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THE MATTAQUASON PURCHASE SITE (M48N6), NORTH CHATHAM

Marie Eteson, Marilyn D. Crary and Mary F. Chase

The site whose excavation is described here was listed by the Massachusetts State Archaeologist as site M48N6. It is located in northwest Chatham near Pleasant Bay and lies on land owned by RCA Global Communications, Inc., which has been used for their extensive antenna system for the past sixty-two years. This land is within the "First Purchase" from Mattaquason, made by William Nickerson (Nickerson 1958). In spite of its being a well known Indian campsite with a history of intensive potholing, nothing, to our knowledge, has ever been reported on it, although many of its artifacts have ended up in local "collections".

With the kind permission of RCA and despite the foreknowledge of the potholing and intensive disturbance, excavation by the Cape Cod Chapter of the Massachusetts Archaeological Society began on February 14, 1974. This report is about the midden that remained amidst all the havoc.

This Cape Cod site (Fig. 1), inhabited by Monomoyick Indians of the late prehistoric period, is protected on the north and west by low hills. To the south of the site the land verges into a swampy lowland through which now flows a sluggish rivulet whose source is Lovers Lake (seen on old maps as Nespoxtet or Lord's Pond). The lake drains through this rivulet to the east through the mosquito-controlled lowlands into Frost Fish Creek and thence to Pleasant Bay via Bassing Harbor. Lovers Lake, 300 yards from the site, also has an outlet via Stillwater (Pasture) Pond into Ryders Cove, known at other times as Eldredge Cove and Herring River (Smith 1971:369, 132). It is possible that both outlets were once navigable by dugout, before their spilling rush from the kettle was slowed by the natural aging processes of the shallow valleys.

The ridge to the north of the site was probably still dunelike when the first inhabitants began dropping debris on the sandy streamside. Erosion would have gentled its steepness creating the sloping bench on the stream's northern edge less than a quarter of a mile from Ryder's Cove. We shall see later how this area, with its easy access to littoral riches, gave sustenance to its inhabitants.

SUMMARY

The Mattaquason Purchase - Site M48N6 - may be a single component, early Late Woodland campsite. It was probably occupied during autumn and early winter by small family groups who returned yearly after the harvest to take advantage of the location ideally near to shellfish beds, migrating flocks of birds, and the few deer individuals browsing around Great Hill. From our shellfish remains we know that the water was at least as warm as it is now. Today knobbed whelk is at its northernmost range in Cape Cod waters. If the climate was colder, when the site was being used, it could not have long been so. Our own experience on site indicates that a winter camp could have been quite livable. The strong, well-made clay floor (Feature XVI) suggests some effort at relative permanence. Subsistence at this loca-

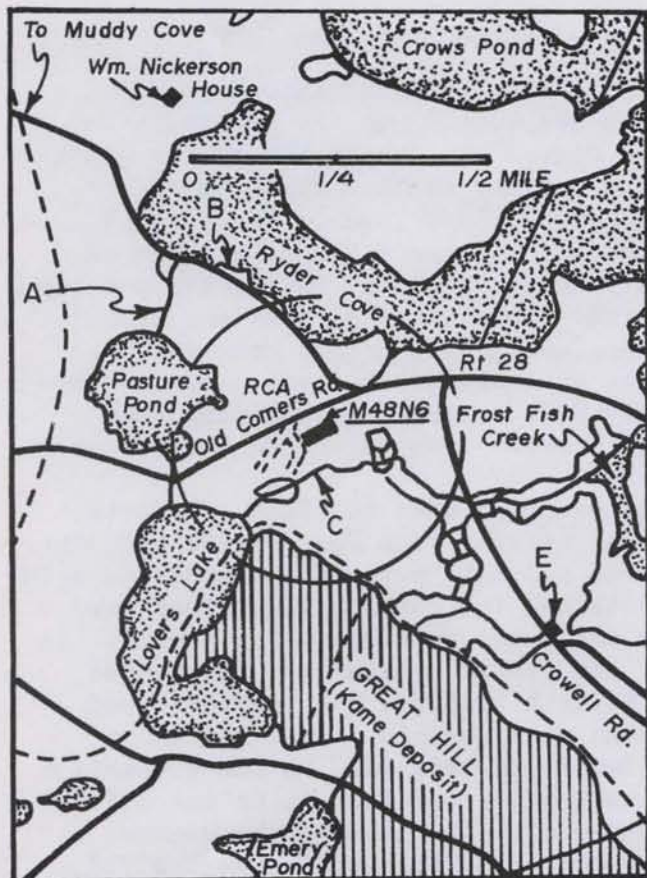


Figure 1. Map showing location of site M48N6 and its vicinity. See text for explanation of symbols.

tion was probably marginal only during January and February.

Local tradition has it that Cape Cod Indians went into the inland ponds to spend the deep winter. However, late winter shellfishing could have drawn them back to await the arrival of the anadromous fish and the first migrating waterfowl. Herring still run via Ryders Cove up to Lovers Lake about a quarter of a mile away, but no artifactual data from the site supports the theory that fishing was of primary importance.

Perhaps, when the ceramics of southern New England have been seriated by more study, the pottery found here will prove to reveal the most about the inhabitants of this site. The crudity of the finds we have made at the bottom of the midden could mean an earlier development stage, but there is also the possibility that new arrivals could have been testing the local clay. What has been found might be dubbed Stage 2 and Stage 3 pottery by MAS terminology. Surely conservative cultures retained, as we do, styles whose forms still fulfilled necessary functions. So we have to restrain ourselves from overemphasizing the percentage (49%) of possibly earlier grit tempered vessels. Similarly, we suspect that our "earlier" projectile points are neither diagnostic nor of sufficient quantity to have meaning.

Perhaps what has not been found has some significance: laminated rims, castellations, metal points, eared, side-notched, or bifurcated points, gouges, plummets, or the adz, ulu and atlatl.

Colonial artifacts were found in the plowzone. A broken latten spoon (Fig. 24;6), showing considerable wear made after breakage, cannot be said to have been so worn only by an Indian.

Previous potholing restricts our pigeonholing propensities even more. Therefore, on the basis of what we know to date, no cultural name can be put to this site by this committee. We will welcome with great interest any observations that enlarge our narrow perspective on this midden.

METHODS

Site M48N6 was laid out from an east-west base line and divided into five foot squares. The RCA antenna pole No. 27 (ca. 10' above sea level) was the center of a quadrant-like numbering system (Fig. 2). Each square was designated by its south-east stake. No vertical datum point was established nor any contour survey made. Thus vertical measurements are from the sloping plane of ground level. No definite limits to the site were determined in advance due to the unknown factors involved in planning a dig with unskilled amateurs. In February 1974, under Guy Mellgren's tutelage, digging began in a northward direction from base line. Short handled hoes and trowels were used. Sifting took place as the digging occurred, using $\frac{1}{4}$ to $\frac{1}{2}$ inch mesh sieves. Squares were dug by a unit level method, worked down in benches. Columns a foot square were left standing at stake positions, but there was difficulty in maintaining them in the sandy soil, except where the midden was very dense. A total of 182 squares or 4,550 sq. ft. of midden was excavated.

Features were recorded when recognized and photographed when possible. Efforts were made to measure and describe them. Charcoal was secured from Feature XVI and others.

Lithic artifacts were all recorded on site cards and many were photographed *in situ*. Artifacts and cards were then turned in to a "dig scribe" for cataloguing. They were cleaned and labelled with catalogue number, square and, when possible, site number. In autumn of 1975 a report committee began a study of the lithic artifacts. References used were Ritchie (1969), Fowler (1963, 1974) and Moffett (1957). The inexperienced committee quickly encountered identification problems with certain types. Still, a quantitative analysis was carried to completion. Based, as this was, on the comparison of artifacts to two-dimensional representations, this study was felt to be insufficient. In the summer of 1976 further study took place with the help of the summer diggers. Focus was on the typology measurements as reflected in Ritchie (Rev. 1971), Dincauze (1976) and Holland (1955). We measured each artifact for thickness; ratios of length to width, width to shoulder height, and width to thickness were determined.

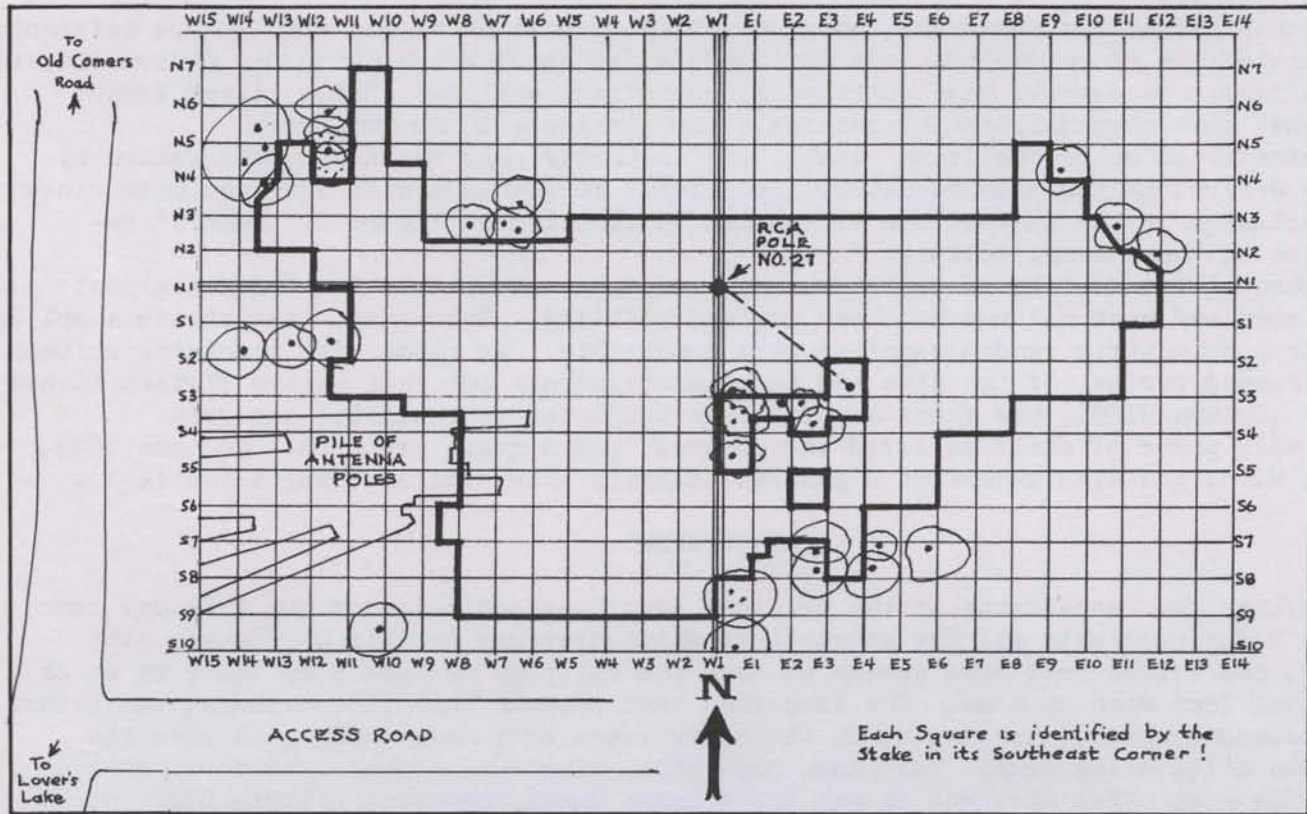


Figure 2. Ground plan of excavated Parcel A, showing grid and limits of excavation.

Using a 40X microscope an attempt was made to understand and report grinding patterns. Some artifacts were then reclassified.

Recording of ceramic artifacts presented problems of method selection. Initially each potsherd was washed, preserved with acetone and Duco, labelled and catalogued. Shortly after excavation began our realization of the likelihood of copious quantities caused a shift to recording only decorated sherds and rimsherds. Later, finding that we were able to reassemble partially some vessels, and hoping to increase this capability, we labelled all sherds with square numbers. Sizable segments of pots were then put together, some fragments of which had been strewn as many as five squares apart at the same depth. The material was then grouped for photography according to decorative elements as we then understood them. These classifications were based on what seemed to be single vessels, so their separate descriptions were qualitative as to temper. New references (Dincauze 1975; Holmes 1882) were secured in the summer of 1976 as well as the personal assistance of Marjorie Bardeen at Plimoth Plantation. Analysis of our groupings was made to ascertain temper materials and size, and methods of construction where possible. Plasticene impressions were examined which necessitated the revision of our descriptions. Color was not recorded as an attribute because the assembling process had revealed enormous variation due to uneven firing, use, place of deposition, and uneven wedging or kneading of clay. In addition, our preservation methods had eliminated any consideration of color or of hardness. This drawback proved an advantage however, when taking plasticene impressions of fragile potsherds.

Bone artifacts were recorded as above. Some were discovered later in faunal remains. They were preserved by coating with matte acrylic varnish, and then labelled.

Colonial artifacts were recorded as above. Modern retrievals were not consistently saved or recorded. Instruction was received from Erik Ekholm in determining the approximate age of kaolin pipes by the Binford system. Some pipe provenience questions were answered by a visual examination by Marley Brown. A few Colonial ceramic fragments were tentatively identified by comparison with labelled artifacts then in keeping of

Plimoth Plantation.

Faunal refuse was saved and, where possible, submitted bagged with square reference. An estimated 90% of refuse bone was included in the specimens sent to Dr. Andrew Konnerth for analysis. To date we have received a preliminary analysis (Table 1) and expect additional data when comparative materials are available to Dr. Konnerth.

Classification of shellfish remains was initially only by onsite observation by Barbara Waters, marine life educator. An attempt to get more data has been made since the conclusion of the part of the excavation represented in Figure 2. Waters' description of the attempt follows:

When it was decided to undertake shell analysis of columns the dig was almost completed and most columns had been dug and refilled. This meant that strata sampling and true scientific random sampling were impossible. We chose five remaining columns that seemed typical of the site and took approximately one foot square fifteen inches deep. Column W12N1, the first studied, was subjected to intensive analysis with each piece of shell measured and counted, and a graph prepared. Columns W8N3, E6S5, W11S1 and W7N3 underwent a general analysis with similar results (Table 2).

ENVIRONMENT

Neither the descendants of the original Americans nor those of the intruder can recount today precisely all the attractions which drew men to this particular site. However, the refuse left here speaks as does the chippage and the clay floor on which aboriginal feet were at home. The iron-rich sand beneath that floor speaks, too (Johnson: verbal communication), telling about the early years of a newly made land when the ocean was still miles away. The land, then stretching out on the continental shelf, was mobile - as often airborne as are the present dunes bordering Pilgrim Lake in Provincetown. Tundra came and left as the glacier inched north. Change followed change, evolving finally 3500 years ago to a sea level much like today's (Oldale & Koteff:1970) and to ecosystems which are changing even as they are being studied.

In asking ourselves what the lost Monomoyick environment consisted of we are forced to recognize the omnipresent shell in our midden as a predominant factor governing selection of the site. That gathered food was preferred over seasonal hunted resources seems confirmed here. Table 2 lists shellfish refuse in order of abundance, but Waters cautions us as follows:

Shells are composed of calcium carbonate. In salt water the pH (acid-base) falls most commonly between 8.9 and 9.5. Calcium carbonate will dissolve slowly in such conditions. However, typical Cape Cod soils and water run-off range between pH7 and pH5; in this case (under much higher acid conditions) calcium carbonate will dissolve at a faster rate. It may be concluded that the thinner shellfish buried in the RCA Site would have disintegrated at a more rapid rate than the thicker shelled specimens. Therefore no conclusion can be accurately drawn from percentages of shell found as to proportion of typical types of shellfish consumed by early occupants. However, because quahogs and softshell clams are by far the most abundant and are easy to collect, it can be assumed they were a common meal. Mussels of all types are also very common on Cape Cod, and one can wonder at not finding many in this site until one realized that the walls of mussels are very thin and hence would disintegrate quickly.

Another hint of the past can be found in the following pertinent evaluation suggested by naturalist William Brady:

A reconstruction of the original forests of Cape Cod can be made using information found in the diaries and records of early explorers and settlers. L. Stanford Altpeter has done this in *A History of the Forests of Cape Cod*. His sources include: Capt. John Smith (1616), *Mourt's Relation* (an early Pilgrim diary), and Thomas Morton (1637). This, of necessity, is a generalized reconstruction not specifically applicable to any one particular area, but it gives a rough idea of the types of vegetation found around the site at the time of the Pilgrims. In order for this information to be applicable to the forests of, for example, 1000 years before the Pilgrims, the assumption has to be made that aboriginal practices affected the forest

in the same manner during both periods. Altpeter (1939) estimated that, at the time of the Pilgrims' landing, 61% of the land surface of Cape Cod was covered with a forest area affected by annual burning; 32% was covered by a mesophytic forest association; 2% was covered by pitch pine on abandoned corn lands; 1.5% was open corn lands; and 2.5% was coast white cedar, swamp, and sand waste.

Natural and Indian-set fires affected the drier forests found roughly above 75' in elevation. Above 100' was a forest with an open, grass-covered floor. Much of this forest was pure pitch pine, but, between 100 and 200 feet were stands of pure oak (scarlet, chestnut, and white) with some red maple and gray birch. Below 100' the trees tended to be taller and better formed. Though pitch pine was still present, white and chestnut oak and red maple made up a greater percentage of the cover below 100'. Red oak and beech first appeared in this stand. Shrubs usually burned out of the forest above 75' included the heaths, laurel, juneberry and scrub oak.

Below 75' the presence of ponds and streams, and the moister forest floor resulted in less burning. Tree species found included white and pitch pine, hemlock, beech, yellow birch, ash species, hickory species, red maple, and white and red oak. On the drier and warmer south exposures were found white, black, and scarlet oak, and white and pitch pine.

In the area of Chatham and the immediate area of the site most of the land would fall in the mesophytic forest association category and much of this would be of a south exposure in which oak and pines predominate. Westward, along the Nantucket Sound coast, the forest would also have been of this category. In the Nickerson State Park can be found some land above 100'. Between there and East Harwich is land between 75' and 100' that would probably have been occupied by the tall, well formed forest. Great Hill immediately to the south of the site may once have been covered with pitch pine even as it is today (except for its northwest end). Thus, there were within eyesight of Site M48N6 extensive areas of the below 75' type forest. Within five miles of the site there was 75' to 100' type forest and some of the above 100' type could be found at a greater distance.

This combination of tree species would have supported populations of white-tailed deer (*Odocoileus virginianus*), racoon (*Procyon lotor*), red squirrel (*Tamiasciurus hudsonicus*), and eastern gray squirrel (*Sciurus carolinensis*).

In a brief digression we remind ourselves that the variable forces of nature at work on buried faunal remains rule out the use of percentages as indicators of relative dietary importance. We shall cite them here as indicators of our interpretation of the available resources.

Understanding the above we then note that, from our preliminary bone analysis (Table 1), 92 specimens out of 159 were identified as deer. To this must be added an estimated 75% of unidentifiable scrap (Konnerth, verbal communication), and also the results of 68 additional specimens now under study. One can assume that deer could have taken cover during autumn and winter in the forested, poorly drained, swampy lowland surrounding Great Hill. This availability, coming at the same time that shellfish were easily gathered close by, could account for the modest percentage of deer.

Another indication of ancient advantages can be found in Champlain's remark, "Game birds are very plenty" (Champlain 1880:125). This succinct statement describing an observation made in autumn can be confirmed by modern studies. Hill (1965) tells us which birds would have been present in the Monomoy-Brewster-Wellfleet triangle. Those present in fall and winter in abundant quantities are Canada goose, canvasback, common gull (and from historical sources, wild turkey). Less abundantly and/or in the fall the following can be seen: black duck, common loon, gannet, common goldeneye, oldsquaw, common eider, American widgeon, bufflehead and scaup.

The saltmarsh, a characteristic feature of the Cape Cod landscape, is found at Frost Fish Creek, marshy verges of nearby coves, and the south shore inlets with their brackish and freshwater swamp headwaters. Coupled with the many inland kettle ponds these furnished prime habitat for the birds cited above. Even given the variables in climatic norms and the unknown shifts of migration routes of specific birds in prehistoric times, one may deduce that birds large and small were common dietary fare. This seems so when looking at the high 20% of avian bone found in Table 1. Without making

a judgment about the relative importance of bird in the diet of these Monomoyick inhabitants we, nevertheless, are tempted to wonder at the high percentage. We might hazard the guess that these birds were taken by netting in those likely areas nearby.

Further littoral advantages can be assessed by regarding the next highest percentage of food remains. Here a puzzle presents itself in the relatively scant quantity of other fish bones vis-a-vis the sturgeon (6.1%). The latter is known to spawn in fresh water in May, June and July, sometimes staying until September. William Wood, writing in 1634 (Bigelow & Schroeder, 1953), reported that the "best catching of them be upon the shoals of Cape Cod and in the river of Merrimack". They were pickled and shipped to England as early as 1628. If, because of the presence of sturgeon - and its known spawning habit - a spring/summer habitation of the site was posited, then what must have been copious remains of smaller fish would have disintegrated in the acid soil, leaving, perhaps, only the more durable bullae. These would have passed easily through even our quarter of an inch mesh sieves. The spawning calendar of sea sturgeon appears not to be a constraint on its availability at other times of the year. Local fisheries currently report winter taking of sturgeon as a not unusual occurrence. In prehistoric times they could have been harpooned. Table 1 shows goosefish (0.6%) which may be found in shallow water year round, tautog (0.6%) found from April through November, and harbor seal (4.3%) found year round, and an unidentified 0.6% of fish submissions. The quantity of blackfish bone is small. This small percentage may imply only a fortunate chance beaching of the kind encountered today to the distress of Cape Cod's local officials.

We have drawn no inference from the rest of the items described in Table 1. It is hoped that further study, made when comparative materials become available, will offer deeper insight into the diet of the Monomoyicks.

Early sailors recorded the culture of corn, beans, squash, flax and tobacco in New England (Winship 1905:45). Champlain and the Pilgrims described large underground pits used for storage of crops, and it may be safe to say that such pits, when emptied, became refuse pits similar to our Features I, IV, V, VII, X, XXI, and XXV. With these pits in mind we examined other recorded evidence of nearby pottery-making/agricultural societies. On Martha's Vineyard single charred corn kernels were found at both the Peterson site, Stratum 1 with shell-tempered pottery (A.D. 1565 \pm 90) and the Hornblower site, Stratum 1B with grit-tempered pottery (A.D. 1160 \pm 80) as described by Ritchie (1969). Without suggesting that our site was the actual locale of agricultural activity, it seems likely that agriculture was a part of the subsistence basis of its part-time inhabitants. Possible roots of a long established tradition of horticulture at Chatham are close at hand; we are able, almost at a glance around the site, to see many plants of potential importance to humans (Table 3). Most can be harvested in spring and summer, many in autumn, and some few on mild winter days. Table 3 expresses something of the variety of Cape Cod micro-environments, and what probably could have been had, for the gathering, by the Monomoyicks of our site.

It would be intriguing to know when gathering became nurturing, and when the nurturers of native plants had developed sufficient skills to cope with the new tropical triumvirate of corn, beans and squash. Towards this end we should ask if Cape Cod shared the climatic ups and downs described in one interpretation of agricultural beginnings in the Mississippi, Tennessee and Ohio River valleys. There Kerby (1974) refers to an agricultural complex based on cultivation of the native plants - sunflower, pigweed, and lambsquarters - beginning about 1000 B.C. To this was added in 650 B.C. squash, and corn in 500 B.C. Climatic deterioration around 50-150 B.C. removed these latter cultigens for about 300 years during which time knotweed (*Polygonum* sp.) was substituted. Thus, in that area, except for a 300 year absence of squash and corn, agriculture based on native and tropical plants took place from about 1000 B.C. onward. This temporal span reaches back to the late Late Archaic. Any succeeding minor climatic oscillation may not have done more than change the length of the growing season or the depth of the local water table slightly.

Regrettably, it is unknown to us how and when our site's inhabitants or their ancestors adapted to the changes inferred from the above cited data. We do know that, in 1620, the Indians of the Plymouth area were cultivating sunflowers (*Helianthus annuus* -

var. *Macrocarpus*) and Jerusalem artichokes (*Helianthus tuberosus*). These, with the corn, beans, squash, gourds and tobacco (*N. rustica*) would seem to indicate long familiarity with agriculture. But it cannot be said here when the Indians of Cape Cod became the people described by Champlain as "not so much great hunters as good fishermen and tillers of the soil" (Smith 1971:22).

Having taken this superficial look at available food resources, let us consider another need -- raw materials for tools and pottery. This is partly satisfied by examination of one fortunate aspect of the site -- its proximity to Great Hill (Fig. 1). This old kame, one of five such Cape Cod deposits (USGS: 1976), was left as the Cape Cod lobe of the Wisconsin glaciation was receding. Despite its interlobal position -- South Channel lobe till and boulder deposits (Fig. 1 dotted line) almost surround Great Hill (Oldale & Koteff:1970) -- it withstood the swirling outwash while the Cape Cod lobe was at a stillstand along the north shore of the present Cape (Oldale, verbal communication). This deposit is a prominent land feature; in the days of the tall ships it was known as the "first land they made" coming home. Its northwestern end bordering Nespoxt (Lovers) Lake is exceedingly steep. At one time it may have resembled the present Chatham Highway Department quarry at its southeastern end where one can see today the cobbles rolling out of the hillside. Forty years ago this steep hill was devoid of growth (Joshua A. Nickerson: verbal communication). Champlain's map recorded Great Hill as bare and surrounded by forests. Its cobbles are the same as those of the Harwich outwash plain -- the same felsites, quartzite, and quartz of which our lithic artifacts are made (Fig. 3), and in its bared edges, around its northeastern side there is a clay-like deposit. Thus we can now speculate, without in any way ruling out an active trade in off-Cape blanks and preforms, or chance acquisition of likely material while away from home grounds, that this hill about a third of a mile away was one of the assets of Site M48N6 of which we have spoken.

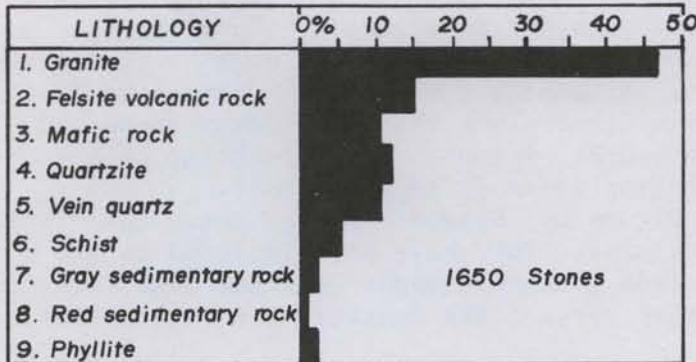


Figure 3. Lithology of the Harwich outwash plain deposits, presumed source of lithic raw materials (from USGS map 3Q911).

a good podzol horizon under 6 inches of humusy loam. Beneath the podzol a dark loam continued to a total depth of 28 inches beneath which yellow sand appeared abruptly. No midden appeared.

Another test pit dug 20 feet south of the site in a flattish field showed no podzol and a brown, sandy loam depth of about 14 inches. All other off-site test pits showed similar absence of podzol and varying lesser depths of loam. Within the site bounds there is, generally speaking, no clear stratigraphy as such, yet recognizably different levels are described, as shown in Figure 4. In most of the squares excavated a scant sod of about 3 to 5 inches (7.6 to 12.7 cm), labeled stratum 1A, tops a grey, sandy loam mixed with small shell fragments (stratum 1B). In some areas light sandy stripes may be seen slanting through it in the telltale oblique plow marks. In the inhabited areas this ends above a shallow leachate zone (stratum 3). The midden proper (stratum 2) appears and gradually thickens as one nears the center of the site around W3S3.

The midden and some of our Features are laid directly on a streaked, yellow sandy leachate (stratum 3) whose depth is related to the degree of blackness of the deposit

Finally, the sea, which provided so much bounty, also made for easier access to Cape Cod by Indian mariner/traders. A tool of Red Triassic sandstone from Feature VI (Figure 18;23), and plumbago point to the west as one source of trade goods for the Monomoyick (USGS:1956), and as an avenue of communication with the larger Algonquin community, probably for centuries.

STRATIGRAPHY

While probing the outer limits of the midden twenty feet beyond the western edge of the excavated area, we recorded three profiles in second growth forest. All had

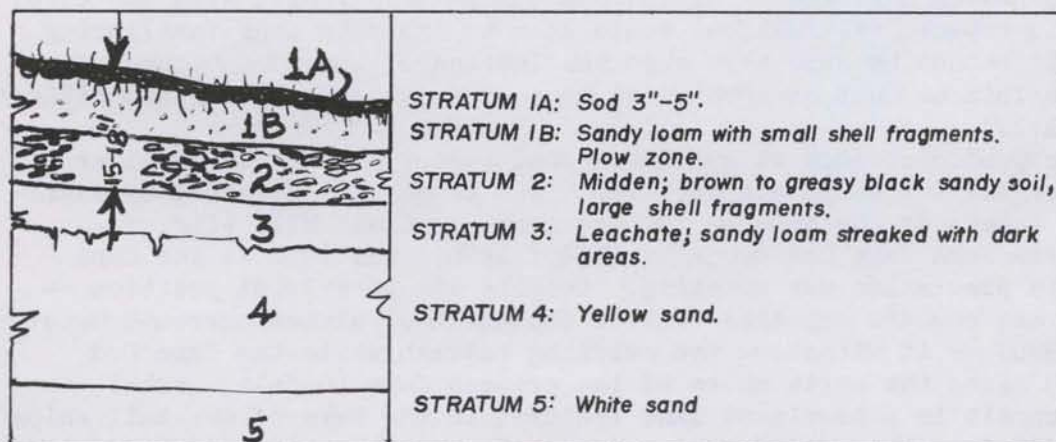


Figure 4. Typical profile, showing generalized relationships of strata.

above. Bright yellow, iron rich sand (stratum 4), is seen to about 30 inches (76cm) in depth, on the south edge, for example, and then white sand (stratum 5). Exceptions to this pattern may be seen in the northeast and northwest edges of the site, where probable erosion seems to have deposited deeper loam atop the midden. The varying depths are sampled in Figure 5.

FEATURES

As we have said, the site, a habitation midden, appeared to have been deposited directly on sand. It was characterized by varying densities of shell, and by thick clusters of shell in lens and bowl shapes. It also contained typical hearth and habitation debris such as bone refuse, lithic debitage, potsherds, random heat-degraded stones of various sizes and groups of stones defined as hearths when some evidence of fire or heat was present. In areas of densest deposit of shell, feature recognition was difficult; in these areas the soil was dark gray to "greasy" black.

A generalized stratigraphic description was provided in Figure 4. However, the reader will note that in this section the Features are not depicted in strata. The drawings may be understood, however, if you combine stratum 1B and stratum 2 into "Loam". The difference between stratum 1B and 2 was most discernible when the former contained tiny shell, and the latter contained heavy undisturbed midden. Those familiar with such middens will realize the difficulty of interpreting areas of less contrast.

The locations of features can be seen on Figure 6. Some of the following descriptions include artifacts not found directly in the features. They have been included on the premise that a displacement of several inches from a feature might indicate some relationship. Besides this, perhaps shaky, premise, they reflect the density of activity that may have occurred near the features.

FEATURE I. In E8N3 and E9N3 at a depth of about 25 inches (43 cm) in stratum 4 was found the remains of a Refuse Pit. This expanded downward in a northerly direction to a depth of about 48 inches (122 cm). It was surrounded by yellow sand. Its location at the base of the path to the houses above would seem to indicate that the depth of overburden of sand is a result of erosion.

FEATURE II. In the northwest quarter of W5S1 in black midden was found a large heat stain at a depth of 16 inches (40.6 cm) at the interface of strata 2 and 3. On this was the base of a dark gray felsite leaf form biface (#89), pottery, chips, bone and charcoal. Nearby at the same depth was a tip of an unidentifiable felsite point (#111).

FEATURE IIIa. & b. At 5 inches (12.7 cm) depth in stratum 1A a group of stones appeared, and at 9½ inches (24.1 cm) in stratum 1B, a second group. In both the stones had been burnt and both held shell and bone fragments. A few small fragments of pottery and some flakes were found in the surrounding soil, which showed evidence of disturbance. Within the square 3 inches (7.6 cm) deeper in stratum 2 was found a reddish, porphyritic felsite leaf-shaped point (Fig. 16;12). Square W4S8 is at about the lowest part of the site, where strata 1B, 2, and 3 are shallowest.

FEATURE IV. In square E5S4 a quartzite point base (Fig. 17;22) was found at a depth of 12 inches (30.5 cm) in stratum 2, 30 inches (76.2 cm) from the north wall and 7 inches (17.8 cm) from the west. Just under this a Refuse Pit was found extending to a depth of 44 inches (111.8 cm). It was 7 feet (2.1 m) east to west, and 4 feet (1.2 m) north

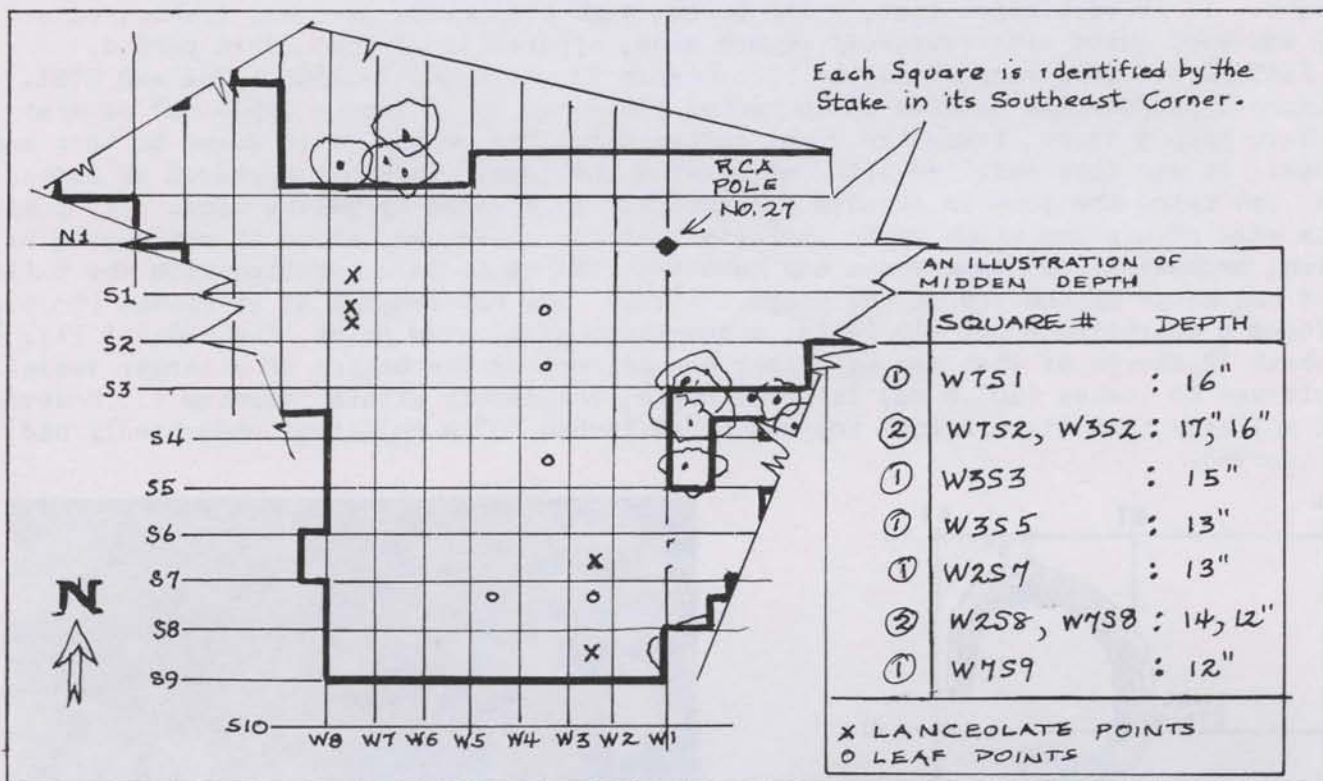


Figure 5. Midden depths and locations of some projectile points from undisturbed provenience, predominantly at the base of the midden.

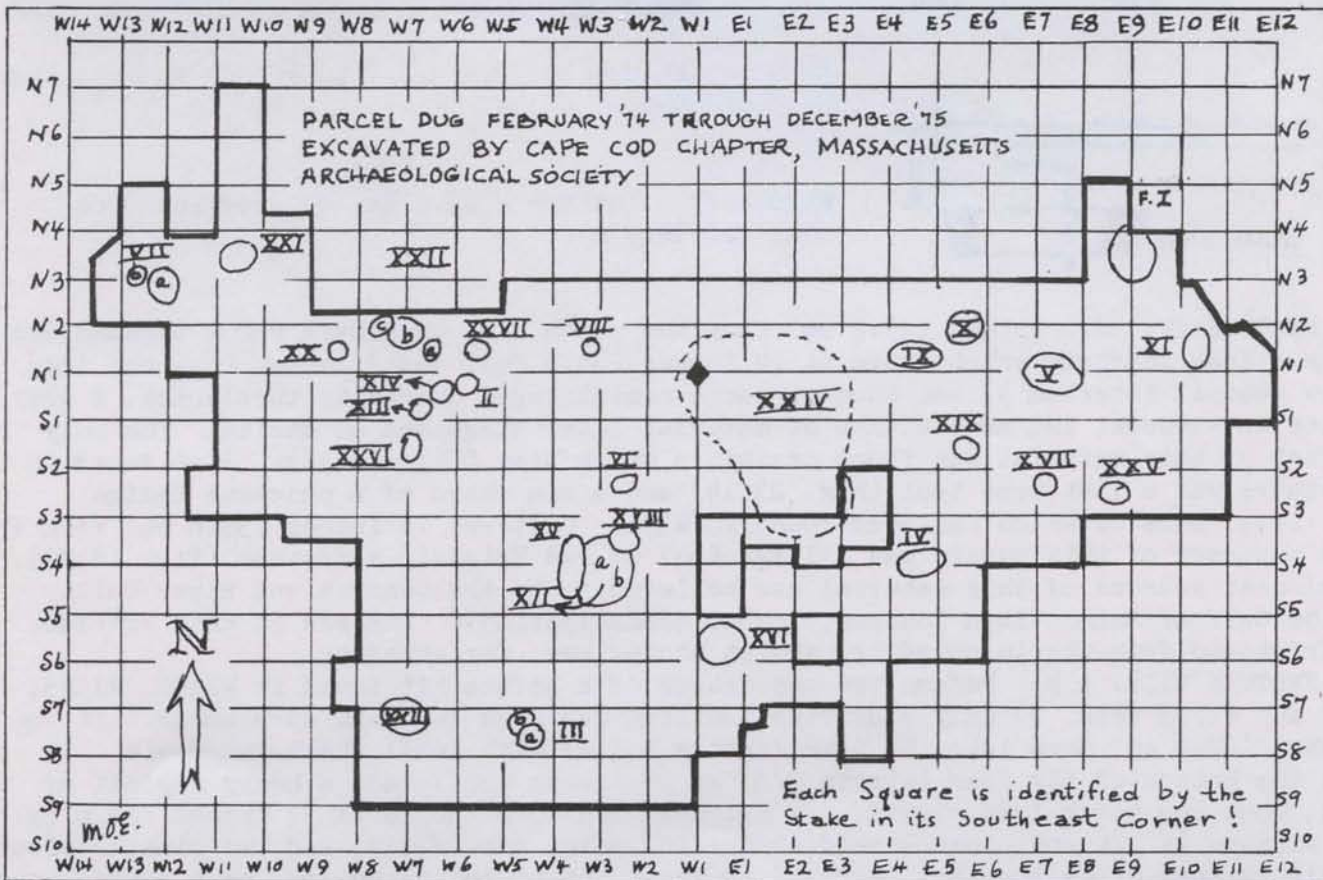


Figure 6. Site plan, showing location of Features.

to south. In it were black loam, a few bones, some potsherds, frequent flakes, some shell and wood chips with sawed-off square ends, apparently of the modern period.

FEATURE V. This remnant Refuse Pit (Figure 7) was found in E8N1, E7S1 and E7N1. In Figure 8 is seen the outside of 6 inches (15.2 cm) to 10 inches (25.4 cm) of what must have been a large, irregular, oval refuse pit. The center of it seems to have been removed. It was then refilled with mixed sand and loam. This pit appeared 22 inches (55.9 cm) below the loam in stratum 4 completely surrounded by yellow sand. Its position on the edge of a steep slope could indicate that the clean sand above it was caused by erosion; mechanical or human means may have been the cause in connection with the building of the house at the top of the slope. Within the pit remnant at 25 inches (63.5 cm) was found a quartzite point tip (#31), a quartzite small stem point (Fig. 16;4 & Fig. 8), and about 12 sherds of what may be either a small pot or the bottom of a larger vessel. The pit was 40 inches (101.6 cm) in total depth, completely within stratum 4. However, it is unlikely that its original top was at 22 inches (55.9 cm); that undoubtedly had been removed.

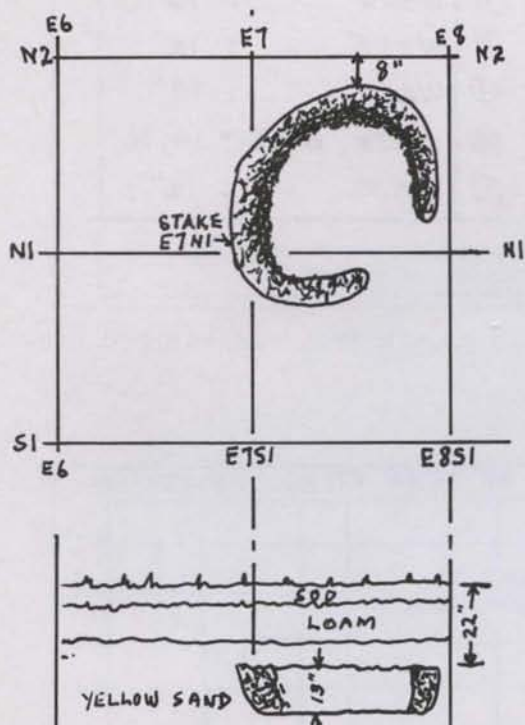


Figure 8. Feature V *in situ*. Photo by Ken Pavao, 6-18-74.

Figure 7. Feature V in plan and profile. See text for details.

FEATURE VI. Six inches (15.2 cm) from the north line of square W2S3, beneath mixed sand and loam leachate which ended at 14 inches (35.6 cm), and 2 inches (5.1 cm) into yellow subsoil (stratum 4) was found a cache containing a quartzite turtleback, a gray felsite turtleback, and many blanks of material later diagnosed as dacite. The only artifact of this material was found nearby, a knife base (Fig. 18;16). Also found in the square was a flat bone tool (Fig. 23;14) and a rim sherd of a punctate design (Fig. 20;3) more of which had been found in W3S1. Centered 14 inches (35.6 cm) from the south boundary of this square was a large tool of red Triassic sandstone (Fig. 18;23). The closest sources of this material are believed to be the Connecticut River Valley and the Gulf of Maine (Eben Johnson, verbal communication). One end of this artifact was fractured from use in pounding, and it showed use for abrading.

FEATURE VIIa. & b. Before the appearance of a Refuse Pit found in W11N2, W11N3, W12N2 and W12N3 (Fig. 9) only a British gunflint had been found in stratum 1B. It was 9 inches (22.9 cm) deep into the loam lightly salted with small shell fragments. At about the bottom of the loam (strata 2/3) at 15 inches (38.1 cm), a heavy deposit of shell, bone and black loam showed. It extended to a total depth of 27 inches (68.6 cm) into stratum 4. It contained a reddish felsite point tip (#201), and two similar-sized roundish stones close together (#202). At least one of the stones may be a gaming stone; it is an exceptionally smooth quartzite cobble showing sedimentary layering. Also

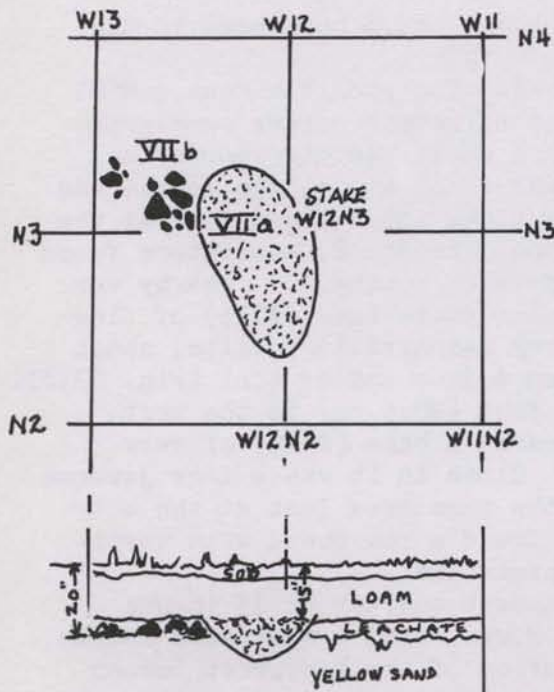


Figure 9. Features VII a and b. See text.

This could have been a small Cooking Pit or oven using hot coals, afterwards refilled, the rocks possibly having had some auxiliary use.

FEATURE IX. At a depth of 11 inches (27.9 cm), under dark gray loam in stratum 2, a Hearth was found containing balckened stones imbedded in greasy, black soil, two bone fragments, small felsite chips, a large heat-rotted stone and 20 smaller stones. They were scattered through a 4 feet (1.2 m) diameter area. Just on the northern perimeter of the hearth was found a small chunk of material which tested on paper as possible hematite. The square was E5N1.

FEATURE X. In E6N1 and E6N2 had been found a small stemmed quartz point (Fig. 16;3). Then an apparent Refuse Pit appeared at about 11 inches (27.9 cm). It contained burned stones in random positions, a great deal of bone, charcoal, and quartz chips. At 14 inches (35.6 cm) there was a very large, complete oyster shell, and deeper, quartz chips and an 18 inch (45.7 cm) diameter circle of black loam heavy with charcoal. At 23 inches (58.4 cm) was found a large deer bone, and a thicker cluster of hearth litter, which included a possible deer jawbone and teeth, and some flint chips. The pit was 48 inches (1.2 m) in total depth, well into stratum 4.

FEATURE XI. This Deposit of unknown purpose was located at the easternmost edge of the midden, probably E11N1. At a depth of 14 inches (35.6 cm) beneath 6 inches (15.2 cm) of sod and 7 inches (17.8 cm) of mixed shell and loam, and resting on sandy subsoil on stratum 2 was found a closely packed layer of large cobbles of an average 4 inch (10.2 cm) diameter. It was roughly oval in shape covering about 3 square feet (0.9 sq m). Although it was in a steep area, a profile of this square does not reflect the same disturbance found in the adjacent Feature XXV. The cobbles showed no heat degradation and neither stain nor ash was present.

FEATURE XII. A Fire Pit (Fig. 10) was isolated in squares W2S4, W3S4, W2S5, W3S5 at 15 inches (38.1 cm) depth. It was discernible only by a lens of ash with no hearth-stones. A possible hammerstone was found atop the ashes and within them a possible burned point fragment (#183).

FEATURE XIIa. A lens of shes without any stones laid directly on sand, stratum 4, was found at a depth of 20 inches (50.8 cm) in W2S4, W3S4 and W3S5. A point badly burnt by the fire was found in the ashes.

Note: The information on the above two features stands a good chance of being inaccurate as to provenience because of square identification problems in the field.

found were two possible point tips (#s 252, 255), and a large, pale gray felsite blade (Fig. 17;34); nearby was found another piece of the latter. Many sherds of coarse, grit-tempered pottery, similar to Fig. 20;8, decorated with a dentate platted design were also found in W7S2, W8S3, W9S3 and W7S3 mostly at the bottom of undisturbed midden (stratum 2) or in leachate (stratum 3) under the midden. Near the feature at 20 inches (50.8 cm) in stratum 3 was a felsite celt (#210) and a point tip of green felsite (#256). Adjoining VIIa. above, was a Hearth VIIb., a collection of burned cobbles.

FEATURE VIII. In W3N1 at 16 inches (40.6 cm) from surface a roughly circular pit about 14 inches (35.6 cm) in diameter appeared on the eastern edge of W3N1. Its sides were almost vertical to the bottom which intruded into sterile subsoil to a depth of 28 inches (71.1 cm). At 19 inches (48.3 cm) three potato-sized rocks and a smaller one were found, all fire or heat-degraded and cracked. Fill material was greasy, black midden material including shell fragments and no lighter soil. Charcoal was taken as well as samples of fill at 20 inches (50.8 cm) and 24 inches (61.0 cm). A small rusted iron fragment was found 4 inches (10.2 cm) from the bottom.

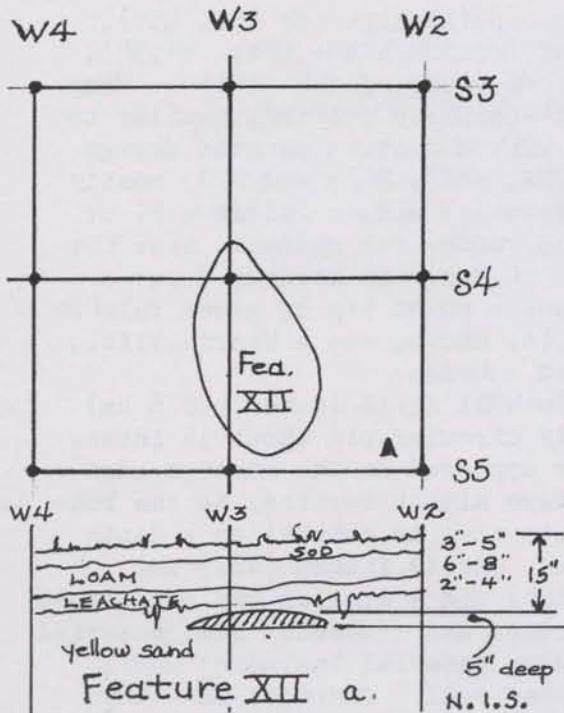


Figure 10. Features XII and XIIIa.
See text.

36 inches (91.4 cm) at its widest. Believed to be a possible "Smoking Hearth", it was about 6½ inches (16.5 cm) thick, its highest point in its middle, and was laid at the bottom of the leachate zone in stratum 3. In W3S5 were found several antler tines (Fig. 23;36,27).

FEATURE XVIIa. & c. Excavation of E1S6 began in its northern half revealing a dark, shelly loam lens which expanded horizontally southwestward. Cutting through this lens was a narrow trench (Fig. 11) containing obvious refill (glass sliver) with scant shell. To the northeast of the lens was a Refuse Pit (XVIIa) which was found to go from 10 to 18 inches (25.4 to 45.7 cm) total depth on the north line of the square, obviously continuing into the adjoining square. Intruding upon its southeast edge was a modern re-filled area (XVIIb) containing bits of plastic, mixed loam, sand, shell, and two artifacts. They were a quartz tip (#213) and an untypable felsite base (#214). Partially excavated Refuse Pit XVIIa contained a large quantity of bone including a complete lower deer jaw, some greasy black loam, dense shell, and some lithic waste. It rested on leachate, in stratum 3.

Digging southward on the east line, where dark loam was lightly mixed with crushed shell, we found a small quartz triangular point at 12 inches (30.1 cm). Adjoining it, in an undisturbed pocket of this midden, at 14 inches (35.6 cm) in stratum 2, a knife section of light gray felsite (#262) showed. This was found to fit fragment (#177) found in W3S2.

The south third of the square showed refill only until, at 15 inches (38.1 cm) deep in the southeast, we came on a layer of light reddish tan clay-like material containing crushed shell. This was isolated, proving to be two separate lenses (XVIIc) of equal depth almost surrounded by refill areas. Paring away the refill and a 1 to 2 inch (2.5 to 5.1 cm) layer of leachate, stratum 3, we isolated a collection of about twenty stones. These were 2 to 5 inches (5.1 to 12.7 cm) in diameter, some showing fire degradation. These scattered stones continued under the lens and leachate.

In the northeast sector, more digging revealed another clay-like lens at about the same level as the other two. Refuse Pit XVIIa was then excavated in E1S5. It was 20 inches (50.8 cm) deep containing throughout dense shell, much deer bone including more teeth, and a handful of fine, dark gray and dark red felsite flakes.

The lens thickness varied from ½ inch (1.3 cm) to 2½ inches (6.4 cm). In places

Either of them, or both, could have been in the W1 row.

FEATURES XIII & XIV. The prolific square W6S1 yielded first from its northeast corner some grit-tempered pottery with a shell dentate impression like Fig. 20;6. It was found among bone refuse and stone chips. Digging along its eastern line at the bottom of the plow zone, stratum 2, excavators found cord-wrapped tool impressed potsherds. Nearby was found a large triangular point base (#115) of finely worked greenish gray porphyritic felsite, about 2 inches (5.1 cm) from a deer antler tool (Fig. 23;21) showing use. Then a foot (30.5 cm) to the west, in the plow zone appeared a base (#116) of very dark gray quartzite. Close to it was a deer jawbone with two teeth. In the same area just at the bottom of this zone was found a rim sherd with vertical shell dentate impressions.

Deep in the northeast quarter at 15 inches (38.1 cm) in stratum 3 was found a scattered Hearth, XIV. Finally, excavation of the southwest corner revealed another collection of stones in random positions with a deer bone in its midst, Hearth XIII.

FEATURE XV. A lens of burnt earth, sterile of artifacts, was found in W3S4 and W3S5. It was roughly oval, about 45 inches (1.1 m) long by

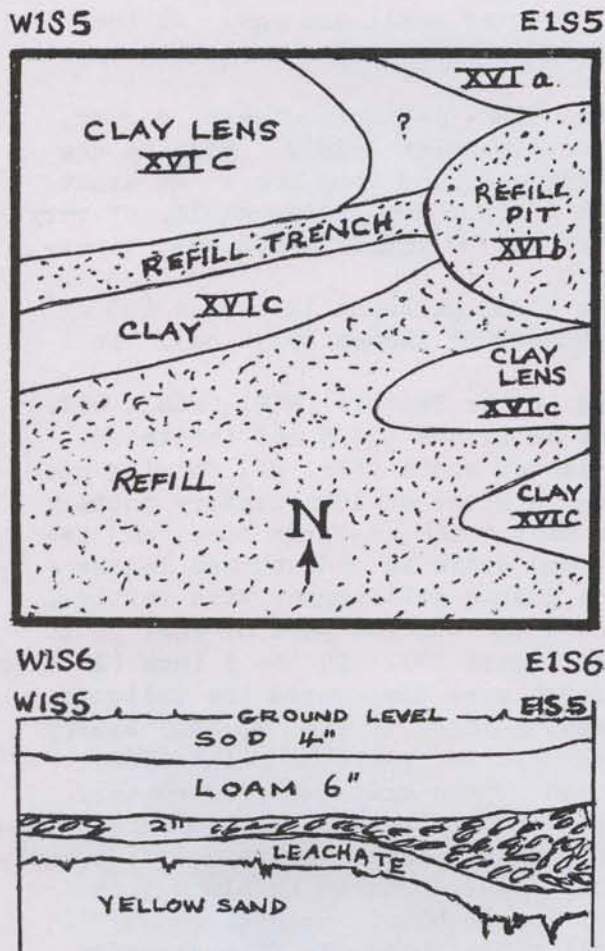


Figure 11. Feature XVI. plan and profile. See text.

it was securely bedded atop the cobbles on leachate (stratum 3); in others on about 1 inch (2.5 cm) of dark loam with small shelly fragments. The "clay" was well mixed with crushed shell and bits of charcoal appeared throughout it.

As we were removing the northwest area the sand beneath suddenly showed reddish. Careful digging procedures revealed nothing of interest beneath it except the underlying layers of leachate and cobbles which did indeed underlie all the lenses. A sample of the reddened sand examined microscopically indicated changes caused by heat. Eight photographs recorded excavation of this "clay" floor as it proceeded.

No report of a similar lens was made for E1S7 or W1S6, and E2S6 and E1S5 were not dug because of the massive disturbance.

FEATURE XVII. Near Feature V in E8S3 at 42 inches (106.7 cm) depth a small, 20 inch (50.8 cm) diameter Refuse Pit (Fig. 12) was found in the northwest quarter. This feature continued down to a total depth of 54 inches (1.4 m). Its contents were densely packed shell, bone, pottery sherds, many chips, and bits of charcoal. A tan quartzite point tip (#134) was found. This Pit was similar to Feature V in that it was surrounded by yellow sand, stratum 4.

FEATURE XVIII. In W2S4 below the mixed shell and loam lens and below the leachate, in yellow sand of stratum 4 appeared a Refuse Pit (Fig 13) containing black loam and shell. It was found at 27 inches (68.6 cm) and continued to a depth of about 32 inches (81.3 cm). It proved to be a bowl-shaped lens in the northern center of the square.

At about one foot (30.5 cm) from the southwest stake about 13 inches (33.0 cm) deep in the shell and loam midden appeared a quartz small triangular point (Fig. 17;2) and many sherds of an extremely coarsely shell-tempered pot (Fig. 21;4) decorated with vertical indented bands possibly made by net impressions. Just below these were found a fragment of a large triangular point of dark reddish gray felsite possibly broken in manufacture due to a vein cutting across the point axis. A foot (30.5 cm) eastward at 13 inches (33.0 cm) appeared a white quartz small triangular point (Fig.17;1) at the same depth, and in the southeast corner a possible scraper of felsite (#103), and a quartzite scraper (Fig. 16;24) showing wear. Also found in this square were two bone awls and an antler tool.

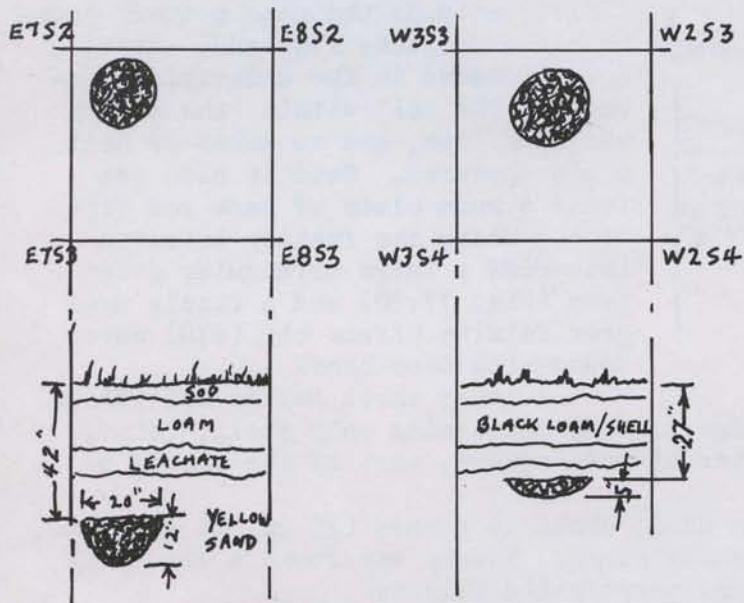


Figure 12. Feature XVII. See text.

Figure 13. Feature XVIII. See text.

(43.2 cm) beneath the midden in stratum 3 in E6S2 was a shell Refuse Pit of quahogs,

large oysters, periwinkles, and nested together, a cluster of small quahogs. At the bottom of the midden were found four sherds of shell-tempered, undecorated ware with smooth inner and outer faces.

FEATURE XX. In W8N1, 11 inches (27.9 cm) from the stake in the southeast corner, in the plow zone was an unidentifiable quartzite projectile point (#193). Beneath the plow zone lay a thick midden containing quahog, oyster shell, and some bone. At about a depth of 20 inches (50 cm) in yellow sand in stratum 4 a pit consisting wholly of very large, soft shell clams appeared. Its opening diameter was 30 inches (76.2 cm), tapering downward to a total depth of 40 inches (101.6 cm).

FEATURE XXI. Beneath a lightly shelled midden in W10N3 at about 12 inches (30 cm) total depth a bowl shaped Refuse Pit appeared to a depth of 36 inches (91.4 cm). It contained a great deal of shell and bone.

FEATURE XXIIa., b., c. The three squares involved in the Feature (W7N1, W6N1, W6N2) yielded several different artifacts. Within the first 12 inches (30.5 cm) (believed to be undisturbed) a plain grit-tempered potsherd, a latten spoon (Fig. 24) showing much use since loss of its handle, a celt fragment (#65) and a piece of 18th Century pottery were found. A few inches deeper in shelly loam was a deer tooth, a large bone, and red felsite chips. Southeast of these at 18 inches (45.7 cm) depth in undisturbed leachate (stratum 3) had been found a rim sherd (Fig. 20;7) of a coarse grit temper with vertical indentations, believed to be net-impressed. Taking down the central part of W6N1 to 15 inches (38.1 cm) we revealed a shell Refuse Pit XXIIa (Figure 14). In its 5 inch (12.7 cm)

depth were discovered the delicate sherds shown in Fig. 20;14. Nearby was a crude possible point (#62), much broken grit-tempered pottery similar to that above, and some flakes. Northwest of this pit a quartz point tip (#64) appeared in black loam with some bone. Excavation of Pit XXIIa disclosed one fire-degraded stone similar to two which had appeared a bit shallower in W7N1 with bone fragments. At 20 inches (50.8 cm) in the midst of what seemed a Hearth (XXIIb) more of the same pottery showed close to stake W7N2 and, later, more appeared in the underlying leachate. The soil within the Hearth was dark loam, and no ashes or heat stain appeared. Near it also was found a rude blade of dark red felsite. Where the feature intruded into W6N2 a large triangular point base (Fig. 17;30) and a finely made gray felsite biface tip (#78) were found with deer bone.

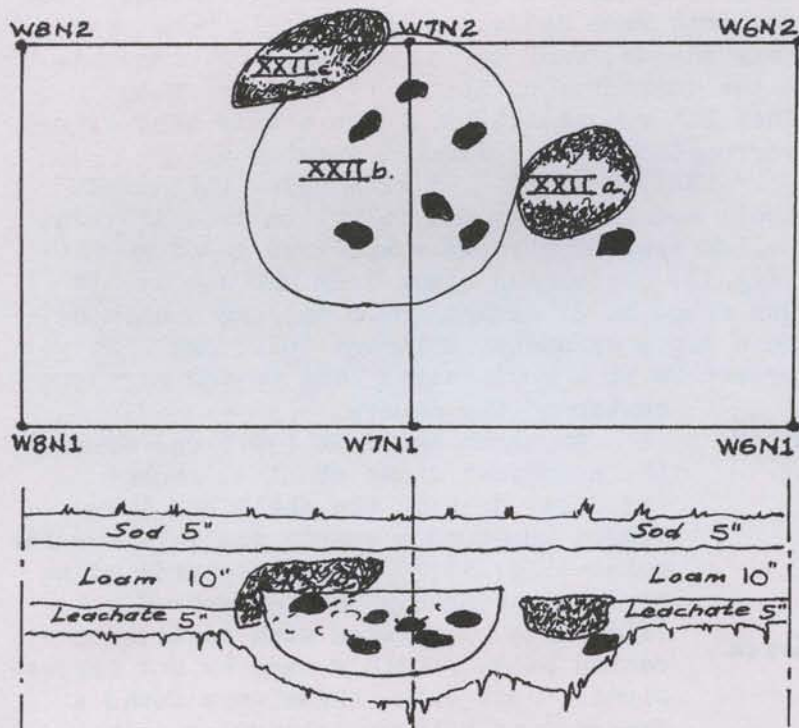


Figure 14. Feature XXIIa. See text.

A later shell Refuse Pit (XXIIc) encroached upon the Hearth on its northwest edge in W7N1 containing only shell, chips, and some bone. Finally in the northwest quarter of that square, part of the handle of the latten spoon came to light.

FEATURE XXIII. A Refuse Pit was found in W7S8, about 14 inches (35 cm) in diameter, consisting of densely packed, unopened, soft shell clams. Nearby was found a very well made triangular point (Fig. 17;24) of dark gray, porphyritic felsite.

FEATURE XXIV. This modern Refuse Area embraced squares E1N1, E1S1, E1S2, E2N1, E2S1, E2S2, E3S1, E3S2, E3S3. Close to an antenna pole and one of its guy wires, this entire area bore evidence of frequent disturbance at great depths (i.e. brick, metal, cement, a safety pin, a cemented brick cistern or cesspool). Nevertheless much aboriginal tool refuse and bone was found as well as a quartz point and a crude hatchet (#25), and a

quartz chipped axe (Fig. 18;26).

FEATURE XXV. Another Refuse Pit was found in E9S3. In mixed loam and shell a thicker deposit developed containing shell, black loam, bone, and chips. It was about 18 inches (45 cm) in diameter and continued downward to 25 inches (63.5 cm). The thickness of the deposit above it in this location seems to suggest only that it is in the steepest part of the site with likelihood of additional fill (See E9N2). Found in this pit was a triangular point (Fig. 17;9).

FEATURE XXVI. At 13 inches (33 cm) in W6S2 was found a pale tan, quartzite biface fragment. Beneath this was a scattered Hearth within an approximate diameter of 24 inches (61 cm) centered on the W7S3-W7S2 line about 3 inches (7 cm) above junction. It contained a good quantity of animal bone and a heavy concentration of shell. Adjacent was found a deer antler showing use from flaking.

FEATURE XXVII. Within W5N1 was found a Hearth beneath light sandy loam lightly mixed with shell. It contained thickly clustered shell, many flakes of dark reddish felsite, shattered shell-tempered potsherds, and bone. Beneath this Hearth were found thick coarse grit-tempered potsherds with incised decoration. Nearby were found a point base, felsite knife tip, and a piece of kaolin pipe.

LITHIC

A chart (Fig. 15) showing depths of projectile point retrievals was prepared. First, however, as discussed in the Methods section, the committee realized that only morphological descriptions could transmit needed data to us. After measuring our artifacts and comparing with known types, we tried to fit them into published typologies. We had to make some choices about the leeway allowable in our descriptions. Resolution of some of our problems was attempted as follows:

D E P T	PROJECTILE POINTS															
	TRIANGULAR						CRUDE	SMALL STEM	D i a m e t e r	TAPERED STEM	CORNER REMOVED		LEAF	LANCEOLATE		
	SMALL			LARGE							Asymmetric Form				# 3	# 9
H	#4	#5	#6	Squib- nocket	Holland Type C	Holland Type D										
5"																
10"		1	3			1										
15"			2			2	4									
20"																
25"																
OTHER DEPTHS																
	2	6	9	2	1	1	17	10	3	1	2	2	1	1	5	5
TOTALS																
TOTAL TYPABLE POINTS													68			
TOTAL UNTYPABLE POINTS & ABERRANT FORMS													15			
TOTAL UNTYPABLE TIPS & BASES & SECTIONS													75			
													7			
NOTE: Typable points, but surface/no provenience													7			
TOTAL LITHIC ARTIFACTS													165			

Figure 15. Vertical distribution of projectile points, and summary to types and classes.

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LARGE TRIANGULAR. Regarding these 18 points, it must first be stated that their lengths and widths place them well within a Levanna-like range. But only two fragments seem to conform to Ritchie's majority thickness of 3/16 of an inch (5 mm). Our majority is 5.3 mm. All have, "to a marked degree", asymmetric basal concavities. Eight are straight sided, four excurvate, two incurvate. One point was quartzite, one argillite, one a fine grained metamorphic stone; their thicknesses were similar to the rest which were felsite. Does the felsite account for the thickness? Are these truly Levanna types in actuality and temporal implications? (Fig 17;19-30)

LANCEOLATE. Our point shape, convex sided and truncated base, is most like the one described by Moffett (1951:101) and Byers and Johnson (1940) as Lanceolate, Straight Base. MAS does not name this point separately; its nearest depicted equivalent seems to be the slender, convex-sided example under Tapered Stem.

One point that we have called Lanceolate approaches Ritchie's Greene point. It would fit in very nicely if it were a bit more elliptical. It is a gray felsite (Fig. 16;15) found at 16 inches, (stratum 2) and is 70 mm L x 28 W x 10 Th. This point has one edge angle of 40° which is slightly sinuous. Two tan points are quartzite; one, well made (Fig. 12;14), found in shell and loam at 12 inches (30.5 cm) in stratum 2 is 62 mm L x 24 W x 8.7 Th. The other (Fig. 16;16), more lobate in form is 55 mm L x 27 W x 10.7 Th. A dark gray, quartzite point (Fig. 16;17) may be closer to Tapered Stem but, when examined, this appearance seems to be the result of flaking difficulties. It has one sinuous edge, 40°, which is serrated, and an irregularly centered medial ridge. The crude result is seen in its dimensions of 52 mm L x 21 W x 9.9 Th. Another point (Fig. 16;18) is proposed with hesitancy. Its base and sides conform to lanceolate form, but manufacture troubles appear to have shortened its intended length at the distal end and as such it was first thought to be a small knife. One edge angle is 30° and it may be worn on that edge.

TAPERED STEM. Four points have been assigned to this classification. They have the common denominators of well-defined obtuse side angles and truncated bases. MAS could be our model except for its qualifying description of sides as "straight or somewhat convex". On Cape Cod the quality of convexity could create problems in differentiating between this point and Lanceolate. In addition, MAS perpetuates the use of "pentagonal" in referring to this point: the logic which led Holland, Ritchie, and Moffett to apply that word to points with rectangular or square bases (90 degree angle) has led us to decide that there is no justification for its use in our description.

One Tapered Stem point of yellow variegated jasper (Fig. 16; 5), found in stratum 2 at 12 inches (30.5 cm), is 47 mm x L x 25 W x 9.5 Th. Its generally fine flaking is marred by an inclusion at its tip and on one side. Edges are sinuous, not serrated. A tan quartzite example (Fig. 16;7) also demonstrates difficulty in manufacture, but was carried through with a rounded stem and possibly adapted for use as a knife, if indeed that was not the original intent. One edge is sinuous. Two other points we have classified as Tapered were poorly made, and both have one convex side. One of brown quartzite (Fig 16;6) has thick edges and is 50 mm L x 27 W x 10 Th. The other of possible syenite (Fig. 16;8) found in stratum 4 in yellow sand at 16 inches is 62 mm L x 27 W x 12 Th One edge is 40°, slightly sinuous.

LEAF. We have placed five projectile points firmly in the designation of Leaf (as defined by MAS and Moffett), called Lanceolate by Byers and Johnson, and described as an ovoid base point by Holland.

A well made red jasper point (Fig. 16;9) found in sand (stratum 3) at the bottom of midden, is almost elliptical in shape, 56 mm L x 22 W x 6 Th. Its angles are about 30°. Slightly less elliptical is a reddish felsite point (Fig. 16;12) found at 12 inches (30.5 cm) in stratum 2 which is 62 mm L x 28 W x 9.5 Th. Point #182 (Fig. 16;10), found in sand at 16 inches (40.6 cm) in stratum 3, is more crudely made, perhaps due to a refractory variation in the felsite present at the base. Its edges are sinuous. Its dimensions (60 mm est. L x 22 W x 8.7 Th.) make it a more slender form. Two quartzite points are so elongated as to approach a drill classification. Number 176 (Fig. 16;13)

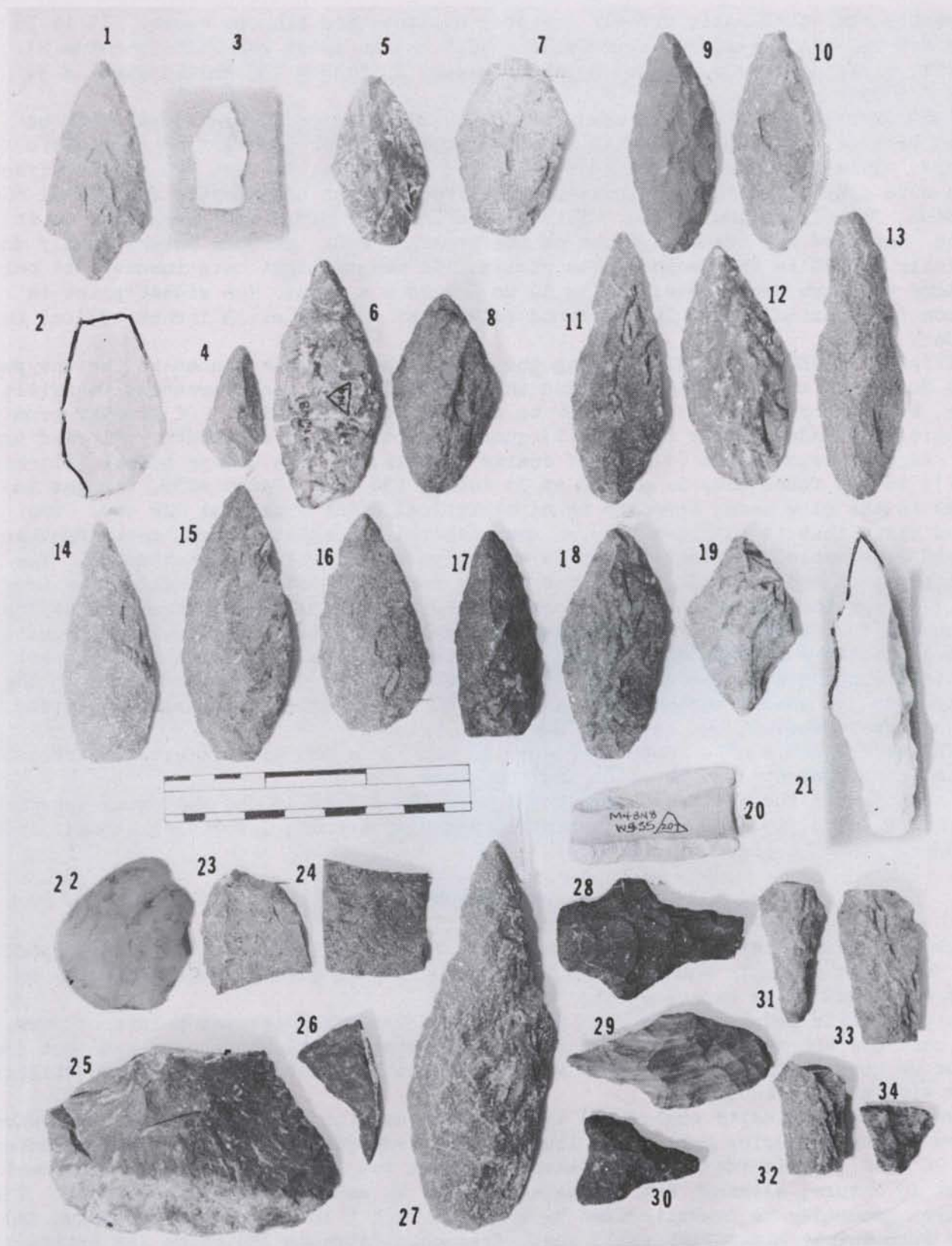


Figure 16. Lithic Artifacts. 1, corner-removed #9 point; 2, corner-removed #3 point; 3,4, small stem points; 5-8, tapered stem points; 9-13, leaf points; 14-18, lanceolate points; 19, diamond point; 20, blocked end tube fragment; 21, pipe bowl reamer; 22-26, scrapers; 27, worked blade; 28-34, drills.

has a faintly red basal half, crudely serrated outline, and sinuous edges. It is 75 mm L x 22 W x 9.5 Th. It was found at 12 inches (30.5 cm) in shell and loam (stratum 2). Number 121, a medium gray quartzite point, found at 13 inches (33 cm) in stratum 3, is 70 mm L x 25 W x 9 Th.

CORNER REMOVED #9. The most beautiful point (#198) we have (Fig. 16;1) must be discussed because a Corner Removed #9 is out of context with the rest of the lithic assemblage. This tool made from a medium-grained quartzite, is also the only artifact from the site exhibiting the possibility of deliberate heat treatment. Its distal end is a medium, faintly yellowish tan. This grades into a reddish tan, deepening as it nears the shoulders and becoming brown on its proximal end. Whether intentionally done or partially burned in the flesh of its victim, its beauty might have insured its being an heirloom and thus found here. It is 59 mm L x 26 W x 9 Th. Its widest point is 12 mm from its proximal end. It was found in W4S5 at a depth of 13 inches (33 cm) in the midden.

UNTYPABLE PROJECTILE POINTS. Among the almost whole points placed in the Untypable class is Number 68 made of andesite found in stratum 1B. It most resembles Rossville in shape, but its crudeness is a barrier to certain identification. Of similar crudity is a possibly intended Corner Removed (?) quartzite point with a probably reworked tip (#122). Another crude point (#172), of coarse felsite, is like Greene points (Ritchie 1971:122); it was found deep in midden at 15 inches (38 cm). Point #233, thought to have been in the plow zone, seems to be an elliptical point broken at one end. The other end hints that it may have been an unsuccessful Lanceolate point base. Another broken and reassembled artifact (#197) is a strange mixture of failed attempts. The apparent proximal end is crude due to the cobble cortex but seems intended to be Leaf shaped. Through the tip half of the stone is a 13 mm band of denser stone; an attempt to compensate for it was made by pecking--unsuccessfully. Additionally, the tip either broke in manufacture or was deliberately flaked into a shape like a Lanceolate point base.

In addition there are seven points (or knives) with bases broken so close to the end as to make one wonder whether it was intentional. Possibilities are two Tapered Stem, two Corner-Removed, two Leaf and one other point.

OTHER LITHIC ARTIFACTS. Seen in Figure 18 are 15 of the tips inferred to be knives because of one apparent straight side and the other rounded.

In addition to the artifacts seen in Figures 16, 17 and 18 the following specimens were found: 2 celts, 1 large tool fragment, 8 pounding stones, 1 abrading stone, 1 possible gaming stone, a piece of plumbago.

DISCUSSION

Figure 19 shows where lithic artifacts were found. Aside from some recording difficulty reflected in empty squares W1S3, 4 and 5, the plan reflects the intensity of activity we sensed as we excavated the "hot spots".

The projectile point chart (Fig. 15) could be used from several points of view, but the only one not requiring caution is a purely statistical study. We have not done this, but we hope that the information will be of use to some qualified person willing to share with us his findings.

However, our curiosity numbed our insufficient caution as you will see. We asked ourselves if, by comparing apples and lemons, their separateness might be better understood. On this fragile idea we have taken a look at two layers of the site which are different in nature, although not separated (except by an arbitrary buffer zone). The upper layer generally is characterized by a 4 to 6 inch (10-15 cm) sod (stratum 1A), a brown loam thinly mixed with small shell fragments (stratum 1B), chips and artifacts. While few actual plow marks are seen, we are defining it as plow zone. The lower layer (stratum 2) typically contains dark brown to greasy black soil heavily larded with large shell, bone refuse, burned cobbles, chips, charcoal and artifacts, and, of course, features intruding down from above or beginning in this layer. Referring to the point frequencies within these layers we learned the following:

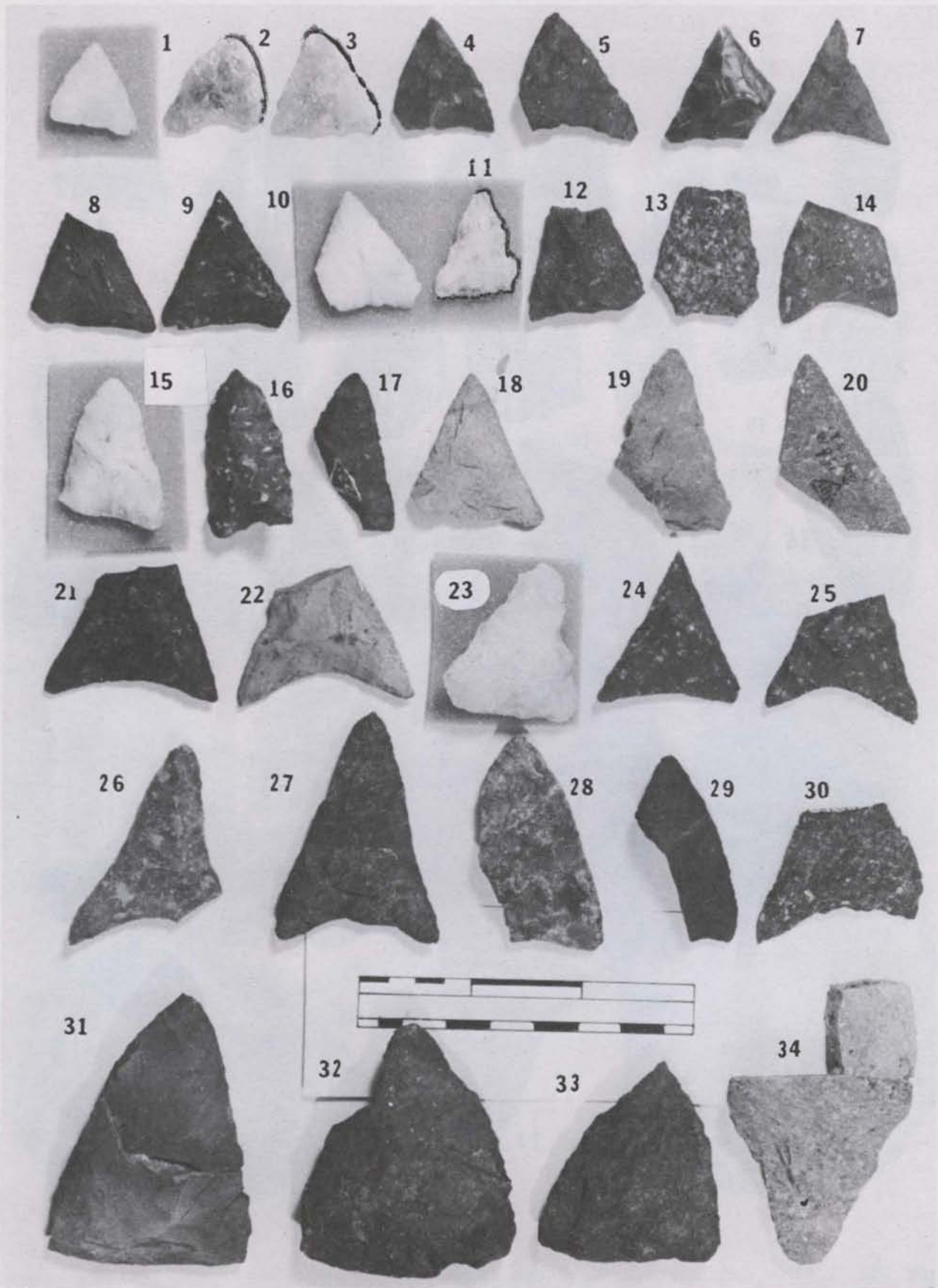


Figure 17. Lithic Artifacts. 1,2,Squibnocket triangular points; 3, Holland Type C. point; 4,5 small triangular #4 points; 6-10, small triangular #5 points; 11-17, small triangular #6 points; 18, Holland Type D point; 19-30, large triangular points; 31, trianguloid knife; 32, 33; triangular tri-excurvate; 34, blade or drill.

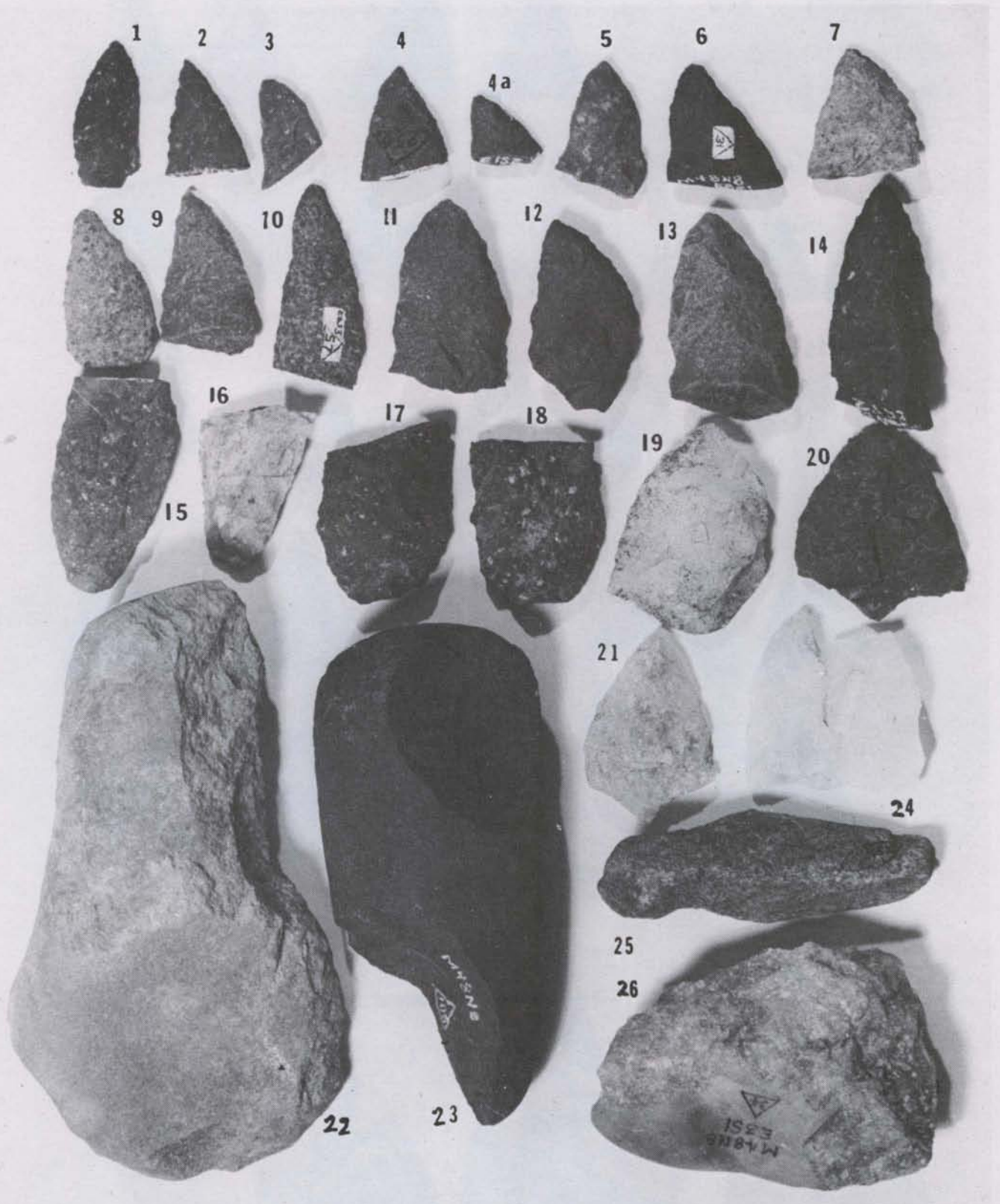


Figure 18. Lithic Artifacts. 1, flake knife (possible); 2-18, knife tips; 19-21, ovate knives (possible); 22, crude hatchet; 23, pouncing stone; 24, trianguloid knife; 25, abrading stone; 26, chipped axe.

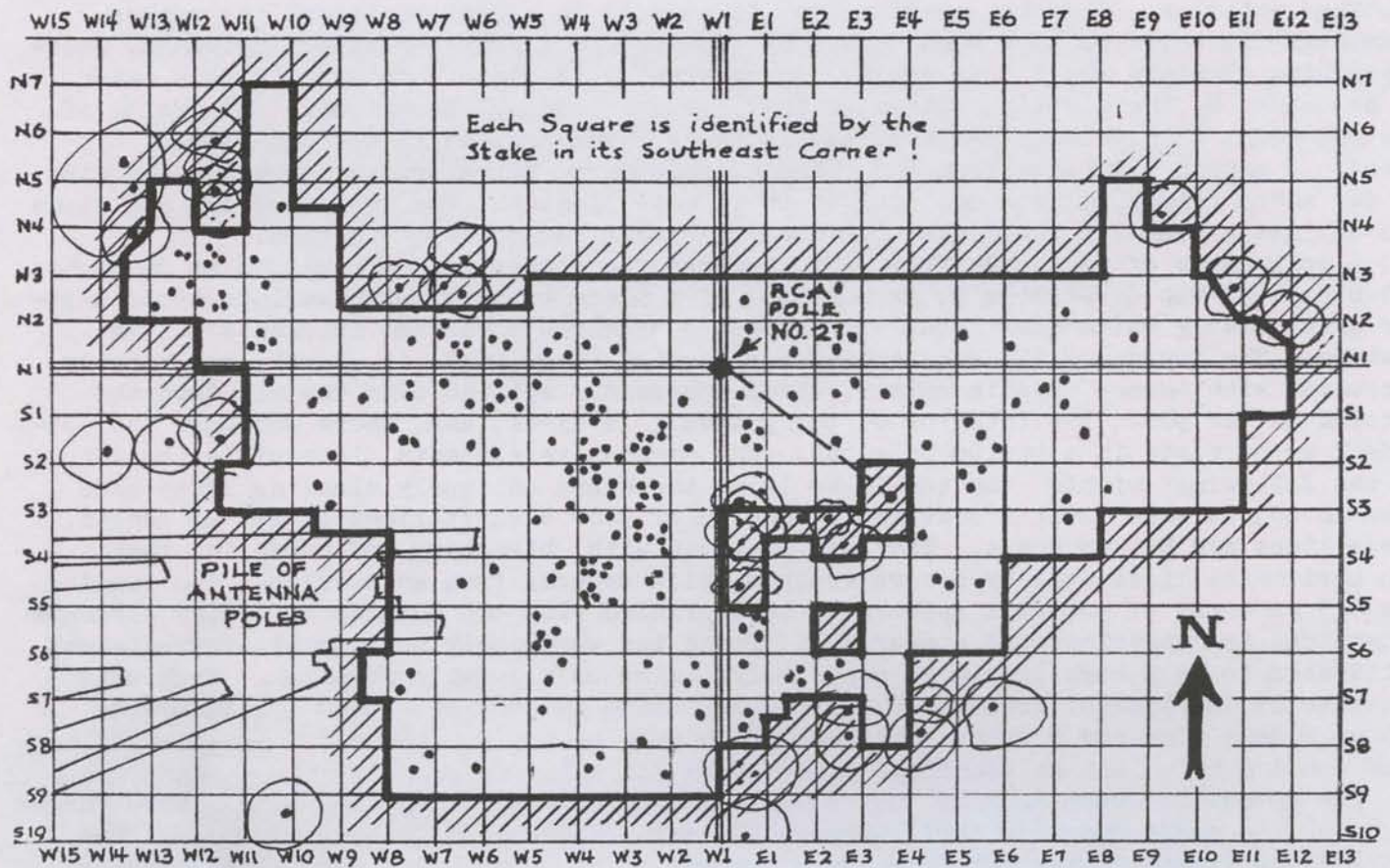


Figure 19. Location of lithic artifacts.

UPPER LAYER - Surface to 10 inches (25.4 cm) total depth - Total points: 21

Small Triangular	28.5%	Small Stem	4.7%
Large Triangular	47.6%	Tapered Stem	4.7%
Crude Triangular	9.5%	Corner Removed #3	4.7%

LOWER LAYER - 12 inches to 16 inches (30.5-40.6 cm) total depth - Total points: 33

Small Triangular	30.3%	Small Stem	0	Diamond	3%
Large Triangular	15.1%	Tapered Stem	6%	Leaf	15%
Crude Triangular	18.1%	Corner Removed #9	3%	Lanceolate	9%

The above identifiable points were made from:

Felsite	50%	Jasper	3%
Quartzite	22%	Flint or Chert	3%
Quartz	12%	Syenite	1%
Argillite	5%	Other	3%

The chart showing the lithology of the Harwich Outwash Plain (Fig. 3) indicates only a few percentage points difference in the available quantities of felsite and quartzite, so we may infer that felsite was the preferred stone.

Our flakes, or chips, were weighed on an ordinary kitchen scale with the following results:

Felsite	22 pounds	Quartz	5½ pounds
Quartzite	4 pounds	Other	Negligible

CERAMICS

Descriptions of our separate vessels are provided below. A dimension will be noted directly after the first reference to aplastic temper in each description; this parenthesized measurement is the largest measurement taken of visible pieces of temper or of cavities.

1. A rim sherd (Fig. 20;1) found in W5S1 made from a paste tempered with coarse, angular grit (3.1 mm). Estimated diameter is 20 cm, greatest thickness 10.7 mm. The

smoothed exterior, fired to a medium tan, is stamped in a pattern resembling rocker-stamping. It seems to have been formed by the edge of a fabric-wrapped implement, whose imprinting elements are 2.3 mm apart. An apparent S imprint is thought in this case, to be caused by the pivoting motion of the "rocker-stamping" technique. The inside of the pot seems to have been smoothed and is badly blackened, as is the interior of the sherd. A smooth rim, seen from the outside, appears to curve upward; however, the size of the sherd deters us from deciding if it is castellation. The inside of the pot shows two obliquely slanting incisions, believed to have a channelling function.

2. A collection of 25 sherds from W4S2 found at the bottom of dense midden at 16 inches (40.6 cm), on top of stratum 3, is composed of a paste tempered with various sized angular grit, mostly white quartz (4.7). Estimated diameter is 23 cm, thickness 9.1 mm maximum. The inside of the reassembled rim section (Fig. 20;2) is smooth, and heavily encrusted with burned organic matter, which apparently spilled over the rim down the outside of the pot. The interior of the pot wall is black, and, where showing, the outside 2 mm of paste is a medium pale tan. The decorative elements discernible consist of the following: within the top 13 to 19 mm there are obliquely slanting lines made from an object which left a dentate impression of 3 or 4 short lines of 2-3 mm length. These lines are 5-7 mm apart. They are overlain with, bisecting and bordering them, two horizontal lines made by a cord-wrapped stick deduced from an overlap. The remaining 5.5 cm depth of pot wall appears to be imprinted with two modules of design elements identical in dimensions and appearance. These two waveringly horizontal, four-element units seem to have been imprinted separately, being only roughly parallel. Each unit consists of the imprint from one S twist cord, crisp in outline, wound 3.2 mm apart, 1.5 mm wide-- a second S twist cord making a softer impression wound 3.7 mm apart, 2.5 mm wide-- and a third and an identical fourth cord too faint to read twist, spaced 3.3mm & 1.8mm.

3. Ten potsherds found in a 10 foot (3 m) radius of RCA antenna pole No. 27, were formed from a fine paste sparsely shell-tempered (4 mm). Estimated diameter is 18 cm. The outside and inside of the pot (Fig. 20;3) appear to have been smoothed. The interior of the pot wall is a medium gray-brown. Thickness maximum is 10 mm, minimum 5 mm. Shallow punctate impressions by an irregularly round object form three unevenly spaced lines on the assembled pot. Beneath them appear three more shallow imprints by a larger, round object. Another two assembled rim sherds appear to be the merging tops of overlapping triangular zones formed by lines of the round impressions. A third sherd has only two vaguely horizontal rows, made by the larger imprint described above.

4. Thirty sherds of a vessel (Fig. 21;4) tempered with very large shell (9 mm) were found in W2S4 in the bottom 4 cm of stratum 2. Its estimated diameter is 33 cm. The interior of the pot seems in some sherds to have been stick-wiped, but most appear smooth. Most are heavily encrusted with burned matter and many have spalled. Breakage is very irregular revealing some very dense clustering of shell temper particles. The visible shell, scratched under 40X magnification, is very soft. Many cavities would seem to indicate leaching of temper had occurred. The decoration appears to have been made by imprinting with a loosely woven fabric whose crossing threads with an S twist are somewhat firm. It may be of a similar weave to that described by W.H. Holmes (1882: 402, Fig. 65). Maximum thickness is 12 mm, minimum 7 mm at the area of imprint.

5. About two dozen sherds of a vessel (Fig. 20;5) tempered with burned, crushed granite (5 mm) were found predominantly in W4S1 at a depth of 16 inches (40.6 cm) in stratum 3 beneath undisturbed midden. No rim sherds were found. Thickness ranges from 11.5 mm to 7.1 mm. The proportion of temper to paste appears to be large, since the surface where undecorated is bumpy where smoothed. The inside is smooth but has indentations possibly formed in manufacture. The decoration seems to be an arrangement of zones, some triangular, formed by imprinting bands in a technique resembling "push-pull". They seem to have been made by the backs of two pieces of broken scallop shell. Despite the density of the grit temper, breakage is clean and no spalling shows in these sherds. There is burned organic matter on the interior of a sherd found 10 feet (3 m) away, apparently of the same pot.

6. Nine rim sherds were found of a fine paste with crushed quartz temper (8.5 mm). The rimsherd illustrated (Fig. 20;6) is 9.1 mm thick; only one of the other sherds is dissimilar in thickness. This latter sherd was from W10S2; the rest were from three

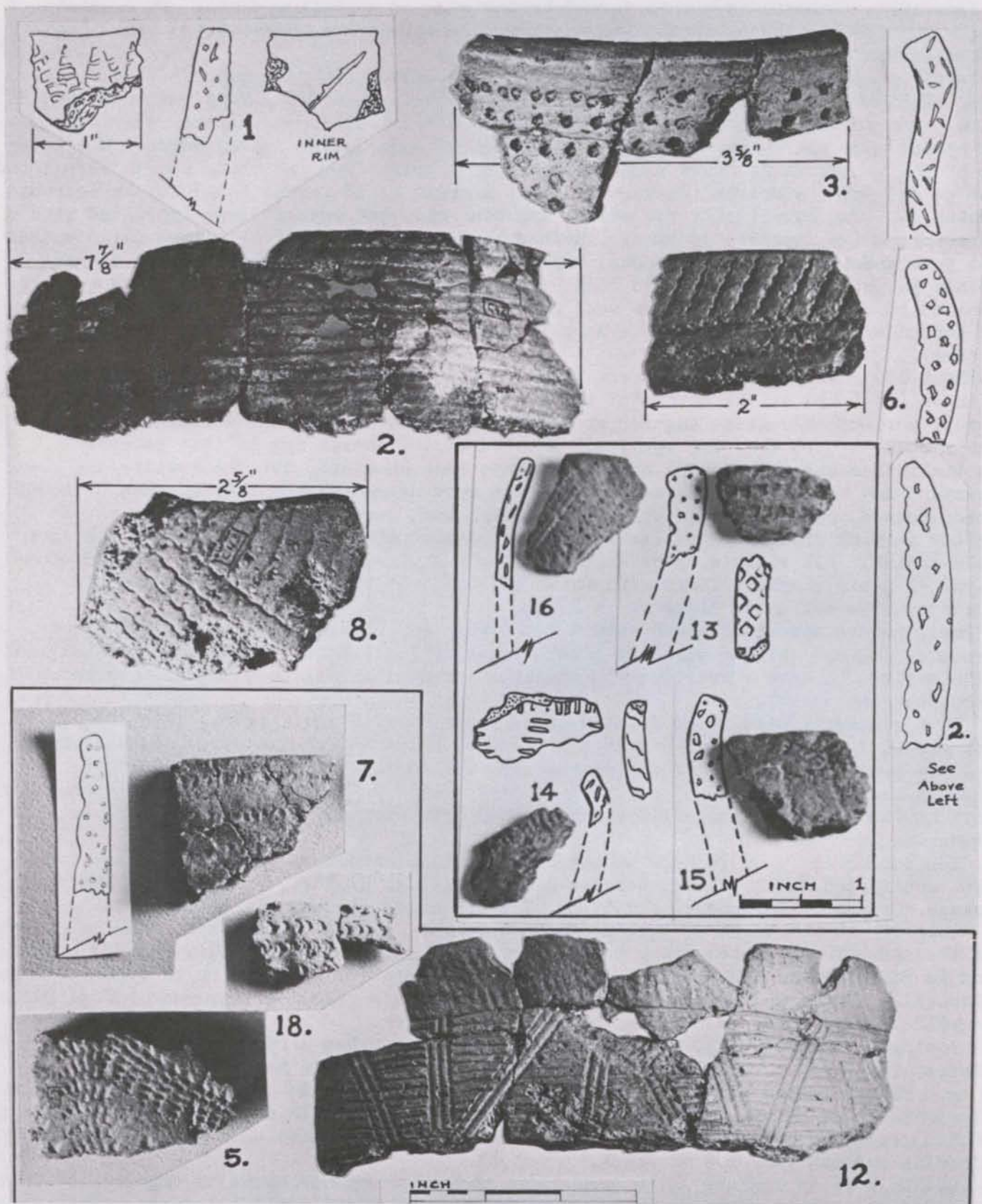


Figure 20. Ceramic sherds. See text.

adjoining squares over 20 feet (6 m) away. The exterior seems to have been smoothed before decorating; the inside was wiped, but not sufficiently to remove possible construction evidence. The interior of this vessel is very dark gray. Estimated diameter is 25 cm.

The decoration seems to have been formed by the edge of a scallop shell. It consists of oblique impressions spaced about 5 mm apart within a zone 1.5 cm below the rim. Beneath are horizontal impressions made from the same tool.

7. Twenty sherds of a coarse paste tempered with burned crushed granite (7.1 mm) were found. Estimated diameter is 29 cm. Thickness is a maximum of 12.7 mm, minimum seen is 8.7 mm. The inside of the pot (Fig. 20;7) seems not to have been smoothed everywhere; some sherds show the temper fragments as visibly as seen on the broken edges. The interior of the vessel walls shows some zoning to dark gray. Most of these sherds were found close to and under a Hearth (Feature XIII) at a depth of 18 inches (45.7 cm) in leachate (stratum 3). The exterior of the vessel had been smoothed before being imprinted with a decoration, which consists of bands indented horizontally; vertical paired marks spaced about 5 mm apart cross the horizontal impressions. Although no twist imprint is discernible in this coarsely tempered clay, it may possibly be made by a fabric whose warp is spaced ca. 7 mm apart, with the woof consisting of paired fibres alternately passing over and under the warp. Where the warp is seen it is 1.5 mm thick; woof threads are the same.

8. About 100 sherds (Fig. 20;8) were found in W9S3, W8S3 and W7S2 mainly at around 16 inches (40.6 cm) at the bottom of the midden on stratum 3. They are tempered with a large proportion of coarse, angular stone (7 mm). Some of the sherds reach a thickness of 12 mm; above that they are spalled. A third of the sherds are in that category. Both the inside and the outside of the pot have been smoothed, but the results are inconsistent due to the very coarse temper. The most extreme color zoning, seen in about a dozen sherds, consists of an exterior, reddish tan, irregularly 5 mm thick, and an interior varying from gray to black. Burned organic matter encrusts a few of the sherds on the inside. All visible outer surfaces show a shell-impressed dentate plaited decoration. A plain rimsherd found with these sherds seems to have the same paste and thickness. Its estimated diameter is 20 cm.

9. The rimsherd described above with a few others may possibly not be the same vessel. There are, inside, oblique markings clearly seen in Fig. 21;9. These marks are believed by the writers to have a function--to assist in channelling viscous ingredients being poured from the vessel.

10. Five rimsherds were found of fine paste tempered with shell (8 mm) (Fig. 21;10). Thickness is 10.7 mm, estimated diameter is 18 cm. The vessel may have been smoothed, but it is crudely made. Color zoning has occurred; outside, 2.5 mm, is reddish tan, inside is tan, and interior of pot wall is dark gray. An apparent decorative element of almost horizontal, wide impressions may be only stick-wiping. The width of the shallow impressions is 4 mm.

11. Ten potsherds found in W3S2 at the bottom of the midden (on stratum 3), are from a plain, untempered small vessel, perhaps a child's (Fig. 21;11). Coil bonding shows at breakage surfaces. Thickness is 7.5 mm. The estimated diameter is 38 mm.

12. This lot is the first of a collection of sherds, most of which were found in Parcel B of the site (found subsequently to the part of the dig covered in this report). Those found in Parcel A are made of a fine paste, shell tempered. Decoration is trailed linear, horizontally banded and overlain with oblique lines in a random arrangement (Fig. 20;12). This will be more fully recorded with Parcel B ceramics.

13. A single rimsherd (Fig. 20;13) was found in undisturbed midden (stratum 2) at 14 inches (35.5 cm). Temper cannot be determined by available methods. Thickness is 7.9 mm. The estimated diameter is 10 cm. Two horizontal bands of a dentate impression fall within 13 mm of the rim, which is obliquely impressed with the same dentate pattern. Smoothing seems to have been done. The interior of the sherd is dark gray, the outer wall being reddish tan, 2.5 mm thick.

14. Within W6N1 in Feature XXIIB were found 19 tiny fragments shown in Fig 20;14. They are of sparsely shell tempered (4 mm) clay and none is a full wall thickness. They were originally believed to be dentate in decorative method; to our surprise, when examined in a plasticene impression each tiny indentation shows a fiber twist, from an S cord, wrapped 3 times in each 5 mm length. On one of the sherds a row of cord-impressed indentations is placed obliquely to another row. On another sherd, a row is imprinted perpendicularly to another. It is possible that this design has been imprinted with embroidery.

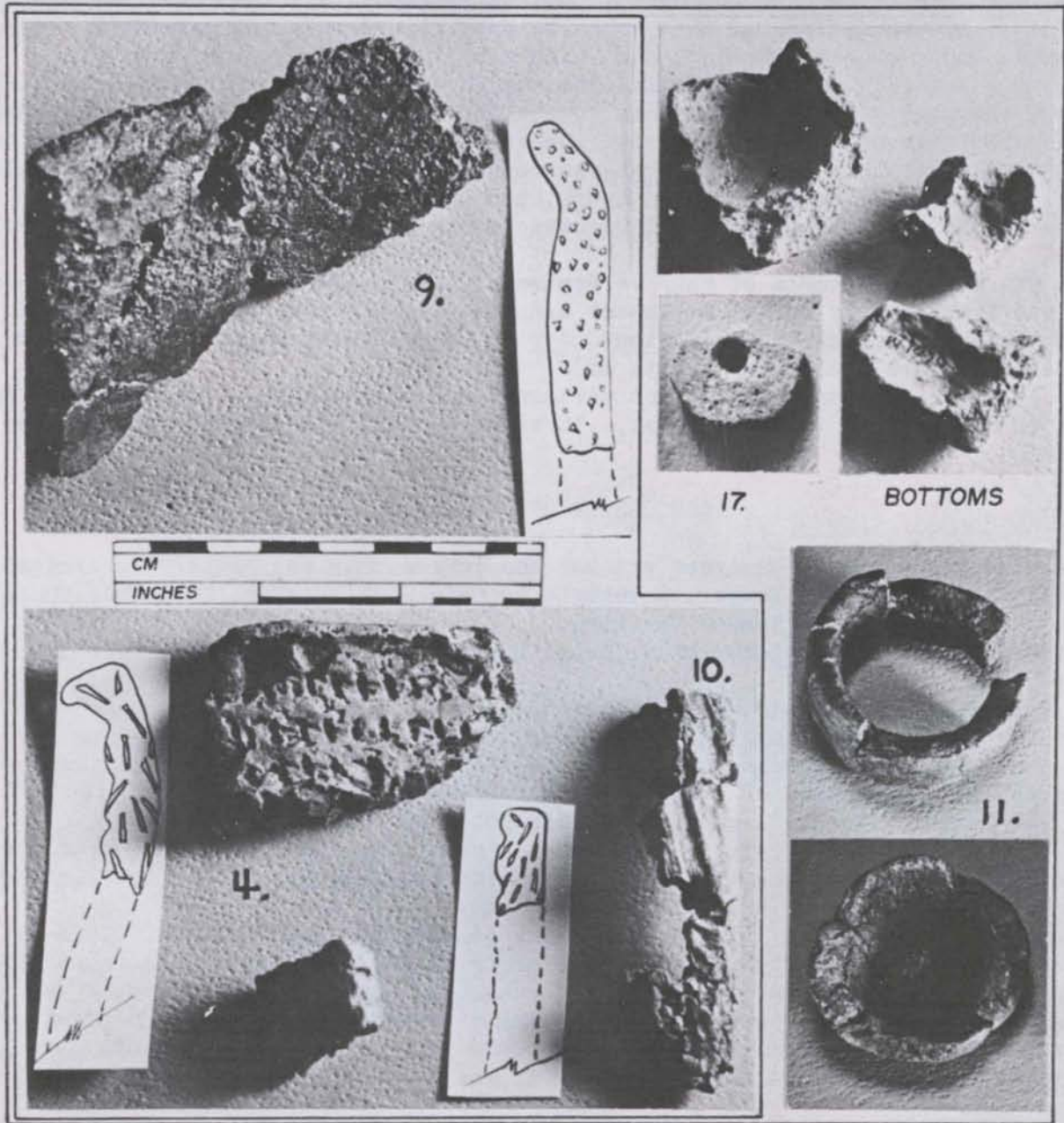


Figure 21. Ceramic artifacts and sherds. See text.

15. There was one sherd (Fig. 20;15) of a coarse paste tempered with grit (4 mm). Thickness is 7.5 mm. Smoothing of inside and outside surfaces has been attempted. The interior of the wall is burned black for more than half its thickness. The design consists of two almost vertical impressions made from a cord-wrapped implement on which the tightly wound cord was an S twist, 1 mm thick. The vertical lines thus formed are 10 mm apart. The rim is imprinted with the same tool in lines 5 mm apart.

16. A single delicate sherd (Fig. 20;16) of fine paste tempered with fine shell (1.5 mm) has a thickness of 4.5 mm maximum. The decoration is a pair of oblique faint incisions below the rim. These are only about 1.5 mm apart and are thought to have been made with a two-pronged tool trailed lightly downward from the rim.

17. In W12N4 was found a fragment of untempered pottery (Fig. 21;17) that seems to have been smoothed after being cord-malleated. It may have been round before breaking. In its center is a hole, 4 mm diameter which, under microscope, seems to have been made before firing. Only one surface of the piece is left, its reverse being spalled. It is of soft paste, badly eroded. We have been unable to infer its original function.

18. A rim of a pot (Fig. 20;18) of which 150 sherds were found in E10N2 in otherwise sterile sand (stratum 4) had a thickness, unspalled, of 9.7 mm. Made of a fine paste showing many cavities of varying sizes and shapes which, under 40X microscope, are seen to be rounded in outline. The paste contains rounded quartz, presumed to be natural inclusions. Several sherds were broken apart, and under magnification were seen to contain minute pieces of black matter. Fingernail impressions form horizontal bands below the rim.

19a. This sherd is an example of many -- apparently cord malleated overall in manufacture. It was imprinted by a flat implement wrapped with a rather firm Z twist cord. and not smoothed subsequent to malleation. A wide range of thickness is found, and most of the sherds are shell tempered (4 mm).

19b. This is typical of another imprint pattern found at the site. The cord used in malleation is of a finer, softer Z twist. It seems to have been lightly wiped after malleation.

DISCUSSION OF VESSELS

These nineteen separate analyses present the interesting preliminary determination that: 8 vessels contain Grit Temper, 8 vessels contain Shell Temper, 2 vessels contain no temper, 1 vessel contains Temper Cavities.

Additionally, it was of interest to learn that the decorative motifs were distributed as follows:

Grit-Tempered Vessels: 3 had cord- or fabric-wrapped tool imprints, 1 was shell dentate (push-pull), 2 were shell dentate - edge, 1 was fabric-impressed, 1 was incised.

Shell-Tempered Vessels: 2 were fabric-impressed, 1 was punctated, 1 was stick-wiped (possible), 2 were trailed linear, 1 was cord-wrapped-impressed.

Untempered Vessels: 1 was cord-malleated, 1 was plain.

Not to be forgotten, however, is the lack of numerical control in our ceramic methods which would have made comparison possible with studies, the statistical conclusions of which were based on individual sherd count.

We tend to try to classify the bulk of this pottery as smooth-bodied. However, in most of the grit-tempered pottery, the irregularity of the paste mixture is such that smoothness occurs only where the aplastic percentage is smallest. Evidence of wet and dry wiping is seen but inconsistently within single vessels. Neither the crudest of the grit-tempered nor the shell-tempered ware could thus be felt to be smooth throughout. Yet the impression left with a potter is that it was smoothed.

ABORIGINAL PIPES

The following artifacts are seen in Figure 22:

1. Bowl fragment of fine paste decorated with parallel incised lines. It is strongly bevelled perpendicular to the incisions, and the joining of the three planes is rounded.
2. A pipe fragment of soft paste. Bottom back of bowl and basal part of stem are flattened into two longitudinal planes which meet at the elbow at an angle of 125 degrees. The bore appears well made for about 13 mm into the stem end, but the process seems to have encountered a previous abortive try; one indentation, perhaps made by the end of the tool, distorts the pipe wall outward just short of the bowl. Inner bottom of bowl is crudely made.
3. A rim sherd (4 mm th.) decorated with three incised parallel lines beneath which is an inverted triangle enclosing five incised lines parallel to rim.
4. A thin rim sherd (2.7 mm) of very fine clay with finely incised parallel lines. It shows a sharp longitudinal bevel which diminishes its acuteness as it nears the rim where it becomes rounded.

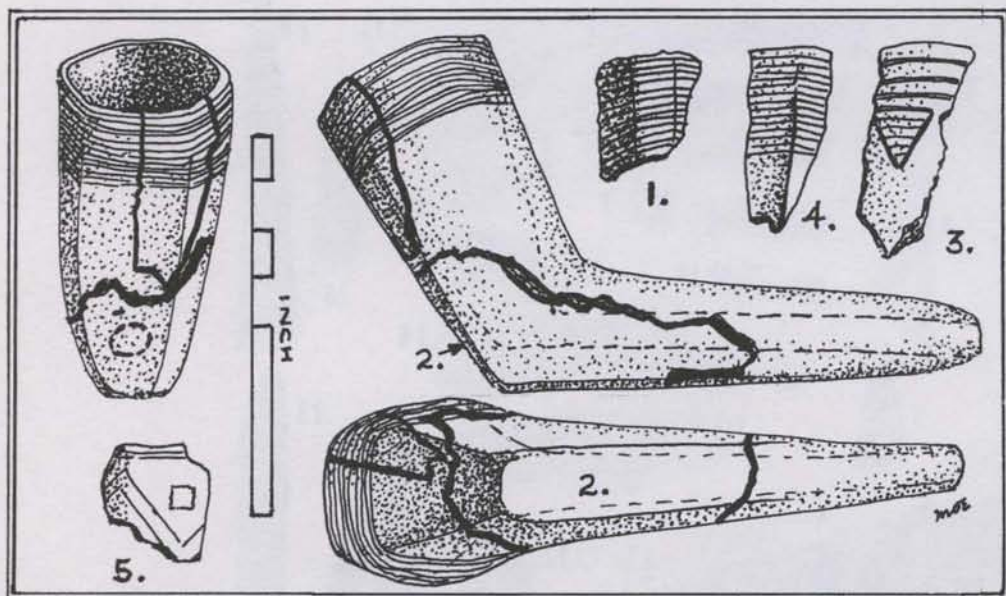


Figure 22. Interpretation of aboriginal pipe sherds. See text.

- The adjoining outer surfaces are gently rounded.
7. A mouthpiece of pipe of light tan paste. Its bore is 3.5 mm.
 8. A highly polished mouthpiece with a taper possibly indicating a short stem. Its bore is 3 mm.

Of the eight sherds found four show longitudinal planes with a well-defined angle. Two others show more rounded joining of the planes. Two show only rounded surfaces. Sherd numbers 1, 2 & 4 were from the same very disturbed square. There is an insufficient number of sherds here to conclude anything other than the concept expressed in Figure 22. It shows the functional basal "bottom"; the extension up the back of the bowl seems to be an aesthetic solution quite independent of the decorative incisions. A similar bevelled pipe fragment was found at the Eel Bridge site (Dunn 1960).

BONE

The midden preserved for us close to sixty bone artifacts, but matching some into single tools lowered the count to forty seven (Table 4). Our most beautiful artifact is a perforated teardrop pendant seen in Figure 23;37. It was found in E9N2 at 16 inches (40.6 cm) near a large Refuse Pit (Feature I). This pendant is but slightly over 25 mm long, 16 mm wide and 3 mm thick. On the perforated end there is a depression almost 1.5 mm deep which may be wear; it may also be functional grooving that would enable the artifact to lie flat when sewn onto something, rather than hung as a pendant. Seen in cross section, at the perforated end, the edges are angular, but at its opposite end it tapers to a flatter, rounded edge. The hole sides are almost straight, any bevel being slight enough to have been caused by wear. Although this has been named a pendant its delicacy might have required a more sheltered duty. A pendant described by Ritchie (1969) from Stratum II, Hornblower Site was 63 mm long and 6 mm thick, a size that seems sturdy enough to survive pendant use in the active aboriginal life.

Another artifact (Fig. 23;38) was found which resembles a two-pronged fork. It is about 44 mm long, tapering to 16 mm wide. The tips of the prongs are broken, but may have been pointed. The fork between the prongs is very polished. There are several small projections on the shaft (?) end. This seems to be a naturally formed bone adapted for an unknown use. There is a counterpart of this on display in the Rose site collection at Truro Historical Society. Besides use as a fork or spear, it could also have served some function in weaving.

An antler tip (Fig. 23;21) found in W6S1 in stratum 2 has a drilled butt end hole resembling those described by Fowler (1976) as socketing. Close to the tip, which is

5. A section of pipe bowl (4.1 mm) of a soft, reddish paste which contains small, red inclusions. The possible rim is encircled with two faint lines. Beneath it appears a band of her-ringbone composed of parallel incised lines. In the triangular zone formed between this last element and the lines above it there is an incised square.
6. A fragment of burnished pipestem showing an outer flattened longitudinal plane.

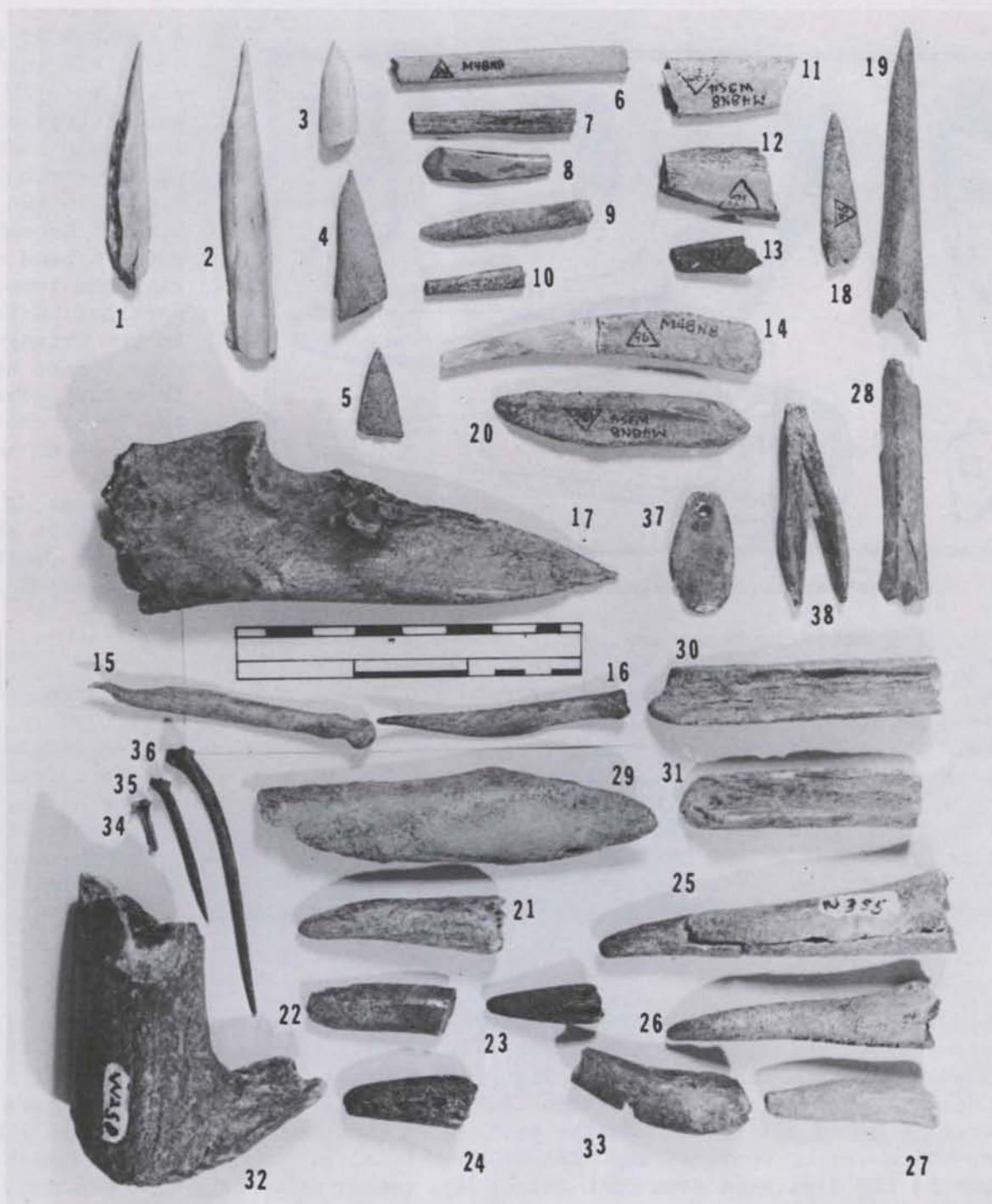


Figure 23. Bone Artifacts. 1, 2, splinter awls; 3-5, awl tips; 6-13, sections of awls; 14-16, flat awls; 17, awl from deer ulna; 18, 19, projectile points; 20, 22, worked bone; 21, socketed antler tip; 24, 27, antler, possibly flakers; 23, 25, 26, antler tips showing wear; 28, bone scribe or graver; 29-31, scoop-like tools; 32, 33, shaft straighteners; 34-36, sunfish spines; 37, pendant; 38, two-pronged bone of unknown use.

a blunt, rounded wedge shape, is an area that is smooth and located on one side. If it is held tip up, with the inverse curve facing the viewer, the smooth area is on the right. Under 40X microscope, the smooth area is markedly different from the rest of the antler. Elsewhere it is roughly pitted, which is also discernible to the naked eye. Another antler tip (Fig. 23;26) is not socketed, but its butt end has deep irregular indentations. Its tip is worn in the same manner described above. In addition, if held as above, it has a smooth area almost encircling the butt end for about 1.5 cm. Another

Another antler tip (Fig. 23;25), found split and broken, then reassembled, is polished on the opposite side of the tip.

Among other items found are three freshwater fish spines (Fig. 23; 34-36) of the perch family, probably sunfish (Prescott, verbal communication). All seem fire hardened. Similar apparently meaningful bones, found in a child's grave in Port Maitland, Welland Co., Ontario (Kipp Island Phase) (Ritchie 1965: Pl. 81, 13-16), have been classified as of unknown purpose by him. We note that the natural hole in their joint ends may have made them useful in weaving or embroidery, but that the angular joint is too large and rough for a piercing, needle-like function.

*** COLONIAL AND OTHER ARTIFACTS ***

METALS

Few finds were of the Colonial period, but several were of real interest. A Massachusetts coin shown in Figure 24;7 was found in W9S1 at a depth of 6 inches (15 cm) in stratum 1B. It is of the Oak Tree series and is a twopence--the only twopence issued by the Massachusetts mint. The mint was established in 1652 with mintmaster John Hull. It was suspended in 1682, at which time the Pine Tree Shilling predominated in use. Sylvester S. Crosby (1875) presents several logical reasons for believing the Oak Tree series to predate the Pine Tree series, including a story about Sir Thomas Temple showing one to Charles II in 1662. Charles, jealous of his prerogatives, is said to have asked what tree it was, and Temple answered that it was "the royal oak which preserved your Majesty's life". Diplomacy or fiction, the story is not repudiated by Sydney P. Noe (1947). He, for various technical reasons, believes the Oak Tree twopence to have been issued quite early in the series.

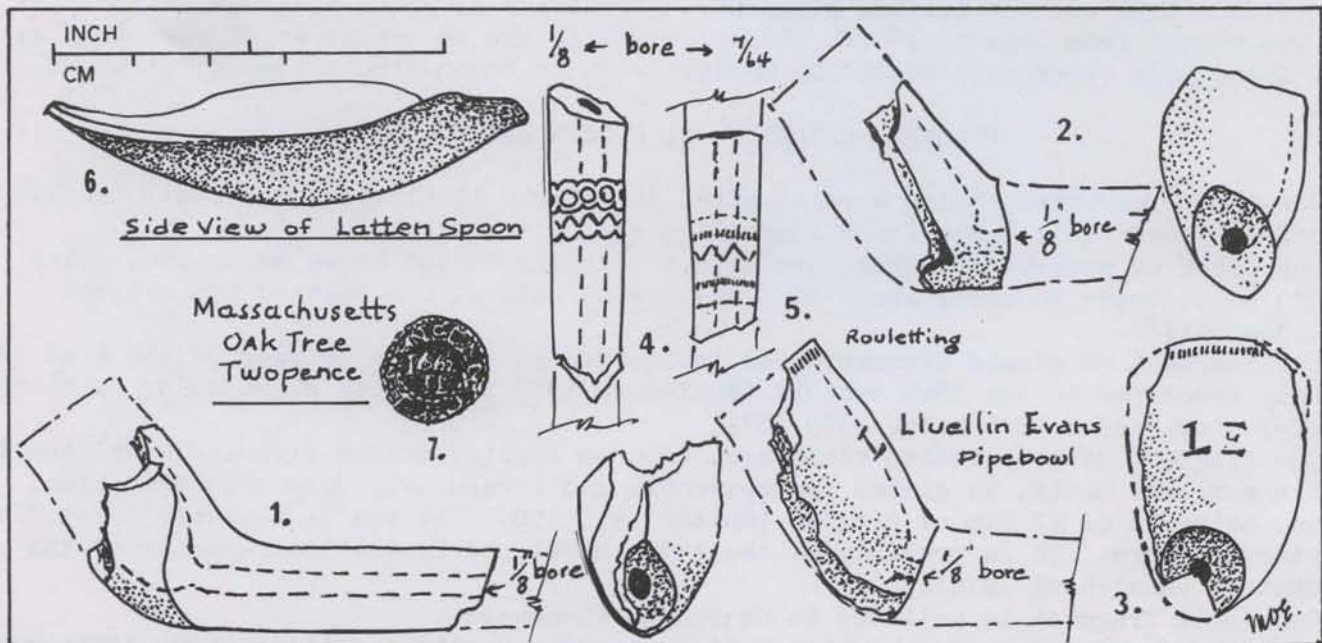


Figure 24. Colonial Artifacts. 1-5, pipe fragments; 6, latten spoon; 7, twopence coin.

Another intriguing find was the bowl of a latten spoon (Fig. 24;6) and part of its handle-- alas, without the diagnostic finial. Ivor Noel-Hume (1976:181) records that a similar specimen was found in an Indian grave in East Dennis, Mass. He dates these from the fifteenth to the mid-seventeenth century, all having fig-shaped bowls and stems rectangular in section, as does our find. A latten spoon from Structure 19 at Jamestown is dated 1600-1650 (Cotter 1958:189). It seems shaped as ours was before the loss of its handle, and the reshaping caused by lots of use. However, no measurements were available in the references for purposes of comparison. More research should be done on our specimen, with the hope that bowl shape and the metal will reveal its age and origin. It was found in W7N1.

FLINTS

Four gunflints were found: one was believed to be a Dutch musket flint found 6 inches (15 cm) deep in stratum 1B; a second, found at 9 inches (23 cm) from the same stratum in W11N2 is English in origin, as is a third (Noel-Hume 1976:221). It may be pertinent that only one flint aboriginal artifact was recovered --a small triangular point (Fig. 17;6); only about $\frac{1}{2}$ cup of flint flakes were found.

COLONIAL PIPES

A meagre thirty-six pieces of kaolin pipestems were found, and, apparently due to the dense shell in the midden, a very few pieces of bowl. Although we are aware that this is a grossly insufficient quantity for sampling, we offer the following preliminary data.

Dating according to Lewis Binford's straight-line regression formula, a mean date of 1652 was obtained. Dating by measurement of bore, percentages of each, and comparison with Harrington's chart (Noel-Hume 1976:298) produced a mean date of around 1650. Ivor Noel-Hume cautions us that "the range of acceptable accuracy seems restricted to the period of 1680 to 1760" (of such methods, when used with a sufficient sample). The latten spoon (15-17 C) and the 1662 twopence have more to suggest about the first Colonial use of the land. The written history is more informative and places us around the last quarter of the 17th century.

Two of the few pieces of pipe bowls (Fig. 24;1, 2) show no heels or spurs. They seem to be angled from the bowl at 130 degrees. Both are of a smooth hard paste; one bore is $7/64$ ", the other, $8/64$ ". Another, diagnosed with difficulty, may be of the same shape. Its rim is rouletted. However, it is impressed with its maker's mark LE (Fig. 24;3). This was the Bristol pipemaker, apprentice of James Fox, named Lluellin Evans who worked from 1661 to 1688. When viewed with the decorated stems seen in Fig. 24; 4 & 5, these pipe finds were judged by Marley Brown to be in "the style of Bristol".

COLONIAL CERAMICS AND MODERN ARTIFACTS

The first four finds below were compared at Plimoth Plantation with their labelled collection. They were tentatively identified as:

One piece of gray-bodied stoneware with a slightly russet brown saltglaze, which seems to be an upper shoulder sherd of a Bellarmine bottle, has none of the typical raised decoration.

One fragment of glazed creamware, an inside spall, seems to be made of the kind of clay body developed in the 18th century (Noel-Hume 1976:123). Its glaze color is closest to Buff-Yellow, color 53 (Smithe 1975:137).

One fragment of gray-bodied stoneware, with an applied molded circular medallion in which is a floral motif, is glazed transparently and irregularly decorated with blue, Cyanine, color 74 or IX 57m of Ridgway (Smithe 1975:190). It was tentatively identified as Westerwarl ware. It is possibly of the style developed in the last quarter of the 17th century (Noel-Hume 1976:280).

One small fragment is believed to be Raeren stoneware.

Five sherds of pale gray to white-bodied stoneware, with a mottled brown saltglaze, seem to have been covered with white slip in the bisque firing.

One piece of blue-green, old glass with pontil mark.

One sherd of thick white-bodied stoneware glazed inside and out with a mottled black glaze could be modern.

Two handmade nails were found, along with about forty unidentifiable rusty nails, other rusty iron fragments.

Sherds of brick and redware, one gold shirt stud (Krementz), and many insulator sherds complete the inventory of debris in this section.

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HISTORY

Accepting the premise that storms and sailing ships made for unpredictable events, one can imagine the probability of many European contacts affecting Chatham Indians, long before a broken rudder forced Samuel de Champlain de Saintonge onto shore. Proof of the intense early interest in the new world's riches may be seen in an English "act against the exaction of money for license to traffique into Iceland and Newfoundland". That legislation stated that "trade out of England to Newfoundland was common and frequented about the beginning of -- 1548" (Hakluyt 1904:7-9). By 1578 nearly 400 vessels from Spain, France, Portugal and England were regularly engaged in fishing and whaling in an area about 600 miles centered on Newfoundland. Anthonie Parkhurst explained to Richard Hakluyt then that "you shal understand that some fish not neere the other by 200 leagues --" (Hakluyt 1904:9-11). Stephen Bellinger of Rouen, who is thought to have seen the Cape in 1583, described having "traffique with the people in tenne or twelve places" (Hakluyt 1881:52).

In May of 1602 Bartholomew Gosnold made friends by giving "some trifles" to Indians at Buzzards Bay. The next day on Naushon Island Gosnold and company began an enriching visit from the red men, described in tantalizing detail by John Brereton. Not until a month had passed did their ship, laden with sassafras, cedar, furs and skins, depart (Winship 1905:42-49).

The next summer the "Discoverer" and the "Speedwell", financed by the mayor of Bristol and others, nosed into Plymouth Harbor in a sassafras search. On instructions from England this trade mission established relations with the native peoples through exchanges for "divers sorts of our meanest merchandize", then settled down for seven weeks. By the end of July the "Discoverer" was returned to Bristol with enough sassafras to satisfy the "adventurers". "Speedwell" lingered until their welcome ran out, then left laden with, among other things, a 17' Indian boat and a "peare-plum" tree (Winship 1905:55-63).

To state that news - or even some "trifle" - did not filter down to Chatham would imply a parochialism in native life that is denied by other accounts. The eager assistance given Champlain was due to Indian foreknowledge of the "riches" to be found aboard the sailing vessels. Probably the October 1606 visit to Chatham by the literate Frenchman was unusual only because of the survival of his excellent report, which left us the oft-printed drawing/map and explanatory description. It also left an appreciative analysis of the region's resources.

This first recorded meeting at Chatham brought more of the tempting trade goods to the Monomoyick - desirable essentials that, later on in the early days of Plimoth, seemed worth the sharing/giving of occasional campsites. Uncomprehended, unequal bargains were easily struck, but misunderstanding was as easily met. The satisfaction of the acquisitive instincts of both sides here would not begin a mutually rewarding history. Lescarbot learned from Champlain's sailors that revenge was taken near Falmouth for the Chatham unpleasantness, by the killing and butchering of six or seven red men and taking their heads back to Port Royal (Smith 1971:22).

We are indebted to the scholarly, detailed "History of Chatham, Mass." by William C. Smith (1971) for the material used in the following six paragraphs.

By 1620 the Cape natives had experienced death, disease and kidnapping from the first Cape Cod tourists. Ample exposure to new ways must have been endured during the thirty-six years that intervened between the landing of the Mayflower and the first purchase of land in Chatham from Mattaquason. Many whites were drawn down the long arm of the Cape to fish and trade - indeed, to settle Eastham in 1643, and to start shipbuilding at Namskaket Creek. So the "First Purchase" by the weaver, William Nickerson of Norwich, England, late of Yarmouth, was but the next step in occupation. That land purchase, begun in 1655, in exchange for "a shallop, ten coats of trucking cloth, six kettles, twelve axes, forty shillings in wampum, a hat, and twelve shillings in money" started a long dispute with the officials at Plimoth. It was not concluded until 1672 when Nickerson was sixty-eight years old, although the record shows that he was making improvements by 1664.

Partitioning of the land to his children followed; land was also sold to others including a cooper from Nantucket named John Savage. On Sept. 18, 1677 Savage was deeded "sixty acres of upland and six acres of marsh". Twenty of the sixty acres were "bounded partely by the herring brooke (Fig. 1;A) and partely by the marsh on the north (Fig. 1;B), and by a little brooke which issues out of the swamp on the south (Fig. 1;C) and devides between it and the land of William Nickerson, Jr. and by the highway on the east" (?). This phrase is now unclear, but the bounds shown as A, B, and C seem to enclose Site M48N6. We are tempted to guess that Savage, with fresh memories of King Philip's War, may have built his house closer to neighbors on the remaining forty acres purchased from Nickerson, on other land "bounded easterly by the highway". This suggests the possibility that construction might not have taken place on our site during his ownership, which terminated when Savage removed to Truro in 1690 selling out to Samuel Smith of Eastham. Smith placed in charge of the farm one William Cahoon, who married William Nickerson's granddaughter, Elizabeth (The Nickerson Family Assn. 1973:30). They may have lived there until 1702, when he was drowned in a fishing disaster. Elizabeth is believed to have emigrated to Duck Creek, Delaware, in the first outward migration in 1711 with her brother Jeremiah.

So we see that for the first 25 years after the First Purchase the land was used, although we cannot say that any dwelling was on our site.

Meanwhile, the few white newcomers gradually imposed limitations on use of the ancient hunting/gathering lands, making the old ways impossible for the original inhabitants, whose western bounds were then Frostfish Creek. Caught in the web of Colonie law, land ownership practices and Puritan concepts of God's Will, many pragmatic natives adapted, their adaptations taking forms pleasing to their neighbors (for example, military service). Others, unable or unwilling to change, slipped away to the west, or were punished or enslaved.

Relinquishment of their lands for whatever combination of reasons meant drastic change in the neighborhood northeast of Great Hill. That so few whites could have so changed the landscape seems unbelievable until, using Altpeter's estimates (1939), we discover that: An early household needing 40 cords of wood (taken from forest yielding 30 cords an acre) used 1.3 acres of woodland annually. The first settlers - about ten families - after the initial clearing, may thus have needed 130 acres annually for household use alone. Mixed grazing of forests and land thus stripped of wood defeated regrowth. At 20 acres per family, the 1691 Chatham headcount of 150 (divided by 5 = 30 families) could have meant at least 600 acres under cultivation (about 25% of the First Purchase). To these basic demands must be added wood for fence posts, White Pine for the British Navy, clapboards for England, oak for ship timbers and fuel for making tar, salt, whale oil, iron and, in mid 18th century, potash. Within fifty years the resulting landscape was fit only for sheep. It is of interest that by 1660 there were at least 7000 sheep in Barnstable County (Altpeter 1939:22).

The outcome of all this pressure on the land had meant the gradual removal of gathering privileges expressed in some original deeds. Ultimately, it meant that the practice of common lands could not be continued. Life was rough enough to force outward migrations of many families. The first of these in 1711 left only 33 households in Chatham.

Nature changed the Cape, too. The harbor entrance opposite Strong Island (Smith 1971:10), through which Governor Bradford sailed with Squanto aboard in search of corn and beans in 1622, continued its southerly movement. Joshua Nickerson, Jr. remembers his grandfather (born 1833) telling of having seen masts of large sailing vessels anchored in the lee of Strong Island. This must have entailed a short northerly run up into Pleasant Bay, however, for by 1887 the eternal southerly movement of beach deposits had moved the harbor entrance about three miles south (Oldale & Koteff 1970). In 1770 a furious gale and tidal wave sealed off the convenient Boatmeadow Creek-Nauset Inlet access to Massachusetts Bay necessitating a dangerous backshore sail. The year 1780 brought an extraordinary drought putting further strain on the war-depleted resources of all the people. Additionally, smallpox periodically took its toll on Indian and white alike.

Nevertheless, various industries were added to the life of Chatham. In our neighborhood a fulling mill was built just after the Revolutionary War (Lester Allen, verbal communication). Its millrace, whose stone remnants can still be seen on the northeast corner of Crowell and Meadowbrook Roads (Fig. 1;E), caused a back-up of eight feet according to one estimate. Such a rise would have, at least, raised the water table at our site, if, indeed, the water didn't tap its edge. The marginal brackish zone between tidal waters of Frost Fish Creek and fresh waters from Lovers Lake would have been erased, and, with it, a particular habitat which has never reappeared. Later, with the huge cedars gone for firewood, most of the swampy lowland east of Great Hill was drained for cranberry bogs.

Inevitably the Indian world had been changed irrevocably. Hosey Stephens, great great granddaughter of Mattaquason, the last of his blood descendents to live on the tribal lands, died in 1800 (Nickerson 1958:65-66).

The land of the weaver from Yarmouth and the cooper from Nantucket continued through many hands until 1914 when RCA Global Communications, Inc. constructed its communications center there. Its antenna system is located in the acreage surrounding and to the west of Site M48N6. Several homes were built atop the rise just behind the site, close enough to suggest use of the site for various purposes, even without the evidence in Feature V, a cistern.

Any spadeful of earth turned throughout its history would have revealed the midden, so it is not surprising that it suffered an active history of collecting. To the Indians there must have been a wry humor in the fact that the densely packed shell took a brutal revenge on early plowshares.

Cape Cod Chapter
December, 1977

TABLE 1 In order of abundance		PRELIMINARY BONE ANALYSIS	
		Number	Percentage
White-tailed deer	<i>Odocoileus virginianus</i>	92	56.4
Bird	Aves	33	20.2
Sturgeon	<i>Acipenser oxyrinchus</i>	10	6.1
Harbor seal	<i>Phoca vitulina</i>	7	4.3
Horse	<i>Equus caballus</i>	5	3.0
Dog	<i>Canis familiaris</i>	4	2.4
Pig	-	3	1.8
Goosefish	<i>Lophius americanus</i>	1	0.6
Tautog	<i>Tautoga onitis</i>	1	0.6
Blackfish (Pilot whale)	<i>Globicephala meleara</i>	1	0.6
Fish	-	1	0.6
Muskrat	<i>Ondatra zibethicus</i>	1	0.6
Raccoon	<i>Procyon lotor</i>	1	0.6
Gray fox	<i>Urocyon cinereoargenteus</i>	1	0.6
Rabbit	Leporidae	1	0.6
Skunk	<i>Mephitis mephitis</i>	1	0.6
Total of Identified Submissions		163	99.6

Note: An additional 68 submissions are still under study. A total of 40 submissions were scrap; to this must be added scrap that was not included in submissions. Found and not submitted: a beaver tooth.

The material above was prepared from a preliminary listing of faunal remains, which was compiled after his investigations by Dr. Andrew Konnerth.

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TABLE 2	Barbara M. Waters	SHELLFISH
Common Name	Scientific Name	
Bivalves (in order of abundance on site)		
*Common Quahog	<i>Mercenaria mercenaria</i>	
Softshell Clam	<i>Mya arenaria</i>	
*Eastern Oyster	<i>Crassostrea virginica</i>	
Bay Scallop	<i>Aequipecten irradians</i>	
Blue Mussel	<i>Mytilus edulis</i>	
Horse Mussel	<i>Modiolus modiolus</i>	
Ribbed Mussel	<i>Modiolus demissus</i>	
Univalves (in order of abundance on site)		
*Knobbed Whelk	<i>Busycon caricum</i>	
*Channelled Whelk	<i>Busycon canaliculatum</i>	
Common Mud Snail	<i>Nassarius obsoletus</i>	
*Basket Mud Snail	<i>Nassarius trivittatus</i>	
Oyster Drill	<i>Urosalpinx cinerea</i>	
Northern Moon Snail	<i>Lunatia heros</i>	
*Shark's Eye	<i>Polinices duplicatus</i>	
(Southern) Moon Snail		
Boat Shell	<i>Crepidula fornicata</i>	

Note: Also found many land snails shells and a few fresh water mussels both of recent origin.

* The more abundant quantities of these indicate warm climate.

All scientific names taken from the KEYS TO MARINE INVERTEBRATES OF THE WOODS HOLE REGION, Ralph I. Smith, Editor. Contribution 11 Systematics. Ecology Program, Marine Biological Laboratory, Woods Hole, Mass. 1964.

TABLE 3	PLANTS OF POTENTIAL IMPORTANCE TO HUMANS IN CHATHAM			
Family	Scientific Name	Common Name	F	B M T
Aceraceae	<i>Acer rubrum</i>	Red Maple	x	x
	<i>Acer saccharum</i>	Sugar Maple	x	x
Adoxaceae	<i>Sambucus canadensis</i>	Common Elderberry	x x x x	
Alismataceae	<i>Sagittaria latifolia</i>	Arrowhead	x	x
Amaranthaceae	<i>Amaranthus</i> spp.		x	
Anacardiaceae	<i>Rhus typhina</i>	Staghorn Sumac		x x x
	<i>Rhus glabra</i>	Smooth Sumac	x	x
Apocynaceae	<i>Apocynum cannabinum</i>	Dogbane		x
Araceae	<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	x	
	<i>Peltandra virginica</i>	Arrow-arum	x	
	<i>Symplocarpus foetidus</i>	Skunk Cabbage	x	x
Araliaceae	<i>Aralia nudicaulis</i>	Wild Sarsaparilla	x	x
Asclepiadaceae	* <i>Asclepia syriaca</i>	Milkweed	x	
Chenopodiaceae	<i>Atriplex patula</i>	Orach	x	
	<i>Salicornia virginica</i>	Samphire	x	x
	<i>Suaeda</i> spp.	Sea Blite	x	
Compositae	<i>Eupatorium perfoliatum</i>	Thoroughwort		x
	* <i>Solidago juncea</i>	Goldenrod		x x x
Corylaceae	<i>Corylus</i> spp.	Hazelnut	x	x x
Cruciferae	<i>Cakile edentula</i>	Sea Rocket	x	
Cyperaceae	<i>Scirpus</i> spp.	Bulrush		x
Ericaceae	<i>Arctostaphylos Uva-ursi</i>	Bearberry		x
	<i>Gaultheria procumbens</i>	Checkerberry	x x	
	<i>Gaylussacia baccata</i>	Black Huckleberry	x	
	<i>Vaccinium macrocarpon</i>	Bog Cranberry	x	x
	<i>Vaccinium</i> spp.	Blueberry	x	

TABLE 3 (continued)

PLANTS OF POTENTIAL IMPORTANCE TO HUMANS IN CHATHAM

Family	Scientific Name	Common Name	F	B	M	T
Fagaceae	<i>Castanea dentata</i>	American Chestnut	x			x
	* <i>Quercus alba</i>	White Oak	x	x	x	
	* <i>Quercus coccinea</i>	Scarlet Oak	x	x	x	
Gramineae	<i>Phragmites communis</i>	Common Reed	x			x
Hamamelidaceae	<i>Hamamelis virginiana</i>	Witch-hazel		x	x	x
Juglandaceae	<i>Carya</i> spp.	Hickory				x
	<i>J. nigra</i>	Black Walnut	x			x
Juncaceae	<i>Juncus</i> spp.	Rush				x
Labiatae	<i>Hedeoma pulegioides</i>	American pennyroyal				x
	<i>Lycopus amplexans</i>	Bugleweed		x	x	
Lauraceae	<i>Sassafras albidum</i>	Sassafras		x	x	
Leguminosae	<i>Apios americana</i>	Groundnut	x			
	<i>Lathyrus japonicus</i>	Beach Pea	x			
Liliaceae	<i>Allium canadense</i>	Wild Garlic	x			
	<i>Smilax glauca</i>	Catbrier	x			
Myricaceae	* <i>Myrica pensylvanica</i>	Bayberry				x
Nymphaeaceae	<i>Nymphaea odorata</i>	Water-Lily	x		x	
Phytoloccaceae	* <i>Phytolacca americana</i>	Pokeweed	x			
Pinaceae	* <i>Juniperus communis</i>	Common Juniper				x
	* <i>Pinus rigida</i>	Pitch Pine	x	x	x	
	<i>Thuja occidentalis</i>	White Cedar				x
	<i>Polygonum</i> spp.	Knotweed	x			
Polygonaceae	<i>Polygonum</i> spp.	Knotweed	x			
Polypodiaceae	<i>Pteridium aquilinum</i>	Braken Fern	x			
Pontederiaceae	<i>Pontederia cordata</i>	Pickerelweed	x			
Pyrolaceae	<i>Chimaphila maculata</i>	Pipsissiwa		x	x	
Rosaceae	<i>Amelanchier canadensis</i>	Shad Bush	x			
	<i>Crataegus coccinea</i>	Hawthorn	x			
	* <i>Potentilla canadensis</i>	Cinquefoil		x		
	* <i>Prunus serotina</i>	Wild Cherry	x			x
	* <i>Prunus maritima</i>	Beach Plum	x			
	* <i>Rosa carolina</i>	Swamp Rose	x			
	<i>Rosa virginiana</i>	Wild Rose	x			
Saxifragaceae	<i>Rubus</i> spp.	Bramble	x			
	<i>Ribes</i> spp.	Currant and Gooseberry	x		x	
Typhaceae	<i>Typha latifolia</i>	Broad-leaved Cattail	x		x	
Urticaceae	<i>Urtica</i> spp.	Nettle	x		x	
Vitaceae	<i>Vitis labrusca</i>	Fox-grape	x			

Key: F signifies Food, B, Beverage, M, Medicinal, T, Technological

Reference was made to Fernald & Kinsey (Rev. 1958), Hinds (1968), Hussey (1970) and Dr. Henry O. Svenson (verbal communication). Classification using *Gray's Manual of Botany* (1970) was by William Brady of the Cape Cod Museum of Natural History.

(*) Seen within seventy-five feet of site, summer 1976.

TABLE 4

BONE ARTIFACTS

AWLS	
polished splinter	2
polished flat	3
polished blunt tip sections	3
from deer ulna	1
polished or ground sections	9

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TABLE 4 (continued)

BONE ARTIFACTS

PROJECTILE POINTS	2
TOOLS (other)	
antler tips, socketed	1
antler tips, possible flakers	2
antler tips	3
worked sections, bone and antler	8
cylindrical antler section, worked butt end	1
bone, graver or scriber	1
bone, scoop-like	3
shaft straightener, antler section, grooved	1
antler, branched	1
TOOTH (blackfish)	1
SUNFISH SPINES	3
ORNAMENT (pendant)	1
UNKNOWN (two-pronged bone)	1
Total	<u>47</u>

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The input which we received from Cape Cod Museum of Natural History naturalist, William Brady, from marine life educator, Barbara Waters, and from Dr. Andrew Konnerth of Woods Hole Oceanographic Institution was essential to our modest environmental study.

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Special thanks are due Guy Mellgren for sharing his long experience, and for the wisdom of his prodding recommendation that a committee take on the study and preparation of the report. Our search for understanding of the raw materials of stone, bone and clay, and for methods of study has been most instructive.

Finally, we invite the attention and comment of professional archaeologists and welcome feedback of any nature.

Cape Cod Chapter, December 1977

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LETTERS TO THE EDITOR

The following comments were received after the publication of Vol. 38 no 3. The Editor and Editorial Board are pleased with these indications of reader interest and concern for the Bulletin, and we sincerely encourage correspondence from others.

From Howard S. Russell, of Wayland, Mass.:

"...You speak of liking to hear from readers. So may I offer ... suggestions. Would it not add interest to an article if an editorial note at the end of each article in two or three lines told the reader a bit concerning the authors? What chapter do they belong to, or where do they live? Are they amateur enthusiasts, college students in search of a degree, or professionals? (To a non-professional like myself this would add a valuable accent.) And who supplied the illustrations?"

(Ed. Other members have made the same excellent suggestion. See "The Authors" feature following the report in this issue.)

From William G. Stead of St. Davids, Pennsylvania:

"Significant figures in measurement should remain consistent for weights and dimension indicated in equivalent metric and English units.

Consider the examples for M.A.S. Bulletin vol 38(3):

Page 38 - 'approximately 5 pounds (2.267 Kg)'

Page 38 - 'about 1 pound (.454 Kg)'

Page 41 - 'about 10 pounds (4.54 Kg)'

Page 48 - 'roughly 27 Kg (59.54 lbs)'

In the first example, the English unit is measured to one significant figure while the equivalent conversion to metric units is to four significant figures. The misrepresentation of one gram accuracy for the metric weight is obvious, and in a translation without the initial English measurement, misleading.

The qualifying adjectives 'approximately, about and roughly' portray a field estimate as to weight. An estimate should not be transformed to four digit significance by a conversion table. I think the following conversions are more equivalent: approximately 5 pounds (2Kg), about 1 pound ($\frac{1}{2}$ Kg), about 10 pounds (5Kg), roughly 27 Kg (60 lbs)."

(Ed. Mr. Stead, who works for a firm of consulting engineers, is absolutely right. The Editor was carried away with the pleasure of playing conversions on her pocket calculator. In the future, conversions will be done with greater sensitivity to degrees of accuracy.)

NOTES TO CONTRIBUTORS

AUTHORS of articles submitted to the M.A.S. Bulletin are requested to conform to the following regulations.

Manuscripts must be typed as originals with two carbons (or photocopies). Margins must be 1½ inches (38mm) on both sides. Corrasable paper should NOT be used. Originals and copies are to be sent to the Editor for evaluation and comment.

Typing is to be on one side of paper only with at least double spacing. Proper heading and bibliographic material must be included.

Manuscript headings should be prepared as follows:

THE PONKAPOAG SITE: M-35-7

Robert A. Martin

Bibliographic references are to be presented as follows:

GOOKIN, D.

1970 Historical Collections of the Indians of New England (1674)
Jeffrey H. Fiske, annotator. Towtaid. Worcester.

They should be listed alphabetically by author; several references by the same author should be listed chronologically by year.

Intratextual reference citations are to include the author's name, date of publication, and the page, plate, or figure number, all enclosed in parentheses. as follows:

(Bowman & Zeoli 1973:27) or (Ritchie 1965: Fig 12)

Illustrations must be submitted to the Editor as originals and must conform to the following set of standards:

1. All illustrations must be planned with the page size in mind, either full page, half page or quarter page. Allowance must be made for caption. Special cases must be discussed with the Editor before illustrations are made.

Drawings should be made for same size reproduction, and must be sent as originals executed in India ink. NO WASH DRAWINGS OR PENCIL RENDERINGS ARE ACCEPTABLE.

Photographs must be glossy prints with HIGH CONTRAST. Standard 5"x 7" or 7"x 9" work out very well. Special problems, as with the drawings, must be referred to the Editor before preparation.

2. All illustrations are called Figures (including maps). They are to be numbered on the back in order of reference from the text. Every item in drawings or photographs must be properly identified either by number or letter. All lettering must be clear print and legible. All persons in photogrpahs must be identified. Captions should not be considered part of the illustration.

Captions for figures should be typed on a separate sheet in order, numbered to correspond to the figures. Scales should be included with all figures for which they are appropriate, and they must be LINEAR (no "full size" notations).

Dimensions and distances should be given in English and metric units, or metric alone. The two systems should not be mixed within a text. If feet and inches are used, they are to be spelled out (no ' for feet nor " for inches).

THE EDITOR is receptive to archaeologically serious contributions of any reasonable length. Long pieces can usually be condensed effectively if they exceed the limits of our publication. The Editor welcomes short pieces and encourages contributors to write them.

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