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BRONSON MUSEUM
Tel. 222-5470

This is the Society's museum, 5th Floor of the 8 North Main Street Building, Attleboro, Mass. — Museum hours are from 9:30 to 4:30, Mondays, Tuesdays, and Thursdays. For special arrangements to visit on other days, contact the Director, Maurice Robbins, or the Curator, William S. Fowler at the Society Office, Bronson Museum, Attleboro, Mass.

The Museum includes exhibits of artifacts and seven dioramas portraying man’s prehistoric occupation of New England. The displays are arranged so as to show man's development through four culture stages, from early post glacial times.

The most recent diorama extends 15 feet across the front of the museum. It depicts an Archaic village of seven large and unique wigwams as indicated by their foundations, excavated at Assowampsett Lake by the Cohannet Chapter. Human figures to scale make the scene come alive and help create what unquestionably is an outstanding addition to our ever growing museum displays.
BAKERVILLE STONE BOWL QUARRY

JOHN NESHKO, JR.

Stone bowl-making in the Late Archaic has been investigated for many years, ever since W. H. Holmes in 1894 reported discoveries made in his excavations of Chesapeake-Potomac quarries. More recently, accounts of quarry excavations in the New England area have appeared in the Society Bulletin, including reports of work at Horne Hill, Oaklawn, Westfield, and Wilbraham. Much has been learned from these quarry digs, which has been studied by the writer. He has been especially interested, since steatite (soapstone) outcrops are numerous in the Winsted, Connecticut region, in what may be termed the foothills of the Berkshires. Four or more quarries were excavated by Rogers in New Hartford some years ago, while in 1948 Fowler reported his work for Yale Peabody Museum at the Ragged Mountain quarry in Pleasant Valley, only about 8 miles from Winsted in the Peoples’ State Forest of Connecticut.

Because of these quarry excavations, one of the more notable results has been the naming and classifying of quarry tools and bowl products, which have shown a remarkable similarity at all these quarry sites. Having absorbed the findings of this former research as a member of the Society, the writer explored the Winsted area in hopes of locating still more sites where steatite was quarried by the aborigines. In the spring of 1962 he made a discovery that is the subject of this report. It has provided new evidence that seems to indicate the probable evolutionary development of stone bowl-quarrying, to be described in the conclusion.

About 4 miles south of Winsted in the township of Bakerville lies Cotton Mountain, a 400 yard long oblong-shaped hill, and it was on this elevation one day that the writer’s attention was suddenly attracted to an unworked piece of steatite that lay at his feet. Apparently, it had been gradually pushed to the surface by a large root of an oak, and seemed to invite further investigation by spot digging. Nearby was a 15 x 50 foot depression, in one side of which a hole was quickly dug. Here was uncovered a quantity of steatite chips that seemed to suggest the presence of a quarry. The area lay in a rocky terrain, which obviously had never been plowed. This at once seemed to indicate an undisturbed condition, something that is rarely ever present at a quarry site. Located on the upper reaches of Rock Brook between the upper Naugatuck and Farmington river valleys, the site was well situated for industrial activity, as it was adjacent to numerous aboriginal occupation areas.

METHOD OF EXCAVATION

Assisted at times by James Wadhams of Torrington, the writer spent three years excavating the Bakerville quarry. The work was carefully conducted, since the importance of noting the position and depth of artifacts was realized because of the undisturbed nature of the quarry. Subsequently, with the position of recoveries recorded, a more careful study of the evidence was made possible.

In the work of excavating, first a 2 by 3 foot area was freed of roots and brush with an ax, and then the top sod was rolled back with a potato fork. From then on the fork was used to rake down through quarry tailings to the original top soil of the hilltop before it was covered by quarry waste. Trowels were used whenever required for careful excavation, resulting in recovery of many small objects. In the end, an area of approximately 60 x 110 feet was thoroughly excavated, with a great quantity of broken tools and bowls saved for study. Besides these, many perfect tools were found in such a way as to make possible what seems to be a valid accounting of the probable industrial progression that took place.

Investigation of the depression, previously noted, showed one end to have unusual depth, which was explored first of all, a description of which follows in the feature section. Working out from this deep quarry pit, to the west of which the quarry rim appeared, digging operations proceeded with contour data noted for use in drawing up a final map of the site (Fig. 1). Work continued to the periphery of the quarry, where depth of tailings fell off to nil, while one trench after another were backfilled. Recording of recovered artifacts, as related to the quarry pit, was carefully followed. In the end this became an important asset in postulating what may have occurred in the process of quarrying by the aborigines.

QUARRY FEATURES

Quarry Pit. This part of the original depression, previously referred to, was deeply filled with tailings that over the years had evidently been washed into it by succeeding rains. After digging out the pit to a 4 foot depth, it became filled with water and remained that way even during a dry summer. Believing that the bottom had not yet been reached, a 3 foot probe failed to reach the remaining bed rock ledge, where quarrying of the steatite vein probably ended. From this it was evident that at this deep pit, which seems obviously to have been the terminus of the quarry,
industrial activity continued to a depth of 7 feet or more.

**Hard Impure Steatite Ledge.** About 30 feet west of the pit appeared a ledge, the remains of a hard grade of steatite. It lay 3 feet underground with its cleavage seams sloping toward the pit. Quarried slabs of this difficult-to-work hard stone lay strewn about the western area as unworked waste, besides partially
Fig. 2. QUARRY TOOLS, Bakerville Quarry, (from area between Dumps #1 and 2). 1, Full Grooved Ax (ends battered); 2, Small Quarry Ax; 3, Large Quarry Pick (both 2 and 3 probably modeled after classic Grooved ax) — (1, 2, basalt; 3, purplish-streaked quartzite).

worked slabs discarded no doubt as unworkable. This hard steatite waste had been cut loose, apparently to expose a softer vein or veins of steatite used in making the bowls of the industry. Doubtless the preferred steatite had been completely worked away, resulting in formation of the quarry pit. And this activity in turn had formed the chips and steatite dust, which comprised the tailing fill.
Tailing Dumps. As indicated on the contour map, there were 4 well-defined dumps, where quarry waste had been deposited. They had depths of accumulated waste of 1 to 2½ feet, and among the tailings of Dumps #2, 3, and 4 were found broken semifinished bowls, and worn or broken tools. These had found their way into the dumps, probably as a result of the work expended in shaping bowls, which seems to have taken place about them. Here appeared scattered charcoal remains marking places where fires had once been, either for the purpose of cooking or just for warmth.

Dump #1. In and about this dump, formerly referred to, were found numerous fragmented slabs from the nearby hard steatite vein, probably evidence of early quarrying in an effort to uncover more workable softer steatite. Also, here were uncovered 2 well-defined Full Grooved axes of basalt — one is illustrated (Fig. 2, #1). Besides these, there appeared in this area 3 broken ax bit ends, which seemed to belong to other Grooved axes, making 5 in all. A great quantity of quartzite End picks and axes were found here. In general, they were shaped like the classic Grooved ax with deep side-notching and worked rounded poll (Fig. 2, #2,3) doubtless were modeled after this well-known kind of ax. Two bushels of these quartzite tools, mostly fractured, were raked out in this area. Some appeared in upper levels, but their frequency greatly increased at lower, presumably earlier levels. Also, at this location a few broken End picks made of basalt occurred along with quartzite picks, but they were more crudely made, with their natural cleavage edges seldom retouched, and with roughly chipped bit points. Above them in upper levels — when not disturbed — where quartzite picks were minimal, broken basalt picks appeared with finely ground pick points, indicating evident improved manufacturing techniques at a later time.

Some bowl products in this area, as gleaned from fragmented remains, consisted of thick-bottomed crudely pecked shallow vessels with wide poorly shaped lugs that were asymmetrical.

Dumps #2, 3, 4. The remaining 3 dumps contained broken tool and bowl remains, mixed in among steatite tailings. Their contents were similar to quarry leavings occurring in areas extending between and around these dumps, but away from the Dump #1 area. Nearby the quarry rim of the pit appeared a relatively small number of quartzite End picks, 10 all told, which were only slightly side-notched; were generally elongated and crudely formed, with little resemblance to ax and pick types from about Dump #1. Evidently, a change of design had taken place, probably following that of columned basalt picks, which were on the increase. In these probable later dump areas the quantity of End picks made of basalt was much larger than that of End picks made of quartzite, and their shapes became more carefully worked, often with ground bits. Also, along with them occurred small specialized tools of basalt, quartz, and quartzite. In addition, there were present 24 fair sized flint chips, indicating the use of flint, and 3 of felsite, as well as 3 drills and 4 projectile points to be described in the following section.

As indicated from quantities of semifinished bowl fragments recovered from these later areas, vessels had more sophisticated shapes and were made in a greater variety of forms than those observed around Dump #1 — although a few exceptions to this rule existed, which might be termed intrusive.

QUARRY TOOLS

End Pick. These tools, which were the most numerous, were made of quartzite and basalt, and ran to large sizes for the most part. Quartzite was readily obtainable from local deposits nearby, and therefore, might have been the first choice at the start of quarrying. Basalt on the other hand probably came from deposits in Canton and Plainville about 9 miles distant, and had to be laboriously brought overland to the quarry. When made of quartzite, the nature of the stone was such that it required much chipping to produce the desired tool shape. In Dump #1 area these tools of quartzite were fashioned with deep side-notching for hafting with usually a rounded poll like a grooved ax, and were made with either a roughly chipped point or an ax blade (Fig. 2, #2,3). Recovered evidence of perfect and broken specimens was sufficient to show that these quartzite picks and axes were hafted from the side like an ax — their size was relatively large. The few specimens of quartzite from other sections of the quarry were longer and more crudely formed with superficial side-notching, similar to picks of basalt.

When made of basalt, which habitually breaks in columned formation, End picks tended to assume more elongated shapes with less chipping required along cleavage edges. Their pointed and chisel-shaped bits were often ground (Fig. 3, #1), to judge from quantities of fractured pick points recovered from all sections, except as previously stated at lower levels of Dump #1 area. Here, instead, their pointed bits were roughly chipped into shape. Basalt picks were often side-notched slightly, as if for hafting, and sometimes had chisel-shaped bits, as formerly mentioned. They appeared in large and small sizes. Frequently, the smaller ones were not side-notched, but were made with a worked poll for a suitable hand grip (Fig. 3, #5). In a few instances, this tool was double bitted with a chipped point at both ends (Fig. 3, #2).
Maul and Hammerstone. Occasionally, heavy side-notched basalt Mauls were present — not illustrated — especially in the Dump #1 area, where heavy work was required to break up the hard steatite ledge in order to get at softer veins of steatite. Also, Hammerstones of basalt occurred; illustrated (Fig. 3, #6).
Fig. 4. SPECIALIZED FINISHING TOOLS, Bakerville Quarry. 1,2,6,9,10, Abrading-Scraper; 3,4,Hand Gouge; 5, Pipe Bowl Reamer; 7,8,12, Shaver; 11, Quarry Knife; 13, Side-notched, 14, T-based Drills; 15, Corner-removed; 3,16,17, Side-notched Projectile Points - (1,2,5-7,10,11, basalt; 3,4,8,12, 15, quartz; 9, quartzite; 13, 14, 16, 17, gray flint).
**Abrading-Scraper.** When it comes to smaller tools, there appeared several specialized ones that conform to types, which have become standardized at other New England quarries. Perhaps the most popular tool was the Abrading-scaper (Fig. 4, #1,2,6,9,10). At this quarry it was made of basalt and quartzite quite generally, and consisted of a small or large piece of stone, depending upon the size of vessel being worked. It is roughly flaked on three edges, the fourth being casually worked for a hand grip. It was probably used with a sawing-scraping motion in hollowing bowls.

**Hand Gouge.** This useful finishing tool was often made of quartz, like the two illustrated specimens. It required a strong tough stone, such as is found in quartz, to withstand the pressure resulting from its gouging action against steatite. It has an extended rounded bit like a scoop chisel, which tends to be uniform with beveled chipping (Fig. 4, #3,4). It doubtless was used to gouge out the inside ends of small bowls, as an assist to the Abrading-scaper.

**Shaver.** Three specimens are illustrated of this tool, one of basalt, the other two of quartz (Fig. 4, #7,8,12). This finishing implement consists of a relatively small, thin-edged blade, which has been chipped to a sharp razor-like condition. At least one end of the sharpened edge is rounded, appearing with the intent of having it fit the rounded inside edge of a small bowl. This tool may have been used to thin vessel walls by scraping from within, and probably was used in making such products as Drinking cups and Paint cups.

**Quarry Knife.** This tool was a sturdy 4 to 5" blade with a ragged saw-tooth edge deliberately chipped on one edge (Fig. 4, #11). Probably it was used to cut off unwanted sections of steatite by sawing. The specimen shown is of basalt, a popular stone for many tools at this quarry.

**Abradingstone.** This was another finishing tool, which consisted of an oval or egg-shaped stone of convenient size to fit the hand. It was made of materials having a rough grainy surface like hornblende, a stone that was often used — not illustrated.

**Spiked Tailing-Breaker.** This useful implement — not illustrated — was required to loosen trampled tailings so they could be removed. At this quarry three kinds of semi-hard stones were used for this tool, which was roughly flaked into an elongated shape with one end crudely pointed. Mica schist was used in slabs ½ to 3" thick, and showed side-notching for some sort of crude hafting. Another stone was hornblende schist, which usually was shaped with a worked blunt poll near crude side-notching for hafting — resembling a rudely shaped End pick. The third material was a granitic stone, which sometimes broke along cleavage planes, with occasional convenient natural notches along the edge, which may have been used for hafting.

**Hand Spade.** Relatively flat stones of any convenient size to fit the hand were doubtless used as spades — not illustrated. Made of schist materials, and sometimes even of basalt, they often assumed triangular shapes with wear usually showing on one edge. They are presumed to have been employed in shoveling loosened tailings into baskets for disposal in quarry dumps. Some of these tools, when large and a suitable shank was present for holding wrapped thongs in place, may even have been hafted.

**Drill.** Of 3 drills recovered, 2 are illustrated (Fig. 4, #13,14). They represent two recognized types of the Late Archaic Age: Side-notched and T-based, and are made of gray flint, except the one not illustrated, which is made of basalt.

**Projectile Point.** Three of the 4 projectile points recovered from between Dumps #3 and 4 are illustrated (Fig. 4, #15-17). Exhibit #15 is of seam silica quartz and represents an ill-defined specimen of Corner-removed #3. The remaining Exhibits #16,17 are of gray flint, and probably should be classed as Side-notched #1, an especially good diagnostic of the Late Archaic. The fourth point — not available for illustrating — has been described as having a basal shape closely matching Eared #3, another important diagnostic of the Late Archaic. It was made from a thin dark gray piece of flint, with sharply worked outlines.

**Quarry Products**

Recovered from the Dump #1 area, where evidence revealed the presence of a vein of hard unworkable steatite, were a few roughly worked unfinished bowl-forms. They were derived from slabs of poor steatite, which had been broken off from the ledge along cleavage planes, and appeared as probable experimental artifacts that had been found impossible to complete. Besides these there appeared other remains of a softer, more workable grade of steatite, from which, as previously mentioned, was fashioned a griddle-like cooking utensil. Broken remains suggested a thick-bottomed shallow vessel with widely shaped crude lugs, similar, as it would seem, to a completed specimen found a half mile from the quarry. It measured 7" wide by 20" long with a 4" thick rounded bottom, and it had a shallow hollowing of only 1".

About half way between Dump #1 and the quarry pit, which might indicate a position connected with a later period of quarrying, appeared a large kettle-
form partially worked (Fig. 5, #5). It was uncovered at a depth of 2 feet, and was lying bottom side up without any quarry tools nearby. It weighs about 70 lbs. and has a lug pecked out at each end, one larger than the other. The tool scars on its surface indicate that it was shaped with a pick with a narrow chisel-like bit. It is of interest to note here that this is the same chisel-tooling appearing on a similar large kettle-form found by Fowler at the Wilbraham quarry, now a part of the Indian quarry set in the Museum of Science at Springfield, Massachusetts. Also, a smaller bowl from the Horne Hill quarry shows chisel scars over its entire exterior, Society Bulletin, Vol. 27 #2. The Bakerville specimen measures 13" wide by 20" long, with a thickness of 8". On its cleavage face, where it was separated from the ledge, there is some evidence to show that the work of hollowing had just commenced.

While this recovery indicates that large bowls were fabricated at the quarry, excavated evidence reveals that small ones also were made. As Fowler reports at Westfield and Wilbraham, Drinking cups—sometimes called Ladles—probably were products of the quarry, and 2 cup-forms from Bakerville partially shaped are illustrated (Fig. 5, #2,4). At only one end appears the start of a lug, which apparently would be developed into a utilitarian handle like those at Wilbraham—not a stylistic one like those at Westfield. Also, smaller Paint cups were made at Bakerville as illustrated (Fig. 5, #3). Such cups may have had a lug at each end, as is suggested by this exhibit. Besides such vessels, at one place the remains of what appeared to have been a Platter was discovered.

A most interesting recovery made at the quarry apparently was to have been a large hexagonal Gorget, which became fractured before its holes were drilled (Fig. 5, #1). It consists of a flat piece of steatite symmetrically shaped with six sides, and has prominently ground beveling on at least two of them.

Among numerous fragments of bowls were 4 pieces that had holes drilled near the bowl rims. One showed the drilling to have occurred from both sides, while another revealed a recess groove that had been made from the drilled hole up to the rim on the outside. This latter feature suggests the possible use of thongs to help lift or carry heavy bowls, although most holes probably served as a means of repair by thong-tying, when a bowl became cracked.

CONCLUSION

Because of the undisturbed condition of the Bakerville quarry either from farming activities or from curiosity pothole diggers, the deposits from quarrying lay in situ, as they had been left by the aborigines when the quarry closed down. At the Horne Hill quarry a radiocarbon measure of charcoal buried 8 feet in the tailings—2,800 years ago—established the belief that quarrying operations there extended over about a 2,000 year span. And now at Bakerville, to judge from the amount of steatite removed from the 15 x 50 foot cavity to a depth at the pit end of 7 feet or more, a reliable estimate also might tend to support the belief that quarrying there was of long duration. For the removal of steatite by stone tool hand labor must have required an excessive amount of time, many hundred-fold more consuming than that of modern mechanical methods. And especially this seems relevant when thought is given to the probable irregular periods of sustained labor by the quarriers, not to mention the long winter months, when work became impossible.

More specifically, however, excavated evidence at Bakerville tends to suggest something other than the probable life span of the quarry. It is of equal importance, and is a postulation never before possible on account of lack of evidence at other quarries. While the kind of tools and steatite products at 6 other stone bowl quarries in the Bakerville area, excavated to a lesser extent by the writer, were similar to those at the Bakerville quarry, this site seemed the best suited for an extensive excavation because of its undisturbed condition. It is now thought possible, on account of the presented evidence, to postulate the evolutionary development of bowl-making at this quarry from its opening to its close.

A glance at the contour map (Fig. 1) will serve to call attention to the inevitable conclusion that the deep quarry pit of 7 feet or more would not have been dug at the start of operations, due to the unnatural requirement of quarrying such a deep hole straight down into the steatite ledge with only the use of stone tools. Therefore, with rim of the quarry nearby to the east, one must look in the only other direction where extensive quarrying took place—to the west—at the end of which is Dump #1. Here were scattered broken slabs of hard steatite, fragments of a ledge that exists as a site feature. Now, since all recovered bowl fragments and forms are made of a good grade of softer steatite, it must be concluded that outcrops of this more easily worked steatite once existed, and were completely dug away. Therefore, so far all evidence seems to point toward the progression of quarrying from Dump #1 easterly into the quarry pit, with bowl finishing being carried on to the north and south, where the remaining 3 dumps were located.

With this deduction made, it now remains but to examine the artifacts which were recovered along the course that quarrying is believed to have taken. Re-
Fig. 5. SEMIFINISHED PRODUCTS, Bakerville Quarry. 1, Hexagonal Gorget; 2, 4, Drinking Cup; 3, Paint Cup; 5, Kettle-form (note reduced scale) — (all of steatite).
ferring back to the tools found about Dump #1 where
the quarry probably was first worked, it seems signifi­
cant that 5 Grooved ax remains appeared there and
nowhere else in the quarry. Further, that round about
them quartzite quarry picks and axes appeared, pre­
dominantly side-notched and shaped like the classic
Grooved ax. Furthermore, when later upper levels at
this location are examined and an approach easterly
toward the quarry pit is made, tool evidence reveals
more elongated basalt picks are on the increase, with
quartzite picks reduced to only 10.

These, by then, were being shaped more like the
basalt ones, elongated in form. And finally, all about
the pit and between the 3 remaining dumps appeared
many small finishing specialized tools, indicating more
attention was being paid to a greater diversity of bowl
styles—apparently some of the finishing was taking
place at the quarry, although most was doubtless per­
formed at home camps.

While most of the steatite products were frag­
mented, enough semifinished bowls and bowl-forms
occurred to provide some idea as to the kind of
products being made at both ends of the quarry
works. Nearby Dump #1 evidence seems to indicate
the making of a crude sort of shallow griddle with
thick bottom as previously described, which may have
been the first kind of vessel to be attempted. And
approaching the eastern end in the area about the pit,
apparently more sophisticated bowls, both large and
small were fashioned out of steatite. This seems to
support the contention that bowl-making with im­
proved techniques was evolving as an approach is
made to the quarry pit.

As a result of this study of the evidence, it seems
possible to postulate some of the events that probably
took place associated with the evolution of quarrying
at the Bakerville quarry. The assumption appears
valid that with the opening of the quarry the Full
Grooved ax, which is a recognized diagnostic of the
Late Archaic Age, was one of the first tools to be used.
However, faced with a ledge of hard steatite, heavy
mauls were found useful in breaking away this diffi­
cult-to-work stone in order to uncover softer steatite,
outcrops of which may have been exposed. The
Grooved ax then came into use, while larger tools
with ax and pick points modeled after it were
fashioned out of local easily-obtained quartzite. That
these tools apparently were shaped like the Grooved
ax seems evidence enough to justify a belief that here
at Dump #1 the start of quarrying took place, with
the culturally present Grooved ax the key to tool­
making.

As time passed, and decades stretched into cen­
turies, quarrying proceeded slowly to cut away the
steatite and make it into useful cooking and eating
vessels. A thick-bottomed griddled-like platter may
have been one of the first attempted, while later on
there evolved a diversified array of bowls and drinking
cups to cope with the new liquid foods of the day.
Creative minds developed new ideas, and with the
evolving of smaller containers development of small
finishing tools became a necessity. There is reason to
believe that contacts of some kind existed between the
numerous stone bowl quarries of New England, for the
small tools at Bakerville are similar to those at other
quarries and have fitted conveniently into several
established classified types.

This quarry, like all others in New England so
far reported, is a part of the Late Archaic Industrial
age, as proven by presence of the Full Grooved ax,
drills and projectile points previously described. And
there is at least one recovery—a probable Pipe-bowl
reamer (Fig. 4, #5)—that may indicate the making
of stone pipes on a small scale before the quarry
closed.

Finally, it should be noted that with the success­
ful development of the quarry the workers began to
go further afield in the procurement of suitable stone
materials for tools. For example, flint was obtained,
doubtless from Hudson Valley deposits not too far
distant. And of greater significance, by overland
routes the quarriers seem to have increased their
transportation of basalt as the work progressed. This
was a most important tool material, obtained in
columned-shapes from known deposits 9 miles distant
at Canton and Plainville. Because of basalt's relatively
long forms, End picks with elongated shapes emerged
to change the style of picks from the quartzite ax-like
ones of former days. While the time span of quarrying
at Bakerville is not a part of this investigation, dis­
losure of the probable evolution of tools and pro­
ducts, as has been described, seems an important con­
tribution to the study of stone bowl-making.

Winsted, Connecticut
October 1, 1968
NEW ENGLAND AGRICULTURE FROM CHAMPLAIN AND OTHERS

HOWARD S. RUSSELL

One of the most detailed and valuable descriptions of the life and customs of the aborigines of the coast New England is the account in French of Samuel de Champlain, who made exploratory voyages along these shores in 1604, 1605, and 1606, reaching as far south and west as Vineyard Sound between Martha's Vineyard and Cape Cod. This was ahead of any English colonization except in Virginia. An acute observer with an inquiring mind, Champlain's accounts of the aborigines and his charts of their harbors and villages are of especial interest to archaeologist and historian alike.

He found the southern New England aborigines to be farmers and fishermen rather than mere hunters like those he had met further east, which caused him to watch and record their ways with close attention. For this reason one of his observations regarding the native method of planting corn, as rendered into English by the translators and as customarily interpreted, has always appeared puzzling to me, a one-time farmer.

"We saw their Indian corn which they raise in gardens," he says of the first agricultural natives he meets, at the mouth of the Saco in Maine. "Planting three or four kernels in one place they heap about it a quantity of earth." How? "Avec des escailles du susdit signoc." With my limited French, escailles means shells—such as those of oysters, a good dictionary says; but what is "signoc"? The word does not appear in any of the comprehensive French dictionaries of a large library to which my search led me, when I began to ponder—not by any means for the first time—the statement which has been current that Champlain saw the shell of the horseshoe crab used as a hoe.

Apparently Charles C. Otis, the careful translator of the early, and now rare Prince edition of the Voyages, published in 1878, was not certain, for he set it down, "with the shells of the signoc before mentioned," and editors since have been apt to follow him. What about "before mentioned"?

A few sentences previously, in enumerating the weapons of the natives, Champlain relates that their arms consisted of pikes (or spears), clubs, and bows and arrows. Some of the arrows, he noted, were entirely of wood. Others were pointed with bone. For still others the point consisted of "the tail of a fish called signoc" ("la queue d'un poisson appelé signoc"). Again translator Otis copies the original word, without attempting to put it in English.

However, it has been generally assumed that the term, as related to cultivation, referred to the crab, and the late Charles C. Willoughby, in his Antiquities of the New England Indians, states that "Champlain saw the shells of the horseshoe crab used as hoes," though the word hoe does not appear in the French text. Without question, by any person acquainted with this crab, its pointed tail might be just the thing for a piercing arrowhead. But would the rather fragile shell be of much use as a tool with which to hoe or mound earth? As a farmer I have long questioned this, and at length decided to look into it further.

Thinking that the word "signoc" might perhaps be local or ancient French for some Bay of Biscay shellfish with which Champlain was familiar, I sought the help of Harvard's Department of Romance Languages, and through the courtesy of Assistant Professor Jean Claude Martin and Professor Louis F. Solano, a specialist in ancient French, I was steered toward a conclusion that appears reasonable.

Professor Solano's philological and linguistic experience caused him to call attention to the close parallel in pronunciation between Champlain's word "signoc" and the Algonquin word that Roger Williams' "Key" gives for clams, "sickissuog,"—the last four letters denoting the plural, pronounced seeky (or suky) suog. Then I noted that J. Hammond Trumbull, who a century ago edited Williams' book about the Indians and their tongue, says that the root of the word means "he spits or squirts." Trumbull quotes the early colonial writer William Wood, as to the habits of the clam, familiar to all who have spent any time on sandy shores.

Wood, who was in New England for four years in the early 1630's, like Williams was an observer of the usages of the Indians, and in his New England's Prospect, published in 1634, he gives light on the subject of their tools for cultivation. "The Indian women exceede our English husbandmen," he comments, "keeping it [the ground] so cleare with their Clamme shell-hoes as if it were a garden rather than a corne field." A hoe, clamshell or other, would certainly seem to require a haft or handle, but Wood, while calling the native tool a hoe, leaves this point open.

Another 17th century writer, Judge Samuel Sewall of Salem, writes to Nehemiah Grew that "the natives tilled their ground with ye shells of fish," but neglects to mention which fish or how the tillage was done. Coming into the 19th century, Rev. Enoch Pratt, in his History of Eastham, Wellfleet, and Orleans, pub-
lished 1884, when Indians still lived on Cape Cod and the islands in considerable numbers, states, on what authority he does not say, that the Indians tilled their corn with the shells of the sea clam, "for which use they were adapted by their size," much larger than that of the round clam or quahaug.

We note that among Williams' list of sea and fishing terms he records "Sequonnock, A Horse Fish," the Algonquin meaning of which editor Trumbull says is summer-shell-fish, one that the colonial writer Josselyn called the horse-foot or asses hoof." When, later in his Voyages, Champlain gives a detailed description of the horseshoe crab, and once more speaks of the tail being used on a weapon, he calls it "Siquonoc," almost identical in pronunciation with Williams' word for the creature.

Champlain, though repeating his statement as to the tail serving to point an arrow, fails here to make reference to the use of the shell in cultivation. He leaves no question, however, as to his close acquaintance with the creature, for he calls it "a fish with a shell on its back like a tortoise," and in the 1632 Paris edition of his Voyages the large folded frontispiece chart of La Nouvelle France Occidental exhibits a series of vignettes of the wonders of New France, among which the horseshoe crab is unmistakable.

Two other references to the crab suggest themselves as being of possible pertinence. In Vol. VIII (1802) of the Collections of the Massachusetts Historical Society, a correspondent from Cape Cod, in a description of the town of Orleans, states: "The horse-foot or king crab was formerly much used for manuring land set with Indian corn and potatoes and it is still employed in parts of the country [Barnstable] ... chopped into small pieces, and not more than one, and sometimes not more than a quarter, put in a hill." In Freeman's History of Cape Cod, the same practice is reported from Truro. The fact that the Indians taught the Pilgrims to use herring as fertilizer for corn suggests that the practice of putting the crab in the hill may have come from the same source, and may suggest a possible explanation of Champlain's crabshell observation, although I have yet to find any record of it.

Putting all this together, taking into consideration the thinness and brittle nature of the covering of the horseshoe crab, and realizing also that no writer other than Champlain mentions its use in connection with cultivation, may it not be that the sound "signoc" represents either a vague remembrance of a word heard in the Indian tongue quite different from French, or a possible misunderstanding of an explanation in sign language as to the use to which the crab was put—Champlain was not on this coast at planting time, and his Indian guide knew little of the local dialect, so he states. If the crabshell was actually a tool in connection with planting, it appears likely that it would have been held in the hand kneeling, rather than used as a hoe blade at the end of a handle.

The hoe of a real clamshell, however, whatever the type of clam employed, must have been a valued implement, for Roger Williams commented: "The Indian Women to this day, notwithstanding our Howes doe use their natural Howes of shells and wood." Clamshells may have been hafted like stone Triangular hoes, referred to later, according to Fowler, as illustrated (Fig. 6). The Rhode Island and Connecticut tribes that Williams knew so well must have had a number of varieties of hoe, each designed for some particular purpose, for he lists three types as follows: 1) "Anaskhig-anash, How, Howes;" 2) "Anaskhomwautowwin, A breaking-up How;" 3) "Monaskumnummautowwin, A weeding or broad How." Definition of #3 is perhaps intended to make clear that this tool is not of the heavy type, known in English as the grub hoe. John Winthrop, Jr., writing from Connecticut, uses the very same words in his report to the Royal Society later in the 17th Century to describe the hoe used in maize cultivation.

![Fig. 6. QUAAHAUG SHELL, with suggested method of hafting, to illustrate how it could have been used as a hoe. In hafting, a nick is made on opposite edge to shell muscle — thongs are crisscross lashed front and back, in the same way as when hafting a stone Triangular hoe.](image-url)
also, what Hariot in Virginia had earlier named "peckers and parers," a foot long and five inches broad, and perhaps of wood. An early English treatise on gardening lists several sizes and varieties, so this is of no great help.

Williams' second class he calls the breaking-up hoe. For new ground—in Algonkian, "Wuskaukamuck," and to break it, "Anaskhommin;" for tearing out tree roots—a job that Champlain mentions; or for opening up a tough stony sward, something especially sturdy would be called for. It would almost certainly require a good haft, so that with a smart blow it would penetrate the surface like a modern pick or mattock. This is shown in a De Bry engraving from Le Moyne's 1591 paintings of Florida Indians, but more specifically from Lafitau's drawing, engraved in 1724, depicting eight Huron women planting maize somewhere in the St. Lawrence River Valley. Four of them are bringing down implements of the pickax type, triangular in shape with a pointed bit (Fig. 7).

Editor's Note: The Boston Athenaeum has just located important information from a French source: Recueil de Planches sur Les Sciences, Les Artes Liberaux et Les Artes Mechaniques, avec leur Application, Pl. 1, Agriculture, Jardinage, Paris, 1762. Among the contemporary French agricultural tools of this age, as shown in this plate assemblage, are two kinds of long iron hoe blades, one with a pointed bit, the other with a blunt truncated one (Fig. 8). From this it seems probable that Lafitau, when illustrating the Huron hoes, had in mind these two styles of French hoe blades, presumably the same in 1724 as they were in 1762. Doubtless, when illustrating the Huron planting scene, memory of the French type with a pointed bit served to justify what he saw, when he illustrated triangular rather than truncated hoes in the hands of the four Huron women. This would then appear to support the belief that the Huron hoes actually were triangular in shape as drawn. Also, that they were probably made of stone, as shown by Fowler's recent recoveries of Triangular stone hoes from Richelieu River sites near Mt. St. Hilaire, one of which is illustrated (Fig. 9, #3). Mt. St. Hilaire is believed to be the mountain complex shown in the background of Lafitau's drawing.

In New England archaeologists often come upon triangular shaped stone artifacts showing clearly the effect of manual working. Too large and thick for spear points, they often show signs of wear on the pointed end. The base usually has an oblique face, sometimes grooved, as though designed to receive a handle at an obtuse angle, and the lateral sides may be slightly notched as though to accommodate thongs.

William S. Fowler, who first called attention to
them, has classified them, I believe with good reason, as "Triangular Hoes" (Fig. 9). He traces their probable origin to the Triangular tailing-breaker used at certain stone bowl quarries of the previous Late Archaic Age.

Dankers and Suyter, Hollanders, in a 1679-80 visit to the Hudson River region report of the Nyack Indians that "the implements of tillage are a small sharp stone and nothing more," which may tend to confirm deductions from archaeological evidence. Willoughby shows six broad bitted stone implements not triangular in shape, with bits ground to a relatively sharp edge and fitted for side hafting, made of Connecticut Valley traprock. He designates these as hoe blades, but Fowler, from careful examination and comparison, believes them to be Hatchets, since they appear to have deliberately honed bits, with side-notching suggestive of a side haft.

On old fields or in sandy soil a hoe of bone might be the proper tool, formed from the scapula or shoulder blade of a large animal. This bone is strikingly adapted by its shape for hafting and tillage. It may, however, be the "weeding or broad hoe" that Williams lists for his third classification: or perhaps the third class may have included the tool formed from the large sea clam mentioned earlier.

Wood says that hoes were made of the shoulder bone of the moose. Moose were few in southern New England; deer were much more plentiful. Abiel Holmes, in his Memoir of the Mohegans, published in 1784, quotes an aged Indian informant: "Our ancestors made use of bone, either moose, bear's, deer's shoulder-plate instead of hoe, to hoe corn with—tie it first to end of stick or helve made for that purpose."

This type of hoe was widely in use elsewhere. Loskiel, in the 18th Century, says that Delaware and Iroquois formerly used the deer's shoulder bone, "fastened to a thick stick." Swanton mentions an 18th Century report from the southeast portion of the country of a bison's shoulder blade turned into a hoe, and the missionary Rev. John Heckewelder, who worked in the middle Atlantic and Lake areas in the same century, heard of traditions of hoes coming from both elk and bison bones. Although far from eastern Algonkian territory, Will and Hyde speak of the elk's shoulder as a Mandan tool in the Upper Missouri Valley. Antlers, and a sharpened turtle shell for cultivation, also get mention, and in Florida a hoe made of a fish bone, fitted to a wooden handle, effective in light soil there.

Recall now that Williams spoke of the women liking their old-time hoes of shells "and wood." This reference appears to be the only mention of a wood hoe among the early New England writers, but Hariot in Virginia gives a description of "wooden instruments, mattocks or hoes with long handles," used to break up the ground. Father Hennepin, exploring the upper Mississippi country observes: "To plant their
Indian Corn they make use of Pickaxes of Wood for want of those of iron,” but Swanton quotes a French chronicler in the south, who says that wood hoes were preferred to iron because lighter, and mentions hickory mattocks shaped like a capital L, noted by Le Page du Pratz (1758), in use by natives in what is now the eastern Gulf of Mexico area in the United States. Apparently, not all wood cultivating tools used by Indians were of the long-handled type, for Cartier on his second voyage into Canada saw native women (Stadicone) cultivating corn with small pieces of wood that reminded his military mind of a half sword. Recall also the peckers and parers earlier mentioned.

To return to another facet of Champlain’s description of aboriginal farming tools and the questions it raises, at Saco where he first met agricultural natives, he also states that in place of plows, the local tribe has a hardwood tool made after the manner of a spade (“fait en façon d’une besche”), which they use to break up the soil for planting. It was early July when he arrived there and the corn was already 2 to 3 feet high, so he may have inferred the part about breaking up the soil with a spade; although later, at Nauset on Cape Cod, he repeats: “They work it [the ground] over with their wooden spades (besches de bois).”

At any rate, so far as I can recall, neither Roger Williams nor any other very early observer in New England speaks of an Indian spade or shovel. In New Netherland, now New York, Van der Donck says specifically that the natives knew nothing of spading: they bought pickaxes for the purpose, De Rasieres (1638) writes. Were the Saco and Nauset tribes the only ones in coastal New England to have invented the spade? Or did Champlain infer too much? Again, this question seemed worth investigating.

Wondering what the French word “besche,” here translated spade, might have meant to a countryman from the center of France’s southwest coast in the early 17th century, I was fortunate enough to be directed by Miss Margaret Hackett, research librarian at the Boston Athenaeum, to A. Parmentier’s Album Historique. In it are pictured two ancient French spades, one from the 13th and the other from the 14th century that are easily recognizable as such. Each has a crosspiece at the upper end of the handle to form a handhold, and each has a flat working piece or blade, which narrows more at the working end than is the case with a modern spade. However, M. l’Abbé Tessier, editor of Vol. II, Agriculture, of Encyclopédie Methodique, published in 1741 in Paris, warns that a more complete work by l’Abbé Rosier—not available to me—describes ten varieties of “besche,” among them a three-tined fork! To illustrate the difficulties of guessing just what explorers may
have seen, Father Sagard in his account of the Canadian Hurons mentions that they freshened up last year’s corn hills (“memes places et aux memes endroits”) with what has here been customarily translated as “a little wooden shovel shaped like an ear.” Yet his word “pelle,” the dictionary says, can just as well mean scoop or even spade, each of the three having a handle such as the text mentions.

Certain flattish stone implements with side-worked stems, found in New England, some with slightly pointed, others with rounded or straight edged bits have been classified as spades (Stone Implement Classification of the Society, Bulletin, Vol. 25, #1). Fowler illustrates the three types (Fig. 10). Delabarre and Wilder mention two well-shaped oval hoes or spades of slate found at Assonet on Mt. Hope Bay. It appears logical that the aborigines in the area might have found spades of some sort useful in digging the Jerusalem artichokes they cultivated, and perhaps the numerous other roots they are known to have used for food and medicine.

Beyond this, a spade would have been valuable in excavating the underground pits that the local natives provided to hold their winter stores of food, as well as refuse pits. Champlain mentions trenches five or six feet deep on Cape Cod, but pits found in the Ware and Deerfield River valleys are reported up to ten feet deep, with a diameter of three to twenty feet. Yet it is pertinent to recall that Indians elsewhere have been recorded as being able, when necessity arose, to make an excavation rapidly with only their axes and their hands.

With all these varieties of spade-like tools in mind, and recalling that Champlain was French and lived three and a half centuries ago, we appear destined to continue to wonder just what it was that Champlain saw the natives use, or describe the use of in sign language, that appeared to him like a French spade. That either spade or hoe had much connection with the carapace or shell of the king crab appears truly doubtful.

To our list of agricultural tools used by the natives of New England one further addition may be made, a dibble-like tool for making holes into which to drop seed. Lafitau’s illustration of Huron corn planting shows one of the women leaning over, straddling the hill, and punching holes in it with a short-handled implement, for another to drop seed into

Fig. 10. STEMMED SPADES (3 styles), with suggested method of hafting.
(Fig. 7). Such a practice gets confirmation also from the De Bry engraving already mentioned, as well as from accounts of explorers and travelers among other North American tribes. No written record of such an implement appears in any early New England document of which I have knowledge. But this is not necessarily indicative, considering the disrespect most early settlers had for the natives and their customs. Father Rale in Maine saw squaws making holes for seed with their fingers or a stick. Yet anyone who has ever reddened the skin of his fingers in setting vegetable or flower plants in gravelly New England soil will agree that for such purpose a tool, however crude, might logically be expected.

Hence when Fowler identified as agricultural tools certain 6 to 7" in length sturdy stone artifacts, which show clear evidence of working, not infrequently stemmed as though for hafting, and classified them as Corn-Planters, the designation appeared appropriate (Fig. 11). Many examples of this tool have since been recovered by archaeologists.

Thus, analysing available accounts of New England's explorers and colonists together with archaeological evidence, we arrive at a picture of perhaps half a dozen implements for aboriginal ground breaking and cultivation. They were fashioned from materials at hand: shell, bone, wood, stone—some with minimum labor, others with a good deal of pains. Certain of these may have been held in the hand without hafting. Others were bound to wood handles, some long, some short, by means of leather thongs or fiber cords.

However crude, agricultural tools at the start of cultivation may have been in prehistoric centuries, by the time written records begin these implements enabled the natives of southern New England to supply themselves with corn, beans, squashes, roots, and perhaps other products, in quantity sufficient to provide a substantial portion of their food, both during the growing season and for winter storage. Willoughby states, I believe correctly, that "agriculture was the mainstay of the tribes of this commonwealth," Massachusetts. Indeed more than once after the whites arrived in their ships, the purchase of some hundreds of bushels of corn from the stores of the natives saved the newcomers from exceedingly lean fare.

One further comment: whatever the crudeness of tools for breaking the ground in spring, the natives seem to have had considerably more fun at it than our white ancestors, who followed the ox-drawn wooden plow, with one man to hold plow, one to bear down to keep the beam in the ground, and a third to turn the sod: all of it hard work. "With friendly joyn-
to help freely.” Hariot and Adair report song and entertainment accompanying ground-breaking bees among Indian tribes elsewhere, a pattern for combining work and pleasure found in primitive societies from ancient Scotland and Sweden to Basutoland.

Thus, at this date so long after, we may share with Champlain, whose account started us on this quest, a feeling of respect at what our aboriginal predecessors, lacking horse, ox, tractor, and tools of metal, were able to accomplish with a few simple and home-fashioned hand tools of stone and bone.

Wayland, Mass.
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ABORIGINAL GRINDING EQUIPMENT

WILLIAM S. FOWLER

The act of grinding food occupied an important place in the economy of most peoples at some period during their evolutionary climb. With some it occurred earlier than with others, depending to a large extent upon the kind of food made available by the environmental surroundings of the group of individuals under study. Here in the Northeast evidence of food grinding first appears at some time during the long duration of the Late Archaic, an age of industrial growth in which bowls were made of steatite, chlorite, and other kinds of stone. In the process of preparing the liquid meals of the day, made possible by stone bowls, use of certain crushed food materials including nuts and berries seems to have been conceived as providing desirable ingredients, to help stave off the pangs of hunger.

Before this the nomadic hunters of the Early Archaic appear to have depended almost entirely upon meat and fish, which required no grinding—no permanent eating vessels were left behind to indicate the use of liquid foods. For during this caribou-hunting age evidence is such at excavated sites, including Twin Rivers and Flat River in the Rhode Island uplands, as to suggest a tundra to semi-tundra condition, in which nut-bearing trees were probably nonexistent. As nuts provide a kind of food that is susceptible to grinding when available in large amounts, the coming of the Late Archaic seems to have set the stage for their use in a ground condition. By this time, about 5,000 years ago, forests had arrived with nut-bearing trees, which would have supplied nuts in quantity. This was during a warm period—"climatic optimum"—of long duration. Besides nuts and berries, evidence also points to the probable use of animal bones in this age as an ingredient, which may have been ground up and mixed with food elements in various recipes. But with reference to nuts, since it is more convenient to eat them, as taken from the shell in whole form, it is likely that the grinding of them did not occur to the people until such mashing would have accommodated itself to the making of liquid recipes. And this quite likely would not have taken place until permanent stone vessels were made in this industrial Late Archaic era. During the course of this age's stone bowl-making, now and then a bowl might have been shaped with walls thick enough to allow it to serve as a grinding vessel—and there is not much doubt that such would have been the earliest form of mortar. However, there is reason to believe that once in a while a more commodious bowl would have been constructed with uniform thick walls scraped smooth, expressly made to serve as a mortar. Such a vessel of steatite is on display in the Bronson Museum (Fig. 12, #1). As can be seen, it is more or less circular in shape, has no lugs, is scraped smooth on both sides, and has walls about 1 to 1 1/2" thick, which taper slightly within toward a flattened bottom. This was a surface find years ago on a plowed site in Attleboro, Massachusetts. While this is the only well-defined steatite mortar known to the writer, others have been reported—see Antiquities of the New England Indians, p.147, by C. C. Willoughby. And when they were not available, regular steatite bowls, as previously suggested, could have been used just as well.

Doubtless the first tool employed for grinding operations was an elongated cobble 7 or 8" in length, used as a pestle. This required no shaping by the hand of man. Such artifacts were numerous at the Late Archaic village site reported at Wapamucket 6 on Assowampsett Lake in Middleboro, Massachusetts, and have appeared at other sites as well. After some time, however, Late Archaic recoveries suggest that more sophisticated pestles were pecked out of elongated slabs of granitic stone, sandstone, or schist. They are relatively short, of no more than 10" in length—usually much shorter—and at first seem to have been left with rather rough uneven surfaces. However, after centuries of grinding experience they were made with excellent cylindrical proportions and with smoother surfaces. When such pestles were used to any great extent, most always they reveal evenly-worn ground ends, indicating wear from friction against stone mortars of the day. Illustrations show two pestles representative of the types referred to. Typologically, they are associated with the Late Archaic (Fig. 12, #2,3).

From a study of artifacts of this age and those of the following Ceramic era there appears much overlapping of stone implement traits, found in the categories of projectile points, knives, and artifacts of certain integrated industrial activities. From this the conclusion seems valid that racial continuity existed between the two ages. With such a strong probability, it is not strange to find that the grinding equipment for maize, which appears with arrival of the knowledge of pottery-making, resembles that used previously for nut-grinding in the Late Archaic. Apparently, the problem of grinding maize was solved in the Northeast in a different way from that in the South.
Fig. 12. NUT GRINDING EQUIPMENT (probably Late Archaic). 1, Steatite Mortar (Attleboro, Mass.); 2, 3, Contemporary Pestles (Narragansett Bay Area).
west, where the metate and mano were the accepted tools over a wide area extending eastward. When maize finally arrived in New England after its long movement across the continent, the western process of grinding proved unacceptable to easterners, whose tradition dictated a different method requiring the mortar and pestle. However, in some cases it appears that the western tools persisted in modified forms in which a shallow stone mortar was sometimes used with a rounded block of stone or Muller, in place of a pestle, for mashing kernels of maize (Fig. 13, #2-4, 6).

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Fig. 13. OCHRE AND MAIZE-GRINDING EQUIPMENT. 1, Honing stone block for grinding red ochre; 2-4, Mullers for use in grinding maize in shallow mortars; 5, Log Mortar (colonial relic, Sturbridge, Mass.); 6, Shallow Stone Mortar (Narragansett Bay Drainage); 7, Corn-mill Pestle (Canaan, Conn.).
Fig. 14. MAIZE GRINDING EQUIPMENT. 1. Stone Geode Mortar (South Deerfield, Mass.); 2-5, Effigy Pestle Heads (2, 3, 5, Marshfield and Narragansett Bay Area, 4, Berkshire Housatonic Valley).
Probably, the earliest mortars for maize-grinding were of steatite—a survival from the previous age—which required but relatively short pestles. Besides these in some cases, in order to obtain a hollowed stone, a natural stone formation was utilized, such as a geode of a commodious size. This stone formation consists of a soft sedimentary shell hardened by heat around a harder pebble or crystal core, formed by natural forces in early geologic ages. When found by the aborigines, the hard core was removed, if it had not already broken loose, leaving a convenient deep hollow, and was subsequently utilized as a stone mortar. Such a mortar was plowed up on a Connecticut Valley camp site in South Deerfield, Massachusetts and is now on display in the Bronson Museum (Fig. 14, #1).

Also, smaller geodes, when found, often containing disintegrated red or yellow powdered ochre, were broken open and employed in a similar way, although for a different purpose. Besides these, flat pebbles, and steatite blanks in Late Archaic times in which a shallow hollow was pecked, were used as small mortars for mixing red ochre with animal oils in making red paint; are known as Paint cups (Fig. 15, #3,6). Connected with this class of small mortars were larger and thicker blocks of sandstone, in which a pecked-out hollow was made in one face. They were employed as mortars in which chunks of hematite were smashed and ground into powdered ochre, with convenient sized cobbles as pounders (Fig. 15, #1). At Wapanucket 8 on Assowampsett Lake were found a great many relatively thin slabs, mostly of sandstone in the LaBrie ceremonial mortuary complex. Most edges had been roughly chipped to produce more or less rectangular shapes up to about 8 x 16" in size (Fig. 13, #1). Excavated evidence revealed that they had been used as honing blocks on which had been rubbed small chunks of hematite to produce powdered red ochre, after the hematite had first been heated in an open hearth to make it more friable and to give the ochre a more brilliant red tone.

Returning now to the subject of maize, there is ample evidence to show that sometimes it was ground in large quantities in the field at places where a boulder occurred, in which a glacial-worn pothole appeared. Such a boulder was used as a mortar, when conveniently located near the spot where maize was being grown; is known as a Corn-mill. However, not all boulder potholes were utilized, and care should be taken to note their shape and interior surface wear before passing judgment. To describe the difference, a water-washed hole that has never been used as a mortar tends to be irregular with convolutions describing a whorled condition. But, when such a hole has been used for maize grinding, natural-formed circular ridges are worn down by pestle erosion to form a more or less conical hollow. This does not have to be smooth, necessarily, since weathering throughout hundreds of years of non-use often roughens once smooth surfaces.

From early reports of such grinding it is evident that in some cases a long, heavy stone pestle weighing as much as 15 pounds or more was used, attached to the end of a sapling for leverage. One of these large pestles is on display in the Bronson Museum. It was found nearby a Corn-mill in Canaan, Connecticut in the foothills of the Berkshires, and, although its knob end is broken off, furnishes a good idea of how these heavy pestles may have looked (Fig. 13, #7).

Among the various kinds of maize-grinding mortars the Log mortar doubtless had the most extensive use, although as they are susceptible to rot few have survived. In support of this hypothesis, the sparsity of stone mortars, not subject to destruction, is so noticeable as to cause doubt that they were in general use for the hundreds and perhaps thousands of instances when mortars were used. Therefore, the Log mortar probably was preferred and widely employed for maize-grinding during most of the Ceramic Age. And it is likely that the colonists acquired their knowledge of them from the natives, and learned how to make them in this way for their own use. A few of these relics have survived the ravages of time and may be seen in antique shops or museums. They appear to have been made by burning out a hollow in one end of a log, and then scraping or digging out the charred wood, while the sides of the log doubtless were kept wet to prevent their burning. A well-preserved medium sized one of colonial origin from Sturbridge, Massachusetts, on display at the Bronson Museum, is illustrated (Fig. 13, #5). It reveals evidence of having been hollowed by fire, since portions of its inside walls are blackened as though from burning.

Also, there is evidence of a less hypothetical nature, which seems to indicate a wide-spread use of Log mortars in late prehistoric times. It appears in the form of assertions by Indian descendants of this area, as well as by those of the Iroquois, that certain Log mortars now in use by them have been handed down in their families from early times. Furthermore, the very fact that the colonists made and used mortars of this kind strongly suggests knowledge derived from their Indian neighbors, who labored for the whites in their corn fields. Certain Indian deeds reveal that Indian women assisted the planters and received half of the harvested corn in payment for their labors.
With such close industrial relations it would seem only natural that the natives would have passed on to the colonists their own methods of grinding, rather than the other way around as some have suggested. For maize, a product of aboriginal invention and thrift, was one of the most important acquisitions from the natives made by the colonists for their survival. Therefore, the attendant methods of planting, harvesting, and preparation of the grain for eating would seem to have derived from the originators of the plant.

In this discussion concerning grinding equipment of aboriginal days, there is another phase of it that should be mentioned. This concerns the preparation of groundnuts for use in making them ready for eating. It is a known fact in historic times that the na-
tives gathered edible tuberous roots of certain plants, commonly called groundnuts, upon which they depended to a great extent for food. However, these rooty tubers probably were not ready for eating until cooked, and the question arises as to how they were prepared. While there are no early records known to the writer that detail the implements used, an account by Mrs. Mary Rawlandson concerning use of groundnuts for food furnishes facts, from which conjectures are possible. In her narrative of her captivity and removes after the burning in King Philip's War of her home town of Lancaster, Mass., in 1676, she makes several references to groundnuts: "Their chief and commonest food was ground-nuts,"—"and the enemy in such distress for food, that our men might track them by their rooting the ground for ground-nuts, whilst they were flying for their lives;"—"and his Squaw gave me some ground-nuts;"—"and he gave me some roasted ground-nuts, which did again revive my feeble stomach."—"another Indian bid me come at night and he would give me six ground-nuts, which I did."—"I having got a handful of ground-nuts, for my support that day."—"So she gave me a mess of beans and meat, and a little ground-nut cake."—"In the morning I went again to the same Squaw, who had a kettle of ground-nuts boiling."

From these extracts taken out of context, it is clear that groundnuts were roasted or boiled before eating—probably would not have been eaten raw. However, when it comes to "ground-nut cake," the reader is left to wonder just how the tubers would have been ground, whether first dried, or were mashed in a green state. In either event, one can only guess what the tools would have been for a group of Indians like this, who were constantly on the move. Obviously, there must have been something quite simple to have offered no hindrance to swift travel; might merely have been two flat stones quickly picked up, between which the groundnuts were ground into a mash. The surprising thing is that with such rude preparation an edible cake could have resulted, baked as it must have been before an open fire.

In the matter of maize-grinding, besides the mortar, which already has been described, there remains only an analysis of the pestle to complete the grinding equipment for this grain. Assuming that the Log mortar type was the favored kind, it is understandable how it happens that the pestles used tend to be long, reaching as much as 25" in length in some cases. For this kind of mortar was hollowed deeper and deeper, no doubt as time went by, requiring longer pestles to accommodate their increased capacity. Therefore, pestles of a foot or more in length doubtless are maize-grinders and belong to the Ceramic Age. Often, such pestles show irregular wear at their ends, indicating usage in wooden, not stone mortars. Sometimes, conical worn ends occur, usually on shorter pestles, indicating either their use in the few stone maize-grinding mortars of the Ceramic, or use in the Late Archaic's nut-grinding mortars.

 Doubtless it can be said with some assuredness that Ceramic era pestles, when fully finished, are quite smoothly worked with pecked surfaces partially erased by abrasion, cylindrical in shape, and with more or less parallel sides. Another distinguishing trait found on a few of these pestles is the presence of an effigy worked at one end of the implement. Illustrated are several specimens from Bronson Museum exhibits, of which only the effigy and part of the pestle are drawn for lack of space (Fig. 14, #2-5). In rare cases other forms of embellishment may be found on Ceramic pestles, as shown by the report in this Bulletin issue of an excavated recovery from Franklin, Massachusetts (Fig. 16). In fact, for one of these pestles to have such well-defined ornaments incised and pecked on its sides is so exceptional, as to represent an independent invention with repetition not to be expected. However, other methods of decoration may be anticipated, which could well be as varied as the whims of human ingenuity. These highly sophisticated pestles are not believed to have been made during the nut-grinding of the Late Archaic. Rather, they appear to have been the outgrowth of pestle manufacture after centuries of toil, and so would be expected after ages had elapsed, or during Ceramic times.

As late as colonial days it is known that natives of this area, as well as the Iroquois, often used long wooden pestles in place of stone, which by then may have become scarce from disuse. Knowledge of how to work stone was soon forgotten at that time with acquisition of English-made goods that either replaced or offered means for an easier way by the copying of such trade goods. On the other hand, it is possible that some wooden pestles had come into use before arrival of the whites, but in either case, as found in 1900 among the Iroquois, they were doubtless large ones with the resultant heft required, for grinding maize in deep Log mortars.

Bronson Museum, January, 1968
AN UNUSUAL PESTLE FIND

WILLIAM S. FOWLER

In the spring of 1966 Nicholas Gazerro, an interested Society member, brought into the museum a unique pestle he had found during his excavation of a site on Beaver Pond in Franklin, Massachusetts. While the pestle, as such, was of little interest, a careful scrutiny of its surface revealed engravings such as the writer had never seen before on any pestle. Because of the unusual nature of this recovery, its description and circumstances concerning its appearance at the Beaver Pond site seem most important, which accounts for the writing of this paper.

The site is located on a sloping elevation overlooking Beaver Pond, and has been subjected to extensive cultivation over the years. Quantities of artifacts have appeared on this plowed field, and have been picked up by numerous town people after each new plowing. Not only have artifacts been removed from the site in this way, but numerous individuals digging at random here and there have uncovered additional relics along with shell deposits, which were quite extensive.

Realizing that here had once been an extensive camp site, Gazerro decided to open a private dig, following scientific methods of excavation. As a member of the Society he had gained the desired information from his reading of the Bulletin, and thought that here would be a good place to put it to use. A certain section was selected and laid out, with full realization of the probable soil disturbances that would be encountered. As the work progressed it became evident that under the plowed loam in the yellow subsoil evidence of former digging was infrequent, with occasional artifact recoveries being made. Among various kinds of implements that appeared, the Small Triangular projectile point made of white quartz was the most numerous. However, although depths of finds were recorded at first, it became apparent that little could be learned in this way about their significance due to the many disturbances encountered, made not only by man but by nature as well. Nevertheless, Gazerro persisted and in December, 1965 his continued digging paid off by discovery of an engraved pestle.

He found it just under the loam resting upright in the yellow subsoil. Why it lay in this unnatural position is difficult to say — possibly as a result of being in a pit, or on account of some other kind of disturbance. But the thing that made this recovery remarkable was the subsequent discovery of shallow engravings on opposite sides of the pestle (Fig. 16). Measuring 12" long it is made from a block of coarse sandstone, medium gray in color and quite porous.

The illustration shows on one side the pecked-out form of a serpent — probably a rattlesnake, as its tail seems to end in a shape resembling the rattle. This work would have been done with a small pick, which

Fig. 16. ENGRAVED PESTLE, Beaver Pond Site.
AN UNUSUAL PESTLE FIND

could have been made from any hard stone block, roughly formed by primary flaking with a point at one end — recently identified as a Chunky pick. However, the reason for a snake as a design motif is more difficult to explain. It might have been a way to indicate ownership of the pestle: to denote that the owner belonged to the snake clan. On the other hand, it may have served as a ceremonial feature for a ritual observance of some kind.

On the opposite side of the pestle appears a chevron design. Execution of this motif differs from that of the snake in that it is incised into the stone with some kind of a sharp blade. It is extremely well done without overlapping of lines where they meet at the five chevron points. This design may have been cut merely for the purpose of decoration, or it is possible it may have been intended to illustrate mountains for some unknown reason. Wear on the pestle ends is irregular and seems to suggest that this tool was used in a wooden log mortar. If so, the probability is that it belongs to the Ceramic Age and was used for grinding corn, since log mortars were an element of the later-day Indian culture, knowledge of which was passed on to colonial settlers.

Bronson Museum,
Sept. 7, 1967

AN ULU RECOVERY AT SWAN HOLD

WILLIAM S. FOWLER

Not so long ago a fractured Ulu was brought into the museum for restoration by Edward G. Bielski. This in itself had little significance, although the specimen was one of those paper-thin Ulus, which are often talked about, but rarely ever seen. However, when the circumstances surrounding its recovery were revealed, the find acquired new meaning, with the possibility of important deductions to be derived from it. At first, there was some doubt as to whether or not the fractured blade could be successfully restored on account of its extreme thinness, which tapered all the way to the cutting edge from slightly less than a \(\frac{3}{4}\)" thickness. However, restoration was finally accomplished, revealing a beautifully worked knife, as indicated by the illustration, finely ground down evenly all over, including its rimmed back (Fig. 17). It represents, perhaps, the height of perfection in the making of this early type of knife, as compared with the chipped condition in which Ulus are sometimes found, which may or may not represent finished blades.

When information finally reached the writer that this rare find was not only excavated at a well known Carver site (Swan Hold), near Plymouth, but was found lying at a considerable depth in the subsoil, the importance of making a complete investigation of the recovery became apparent. For the purpose of a clearer understanding of the situation, a review of the site and the work done there seems essential.

As reported in the Society Bulletin of 1952, Vol. 13, No. 2, Richard H. Bent and other members of the Society from the Plymouth area excavated the Swan Hold site in Carver, Massachusetts. At that time evidence was revealed, which tended to establish three culture levels of occupation: Early Archaic, Late Archaic, and Ceramic. The last named, or youngest cultural evidence extended through the humus cover of 8 to 10" in depth. This was underlaid in the subsoil by the middle zone — Late Archaic — extending about 10" from junction of subsoil with humus. Below this appeared certain artifact types, which suggested an Early Archaic occupation reaching down another 10 to 14" to white sand. In this stratum oc-
curred the diagnostic Corner-removed #9 point, Oval atlatl weight, and Ulu (represented by a small fragment of a ground blade). Subsequently, in 1962, Society Bulletin, Vol. 25, No. 2, Bielski reported recovery at the site of 2 Channeled gouges at a depth of about 18' below Junction — representing a deposition in this Early Archaic zone. This was an important find that supported other site evidence of the area, to indicate the Channeled gouge as a probable diagnostic of the Early Archaic.

At this point the Early Archaic zone of the site had been established by appearance of certain diagnostic stone implement traits, just mentioned, strengthened by addition of the Channeled gouge. However, the Ulu was represented at this low level by only a small fragment, although about 3/4ths of a blade also had been recovered by Bent at Junction in the humus — apparently out of context. It had been reworked with both broken ends squared off to make it usable, and may have been accidentally found by a later-day Ceramic native, reshaped and put into service again. Therefore, news of the new recovery at the site by Bielski of a paper-thin Ulu was received with enthusiasm, since it appeared to strengthen the inclusion of this implement trait as an Early Archaic diagnostic, if data concerning its stratigraphic position proved pertinent in this respect.

Still another significant discovery was made at Swan Hold in the summer of 1965 by Richard G. Sautter and reported by him in Society Bulletin, Vol. 28, No. 2. Although it does not contribute directly toward the purpose of this paper, it is relevant to the site as a whole, and therefore deserves mention. Located on an elevated wooded plateau rising abruptly beside the excavated sand terrace of the site, remains of human cremations were uncovered in the form of 2 disturbed areas and charcoal-filled pits, the largest one of which contained quantities of burnt stone implements. Typologically, they appeared to have close affinity to the Late Archaic culture, represented at the site by recoveries from its middle zone. Cremations with their related ceremonies seem to have been removed to this elevation, away from the occupied area — no evidence of camp litter was discovered on the plateau. However, this paper is concerned with examination of artifact recoveries from the site's lower zone of the sand terrace, the earliest occupational evidence at this station.

Returning now to the paper-thin Ulu, the subject of this report, Bielski was excavating a section of the terrace not disturbed by previous digging about 65 feet to the east of the place he had formerly recovered the 2 Channeled gouges. At this spot he had carried his excavation to a depth of about 15" below Junction, when he uncovered the Ulu. The surrounding sand showed no sign of refuse pit disturbance, although it appeared reddened as if from natural iron discoloration, and a few minute calcined bone fragments were present, indicating probable occupational evidence at this level. Therefore, it seems most likely that the Ulu was present as a result of natural deposition. At this depth, previous work at the site, as related, had produced evidence to show that this lower zone belonged to the Early Archaic because of its artifact content. Hence, this Ulu find now seems to support and strengthen this belief, and to indicate the source for this trait at Swan Hold to lie in the lower zone.

Bronson Museum, March 25, 1967

A CACHE OF BONE IMPLEMENTS
DONALD G. SCOTHRONE

Excavation of the North Hill Marsh site in Duxbury, as reported in the Society Bulletin, Vol. 26, No. 1, established the probability of the site's occupancy by people of the Ceramic Age, to the exclusion of other earlier aborigines. But the most interesting thing about the site was the over-all excellence of its artifacts, which seemed to me evidence of superior workmanship. Because of this, I have returned to the site on several occasions to excavate and explore areas, which I had not worked originally. This was done with the permission of Roy Parks of Duxbury, to whom I am greatly indebted.

The appendix of the former report tells about the results of one of these return visits, in which the find proved to be a ceremonial pit of some kind con-
A CACHE OF BONE IMPLEMENTS

Editor's Notes: An examination of the bone implements from the Duxbury cache impresses one with their high quality and their perfect condition. Specifically, the relatively fine, slender shaped needles are most noteworthy. Presumably, they would have been used for sewing small objects, such as moccasins. It is difficult to imagine just how the two needles containing much red powdered ochre, and an assemblage of 39 stone implements, including a large rim sherd of Stage 2 pottery. Perhaps the most unusual feature of this cache was the appearance of 7 Gravers of black flint, shaped like those found with Paleo deposits at other sites. Obviously, from this it is now evident that this specialized tool was probably made and used by later-day Ceramic people, which seems to remove it as an exclusive property of the much earlier Paleo era.

This paper relates another startling recovery I made at the site on one of my subsequent visits. Because of the perfect condition of the recovered bone artifacts on this occasion, it seems worthwhile to tell how they were extricated from the damp pit in which they lay. While scraping with my trowel I suddenly struck red powdered ochre, which at once suggested the presence of some sort of an artifact deposit. Working around the ochre-stained sandy subsoil, and slowly digging deeper, I uncovered discolored soil indicating the top of a pit. Anticipating something unusual, I now began an exploration of the pit, brushing carefully with a whisk broom. Working slowly downward, soon a bone needle came into view. Upon attempting to remove this choice artifact from the pit, it broke into three pieces. This at once posed a problem of how to recover, unharmed, whatever other like articles might lie in the pit. This needle had a spongy consistency, which meant that extreme care would be required, if the remaining bone implements, presumed to be in the pit, were to be saved.

First, I removed the sand to within two inches from around the pit, reaching down as far as its base. Then, I slid a shovel underneath the pit, and lifting up very slowly, placed it in a large cardboard box I fortunately had on hand. After bringing the box home, it was allowed to rest in a dry place until the contents had become thoroughly dried out. From then on, excavation of the pulverized sand was no problem, and one by one perfect bone implements were recovered intact without breakage. They consist of 5 needles, of which 3 have perforated eyes; 3 harpoon points — one with a perforation; and 3 probably fishhook prongs. Also, included in the assemblage is a snail shell pendant and a steatite pendant engraved on one face with what appears to be a good likeness of the Thunderbird (Fig. 18). This latter artifact is made from a rough-edged unfinished small fragment of a stone bowl. The broken needle, first encountered, was glued together when it had become dry, and all of the bone artifacts were preserved with clear plastic spray.

Realizing the unusual nature of these recoveries, I have asked the Editor to conclude this report with any qualifying remarks he may think appropriate. And I am indebted to him for the illustrations, which enable a much better conception of how the artifacts look, than words alone can convey.

Pembroke, Mass.
February 15, 1967

APPENDIX
out eyes (Exhibits #9,10) could have been used in their present state. One explanation might be that they are unfinished needles, in which the eye had not been perforated for some unknown reason — they seem too short and slender to have served as awls, although this, also, is a possibility.

With reference to three shorter bone implements (Exhibits #4-6), presumed to have been used as fishhook prongs, attention should be directed to their bases. These will be seen to have been angled obliquely — more prominent in the case of two — when they were cut off and finished. This end-finishing trait is usually found on such fishing gear. It is useful in deflecting the prong at a sharp angle away from the wooden stem to which it is bound, to produce the hook required in catching fish. An illustration suggestive of this fishhook haft may be found in Long Cove: A Maine Shell Deposit Site, Society Bulletin, Vol. 27, No. 1, Fig. 3, #19. The Duxbury specimens may appear a little too spindly for this use, but nevertheless are believed to have been used in this way.

The steatite engraved pendant is a rare find, because it depicts on its face the Thunderbird, a ceremonial spirit of aboriginal days. It is well done, when compared with other extant less sophisticated renditions of this revered spirit. This use of a fragment from a broken stone bowl of the Late Archaic may suggest to some an association of the pit's contents with the Archaic, although all recoveries from the site, as previously reported, appear to be of the Ceramic Age. In explanation, it is now evident from other sites that many stone bowls were carried over from Late Archaic times and used by Ceramic aborigines until they became broken. This, then, probably accounts for the steatite fragment turning up on a closed Ceramic site.

**A LATE WOODLAND BURIAL ON MARTHA'S VINEYARD**

**BERNARD H. STOCKLEY**

On October 10, 1965, the writer received a telephone call at his home on Nantucket Island from Mr. E. C. Huntington of Martha's Vineyard, Massachusetts, asking for help in removing an Indian burial that had been exposed by erosion. The writer agreed to travel to Martha's Vineyard two days later to excavate the burial.

The discovery was made by Mrs. Alexander Trzcinski of Berkley, Massachusetts, who was vacationing with her family on the island. She recognized as probably human some fragments of skull bone which were lying on the surface in a rutted road. The exact location was on the southeast side of the rutted road on a hill facing the head of Menemsha Basin, about 100 feet to the rear of the William C. Seward grocery store in the village of Menemsha, town of Chilmark, near the western end of Martha's Vineyard island.

While Mrs. Trzcinski was seeking an experienced excavator, and, through Mr. Huntington, contacted the writer, her daughter Andrea exposed enough of the burial to confirm that it was a human burial. Both Mrs. Trzcinski and Andrea are members of the Massachusetts Archaeological Society, and Andrea, although only 16 years of age at the time, already had considerable experience on controlled archaeological excavations.

Except for fragmentation of the skull, previously mentioned, the skeleton was in an excellent state of preservation. It was interred in a round pit, the level of origin of which was not discerned in the topsoil although it was diligently sought. The reason for this became evident when a piece of anthracite was encountered at the 15" level. Some deep disturbance, probably plowing, had obliterated the outline of the upper portion of the pit. But the skeleton itself had not been disturbed. At about the same level the outline of a small refuse pit appeared, intruding into the northeast side of the burial pit, but again the skeleton was not disturbed. The refuse pit, which was clearly more recent than the burial because of its intrusive nature, contained stone chips, charcoal, and shells of: Soft-shelled Clam (*Mya arenaria*); Quahog (*Venus mercenaria*); Bay Scallop (*Pecten irradians*); and Common Boatshell (*Crepidula fornicata*).

The skeleton was lying on its left side in a tightly flexed position, head to the northwest, facing the northeast. The forearms were crossed at the wrists, with the hands near the forehead.

At this writing the skeletal remains have not been
A LATE WOODLAND BURIAL ON MARTHA'S VINEYARD

examined by a physical anthropologist. Field observations lead to the tentative conclusion that it was an adult male, over 30 years of age. Height of the individual in life was approximately 5'4". No bone abnormalities nor apparent cause of death was observed, and there were no grave goods.

The skeleton and all associated materials were turned over to Mr. Lorenzo Jeffers to be deposited in the Gay Head Indian Museum on Martha's Vineyard. It is hoped that the skeleton may be reassembled as a museum exhibit after examination by a physical anthropologist.

CONCLUSION

The burial, except for its good state of preservation, is a typical prehistoric Woodland period flexed burial. Since there was no evidence of contact with Europeans—indeed, the presence of stone chips controverts this possibility—the burial is presumed to be prehistoric. Lack of European trade goods and the presence of stone chips in the later intrusive refuse pit tend to strengthen this presumption. But the good state of preservation of the skeleton is clear evidence that it is not extremely old. Burials of eight individuals which were excavated under the direction of the writer on Nantucket and Tuckernuck islands have all been in a poorer state of preservation. Seven of these, the Tuckernuck burials, have been dated to the middle of the 16th century.

The burial, on excavated evidence, is judged to be prehistoric. But the question of when the recorded history of Martha's Vineyard began is rather cloudy. Some writers have concluded that the first European visitor was Giovanni da Verrazano in 1524. Others maintain that the first European to land on the island was Bartholemew Gosnold in 1602.

It is known that there were large numbers of fishing vessels, as well as many exploring parties, in New England waters from the early 16th century onward. It is almost inconceivable that Martha's Vineyard remained unexplored until 1602. Therefore, although there is no definite proof that da Verrazano ever visited the island, this writer believes that the first white contact must have taken place much earlier than 1602. By extension, the conclusion is drawn, on admittedly tenuous evidence, that the individual was interred about 1500 A.D.

Thanks are due a number of persons who made this excavation and report possible: Mrs. Alexander Trzcinski and Mr. E. G. Huntington for bringing the find to the writer's attention and for many other kindnesses; Mr. Alexander Trzcinski, Mr. Alexander Trzcinski II, and Miss Andrea Trzcinski for assistance in excavating and recording; Mr. Trzcinski and Police Chief Albert Emin of Chilmark for protecting the burial from threatened vandalism until it could be properly excavated.

Nantucket, Mass.
March 7, 1966

THE FUNCTION OF PECKING: HOW USED

Probably one of the earliest tools used by primitive man was a stone with one end chipped into a rough sort of point. Such a tool has been identified as belonging to man of the early Paleolithic's Chellean period, and is referred to as a Hand Ax. Also, as evidenced by Dr. Leakey's finds in Kenya, Africa, roughly chipped hand-size stones, some with crudely pointed ends were left behind by early man of the next Acheulian Age, some 200,000 years ago. Doubtless, these tools were useful in defense against human or animal attack, as well as for digging and cutting meat away from the bones of game brought in from the hunt. So, we see that the idea of a pecking tool was invented at a relatively ancient time. Before this, dating back to anthropoid-like man, more crudely flaked hand stones, lacking specialized forms, seem to have been in use. All of which points to the process of whacking and pecking as being one of earliest man's activities to assure his survival.

While this evidence emanates from the Old World, today there are remains of somewhat similar hand stone implements in the New World called Pebble tools. They have been classified in Alabama as the Lively Complex. In that southeastern area quantities have appeared in certain locations in plowed fields. Recently, some of these crudely chipped pebbles, often with one end worked to a rough point by primary
flaking, have been recovered in excavations in Alabama at a low level, but with no derived conclusions as to their age as yet. In other parts of the country research has turned up similar Pebble tools. Here at the Titicut site, as noted in Society Bulletin, Vol. 28, Nos. 3 and 4, Pebble tools were recovered from one single location at a low level, but no evaluation of them has yet been forthcoming. However, the main feature about most of these implements is that the idea back of their use appears to have been that of pecking in order to accomplish certain desired results. Further, in the case of those specimens observed by the writer, no damaging wear appears on their pointed ends, nor has such been reported for the Alabama finds. Therefore, it seems clear that they were not used to peck hard materials like stone, but rather were employed against softer substances such as animal flesh.

During the earliest documented age in this area, when the Paleo-American fluted-point hunters searched tundra wastes for elephant-like animals of those days, hand axes of the order just referred to, or other kinds of picks appear to have been non-existent. Nevertheless, Pebble tools may eventually be found to have some connection with that age—an intriguing piece of research for the future. For the present we must be content to look elsewhere for evidence of the pecking technique and the results obtained from its use.

In the Early Archaic horizon, which overlies the Paleo, about 6,500 years ago, or probably somewhat

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Fig. 19. 1, Chunky End Pick — double pointed, worn down; 2, Gouge — bit end, showing hollowing in progress; Ulu — showing start of pecking (arrows indicate 3 pecked areas).
earlier in some areas, there appear several kinds of large implements not found among Paleo remains. Notably among them occurs the Ulu (knife), Channeled gouge, and Classic plummet. These three tool types exhibit peck marks over their surfaces, produced in one stage of their development. Such marks probably indicate work done by means of a pointed stone tool of some kind. For example, in the case of the Ulu, its manufacture clearly indicates pecking as one of three techniques used before its finished form emerged. In the first stage its semi-lunar shape was formed by percussion flaking to produce a roughed-out implement, usually made of slate. Next, a thick-bodied pointed end pick seems to have been employed to peck all surfaces. This process evidently served to remove primary flaked scars, which resulted in flattening both faces. At the Heard Pond site in Wayland, Mass., C. C. Ferguson excavated and recovered numerous Ulu specimens from a low level. With them appeared a worn-out pecking implement with its point worn smooth, obviously from friction against something as hard as stone (Fig. 19, #1). It is now on display in the Bronson Museum along with two other specimens from museum collections from this area, which seem to have similar traits. Also, a fractured large sized Ulu is exhibited with them, showing clearly pecked-over areas along side of some untouched flake scars. A sudden fracture causing the loss of one end saved this specimen for our present study (Fig. 19, #3). Finally, the third stage consisted of grinding the two faces smooth and thinning the blade in this way with an Abradingstone to the desired thickness.

In the case of the Channeled gouge of the Early Archaic, the thick-bodied End pick was again used; it would seem, to shape the implement, especially to hollow the blade on one face. From Ferguson's Wayland recoveries were many specimens of this type of gouge, and among them was a broken-ended one with the hollowing only partly completed (Fig. 19, #2). This specimen shows how the work of pecking was carried on with the start of the hollowed groove pecked in two grooves parallel to each side of the blade on one face. Evidently the thrust of the pick was directed toward the central un-pecked area, which eventually would be worked away, thus producing the hollowed face of the gouge. Like the Ulu, the final stage in producing this tool also was one of grinding. Often, this was confined to the bit end for the purpose of sharpening, but sometimes abrading and polishing extended over the entire tool.

The Classic plummet of the Early Archaic appears to have been pecked into shape by the same sort of a chunky End pick as used for the previous two kinds of tools. Usually, this pecking process was the final act in finishing the plummet, but occasionally the implement was smoothed all over by abrasion, which sometimes is carried to a high polish.

Generally speaking, little thought is given by most collectors to the use of these stubby End picks in producing the three classes of tools just referred to. As a result, this style of pick is rarely identified and few specimens have been recovered and saved for study. However, from the few available specimens this pick seems to have somewhat different traits from those of the stone bowl industrial End picks of the following cultural age. They are chunky and of a hand size, with a stubby pointed end. They are made of durable stones such as basalt, felsite, or rhyolite. Their bases are thick with sharp edges dulled by pounding to produce a good hand grip; are never thinned as though for hafting. While this sort of a pecking tool may be associated with tool making of the Early Archaic, there is every reason to believe that a similar implement must have existed in the following Late Archaic era for the making of certain tools of that age, i.e., Grooved gouge, Grooved ax, and Clumsy plummet.

Furthermore, in those later days with the opening of stone bowl quarries, other styles of End picks, besides the one just mentioned, were devised for pecking steatite and fashioning out of it platters, bowls, and eating vessels of all kinds. A report dealing with quarrying at the Oaklawn site, Society Bulletin, Vol. 29, No. 1, describes these picks and also those used in pecking out stone pipes at the close of stone bowl making.

However, this report is written with the idea, chiefly of bringing to the attention of its readers, the little known Chunky picks used in shaping the several types of stone implements just mentioned. That these picks were called upon to withstand great wear from the pecking of hard stone surfaces is self evident. Therefore, a badly worn point should be one trait to look for in identifying this special tool, assuming of course that the recovered specimen is one which had seen hard usage. Another trait to be considered is the kind of stone used in making these picks. It must have been one which had durable properties, but with a grain that would not shatter easily, as is found in the stones already mentoned: basalt, felsite, and rhyolite. For example it is unlikely that quartz, a stone with a crystalline composition, although a preferred stone for stone bowl-making picks, would have been used—it shatters readily when struck against other hard stones. Finally, stone tool-making picks probably were never larger than some sort of a chunky stone that would fit conveniently into the hand, and of a comparatively moderate weight in order to allow a quick succession of strokes to be made.