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The Bronson Museum is located on the fifth floor of the 8 North Main Street Building. Museum hours are from 9:00 a.m. to 3:30 p.m. daily, Monday through Friday. Although this schedule is usually adhered to, it is wise to call the Museum before coming. The Museum is also open by appointment at other times. Call the Museum Director, Maurice Robbins.

The Museum has extensive exhibits of stone implements, obtained for the most part from the Massachusetts area. They are arranged in culture periods identified in the Northeast, and cover a time extension of some 10,000 years.

EDITOR'S NOTE

Barbara E. Luedtke

Both contributions to this issue of the *Bulletin* are tributes to members of the MAS who have died in recent years, but whose work will continue to be important to future generations of Massachusetts archaeologists. One of the pleasures, as well as the perils, of archaeology is that much of what we do is *permanent*, for good or for ill. The perilous fact is that in order to excavate a site we must destroy part of it forever. Recent recognition that the number of archaeological sites of all types is limited and rapidly decreasing has led to increased emphasis on thorough recovery and documentation during excavation, and also to increased efforts to protect our remaining sites.

On the other hand, one of the pleasures of archaeology is the knowledge that if the work is done well, one's contribution will continue to be useful for far longer than is common in many other sciences. Every piece of information, no matter how small, adds to our growing knowledge of the past and results in a bit of immortality for the people who provide that information. The *Bulletin of the Massachusetts Archaeological Society* is honored to have been the means of assuring the permanence of many of Benjamin Smith's and Donald Hayward's contributions to archaeology.

Both of the articles also emphasize the fact that excavation is only the first small step in archaeology. Excavation is basically destructive; the constructive aspect comes from careful documentation of the field work, description and analysis of the artifacts found, and especially from publication of the results. Ben Smith clearly recognized his responsibilities in this regard, and his many publications reflect his concern with both description and interpretation of his findings.

Smith's collections are also important and irreplaceable contributions in their own right for several reasons. First, as Loring points out, they provide our only information about many sites that have long been destroyed by development. Perhaps more important, though, Smith's collections are carefully documented with maps, field notes, etc., and this adds greatly to their value. Finally, Smith wisely made sure that his collections would be available to future archaeologists by depositing them with public institutions. The studies of these artifacts that will undoubtedly be done in coming years will all be tributes to Smith's foresight.

Marie Eteson also clearly recognizes that archaeology isn't finished when the dig ends. Because Hayward's ill health and subsequent death made it impossible for him to write up the site he had excavated, Mrs. Eteson stepped in to prepare the materials for publication, as Don surely would have wished. This publication allows the archaeological public to know what was found at this interesting site, and also begins the process of analysis and comparison that leads to understanding of the people who made these tools. Again, Eteson's work is a model of archaeological responsibility, and also an encouraging demonstration of how much can be done with relatively undocumented material.

In summary, Massachusetts archaeologists, amateur and professional alike, are richer for Smith's and Hayward's contributions, though many will miss their company and wisdom.

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IN MEMORIAM - BENJAMIN LINCOLN SMITH (1900-1981)

Stephen Loring

> As sportsmen go in pursuit of ducks and musquask, and scholars of rare books, and travelers of adventures, and poets of ideas, and all men of money, I go in search of arrowheads when the season comes round again. So I help myself to live worthily, loving my life as I should.
>
> (Thoreau, 1883)

Spring in Concord; the snows that covered the farm fields above the Sudbury and Concord rivers disappear, leaving the rich dark soil exposed to the sky. Once this soil was strewn with arrowheads, and Benjamin Smith, like Henry Thoreau before him, could often be found walking over these plowed fields where the mystery of former inhabitants was lovingly sought.

With the passing of Benjamin Smith, who died in Concord on the 15th of April, 1981, Concord lost an accomplished and valued citizen; the archaeological community an active, life-long supporter; and his family and acquaintances a gracious and loyal friend.

Ben Smith was one of the twenty-nine charter members who met in Andover in April, 1939, to form the Massachusetts Archaeological Society. His enthusiasm and dedication to amateur participation in archaeology never wavered; he remained a steadfast supporter of the Society which he served as its first Vice President (1939-1941) and later as President (1949-1951). As one of the Society's most active and prolific members, he conducted archaeological excavations in Concord, at Follins Pond on Cape Cod, and in Maine. During the Society's formative years Ben Smith's seemingly ceaseless activity and concern helped chart the goals and structure of the Society and helped organize the research priorities (Smith 1939, 1940a, 1949a, 1949b). In addition to site reports he contributed numerous articles to the *Bulletin* that sought to explain archaeological classification schemes and adapt them to problems in Massachusetts.

Altogether a quiet and unassuming man, Ben Smith was always willing to share his impressive knowledge of New England Indians and archaeology with anyone who was interested. He was the recognized authority on the prehistory of the Concord River drainage, and there are few professional archaeologists working in the region who have not benefited directly from his observations and knowledge.

After participating on the R.S.Peabody Foundation's survey of the Concord and Merrimack River valleys with Warren King Moorehead in 1930, Smith contributed a section to the survey report (Moorehead 1931). His 1940 and 1941 work with Dr. Hallam Movius at the M.A.S. excavation of the Davis Farm site near Nine Acre Corner in Concord is also recognized as an important contribution (Movius 1941).

As chairman of the Projects Committee for the M.A.S., he reported on an investigation of a stone ring at Lenox, which proved to be a Colonial lime kiln (Smith 1940d, 1941b), and he helped direct the field work at Follins Pond at the supposed site of Lief Ericsson's Vinland winter settlement (Smith 1953). In both reports there is a logical and clear presentation of archaeological data that convincingly refutes the unsubstantiated claims for a greater antiquity for these sites. His rigorous methodology and the interpretations deduced from his data set enviable standards that should serve as a model for others investigating the more fantastic claims of pre-Columbian voyagers in the Americas.

In the course of his lifetime Ben accumulated an extensive collection of archaeological material from over 150 sites that he located between Framingham and Lowell. For much of his childhood and during the first few decades of this century, Concord was primarily an agricultural town providing fresh produce for the markets of Boston. The deep

plowing necessary for the trenches in which asparagus was planted, formerly the dominant crop, often revealed traces of Concord's prehistoric past. With the decline of agriculture in Concord, and with the accelerated increases in residential housing, commercial development and highway expansion, the areas in which one might look for evidence of the earlier Indian heritage in the Concord region have continuously shrunk, until there is today no chance to amass a collection comparable to the one Ben put together.

Principally, Ben's collection is derived from sites in the Concord and Sudbury watersheds. His meticulous care in conserving and cataloging his collection provides a significant potential contribution to understanding the prehistory of this region. The collection, which now totals approximately 5000 specimens, began with the auspicious discovery of an arrowhead which he found as a boy in 1909 at the Battleground in Concord, while walking on the path between the Old Manse and the North Bridge. In addition to his own collecting activities, Ben actively acquired other local archaeological collections which he documented as much as possible, ensuring that these collections were neither dispersed nor lost.

Faced with the irrevocable loss of archaeological sites, archaeologists must come to rely more and more on the use of existing collections to derive their understanding of prehistoric cultural processes. The development of analytical procedures and hypotheses applicable to such material remains one of the most pressing challenges currently facing the archaeological profession. Because of its careful documentation, Ben's collection has the potential to provide the data to make such studies possible. As such, it remains his principal legacy.

It was Ben's ardent desire that his collection remain in the community from which it was derived. In addition, he also recognized the critical importance of the associated manuscript materials including catalogues, notes, maps, correspondence, and unpublished research results. His concern for maintaining the collection's integrity was realized in the fall of 1979 when arrangements were made to donate both the archaeological and written materials to the Concord Antiquarian Society.

One cannot contemplate for long the intricacies of New England archaeology without becoming fascinated by the Mystery of the "Red Paint" cemeteries in Maine. Contemporary research has placed much of this material, now called the Moorehead Ceremonial Complex, in perspective. However, prior to the recent accelerated rate of archaeological research in the Northeast, these Maine cemeteries, with their richly-endowed graves covered with red ocher, existed in a cultural and temporal void.

Ben always retained a close personal attachment to the State of Maine, as it was the site of the Smith family's summer home during much of Ben's youth. Later, when Ben joined the lumber industry, his work afforded many opportunities to travel throughout Maine and Eastern Canada. In 1940 he acquired a large collection of Moorehead Ceremonial Complex artifacts from one of the workmen who had uncovered them during a road construction project in 1939 on Indian Island, north of Bangor.

His monograph on the Moorehead Complex is one of the principal references for students of this period (Smith 1948). Its methodical and careful analysis, a characteristic of Ben's work, refuted much of the rampant speculation that surrounded the Maine material and attempted to quantify and describe the heretofore disparate and incomplete accounts.

Ben recognized the "borrowed" nature of his "Red Paint" collection and arranged for it to be returned to the land of its origins through a generous donation to the Maine State Museum.

Perhaps one of the most interesting episodes of Ben's archaeological career concerns the recovery of the gunflints that were dropped when the Minutemen mustered prior to the battle at the Old North Bridge on April 19, 1775. In a field off Liberty Street above the Battleground, Ben, his brother Donald, and a companion, William Tolman of Wayland, recovered over 40 flints, which have been described as being aligned in a linear fashion

reflecting the Minutemen battle-lines prior to the engagement with the British troops. Apparently the order was given to the Minutemen militia to change the flints in their muskets as it was feared that they may have gotten wet during the preceding night's march. To one such as Ben, who was born and raised in Concord, such a tangible link with the events of that momentous day were treasures indeed!

Ben Smith's collection of Indian artifacts was not the first to be won from the soils of Concord. There had been over a century of intensive collecting and two great collections were formed before he ever made his first finds. It is probably safe to say that something of the same romantic quest for ancient things that guided the search of his 19th-century predecessors may have influenced Ben at first. However, as his collection and interests expanded, the distant shadowy image of the long-vanished Indian inhabitants of the Concord countryside, the noble savage of Thoreau's romantic contemplation, was replaced by a growing awareness of the environmental and historical context of his finds. Ben was one of a small cadre of diligent amateur archaeologists whose dedication and careful methodology approached the professional standards of their day. He recognized that the responsibilities of collecting included careful documentation and publication.

His achievements and dedication, his unfaltering graciousness and kindness should be a model of standards for professionals and amateurs alike.

Ben died at Emerson Hospital, which is situated above the Sudbury River on the Clamshell Bluff of Thoreau's day. The hospital was built on the site of a Late Archaic shell midden, much of which Ben excavated before it was destroyed. I like to think that he might have found peace thinking about his many days spent beside the river, swollen with the spring run-off, dark and deep, and hope that something of the wealth that he bestowed on others was his.

> I feel no desire to go to California or Pike's Peak,
> but I often think at night with inexpressible satisfaction
> and yearning of the arrowheadiferous sands of Concord.
> (Thoreau, 1927)

Figure 1. Photograph of Benjamin Lincoln Smith taken July 1979.

ACKNOWLEDGMENTS

Graciousness, reminiscent of Ben's, is found in his brother Farnham W. Smith of Carlisle, and in Alfred Mansfield of Wayland and Dale Farrell of Bolton, who shared their memories with me.

The photograph is courtesy of the *Concord Journal*.

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THE HAYWARD'S PORTANIMICUTT SITE (19-BN-324)

Marie O. Eteson

INTRODUCTION

Hayward's Portanimicutt is named after its excavator, Donald W. Hayward, and was referred to as such by his fellow M.A.S. Cape Cod Chapter members while he was digging it singlehandedly in 1977. Although this locus is listed with the Massachusetts Historical Commission as shown above, it is possible that it is included within the multiple listings made by Howard Torrey with the Massachusetts Archaeological Society under Number M42-5. That entry is listed as 19-BN-216 at the Massachusetts Historical Commission.

Between the Namequoit River and Little Pleasant Bay in South Orleans is land known in Colonial times as Namecoyick Neck. It was part of the larger Potonumecott, an area whose early history has been interpreted by Nickerson (1958:53-55,60), Paine (1937), Barnard (1975), and others. The Potonumecott Indians who lived on this Neck may have been among those who gave friendly help to survivors of the English vessel *Sparrowhawk*, when her planks loosened from thumping over a sandbar through Middle Harbor opposite Potonumecott in December, 1626 (Swift 1897:34).

Later, Indians of the Neck began selling their land to whites as early as 1648. Among the early transactions was the purchase of property by John Rogers, a grandson of Mayflower passenger Thomas Rogers. The Indian grantor of this deed, dated April 26, 1704, was John Sipson. This parcel, and others bought by other descendants of Thomas, remained in the Rogers family, becoming known as the Rogers Farm. In the spring of 1917, a parcel of that land, where Hayward's Portanimicutt is located, was sold by Charles E. Rogers to Stanley W. Smith. It was his son, the Reverend Stanley B. Smith, who urged Don Hayward to excavate the site, which had been known to the family for years.

The nature of the excavation was dictated by the constraint imposed by the terminal illness of Reverend Smith. Don's own failing health became a determinant factor, also. Not long after Don's death, Mrs. Marjorie Hayward agreed to let me study the artifacts with the aim of bringing them to the attention of the archaeological community. Don Hayward, a gentle, witty, retired musician, was a person who gladdened the hearts of all who dug with him at the Mattaquason Purchase Site.

PURPOSE

This report is intended to carry out the aim stated above; it will document the existence of the locus and its assemblage of 625 artifacts. Moreover, the artifacts served as the basis for two instructive mini-studies, and the results of these are included in this report.

SITE DESCRIPTION

At Hayward's Portanimicutt a rectangular excavation of about 15 by 30 meters was dug around the edges of, and in, a garden that lies on the slightly sloping northern edge of a high marsh. It lies parallel lengthwise to where, formerly, a creek drained from springs that are located in the lowlands about 209 meters west of the site. In 1950 Ralph Rogers and Sidney Watson (both long familiar with the area) recounted to Leo Gallagher, an abutter of the Smith land, that the lowland had once been a bog. Water level had been controlled by the use of pipes through the shallow, filled-in valley. Today the bog is just a lowland still moist from the springs that once fed the creek, and bearing highbush blueberry, shadbush and loosestrife.

North of the site rises a prominence (U.S.G.S. 1974) which is about 6 meters above sea level. This is part of the long "Rogers Farm" terrace. About 15 meters east of the site the salt marsh begins. There the marsh is cut by mosquito control ditches. Their drainage soon reaches the open creek which widens into Little Pleasant Bay. Through the mouth of the inlet can be seen Barley Neck, several islands, and the Outer Beach. Looking south across the shrub swamp, where the creek once flowed, one sees a range of 15-meter-tall hillocks, now in softwood forest. With the terrace at its back, the height of land on the south, and the width of the mid-Cape on the west, this site is protected from all but easterly winds. It lies, however, on the flood plain (N.E.R.B.C. 1977), (Magee and Long 1979).

At the time artifacts were being dropped at Hayward's Portanimicutt, lower sea levels meant a higher, drier location. A compromise between Redfield's (1967) 1 millimeter sea level rise per year, and new evidence of a recent rate of rise of 3 millimeters (Giese 1981, pers. comm.), suggests (at 2 mm± 1 mm) a possible sea level about 2 meters lower in 950 A.D. Two thousand years earlier than that date, it would have been about 5 meters below today's present sea level (Redfield 1967), (O'Donnell and Leatherman 1980:4-7).

The Indians of this site lived in an environment that provided many of the same subsistence benefits enjoyed by their Monomoyick neighbors (Eteson, Crary and Chase 1978: 4-7). In addition, many landforms close by would have been cut away by storm and tide as well as early meltwaters. In many of these steep places, clay lenses are visible. Workable stone is there for the taking. One boulder of porphyritic felsite was found on the shore about ½ kilometer from the site (Torrey 1970:50).

At the site located on the Harwich Outwash Plain (Oldale, Koteff and Hartshorn 1971), felsic volcanics (15%) and quartzite (12%) are exceeded in percentage only by granite (40%). Across Pleasant Bay, on the Nauset Heights Deposits, mafic volcanics (about 27%) --and thus, probably basalt (Oldale 1980, pers. comm.)--and quartzite (about 17%) are available in the till. Felsitic rocks total only about 10% there. On the west side of Pochet Island only about 3 kilometers from Hayward's Portanimicutt, a cliff rises 15 meters above sea level and the till tumbles from its bare, steep slope. Careful choice of tide and weather (Munsey 1980, pers. comm.) would certainly have permitted dugout trips to this lithic-rich area; however, it will be seen below that a concentration of felsite was probably available much nearer the site, and that it was used by the people who lived on or nearby the site.

Regarding Don Hayward's excavation methods, it is known that he sieved through a half-inch mesh screen. Nothing else is known about his procedures or standards for selection. The only reference to stratigraphy at Hayward's Portanimicutt locus was that which was frequently reiterated by Hayward when he periodically showed us his latest finds. He reported, "Everything is about 18 inches down--under the shell." To that capping shell we apparently owe the fine preservation of bone and antler artifacts and faunal remains.

TABLE 1.

BONE AND ANTLER TOOLS, AND FAUNAL REMAINS.

BONE	NUMBER OF ITEMS
PERFORATORS	
Needles	2
Awls	6
POINTS	4
ORNAMENTS - BEADS	3
SHAFTS, WORKED	
Two-pronged forks	4
Other	5
ANTLER	
Tines	11
Flaker and/or handle	1
Light billet flaker	1
Beam (partial) broken, in two sections	2
FAUNAL REMAINS	
MAMMALS, TERRESTRIAL	
Woodchuck (*Marmota monax*)	13
Cottontail (*Sylvilagus* sp.)	3
Beaver (*Castor canadensis*)	1
Striped skunk (*Mephitis mephitis*)	1
Unidentified small mammal	1
White-tailed deer (*Odocoileus virginianus*)	32
Sheep (*Ovis* sp.)	2
Cow (*Bos* sp.)	1
Unidentified large mammal	5
MAMMALS, MARINE	
Gray seal (*Halichoerus grypus*)	6
Atlantic pilot whale (*globicephala melaena*)	18
BIRD	
Domestic fowl (*Gallus gallus*)	1
REPTILE	
Painted turtle (*Chrysemys picta*)	1
FISH	
Sturgeon (*Acipsenser* sp.)	3
Stingray (*Dasyatis centroura*)	2
Bony fish	3
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REFERENCES: Bigelow and Schroeder 1953; Olsen 1964,1972; Schmid 1972.

Marilyn D. Crary has studied this bone collection, working partly with the labeled specimens of faunal remains from the Mattaquason Purchase Site (which had undergone preliminary identification by Dr. Andrew Konnerth). These artifacts (and also those made of stone) were classified using the guidelines of the in-house document of the Prehistoric Survey of the Massachusetts Historical Commission (Anthony, Towle and Carty 1980) and it is hoped that our gross data will be inserted into their records. From the study of this bone assemblage and from Crary's contribution may be deduced some of the additional aspects of the environment.

BONE AND ANTLER TOOLS, AND FAUNAL REMAINS

Descriptions and possible uses will be given for the 24 items of bone and antler that were recovered (Table 1). Possible seasonality of the faunal species identified from 108 remains will be offered. Any attempt to assign percentages to groupings would be futile, as the completeness of recovery is unknown.

PERFORATORS

Of the 8 perforators identified, No. 1 (Fig. 2) is a delicate example of a polished, single-pointed, curved flat needle, distal end beveled, proximal end "notched" and perforated within 1.9 cm of the distal end. This tool originally may have been double pointed, then broken at the perforation and redrilled as suggested by Willoughby (1935:

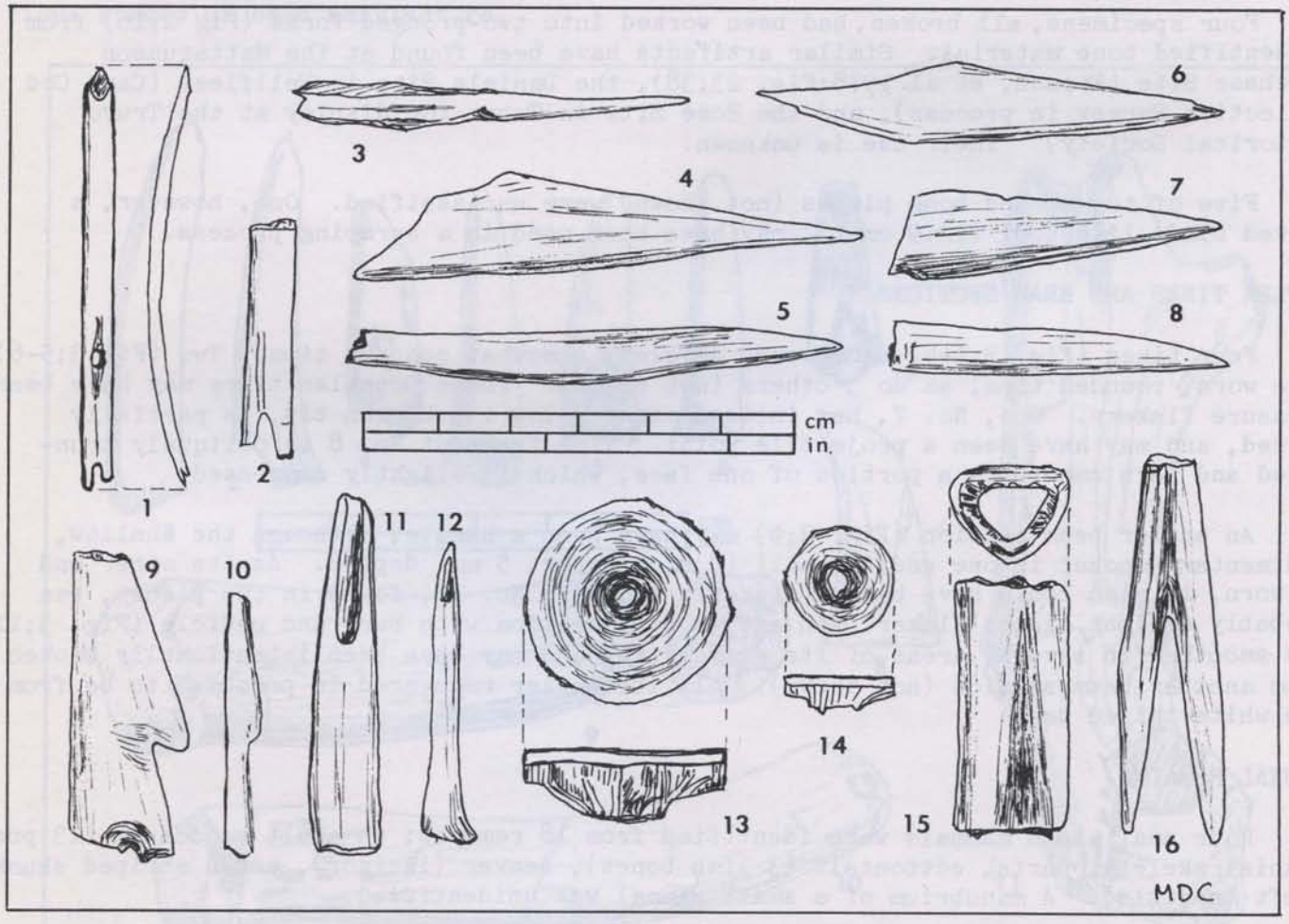


FIGURE 2. Worked Bone. Perforators: 1, 2 needles; 3-8 awls. Points: 9 harpoon; 10 small harpoon (?); 11, 12 bird bone projectiles. Ornaments: 13, 14 round beads made from bony fish vertebrae; 15 tubular bone bead. Unknown: 16 two-pronged fork.

Fig. 12h, h). A second needle (Fig. 2;2) is broken. Other perforators (Fig 2; 3-8) are bone splinter awls with polished tips. No. 3 has a sharp, needle-like tip, while No. 8 is a flat awl with a sword-like blade, lenticular in cross section. The perforators indicate activities at the site such as weaving and working with animal hides.

POINTS

Four points were found. One (Fig. 2;9), a harpoon, is unilaterally barbed, and is perforated at the proximal end which is broken, as is the distal end. Another small harpoon (Fig 2;10) has a rounded, very slight barb, and is almost round in cross section below that. Projectile points (Fig. 2;11-12) are of bird bone, hollow, with beveled tips that appear to have been worked. The harpoon could have been used for spearing fish such as sturgeon, other large bony fish, or gray seal.

ORNAMENTS

Three ornaments had been fashioned: a tubular bone bead (Fig. 2;15), and two round beads (Fig 2;13,14) made from the vertebrae of a large bony fish. These latter beads show peripheral grinding and central perforations, and similar beads were found on Martha's Vineyard (Ritchie 1969:Pl. 9, 32, 50-51).

BONE SHAFTS, WORKED

Four specimens, all broken, had been worked into two-pronged forks (Fig 2;16) from unidentified bone material. Similar artifacts have been found at the Mattaquason Purchase Site (Eteson, et al. 1978:Fig. 23;38), the Daniels Site in Wellfleet (Cape Cod Collection Survey in process), and the Rose Site in Truro (on display at the Truro Historical Society). Their use is unknown.

Five of the worked bone pieces (not shown) were unclassified. One, however, a curved blade-like tool (12.9 cm L), may have been used in a scraping process.

ANTLER TINES AND BEAM SECTIONS

Four tines (Fig. 3;1-4) have worn, beveled, somewhat concave tips. Two (Fig.3;5-6) have worn, rounded tips, as do 3 others (not shown). These 9 antler tines may have been pressure flakers. One, No. 7, has incised marks below its broken tip, is partially burned, and may have been a projectile point. Tine fragment No. 8 is obliquely truncated and worn smooth on a portion of one face, which is slightly depressed.

An antler beam section (Fig. 3;9) may have been a handle, although the shallow, rudimentary socket in one end is small (8 mm diameter, 5 mm depth). As its other end is worn, it also could have been a flaker. Another, No. 10, found in two pieces, was probably a light billet flaker. An antler beam section with burr and pedicle (Fig. 3;11) was smoothed in several areas of its extremities and may have been intentionally broken from another beam section (not shown). All the antler recovered is presumed to be from the white-tailed deer.

FAUNAL REMAINS

Four small land mammals were identified from 18 remains; an adult woodchuck (13 post-cranial skeletal parts), cottontail (3 limb bones), beaver (incisor), and a striped skunk (left mandible). A manubrium of a small mammal was unidentified.

The cottontail and skunk could be taken all year 'round, while the woodchuck would hibernate from October to March, and the beaver would be less likely to be taken in winter.

Three large land mammals were identified from 35 remains: white-tailed deer (4 post-cranial skeletal parts, 1 partial mandible, 4 molars, 1 incisor, 22 pieces of probable refuse, and most of the items listed under *BONE* and *ANTLER*; sheep (2 molars), and cow (1 very worn, deciduous molar). Five vertebrae of a large mammal remain unidentified. The antlered male white-tailed deer could be taken from late summer to February.

The gray seal was identified from six fluted teeth (3 canines, 2 premolars, 1 incisor). This marine mammal could be taken at any time of year, but most likely in the winter months. Fifteen unfluted teeth and 3 rib bone sections were identified as those of the Atlantic pilot whale. These marine mammals are distributed in coastal waters as well as in deep waters of the northeastern Atlantic, and frequently beach themselves (Leatherwood et al 1976:93). They could be taken at any time of the year.

The only bird represented was domestic fowl, identified from a single metacarpus.

A plastral fragment from a painted turtle was found. This basking reptile is known to inhabit brackish, tidal waters, and could have been taken most readily from May to July.

Two fishes were identified: sturgeon, a bony fish (3 bony shields) and the stingray, a non-bony fish related to the shark family (from a partial tailspine, and a double-thorned skinspine). In addition 3 vertebrae from an unidentified bony fish were present in various stages of bead manufacture.

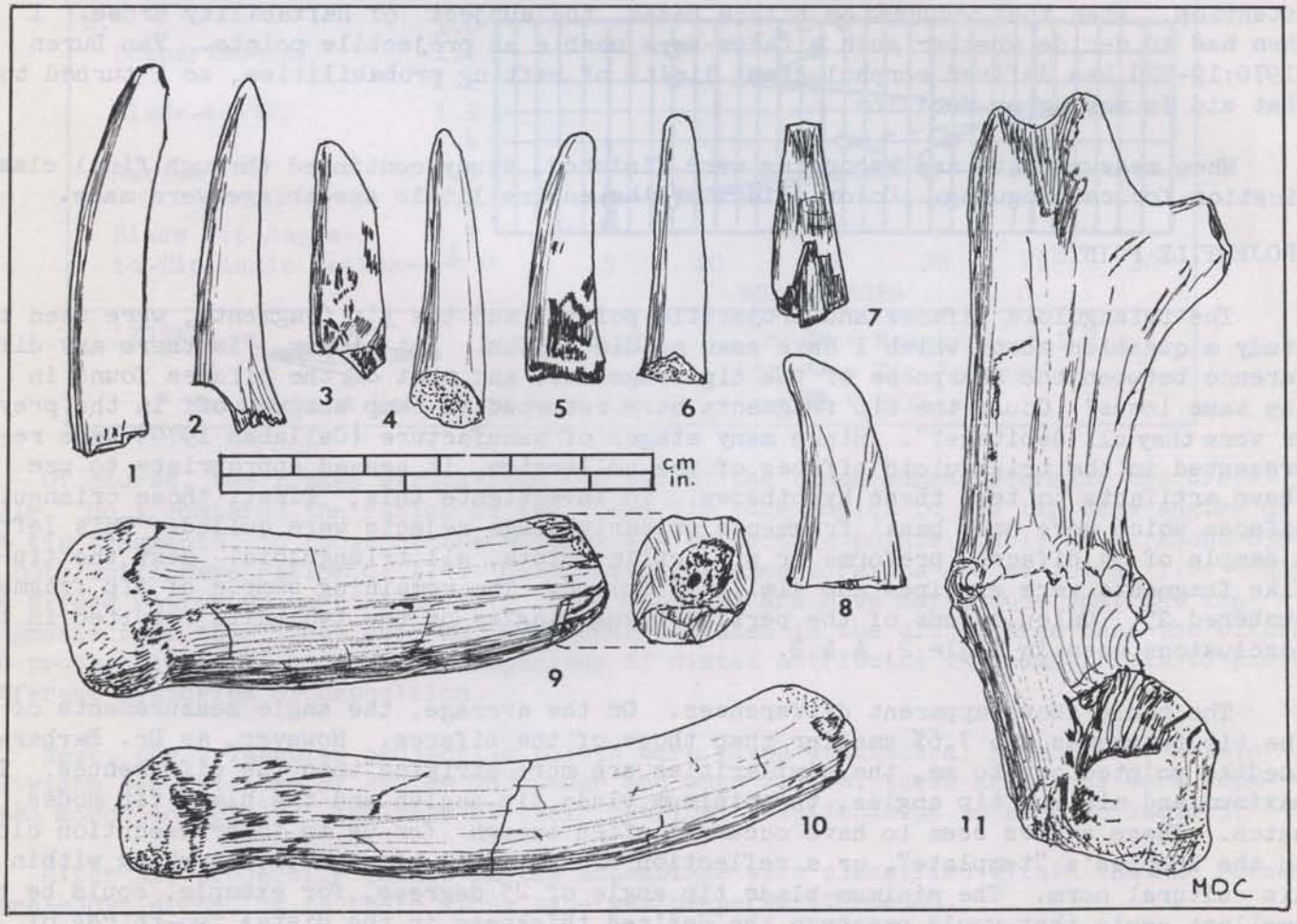


Figure 3. Antler tines and beam sections. Tines: 1-8. Beam sections: 9 handle and/or flaker; 10 light billet flaker; 11 with burr and pedicle.

STONE ARTIFACTS

PROCEDURES

The 283 stone artifacts were first separated into obvious gross classes morphologically. Numbering and labeling proceeded within that arrangement. When study brought about changes in interpretation, numbering remained unchanged. As stated in *Bone and Antler Tools, and Faunal Remains*, classification follows the format used by the Prehistoric Survey of the Massachusetts Historical Commission (Anthony et al 1980). Designed for the study of collections, this system has, as a prime characteristic, mutual exclusivity. When the specific MHC attributes are used as criteria, all artifacts must fall into one and only one category.

All bifaces were measured for length, width, thickness, edge angles and weight, and ratios of L:W and W:TH were calculated. The data for each artifact were recorded on 4 x 6 pads and the artifact outlined; on most, flaking patterns were drawn. The data were then transferred to a master chart.

Measurement technique for edge angles should be stated. The biface edge was placed in a goniometer so that its innermost edge was 1.5 - 2 mm from the edge of the goniometer and the arms of the goniometer lay against the dorsal and ventral surfaces of the biface (if the angle permitted). On some thinly flaked bifaces this angle might be called by others a "spine plane angle". When large step or hinge fractures paralleled edges closely, large readings often occurred. Such readings alerted me to areas needing closer attention. When they occurred on biface bases, the subject of haftability arose. I then had to decide whether such bifaces were usable as projectile points. Van Buren (1970:19-22) has defined morphological limits of hafting probabilities, so I turned to that aid in making my decision.

When measurements and recording were finished, study continued through final classification for cataloguing. Color slides of the entire lithic assemblage were made.

PROJECTILE POINTS

The trianguloid bifaces and projectile points, and the tip fragments, were used to study a question about which I have seen no discussion. Put simply, "Is there any difference between the sharpness of the tip fragments, and that of the bifaces found in the same locus? Could the tip fragments have returned to camp snapped off in the prey? Or were they all debitage?". Since many stages of manufacture (Callahan 1979) were represented in the trianguloid bifaces of the collection, it seemed appropriate to use these artifacts to test these hypotheses. To investigate this, first, those trianguloid bifaces which were only basal fragments or early-stage rejects were culled. This left a sample of 34 bifaces, preforms or projectile points, all trianguloid. Next the tip-like fragments were examined and similarly culled. The remaining sample of tip fragments numbered 25. Calculations of the pertinent edge angles of the two units resulted in the conclusions seen in Table 2, A & B.

The table shows apparent differences. On the average, the angle measurements of the tip fragments are 7.6% smaller than those of the bifaces. However, as Dr. Barbara Luedtke pointed out to me, the similarities are more striking than the differences. The maximum and minimum tip angles, the minimum blade tip angles and the blade tip modes match. These angles seem to have occurred often enough for us to infer execution close to the knapper's "template", or a reflection of his level of expertise working within his cultural norm. The minimum blade tip angle of 25 degrees, for example, could be the smallest angle that would preserve the desired thickness in the distal two-thirds of the biface and would resist snapping on impact.

TABLE 2.

ANALYSIS OF TIP SHARPNESS

A.

ATTRIBUTES COMPARED

Tip Edge Angle

Blade Tip Edge Angle

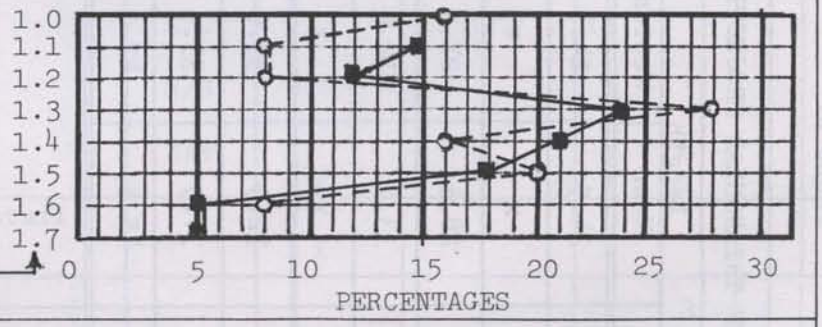
See *

	Minimum Tip Angle	Maximum Tip Angle	Average Tip Angle	Median Tip Angle	Mode	Minimum Blade Tip Angle	Maximum Blade Tip Angle	Average Blade Tip Angle	Median Blade Tip Angle	Mode
Tip Fragments	20°	40°	27°	25°	28°	25°	45°	36°	36°	40°
Bifaces & Projectile Points	20°	40°	29°	28°	30° 32°	25°	50°	38°	39°	40°

B.

Comparison of Blade-to-Tip Ratios

Blade Tip Angle-to-Tip Angle Ratios



LEGEND:

= Edge Angle

--> = Measurement Point

---O = Tip Fragments

—■ = Bifaces

* Measurement Method on Page 12

Of course, the flakes struck from the tip of the blade edges determine the distal angle. So I compared the ratios of the blade tip edge angles to the tip edge angles of the tip fragments, to those of the bifaces and projectile points (Table 2B). About 63% of both units have ratios of 1.4. Only the tip fragment ratios are as low as 1.0. Only the biface ratios go as high as 1.7. From Table 2A and B we may deduce that the tip fragments from this locus were not more thinly flaked in the distal area than the bifaces and projectiles. In this case, comparison of distal attributes is insufficient to prove different histories of deposition.

Next, the triangular projectile points were given statistical attention. Within the width subdivisions of *2.5 cm and under* and *over 2.5 cm*, these artifacts were separated morphologically. Analysis of their metrical relationships is seen in Table 3.

After all projectile points in the assemblage were classified within the MHC format, a breakdown according to their stone type was prepared (Table 4).

Projectile points that were non-trianguloid were illustrated; their small quantities did not lend them to statistical study (Figure 4).

TABLE 3.

ANALYSIS OF TRIANGULAR PROJECTILE POINTS

Description	Shape	N	Length				L:W Ratio		W:Th Ratio	
			Range	Mean	Median	Mode	Range	Mean	Range	Mean
2.5 cm and under	E/CV	12	20-31	24.5	24.5	22	0.8-1.3	1.1	3.7-6.2	4.7
	E/S	3	25.4-34.5	x	x	x	1.1-1.4	x	3.6-4.9	x
	S/CV	7	21-39	28.3	27.5	30	0.8-2.1	1.4	2.5-5.9	4.3
	E/CV	12	22-48	33.2	32.0	32	0.7-1.2	1.0	4.2-8.3	5.7
	E/S	1	73	x	x	x	1.3	x	5.7	x
Over 2.5 cm	S/CV	17	26-44	32.9	33.0	29	0.8-1.4	1.0	4.1-6.9	5.6
	S/S	8	26-46	34.5	33.0	33	0.9-1.4	1.0	3.1-9.3	5.6
	I/S	12	30-73	45.5	42.0	53	1.0-1.6	1.3	4.4-10.3	5.6
Summary										
2.5 cm and under		22	20-39				0.8-2.1	1.2	2.5-6.2	4.3
Over 2.5 cm		50	22-73				0.7-1.6	1.1	3.1-10.3	5.6

Legend: E = Excurvate (Side) S = Straight (Sides or Base) x = Not pertinent due to small sample

I = Incurvate (Side) CV = Concave (Base)

TABLE 4.

DISTRIBUTION OF PROJECTILE POINTS BY STONE TYPE

Morphology	Type	Shape	Untyped	Re-worked	Felsite	Quartzite	Quartz	Basalt	Unknown
	2.5 cm & under								
	"Squibnocket"	E/CV			6	2	2		2
		E/S			3				
		S/CV			4	1	1		
			X		3				
Triangular									
	Over 2.5 cm								
	Levanna	E/CV			6	3	4		
		E/S				1			
		S/CV			13		3		1
		S/S			7	3			
		I/S			5	6			1
			X		7	1	1		
Expanding Stem	Orient-Fishtail				1				2
			X		1				
Diamond	Rossville				1	3			
			X		2				
Lanceolate	Greene				1				1
Ovate			X		2	1	3		
Contracting Stem			X		6	3			
			X	---X		2	1		
Corner Notched			X					1	
Side Notched			X		1	1			
Straight Stem	"Genesee"								1
			X		1	1			1
			X	---X		3			
Total of Projectile Points					70	31	15	1	10
Percentage					55.2%	24.5%	12%		8%

Legend: E = Excurvate I = Incurvate S = Straight CV = Concave

TABLE 5.

DISTRIBUTION OF POINT FRAGMENTS BY MATERIAL TYPE						
Untyped	Quantity	Felsite	Quartzite	Quartz	Flint	Unknown
Tips	36	21	9	5	0	1
Midsections	2	2	0	0	0	0
Bases	8	6	0	0	0	2
Totals	46	29	9	5	0	3
Percentages	100%	63.2%	19.6%	11%	0	6.2%

Untyped projectile point tips, midsections, and bases were not included in the stone type distribution and may be seen in Table 5. The percentages of various stone types closely parallel those of the finished projectile points. The slightly larger felsite percentage may not even be enough to reflect the intractability of the stone, resulting in more forms that are aberrant or untypable.

Incidentally, of the 10 projectile points shown as "Unknown" in Table 4, two (Fig.4; 2, 5) are heavily patinated, and two (Fig. 4; 1,8) are encrusted with a thin layer of an unidentified material. The point listed under Basalt (Fig. 4;6) is more accurately described as traprock with basalt veins, and it may or may not represent trade with the western Connecticut people. A point called "Genesee", not illustrated, is badly burned and eroded.

CHIPPED STONE - EDGE TOOLS

Edge tools, in the MHC format, are defined as having an edge or edges modified by visible, deliberate flaking, or with thickness greater than 1.5 cm. This class is intended for such tools as spokeshaves, scrapers, etc., as well as for early stage bifaces (Table 6). If early stage bifaces were thinner than 1.5 cm and 4.0 cm or more in length, they would be classified in this mutually exclusive system as Biface Implement Blades. The latter class has been revised to include a length measurement (Towle 1981, pers. comm.) which would enable the class to accommodate atypical lengths. However, thickness is still a factor requiring use of the Edge Tool class. Table 6 shows my necessary distinction between the two kinds of tool-bifaces and smaller edge tools.

An additional category has been added to fill a gap: trianguloid scrapers. Among the scrapers (Table 6, B) are 2 trianguloid bifaces (HL 17, HL 145) which are seen in Figure 5 (9-10). Both show polish on their bits, which are rounded from use. The polish is lined with very faint striations parallel to the longitudinal axis. This may be the kind of wear described by Keeley (1977) as hide wear.

Among the 21 artifacts placed in this class, one tool of unknown purpose is illustrated (Fig. 5;8). This artifact (HL 180) is carefully serrated along one edge. Another, (HL 136) is serrated in the same place, but the serration is here the natural, fortuitous result of the many crystals of similar small size of its felsite porphyry.

CHIPPED STONE - CHIPPING WASTE

Apparently, only those flakes were saved which seemed to be exotic or exceptional. The quartzite and felsite trimming flakes are all of a very fine-grained stone. Some of the flint flakes are of a medium orange-brown stone. The other flint flakes are shades

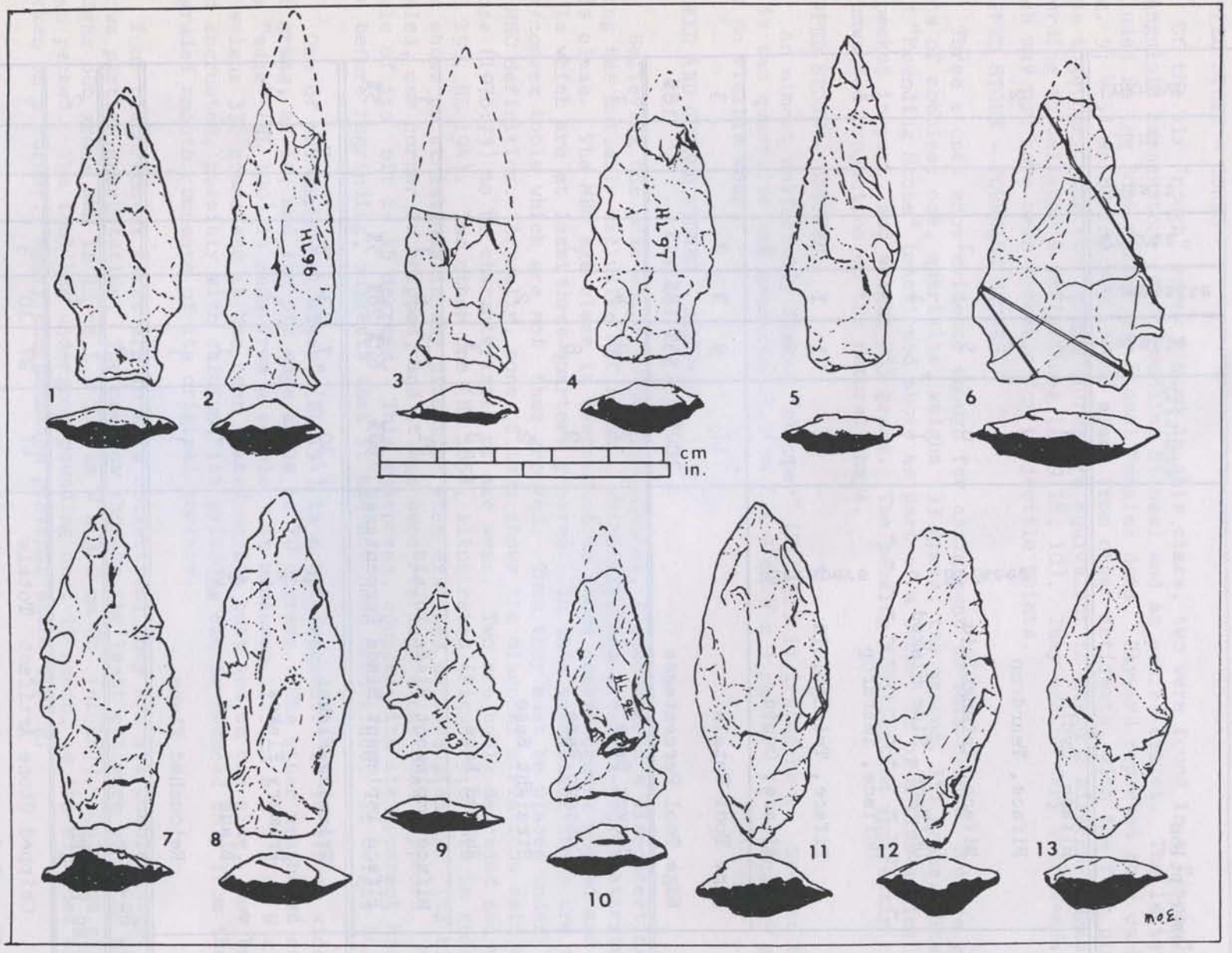


Figure 4. Non-Trianguloid Projectile Points. 1-3, Orient Fishtail; 4, Untyped Expanding Stem; 5, Untyped Straight Stem; 6, Untyped Corner Notched; 7, 8, Greene; 9, 10, Untyped Side Notched; 11-13, Rossville; 1, 2, 5, 8, Unknown Stone, Patinated or Encrusted; 3, 4, 7, 9, 12, Felsite; 6, Traprock with Basalt Veins; 10, 11, 13, Quartzite.

TABLE 6.

DISTRIBUTION OF CHIPPED STONE ARTIFACTS BY STONE TYPE

Description		Quantity	Felsite	Quartzite	Quartz	Basalt	Flint	Unknown
EDGE TOOLS	Biface, Ovoid	3	2	1				
	Biface, Teardrop (Bifaces)	3	1					2
	Biface, Trianguloid (Bifaces)	6	5		1			
	Uniface, Side Flaked (Bifaces)	1		1				
	Uniface, Teardrop (Scrapers)	1						1
	Biface, Trianguloid (Scrapers)	2	1	1				
	Biface, Ovoid (Scrapers)	1			1			
	Edge Tool Totals	17	9	3	2			3
	Edge Tool Percentages	100%	53%	18%	11%			18%
BIFACE IMPLEMENT BLADES	Convex Base	7	2	4				1
	Concave Base	9	8		1			
	Straight Base	2		2				
	Angled Base	3	3					
	Biface Implement Blade Totals	21	13	6	1			1
	Biface Implement Blade Percentages	100%	62%	28%	5%			5%
CHIPPING WASTE (See Text)	Trimming Flakes	30	7	13	3		7	
	Primary Flakes	3		3				
	Blade	1	1					
	Retouched Flake	1	1					
CORES, Rough		6	5					1
POUNDING STONES		3		1				2
	Chipped Stone Artifact Totals	47	27	10	3			7
	Chipped Stone Artifact Percentages	100%	58%	21%	6%			15%

of grey and tan. Since all flakes from the excavation were not saved, percentages are not supplied here, nor are these artifacts counted in the final Chipped Stone totals (Table 6).

CHIPPED STONE - CORES

Of the six "rough" cores placed in this class, two were found in a "cache" with a trianguloid hammerstone (see Pounding Stones) and an antler billet. The latter is not included in the Bone, Antler and Faunal Remains data. Hayward reported this cache (Fig. 5; 4-5) as having been found apart from other artifacts, with the four pieces close together. The two "rough" cores are equivalent to Stage 2 Bifaces--edged pieces, according to Callahan's definitions (1979:18, 10). They are of very coarse-grained stones which may not have been workable for projectile points.

CHIPPED STONE - POUNDING STONES

Three stones show evidence enough for assignment to this class. Two are end fragments of cobbles: one, quartzite, weighs 133 grams; the second, 157 grams. The trianguloid "Pounding Stone" (mentioned above as part of a cache) is of a fine-grained stone, is pecked in part, and weighs 285 grams. The pecking modification apparently removed an unwanted projection on the natural shape.

CHIPPED STONE - UNTYPED

An almost unifacially flaked "chopper" (HL 191) is listed here. Seen in Figure 5 (3), it is tan quartzite and measures 13.3 cm L x 9 cm W x 3 cm Th. It weighs 449 grams and has no visible wear.

PECKED AND GROUND STONES - ADZES

Believing the adze shape to be plano-convex, I encountered a disconcerting result using the mutually exclusive MHC format, which also has a convex-convex attribute for this class. The MHC axe class is restricted to those convex/convex pecked and ground tools which are at least three-quarters grooved. In this assemblage there are three convex/convex tools which are *not* thus grooved. Thus they must be placed under "Adze" by MHC definition. Actually, none of them shows the diagonal striations said by Dincauze (1976:73) to be characteristic of axe wear. Two are badly degraded and weathered (HL 190, HL 194). The other one (HL 185), illustrated (Figure 5;2), is in good condition but shows no striations in any direction when examined macroscopically. Its bit is angled, one corner is chipped, and it has been reground since that happened. The edge angle of its bit is 45 degrees. This sharpness, coupled with its apparent history of use before regrinding, suggests that it had not been used since. It weighs 442 grams.

One of the weathered "adzes" (HL 194) is a bit fragment. It is 8.2 cm wide, weighs 246 grams, as is, and its bit edge angle is 70 degrees. The other weathered convex/convex "adze" (HL 190) is made from a cobble. It measures 11.3 cm L x 5.5 cm W x 2.5 cm Th. It weighs 338 grams and it has been flaked on its butt and on one side. Now badly eroded and encrusted, possibly with calcium, its grinding can be deduced only from the undegraded smooth remnants of its original surface.

Four plano/convex adzes are in this collection; they are all cobble adzes. Each shows partial encrustation. The one now showing the least evidence of being manufactured weighs 606 grams and is 13 cm L x 7.5 cm W x 3.2 cm Th (HL 187). Only one side has been pecked. The tool has undergone pounding use, it seems, as its expanded bit has been broken on a corner. Heavy encrustation prevents stone typing.

A second of these cobble adzes (HL 188) is 14 cm L x 7.5 cm W x 3.2 cm Th, and weighs 436 grams. Besides being encrusted it is badly eroded. It has been pecked. The butt is broken on a slant and its bit has suffered the loss of a rounded chunk, which may have made some gouge-like function possible.

Figure 5. Stone Artifacts and Antler Billet: Cobble Adze, 1; Axe (See Text, "Adze"); Chopper, 3; Cache of Hammerstone, Biface and Antler Billet, 4-6; "Animaloid" Rock; Tool of Unknown Purpose, 8; Hide Scrapers, 9-10.

The cobble adze numbered HL 189 is 15 cm L x 7.3 cm W x 3.9 cm Th (Fig. 5;1). It weighs about 624 grams. This adze shows striations parallel to the long axis of the tool. Its expanded bit, rounded from use, shows battering on one corner and flaking from its ventral side. Both scars are crossed by subsequent striations.

The fourth cobble adze (HL 186) is 15.8 cm L x 8 cm W x 4.2 cm Th and weighs about 738 grams. Its butt underwent some flaking before being pecked. The expanded bit is striated parallel to its long axis and is slightly rounded off to one side of the tool.

The weathering and/or encrustation of these adzes described above is marked, when compared to the rest of the lithic assemblage. The reground "adze" (HL 185) is entirely different from the cobble tools in condition, shape and size. Since it is possible that the former have been altered by underwater conditions, the latter would appear to have a different depositional history. Such possibilities need to be mentioned, since the degraded adzes as well as the "Orient Fishtail" projectile points raise the question of multi-component versus single- or dual-component occupancy of Hayward's Portanimicutt.

PECKED AND GROUND STONE - PESTLES

A long, coarse felsite cobble fragment in the collection has a slightly battered tip (HL 193). Some possible striations are seen there; they are quasi-longitudinal to the axis of the fragment. As is, it weighs 430 grams.

PECKED AND GROUND STONE - MORTARS

A large stone was found which has an irregularly round "pit" about 10 cm in diameter and 1 cm deep. The stone is 23 cm long (or rough diameter) and about 65 cm in greatest circumference. The un-degraded polished "pit" was made in a natural slight depression.

PECKED AND GROUND STONE - GORGETS

Three pieces of drilled phyllite were found. Two are incomplete fragments; the third is a crude one-hole gorget.

ABRADINGSTONES

One grooved abradingstone fragment was found. Originally this artifact was much larger. Its groove, which is 7 mm deep, is curved lengthwise. The rock from which it was made seems to have been flattened on one side by grinding and the groove was then sunk into the flat ground facet by use.

OTHER

Fifteen other rocks were saved. These now offer no real sign of having been altered or used by man. However, many of their shapes suggest intended uses. For example, one is a possible hoe. Two "animaloid" stones of fine-grained rock are of interest. One (Fig 5;6) is similar to one found at the Mattaquason Purchase Site which was not recorded, out of caution. Seeing such stones again gives me the temerity to say, "They probably picked them up and saved them because they resembled seals - or whatever".

HISTORIC

Two pieces of metal are in the collection. One is a cut nail and the other is a piece of copper, roughly 65 mm L x 45 mm W x 1.5 $\pm$ .5 mm Th. This artifact is presently undergoing analysis to determine its probable mode of manufacture and, thus origin. This irregularly shaped object is covered with indentations impressed from one side. These multi-sized pits, polished on the reverse protrusions, frequently contain small, deeper indentations. These indentations may be from the pressure of being trod upon while lying on a rough surface.

CERAMIC ARTIFACTS

Based on experience with the large ceramic representation in the artifacts from the Mattaquason Purchase Site (M48N6), I admit to the bias of believing that much variation is seen in attributes of individual ceramic vessels found on the Cape. Hardness, color, and temper percentage and size all vary from side to side and top to bottom of most single vessels. Rim profile shapes frequently vary around the rim of a single vessel. Cordage twist angles, and cordage diameter and/or cordage hardness, often vary within single cord lengths.

I would expect these variations to be present in the ceramic artifacts from the Hayward's Portanimicutt locus, which is only about 8 kilometers from the Mattaquason Purchase Site. Therefore, no inference was drawn that the attributes of the ceramics of Hayward's Portanimicutt were constant in the original, complete vessels. Nevertheless, attribute analysis was done on the sherds and the results are discussed below.

PROCEDURES

In order that I, at least, might be consistent about these 208 clay artifacts, I examined and measured every potsherd except for a few small ambiguous pieces. They were then separated into apparent, single Vessel Units. Vessel Units P and Q (neither a single pot) are wastebasket groups of mostly tiny or indecipherable sherds. All sherds were recorded on numbered ceramic analysis forms, either singly or grouped, several to a form, within Vessel Units.

Each sherd was examined macroscopically for embedded seeds or grasses. Burned encrustations were scraped from the sherds, packaged in foil and labeled for possible later examination. Unpreserved sherd samples of most of the Vessel Units were saved for future testing also. The balance was washed and preserved with a mixture of Duco and acetone, resulting in a burnished appearance in those fragile sherds requiring more preservation. Analysis and recording followed. Assembly into portions of single vessels was possible in some cases. From typical sherds of most Vessel Units, latex molds were made. Observations about these were added to the forms. Color slides were made of the sherds and their molds.

An attribute analysis chart (Table 7) was prepared. When examining it, one must note that measurement of Maximum Thickness was from the thickest sherd of the Vessel Unit; Minimum Thickness was from the thinnest. Thus Vessel Units with many sherds (e.g. H & J) exhibit a wide spread between these measurements, which should not be mistaken for variation within a single sherd.

The two Vessel Units with largest sherd counts (H & J) were used to study the relationships between grit and shell temper size and sherd wall thickness. Table 8A was the result. A reversal of what I had expected is seen; shell-tempered vessel H has an average wall thickness of 9.2 mm while grit-tempered vessel J averages 8.1 mm. Another close look at the two pots leads to the conclusion that these averages have little value for a comparison of grit- and shell-tempered wares as a whole. Vessel Unit H is cord- or fabric-impressed, or malleated, and it is tempered with very large scallop and quahog fragments. Vessel Unit J is a finely made grit-tempered pot of some technical excellence, and it is very smooth-bodied.

This investigation was extended to include comparison of the Thickness Maximum of all shell-tempered sherds (65) with all the grit-tempered sherds (53). Table 8B shows that the average (mean) Thickness Maximum of the two classes is very close. Any search for a conclusion ought to take into consideration the results of a subjective examination of these sherds. Such an examination shows that 3 grit-tempered vessels and 4 shell-tempered vessels are very finely made. Two of each temper type were well made. Coarsely constructed vessels included 3 of grit and one of shell.

TABLE 7.

ATTRIBUTES		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Number of Potsherds		1	1	6	6	5	7	8	49	16	51	1	1	1	1	1	50	3
Diameter (Centimeters)		13	18	23	23	20				20			12.5					
Thickness Maximum (mm)		10	8	12.8	13.8	13.3	15	8.5	12	10.5	11.5	8.9	/	8.5	11	10.5	11.5	12
Thickness Minimum		/	6.5	8.3	9.8	6.5	9.3	6.3	6.5	6.8	6.1	7	/	8.3	9	/	4.9	8
Grit Temper		X			X		X			X	X	X	X					X
Maximum Size (mm)		2	8	10	10.5	14	5.5	12	11	4	5.5	4	3	4	6	4	6	8
Shell Temper			X	X		X		X	X					X	X	X	X	
Manufacture	Exterior Cord-Marking								X			?	X					
	Interior Cord-Marking											X						
	Exterior Wiping																X	
	Interior Wiping		X	X		X			X		X						X	
	Exterior Smoothing	X	?	X	?	X	X	X		X	X				X	X	X	
	Interior Smoothing	X	X	X			X	X		X	X		X	X	X	X	X	
	Coil Bonding	?		?	X	X		X	X	X	X			?		?	X	
Decoration	Incised or Trailed													X		X		
	Dentate	X			X		X											
	Punctate										X							
	Cord-Impressed														X			
	Net or Fabric-Impressed		?												?			
	Mat or Basket-Impressed									X								
	Cord-wrapped Stick or Paddle			X		?			X				?					
	S or Z Twist of cord		S	S											Z			
	Turns per Centimeter		4	6											5			
Exterior Color		5YR 4/4	10YR 6/2	10YR 5/4	10YR 6/2	5YR 6/4	10YR 6/2	10YR 5/4	10YR 6/2	10YR 6/2	10YR 6/2	10YR 6/2	10YR 6/2	10YR 2/2	5R 2/2	5YR 6/4		
Inner Zone Color		5YR 5/2	10YR 2/2	**	**	**	BL	10YR 2/2	5YR 2/2	5YR 4/1	**	**	**	10YR 6/2	5Y 6/2	5YR 5/2		
Interior Color		10YR 5/4	10YR 4/2	10YR 5/4	5YR 2/1	10YR 2/2	10YR 4/2	5YR 4/1	5YR BL	10YR 2/2	10YR 2/2	10YR 2/2	10YR 6/2	10YR 2/2	5Y 6/1	5YR 6/4		
Paste and Condition		VG	VFa	FiP	CP	FiP	CP	FiFa	VP	CP	FiFa	VP	VFa	FiG	FiFa	VP		

Legend

X = Yes
= No
? = Possible
/ = Rim

COLOR
BL = Blackened
** = Blended

PASTE
C = Coarse
V = Variable
Fi = Fine

CONDITION
P = Poor
Fa = Fair
G = Good

TABLE 8.

COMPARISON OF THICKNESS AND TEMPER MEASUREMENTS

Measurements in Millimeters [A]	THICKNESS MAXIMUM	Mean	Median	Mode	THICKNESS MINIMUM	Mean	Median	Mode	MAXIMUM TEMPER SIZE Mean
VESSEL UNIT "H" (shell-tempered)	12	9.8	9.5	9.5	6.7	8.6	9	8.9	11 / 7.9
VESSEL UNIT "J" (grit-tempered)	11.5	8.8	8.6	8.7	6.4	7.4	7.3	7.3	5.5 / 4.3
MEAN THICKNESS OF "H"		9.8 ------plus----------				8.6---equals 18.4 ÷ 2 = 9.2			
MEAN THICKNESS OF "J"		8.8 ------plus----------				7.4---equals 16.2 ÷ 2 = 8.1			
ALL MEASURABLE SHERDS OF [B] HAYWARD'S PORTANIMICUTT	13.2	9.6 Mean THICKNESS MAXIMUM, Shell-tempered Sherds							
	15	9.8 Mean THICKNESS MAXIMUM, Grit-tempered Sherds							

The two kinds of temper are divided almost evenly: 47.15% of the vessels are grit-tempered and 52.95% are shell-tempered. The shell temper consists of quahog and scallop. The grit temper recognized here is crushed quartz, and, probably, crushed granite (Pavlish 1980). Both are close at hand in glacial till (Oldale et al 1971). Granite is more ubiquitous than shell, and, moreover, is always available in the steep slopes around the edges of Pleasant Bay, or around camp, as fire-cracked or disintegrating cobbles.

Limited variation is seen in the firing results as determined by color. Only one sherd (N) appears completely unoxidized. Otherwise, where smudging or blackening by contents has not occurred, the predominant color is pale yellowish brown (10YR 6/2). That color ranges downward in value to dusky yellowish brown (10YR 2/2), and to other closely related tans and browns. Zoning is rare (B, G) and five other pots blend gradually from exterior to interior. The rest exhibit limited variation as seen in the chart (Table 7).

The inhabitants of Hayward's Portanimicutt, if indeed they made this pottery, achieved some creative and rather successful results (Fig. 6;A,I). Decoration by incision (2 vessel units), dentate impression (3 vessel units), and punctate impression (1 vessel unit--appearing dentate where close together) was used. One of the Vessel Units may have been made with the functional support of matting while drying, or else was impressed with it as decoration (Fig. 6;I). The predominant attribute of most of the pots is exterior smoothing. Even the coarsest of the vessels (grit-tempered D) appears to have been smoothed before its shell dentate impression was made.

Exterior cord-marking during manufacture, subsequently not smoothed, is rare (3 vessel units). One of these (H) is further differentiated as a fabric-wrapped paddle-

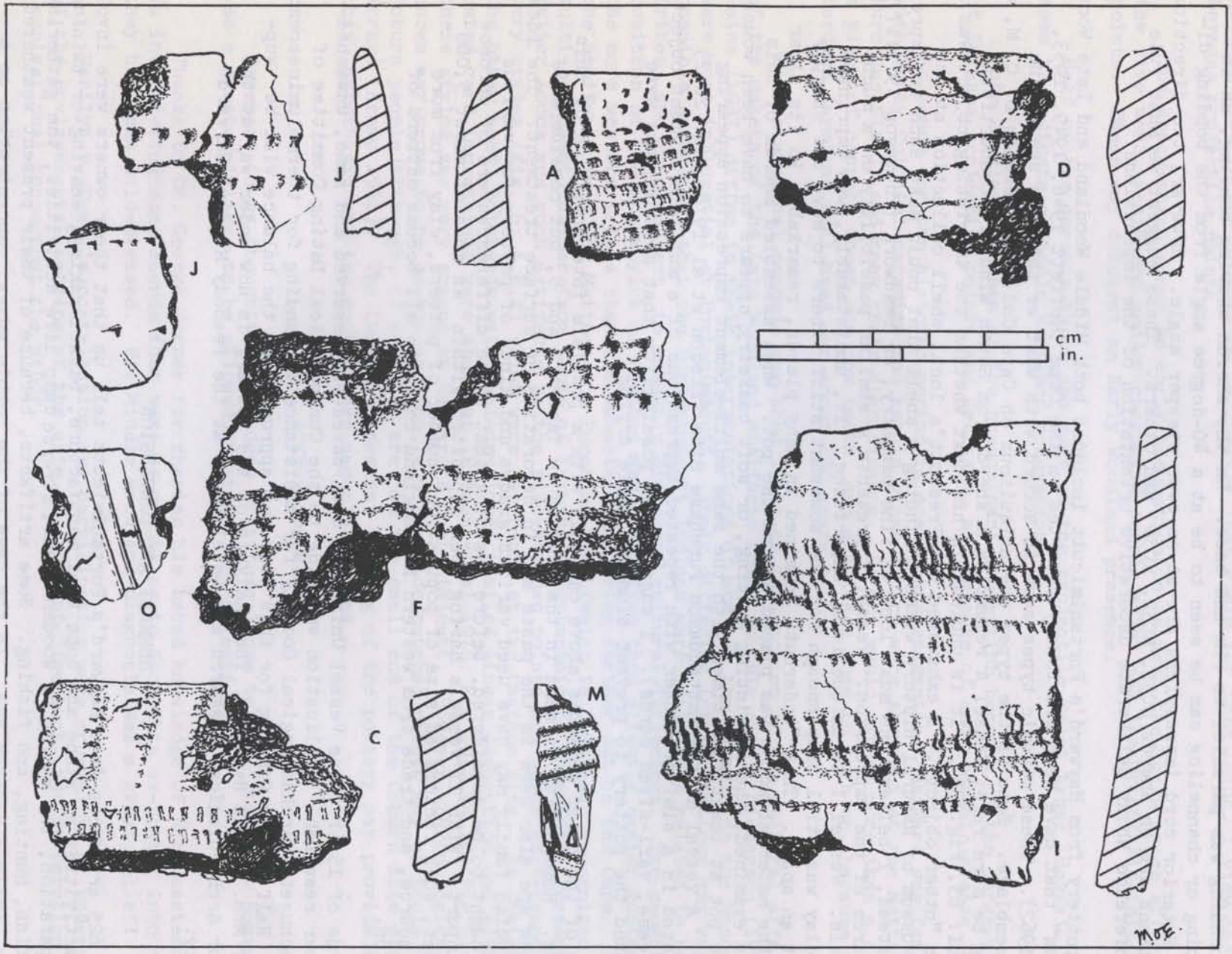


Figure 6. Ceramic Sherds; J, Punctate; A, Dentate, Basketry or Beadwork Impressed; D, Shell Dentate; O, Incised; F, Dentate, Basketry or Beadwork Impressed; C, Cord-Wrapped Stick Impressed; M, Trailed Linear; I, Mat Impressed. O, C and M are Shell-tempered; Others, Grit.

impressed vessel (not illustrated). The 49 sherds of this pot would be worth examination by someone knowledgeable about twining and weaving. There is evidence of coil-bonding (or slab) on a few sherds. Rim sherds are missing for these vessels, but I assume that the coil bonding was parallel to rim and base. On the sherds showing bonding, an interior wiping or channeling can be seen to be at a 40-degree angle from the bonding direction. Exterior cord impressions are at an even steeper angle. However, two-directional malleations are on sherds HC51, HC52, HC38 and others. These suggest we must rule out any inference about deliberate decorative orientation of the impressions.

The pottery from Hayward's Portanimicutt includes both Middle Woodland and Late Woodland "types" that have been previously reported on the Cape (Moffett 1946, 1949, 1953, 1959 and 1962). These ceramic types seem in accord with what we think we see in the lithic assemblage. Some of the types are ubiquitous on Cape Cod (e.g. Vessels D, C, M, J). Others may be more rare; Vessel A resembles a sherd from South Windsor, Connecticut (Rouse 1981: 63, Fig. 3B). It is unclear in his text whether the imprinting object was "shell" or "other object". I exhausted Bob Prescott's local shell collection at the Cape Cod Museum of Natural History without finding a shell that could make such an impression. Instead, I believe one must look to fine basketry, or beadwork (Thompson 1973:17) as the source of the impression. Vessel F presents a similar possibility on a much larger scale. Vessel I is unique in my experience. It, unmistakably, was imprinted when the clay was still damp enough for the somewhat stiff fibers to have cut sharply into it at an angle. That "undercut" remained in many places, remarkable in its clear proof of the material which was placed around the pot. When assembled sherds of this vessel are examined, the imprinting matting, or soft basketry, appears to have been wound around the pot at least four times with the same multi-element empression appearing each time. A vessel at the Mattaquason Purchase Site (Eteson et al 1978: Fig. 20,2) was decorated in a similar manner with repeated impressions of a multiple element object (in that case, vari-sized cords). I suggest the possibility that soft objects were wound around the pottery to prevent slumping while drying.

Some of the brief comments above can help with a possible interpretation of this collection. Homogeneity is seen in the results in Tables 7 and 8, but considerable differences are also seen in the paste and in decorative or surface treatment. The idea that an Indian family may have used various grades and kinds of pottery for various purposes ought to be considered, before assuming that these differences are of chronological import. With 17 vessels having been deposited within an area of about 5,000 square feet, such factors as size of population, number of potters, clay from more than one source, and trade from western New England contacts all become matters of speculation.

Sherds of 15 of these Vessel Units had been saved--unpreserved and some, unwashed--for further research. Application was made to the Chronological Dating Committee of the Massachusetts Archaeological Society for assistance in funding for thermoluminescence testing. Half of the funding for this test was approved and the balance will be supported by Mrs. Donald Hayward. The analysis of the pottery is now under way at the Center for Archaeological Research and Development at the Peabody Museum, Harvard University.

SUMMARY AND CONCLUSION

The 625 artifacts from Hayward's Portanimicutt tell us that their owners were involved in such activities as stone and bone tool manufacture, basket making, weaving or twining, hide preparation, the making of wooden items, diverse camp life activities, the gathering of shellfish, hunting, and fishing. Some artifacts, because of their present weathered condition, imply a greater age. In the case of the cobble adzes, concentration on a single activity--woodworking--is suggested. The artifacts left by these people suggest multi-component occupancy.

If we follow the format of the Prehistoric Survey to the extent of accepting their mutually exclusive time frame, we must assume that the Squibnocket Complex is represented here by the small triangular projectile points (2.5 cm and under). However, recognizing nothing else in the assemblage to justify that claim for this locus, I view them as small Levanna projectile points.

The speculation about an early occupation on or near the locus arose after viewing the five worn, weathered and/or encrusted cobble adzes and the Orient Fishtail projectile points. These may document an Early Woodland presence.

Half of the ceramic types and some of the projectile point types (Rossville, Greene) seem to indicate a Middle Woodland occupation.

Late Woodland is seen as the predominant occupation because of the large quantity of Levanna projectile points and debitage, and because of some ceramic traits.

Evidence for the historic period is scanty and enigmatic. Hayward was familiar with early Colonial ceramics and kaolin pipes (which were abundant at the Mattaquason Purchase Site), and knew their significance. So one would expect more than a cut nail, a piece of copper, sheep and cow teeth, and a chicken bone to turn up, because the locus borders farmland well used for about 250 years.

Ethnohistorical records may shed light on the problem of the cultural affiliation of the makers of the Late Woodland artifacts found at this site. Nickerson (1958) and Paine (1937) differ in their interpretations of whether the Nausets or the Monomoyicks were most influential at Portanimicutt. Their differing interpretations may suggest a possible actuality--that the Portanimicutt Indians were intimately related to both tribes, and thus subject to slightly different cultural influences. The geographical position of the Monomoyick of Chatham may have given them slightly easier contact with the more western tribes than the Nausets had, living farther out on the Cape. In fact, the artifacts from the Mattaquason Purchase Site (which is belatedly recognized as multi-component) differ from those of Hayward's Portanimicutt somewhat. Present at the latter locus are such artifacts as the side-notched points and three grit-tempered pottery styles (Fig. 6: A,F,I) which were not found at the Chatham site. At Chatham, on the other hand, potsherds with well-developed trailed linear decoration and with sophisticated cord impressions were abundant (Eteson et al 1978: Fig. 20;2,14,12; Fig. 21;4) and these styles are very scarce at Hayward's Portanimicutt. However, chronological differences may prove to be an explanation, and the side-notched points may be tools of the Coburn people (although, if so, they are on the small end of the Coburn site side-notched array) (Kremp 1961). The thermoluminescent testing of the pottery may provide clues to this hypothesis and the results are eagerly awaited.

ACKNOWLEDGEMENTS

Foremost in my thoughts is the deep gratitude I owe to Mrs. Donald W. Hayward. It was a great privilege to be allowed to study the collection.

Thanks to Dr. George Horner for sharing his broad knowledge of Northeastern ceramics in interpreting some sherds that were so smooth as to fool this ex-potter into thinking they had been mold-pressed. His Middle Woodland diagnosis was a great relief!

Marilyn D. Crary's contribution and participation were crucial to my understanding of the environmental setting of the site. Her cogent "feedback" and cooperation were inspirational throughout the study.

The following institutions and people gave much-appreciated assistance to Marilyn in the identification of the faunal remains: Robert Prescott, former Education Director,

Cape Cod Museum of Natural History, Brewster; John Kirsch and staff, Mammal Department, and Raymond G. Paynter, Bird Department, both of the Museum of Comparative Zoology, Harvard University; and Richard Meadow, Zooarchaeology Laboratory, Peabody Museum, Harvard University.

A number of people very kindly helped me with various problems of interpretation: Leo Gallagher, Graham Giese of the Center for Coastal Studies in Provincetown, Robert Hand, Robert N. Oldale of the U.S. Geodetic Survey at Woods Hole, and Lesley Sage.

In fairness to the Prehistoric Survey of the Massachusetts Historical Commission, it should be emphasized that their in-house document was intended for their own use by their Survey archaeologists. Initially I secured a copy to assist me in working on the Cape Cod Collections Survey. Without fully discussing it with them, I put it to this expanded use. Given my difficulties, exceptions, additions and caveats, they may wish that I had not done so. In that case, my apologies should accompany my thanks to David Anthony, Linda Towle, and MHC. For the avocational archaeologist, and with only a few exceptions, this document should serve well the function of collection analysis. It could, furthermore, hasten the orderly gathering of such data at the MHC for the urgent use of today's professionals.

Drawings of bone and antler artifacts were by Marilyn D. Crary. Photography was by James M. Eteson; drawings of stone and clay artifacts were by Marie Ostenkamp Eteson.

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