4-1954

Bulletin of the Massachusetts Archaeological Society, Vol. 15, No. 3

Massachusetts Archaeological Society

Follow this and additional works at: https://vc.bridgew.edu/bmas

Part of the Archaeological Anthropology Commons

Copyright
© 1954 Massachusetts Archaeological Society

This item is available as part of Virtual Commons, the open-access institutional repository of Bridgewater State University, Bridgewater, Massachusetts.
Contents

AGRICULTURAL TOOLS AND TECHNIQUES
OF THE NORTHEAST ........................................... William S. Fowler
PREMONITION SPIRITS ........................................... Nicholas N. Smith
A WORK SHOP AT LAKE TACOMA (MAINE) ............ Gerald C. Dunn
SOME SAMPLES OF RED OCHRE .............................. Ross Moffett

PUBLISHED BY THE
MASSACHUSETTS ARCHAEOLOGICAL SOCIETY, INC.

MAURICE ROBBINS, Editor, 23 Steere Street, Attleboro, Mass.
WILLIAM S. FOWLER, Secretary, Bronson Museum, 8 No. Main Street, Attleboro
AGRICULTURAL TOOLS AND TECHNIQUES OF THE NORTHEAST

By William S. Fowler

FOREWORD

Research in the fields of archaeology and history has already exposed some of the aboriginal implements used by Indian agriculturists of the Northeast, especially as it relates to New England. Early historical commentators, such as Samuel de Champlain, William Wood, J. F. Lafitau and others have partly lifted the veil and have revealed some native agricultural tools and activities of their day, but with only superficial reference to such matters. Much of this information has been recorded in a previous paper by the author: “Triangular Hoes of the Northeast and Their Diffusion,” Bulletin of the Massachusetts Archaeological Society, Vol. 9, No. 4, pp. 83-88. However, for the purpose of clarification, since this evidence in part forms the basis of this paper, it may be well to restate it and include additional related evidence. Also, in order to condition one’s thinking in respect to the passage of time, it should be recalled that certain carbon-14 measurements in New York State suggest that agriculture has been practiced in the Northeast since about 800 B.C. if its introduction approximates that of ceramics as is generally believed. In this long period of more than 2000 years, before the coming of the Pilgrims, a slow advance in agrarian activities seems to have taken place continually hampered, no doubt, by the male preference for hunting and fishing; all evidence with but a few exceptions points to agriculture as a female occupation. Therefore, it may be assumed that at the start, woman seized the opportunity shunned by man to learn how to raise maize, beans, squash, and pumpkins; how best to cultivate the soil; and what sort of implements to invent or adopt for agricultural uses.

HISTORICAL EVIDENCE

From the pen of early commentators it now seems evident that there were various kinds of cultivating tools in use during the protohistoric age in different sections of the country. Their composition, no doubt, depended somewhat upon available materials and existing conditions indigenous to their respective localities. In 1604, Samuel de Champlain explored the coast of New England; found some coastal people near Cape Ann using as he relates: “an instrument of the very hard wood shaped like a spade, in place of ploughs.” Somewhat later, William Wood and Roger Williams report seeing native women about Boston using clam shells for hoes, and remark how free from weeds they kept their corn hills. Williams goes on to say that formerly hoes were of stone in these words: “Stone formerly being to them in stead of Knives, Awleblades, Hatchets and Howes.” He further states: “They (women) plant, gather, barne and beat it (maize).” J. F. Lafitau, a French explorer of the early 18th Century, illustrates Huron squaws of the St. Lawrence River basin cultivating flat topped oval corn hills with triangular pointed hoe blades, presumably of stone and hafted at the end of wooden handles. This seems to present historical confirmation of archaeological discoveries made by the author, which reveal similar stone triangular hoe blades with pointed bits, sometimes blunted, and with thick oblique bases (Fig. 15, Nos. 1-3). This kind of artifact has a wide distribution extending into New York State, and has a greater frequency than other types of hoe blades. Of lesser note is a stemmed stone hoe blade that has either a straight edged bit, or one shaped more or less like the bowl of a spoon (Fig. 15, Nos. 4, 5).

In other parts of the country at the close of the 19th Century, mention is made of various investigators for the Bureau of American Ethnology of other agricultural equipment and techniques. O. Dorsey says that the Omaha Indians use the shoulder blades of buffalo for hoes. Gerald Fowke states that chipped oval and pointed flint spade blades are used by Plains tribes of the Mississippi Valley, some side notched for hafting. Similar blades have been found in several exhumed graves at Casa Granda, Arizona; are presumed in this instance to have been used for digging these grave shafts. Also, similar recoveries have come from the Alabama mounds. E. T. Denig, who married Hae-kees-kak-wee-lak (Deer Little Woman) an Assiniboin and who for 21 years lived with these Indians, relates: “The labor attendant on planting and raising crops of maize is performed by the women, while the men hunt like the surrounding tribes; work of this description, as their present ideas exist, being a disgrace to the males.” J. W. Fewkes states: “The Haitian method of preparing fields for agriculture was to clear them of vegetation by fire. The burning of brush was apparently done by the men; the remaining processes of agriculture were performed by the women. In planting they used a sharpened stick called coa as a drill for making
holes in the earth for sprouts, cuttings, or seeds." Frank Russell, in his research among the Pima Indians of the Southwest, comments concerning irrigation: "The canals were dug with the digging stick and shovel of wood, the former being also used to prepare the easily pulverized ground and to plant the seed. In addition to the digging stick and shovel the primitive agriculturists also used a wooden implement which served the purpose of a hoe, though it resembled a weaver's batten in appearance." Alice C. Fletcher, in her work among the Omaha tribe, reports: "Garden patches were located on the borders of streams. Occupancy constituted ownership and as long as a tract was cultivated by a family no one molested the crops or intruded on the ground; but if abandoned"—"the ground was considered free for anyone to utilize. These gardens were mounded in a peculiar manner. The earth was heaped into oblong mounds, their tops flat, about 18x24", and so arranged as to slant toward the south. These mounds were 2 or 3 feet apart on all sides. In one mound, seven kernels of corn were scattered; in the next mound squash seeds were placed, and so on alternately." — "If ground space was limited, the beans were planted with the corn, the stalks serving the same purpose as poles." — "when the corn was well sprouted, it was hoed with an implement made from the shoulder blade of the elk."

It is the purpose of this paper to enumerate several different cultivating tools that have been identified in New England through archaeological research, and from them deduce probable associated agricultural techniques. While implements of perishable materials like wood and bone are less likely to appear intact today, they undoubtedly were used at times, as is indicated by occasional finds where natural conditions are right for preservation. However, stone, more than any other material, because of its indestructibility, must be relied upon to provide a greater amount of evidence. For many years, stone cultivating tools in the Northeast have been held by many archaeologists to be nearly, if not entirely nonexistent. Tilling the soil is presumed by them to have been accomplished, for the most part, either with digging sticks as in the Southwest, with shoulder blades of elk or deer, or with specially shaped wooden spades (Champlain), which in most cases have long since decomposed and disappeared. Notwithstanding, persistent research has recently brought to light stone implements in three different categories: hoes, spades, and corn-planters. These artifacts are constructed in such a way as to leave little doubt as to their intended functions. Accompanying illustrations show specimens of each classification representing artifact evidence from the surface or by excavation from the southern half of New England, and in part from the Hudson and Mohawk River valleys. In no case when excavated do these agricultural implements occur in preceramic horizons; are therefore presumed to be associated with agricultural activity of the last cultural uplift. However, since such stone tools are not mentioned by early explorers or Colonial historians as being in use during their time, it may be contended that they occupy a pre-Columbian position; were a factor in the long preceding period of agricultural development.

ARCHAEOLOGICAL EVIDENCE

Before discussing specific characteristics of the three types of cultivating tools that are thought to have been associated with agricultural activities of the Northeast, it is important to prepare one's thinking by a review of the circumstances connected with probable aboriginal cultivating techniques.

In the first place, it may be inferred from historic data already presented that agriculture was traditionally a female activity. That with its advent, woman undoubtedly chose to develop and carry on the industry without male assistance; hunting and fishing were male activities. Such tools as were used for tilling the soil, therefore, may well have been woman's responsibility to provide. Consequently, in all probability it was woman's choice to either conform to established customs from the Southwest or the Mississippi Valley, whichever was source for agricultural diffusion, and adopt such tools as existed there, or adapt certain local implements with which she was more familiar. Seemingly, she chose to follow in part both courses of action, as will be shown further on. Nevertheless, greater emphasis it would seem was placed on the adaptation of local well known tools, while inventive improvements seem to have been made upon one imported implement, the idea for which may have been diffused with the knowledge of agriculture. In this respect, if true, woman followed human behavior as known to all ages, by holding to local traits in preference to adopting strange diffusive ones.
From this it seems to follow that since woman probably assumed responsibilities having to do with the cultivation of maize, a new food supply, it was she who made the tools that were required. In other words, it is quite possible that cultivating implements were not made by experienced male artifact makers. In support of this contention is the preference shown for semi-friable stones, such as shale, sandstone, granite, schist, and pegmatite from which most of these tools are made. Such stone materials, in all probability, would not have been considered durable enough by well established artifact artisans. However, stones with greater tensile strength such as, quartz, felsite, and basalt were sometimes utilized, but usually only when unfinished spalls of these stones offered nearly the shape desired. Cumulative evidence suggests that in most cases the fabricators were satisfied in making tools that required as little flaking as possible. Often the original spall contained nearly all the required traits and needed but to have a corner lopped off, or one or two shallow notches made for hafting. In general, cultivating implements appear to be casually chipped as though their makers were more concerned over developing certain functional traits that would accomplish the desired results than in spending time to create artifacts of beauty. Such a condition seems to satisfy this paper’s thesis, which depicts female cultivating labor with scant time for the manufacture of aesthetic tools that gives way to more quickly made crudities.

Abrasion of stone blades against soft soil has produced noticeable wear on the bits of some specimens, but in no case does this produce a high finish. To obtain such a result, harder substances than soil are required for the abrasive agent such as stone or wood, as has been demonstrated by actual test. Also, in most cases the coarse grained composition of these stone artifacts tends to prevent lustrous finishes often found on flint spades from Middle-western sites. There, agricultural pursuits had reached a more advanced stage in later years with male participation and better tools of flint, which may not have been used alone from preference but because of its availability.

Lastly, in support of the hypothesis of female-made cultivating tools in the Northeast, it should be noted that in no case have these tools been found in caches. Instead, they have appeared nearby wigwam emplacements, scattered over adjoining areas, or at garden locations along the banks of streams, and sometimes on hillside garden plots where little or no campsite litter appears. This wide distribution suggests lack of interest in preserving such implements from one season to the next. Instead, it seems to indicate frequent manufacture from ordinary field stones picked up at random and quickly shaped by women workers at the various garden sites where they were used and then abandoned. For example, a well notched triangular hoe blade occurred on a hillside garden in the Manhan River Valley at the foot of Mt. Nonotuck. It was made of black grained granite, similar to blocks of the same rock from which spalls had been removed lying not more than 100 feet away, and presumed to have been its source.

**Triangular Hoe Blades (Fig. 15, a, c).** In this classification are blades that have by all odds the highest frequency of any type of hoe, whether recovered by excavation or from the surface. The type holds roughly to a triangular form with a thinned pointed bit, often blunted from wear or by design; wear never occurs on any other edge. Its relatively thick base has an oblique facet that usually forms an obtuse angle with the back of the blade. Its face is often somewhat concave giving the implement the appearance of a slight hook, thus making it unsuitable for side hafting. Mild side notching is frequently present just below one or both of the basal barbs that are often knocked off enough to effect symmetry. Spalls formed by fire or percussion action are often in evidence; have been roughly worked into the desired shape. Presumably, hafting followed uniformly one pattern as illustrated (Fig. 15, a). In describing this method, it may now be confidently stated that on the oblique base of the blade one end of a straight wooden handle was placed, after a flattened facet had been made by splitting off a section of the stick. Then the lashing was criss-crossed on both sides of the blade. This method has now been quite clearly substantiated by a study of certain characteristics of a triangular blade recently recovered from a Palmer River site in Swansea, Massachusetts (Fig. 15, No. 1). While this specimen has been shaped solely by primary flaking, it also exhibits marked reworking below each basal barb, principally on its back. The purpose of these reworked edges is quite obvious: to remove the sharp edges of the blade at these points so as to prevent them from cutting the thongs that would be used to lash it to the handle. Because...
of their asymmetrical shape, specimens like this that include all triangular hoe blades in general seem to demand that the hafted handle be placed on top of the base, rather than at the side of the blade like an ax. Most hafted specimens produce an obtuse angle with the handle, which seems intentional in order to produce the correct stance for driving the bit into the soil. When this is not the case, a frog may be used to produce the desired obtuse tilt, or an extra wrapping of thongs under the blade’s base fore or aft may be enough. Triangular blades have been recovered from camp sites on river courses from the Merrimack Valley, south and west through Massachusetts, Rhode Island, and Connecticut. Also, the author has found them on sites both sides of the Hudson River and as far west as Schenectady on the Mohawk River in New York State. While J. F. Lafitau’s illustration of Huron Squaws using triangular bladed hoes leaves little doubt of their existence ‘as far north as the St. Lawrence River drainage, archaeological investigation in that area has not yet confirmed it. However, it is believed that continued research may provide evidence to show their existence throughout maize growing regions of the Northeast including the St. Lawrence Valley. The American Museum of Natural History in 1950 published Vol. 43, Part 2, written by Carlyle Shreeve Smith, entitled: “The Archaeology of Coastal New York.” On page 104 he refers to an early reference by Jasper Dankers and Peter Sluyter who visited New York in 1679 and 1680, and also “plantation” of the Nyack, a branch of the Canarsee, situated at the southwestern end of Long Island, near the present site of Fort Hamilton. After entering native wig-wams, these two men reported seeing certain tools and equipment among which, in their words, was: “a stone hoe with a sharp point.” There can be no doubt that they had seen a triangular hoe blade hafted on a wooden handle; no other shape of blade could have provided the point to which they refer. Apparently, the fact that a hoe blade had a pointed bit in those days of broad bladed Dutch hoes attracted their attention and caused their remark. From this it seems probable that triangular hoes were in use on Long Island in proto-historic days. These hoe blades occur in various sizes, each with certain probable functions: large ones for breaking the ground; medium sized blades for tilling the soil and for the building of corn hills; and small ones for weeding the hills. Finally, it has been established by trial that quahaug shells, of which Williams and Wood are probably speaking when they refer to clam shell hoes, may be readily hafted like triangular stone blades after a nick has been chipped in the edge opposite the muscle. Thus, a probable method is now provided for the attachment of handles to clam shells as used for hoes near Boston in Colonial times, no doubt an inherited technique from earlier day hafting of stone blades.

**Stemmed Hoe Blades (Fig. 15, b, d).** These stemmed tools are from recoveries in the Connecticut Valley of Massachusetts. While they are not known to the writer to have appeared elsewhere, it is probable that they may exist beyond this area, and in time will be identified. They occur in two general shapes, with other variations possible: with a straight edged bit; and with a spoon-like blade. They are made from stone spalls that have a well defined crook, or convex back. One end projects slightly and serves as the stem for hafting, while the other end is the bit. Whenever wear is present it is found only on the latter, which has a thinned edge. Attachment to the handle is easily accomplished by merely wrapping thongs around the artifact stem and end of the handle after the former has been properly seated in the wood. Only a comparatively few of these hoe blades have been found. Probably their manufacture was restricted due to a limited supply of spalls with the necessary crook that would tilt the bit away from the handle at an obtuse angle as required. In contrast, the triangular blade has no such obstacle; may be more quickly fashioned from spalls that frequently assume nearly the desired shape, and are hafted without difficulty on straight sticks.

**Spades (Fig. 16).** These blades appear in three different shapes: pointed; straight; and convex. They are made from flat stones with one end side-notched, or with its corners-removed, which at times are quite deeply worked. Occasionally, enough stone is removed in the latter case to form a decided stem. They are usually relatively large in size, although small specimens are not uncommon. The probable method of hafting seems to have followed a rather obvious course. First, a flat facet is made at the end of a straight branch—a dead branch no doubt, probably the source of most agricultural tool handles—by splitting off a small section. Then the stem of the stone blade is laid flat against this facet, and thongs wrapped
around stone and handle as illustrated. It is believed that these implements were not only used for agricultural purposes, but also served the important function of digging grave shafts. When used in this way they may have been made by regular male artifact artisans. This may account for their superior shapes in some cases, the result of careful specialized workmanship that characterizes numerous large specimens.

**Corn-Planters** (Fig. 17). Contained in this group of artifacts are chipped stone spikes that measure from 4 to 7 inches in length. Made of shale or sandstone, they are worked into shape with the same sort of casual flaking as in the case of hoe blades. Their bits are roughly pointed at one end, and show considerable wear in most instances. One illustrated specimen has a rude knob at the opposite end (Fig. 17, No. 4), while certain others have pecked-over stems instead, as if all these were intended for hand use. However, about half those illustrated have slight side notching on the stem, prepared as if for hafting. From this it would appear that they were used both as hand tools as well as attached to handles. With the exception of one specimen (Fig. 17, No. 6), all others of those illustrated are without much symmetry. In the case of this exception, however, care has been used to develop a nicely graduated bit with a well defined side-notched stem at the other end. When shaped in this way from durable stone, of infrequent occurrence, the corn-planter is often mistaken for a rude knife; may be recognized, however, by its point that is worked on both edges near the tip.

These simple tools, recently discovered by the author, like other cultivating implements are made of stones with low tensile strength in most instances. Because of this, it is inconceivable that they were intended for use where stronger materials would have been required. Therefore, since their composition of semi-frangible stone and their rude workmanship is similar to that of other known cultivating tools with which they are now found to be associated, it is assumed that they too belong in the same horticultural category. If this is so, then they may be thought of as cultivating dibbles, or implements whose probable function was the making of holes in the soil. And in this capacity, how better could they be characterized than as corn-planters: instruments by which kernels of maize
were planted in corn hills? To haft on the end of a stick, the base of the planter is seated in the wood by removing the necessary splinter, and then bound on with thongs wound around stone and handle. Specimens have been recovered from the Heard Pond site in the Concord River basin of Massachusetts, and from Kickamuit Spring and Green Point sites in the Narragansett Bay drainage of Rhode Island. Recently, specimens have appeared, also, in Swansea on the Palmer River, at the Wapanucket site on Lake Assawompsett, and on a Taunton River site in Massachusetts. This suggests a broader distribution of the trait than at first was anticipated, and may mean that its area of diffusion in New England may eventually approximate that of the triangular hoe.

Corn-planters appear to have close affinity with digging sticks of the Southwest. The idea probably is an invention of New England natives, who concluded the life of a digging stick could be increased by the addition of a stone point. Whatever its source, the corn-planter strongly suggests that the wooden digging stick was probably adopted, but eventually was modified and improved through the attachment of a stone spike. By the same token, it seems probable that the functional use of the digging stick may also have been modified, so that it supplemented other local tools with which the people were more familiar; did not become their main cultivating implement as in some parts of the Southwest.

CONCLUSION

Archaeological research in the Northeast has now advanced far enough, it would seem, to justify an attempt at portrayal of what aboriginal agricultural tools and techniques were like. However, to do this one must be ready to accept certain artifact evidence, like that which has been illustrated in this paper, as trustworthy, which may appear questionable from the orthodox point of view on account of its crudeness. This is not to insist that any stone of a correct shape should be approved as evidence. Rather that any stone of a correct shape that has been modified by pecking, flaking, or grinding, even though only slightly, to give it some desired form should qualify. By and far, agricultural tools seem to be of this kind; are rudely flaked from indigenous semi-friable stones. In this connection, it should be emphasized that roughly shaped artifacts with elementary flaking seem rude only when compared with modern precision standards. When compared with stone-age standards, they would have been thought acceptable if they accomplished the work for which they were intended. Therefore, it is probable that many collectors, in avoiding such rude implements, have missed the chance to display artifacts that once played an important part in culture building. Furthermore, in order to evaluate cultivating processes, these rude instruments of labor must be used as evidence since they represent probably the chief, if not the only available agricultural implements of the age. Evidently, as long as the search goes on for more well defined and better made cultivating tools, just so long will agricultural techniques remain an enigma, for more refined tools, probably, do not exist.

Just what circumstances surrounded the introduction of agriculture to the Northeast may never be known, but it is fairly clear from the evidence already presented that the knowledge of growing maize and other vegetables sprang from ideas and seed supplies issuing from regions in the Midwest or Southwest where agriculture was already an accomplished fact. Both historic as well as archaeological evidence strongly suggests that Northeastern women rather than men first conceived the advantages that would accrue from the cultivation of maize by providing a supplementary food supply, and eagerly adopted the new industry. If this is so, then woman became an important factor as a bread winner for the family and consequently gained the respect of her male consort, an advantage that formerly she had enjoyed to a much lesser degree.

With the idea of growing maize probably came the introduction of the digging stick (cane-sized with pointed end), a more or less universal cultivating tool in arid regions of the Southwest and Middle America. However, the Stone Bowl Makers of New England, who are believed to have been the recipients of these diffusions, apparently favored certain tools of their own make from the steatite quarries, where for many centuries they had been cutting out stone household vessels. Throughout this previous period triangular and spiked tailing breakers, and hand spades of the quarries are thought to have been used by women industrial workers for removal of steatite tailings.
FIG. 16. Spades. 1, Pointed blade; 2, Straight blade, showing probable method of hafting; 3, Convex blade; (All specimens are of granite).

This is supported by evidence from New England steatite quarries, excavated under the direction of the writer. At Westfield and Wilbraham sites in western Massachusetts appeared triangular tailing breakers that showed signs of having been attached to handles. Also were found hand spades and some that may have been hafted. At all other quarries investigated including those at Ragged Mountain, Oaklawn, Eight Lots, and Dolly Bond, situated in Connecticut, Rhode Island, and central Massachusetts, beside many hand spades, only spiked tailing breakers occurred. Since woman appears to have adopted these tools in smaller sizes to aid in her later agricultural activities, it is probable that she did so because she had become well acquainted with their productive capabilities from her intimate knowledge of them over many years of work at the quarries, and refused to give them up for new-fangled gear. So, it may well be that out of triangular tailing breakers issued various sized triangular hoes; from quarry hand spades emerged improved spades with long handles for cultivating; and from spiked tailing breakers came the idea of corn-planters: stone spikes sometimes attached to the end of digging sticks. Thus, the enterprise of growing maize in New England appears to have been undertaken with new cultivating gear derived from the stone bowl industry. As a result, new agricultural techniques apparently came about through the inventive genius of a people who preferred their own traditional tools and work methods to imported ones. While it is true that New England cultures undoubtedly were peripheral to agricultural diffusion, and adopted rather than discovered the idea of growing maize, nevertheless, archaeological research as herein submitted suggests that the people preferred to till the soil in their own way. In this respect they proved themselves as resourceful and independent as other inventive races of the world. Hence, it may safely be contended that New England natives placed their creative stamp upon agricultural diffusive traits and techniques, which now tends to identify them.
An interpretation of artifact evidence from regions of the Northeast as presented in this paper suggests to the author certain quite definite cultivating techniques. While divergence from a set cultivating procedure may have occurred in different sections of the area to satisfy independent ideas and varying conditions, repetition of the evidence is too well defined and widespread to suggest much deviation from a more or less uniform pattern. This postulated plan of operation is now submitted for the purpose of further study and modification as new evidence is brought to light.

At first, and for many years thereafter, it seems probable that gardens consisted of small plots next to wigwams, while sometimes they may have been somewhat removed on the banks of streams. Undoubtedly, they were made possible by openings in the forest due to poor sandy soil where little clearance of brush was necessary. In protohistoric years, much larger tracts were brought under cultivation to such an extent as to cause Capt. John Smith to remark in 1614: "Here (Agawam—now Ipswich) are many rising hills" — "on tops and descents are many corn fields." Toward the close of the century, Governor Winthrop reports seeing: "—plots of cleared land in the vicinity of Indian settlements upon which squaws raise Indian corn, beans and squash, also extensive tracts of woodland where the trees are so scattered that green herbage and even strawberries flourish among them." While little or no artificial clearance was required for small gardens at first, larger areas later on were probably partly freed of brush by fire. After this, the ground is thought to have been broken with large triangular stone hoes whose weight and pointed bits would have aided greatly in loosening the top soil. This was then pulverized with medium sized hoes. Afterwards, the softened soil was pushed up into oval flat topped hills approximately two or three feet long, as illustrated by J. F. Lafitau, and as described by Fletcher in use by the later day Omahas. Also, Champlain reports similar corn hills as being spaced about 3 feet apart. The labor of making the hills is thought to have been accomplished with stone spades and medium sized hoes at first, while in later days on certain coastal sites by various substitutes: wooden spades and shells of the horseshoe crab, as described by Champlain. While in the beginning the soil was probably quite sterile and sandy in most garden plots, in later years improved

![Fig. 17. Corn Planters](image-url)
knowledge used herring or other small fish for fertilizer whenever available. Such fish are believed to have been thrown on the ground, the soil being heaped up over them to form corn hills. Governor Bradford’s account of the Pilgrims at Plymouth relates how Squanto taught them how to fertilize their corn fields with herring that ran up Town Brook in great numbers every spring, by putting two or three herring in each corn hill. But to continue; after the corn hill had been formed, stone corn-planters (sometimes attached to sticks) are believed to have been used for making holes in the hill. As many as seven or more holes may have been made into which maize kernels were dropped. Later, after corn shoots had started to grow, small triangular or spoon bladed stemmed stone hoes were used for removal of weeds from between the shoots. In protohistoric days, as has been cited, some tribes near Boston were reported by Williams and Wood to be using clam shell hoes for weeding. It now seems probable, as has been mentioned, that these were hafted like triangular hoes and could well have been derived from them. In time, maize shoots produced roots that tapped the fish fertilizer at the bottom of the corn hill and thus became well rooted, producing big yields in some cases.

Enough historic reports are available to indicate the prevalence in the 17th Century of sizeable ears and abundant growth in certain areas. Champlain states: "—corn reaches to the height of from 5 to 6 feet." Then again, in 1675 Governor Winthrop describes Indian corn as rising 6 to 8 feet tall, although some stalks, he says, were shorter. Ears measured as much as 9 inches in length, according to Winthrop, and included variously colored grains: white, yellow, red, blue, olive, greenish, black, speckled, and striped. At about this time, Gookin states that a Wabiquisset (near Woodstock) native corn yielded 40 bushels to an acre, while Roger Williams asserts that women produced 25 to 45 bushels of maize for each family. Sylvester Judd in his History of Hadley relates that up to 70 acres were planted to maize by the natives between Holyoke and Sugar Loaf Mountain in South Deerfield. Notwithstanding, he further observes that even by the middle of the 17th Century agriculture was of no major concern to the men, as is suggested by many land deeds. These reserved to the Indians, solely, the right to hunt and fish—not to grow corn. Thus, the squaws lost their corn fields, but got 50% of the crop in return for helping the English plant and cultivate the fields that formerly were theirs.

While all these large protohistoric yields are impressive, there is archaeological evidence to show that in prehistoric times ears of maize were relatively small. In the Northampton meadows a large ceramic pot of the Intermediate Stage was recovered by W. S. Rodiman after the last great flood of the Connecticut River, and in it appeared many tiny ears of corn about 2 inches in length. They had been preserved in a dried out state and could be easily recognized. From New Jersey comes substantiating evidence of similar short ears. An Owasco, Castle Creek ceramic urn from Minisink Island near Delaware Watergap, now in the Bronson Museum, has its outer surface maleated by ears of maize 2 to 3" in length, showing relatively small kernels. These were rolled meticulously over the clay while wet. And then again, there is an instance of a ceramic pot found crushed under a stone in New Jersey. Among the shreds appeared numerous ears of Indian maize; and these too had a length of only about 3 inches with correspondingly small kernels. From this cumulative evidence it seems probable that maize grew to sizeable proportions in later days when advanced horticultural techniques were in evidence; but remained in dwarf sizes earlier when soil in easily acquired garden plots was poor, and fertilizer perhaps was unknown. Undoubtedly, plants were undernourished for many years by repeated lack of attention through human ignorance. Such deficient knowledge might be expected to have obtained during the early rather than the late stage of agricultural development in the Northeast; might well have been the factor that retarded production of maize and prevented its more universal adoption as a staple food supply. However, based on known human behavior, it is unlikely that men would have joined women in making agriculture the main source of food, even under more favorable conditions, until hunting and fishing became so unprofitable as to force the issue. But this condition was always far from a reality in most sections of the Northeast, so that probably at no time did men seriously consider such a possibility. However, in other parts of the country such as the Southwest and sections of the Plains, game had become scarce toward the end of the 19th Century, and in some sections of this area long before this. Hence, there, men were forced to labor in the corn fields with women for the common
weal, and their combined efforts raised maize on an increased scale of productivity. As an illustration, Alice Fletcher reports in 1906 that the Omaha tribe used male and female labor in agriculture. She states: “Men and women worked together on the garden plots.” But in 17th Century New England Indian land deeds only occasionally indicate interest in aid to agriculture, as is evidenced in 1654 when transfer was made of a parcel of land in Hadley from six Indians as arranged by John Pynchon. Here, the English bind themselves to plow 16 acres of land involved in the transfer for use by the Indians as a place in which to grow their corn. On the whole, the evidence seems to support the postulation that in the Northeast agriculture was a female enterprise; probably had been since its inception. Therefore, it may well have fostered, for the most part, female produced tools and techniques as herein described.

Bronson Museum, January 1952

APPENDIX

Since writing this report, it has been brought to my attention that confusion exists in the minds of many as to just what constitutes a triangular hoe. Triangular shaped spalls from fire-cracked or otherwise broken cobbles have been picked up by some, believing that in some way these must be triangular hoes because of their overall triangular shape. When told they were not; that they were merely stone spalls without the required characteristics of triangular hoes, these people were inclined not only to throw out the specimens but also the idea of a triangular hoe as well. Therefore, what I have to say is presented for the sole purpose of preventing this sort of wholesale rejection of a concept that has been logically conceived from well established factual evidence.

While I admit that it may be possible to pick up fire cracked spalls on most camp sites with triangular shapes but with no claim to the classification of triangular hoes, I must add that it is also possible to recover from these sites triangularly shaped spalls with certain qualities that make them triangular hoes. That which makes the difference lies in several conditions, which should be carefully kept in mind when specimens are being examined.

First, the triangularly shaped spall must have an oblique base of a half inch or more in depth, that usually slopes in such a way as to tilt the blade at an obtuse angle to the handle, which rests on the oblique face of the base. This surface may be—a natural surface of the spall.

Second, there must be indication along some edge or edges that percussion-flaking or pecking has been used to modify the original shape of the spall, even though it may be weathered and nearly obliterated. Frequently, only one side of the bit is chipped to produce a symmetrical taper to the point, and infrequently even this does not appear. However, in this case when a spall occurs of exactly the right shape, reworking by pecking or chipping must appear just below the basal points to soften sharp edges that otherwise might tend to cut the hafting thongs. If, after examination, you are still uncertain as to what the modification if any has been, try this test. Place the spall on a sheet of paper and with pencil draw its outline. Before lifting spall, project on the paper with dotted lines all natural formed edges from points where they seem to break. If this projection falls beyond and outside of the outline, then the portion within the dotted lines is the part of the original spall that has been removed by flaking. Often only slight chipping is required to modify the bit so as to bring its point into the center of the blade for the purpose of symmetrical balance.

Third, examine basal points and note if they have been lopped off either much or little. If they have, then you probably are dealing with a triangular hoe blade, for a large percentage have basal points removed.

Fourth, turn the spall sidewise and see if it has a slight hook, or convexity. While some are perfectly straight, many have a hook thus enhancing their value as a hoe. Above all, do not be disturbed if the point of the bit is rounded or otherwise
modified, since some are purposely rounded while others are worn down to that shape.

In adjusting our thinking to accept pointed bitted hoes as a probability, we should remember that their functional uses differed from those of hoes of today. Heavy ones were used to break up the soil, wherein a pointed stone obtains the best results. Small ones were used in picking out weeds from between corn shoots, and a pointed bit in this case would be better able to avoid the shoots as it weeded than a broad bladed one. In most cases, gardens were near habitations, so that it was natural enough for a woman, as she went to work, to pick up from the camp litter a fire spall or fractured rock of nearly the shape desired, and with a pebble quickly modify it slightly by chipping to make it useable.

In the last analysis, while a completely unworked triangular spall with the required traits may have been used, because of its lack of reworked chipping its usefulness as evidence is nil, and therefore it should be discarded.
During the past year I have tried to find some remnant of stories among the remaining Wabanaki Indians living in Maine and Canada which make up the Penobscot, Passamaquoddy and Malecite tribes. I could find very little material of this nature. Even the Kuloskap tales were almost forgotten by them. The Malecites, who retain many of their place-names, remember more of these stories than the others. Some of the place-names refer to Kuloskap’s feats. I was much surprised to find that a Passamaquoddy, Sabbattis Tomer, son of Tomer Joe, who gave much information to Charles Godfrey Leland and John Dyneley Prince, authors of “Kuloskap the Master”, could not tell me any of these stories.

I did find out about three spiritual characters that I have called premonition spirits, because their job has been to warn of approaching sickness or death, something quite helpful to a hunter far away from his family.

The first of these stories is not altogether prehistoric although the idea must have been. It was called “Ka-tukw-ss”, which translated means “ghost”. It was the ghost of a white man who gave warnings of storms, sickness, and death, but, as the Indians became more civilized, he was heard from less and less until all that he forecast was deaths. The story as I heard it from my Malecite friend, Peter L. Paul of Woodstock, New Brunswick, Indian Reservation is as follows:

KA-TUKW-SS

“This happened when the Indians lived further back in the woods and not here by the riverside (St. John River). There was an old man that lived here. He was not married but lived with a woman. They were drunk most of the time and we could hear him laughing many evenings when we were living across the road. One night he died. The priest would not bury him in the churchyard because he had been such a bad man. He was buried right here (pointing) where that house is now. It was about sixty years ago that he died.

It was usually before a storm that we could hear him whoop. After he died we could still hear it before a storm, but when we moved down here, we didn’t hear it as often. For many years it (the whooping) had forecast a death among our tribe. Before the death occurred, a noise like a duck being choked could be heard. I never believed in this until I heard it.

I was visiting Peter Polchies one night. He had to go out. When he came back, he said he had heard Ka-tukw-ss. The next day Molly Paul, my great aunt, died.

The next time I heard it was a few years later. An elderly woman lived in that house (pointing). I saw her come to the door and call her daughter who was visiting a neighbor. A few minutes later the daughter came running here and said she found her mother lying on her bed, dead. (Note that the woman was alone when she died and the noise was heard before the death, the daughter being seen after the noise was heard.)

The third time I heard the noise was in the springtime and the children were at the river eel fishing. All of a sudden they came running into the house crying and laughing at the same time. They said they had heard Ka-tukw-ss. I went out and sure enough I heard the long drawn out mournful laugh. Later that evening news was received that one of our men had been killed in an automobile accident about ten miles away.” (Note that the noise was heard about the same time as the death occurred but the person killed was about ten miles away and the death was unexpected.)

A few weeks later I was visiting Hugh Judge, a friend of mine in Woodstock. He knew the Indians well so I asked him if he had ever heard of Ka-tukw-ss. “Yes,” he said, “about twenty-five years ago when I was visiting the reservation. I thought that the noises were the hysterical laments of the first person to find a loved one dead.” In all cases more than one person heard the noise and it definitely came before the death, in at least one case there was no expectation of approaching death.

On a later visit to Peter Paul I asked him when he had last heard Ka-tukw-ss. His reply was that about five years ago, when a house was built where the grave was, the skeleton had been removed. The bones were buried in a cemetery and the noise had not been heard since that time.
The second of these premonition spirits that I became acquainted with was called Es-sque-de-wit, or "the fiery one". This spirit had the same kind of task as Ka-tuk-ss but was mobile and might turn up anywhere, especially convenient for a hunter who was away from his friends. My friend Peter Paul also informed me about this character. He described it as "like a ball of fire which announced death to a hunter in the woods." He continued: "Once when I was in the woods with a friend, I saw it. It was in the evening and we were cleaning up after supper and had a kerosene lamp lit. Suddenly a light from outside illuminated the whole inside of the cabin. It was like a ball of fire travelling through the woods very rapidly. My companion said, 'We must pack and go home at once.' We did, and the next day we got home. He found his baby brother had died the night before."

Sabattis Tower, a Passamaquoddy of about 85, told me that he remembered seeing one (a fiery one) at the lower end of Peter Dana's Point, in Princeton. He said that the fiery ball came along the edge of the lake and when it got close to where the men were camping it exploded. Within two weeks one of the men drowned. "A white man would scoff at this and ask about the time element and other conditions," but he believes that this phenomena was Es-sque-de-wit forecasting the person's death.

Spirits of this type were a necessity in the life of the Indians. Being away from home in the woods for long periods of time, this was their means of communication with them. Theirs was the philosophy of "no news is good news". Now that their ways have changed, the need is gone, and we hear little or nothing about them. Perhaps there were powers of mental telepathy that the Indians of today have lost. The people becoming accustomed to being away from their loved ones for long periods of time may have developed certain sense to serve them in periods of anxiety. The shamens certainly seem to have possessed powers which enabled them to predict the future. Spirits with this sort of power would have been very practical in the old days.

An adaptation of this same type of spirit to more modern circumstances occurs in another story related to me by Peter Paul.

"Two Indians were travelling up the St. John valley looking for work. One evening they went into an old vacant barn for their lodging. It was not long before both were asleep. Suddenly one awakened to see a ball of fire go around the barn, find an exit, and disappear down the road. He looked over to his companion and tried to awaken him. However he seemed dead so the first man tried to roll him over and revive him. Suddenly he saw the fiery ball making its way up the road again. It entered the barn at the same place it had departed, buzzed around until it was right over the unconscious man and then come down on the back of his head as if trying to penetrate. It did this three times. The man watching this turned the unconscious one over on his back again. The next time the ball of fire came down, it went in his mouth. The unconscious man then awoke and began telling of a dream he had just had. It seemed very realistic. He had been walking up the road and into the next town. He described the town, although he had never been there. He was able to tell where men were wanted to work. The next morning they arrived at the town and found it just as had been described even to finding work."

A similar story was told to Dr. Frank Speck by Kattie Mitchell, a Penobscot, in 1910.

**A DREAMER ASSUMES THE FORM OF BALL OF FIRE**

"An old man and his son went hunting. His wife and daughter-in-law did not like to stay home so they went with him. They built their camp out of boughs and made a fire in the midst of the shelter. The father and son went out hunting and left the women at the camp alone. They were to be back in three days, but at the end of the three days they did not return. The son's wife got weary and did not know what kept them so long, since it was four or five days since they had gone. That night the mother-in-law, who was fond of smoking, lay down near the fire to smoke. Her daughter-in-law was lying in one corner of the camp on the boughs. The old woman told the younger that she was going to sleep and dream about where the men were, and what they were doing. When she was finished
smoking she laid on her back. Finally the young woman saw a ball of fire come out of her mouth. She jumped up and tried to rouse the old woman, she turned her on her side and shook her. Then she believed the old woman to be dead. The ball of fire that came from the old woman’s mouth went round and round the camp and around the old woman.

The young woman turned her over again and when she did so the ball of fire went back into the old woman’s mouth. Then she began to move about. She said that she had had a long sleep. She said, ‘Don’t worry; they will be back tomorrow. They have had good luck and are bringing lots of game. I just saw them sitting by their bed eating supper:’

The next day the hunters appeared with an abundance of game of all sorts.”

This story is surprising in its similarity. First the people sleeping and the firey ball emerging from the mouth of one, buzzing around like a bee, the one not under this spell thinking the other to be dead after attempting to arouse him and not being able to do so. When the ball of fire returns it cannot enter the unconscious one so the conscious one turns the other over and the fire enters the mouth. Finally both of the dreams come true.

Another experience with similar characteristics is one that was related to me by Andrew Dana concerning Mitchell Francis, both Penobscoets. Mitchell was hunting at Olamon, about fifteen miles above Old Town. One night he saw a bright light and then the likeness of his daughter. He immediately packed and went home, getting there the next day. As he entered the house he saw the same thing. He took his daughter into his arms where she died.

Still another story, which is a bit more involved, contains the idea of the spirit appearing as a ball of fire was related to W. H. Mechling by a Malecite.

THE MAN WHO FOLLOWED HIS WIFE INTO THE SPIRIT LAND(2)

“Once there lived an Indian who loved his wife exceedingly well. Indeed, so much did he love her, that he determined to follow her spirit when she died. The Indian’s wife fell ill, and when she showed no signs of recovery, he made preparations to follow her spirit. First he cut a hole in the bark of the wigwam at the side of her bed, for he thought to himself: ‘She will certainly go out this way.’ He then went outside the wigwam and seated himself beside the hole to watch for the flight of the spirit. Presently he saw something go out through the hole which had the appearance of a puff of smoke. He knew at once that it was his wife’s spirit. He, therefore, collected the things necessary for the journey and followed in the direction taken by the departing spirit. All this happened in the morning. He travelled until midnight when he came to a camp, inside of which he found an old woman. He asked her if she had seen his wife pass, to which she replied that his wife had passed about noon, going like the wind. He then questioned the old woman about his chances of overtaking his wife. This she did not know, but advised him that if he continued on his journey he would come to a house of an older woman, who could better answer his question. The Indian, without resting, continued traveling all that night and the next day.

When dusk fell, he arrived at the camp for which he was searching. Here he found a woman who looked older than any one he had ever seen before. As a mark of respect he addressed her as grandmother and asked her if she had seen his wife pass. She replied that his wife had passed about noon, going like the wind. Here too, he asked if he could overtake his wife, and she replied that she was unable to state, but referred him to an older woman who dwelt farther along.

“He arrived the next evening at the camp of this woman, and she appeared still more aged than the last. Indeed, he thought she must be the oldest woman in the world. Upon putting to her the question he had put to the others, he learned that his wife had passed the morning of the day before. He asked her if he could overtake her, and she replied that she was unable to state, but referred him to an older woman who dwelt farther along.

doing so. I will give you a little nut to take with you. Tomorrow morning you are to set out in the direction I will indicate to you. Do not stop on your journey until you come to this wigwam. On your way you will hear all sorts of noises behind you, but on no account are you to turn around. You will even hear your wife's voice, but you will lose all if you turn around. When you reach the wigwam, go in and sit down in an out-of-the-way place. After a while the spirits will arrive and begin dancing around the wigwam. Your wife will be among them. When she dances past you, open the nut, and you will thus bring her back to life. As she goes past you, close it. Pass out of the wigwam, and proceed to return in the same direction whence you came."

The Indian followed the instructions of the old woman. But it took him much longer to return than it did to come. Several nights had passed before he reached the first grandmother, who asked him how he had made out, to which he replied that he was fairly successful. He then passed the nut to this grandmother. She scrutinized it favorably. She told him that the nut was full of oil and bade him, when he reached home, dig up his wife and grease her joints with the oil, which would just suffice for the purpose. She also gave him a wooden comb to comb her hair. The Indian expressed his thanks and the next morning departed. It was several days before he reached the home of the second old woman. She, too, questioned him, after which he again proceeded on his way.

It was a long time before he reached his home. Upon his arrival he perceived that all his people had grown greatly aged. For he had, to be sure, been a long time absent. With his own hands the Indian made a wooden shovel, and having dug up his wife, began to oil her bones. There was no flesh on her, for she had been buried for a great while. When he exhausted his oil supply the woman looked as natural as she had before her death. Her first words were a request for a drink. The Indian then rushed to his mother-in-law's to get clothes for her. The old woman began to weep, but he bade her rejoice, for she would soon see her daughter again. From an old moosehide bag she took out some clothes, and with these the Indian returned to the place where he had left his wife. After she had dressed, the two proceeded to the camp where her parents were. Upon their appearance the old pair became young again, appearing just as they were before the death of the woman."

Woodsmen tell tales about seeing and following balls of fire, especially in early spring in or near swampy areas. I have heard them tell about following them when suddenly they disappeared. There would seem to be some connection between the melting of the snow and the creation of gasses which sometimes ignites and seems to dart about through the woods until consumed. Some people believe that this phenomena was the Indian's Es-sque-de-wit.

SQUEAO-TA-MOS

A third wood's spirit also possesses this power of warning those close to an individual at a time of need. This is Squea-ta-mos, or Swamp Woman. Unlike Ka-tuk-ss, she has a high pitched laugh, according to Mr. and Mrs. Frank Tomah, Passamaquoddies of Peter Dana's Point, who heard her one night when they were in camp at Milford, Maine. This spiritual personage is also known to the Penobscots. I could not find any particular account of her, but some mistake her for Bpa-mo-la, malevolent spirit of Katahdin. (Some spell this word with a B, others with a P. The sound is in between, so I have used both letters). Blanch Perham told me that one night she was alone in the house except for her daughter. They were both asleep. Suddenly she was awakened by an awful laugh which seemed to come from the river in back of her house. The daughter woke up and heard it also. The next morning they found out that an Uncle, Joe Solaman, had died during the night. These were all Penobscots.

Andrew Dana, a Penobscot, who does not believe in the supernatural and is a good Catholic, told me the following story but could offer no explanation for it:

"My wife and I were camping at Lincoln, Maine. My wife was asleep and I was dozing when I heard footsteps outside. My wife woke up. It came to the step and rattled the latch on the door. I quickly got up and got my gun thinking it was an animal. When I got to the door I saw no animal and not even a track, although there was a heavy frost. I went back to bed. The next day
a messenger arrived from Old Town informing me that my brother had been killed in an automobile accident that night. It occurred about the same time that we heard the noise outside the door."

Sabattis Tomer also told me of an occasion when he heard Swamp Woman. This was when he was a young man and he was camping with his father, Tomer Joe. They were at Grand Lake Stream. They heard a high pitched voice that sounded like that of a woman. They went out in search of her. Soon they came upon a partridge that was making the noise. Swamp Woman had taken the form of a partridge, so they did not shoot it. Later that day when they checked their traps, they found seven otter, two black cats, and fifteen mink. Here it seems to have been an omen of good luck.

A different type of spiritual forecasting was described to me by Blanche Perham. One evening she was about to leave her house. Walter Ranco and Leo Shay were sitting in her parlor and vouched for the story. When she opened the inside door to go out, the screen door opened. She backed away to let the person inside. No one entered but something bumped into her midway between the two doors. She jumped back and turned on the light, but saw nothing. She went back into the parlor and told the men what had happened. They laughed. She said that something was going to happen so she was not going out of the house. The next day she received word that her daughter's sister-in-law had died.

I have heard many stories about white people who also had some kind of knowledge about a relative passing away, usually in the form of a dream. Stories of this kind were especially numerous during the late war when the person involved was far away. I know of no explanation for this but the experience is very real to those to whom it has occurred. If one can believe in these modern stories one can also accept these Indian tales. Among the Indians a need for this type of communication existed and they, living very close to nature, may have developed a keen sense for supernatural experiences.

Gloucester, Mass.

December 1953
The summer and fall of 1952 was extremely dry as far as the state of Maine was concerned. The water level in the streams and lakes was at the lowest point in a number of years.

Cobboscontee Stream, site of the flooded Indian fishing station reported in the Bulletin (Vol. XII No. 1) was reduced to a mere trickle. Additional material was recovered from this site. Reconnaissance trips along this stream and at nearby lakes and ponds indicate that these water ways were much used by Indians. Upon the invitation of Mr. Mervin Hatch I visited an island in Lake Tacoma which he owns and uses for a summer camp. This resulted in a most unique find.

Although my first inquiry: "Have you ever found Indian artifacts on this island?" was answered in the negative, a search of the shore near the camp soon produced results. A celt, plummet, a few projectile points, and a great many chips were found much to the surprise of Mr. Hatch. A short walk around the point on which the camp was located produced our most interesting find. Here, on a small promontory, was a fair sized rock in which three distinct grooves were noticed. This rock which is composed of a fine grained grey material with abrasive qualities, weighs approximately seventy pounds. Three parallel grooves were visible on its exposed face which immediately suggested its use as a grinding stone for the manufacture of celts, gouges and the like.

Although Mr. Hatch was very familiar with the spot he had never before noticed this peculiar stone. A search of the immediate area was without result, the spot was barren of chips, rejects, and any sort of worked stone. A broken celt was found at some distance. This would seem to indicate that the polishing rock was not in situ but had been brought to the spot recently. Surely had this been a work shop site some evidence of it should be present. The presence of Indian artifacts on the shores of Lake Tacoma has been reported and it is possible that someone had previously found this polishing rock, carried it to this spot, and decided that it was too heavy to carry further.

By bringing a boat into the shore stern first I was able, with much "huffin and puffin" to dislodge the rock from its bed and lift it up and over the stern of the boat. Much to my surprise I found that there were similar grooves on the other side of the rock.

An examination of these grooves seems to indicate that the objects which were ground or polished in the grooves were rubbed lengthwise in the grooves and perhaps sand and water was introduced to assist in the grinding process. There is, however, some indication of circular grinding near the edges of the rock as if the finishing touches had been applied in this manner.

This entire area was an attractive one to Indians, it is a mass of connecting lakes and streams. Cobboscontee Stream, which has its origin in a lake of the same name empties into the Kennebec River at Gardner. This stream is known to have been an important Indian highway. An Indian site and burial ground has been reported at the point where this stream emerges from the lake. Another small stream flows out of the series of ponds and lakes which make up the Tacoma area and empties into Cobboscontee Stream affording entry from the lakes to the greater chain of Cobboscontee, Annabessacook, and Maranacook Lakes, all of which are fairly large bodies of water.

We may then assume that Tacoma Lake and the Island were easily accessible. The shore line of the island and lake as it was washed and scoured by the ice and high water of spring was a good source of material, and that somewhere on the Island is a workshop from which this polishing stone came.

Gardner, Maine
October 1953
58

SOME SAMPLES OF RED OCHRE

By Ross Moffett

Below are brief notes on several samples of red ochre from graves and other sources. The first three specimens were submitted to me by the late Howard Torrey in 1949; the fourth was given to me by Harold Curtis in 1952; and the fifth was found by me in a Cape Cod shell heap. In the examination, each powder was first rubbed out on white paper and inspected for color and texture. After this, a slide of each material was prepared and inspected with a petrographical microscope.

SAMPLE 1

This specimen came from the Ore Mountain outcrop, Katahdin Iron Works, Maine, and was collected by Benjamin L. Smith. In reflected light, the material is a deep Indian red. Under the microscope, in transmitted light the thinner fragments of the essential mineral are a deep brown, or slightly reddish brown, and they tend to have a scaley or platey character. This translucent brown mineral is not doubly refracting. Accessory minerals, which light up between crossed nicols, are feldspar and quartz, both being in very fine grains.

SAMPLE 2

This sample is from a mass of red ochre covering a burial removed in 1915 by Fred B. Luce and Warren K. Moorehead from the railroad cut at the north end of Corn Hill, Truro, Massachusetts. As to color in reflected light, this material is about the same as the first sample. The microscope shows the same deep brown mineral again present, as well as about the same accessories.

SAMPLE 3

The powder is designated as from a glacial deposit at the easterly end of Newcomb’s Hollow, Wellfleet, Massachusetts. It is not from an Indian site and was evidently collected for purposes of comparison. The material in reflected light is brown rather than red, and when mixed with oil gives a pigment about the shade of Van Dyke brown. The slide of this powder shows the same brown, or red-brown, mineral as in the first two samples. Some of the accessory grains are relatively large and appear, in part at least, to be turbid feldspar.

SAMPLE 4

This specimen is from a red ochre burial excavated by members of this society at the site at Assawamsett Pond, near Middleboro, Massachusetts. To the unaided eye the material is a rather bright red, approaching the shade of Venetian red. The powder is fine and tends to be opaque, but specks thin enough to transmit light show the same deep brown mineral found in the other samples.

SAMPLE 5

The sample was scraped from a piece of soft, bright red rock, which was found loose in the shell heap. The powder is distinctly gritty. A microscopic inspection reveals the deep brown, isotropic mineral again present, but there is more quartz than heretofore. In fact, the specimen might be described as fine sand cemented with iron oxide. This sample, like the preceding one, probably came from the local, oxidized, glacial sands or gravels.

COMMENT

We have in all five samples a singly refracting, deep brown mineral, which is the essential in at least the first four samples. The optical properties of this mineral qualify it as limonite, the colloidal or non-crystalline, hydrous iron sesquioxide. It is interesting to note that a chemical analysis of the ore from Ore Mountain gives constituents substantially the same as those required for limonite. In none of the present samples is there any discernable trace of hematite, the crystaline, anhydrous iron sesquioxide. In this last connection, however, it may be well to note that the samples probably came from deposits near the surface and hence subject to weathering processes.

As respects archaeology, the possibility of identifying the red ochre of, say an Indian grave, with a particular source by any sort of optical tests would seem almost nil. If this is ever to be done, I think it will have to be by spectographic methods.

(3) E. A. Dana, ibid, pp. 483-5.

Provincetown, Mass.

January 5, 1954