5cm
1 grey chert secondary flake 1.1cm
1 graphite fragment .1g 1.2cm
2 white quartz secondary flakes .5, .7cm
1 clear quartz secondary flake .7cm
3 calcined mammal bone fragments .1g
NE
1 white/ clear quartz cobble, 2 flakes removed 12.2 x 7cm
40-45 cm Feature 1 West half
SE
1 white quartz shatter 1.2cm
45-50 cm Feature 1 East half
NE
1 white quartz secondary flake 1.1cm
Soil Sample 45-50 cm Feature 1 East half
4 charcoal fragments .1g
1 calcined mammal flatbone fragment .1g
7 grit-tempered pottery frags
1 white quartz secondary flake .7cm
45-50cm Feature 1 West half
NE
1 granite FCR 113.4g 7.7 cm

1 granite possibly fire affected cobble 11cm 600g

**Excavation Units**
**EU 1E**
0-10 cm
1 cupreous wire frag
2 sandstone FCR 22.5g 1.5, 3.4cm
3 granite FCR fragments 2.9g 1.3, 1.5, 1.6cm
1 grit-tempered pottery rag
3 shell-tempered pottery frags
4 quahog shell fragments 4.7g
15 recent charcoal fragments 1.5g
1 clear machine made bottle glass frag
1 grey rhyolite secondary flake 1cm
10-20 cm
4 granite FCR fragments 195.3g 2.5, 3.8, 5.3, 8cm
1 sandstone FCR fragment 10.4g 3.5cm
21 quahog shell fragments 1 hinge 16.8g
1 aqua flat glass fragment probably window glass
5 redware fragments glaze missing
2 shell-tempered pottery frags
1 white quartz core 4.6x3cm blocky
1 white quartz shatter fragment 2.3cm
2 white quartz secondary flakes .9, 1.6cm
3 grey rhyolite secondary flakes .9, 1.3, 2cm
1 grey green rhyolite secondary flake 1.4cm
1 purple grey rhyolite secondary flake 1cm
20-30 cm
17 quahog shell fragments 23.5g
1 whelk columnella fragment .5g
4 grit-tempered pottery frags
5 granite FCR fragments 424.6g .5, 1.4, 4.1, 4.8, 7, 7.5cm
1 quartzite FCR fragment 69.1g 3.5cm
2 charcoal fragments .1g
1 graphite fragment .5g 1.8cm
1 very dark grey rhyolite secondary flake 1.7cm
Soil Sample 30-35cm Feature 5
13 charcoal fragments .3g
2 graphite fragments .4g .6, .7cm
2 grit-tempered pottery frags
Soil Sample 30-35cm Feature 5 Pottery Concentration
86 grit-tempered pottery frags
30-35cm Feature 6
1 purple grey rhyolite secondary flake 2.9cm

6 grit-tempered pottery frags

**Excavation Units**
**EU 1N**
0-10 cm
11 solarized machine made bottle glass fragments
1 graphite fragment .5g 1.7cm
1 grey green argillite secondary flake 1.7cm
10-20 cm
6 granite FCR fragments 55.4g 1.2, 1.5, 1.8, 2.3, 3, 4cm
10 quahog shell fragments 1 hinge 4.2g
2 graphite fragments .6g 1, 1.4cm
2 flat aqua glass fragments possible window glass
2 white quartz shatter fragments 1, 1.7cm
2 white quartz secondary flakes .8, 1cm
6 charcoal fragments .4g
1 shell-tempered pottery frag
1 grey green argillite secondary flake 1cm
1 dark maroon purple rhyolite secondary flake 1.3cm
1 dark maroon purple secondary shatter 1cm
1 light purple grey rhyolite trim flake .8cm
1 grey green rhyolite secondary flake 1.2cm
1 white/ clear quartz Levanna mostly complete 3.8cm long 2.5cm wide ears broken off .8cm thick
20-30 cm
2 granite FCR 84.4g 3, 5.5cm
4 quahog shell fragments 2.4g
4 charcoal fragments .3g
1 white quartz shatter fragment 1.3cm
1 graphite fragment .4g 1.9cm
1 grey rhyolite secondary flake 2.2cm
1 dark grey rhyolite secondary flake 2.2cm
2 shell-tempered pottery frags
30-40cm
1 granite FCR fragment 3.8g 2.6cm
1 quahog shell fragment .2g
30-40cm Feature 4
18 charcoal fragments 1.4g
1 grit-tempered pottery frag

**Excavation Units**
**EU 2**
0-10 cm
NE
9 olive green machine made bottle glass frags

2 clear machine made bottle glass frags
1 oyster shell fragment .8g
41 railroad cinder 7.2g

NW

5 machine made clear bottle glass fragments "forbids.../this bo../" embossed on front
33 railroad cinder 4g

SE

20 railroad cinder 3.4g
2 quahog shell fragments .3g
1 oyster shell fragment .1g

SW

10 railroad cinder 2.3g
1 brown machine made bottle glass body frag
1 machine cut nail 8.2cm
4 quahog shell fragments 1.7g
2 quartz secondary flakes 1.1, 2.1cm
10-20 cm

NE

1 clear machine made liquor bottle glass fragments houlders neck
8 railroad cinder .8g
3 quahog shell fragments .9g
1 white quartz secondary shatter 1.9cm
1 grit-tempered pottery fragment

NW

3 railroad cinder .5g
10 quahog shell fragments 5.2g
1 oyster shell fragment .1g
1 dark maroon purple rhyolite secondary flake .8cm
3 dark grey rhyolite secondary flakes 1, 1.8, 2cm
1 grey quartzite decortification flake 1.5cm
1 tan grey fine grained quartzite secondary flake 1.3cm
1 white quartz secondary shatter 1.7cm
1 white quartz secondary flake 1.1cm
1 white/ clear quartz decortification shatter 2cm
1 white/ clear quartz secondary shatter 1.1cm
3 white/ clear quartz secondary flakes .8, 1.2, 2.5cm
2 shell-tempered pottery frags

SE

7 quahog shell fragments 9.5g
28 oyster shell fragments 2.5g
9 railroad cinder .9g
1 burned medium mammal bone fragment .3g
6 white/ clear quartz secondary flakes .7, .8, 1, 1.5, 1.7cm
3 dark maroon purple rhyolite secondary flakes 1, 1.1, 1.2cm

2 grey rhyolite secondary flakes 1.5, 1.5cm

SW

1 grey quartzite Lagoon missing tip 4.8cm long, 2.5cm at shoulders 1.2cm wide base .7cm thick
1 grey rhyolite core 5.1x 3.1x 3.1cm
3 quahog shell fragments 3.3g
1 oyster shell fragment .1g
2 railroad cinder .1g
1 white quartz secondary flake .8cm
3 white/ clear quartz secondary flakes .8, 1.5, 1.5cm
2 dark maroon purple rhyolite secondary flake 1.1, 1.2cm
1 tan quartzite secondary flake 1.1cm
1 grit-tempered pottery frag

20-30 cm

NE

1 white quartz Squibnocket Triangle missing ears 1.7 cm long 1.5 cm wide .5cm thick
44 oyster shell fragments 5 left in hinges 1 right out hinge 23.6g
2 quahog shell fragments .4g
3 railroad cinder .4g
1 white quartz shatter fragment 1.5cm
1 white quartz decortification shatter 1.5cm
1 white/ clear quartz secondary flake 1cm
1 maroon tan Saugus Jasper secondary flake 1.2cm
1 grey rhyolite secondary flake 1.1cm
2 black rhyolite secondary flakes 1.4, 1.5, 1.6cm

Soil Sample 20-30cm Feature 8

NE

232 oyster shell fragments 31 in hinges 22 out hinges 184.3g
1 soft shell clam fragment .2g
52 charcoal fragments .7g
3 railroad cinder .1g
6 land snails <.1g
10 unburned small fish vertebra <.1g
3 burned black small fish vertebra
9 small fish scales (herring?)
21 small fish cranial fragments (all small fish .1g)
2 larger fish cranial fragments <.1g
1 possible burned seed

SE

28 oyster shell fragments 1 hinge 6.7g
5 quahog shell fragments 1 hinge 7.7g
2 railroad cinder .2g
1 calcined mammal longbone fragment .1g
1 graphite fragment .3g 1.1cm
1 granite FCR fragment 2g 2.5cm

1 clear/ tan very fine grained quartzite secondary flake 1.1cm
1 grey rhyolite secondary flake 1.3cm
1 very dark grey rhyolite secondary flake 2.3cm
SW
6 oyster shell fragments 1 left in hinge 1.8g
11 quahog shell fragments 8.2g
1 granite FCR fragment 16.4g 3.1cm
1 railroad cinder .1g
1 grit-tempered pottery frag
1 white quartz shatter 3.5cm
2 white quartz secondary flakes 2.2, 2.4cm
1 white/ clear quartz decortification/ secondary shatter 3.2cm
1 white/ clear quartz secondary shatter 1.8cm
4 black rhyolite secondary flakes 1.4, 1.2, 1.2, 2.1cm
30-35cm Feature 8 East half
8 oyster shell fragments 1.5g
1 charcoal fragment .1g
Soil Sample 30-35cm Feature 8 East half
22 oyster shell fragments 1 out hinge 11.4g
4 forest snails <.1g
2 railroad cinder <.1g
3 unburned small fish vertebrae <.1g
3 burned black small fish vertebrae <.1g
1 calcined small fish fin ray <.1g
1 small fish cranial fragment <.1g
2 mammal flatbone fragments <.1g
1 calcined mammal longbone fragment <.1g
1 calcined turtle carapace fragment <.1g
2 carbonized seed fragments <.1g
3 clear quartz secondary flakes .4, 6, .8cm
1 shell-tempered pottery frag
2 grit-tempered pottery frags
100+ charcoal fragments .9g
Soil Sample 35-40 cm Feature 8 East half
8 oyster shell fragments 4.8g
1 quahog shell fragment 1.8g
56 charcoal fragments .6g
1 granite FCR 22.7g 4.3 cm
1 clear quartz secondary flake .7cm
1 grit-tempered pottery frag
2 calcined Turtle carapace fragments <.1g
2 calcined mammal fragments <.1g
1 fish cranial fragment <.1g
35-40 cm Feature 8 East half

1 burned mammal bone fragment 1g possibly cranial
1 burned turtle plastron fragment .1g
5 charcoal fragments .2g
7 quahog shell fragments 1.4g
1 oyster shell fragment .6g
35-40cm Feature 8 west half
7 charcoal fragments .1g
Soil sample 40-45cm Feature 8 west half
1 quahog shell fragment .8g
1 railroad cinder .1g
15 charcoal fragments .2g
40-45cm Feature 8 west half
1 oyster shell fragment .3g
Soil Sample 45-50cm Feature 8 West half
29 charcoal fragments .2g
1 possible hazel nut shell fragment <.1g
1 possible carbonized seed <.1g
1 medium mammal flatbone fragment .1g
16 railroad cinder .2g
45-50cm Feature 8 West half
1 graphite fragment .6g 1.3cm
1 charcoal fragment .1g
50-55cm Feature 8 west half
1 charcoal fragment <.1g

**Excavation Units**
**EU 3**
0-10 cm
NE
11 railroad cinder 2.6g
2 quahog shell fragments .5g 1 hinge
NW
1 iron railroad spike 13.7cm
13 railroad cinder 1.5g
2 graphite fragments 1.4g 1.2, 1.5cm
SE
10 railroad cinder 7.6g
1 quahog shell fragment .5g
1 white/ clear quartz secondary flake 1.2cm
SW
36 railroad cinder 7g
1 slag fragment 24.3g
1 brown machine made vessel glass fragment body
1 medium mammal longbone fragment .2g
5 railroad cinder .8g
1 tan quartzite decortification flake 4.9cm
1 grey quartzite decortification shatter 3.5cm
1 grey quartzite secondary flake .8cm
1 black Hornfels secondary flake .8cm
1 tan grey rhyolite secondary flake 1.1cm
1 green grey rhyolite secondary flake 2.1cm
1 very dark grey rhyolite secondary flake 1cm
1 very dark grey rhyolite secondary flake 2cm
1 grey rhyolite decortification shatter with flake scars 4.9cm
1 clear tan vein quartz shatter 2.5cm
1 blocky white/ clear quartz shatter 2.3cm
1 white/ clear quartz decortification flake 1.4cm
1 clear quartz secondary shatter 1.2cm
1 white quartz secondary flake 1.5cm
2 quahog shell fragments .5g
1 white quartz shatter .7cm
10-20 cm
NE
40 quahog shell fragments (3 hinges) 35.7g
1 whelk shell fragment .4g
3 soft shell clam fragments .3g
2 graphite fragments 4.7g 2.1, 2.2cm
1 grit-tempered pottery fragment
3 granite FCR 455.2g 3.1, 5.5, 10.3cm

1 burned mammal longbone fragment .2g

NW

92 quahog shell fragments 10 hinges 175.7g
7 oyster shell fragments 2.8g
9 soft shell clam fragments 1g
1 whelk columnella .3g
14 railroad cinder 1.9g
4 graphite fragments 7.6g .8, 1.1, 1.1, 3cm
2 black Hornfels secondary flakes .9, 1.2cm
1 white/ clear quartz secondary flake 1.3cm
1 purple grey rhyolite secondary flake 1.2cm
1 grey rhyolite secondary flake .9
1 dark grey rhyolite secondary flake 4.2cm
1 dark purple grey rhyolite decortification shatter 4.2cm
2 dark purple grey rhyolite secondary flakes 1.1, 1.4cm
1 grit-tempered pottery fragment
1 small mammal scapula burned .2g
1 small mammal mandible burned .5g

SW

68 quahog shell fragments 9 hinges 125.1g
2 whelk columnella 2.2g
13 soft shell clam fragments 1 umbo 1 chondrophore 2.7g
89 oyster shell fragments 4 out 3 in hinges 26.3g
1 grey quartzite decortification shatter 3.4cm
1 granite FCR 1.4g 1.5 cm
5 railroad cinders .8g
4 graphite fragments 1.7g 1, 1.1, 1.8, 2cm
2 white/ clear quartz decortification shatter 5.2, 1.7cm
2 white/ clear quartz secondary shatter 1.2, 1.3cm
3 white/ clear quartz secondary flakes 1.1, 1.1, 1.2cm
1 grey quartzite secondary shatter 1.6cm
2 black Hornfels secondary flake .7, 1.2cm
1 black chert secondary flake 1cm
1 grey green quartzite secondary flake 1.3cm
1 red brown rhyolite secondary flake 1.1cm
1 grey green chert secondary flake 1.9cm
2 dark grey rhyolite trim flakes .8, 1.1cm
1 purple grey rhyolite secondary flake 1.7cm
7 dark purple grey rhyolite secondary flakes .6, 1, 1, 1.7, 1.7, 1.2, 1.5cm
3 grit-tempered pottery frags
1 shell-tempered pottery frag

SE

7 whelk shell fragments 9.4g

9 quahog shell fragments 6.6g
2 oyster shell fragments 2 out hinges .8g
7 railroad cinder .9g
1 white/ clear quartz biface 5.6cm long
3 white quartz secondary shatter 1.1, 1.3, 1.4cm
4 white quartz secondary flakes .9, 1.2, 1.3, 1.3cm
1 very dark grey rhyolite secondary flake 2.1cm
3 dark grey rhyolite secondary flakes .8, 1, 1.6cm
20-30 cm
NE
1 whelk shell fragment 1g
23 oyster shell fragments 2 out hinges 7.3g
34 quahog shell fragments 4 hinges 24.5g
4 graphite fragments 11.9g 1.4, 1.5, 2.5, 2.8cm
1 flattened lead bullet-.22 cal 1.9g
1 tan grey quartzite decortification shatter 2.7cm
1 calcined small mammal cranial fragment .1g
2 grit-tempered pottery frags
6 granite FCR fragments 182.3g 1.8, 2.7, 3.3, 3.5, 4.2, 6cm
4 white/ clear quartz secondary shatter 1.1, 1.7, 2.2, 3.5cm
3 white/ clear quartz secondary flakes .8, 1.3, 1.9cm
1 green grey quartzite trim flake 1cm
1 light purple grey rhyolite secondary flake 1.3cm
1 purple grey rhyolite secondary flake 2cm
3 very dark grey rhyolite secondary flakes 1.1, .9, 1.3cm
1 black Hornfels secondary flake 1.2cm
NW
1 whelk shell fragment .2g
14 soft shell clam fragments 2 chondrophores 3.2g
45 oyster shell fragments 3 in hinges 11.2g
115 quahog shell fragments 13 hinges 154.4g
1 graphite fragment .3g 1cm
4 railroad cinder 1g
1 granite FCR 5.1g 3.4 cm
1 light tan rhyolite secondary flake 1.2cm
1 grey rhyolite secondary flake 3.7cm
2 very dark grey rhyolite secondary flakes 1.1, 1.2cm
1 white/ clear quartz decortification shatter 4.3cm
4 clear white quartz secondary shatter 1.5, 1.7, 1.3, 2.2cm
2 white/ clear quartz secondary flakes .9, 2cm
1 grit-tempered pottery frag
1 fish vertebra
SE
3 whelk frags, 1 whorl 3.4g

16 quahog shell fragments 1 hinge 8.3g
1 calcined mammal bone fragment .2g
2 white quartz secondary shatter 1.2, 4.1cm
5 clear quartz secondary shatter .8, .9, 1.1, 1.2, 1.2cm
4 white quartz secondary flakes .5, .9, 1.5, 2.6cm
1 clear quartz secondary flake 1cm
1 dark maroon rhyolite secondary flake 3.4cm
1 tan rhyolite secondary flake .9cm
2 purple grey rhyolite secondary flakes 1.1, 1.2cm
2 very dark grey rhyolite secondary flakes 1.7, 2.2cm
20-25cm Feature 9
SW
125 quahog shell fragments 15 hinges 273.8g
19 soft shell clam fragments 1 umbo 3.8g
109 oyster shell fragments 1 out hinge 38.7g
1 burned soft shell clam fragment .1g
2 grit-tempered pottery frags
3 granite FCR fragments 51.2g 2.2, 2.9, 3.7cm
1 railroad cinder .1g
2 medium mammal bone fragments .4g
2 calcined medium mammal bone fragments .4g
2 charcoal fragments <.1g
Soil Sample 20-25cm Feature 9
SW
1 boat shell (Crepidula fornicata) <.1g
4 whelk frags, 2 collumnella 1.2g
13 soft shell clam fragments 1 chondrophore 1.6g
71 quahog shell fragments 6 hinges 76.6g
65 oyster shell fragments 1 in hinge 23.1g
1 graphite fragment .3g 1cm
1 grey green chert possible Orient Fishtail base fragment 1.2cm long
3 railroad cinder .1g
1 forest snail
1 possible burned seed fragment <.1g
1 turtle shell carapace fragment .1g
1 small fish vertebra <.1g
2 bird longbone fragments <.1g
3 mammal flatbone fragments .1g
1 possible shell-tempered pottery fragment
13 charcoal fragments .2g
Soil Sample 25-30 Feature 9
SW
31 quahog hinges 386.2g
191 quahog shell fragments 360.1g

68 soft shell clam fragments 3 chondrophore 4 umbos 18.6g
1 boat shell Crepidula fornicata .1g
5 whelk shell fragments 4 columnella 7.3g
21 oyster in hinges 141.4g
19 oyster out hinges 36.8g
918 oyster shell fragments 296.3g
1 oyster shell fragment with ribbed mussel impressions on surface
7 burned oyster shell fragments .2g
4 ribbed mussel fragments .2g
8 turtle carapace fragments .7g
1 small mammal longbone possible humerus <.1g
16 mammal longbone fragments .4g
4 calcined mammal longbone fragments .2g
2 forest snails <.1g
26 small fish vertebrae .3g
4 herring scales
1 tautog tooth <.1g
2 medium fish cranial fragments .1g
8 small fish cranial fragments <.1g
2 graphite fragments <.1g .5cm
3 granite FCR fragments 112.9g 4.1, 5.2, 4.6cm
8 grit-tempered pottery frags
17 railroad cinder .4g
1 clear quartz secondary flake .5cm
3 white quartz shatter .7, .8, 1.2cm
1 dark purple grey rhyolite secondary flake 1.5cm
56 charcoal fragments .8g
25-30 Feature 9
SW
266 quahog shell fragments 36 hinges 371.8g
18 soft shell clam fragments 3 umbo 1 chondrophore 4.2g
2 burned soft shell clam fragments .2g
1 whelk columnella .3g
1 mud nassa .2g
144 oyster shell fragments 2 out 2 in hinges 47.4g
2 grit-tempered pottery frags
1 turtle shell fragment .5g
2 calcined mammal longbone fragments .4g
1 granite FCR fragment 6.7g 2.5g
1 railroad cinder .2g
1 charcoal fragment .1g
2 white quartz secondary shatter 2, 2.4cm
2 white/ clear quartz secondary shatter 1.5, 1.8cm
1 dark maroon rhyolite secondary flake 1.6cm

1 grey rhyolite secondary flake 4cm
6 very dark grey rhyolite secondary flakes 1.3, 1.2, 1.6, 1.4, 2.4, 3cm
NW
61 quahog shell fragments 6 hinges 107.1g
2 whelk shell fragments .7g
5 soft shell clam fragments .5g
1 burned oyster shell fragment .2g
37 oyster shell fragments 6g
1 grit-tempered pottery frag
1 quartz FCR fragment 5.3g 2.2cm
1 very dark grey rhyolite secondary flake 1.3cm
NE
15 quahog shell fragments 1 hinge 7.1g
6 oyster shell fragments 1.1g
Soil Sample 30-35cm Feature 9
SW
1 possible whelk shell fragment <.1g
9 quahog shell fragments 2 hinges 16.9g
6 soft shell clam fragments 1.4g
139 oyster shell fragments 3 in hinges 2 out hinges 58.7g
2 railroad cinder <.1g
2 charcoal fragments <.1g
3 small fish vertebra .1g
1 small fish cranial frag
2 mammal flatbone fragments burned grey <.1g
1 forest snail shell
Soil Sample 35-40cm Feature 9
SW
8 quahog shell fragments 1 hinge 25.7g
1 whelk shell fragment .1g
4 soft shell clam fragments 2 chondrophores 2.3g
137 oyster shell fragments 1 out hinge 7 in hinges 51.6g
1 boat shell Crepidula fornicata <.1g
4 ribbed mussel shell fragments .1g
5 charcoal fragments <.1g
3 forest snails
3 railroad cinder .1g
2 small fish vertebra .1g
1 mammal flatbone fragment .1g
1 small mammal incisor .1g
1 small mammal sacral vertebra <.1g
1 small mammal flatbone fragment <.1g
30-40cm
NE

28 quahog shell fragments 1 hinge 15.6g
1 whelk columnella .5g
3 oyster shell fragments 1g
1 grey quartzite decortification shatter 1.6cm
4 railroad cinder .5g
1 graphite fragment .2g .8cm
3 grit-tempered pottery frags
30-35cm Feature 9
SW
10 quahog shell fragments 5.3g
18 oyster shell fragments 5.4g
1 granite FCR fragment 86.9g 5.6cm
1 graphite fragment 4.3g 2.8cm
1 Hornfels secondary shatter 1.5cm
1 grey green rhyolite secondary flake 1.4cm
12 white/ clear quartz secondary shatter 4cm
2 grit-tempered pottery frag

**Excavation Units**
**EU 4**
0-10 cm
NW
1 white quartz Squibnocket Triangle L: 1.3cm W: 1.6cm T: .35cm
1 granite FCR 44.3g 6.8 cm
5 railroad slag fragments 2.3g
1 graphite fragment 1.7g 2cm
1 white quartz shatter fragment 1cm
1 almost clear quartz secondary flake 1.35cm
1 very dark grey rhyolite secondary flake 1.2cm

SE
4 railroad slag 45.6g
1 brown machine made vessel glass probable bottle recent body frag
SW
2 railroad slag 93.9g
10-20 cm
NW
5 white vein quartz shatter blocky 2.3, 2.7, 3.4, 5.5, 6.1cm
5 white vein quartz secondary flakes .8, 1, 1.3, 1.5, 1.9cm
2 grey/ clear quartz shatter 1, 1.4cm
3 white/ clear quartz secondary flakes .7, 1, 1.5cm
1 grey rhyolite secondary flake 1.9cm
1 very dark grey rhyolite secondary flake 1.1cm
1 black rhyolite secondary flake 1.2cm

2 graphite fragments .5g, 1.1, 1.3cm
8 quahog shell fragments 7.5g 1 hinge
1 shell-tempered pottery fragment .5cm thick
SW
1 granite FCR 174.1g 6 cm
11 quahog shell fragments 6.5cm
3 graphite fragments .7g 1.3, 1, 14cm
1 grit-tempered pottery fragment
1 tan/ white fine grained quartzite secondary flake 2cm
1 white quartz shatter .8cm
1 clear quartz shatter 1.5cm
2 white quartz secondary flakes .8cm
1 clear quartz secondary flake 1.1cm
1 burned grey rhyolite secondary flake (?) with spalling 1.3cm
1 weathered purple grey rhyolite secondary flake 1.6cm
1 grey rhyolite secondary flake 1.2cm
1 grey quartzite secondary flake 1.7cm
1 black rhyolite secondary shatter 1.6cm
2 dark grey rhyolite secondary flakes 3.2, 1.4cm
SE
54 quahog shell fragments 1 hinge 35.2g
4 whelk collumnella fragments 3.8g
3 oyster shell fragments 1 in hinge .3g
2 calcined mammal longbone fragments .1g
1 calcined turtle shell carapace fragment .1g
1 calcined possible sea robin cranial fragment .1g
4 railroad cinder .3g
1 mudstone FCR fragment 3 cm 5.6g
4 graphite fragments 1.5g 1, 1, 1.2, 2cm
1 black Hornfels secondary flake 2.3cm
1 green grey rhyolite secondary flake 1.1cm
1 dark grey chert blade- tip and midsection probable Orient Fishtail
1 dark maroon Saugus jasper shatter secondary 3.5cm
1 very dark grey rhyolite secondary flake 1cm
1 dark brown purple rhyolite secondary flake 2.1cm
1 very dark grey quartzite secondary flake 1cm
1 very dark purple grey rhyolite secondary flake 1cm
5 white/ clear quartz secondary shatter 1, 1, 1.5, 1.4, 2cm
1 smoky quartz secondary shatter 2cm
1 white quartz secondary flake 1.7cm
2 white/ clear quartz secondary flakes 1.1, 1.2cm
1 light tan quartzite secondary shatter 1.7cm
1 grey quartzite secondary flake 1cm
20-30 cm

NW
3 charcoal fragments .1g
1 graphite fragment .2g .5cm
6 grey/ clear vein quartz possibly natural shatter very grainy 1.1, 1.1, 1.6, 2.2, 2.6, 3.2cm
1 white/ clear quartz shatter blocky 1.7cm
1 black rhyolite secondary flake 1.1cm
8 quahog shell fragments 1 hinge 8.6g
1 granite FCR fragment 4.7g 2cm
1 quartzite FCR fragment 66g 4.2cm
1 rhyolite FCR fragment 158g 8.8cm
SE
31 quahog shell fragments 2 hinges 21.2g
1 whelk columnella .4g
2 granite FCR fragments 240.3g 5.6, 6.3cm
2 graphite fragments 1.6g 1.4, 2.1cm
8 heavy grit-tempered pottery fragments 1 rim
1 white/ clear quartz secondary flake 1cm
4 very dark grey rhyolite secondary flakes .8, 1.2, 1.2, 1.3cm
SW
3 granite FCR fragments 188.1g 2.5, 4.5, 7.7cm
1 sandstone FCR 138.2g 5.8 cm
2 graphite fragments 1.1g 1.1, 1.6cm
7 quartz shatter fragments 1 with cortex 1.9, 1.7, 1.5, 1.1, 2.2, 1.8, 2.7cm
1 white quartz secondary flake 1cm
9 quahog shell fragments 8.7g
1 whelk columnella 1.2g
4 charcoal fragments .3g
4 medium mammal calcined longbone fragments .4g
1 grey rhyolite secondary shatter 1.4cm
2 grey rhyolite trim flakes 1, 1.1cm
1 very dark grey rhyolite secondary flake 1cm
1 black rhyolite secondary flake 1.1cm
1 grey quartzite decortification flake 2.7cm
25-30cm Feature 9
NW
28 quahog shell fragments 2 hinges 74.5g
120 oyster shell fragments 1 hinge 40.4g
1 whelk columnella 1g
2 calcined mammal longbone fragments .3g
SE
13 quahog shell fragments 1 hinge 12.2g
1 quartz FCR 5.3g 2 cm
2 granite FCR fragments 15.3g 2.4, 3.3cm
1 very dark grey rhyolite secondary flake 2cm

30-40 cm

NW

6 charcoal fragments .6g

5 oyster shell fragments .8g

SW

10 charcoal fragments 1g

2 quahog shell fragments .9g

1 grey rhyolite secondary flake

1 quartz secondary flake 1.7cm