THE PRESERVATION OF ARCHAEOLOGICAL SITES AT RAM PASTURE.

by Elizabeth A. Little and Elizabeth Gosnell

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Archaeology Department, Nantucket Historical Association.

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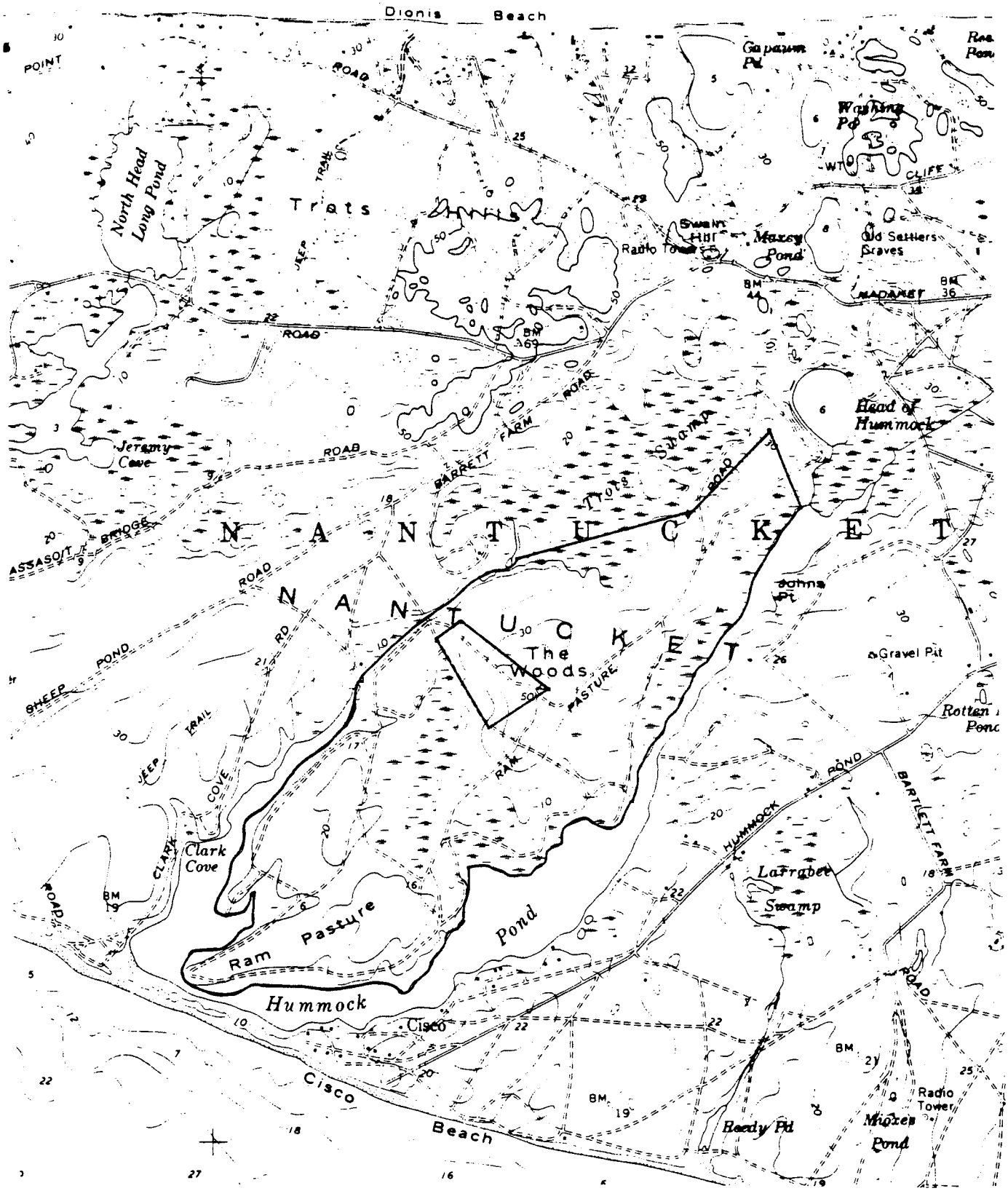

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Figure 1. The heavy line shows the bounds of the Nantucket Conservation Foundation, Inc. property called Ram Pasture. The quadrilateral area within Ram Pasture is privately owned. Topographic map is the Nantucket Quadrangle (USGS 1977).

THE PRESERVATION OF ARCHAEOLOGICAL SITES AT RAM PASTURE.

INTRODUCTION.

Preservation of significant archaeological sites, curation and study of artifacts already excavated from the ground, analysis of the data, and publication of the results, constitutes responsible conservation of our prehistoric resources.

In order to preserve archaeological sites at Ram Pasture, the first step is to determine what archaeological sites exist there. For a preliminary survey such as this, several methods were used to estimate archaeological potential. A previous survey of known sites on Nantucket (Little 1979) has established an average density of at least 0.8 prehistoric sites per square kilometer on the whole island, and a density of at least 1.2 sites per square kilometer on land less than 200 m (meters) from fresh water. Of the approximately 2.2 square kilometers (NCF, Inc. 1982-83; Schofield Brothers, Inc. 1975) which constitute the Nantucket Conservation Foundation property at Ram Pasture, excluding swamp and open water, 95% is less than 200 m from water (Fig. 1). We would, therefore, expect to find at least three sites.

To test this expectation, reports from previous excavations and collections (Little 1979) were reviewed; historic records at the Foulger Museum were consulted, and several knowledgable people were interviewed. Finally, with Olive Ingram, an associate of the Archaeology Department (NHA), we walked the land, looking at disturbed areas (roads, bluffs, gravel pits, plowed areas, previous archaeological excavations). In addition to five kinds of historic archaeological sites (houses, roads, duck blinds, plowed fields, pits), nine prehistoric sites were identified by this method, or three times more sites than predicted.

After presenting and evaluating our findings, we give recommendations for future archaeological research which is not destructive of sites, as well as some site preservation suggestions which resulted from this study.

BACKGROUND.

The Long Trees (Figure 2), the Long Woods (NCD 3:66), The Woods (Fig.1), Pattaconet's Island (NCD 3:37), and Ram Pasture (Fig.1), are terms which historically have been used to name parts of the area commonly known today as Ram Pasture. In 1664, this land was called "Nanahuma's Neck", for the sachem who probably lived there (Fig.2; Figure 3). This neck or peninsula, which lies between the arms of Hummock Pond and Trotts Swamp, was sold to the English in 1664 by Pakepanessa, Jonas, Harry, and Kimmo, for 25 pounds (Little 1981a:42; Worth 1901:117; Fig. 3). Another five pounds was paid Nanahuma`s son, George Nanahuma, in

1678 for his rights in the Plains and the Neck (NCD 3:66). Since this date, a certain amount of history is known about the area. In 1701, tracts of land were set aside for freeholders in "the Long Woods", and whole-share men were allowed to keep 20 sheep each on "the Neck" (Forman 1966:64). We know this land was used for pasture, meadow hay, brush cutting, and wood, in the 17th and 18th centuries, and that one or two farms existed on it in the 18th, 19th and 20th centuries (Gardner 1946; maps at Foulger Museum; Little 1981b). Much history is involved with this land and further research is needed to uncover information about past land use at Ram Pasture.

Even less is known about the area prior to 1664. Evidence of Indian habitation was discovered by the Shawkemo Chapter during an excavation led by Bernard Stockley in 1962 ("RP-I"). 359 artifacts were found, which revealed Late Archaic Period and, predominantly, Woodland Period site components (Stockley 1964, 1965; Waters 1965; Appendices 1,2,3,4). The Late Archaic Period dates approximately 5-2500 years ago; the Woodland Period dates from about 2500 years ago until about 400 years ago. A Carbon-14 date from charcoal at the site gave a date of 940 ± 100 years A.D.(Little 1983b:23).

METHODOLOGY.

Elizabeth Little has reported on a process for up-grading our knowledge of site locations on Nantucket, without doing any excavation. Her article, "Initial Predictive Map for Prehistoric Sites on Nantucket" (Little 1983a), was the basis for our own search for Indian sites in Ram Pasture. On the basis of a survey of prehistoric sites on Nantucket sponsored by the Nantucket Historical Association in 1978 (Little 1978), Little determined the attributes of the land common to the 106 sites listed in the survey, and observed that there are four key zones which are likely to contain Indian sites on Nantucket. Zone 1 consists of land less than 200 meters to fresh water; Zone 2 consists of land less than one kilometer to shell-fish habitat; Zone 3 consists of hillcrests within two kilometers of shellfish habitat; and Zone 4 consists of sandy outwash plain more than 10 m above mean sea level. Little emphasized that these hypothetical zones need field testing, which the present study set out to do.

Furthermore, with the exclusion of burial sites and 12 shell middens, Little determined that 81% of the Nantucket sites listed in the 1978 survey were 100 m or less from fresh water, and 97% were less than 200 m away. The ground at Ram Pasture which falls within Zone 1 and especially the first 100 m from water, thus has a very high probablility of containing sites.

On a map of Ram Pasture, areas up to 100 m and 200 m from fresh water or swamp have been indicated (Figure 4). Ram Pasture predominantly has the characteristics of Zone 1, which is defined as land less than 200 m from fresh water. Not only is the property bounded by Hummock Pond and Trotts Swamp (Fig. 1), but

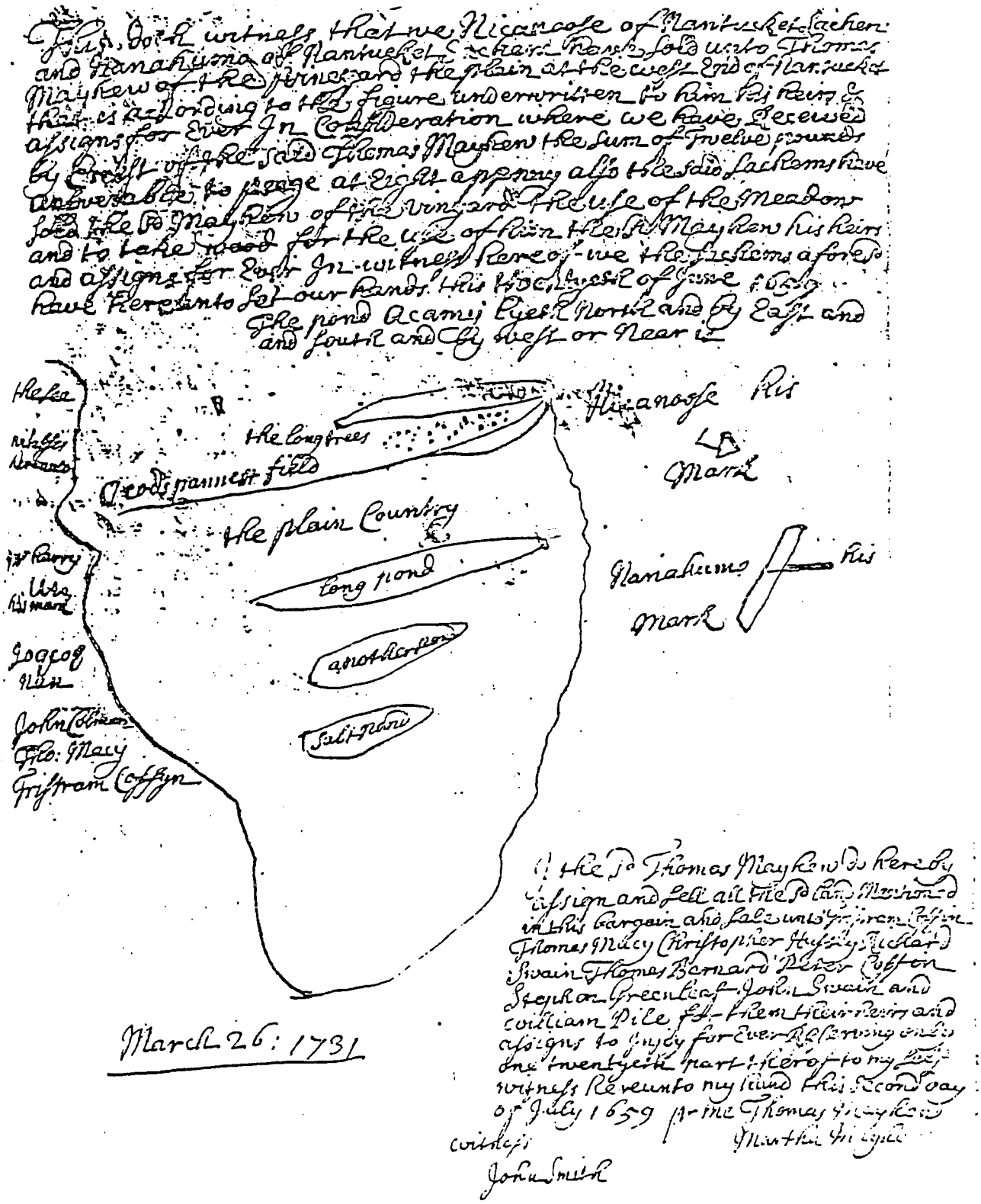
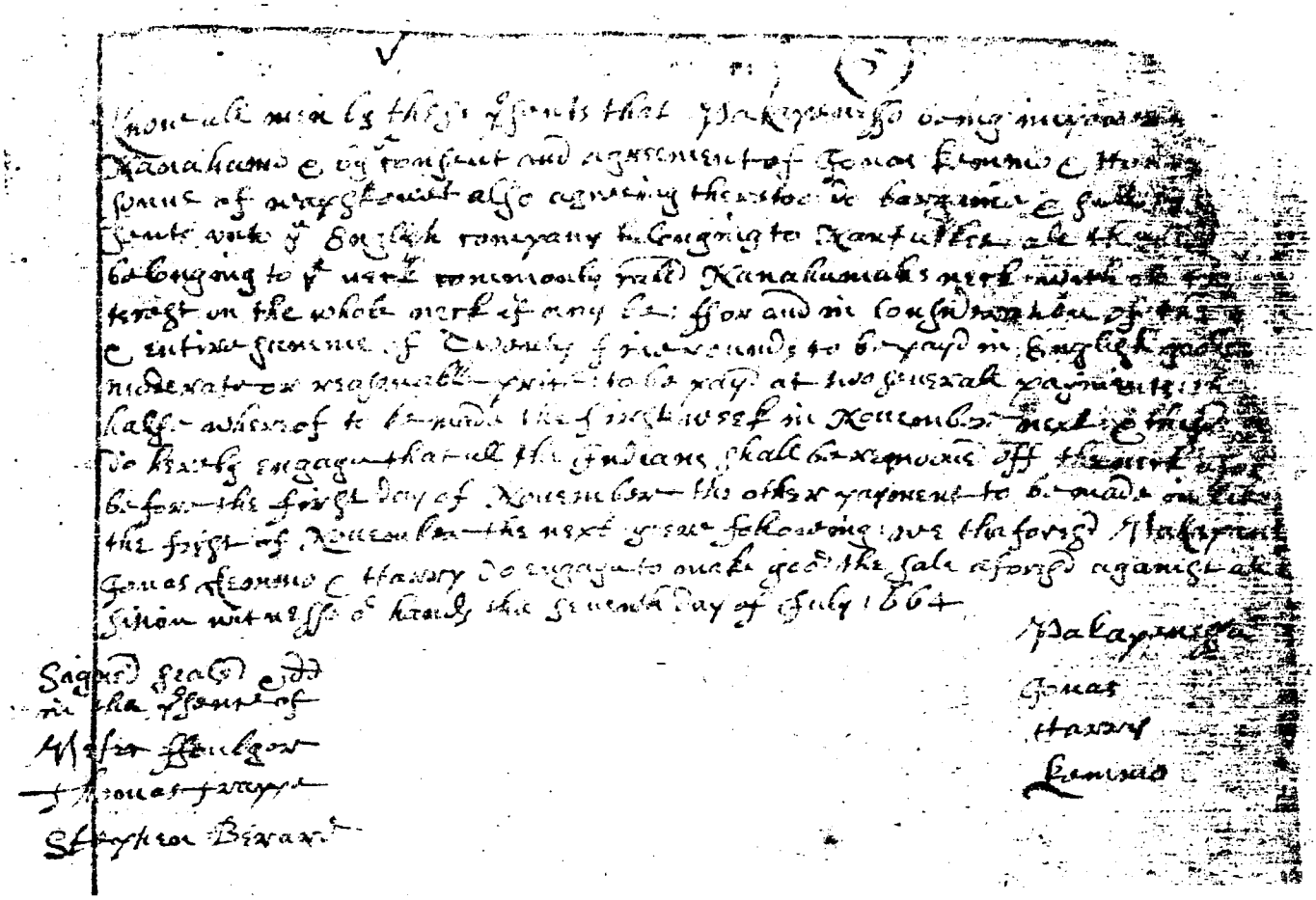


Figure 2. First Nantucket deed (1659), of "the Plain at the West End of Nantucket", and "the use of the meadow and to take wood", "according to the figure", for 12 pounds (NCD 4:93). Use of the wood at Ram Pasture, called The Long Trees, is possibly included in this deed. Note Sachem Nanahuma's mark. North is at 8 o'clock.



Know all men by these p'sents that Pakapenesso being impower--
Nanahumo & by consent and agreement of Jonas Kemmo & Harry
sonne of Wapskowet also agreeing theretoo: do bargaine & sell---
---unto ye English company belonging to Nantukket, all the old
fields belonging to ye neck commonly calld Nanahumahs neck with
all the -terest on the whole neck if any be: ffor and in
consideration of the - & entire summe of Twenty five pounds to be
payd in English goodes at - moderate or reasonable price: to be
payd at two generall payments:the halfe whereof to be made the
first week in November next: & the sd -- do hereby engage that all
the Indians shall be removed off the neck afor-- before the first
day of November. the other payment to be made in like -- the
first of November the next yeare following: ane thaforesd
Pakapanes- Jonas Kemmo & Harry do engage to make good the sale
aforesd against all --sesion witnesse oe hands the seventh day of
July 1664.

Signed sealed &dd
in the p'sense of
Peter ffoulger
Thomas Trappe
Stephen Bernard

Pakapenessa
Jonas
Harry
Kemmo

Figure 3. Facsimile and transcription of one of the earliest deeds to Ram Pasture (Nanahumah's Neck) (NCD 1b:5). Note that Indians were living on the Neck in 1664. Dashes indicate illegible or missing letters or words.

the drainage in the high middle part, a glacial drumlin (Oldale 1981), is poor (USDA 1979), and small swamps occur through out the high land.

The total area of Zone 1 on Nantucket has not yet been measured, but we estimate it for this study as less than half of the island or 65 square kilometers. Its site density is then at least 79/65, or 1.2 sites per square kilometer (Little 1983a). We used an overlay grid with a 1/2 inch mesh to measure areas on the 200 ft:inch map (Schofield Brothers Inc. 1975). Ram Pasture has approximately 2.2 square kilometers (not swamp or pond), 95% of which is in Zone 1, and thus we should expect to find at least three prehistoric sites, if our assumptions have been correct. Zone 1 marks an important area which should be carefully surveyed if any land use project is planned for areas within the zone.

Over the past 10,000 years the fresh water table may have changed. Although this problem is beyond the scope of this study, we call attention to it as of potential importance for the location of the oldest sites.

An analysis of the soils map (Figure 5) reveals that the drumlin in the middle region of Ram Pasture is best suited for agricultural purposes. The southern region and the northern region are poorly suited because of the excessive drainage of the sandy soil. It is, therefore, likely that any Indian farm sites would be located on the drumlin in the middle region. Interestingly, "The Woods" historically were located in the soils "well suited to agriculture" (USDA 1979) of the drumlin, and the 19th century farms which developed on the peninsula were also located on the drumlin. Ram Pasture presents a nice example of the variation of tree growth and land use with soil moisture on Nantucket (Little 1981b).

Locations of burial grounds, Zones 3 and 4, to date at Nantucket (Little 1983a) have been found on high land with good drainage. The southern section of Ram Pasture has sandy soil with good drainage, but the land is much lower than any burial ground yet discovered. The high middle section, the drumlin, does not have good drainage. It is not likely, therefore, that any burial grounds are located in the central section. If there are any burials, it is most likely that they would be found at high elevations in the sandy, hilly northern section.

RESULTS.

In our field survey of the land, flakes and sometimes shell were discovered in disturbed open areas, in eroding roads, in gravel pits, and in the areas where sites had been reported to us by informants or by collectors. Collections of artifacts exist which were found around the farm buildings, in plowed fields, and in gravel pits, by previous owners of the property. There is faunal material and pottery excavated from the Ram Pasture I site, in storage at the Nantucket Historical Association.

Altogether, reports, our surface hunting, and our informants provided evidence of nine prehistoric Indian sites, for a density of 4.1 per square kilometer (Table 1). These sites were located, in 7 out of the 9 cases, in areas which had been disturbed by historic or modern man. All were less than 200 m from fresh water and seven of the nine sites, or 78%, were located in the 100 m closest to water (Fig. 4).

Table 1. Measured Site Densities at Ram Pasture.

Distance from Water	Area (sq.km)	Number of Sites	Site Density
less than 100 m	1.4	7	5/km2
100-200m	.7	2	3/km2
more than 200m	.1	0	0
Total	2.2	9	4.1/km2

Interestingly, the southeast facing hillsides have a larger number of sites (5) than the northwest facing hillsides (2). This is thought to be a result of the prevailing northwest winter winds (Little 1983c), and implies that a site on the southeast of a hill, like RP-I, was probably a winter site.

Historic land use studies clearly can make significant contributions to understanding the archaeology of an area. In connection with the Ram Pasture farms, there once was a bridge across Hummock Pond, taken out by ice in the 1930's (Robert Mcgrath, 1983 personal communication). In the recent past Ram Pasture was managed as a hunting preserve, and has the sites of 14 duck blinds, and at least three gravel pits which were used to make roads (Timothy Lepore, 1983 personal communication). Aerial photographs (Assessors Office) show what appear to be airstrips, but are plowed fields which were planted with rye for birds (Robert Zaremba, 1983 personal communication). Owners of the two farms about 1850 were: Lot Palmer, Henry Coleman, May Brayton, William Wallace, and David G. Hussey (Gardner 1946). A number of previous owners or users who are still living have valuable historic land use information about Ram Pasture.

CONCLUSIONS.

We wish to emphasize that the sources of data about archaeological sites at Ram Pasture which we identified during two and a half weeks were greater than we could properly record and study. In particular, we discovered that there are a number of Nantucket people who could profitably be interviewed both to record their recollections of historic land use at Ram Pasture, and to catalogue their collections of Indian artifacts, many of which were recovered from Ram Pasture.

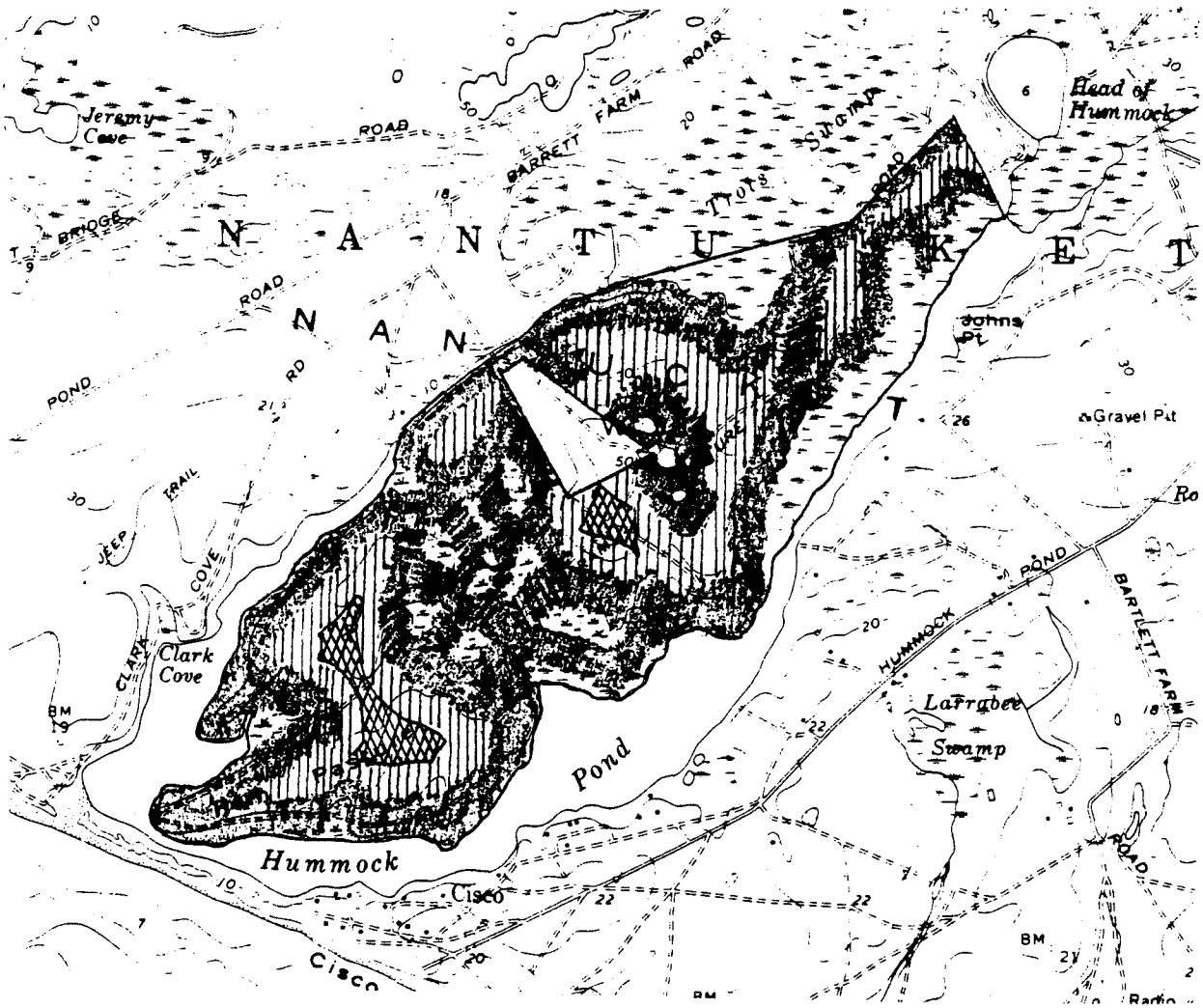


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Figure 4. Ram Pasture (USGS 1977) showing the area 100 m (meters) or less from fresh water (shaded), the area 200 m or less from fresh water (parallel lines), and the area more than 200 m from fresh water (cross hatched). The in-holding is unmarked.

LEGEND:

Soils poorly suited for agriculture-	Soils suited-	Soils well suited-
EvA, EvB, EvC	Rd	RfB
BE	Kp	WaA
ME		WaB

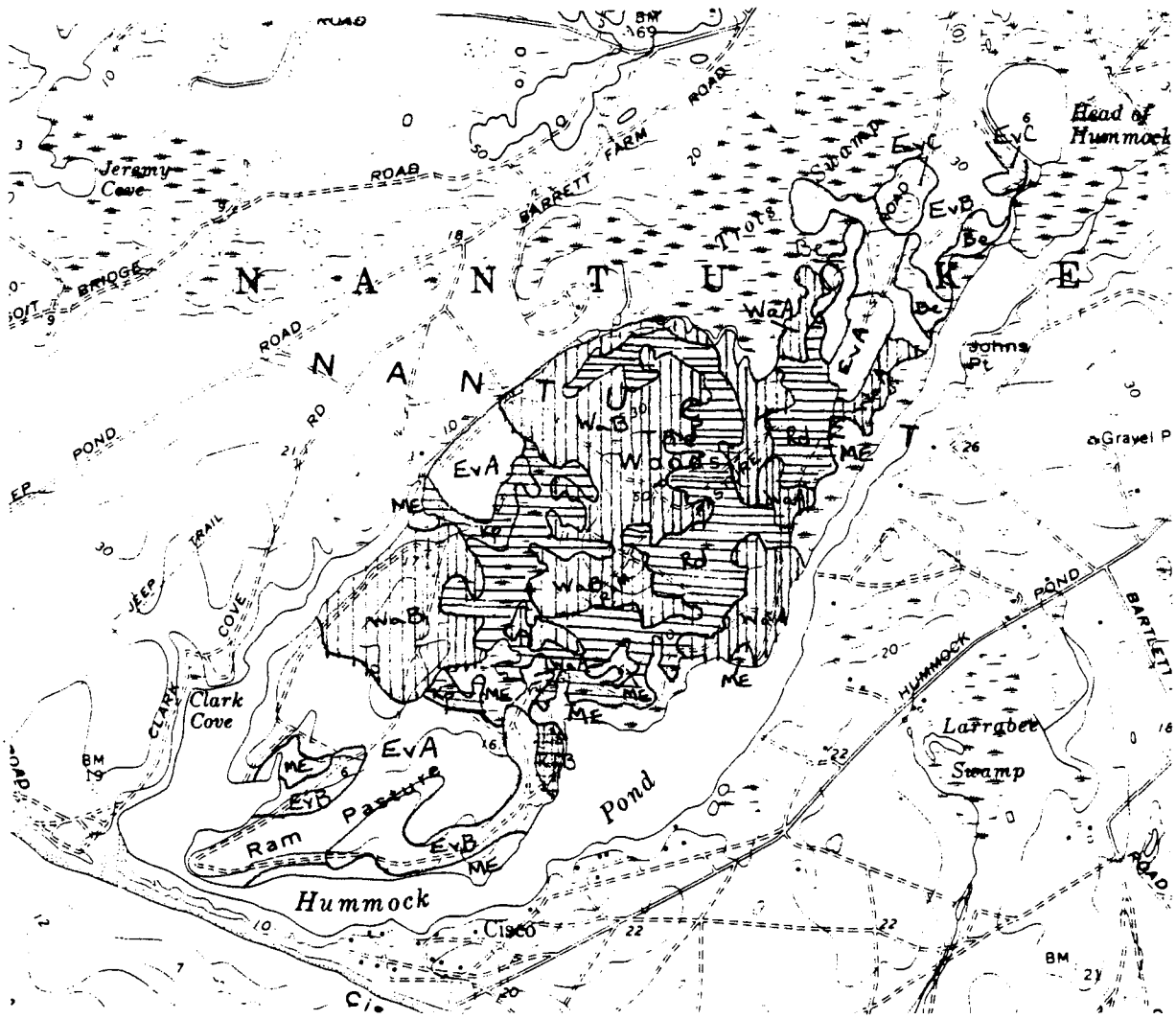

Figure 5. Map of Ram Pasture showing soils poorly suited, suited, and well suited to agriculture (USGS 1977; USDA 1979).

Archaeological excavations at Ram Pasture, unless fairly sophisticated, are not likely to increase our understanding of the artifacts that we have now in storage. Therefore, we recommend, on the basis of this preliminary archaeological survey, that the abundant available resources not requiring excavation form the basis for a thorough study of historic and prehistoric land use at Ram Pasture. A deed search could also be carried out for this land, and might add important land use details.

We found evidence for at least <u>three times</u> as many prehistoric sites as we expected on the basis of estimated Zone 1 site densities, but, as was the case in the 1978 survey, ca. 80% of the sites were within 100 m of fresh water. Too high an estimate for the area of Zone 1 can account for the low density estimate. Another explanation for the abundance of sites is that we put more energy into the study of one small area than has been put into other areas of the island. Another possibility is that Ram Pasture, which is secure, diversified, and today has an abundance of deer, had special value and thus more prehistoric sites than the average Nantucket land. Further tests such as this can help resolve these issues. We assume that still undiscovered sites exist.

The stability of the 4:1 ratio (Little 1983a) for the number of sites less than 100 meters from fresh water, compared to the number 100 to 200 meters from water, is interesting, and warrants further study, both to obtain additional data and to test various hypotheses.

Further analysis of the kinds of artifacts found could help explain what the prehistoric inhabitants were doing here, what they were eating, and when individual sites were occupied. That shell remains are found here, three kilometers from shellfish habitat, is unusual on Nantucket (Little 1983a).

Considerable effort is required to find Indian artifacts in land which is not disturbed. We found no archaeological evidence in presently vegetated roads, where N. O. Dunham and E. Brooks found sites which were recorded by the Massachusetts Archaeological Society in 1940. Conversely, disturbed land is likely to display artifacts, and, as a result, to attract pot hunters or vandals. Since most (80%) of the Ram Pasture sites were found as a result of historical or modern disturbances, minimizing or eliminating erosion and other disturbances of the land could go a long way toward the preservation of Indian sites. Can gravel pits be replanted?

Preserving Nantucket's archaeological heritage is a task of utmost importance and one which requires the cooperation of many. We hope this study will be helpful in conserving archaeological sites which may in the future produce vital information concerning Nantucket's past 10,000 years.

ACKNOWLEDGEMENTS.

The authors wish to acknowledge the encouragement and assistance of the Nantucket Conservation Foundation, Inc., and of Mr. James F. Lentowski, Executive Secretary, in the initiation and execution of this study. We are grateful, too, for the support of the Nantucket Historical Association, and especially for the use of the research materials at the Foulger Museum.

We also thank Olive Ingram, Dr. Timothy Lepore, Robert McGrath, Robert Zaremba, Nelson Olney Dunham, Ralph Hammond, Bernard Stockley, John Gilbert, Greg Cassidy, and Mel Crosby, for contributions to this study.

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APPENDICES.

Ram Pasture Excavation Archeologically Disappointing

BY EDWARD B. ANDERSON

Preliminary Report to Members:

The purpose of the 1973 Ram Pasture Excavation was twofold. First, to provide an opportunity for members, students and interested residents or visitors, in that order of priority, to learn modern archeological techniques under competent supervision. To provide this supervision we were very fortunate in having the assistance of Dr. Selina Johnson, Mr. Dan Crozier of Temple University and Miss Barbara Kranichfeld who has returned to the southwest to work on an Arizona State Excavation. The dedication and enthusiasm these three exceptionally able people brought to the field led to the success of the excavation as an educational venture. Over 40 volunteers participated in on-site training for periods of time up to its full 90-day duration. In addition, Miss Barbara Linebaugh arranged to have her history class from Nantucket High School spend some time on the dig, which they did under the same conditions as regular volunteers. To enhance the educational nature of our excavation the Nantucket Institute organized a series of lectures on archeology given during August in the Peter Foulger Museum.

The second objective of the excavation was archeological: to gather additional evidence from the site of the prehistoric Indian economy of Nantucket. Prior digging by the Shawkemo Chapter of the Massachusetts Archeological Society had yielded a rich assemblage of artifacts, living debris, architecture and pottery from what seemed to have been a site of long standing village settlement. The co-directors of the excavation, C. John Gilbert and Ted Anderson, agreed to a legal contract with the Nantucket Conservation Foundation, owner of the land on which the site is located, which provided for the collective disposition of all archeological evidence and records obtained from the dig, limitations on the extent and use of the land for excavation, a 90-day time limit on use and controlled access. We feel that on all counts both the Conservation Foundation and the Historical Association were pleased with this agreement and benefitted from the joint venture. Unfortunately the bulk of archeological evidence obtained was negative. We have very little concrete to show for our labors.

After setting up a grid based on two meter squares oriented on true north, we chose to open four squares in the northwest quadrant. It was proposed that two workers be daily assigned to work each square thus limiting the number of people on site to nine at any one time. This was felt to be a manageable number for the field supervisor to guide. One of the two workers assigned to each square was given the specific responsibility for the field notes on a rotating basis. As the excavation progressed the workers would learn through supervising each other's progress.

The surface survey of the northwest quadrant produced two features of interest. The first was a circle of vegetation of the type that has been thought of as evidence for an underlying floor and consequent Indian domestic architecture. With the aid of resources at the Maria Mitchell Library, Dr. Johnson identified this plant growth as a species of rush. While dense growth was limited to an obvious circle, the rush grows profusely throughout the area. One square was opened in this "Rush Circle" in hopes of locating some architectural features. There was none. In fact, that square, N2W2, was completely sterile right down to glacial deposit.

The second surface feature of interest was a small circular mound in square N10W2. (Each square was given the number of the location of its southwest corner on the grid system. N10W2 is 10 meters north of the east-west grid line and 2 meters west of the north-south line.) It was therefore decided to excavate that area. Since the agreed maximum dimension of the area under excavation would be 15 meters the two squares chosen by surface features of interest determined the north-south limits of the dig. The remaining two squares initially opened were N4W4 and N6W2.

Of the four squares only N10W2 proved productive. The questionable circular mound was soon identified as an abandoned ant hill, one of many in the area. Our two most interesting artifacts came from N10W2, a turtle backed point and a flake scraper, both quite common to the Island. Both were found within 15 cms. of the surface. Both N10W2 and N6W2 yielded small quantities of flaked by-products of implement manufacture. The squares to the south being sterile it was decided to investigate the quadrant further to the north despite the danger of encroaching on the previously disturbed area. After closing N2W2 and N4W4, N26W2 was opened and identified as within the grid of the former excavation. N24W6 was barely underway before we closed the dig for the season but gave considerable evidence of containing a fire hearth.

On October 31, the 90th day of the agreement, the dig was closed out by Ted Anderson and Barbara Kranichfeld. To restore the land as nearly as possible to its original appearance, the trenches were filled, reseeded and the general area picked up. The terminal depth of N10W2 was 54 cms.; N6W2, 72 cms.; N26W2, south half 52 cms., north half 42 cms.; N24W6, 27 cms.

Appendix 1. Ram Pasture Excavation...(Anderson 1974). Reprinted by permission of Nantucket Historical Association.

SOME UNUSUAL ARTIFACTS FROM RAM PASTURE I, NANTUCKET, MASS.

BERNARD H. STOCKLEY

(Illustrations by Patricia Gardner)

In the early summer of 1962 the Shawkemo Chapter of the Massachusetts Archaeological Society began excavation, under the direction of the author, of a village site near the shore of Hummock Pond on Nantucket Island, Mass. During the 1962 season a total of 1710 square feet was excavated, and evidence of a two-culture (Late Archaic and Ceramic-Agricultural) sequence was found. Work will continue at the site, known as "Ram Pasture I" through 1963 and possibly for several more seasons. A total of 359 artifacts, exclusive of potsherds, were found during the first season, and 60 archaeological "features" — fire and refuse pits, hearths, and a possible burial were excavated.

A few of the artifacts are unusual, and it seems desirable to describe them at this time rather than wait until publication of a full report some years hence. The first of these unusual artifacts is a complete ceramic obtuse angle pipe (Fig. 14, No. 1). This is made of light brown clay, well fired and quite durable. No tempering material could be observed. Incised decoration is in the shape of diamonds on one side of the bowl but degenerates to rather random triangles on the opposite side, giving the impression of a hasty and haphazard job.

Fragments of at least 8 other ceramic pipes were found. All appear to have been similar in style to the complete specimen, but with considerable variation in design elements and workmanship. One bowl fragment has a small portion of an incised decoration composed of two parallel lines in a geometric pattern, and several different bowls are decorated with tiny, close-spaced, dentate circles covering most of the bowl. One bowl has the tiny dentate circles widely spaced in what appears to be a chevron pattern. The tool which was used to make the circles might have been the end of a small reed or a small bone. Surface decoration was found only on the pipe bowls. Stem shape is usually round, as in the complete pipe, but one is nearly square in cross section. One stem was found with small patches of graphite adhering to the surface.

Close study of the complete pipe and the fragments has provided some information that indicates the probable method of manufacture. The interiors of the stems, as well as some of the bowls, have shallow lengthwise striations which show quite clearly that reeds or small straight twigs were the "form" over which the stems were shaped, and that a larger stick was used as a "form" for the bowl. One bowl fragment, in which the stem hole continues on through the distal end of the bowl, indicates that the "form" was not made in one piece — as might have been done by inserting the stem "form" into a hole drilled at an angle into the bowl "form". The outside of the complete pipe and many of the fragments show marks of a scraping tool.

These observations lead to the hypothesis that the clay was first applied over the "form" in a rough shape. Then, when the clay had partially dried but was still slightly plastic, it was carved and scraped until the desired shape was attained. If smoothing or decoration were to be done it would also be done at this time. The "green" pipe would then be set aside until it had dried completely, after which it would be fired, by whatever method was used, "form" and all. In the firing process the "form" would be wholly or partially burned out perhaps leaving a little charcoal to be poked out of the stem or bowl. The completed pipe could then be painted with graphite or some other pigment if desired. Probably a reed was then inserted into the stem to serve as a mouthpiece.

The second unusual artifact is a bone amulet or gorget, (Fig. 14, No. 2). This was identified by Joseph H. Waters of the Zoology Department, Duke University, as a vertebra of a small whale, probably Blackfish *(Globicephela malaena)*, which has been shaped and bored. This artifact appears to be unique. A search of available literature turned up only a few reports of bone gorgets. None of these were similar to the illustrated specimen.

Pieces of whalebone were found in several of the refuse pits. However, neither these nor the gorget can be taken as evidence of prehistoric whaling. Whales are occasionally washed ashore on Nantucket even now, although they are now less plentiful in the surrounding waters than they must have been in prehistoric times. Stranded whales were probably the source of the bone found in the pits and the raw material for the gorget.

The third and last of these unusual artifacts is a Large Triangular projectile point (Fig. 14, No. 3). It is of particular interest because of its extreme size

Appendix 2. Some Unusual Artifacts from Ram Pasture I...(Stockley 1964). Reprinted by permission of Bernard H. Stockley, and Trustees of the Massachusetts Archaeological Society.

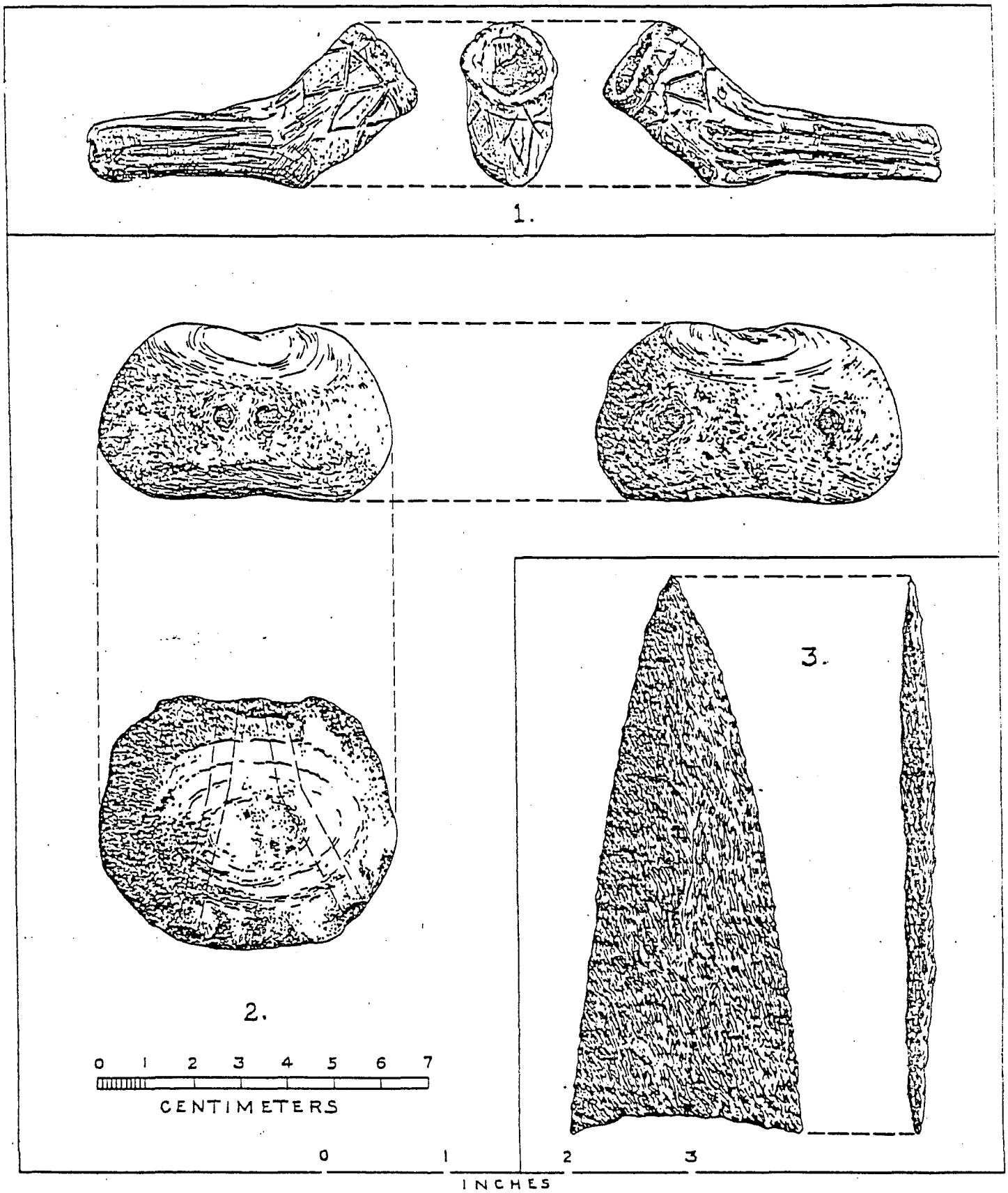

Fig. 14. ARTIFACTS FROM THE CERAMIC-AGRICULTURAL COMPONENT, RAM PASTURE I, Nantucket, Mass. 1, Ceramic Obtuse Angle Pipe; 2, Whalebone Gorget; 3, Large Triangular Projectile Point.

for this type of point, and for its superb craftsmanship. The material is a medium gray, fine grained igneous rock with light colored phenocrysts of feldspar. Overall length is 4½", width at the base is 1⅞", maximum thickness is about 3/16".

All of these artifacts were found in pits of the Ceramic-Agricultural period. The pit containing the pipe may have been a burial. Badly decayed bones found in the pit were identified as a "Possible part of a radius or ulna of a small or immature person." Other evidence in the pit also indicated a possible ceremonial burial.

Nantucket, Mass.
May 2, 1963

PRELIMINARY REPORT, RAM PASTURE I, A STRATIFIED SITE ON NANTUCKET ISLAND, MASSACHUSETTS

By Bernard H. Stockley

Excavations at the site known as Ram Pasture I (M52/31) on Nantucket Island, Massachusetts, were conducted by the Shawkemo Chapter of the Massachusetts Archaeological Society from June, 1962 to December, 1963, on a part-time basis. Because of the importance of the site a longer schedule of excavations was planned, but the work was halted by one of the property owners after the second season.

Ram Pasture I is a village site located on the shore of Hummock Pond, west of the center of Nantucket Island. It was first occupied during the Late Archaic Period, and apparently more or less continuously through the remainder of the Late Archaic Period, throughout the Woodland Period and into early Contact times. While the trait lists of both Late Archaic and Woodland components are generally similar to their mainland counterparts, there are some noticeable differences. At this time it is impossible to state whether these differences represent local adaptations, cultural lag, or a combination of the two.

Artifacts associated with the Late Archaic occupation include: small triangular projectile points with excurvate sides and concave bases; large and small "eared" projectile points with side notches and concave bases; side-notched, straight-based projectile points; ovate knives; plain gouge; ellipsoid, bi-truncate slate gorget.

Small stemmed projectile points (using the M.A.S. classification system which specifically exempts small "eared" points from this category), and fragments of steatite vessels were not found. Both are common on the Late Archaic sites on the nearby Massachusetts mainland.

Charcoal-filled small pits, and small pits containing only an occasional chip were also associated with this component. A radiocarbon specimen from one of the charcoal pits was dated by the University of Michigan Laboratory (M-1502) at A.D. 940. This date seems to be obviously erroneous, but further radiocarbon testing is expected to establish whether the date is accurate or not.

In the Woodland component the projectile points were almost entirely (more than 95%) broad-based triangulars with relatively straight sides and straight to slightly concave bases. Other artifact types include: stemmed and flake knives; crescent base and expanded base drills; side and stemmed scrapers; plain gouges; plano-convex adz; ellipsoid bi-truncate and "winged" gorgets; hammerstones; ovate and stemmed spades; pestle; ceramic obtuse-angle pipes; straight-sided, shell-tempered, cord-paddled pottery; bone needles or bodkins; bone amulet or gorget.

Trade goods were extremely sparse, consisting of: four blue-green glass beads, one small fragment of glazed pottery, one rolled copper bead, and copper scraps.

The ceramic pipes found at this site are deserving of special note. This type of pipe is not common in Southern New England and the fact that one complete pipe and fragments of at least 10 others were found in an area of less than 3,000 square feet is quite remarkable. While the complete specimen has an incised design of diamonds and triangles, and two others have diamond or chevron patterns, the most common type of surface decoration is reed punctation. Although reed punctation is not commonly used on pipes in any part of the Eastern United States, the motif is frequently used on pottery in the vicinity of New Jersey and the Chesapeake Bay. Elbow pipes and straight-sided triangular points are also common in the same area. It therefore seems likely that the cultural affinities of the Woodland occupants of Ram Pasture I are closer to areas south of the Hudson River than to the mainland of Massachusetts or even to the eastern end of Nantucket Island. Excavations at the eastern end of Nantucket Island in Woodland-period shellheaps produced a very different trait list. Straight-sided triangular projectile points were present but were not the predominant projectile-point type, and ceramic pipes were not found. A similar pattern is now developing at the Shawkemo Chapter's excavation at the Norcross site (M52/9) near the eastern end of Nantucket Island.

While much remains to be learned about the prehistory of Nantucket, the evidence that has been unearthed to date concerning the Woodland period seems to bear out a tradition that was reported to the first settlers of Nantucket by the local Indians. According to this tradition, the people of the eastern and the western parts of Nantucket had been warring on each other for an extended period of time until about 1630. At that time, goes the tradition, the island was divided and the boundaries of each group's lands established. There is some evidence, both historical and archeological, which tends to support this tradition, but which falls beyond the scope of this paper.

Appendix 3. Preliminary Report, Ram Pasture I... (Stockley 1965).
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ANIMAL REMAINS FROM SOME NEW ENGLAND WOODLAND SITES

by Joseph H. Waters

INTRODUCTION

Some animals used as food by late Archaic and Woodland cultural groups in New England have previously been analyzed (Waters, 1962a). However, as pointed out in that report, only a small portion of the New England area was represented. Recently, animal remains from two areas not represented - Connecticut and Nantucket - have been analyzed, as well as a good sample from Maine. Materials were obtained only from Woodland horizons, but add significant new information. The Connecticut site is of particular interest because materials therefrom date from the initial period of European occupation of that area.

Animal remains and data regarding the sites were kindly provided by the following: Mr. Bernard H. Stockley of Nantucket, Massachusetts; Mr. Harold E. Brown of Bath, Maine; Mr. Bert Salwen of Bennington College (Bennington, Vermont). I am particularly grateful to Mr. Salwen for permission to use the accurate dates he derived for the Connecticut materials. Identification of skeletal materials was aided in various ways by the following: Dr. Joseph R. Bailey of the Department of Zoology at Duke University; Dr. Sheldon P. Applegate of the Los Angeles County Museum (formerly at Duke University); Dr. Frederick S. Barkalow of the Department of Zoology at North Carolina State College; Dr. David H. Johnson and Dr. Phillip S. Humphrey of the U.S. National Museum; Mr. Charles W. Mack, Dr. Raymond S. Paynter, Jr., Dr. Ernest E. Williams, and Mrs. Myvanwy M. Dick of the Museum of Comparative Zoology at Harvard College; Dr. Richard H. Backus and Mr. Richard Haedrich of the Woods Hole Oceanographic Institution.

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DESCRIPTION OF SITES

The Pocomo Site on Nantucket Island (Fig.1), although less than ten feet above mean sea level, is about 200 yards from the nearest salt water, and about one-half mile from the nearest fresh water (a spring). The soil is sandy, and shells and artifacts extend from the topsoil down to about eighteen inches. The site is at least partly post-contact. Artifacts from the late Archaic cultural period have not yet been found, but less than fifty square feet have been excavated to date.

The Ram Pasture Site I on Nantucket Island (Fig. 1) is about 450 feet northwest of the northern end of Hummock Pond, on a sandy knoll less than fifteen feet above mean sea level. Hummock Pond, closed off from the sea and entirely fresh water, is not known to have been open to the sea within historic times. The overlying humus is six to seven inches deep, and the underlying sandy subsoil is about twenty inches deep. Beneath the latter is sand and gravel. Shells and Woodland artifacts were found primarily in the top six or seven inches of soil. Late Archaic artifacts were found in the upper eight inches of the underlying sandy subsoil, but refuse pits in which skeletal remains were located are all assignable to the Woodland cultural period. Maximum age of the Woodland stratum is not known, but there is definite evidence that the upper level is at least partly post-contact.

ANIMAL SPECIES IDENTIFIED

Species identified are listed in Table 1. All mammal species except the Indian Dog and the Sea Mink are still in existence, and all species were in existence when Europeans first arrived in North America. All bird species except the Great Auk are still in existence, and the latter was apparently seasonally common when Europeans first arrived in New England. The Eskimo Curlew is presently very rare. All species of turtles, fish, and shellfish identified are still in existence. The Sea Sturgeon is reduced in numbers.

Most existing species still occur in the vicinity of sites from which they were identified. Beavers were eliminated from southern New England after the arrival of Europeans, but have since been re-introduced into many areas. Black Bears no longer occur in southeastern and extreme southern New England, but are still common in some parts of northern New England. Turkeys were eliminated from New England in the last century, but have been re-introduced into western Massachusetts and Naushon Island.

PARTIAL ANALYSIS OF SITES

Ram Pasture Site I.-- One striking feature of this site is the paucity of mammal species represented (Table 1). White-tailed Deer of all ages (primarily two- to four-year-olds) were used in large numbers, but remains of only one Indian Dog, Meadow Vole, and Blackfish Whale were found. All mammals eaten could have been taken at any time of the year. The Blackfish Whale may have been one that drifted or was driven ashore (e.g., by a Killer Whale).

Appendix 4. Animal Remains...(excerpts)(Waters 1965). Reprinted by permission of Archaeological Society of Connecticut.

The only bird remains found at this site were those of two ducks. It is possible that the Common Eider was taken on Hummock Pond, but more likely that it was taken offshore by boat in winter (see: Griscom and Snyder, 1955). As the other duck could not be identified to species, no comment is warranted.

The Sea Sturgeon were probably harpooned offshore from a boat. They were all large adults, and could probably have been taken at any time of the year. The Sand Shark could have been taken near the shore any time from June to November, and the Sea Robin was probably taken near shore in May or June (Bigelow and Schroeder, 1953). All shellfish (all marine species) could have been taken at any time of the year along or near the shore.

In summary, this site was probably occupied year round. Animals were used as they were or became available. Some terrestrial mammals were consumed, but a major portion of the diet came from the sea.

Pocomo Site.-- Aside from the Norway Rat, the only mammal remains were those of White-tailed Deer (Table 1). The Norway Rat must have come over on a European ship. The only bird identified was an Eskimo Curlew. This bird is now nearly extinct. In the early 1800's, before its numbers were greatly reduced, it occurred irregularly in spring and fall along the Massachusetts coast (Griscom and Snyder, 1955). The Box Turtles could have been taken on land any time from spring to fall (Carr, 1952). The Sea Sturgeon could have been harpooned offshore at any time of the year. The Sea Catfish was also probably taken offshore. The shellfish could have been collected at any time of the year along or near the shore.

This site, even though it is at least partly post-contact, has not yet yielded evidence of use of European domestic animals by the occupants. Perhaps it was occupied just prior to permanent European occupation of Nantucket.

DISCUSSION

Several animal species, used as food by New England Woodland peoples, are added by this study to those previously identified by Waters (1962a). New species include: Cow, Sheep, Pig, Bobcat, Cottontail Rabbit, Porcupine, Skunk, Norway Rat, Otter, Meadow Vole, Gray Squirrel, Ruffed Grouse, Brant, Oldsquaw, Common Eider, Eskimo Curlew, Turkey, Box Turtle, Painted Turtle, Striped Bass, Sea Catfish, Barracuda, Tautog, Bluefish, Sand Shark, White Shark, Waved Whelk, Oyster Drill, Flat Slipper, and Ribbed Mussel.

Some species identified by MacCurdy (1914) at a coastal Connecticut site (probably Archaic) were not found at the Fort Shantok site: Porcupine, White-footed Mouse (Peromyscus leucopus), Wapiti (Cervus canadensis), and Blackfish Whale. All except possibly the Wapiti were probably available to the Fort Shantok people, even though the site is probably 1000 years or more younger than MacCurdy's site. Species found at the Fort Shantok site but not at MacCurdy's site were probably available to occupants of the latter: Woodchuck, Cottontail Rabbit, Skunk, Otter, Ruffed Grouse, Canada Goose, Painted Turtle, and all the fish. In short, apparent differences are largely due to collecting artifacts and/or failure of some materials to be preserved.

Bullen and Brooks have identified animal remains on Nantucket from a late pre-contact site (1947: Squam Pond), and one thought to be at least partly early post-contact (1949: Herrecater Swamp) that is overlain by a Colonial horizon. They did not find some species identified in the present study: Indian Dog, Gray Fox, Norway Rat, Blackfish Whale, Eskimo Curlew, Box Turtle, or any of the fish. At the Squam Pond Site they found some species not found in the present study: Gray Seal (Halichoerus grypus), Common Loon (Gavia immer), two marine snails (Nassarius trivittata, Polygyra thyroidus), and a terrestrial snail (Anguispira alternata). They also found some species at the Herrecater Swamp Site not found on Nantucket in the present study: Cow, Pig, House Cat, Teal (Anas sp.), Cormorant (Phalacrocorax sp.), Laughing Gull (Larus atricilla), Brant, Loon (Gavia sp.), Domestic Hen, and Sculpin (?). It is probable that all species were available to occupants of all four sites, except for domestic animals.

It is of some interest to compare the Nantucket sites with some Woodland sites on Cape Cod. Moffett (1946) discusses some sites excavated at Truro, Massachusetts (outer Cape Cod). He notes that in these sites there was an overlying Woodland stratum with shell and bone, and an underlying late Archaic stratum without shell or bone. This was also the case at the Ram Pasture Site I and the Lagoon Pond Site on Martha's Vineyard (Huntington, 1959). Moffett mentions bones of White-tailed Deer (also found on Nantucket). Bullen and Brooks (1948) excavated some late pre-contact Woodland shell heaps on Sandy Neck in Barnstable, Massachusetts (middle Cape Cod, north shore). They identified remains of several species also found on Nantucket, and some not found there: Raccoon, Heath Hen (Tympanuchus cupido), Great Auk, Blue Mussel, and Razor Clam (Ensis directus). Waters (1962a) discusses animal remains from Woodland shell heaps at Orleans (outer Cape Cod) and West Wareham (inner Cape Cod, south side), and mentions some additional species not found on Nantucket: Black Bear, Woodchuck, Sea Mink, Harbor Seal, and Bloody Clam (Arca pexata).

It is obvious that the Nantucket sites are structured similar to those on Cape Cod. Some species found on Cape Cod may never have occurred on Nantucket. However, it is felt that others - e.g., Great Auk, Harbor Seal - were found on or near Nantucket at the times the sites were occupied. Additional work may turn up remains of these and other species.

Remains of more species were found in Woodland sites on Martha's Vineyard than on Nantucket. Waters (1962a) mentions several species found at the Lagoon Pond Site (Martha's Vineyard) that were not found on Nantucket: Beaver, Red Fox, (Vulpes fulva),

Table 1.-- Animals identified at four New England Woodland sites.

SPECIES	NUMBER PER SITE (Adults unless otherwise noted)			
	Basin	Fort Shantok	Ram Pasture	Pocomo
MAMMALS				
White-tailed Deer (*Odocoileus virginianus*)	20+	54+	21+	8+
Moose (*Alces alces*)	2			
Black Bear (*Ursus americanus*)	2	2		
Raccoon (*Procyon lotor*)	2	9		
Sea Mink (*Mustela macrodon*)	1			
Otter (*Lutra canadensis*)		2		
Skunk (*Mephitis mephitis*)		7		
Indian Dog (*Canis Familiaris*)	6	1	1	
Gray Fox (*Urocyon cinereoargenteus*)		1?		
Bobcat (*Lynx rufus*)	1	1		
Harbor Seal (*Phoca vitulina*)	2			
Gray Squirrel (*Sciurus carolinensis*)		3		
Woodchuck (*Marmota monax*)	3	7		
Beaver (*Castor canadensis*)	3	4		
Meadow Vole (*Microtus pennsylvanicus*)		1	1	
Norway Rat (*Rattus norvegicus*)				1
Porcupine (*Erethizon dorsatum*)	1			
Cottontail Rabbit (*Sylvilagus* sp.)		1		
Blackfish Whale (*Globicephala melaena*)			1	
Pig (*Sus scrofa*)		1		
Sheep (*Ovis* sp.)		9		
Cow (*Bos taurus*)		6		
Horse (*Equus caballus*)		2		
BIRDS				
Canada Goose (*Branta canadensis*)	2	4		
Brant (*Branta bernicla*)	2			
Mallard (*Anas platyrhynchos*)	1			
Anas sp.			1	
Old-squaw (*Clangula hyemalis*)	1			
Common Eider (*Somateria mollissima*)	1		1	
Ruffed Grouse (*Bonasa umbellus*)		3		
Turkey (*Maleagris gallopavo*)		6		
Eskimo Curlew (*Numenius borealis*)				1
Great Auk (*Plautus impennis*)	5			
TURTLES				
Snapping Turtle (*Chelydra serpentina*)	1	9		
Box Turtle (*Terrapene carolina*)				2
Painted Turtle (*Chrysemys picta*)		1?		
FISH				
Sand Shark (*Carcharias taurus*)			1	
White Shark (*Carcharodon carcharias*)		1		
Sea Sturgeon (*Acipenser oxyrhynchus*)	3+	9 Adults 4 Young	3+	1
Northern Barracuda (*Sphyraena borealis*)		1		
Bluefish (*Pomatomus saltatrix*)		3		
Striped Bass (*Roccus saxatilis*)	8+	1		
Common Sea Robin (*Prionotus carolinus*)			1	
Tautog (*Tautoga onitis*)		10		
Sea Catfish (*Galeichthys felis*)		1		
SHELLFISH		(*)		
Virginia Oyster (*Ostrea virginica*)			Present	Present
Bay Scallop (*Pecten irradians*)			Present	Present
Blue Mussel (*Mytilus edulis*)	Present			
Quahog (*Venus mercenaria*)	Present		Present	Present
Ribbed Mussel (*Volsella plicatulus*)			Present	
Surf Clam (*Spisula solidissima*)			Present	
Long Clam (*Mya arenaria*)	Present		Present	Present
Common Northern Moon Shell (*Polinices heros*)	Present		Present	Present
Flat Slipper (*Crepidula plana*)			Present	
Boat Shell (*Crepidula fornicata*)	Present		Present	Present
Channeled Pear Conch (*Busycon canaliculatum*)			Present	Present
Knobbed Pear Conch (*Busycon caricum*)			Present	Present
Waved Whelk (*Buccinium undatum*)	Present			Present
Oyster Drill (*Urosalpinx cinerea*)				Present

Gray Fox, Black Bear, Mink (Mustela vison), Red Squirrel (Tamiasciurus hudsonicus), Harbor Seal, Red-throated Loon (Gavia stellata), Common Loon (Gavia immer), Great Blue Heron (Ardea herodias), Red-tailed Hawk (Buteo jamaicensis), Bald Eagle (Haliaeetus leucocephalus), Great Auk, Snapping Turtle, Plymouth Turtle (Pseudemys rubriventris bangsi), Roughtail Sting Ray (Dasyatis centroura), Black Seabass (Centropristes striatus), Sculpin (?), Scup (Stenotomus chrysops), Wolffish (Anarhichas sp.), Blue Mussel, Lobed Moon Shell (Polinices duplicata), and Thick-lipped Drill (Eupleura caudata). Byers and Johnson (1940) found some additional species at two other Woodland sites on Martha's Vineyard: Muskrat (Ondatra zibethica), Raccoon, Skunk, Otter, and Cottontail Rabbit. It is felt, although there is no confirming evidence, that at least some of these terrestrial and fresh water vertebrates, and all the marine animals, were also available to the Nantucket people. The Snapping Turtle is common on Nantucket today, and the Plymouth Turtle may also have occurred there (see: Waters, 1962b). It is felt that additional work on Nantucket may turn up remains of some of these species.

Evidence produced to date suggests that the people of Nantucket used proportionally more marine animals for food than did the people of Cape Cod, Martha's Vineyard, the Basin Site, and certainly the Fort Shantok Site. Apparently some species of fresh water and terrestrial vertebrates did not occur on Nantucket, and perhaps populations of those that did were small (except White-tailed Deer). The Nantucket people may have been forced to look more to the sea for food.

It appears that food-gathering and dietary patterns were similar at the four sites. Differences noted herein resulted from differences in the local fauna - differences in species composition and relative population sizes. Occupants of the sites were opportunistic. That is, they consumed any edible species (not prohibited by taboos) that could be obtained. Shellfish were gathered by hand. Small fish were probably taken by hook and line, nets, and perhaps spears. There is no evidence of fish traps at any of the sites. Large fish (sharks, sturgeon) were probably taken by harpoon - from boats, or from the shore. Occasionally, a Blackfish Whale might be trapped in shallow water and taken by hand. The seals may have been taken by hand, or by weapons on shore, or they may have been harpooned in the water. Terrestrial mammals and birds, and otters (fresh water) were probably taken largely by bow and/or spear, as were most waterfowl. Some of the latter (e.g., Common Eider, Oldsquaw) may have been taken offshore from boats. Occupants of the sites probably did not travel far to hunt. They could obtain what they needed nearby.

It is of interest to note that remains of snakes and amphibians were not found in any of the four sites. This coincides with previous findings at other New England Woodland sites (Waters, 1962a). It is also of interest that shells were not associated with the late Archaic stratum of the Ram Pasture Site I - also coincident with previous findings (Waters, op. cit.). However, it must be noted that shells have been found in sites of the late Archaic time period on Long Island (Ritchie, 1959; Salwen, 1962) and in the lower Hudson River Valley (Ritchie, 1958; Salwen, op. cit.). It becomes increasingly difficult to accept the hypothesis that there were taboos against the use of shellfish in southeastern New England late Archaic peoples, but not in contemporary populations immediately to the south and southwest. It seems more likely that sites excavated to date in New England were well inland at the time of occupation, and that those near the coast (where shellfish were probably used) are now submerged. Additional study of coastal sites, and of relative sea level fluctuations, is badly needed before this matter can be finally resolved.

Appendix 5. Soils map of Ram Pasture (USDA 1979).