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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.
Over the past quarter century the industry of stone bowl making has been found to represent an important element in the long duration of the Late Archaic. From evidence recently reported at the Horne Hill quarry in Bramanville, Bulletin of the Massachusetts Archaeological Society, Vol. 27, No. 2, the extent of quarrying appears to have been spread over 2,000 or more years. During this time workmen advanced their skill in making many different kinds of stone cooking and eating vessels. Much effort has been expended in the search and excavation of aboriginal steatite (soapstone) quarries. This has resulted in the location of between 20 and 30 sites in Massachusetts, Rhode Island, and Connecticut; areas in which outcrops of steatite frequently occur. Reports of some have already been published, but there are others, which, although excavated, have not as yet been written up. The author has participated in digging 7 quarry sites in New England over a period of 9 seasons, as well as the Christiana quarry in Pennsylvania. During this time he has been in touch with the work of other quarry excavations. Undoubtedly, there are more sites not yet discovered, to judge from hearsay reports received from time to time from farmers and other individuals. However, the contents of this paper is directed toward an examination of evidence at the Oaklawn quarry in Rhode Island. This site has been subjected to an almost continuous barrage of digging over the quarter century span covered by this report. Much of this has been carefully undertaken by members of the Massachusetts and Rhode Island Archaeological Societies, with notice made of their important recoveries.

Of course, it should be obvious to all that where so much disturbance has occurred, no benefit can be derived from noting the depths at which artifacts appear. Therefore, stratigraphy will only be referred to in a general way, while typology will form the major role in this report.

Oaklawn quarry was first discovered many years ago. At that time, someone noticed a hollowed out stone in a stone wall on the hillside back of what is now the Hillside Dairy farm in Oaklawn, Rhode Island. Closer scrutiny of the stone revealed that it was of steatite with traits resembling a bowl. Following this, a search for further steatite remains located evidence of an aboriginal quarry on top of the hill. Here, scattered over a rather large area of some 22,000 square feet, extensive digging over the years has exposed broken stone litter of the quarriers, and this has caused a general surface upheaval.
Excavations at the site were first reported in 1945 by Gerald C. Dunn, in Bulletin of the Massachusetts Archaeological Society, Vol. 6, No. 4. He stated that 100 years ago talc from the quarry brought a high price in New York, according to historic reports. However, it would seem to this writer that the talc quarry referred to, if it actually existed, must have been located elsewhere in the area: evidence of free talc at the quarry is lacking, and indications of mining excavations of a talc industry are nonexistent. In support of this observation, reference is here made to a small steatite quarry of colonial days in the Berkshire Hills, near Dalton, Massachusetts. At this site, the author saw prominent overgrown cuts in the ground, 5 to 10 feet deep, beside boulder outcrops of steatite still untouched. This provides proof of colonial quarrying for steatite, which apparently was short lived. No such evidence as this or anything more extensive is to be noted at Oaklawn. This seems to rule out the possibility of this site's use in earlier times, either for the extraction of talc or steatite.

However, it is true and amply evident that the site has been repeatedly dug by numerous individuals searching for quarry products left behind by its aboriginal quarriers. Some of this exploratory work was done with pick and shovel mainly to recover bowls and pipe-forms, with little regard to recovery of industrial stone tools. This early digging covered the central area of the quarry, where remains were thought to be the most numerous. It was carried to a depth of about 3 feet, which proved to be superficial. A more thorough search by later diggers brought excavations down to depths of 5 and 7 feet, where outcrops of steatite were encountered. At one place appeared the partly pecked-out remains of several bowls, left unfinished when bowl quarrying came to an end (Fig. 1). Also, at another spot where a steatite vein had been profusely pecked, a fractured but well-shaped Platform pipe-form of steatite appeared in close proximity. As a matter of fact, pipe remains appeared everywhere mixed indiscriminately with those of stone bowls. After repeatedly being faced with this situation, it became evident that this condition had come about as a result not only of present day digging, but of several aboriginal disturbances. First, there was the constant turnover of tailings in the removal of waste by the quarriers themselves, to say nothing of their re-excavation of areas covered inadvertently by such litter. Then there is the probability, to be dealt with later, that pipe making did not take place during the long period when bowls were being made. This subsequent activity would have overturned previous accumulated debris in order to find available steatite or chlorite veins not previously worked away.

For whatever valuable knowledge has been derived about the making of stone bowls and pipes at the Oaklawn quarry, the most credit should go to Herman Johnson, owner of the Hillside Dairy and land on which the quarry is located. He has been most generous in allowing free access to the site, with the right of excavators to retain such artifacts for study, as might be dug up. His generous attitude over the years has been much appreciated, and it is with grateful thanks that mention is here made of this noteworthy cooperation.

**MINERALS AND STONES AT THE SITE**

Stone materials at this quarry exhibit the usual varied assortment of minerals as found at most steatite quarries, with some additions. Various mineral elements occur in small deposits, which often appear as impurities imbedded in steatite or chlorite masses. For example, such ingredients as asbestos, actinolite striated crystals, serpentine, quartz, and small garnets are the most common intrusions. These tend to make steatite stock difficult to work when they occur in excess. Chlorite, a companion outcrop with steatite, is less subjected to such contamination and impairment of its workable qualities. Talc, found to a greater extent in steatite than in chlorite, is the mineral that makes these two major stones soft enough for use in the production of bowls and pipes. Most bowls were pecked out of steatite with only a few from chlorite, while for pipes there seems to have been a preference for chlorite. Possibly, steatite's frequent actinolite impurities tended to discourage its use for a product as small and intricate as a pipe. Recoveries show that only when steatite could be found without such impurities was it successfully used for pipe making.

Stone tools for all products were fashioned, for the most part, from hard stone materials that outcrop at the quarry. The most prominent one is a dark gray igneous stone, probably rhyolite. It has good conoidal qualities and was used to a large extent, as it was tough enough to withstand considerable strain. Also, a usable vein of transparent quartz crystal was ultimately discovered, probably by the pipe makers, and became the source for a finishing End pick, Abradingstones, and many small Flake scrapers. Besides this hardest of stones, white quartz and quartzite were two more stones which frequently were used. They were obtained both from small outcrops as well as from cobbles brought up to the quarry from the river basin below.
OAKLAWN QUARRY: STONE BOWL AND PIPE MAKING

Tailing-removal tools were made of less durable stone stocks. These materials were sufficiently hard to withstand the breaking up of hard-packed tailings on the quarry floor, but not strong enough to be used in pecking and breaking stone masses of steatite and chlorite. For these tools the most frequently used stone was granite schist. It occurs in large deposits along side of steatite and chlorite veins. When broken up, it tends to split off in slabs. These have the flat-faced characteristics required for tailing-breakers and spades. Also, quartzite, which sometimes breaks into slabs, was used. And chlorite was frequently utilized, when it occurred in flat-faced spalls in convenient shapes. Still another stone occasionally appears in this class of tools. It has a coarse conglomerate consistency of quartz or feldspar crystals, and occurs in dikes with granite outcrops. This useful stone is pegmatite, and it seems to have been selected for some of these tools, and for Abradingstones as well.

QUARRY EXCAVATIONS

Perhaps the first excavator to carry on extensive operations at the quarry was a Mr. Congdon of Oaklawn. It is reported that the entire central area was dug over by him to a depth of 2 or 3 feet, previously referred to. Later, Gerald Dunn dug an 80 foot trench and made recoveries below the Congdon disturbance. Subsequently, the author ran several shorter trenches through the area with satisfactory results. Valuable artifacts were found not only below Congdon’s digging, but often within his back-fill as well. In more recent days, various members of this Society and of that in Rhode Island have dug through previous superficially excavated areas, as well as many places around the outskirts of the works, which appeared to be free of previous disturbance from excavators. One of the writer’s most rewarding trenches ran along the upper periphery of the quarry just under an extensive outcropping of granite boulders. It was carried for a distance of about 20 feet and to a depth of some 6 or 7 feet, down to the pecked-over steatite vein, where quarrying had stopped, when the quarry closed down. There, at one place on the vein, were the charcoal and ash remains of a fire, which had apparently been used extensively for the manufacture of stone bowls, or for Abradingstones as well.

CARBON-14 MEASURE OF CHARCOAL SAMPLE

Fortunately, at one place a rather extensive accumulation of charcoal and ash was noted, which had not been disturbed by previous digging. Close by occurred broken pipe-form remains rather than fragments from broken bowls. This seemed to identify the charcoal as belonging to quarriers, who were making pipes rather than bowls. A sample was taken and was processed by the radiocarbon laboratory at the University of Michigan, with results as reported in Bulletin of this Society, Vol. 24, No. 1, p. 9. The test furnished an approximate date of A. D. 731, or at a time during Stage 1 Ceramic days, after stone bowl making is believed to have terminated. This Carbon-14 date is significant because it furnishes evidence of stone pipe making during the first several hundred years in which ceramic pots were being made. How much earlier were pipes made at this quarry or elsewhere cannot be determined with any degree of certainty. However, much can now be deduced from other evidence that follows to provide a reasonable answer to this problem.

HABITATION FEATURES

Just above the trench, previously referred to and beside low boulder outcrops that border the quarry on the west side, appeared two stone hearths in situ. They lay a few feet apart under humus and in quarry litter near periphery of the quarry. They seem to indicate the location, where two wigwams of the quarriers had once stood. Nearby, a sizable area extending away from the quarry and the upper edge of the hearths was carefully excavated to a depth of about 7”. Here was found a preponderance of pipe making evidence. Occasionally, a bowl fragment would appear, doubtless-intrusive from another period of occupation. However, in the main the spot had evidently been used extensively for the manufacture of pipes. Consequently, this evidence seems to indicate association of the pipe industry with the hearths. But what appears of additional value was recovery here of a number of Side-notched #3 and #6 projectile points (Fig. 2, #2-6). These types have been found at certain excavated camp sites with #6 appearing in a stratum between the Stone Bowl and Ceramic zones of occupation, and #3 within the early part of the Ceramic. Together, they suggest a period extending...
Fig. 2. POINTS AND KNIFE, found near 2 hearths at edge of Oaklawn quarry. 1, Small Triangular #5; 2-5, Side-notched #3; 6, Side-notched #6; 7, Corner-removed #8; 8, Stemless Knife.

This group of tools contains several well-defined types, flaked into shape by percussion with hammerstones. Each has a specialized function in the making of stone bowls. They were identified at the Westfield quarry, where tests were made to discover their probable functions. Subsequently, they were found to be present at Wilbraham, and some, if not all, at other New England stone bowl quarries. The principal types are described and illustrated in the Society's Bulletin, Vol. 25, #1, p. 23, Classification of Stone Implements of the Northeast. Their classified names, as presented in this publication, have been in use for some time and will be referred to here without change. Although fully depicted before, a selected showing of Oaklawn material is illustrated and described to provide a better understanding of the shapes and quality of tools at this quarry.

_end_pick_ (Exhibit #5-8). This important implement occurs oftener than any other. Apparently, it was depended upon to a great extent, both for quarrying bowl-forms from steatite outcrops, as well as for the primary shaping and hollowing of semi-finished bowls. All sizes appear both large and small, a selection being made, no doubt, depending upon the size of bowl or kind of work being undertaken. As the name implies, this tool consists of a block of stone, which has been chipped to produce a stubby point at one end, or corner — the latter variation is referred to as a Corner pick. The large end of the block is usually worked over by hammering. In this way the sharp edges were bumped off to provide a suitable hand grip, for most picks at Oaklawn appear to have been held in the hand.

Hand Gouge (Exhibit #9). As found in western Massachusetts quarries, this tool occurred at Oaklawn in well-defined shapes, both large and small. It consists of a relatively flat faced stone, one edge of which has been thinned and shaped into a protruding rounded bit. Usually, this has a uni-faced beveled edge suitable for scraping — illustration of white quartz shows only the flat face, the opposite worked face is hidden from view. It is believed that this tool was used primarily like a scoop chisel to gouge out the interiors of small and medium sized bowls.

Abrading-scraper (Exhibit #1). Next to the End pick, this tool seems to have been a favored implement to judge from its frequent appearance. Doubtless, its use was for hollowing bowl interiors after pecking had reached a point, when to continue might have caused breakage. Scars still showing on the interior of some bowl fragments indicate that this tool was used with a sawing-scraping motion, which safely reduced the thickness of the bowl’s interior to reasonable proportions. Medium in size, it is made from a relatively thick stone spall with more or less flat faces. It is roughly flaked bi-facially on three edges to form...
Fig. 3. STONE BOWL-MAKING TOOLS, Oaklawn Quarry. 1, Abrading-scaper; 2, Quarry Knife; 3, Abradingstone; 4, Shaver; 5-8, End Picks (stubby points); 9, Hand Gouge.
an irregular curved blade. The fourth edge, length­wise, is left in a rough state with only slight flaking. This forms the handle, which in some cases may have been wrapped around with leather thongs to provide a better hand grip.

**Shaver (Exhibit #4).** This little-known implement is well represented among recoveries at the Westfield tool-quarry workshop, but appeared only sparsely at Oaklawn. Basically, it seems to be a scraper but with certain specialized functions. It is believed to have been used to reduce the thickness of bowl walls by interior scraping beyond that produced by the Abrading-scraper. Especially in the case of small vessels such as Drinking cups, it would have served well. For instance, the part of the cup that touched the lips required special thinning, for which this sharp-edged tool would have been well suited. However, it seems likely that this sort of finishing would have taken place at the home site to which the semi­finished cup was brought, although at times it must have been performed at the quarry, as the limited appearance of this tool attests. This implement is made from a small piece of hard stone 1½ to 2¼” in length — usually (as Exhibit #4) of white quartz — of which one edge is thinned to a relatively straight keen-cutting blade. One, or infrequently both corners of the blade are rounded to fit the rounded contour of the cup’s basal interior.

**Quarry Knife (Exhibit #2).** In this category infrequently appear at some quarries rather large Stem­less knives of hard stone. They have a coarse serrated edge along one or both sides. Wear is often noticeable, since these tools were used to cut off segments of unwanted steatite by sawing. Only one, as illustrated, has appeared at Oaklawn so far as is known, but chunks of steatite with remains of a groove sawed by such a knife have occurred.

**Abradingstone (Exhibit #3).** A less well-recog­nized tool is this implement, mainly because it lacks a definite shape. And yet, it seems to have filled an important function. It may be identified by worn facets over its rounded exterior. In this respect, only, it differs from a Hammerstone, which it might have been to start with; the latter reveals roughened facets rather than worn ones. Doubtless, the Abradingstone was used to rub down both the inside and outside of bowls by abrasion, and frequently the edges as well. The latter use is indicated by some Abradingstones that have a prominent worn groove showing. These tools appear in the form of chunky stone blocks with flat or round worn surfaces. They are made from coarse hard stone materials, some of which have crys­tal intrusions, such as are found in certain stones, i.e., conglomerate, pegmatite, crystalline quartz, and garnet-incrusted hornstone.

**Maul (not illustrated).** This large tool was used to bump off chunks of stone materials, which ob­structed the quarrying of steatite and chlorite. It has no definite shape; appears in large stones with rounded ends of 4 to 6 lbs. in weight. Sometimes, super­ficial grooves around its center section served for thong supports when hafted.

### STONE BOWL PRODUCTS

*See Society Bulletin, Vol. 27, #3 & 4, p. 35* for finished products

Oaklawn quarriers made bowls in varying shapes and sizes, evidence of which occurs, for the most part, in the form of fragments from broken semi­finished vessels. One or two specimens have been recovered, unbroken, in partially finished condition. They serve to show the probable shape that was followed for most stone bowls. Generally, oval in form with a lug occurring at both ends, they had pecked­out interiors in various depths and were made, generally, of steatite or chlorite. One medium sized bowl, the base of which was partly shaped, was even being fashioned from a block of fine grained granite. Large and deeply hollowed bowls served as kettles, while smaller ones may have been used for storage con­tainers, or for cooking small portions of food.

Deep dishes were often made, usually without lugs, with medium hollowing. Plates in small and large sizes were in good demand to judge from their broken remains. They were fashioned out of slabs of chlorite, steatite, and sometimes granite schist. Some had a lug or handle projection at one or both ends, while others were either oval or nearly circular with no handles at all.

Platters occur among broken quarry products. They seem to have been slightly hollowed slabs of steatite, usually with a lug at both ends. They measure about 12” in length, with oval or circular dimensions.

Of small containers, the Paint cup in minute sizes seems to be the smallest. Evidence at the quarry shows these cups to have been made from blocks of steatite, rarely of chlorite. Semi­finished specimens measure about 3½” in length or less. A few have two lugs the same as large bowls, but most show manufacture from flat-faced chunks of steatite with no lugs in evidence.

Among small vessels, the Drinking cup, often referred to as a Ladle, was most in demand, if excavated evidence can be relied upon as an indicator.
OAKLAWN QUARRY: STONE BOWL AND PIPE MAKING

Obviously, with the introduction of hot liquid foods, some means other than cupped hands had to be found by which the family could be fed. The answer was development of a cup of suitable proportions, doubtless one for each member of a family group. At Oaklawn, cups were made as at other quarries, always with one lug, never more. This appears at one end of a cup-form, usually of steatite, about 5 to 7" long, which has had preliminary rounding of one face for its base. The lug appears in two shapes, depending upon the maker's fancy. A utilitarian form is merely a short lug, sometimes no more than a lump, with no sign of styling. The other form is stylistic in shape. It extends 1 to 2½" from one end of the cup, and has triangular proportions.

BOWL-MAKING TECHNIQUES

Methods of quarrying and making of bowl products, followed closely those as reported at other quarry sites. First, with a large quarry End pick, a bowl-form was pecked out on the steatite vein, usually in an oval shape with its rounded bottom appearing on top. Lugs were not included at this early stage, but were formed later, after the bowl-form had been removed from the vein. This took place after it had been undercut with End picks to reduce the size of its base. From a 7 x 10" oval specimen from Oaklawn, now on display in the Bronson Museum, it would appear that the final operation in separating it from the lode was accomplished by means of prying with a lever forced into the undercut crevice. This tended to produce a flat-faced split on one side as the form was pried loose.

Next, a smaller End pick was used to refine the rounded contours of the bowl-form, at which time lugs would be formed. Then came hollowing of the interior. At first, an outline of the area to be removed was sometimes marked by continuous peck marks around the flattened face. This was followed by strokes of the pick directed obliquely from the outline toward the center. Gradually, by this encircling pecking the central lump of stock was split out. From then on, accurately directed pick blows carried the excavation down to a spot, beyond which discretion dictated that scraping be used in place of pecking to prevent breakage.

For this scraping process the Abrading-scraper was used, followed by finishing with an Abrading-stone. The larger bowls were hollowed out in this way, but for smaller ones including Drinking cups the Hand gouge, Shaver, and Abradingstone were the tools probably employed. While quarry evidence points to these manufacturing techniques, it is likely that the final finishing was seldom carried out at the quarry. Instead, only enough work was done to lighten the bowl and make it less cumbersome for being conveyed to home sites, where finishing was completed. It could well be that the final work at home was done by women, who at times decorated the bowl by cutting notches around its rim.

PIPE-MAKING TOOLS — Fig. 4

As has been mentioned, quarry litter at Oaklawn contains an unusual amount of broken semi-finished pipe remains. They are much in evidence, and indicate that at some period the quarriers devoted much time and thought to the making of stone pipes. While the larger picks used in quarrying pipe blanks, doubtless were similar to some of those employed in making bowls, the smaller ones for the finishing had sharper and more pronounced cutting bits. Attested to this belief are the small pitted scars as found on most pipe-forms. They suggest the use of sharply pointed picks of a medium to small size, which probably would have been made of the hardest kind of stones.

End Pick (Exhibits#17-22). This tool is medium in size, but always has at least one end of a stone block worked down to a sharp point; sometimes all ends of the block are pointed as illustrated. One unusual pick, Exhibit #22, is fashioned from pure quartz crystal, an exceptional development from this hardest of stones. These picks are not chunky like bowl picks, but may be identified by their slender and sturdy pick points, as well as by the fine grained hard stones from which they are made.

Pipe Bowl Reamer (Exhibits#9-12). After the pipe-form had been achieved, its bowl had to be hollowed. For this operation a reamer was employed; usually is to be found at home camp sites. However, occasionally this work must have been done at the quarry, at least in part, as the several reamers recovered at Oaklawn attest. The tool is made of hard stones 3 to 4" in length, in elongated forms. One end is narrowed by chipping into an extended tapering bit with a moderately pointed end, often almost truncated instead.

Graver (Exhibits#7-8). Among quarry litter and thought to be associated with pipe making appeared these well-shaped Gravers. They are unique, not only because they are the only ones so far recovered at the site, but on account of the belief held by some, that this tool whenever found is assumed to belong to the Paleo-American Age. However, their presence in the quarry workings leaves no doubt as to their cultural affiliation with some aspect of quarry operations.
Fig. 4. STONE PIPE-MAKING TOOLS, Oaklawn Quarry. 1-6, Flake Scrapers; 7, 8, Gravers; 9-12, Pipe Bowl Reamers; 13-16, Abradingstones; 17-22, End Picks (sharp pointed). 1-7, 14-16, 22, Quartz Crystal.
Fig. 5. STONE PIPE-FORMS, Oaklawn Quarry. 1-3, Platform Pipe-forms; 4, Finished Pipe Stem (ground end, ready for drilling); 5, Straight Pipe-form; 6-9, Elbow Pipe-forms; 10, Pipe-blank. 2, 4, 5, 8, 10, Steatite; 1, 3, 6, 7, 9, Chlorite.
Because of the association of the small crystal specimens with the other crystal tools, as referred to elsewhere in the report, these tools are presumed to belong to the pipe industry. They might have served as incising tools, or as minute picks for delicate pecking of pipe stems.

Abradingstone (Exhibits #13-16). Cutting down the pipe-form after drilling, and thinning of the pipe bowl was performed partly with an Abradingstone. This is a similar tool to that of the stone bowl industry, except smaller sizes would have been used for pipe shaping, such as the crystalline quartz, and sharp-edged quartz crystal specimens as illustrated.

Flake Scraper (Exhibits #1-6). Another tool that assisted in pipe shaping was a scraper made from a flake of hard stone, like the quartz crystal illustrations. A tool of this kind, usually has one edge slightly curved and beveled by retouched chipping. The illustrated specimens came from a large quantity of crystal flakes near a worked vein of this hard stone. Many were found to be scrapers, and some abraders, besides one End pick (Exhibit #22) and a Graver (Exhibit #7). Close by an Elbow pipe of chlorite (Fig. 5, #6) was recovered, which suggests that these tools were associated with pipe making.

STONE PIPE PRODUCTS — Fig. 5

See Society Bulletin, Vol. 27, No. 3 & 4, p. 46 for finished products

Pipes were made from both steatite and chlorite, with the latter apparently the favorite. Three distinct types of pipes are represented among the pipe-form remains at Oaklawn, and are described further along. Variations in each group are numerous depending upon the whim of the maker, but all were pecked into shape from roughly worked pipe-blanks (Exhibit #10). Unlike the making of bowls, pipe-blanks seem to have been derived at times from broken chunks of stone, presumably taken from earlier bowl-making waste; no pipe-forms have been detected still clinging to a worked vein of stone awaiting final removal. However, this should not rule out the possibility, if not probability that many blanks were derived directly from quarried veins. Pipe-blanks are rudely formed chunks of stone, which have been flaked or pecked into convenient shapes for further processing. Doubtless, many of these ill-shaped blanks have been overlooked by excavators, however well intentioned, and may still be found in quarry waste at some quarries — but not all, as will be explained in the conclusion.

Straight Pipe-form (Exhibit #5). This form produces a pipe with its bowl projecting in line with the stem to form a unit of stem and bowl without a bend.

This form could have produced the Cigar-shaped tubular pipe — an imported style from its Adena Ohio homeland.

Platform Pipe-form (Exhibits #1-3). Popularity seems to have been divided about equally between this and the Elbow type. The Platform style has the bowl upright in about the center of the stem, one end of which is drilled, while the other end serves for a finger grip. This form, like all others, has an oversized shape to allow ample stock beyond that required for the final pipe to be made, to reduce the chance of breakage. However, even with the oversized dimensions the contours of the pipe that was planned are quite well defined.

Elbow Pipe-form (Exhibits #6-9). In general, this form assumes a bent shape between bowl and stem, which may vary from a slight bend to a full right angle. Variations in the length of stem are numerous, but in the main, shorter lengths are more in evidence. During the early days of pipe making the stem was always of stone, and formed an integral part of the whole pipe. Not until later, during Stage 2 pottery days was the bowl made without a stone stem. This is known as the Bowl type. It has a hole in the bowl at its base for insertion of a hollow reed for the stem; no evidence of this type has appeared at Oaklawn, so far as is known.

PIPE-MAKING TECHNIQUES

After the pipe-blank had been roughed out, a small to medium sized, sharp pointed End pick was employed to work out the form desired. However, before this took place, the workman, at times, pecked the outline of the pipe-form to be made upon the surface of the pipe-blank — as shown by one recovery now on display in the Bronson Museum. This was one way — doubtless there were others — of transferring the contemplated design from the mind of the artisan onto the stone to be processed. In place of modern layout facilities, the workman used such methods and materials as his ingenuity provided.

Following the design layout, which probably would have worked best on blanks having at least one relatively flat face, a sharp pointed pick was employed to peck away the stone up to the outlines of the layout. After this operation had been successfully completed, bowl and stem were rounded into shape. Probability of breakage during these operations was great, to judge from the hundreds of fractured specimens in various stages of development recovered from quarry tailings.

The next operation consisted of rubbing flat the top of the pipe bowl, end of the stem, and sometimes...
other facets of the form with an Abradingstone (Fig. 4, #13-16). Reaming and drilling operations that followed, probably were accomplished at home camp sites for the most part, although recovery of several Pipe bowl reamers at the quarry suggests that some reaming was done there (Fig. 4, #9-12). However, in support of the camp oriented belief, an Elbow pipe-form of chlorite — observed by the writer to be made of Oaklawn chlorite — appeared in excavations at the South Cove site, Mount Hope, Rhode Island. It was perfectly pecked into shape, — not drilled, and doubtless was brought there from Oaklawn for finishing.

The stem-drilling operation was most important, and great care had to be taken to keep the perforation directed toward the bowl’s base. The small hole found in many pipes requires a 1/16” drill with a gradual taper to 1/16”, 1 to 2” in length to produce it. As stone drills do not have such restricted dimensions, some other kind of drill must have been used. Through experiments of the writer, a 1/8” wooden drill made from a stick of fine grained hard wood, i.e., apple wood, was found acceptable for this drilling. Oscillated between the hands, after a pinch of fine sand had been repeatedly placed in the hole being drilled, the work was accomplished by abrasion. Writer’s speed in drilling 2” through the stem and into the bowl was at a rate of 1/16 to 1/8” per hour, depending upon the presence or absence of crystalline impurities, as the work progressed.

Reaming of the bowl that either followed or preceded drilling of the stem was performed with a wide bitted stone drill or Pipe Bowl reamer. This work may be conveniently accomplished by twisting the reamer back and forth, while held in the hand. Circular drill marks still showing on the interiors of some pipe bowls attest to such stone tool operations.

After reaming and drilling came the final shaping of the pipe. From the oversized pipe-form, stock was gradually worked away with an Abradingstone and a Flake scraper of suitable shapes and sizes found most convenient. At times, stock was left at the bowl’s top to provide for a prominent flange or lip around the opening. At other times, the bowl was made with straight plain walls. Writer found that this shaping operation may be quickly accomplished within the space of only about an hour. Finally, a lump of steatite or a small smooth-faced pebble was used as a fine abrasive to produce a smooth finish over all surfaces.

TAILING-REMOVAL TOOLS — Fig. 6

As steatite chips and dust from the workings were trampled under foot, it became necessary to remove this waste, so that quarrying operations could be carried on at even lower depths. Tools were devised for this tailing removal work, which seems to have been done by the women as explained in the conclusion. Obviously, these tools must have been developed soon after quarrying started, and from then on were in constant use down through pipe-making times, to judge from their frequent appearance. Many are broken or worn down to small proportions from the hard use to which they were put.

Spiked Tailing-breaker (Exhibit#2). This implement appears to have been the preferred type for digging into, and loosening quarry tailings at Oaklawn. Usually, it is made from granite schist. Occasionally, chlorite is used, but in both cases the stone material is not hard enough to have withstood the strain of working steatite in the form of picks. However, it seems to have been tough enough to have served well in digging into the trampled tailings. This tool is made from an elongated slab of stone, which is rudely chipped to a point at one end, the other end being left for the handle. Frequently, the pointed bit has survived without fracture long enough to show an overall wear from contact with a loosened material like tailings. Tailing-breakers have been found at times in relatively large sizes, weighing as much as 6 lbs. or more.

Triangular Tailing-breaker (Exhibit#1). As found exclusively in western Massachusetts quarries, this kind of tailing-breaker was hafted. Only one specimen has occurred at Oaklawn, as illustrated. It is made of pegmatite and shows overall wear on its pointed bit. It is moderately large, and has a triangular shape with its longest end pointed. A wide oblique base from which one end has been lopped off to effect good balance, would have served as a support for the handle to which it was lashed. Evidently, introduction of this type of tailing-breaker at Oaklawn came at a late date, which may account for the single recovery.

Hand Spade (Exhibit#3). After quarry waste had been broken up, its removal became possible. This was accomplished by shoveling it into containers — presumably baskets — and dumping it at the quarry’s edge. The work was performed with flat-faced stone slabs. These were rudely flaked into form and became the equivalent of spades for hand use. At Oaklawn they are made of granite and chlorite schist, which has spalled in various shaped slabs. By coarse flaking, one end has been reduced to a relatively thin edge, which often tends toward a spoon-shaped bit as illustrated. The other end is left unworked for the handle. Usually, this space is of a size, which could
CONCLUSION

A great mass of evidence over the years has been exposed at the Oaklawn quarry, indicating extensive quarrying of steatite and chlorite for the making of stone bowls and pipes. Remains of both products are extensive, and it is difficult to say which is larger, although from casual observation, stone bowls seem to hold the edge over pipes. However, quantities are poor criteria in determining duration or size of an industrial occupation. For they may represent the work of a few or many, who worked continuously or only occasionally. Fortunately, radiocarbon dating has now helped produce certain reasonable hypotheses, which formerly were subject to much speculation.

It has been shown by extrapolation from a Carbon-14 date at the Horne Hill quarry near Millbury, that quarrying there probably was first undertaken for the making of stone bowls and associated vessels some time about 3,800 years ago; and that it continued over a span of about 2,000 years. At this quarry, this long period of manufacture was devoid of pipe-making evidence. However, pipe evidence is present, although limited, at several other New England quarries, while at Oaklawn it is found in profusion.

A Carbon-14 date at Oaklawn of A.D. 731 together with the contemporaneous projectile point-connected evidence for the pipe-making industry, as presented, now seems to indicate that this quarrying enterprise came late rather than early; presumably toward the closing days of bowl making, or directly following its termination.
Perhaps the most significant contribution to be made by this quarry study is a new temporal concept of pipe making as related to bowl making. It is now safe to postulate probable quarrying activities in the making of stone bowls and pipes, and their respective separation as related to two different quarrying periods.

**Stone Bowl Making.** Sometime about 3,800 years ago, approximately 1,000 years after the start of the Late Archaic, discovery of steatite outcrops inspired the invention of stone bowls cut from this soft workable stone. During a slow population increase from the time when the Late Archaics first arrived, a thousand years or more could have elapsed before stone bowl industrial activities commenced. By then, group cooperation at quarries could have taken place. And with the advantage of more hands and brains, development of the industry pushed slowly ahead, preceded by a long period of tooling, in which twelve types of specialized tools emerged. Production of permanent stone cooking vessels brought about the addition of liquid foods to the diet. This in turn must have caused formation of new mores, which doubtless advanced the living standards of those days. Looked at in this way, the Late Archaic industrial period assumes a new and inspired aspect, in which stone bowl making must have produced a tremendous social impact of dynamic proportions.

This could well have produced a culture center in New England from which industrial methods for making stone bowls diffused throughout the Appalachians wherever steatite outcrops occurred. Certain evidence is available that tends to support this hypothesis. It is presented here in detail in hopes that it may serve to satisfy anyone, who has been critical of this postulation when presented in the past.

First, a Smithsonian report, No. 3578, by David I. Bushnell, Jr. published in 1940 states: "The use of soapstone is thought to have developed in the north and to have advanced southward." In support of this statement, Bushnell refers to certain grave excavations in the Upper Tennessee Valley, as reported by M. R. Harrington: "— research (in this area) disclosed proof of three distinct periods of occupancy, the most recent being that of the Cherokee. The form of burial practiced during the earliest of the three periods differed from the others. The graves were cylindrical and of small diameter, and the remains were forced into them after being closely bound with the chin between the knees. The name "Round Grave" was given to this culture by reason of the distinctive form of burial. Many fragments of soapstone vessels were found associated with material which belonged to the "Round Grave people"—"but no soapstone was encountered on sites attributed to the later inhabitants of the region. Certain types of objects which belonged to the "Round Grave people" connect them with the Algonkian culture of the middle Atlantic seaboard and point to decided influence if not actual relationship. This suggests that the knowledge of soapstone was carried southward by early Algonquian tribes who entered the region centuries ago and from whom other groups would have acquired the art of making soapstone vessels." Bushnell concludes with the statement: "Soapstone was used in the far North [using Georgia as a base], and the knowledge of its adaptability for making utensils and the comparative ease with which it could be worked, may have been brought from the North by early Algonquian tribes and later communicated from tribe to tribe until it became known to all by whom it could be obtained. This is suggested by discoveries in Tennessee, previously mentioned when referring to the age of the quarries, and if the hypothesis is correct, the stone [soapstone] was used in the North long before it was quarried in the South. Consequently, some of the utensils found in New England may be much older than similar pieces discovered in the valley of the Savannah —"

Finally, evidence comes from an examination of tools from New England quarries as compared with those from quarries to the south. In 1894, W. H. Holmes reported in the 15th Ann. Rep. Bureau of Ethnology about quarry recoveries in the Potomac-Chesapeake Tidewater province. He illustrates semi-finished soapstone bowls like those at Oaklawn, as appearing in Virginia, and enumerates the stone tools appearing at several quarry sites in that area. They include End pick, large and small, Chisel-bitted pick, Grooved gouge, and Grooved ax, but no other smaller tools. In contrast to this, New England quarries have produced not only all the tools Holmes mentions, but smaller specialized tools as well: Abrading-scraper, Chisel-scraper, Shaver, Hand gouge, and Abrading-stone. Most of these implements have high frequency in New England quarries, but as a move is made to Pennsylvania, the writer observed only two of these types at the Christiana quarry, and they were sparse: Abrading-scraper and Hand gouge. This comparative analysis seems to present a plausible deduction that the northern quarries had advanced further in making more diversified tools than those to the south because of their prior opening and development; that these smaller specialized tool types were being adopted by Pennsylvania quarriers, sparingly; and that other quarries further south had not adopted them before
they closed down. This tooling situation seems to suggest that stone bowl making had its beginning in New England with establishment there of a culture center, which diffused industrial knowledge and inspired the opening of quarries to the south.

Returning now to Oaklawn, it is of interest to analyze the personnel complex that may have existed at the quarry. After a study of tailing-removal tools, it is now evident, as previously emphasized in published reports, that quarrying was by no means an exclusive man's industry. Comparative analysis between woman's agricultural tools—Triangular hoe, Corn-planter, and Stem spade—that followed with the introduction of ceramics and maize, and tailing-removal tools of the quarry—Triangular and Spiked tailing-breakers and Hand spade—furnish typological proof, because of their similarity, that probably the former were inspired by and derived from the latter. And since perpetuation of customs and implement traits in any traditional change is usually confined to the sex to which the persons affected belong, the following assumption seems valid. Female planters at the start of Ceramic times doubtless derived their ideas for planting tools from having seen larger similarly styled tailing-removal tools in use at the quarries by their mothers. Also, it is probable from stone hearths in situ at three quarries that the whole family sojourned to the quarry, and under uncomfortable living conditions spent whatever time was required in making the stone bowls they were in need of. Therefore, it now seems evident that women performed the work of removing tailings, a necessary operation to permit extension of quarrying to lower depths. However, this must have been considered menial labor by the men, who doubtless performed all other quarry tasks in the making of stone bowls, much of it consisting of heavy work, and were in control of all operations. In other words, stone bowl quarrying was without doubt a male-dominated industry, in which women participated as servants.

Stone Pipe Making. Just when the advent of stone pipe making occurred in New England is not known. However, it seems probable that the idea of smoking was diffused into the northeast from outside culture centers to the west. For instance, it is known that several kinds of stone pipes including the Platform type were being made and used by the Adena people of Ohio as early as 500 B.C. or before. Also, evidence is now available to show that small groups of this race migrated eastward, some of which finally reached New England about A.D. 200, when stone bowl making was drawing to a close. Then, with the introduction of ceramics, perhaps 100 years later, the quarries closed down since their heavy stone bowls were wanted no longer; lighter weight ceramic pots made by the women had displaced them. Apparently, an industrial revolution had taken place, in which women had replaced men as the industrialists of a new age.

The probability is that during this period of change, Adena influence was being felt, and among various diffused ideas and customs was that of smoking. Soon it caught on and at several quarries, which were in the process of closing, efforts were made to produce stone pipes. Pipe-blanks, Pipe Bowl reamers, or both in minimal amounts have appeared at Dolly Bond, Westfield, and Wilbraham quarries, which suggests limited pipe-making activities at these sites. Other quarries, such as Horne Hill, may have actually stopped bowl operations by then and were never used again for pipe making. However, Oaklawn quarry for some unknown reason was selected for intensive pipe making, and perhaps became the center of this new industry. In as much as men had been stone bowl artisans for centuries and were conversant with the making and use of the stone tools required, it seems probable that they made the necessary tools and became the stone pipe makers of the ensuing industrial period. Their skill acquired over countless ages of labor would have provided them with the required knowledge of how to proceed from the start; inferior semi-finished pipe remains suggestive of an experimental period are scarce at Oaklawn. Later, after women had acquired skill as potters, ceramic straight and elbow pipes were made by them, while stone pipes probably continued to be made by the men.

Living Quarters. When quarries are excavated, the question invariably arises: Where did the quarriers live? At Ragged Mountain the answer was clear and definite, for there quarrying took place within a rock-shelter with a spring-fed brook nearby. In the shelter and lying beside industrial tools were projectile points, knives, etc., the domestic remains of family living. Also included were stone hearths and a well-defined living area. However, at Oaklawn conditions are different. Here the quarry lies on top of a hill where drinking water is not available. This necessary supply would have had to come from one of two sources, a spring-fed brook about a quarter of a mile down hill to the west, or a spring and brook a shorter distance down hill to the east. Water had to be conveyed to the workers from one of these sources without doubt, and could have supplied family life in or about the quarry as well. The two stone hearths re-
ported at the quarry edge indicate such a possibility, and if the entire periphery of the workings could be exposed, other hearths might be found. Whether the various charcoal remains throughout the quarried area indicate group living, with the family making use of nooks on the quarry floor for beds, cannot be determined with any degree of certainty. However, it is possible, since domestic implements including projectile points and knives have appeared to some extent throughout the tailings (Fig. 7), as well as one large stone hearth in situ. More specifically, the finding of a Stemless knife and projectile points near the two stone hearths at the outer edge of the works supports the belief that here, at least, was one living area.

During the long span of industrial activity the probability is that group warfare had not yet developed, because of a sparse population. A peace-loving people worked the quarry and made the resulting inventions as indicated by the recovered artifacts. For, it would be unrealistic to expect such impressive accomplishments as are evidenced by quarry remains, if group infighting existed. Fear of sudden attack from one’s enemies would have interfered with the persistent creative effort required in development of the industry. Therefore, it may be surmised that the quarry was open to all alike, with full freedom of action assured.

At Oaklawn, pipe making must have continued for a long time, to judge from the excessive amount of broken-pipe litter. The radiocarbon date of A.D. 731 and the probable advent of pipes due to arrival of Adena migrants at the close of bowl making indicates that operations had been in progress for over 400 years from the time when stone bowl making had terminated. And it seems probable that at least another 400 years may have elapsed before the last pipe was made at the site. Apparently, this was before introduction of the Bowl type without stone stem, for remains of this kind of pipe are absent in the quarry waste. Pipes of this type probably were made elsewhere at a later date; one of fine grained chlorite appeared in the Stage 2 pottery zone of occupation at the Sweet-Meadow Brook site in Rhode Island, and others of steatite, sandstone, or slate have been recovered at other locations.

Finally, examination of the domestic knives found at Oaklawn reveals the Stem and Stemless types, alone, which are known to belong to both the Late Archaic industrial period and the Ceramic that followed. No remains of the Leaf knife and Ulu, presumed to be diagnostic of the Early Archaic appeared. This seems to present another piece of evidence to support the belief that the Early Archaic — a highly nomadic caribou-hunting existence — should be considered as separate from the industrial age of stone bowl making, and probably without racial affiliation.

Bronson Museum,
December, 1965
This question is an oft repeated one, and indicates an avid interest expressed by many in knowing how to identify aboriginal camp sites. At times when an occupational area is being excavated, there are those looking on, who wonder how the diggers could have known in advance that artifacts of an early people lay beneath the sod. For, to the average eye, all that appears on the surface are trees, bushes, rocks, or unfriendly terrain, among which, man-made artifacts seem totally absent. And generally speaking, this commonly held feeling of skepticism is justifiable. For, if one were to strike out without preconceived ideas of what to look for, and dig test pits here or there without regard to certain essential site requirements, location of early man’s relics would be an almost impossible task. Locating a site takes more than a trained eye. It requires placing yourself thousands of years back in time and dispossessing yourself of all concepts of modern living. It requires thinking in a primitive way like an aboriginal, who is seeking a place to live, where nature offers advantages which seem best for survival.

However, even with such a carefully planned concept, it is no easy task to detect a site, which will produce favorable results. And even after a site is located, much pit testing and actual excavation by trench or square area digging is usually required before a productive section is located — and this is by no means a certainty.

There are at least two ways a site may be discovered: by chance, or through deliberate search by those interested. In the first mentioned way, bulldozer removal of loam for sale frequently uncovers remains of a former occupation. This may be in the form of charcoal blackened refuse pits or stone hearths. Such evidence is large enough to catch the eye of almost anyone, and often leads to a controlled excavation by qualified groups, such as are found in this Society. Pillage of such a site solely for artifacts is inexcusable and always results in loss of important knowledge about the past. Other chance discoveries may be made in plowed fields, or when construction operations are under way of such projects as road building, house developments, and water reclamations. Or, it might be as simple as an accidental recovery of an artifact, either in a garden plot, a washout, on shore of lake, stream or sea coast, or, as in one known case, in a hole dug beside a house with recovery of a fanciful Birdstone. Such random finds often excite the imagination, resulting in the erroneous idea that such artifacts lie everywhere and are simply waiting to be dug up. Thus, of course, is not the case, as will be readily understood when consideration is given to the second way of discovery.

In the deliberate search for a site, certain conditions resulting from an aboriginal camp are well to keep in mind. To begin with, scattered firestones — cracked and reddened from fire exposure — derived from demolished stone hearths of aboriginal camps, are often in evidence. These stones are sure proof that an occupational site is nearby, denoting occupancy by family groups. For, hearth construction and tending fires were woman’s duties, and where women were the rest of the family most certainly were to be found.

Next in order of importance as a site indicator are chips, resulting from the making of stone implements. Such flakes may be small or large, but whatever their size they connote the former presence of stone workers. The occupation of making implements was one of several duties attributed to men. They were the tool makers of their day, and chips were struck off stone cores by percussion strokes, while small artifacts were finished, most always, by pressure flaking. Usually, chip debris is more in evidence than any other kind of camp litter, and may be depended upon as clear evidence of occupation.

Another frequent marker indicating man’s presence are broken shellfish remains. Such crushed shell is present more often on seashore sites or along nearby lakes or streams. Shell litter may appear in shellheaps (shell middens), or scattered over the ground, exposed by plowing or uncovered by water or wind erosion. That tidewater people of this area ate shellfish during all of the Ceramic Age is a well known fact from site excavations already completed around Narragansett Bay, and as far removed as the coast of Maine. Also, it has been discovered at such sites that shellfish were not eaten by Archaiacs of the preceding era; became a part of people’s diet at the start of the Ceramic Age, for the first time.

Then, there are other important factors to be kept in mind, which may determine location of a site. First, there is the all-important need for drinking water. Aboriginal man appears to have preferred cold, fresh water when obtainable, just as people do today. Therefore, when sizing up a prospective site, make certain that there is a good source of drinking water nearby. It should be a spring, or spring-fed brook,
but, as a poor substitute, may be a river or lake. The latter two might only have served as temporary sources. Sometimes, a washed-out gully extending down into a present water course may indicate where spring water formerly flowed. Here, over the thousands of years intervening rain water gullying has occurred; the water table that produced the spring, now extinct, could have been higher in ancient days. Sites are more frequent along water courses or on the shores of lakes and ponds, for primitive peoples depended to a considerable extent upon water travel in dugouts, and desired navigable water nearby for easy and quick egress.

Another required camping condition was good drainage. Sandy soil seems to have been preferred over heavy soil for summer camps — not necessarily so for winter sites. Also, and of prime importance, was the factor of elevation. More often than not, summer camps were located on high banks or hillocks overlooking lakes or water courses. Apparently, such high ground, besides affording a good lookout, insured quick run-off of rain water. This provided healthier and more livable quarters. On the other hand, a winter camp is more likely to be found in deep woods, sometimes protected by hillocks against a north wind. As the ground would have been frozen, there was less need to provide for adequate drainage. A slight elevation of suitable dry soil in the form of an island or point of land jutting out into a swamp would have been sufficient protection from water penetration, when snow and ice was all about. At such a site, it is only necessary to turn over the leaf mold to see what lies beneath, in order to find evidence of former occupation.

In looking for sites, it is often profitable to make use of outside assistance. For example, farm plowing has been the means over the years, more than any other factor, in exposing evidence of probable camp sites. However, natural erosion by water or wind has also proved useful, in the form of washed-out banks or sandy blow-outs.

Finally, sites of a smaller nature are to be found in what are known as rock shelters. At places situated sometimes at the base of extensive rock outcropping may occur an overhanging rock shelf. Often, this provided temporary shelter in early times, as well as in more recent days. At other places, outcrops may jut out of the ground in such a way as to form a commodious crevice, which could have been covered over for a shelter. It is thought likely that a rock shelter with an overhang was utilized by leaning poles against the overhang, and closing the exposed side by wattle to make a sort of lean-to. Careful examination of the floor of shelter abodes many times reveals evidence of early occupancy. This is usually mixed on the surface with remains of more recent campers. At such sites, the searcher is often confronted by an accumulation of large stone slabs, which have broken off the overhang to cover most of the shelter's floor. At such times, it is necessary to remove this rock litter before an evaluation of what lies below can be made. This is tedious work, and usually requires heavy tools such as crowbars and sledge hammers, wielded by many hands.

In closing, a word of caution seems advisable in order to prevent over-hasty indiscriminate digging of sites. The act of finding artifacts causes many to forget that uncontrolled digging for relics destroys all else but the objects recovered. Knowledge of what took place at the site, at what time it was occupied, who the people were and where they came from, what they looked like, what their spiritual beliefs were, if any, and what kind of industry prevailed are lost forever. On the other hand, all of these and other important facts essential to archaeological research are often obtainable under proper scientific controlled excavation. An inexperienced excavator should seek qualified guidance, so that the site's evidence may be properly recorded and studied. To this end, it is essential that information concerning proper methods of excavation be obtained before the digging starts. At the Bronson Museum, Society officials stand ready to offer advice, as the occasion may require, and solicit cooperation from Society members in an effort to prevent needless pilferage of artifacts from sites, with subsequent loss of valuable associated evidence.