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BULLETIN OF THE
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THE OAKLAWN SOAPSTONE QUARRY

Gerald C. Dunn

As a number of reports have been published on the findings made at several steatite quarries in Massachusetts by members of the Massachusetts Archaeological Society, it may be well to make a report on the quarry located on the farm of Herman Johnson in Cranston, Rhode Island. Before going into detail relative to this quarry, which from now on will be referred to as the Oaklawn Quarry, the designation previously used by others, we will call attention to an old report relative to the location of steatite in Rhode Island.

The first reference is on pages 80, 81 and 111 of the "Geology of Rhode Island" by Charles T. Jackson, M.D., published in 1840. A map showing the location of these deposits is included with his report. The following quotation from page 81 explains as well now as it did 100 years ago the minerals we might expect to find and the composition of these steatite deposits.

"Limestone also occurs on the Almy farm now belonging to Mr. William Jenkins. I examined the bed and found it to consist of the granular varieties of limestone, included in hornblende rock, associated as usual with frequent beds of chlorite slate, soapstone and serpentine." Further, "The towns of Cumberland, Smithfield and Johnston have hornblende and talcose rock which occur only in beds included with other rocks in these towns. It is very limited in extent. Pure apple green talc occurs in Smithfield and Johnston."

The steatite quarry located at Ochee Spring in Johnston and the Manton Quarry in Providence are well known and have been referred to by various writers in recent times. A quarry is also vaguely mentioned in the vicinity of Westerly, but inquiries thus far have failed to locate this and early histories do not mention it. The Manton Quarry is in Providence, off Atwells Avenue. Indications are that the area used as a quarry by the Indians was relatively small. The Ochee (or Johnston) Quarry on the Hartford Pike has been reported on by F.W. Putnam (Reports of the Peabody Museum of Archaeology and Ethnology, Vol. II, p. 274-276). Charles O. Willoughby, in his "Antiquities of the New England Indians," quotes Putnam's account of the site.

The formation of the Oaklawn Quarry on the Johnson Farm (Hillside Farm) in Cranston would indicate that steatite was quarried from only a relatively small area. Whether it was in a ledge or banded formation is now hard to determine for there only remains exposed what appears to be a small part of the original outcrop. Blanks have been removed and there are two bowl blanks which have been started but never removed.

The location of the quarry is on the north slope of a hill which rises sharply back of the farm buildings a distance of one-half mile. It is situated three and a half miles from the Pawtuxet River, five miles from Providence Bay and nine miles from Greenwich Bay. A considerable Indian population is known to have lived in these areas. Many camp sites in the vicinity of these bays and rivers have furnished broken bowls, pipes and pipe blanks made of steatite, presumably from this or nearby steatite quarries.

The Oaklawn Quarry has been known to collectors for some time. Messrs. Congdon and Hawkley of Rhode Island reported their findings some years ago to Maurice Robbins of Attleboro and exhibited material found there. Mr. David Straight, of East Greenwich, has been there, as many others doubtless have.

It is reported that talc taken from Oaklawn Quarry about 100 years ago brought a high price in New York.

Our first visit to this site was made with Maurice Robbins and Earle Bryant, both members of the Warren K. Moorehead Chapter in the spring of 1943. Since that time the work has been done by R.O. Bale of Greenwood, R.I. and the writer.

The slope where the quarry is located is covered with maple, grey birch, and scrub oak. It has been cleared and undoubtedly used as a pasture some 15 years ago. An area of about 10,000 square feet is covered with hundreds of pieces of steatite of all sizes. It has been so moved about by relic hunters that it is impossible to tell where it was originally placed. How much was on the surface and how much below the surface would be guess work.

The quarry hole itself is not extensive, being some 60 feet by 20 and about 5 feet deep in the deepest part. This quarry hole is at the northwest side of the debris-covered area. It is our belief that from this excavation white men removed steatite for commercial use and that broken pieces and miscellaneous
debris were used to fill in the road leading from the quarry to the farm at the foot of the hill. To confirm this last statement, we find steatite fragments the entire length of the road; a broken rim and other fragments which have been picked up and which show evidence of having been worked, bear out this assumption. A drill-hole in steatite, a broken drill and hand hammer indicate the use of white men's tools to remove steatite. It is our belief Indians did not make this excavation, at least not to the extent it now covers.

We have concluded that the Indians worked on outcroppings near the surface and excavation bears this out. With this background one can see the difficulty of carrying on a careful research job such as reported by other members working on sites that have not been badly disturbed.

Reports are that this area was dug over with clam hoes to bring to the surface material which could be reached by this method. Because the site had been thus disturbed, it was necessary to begin our search for material left by ancient quarrymen at a lower level.

A trench was started on the east side of the excavated area and carried a distance of 80 feet. As the trench progressed, it was very evident that we were working in not only the original area occupied by the Indians, but that the upper part was material thrown out from the excavation and piled up along the sides. All this disturbance indicated little chance of recording much of value in respect to original location of material, etc. Therefore, this report will be one of imagination plus findings that tend to indicate certain truths.

At the northern end of the excavation are the remains of part of the steatite outcrop. It is approximately 20 feet long by 5 feet by 4 feet in height. On the upper surface are two bowl blanks in the process of removal. There are indications that blanks for other bowls have also been removed. The greatest diameter of the larger of the two bowl blanks not removed is 2 feet 7 inches.

In depth, our trench varied from 7 inches on the down hill side to five and one-half feet on the upper. Material was found at these depths below the present surface level which could not have been the true level in ancient times. Three small areas gave evidence of small fires. These were well below the surface and some small flakes of charcoal were found but most apparent was the reddened burnt appearance of the earth itself. The pieces of steatite were scattered all through the soil with no apparent relation between one piece and another. As might be expected, some spots would run to large pieces, others to smaller. In no location was there an abundance of broken dishes, pipe blanks, etc., that would allow us to identify that spot as the place where broken and rejected material was dumped. We removed many pieces of steatite and similar rock so large that it was all one man could do to move them. Found in fragments, varying in diameter from an inch or two to that of a croquet ball were found. Many showed evidence of having been worked while others appeared to be pieces broken off in the process of reducing a large blank to a smaller and more usable size. Forms that were definitely recognizable included blanks for bowls, dishes, platform and elbow pipes, broken rims of bowls and nearly completed dishes. Many pipe blanks were well along in the process of manufacture. Lugs broken from dishes were found in great numbers; they varied from crude rough forms to beautifully smoothed ones. These apparently broke off easily. If we were to dig over the entire area it is doubtful if we would be any better off, for enough has been found to give us information about the form and size of objects made here.

From all descriptions, Oaklawn resembles the Dolly Bond Quarry as reported by Ripley P. Bullen in the October 1940 issue of the Bulletin of the Massachusetts Archaeological Society. Because of this, a similar outline and comparisons will be followed.

Quarry tools

Nothing has been found that corresponds to the nicks reported from other quarries. There were no grooved or flaked implements. Fifteen pieces of gneiss which we found may possibly have been used as nicks. They fit the hand well, but they show no effect of working, and do not seem hard enough for this use.

Eleven large battered stones, possibly used as hammer stones, were found. They are considerably battered, and most of them are of quartzite.

Many large flakes of quartzite and serpentine were found. As a rule they are three by three inches with sharp cutting edges. These sharp edges are caused by fracture of the material and show no chipping. By using some of these, we found them to be excellent for cutting grooves and smoothing steatite. These files or scrapers show no definite effort to work them to fit the hand. However they do fit the hand very nicely, due to the manner in which they were flaked from the core, great numbers of which were found. Although most cores are about the size of an orange, some are even larger. They are of serpentine, quartzite, an occasional quartz, and felsite. Flakes have been removed from the entire surface.
Worked steatite

Dishes represented include large bowls, possibly drinking cups, and small shallow dishes, according to the shapes of sherds. Dishes had the customary lug frequently associated with Indian vessels of this class. Fragments include ten lugs or handles, some complete and smoothed, others rough and broken, not yet completed. But undoubtedly they were broken off in the process of manufacturing vessels. Eleven large pieces of broken or unfinished bowls or dishes, seventeen large pieces of rims, fourteen roughed out blanks for bowls or dishes, the smallest 3 by 4 inches in diameter, the largest 6 by 11 inches in diameter. All the material used in making these vessels was steatite with one exception; this was a broken bowl blank made of a mixture of about 50% actinolite, 50% talc. Chlorite schists do not appear to have been used for vessels.

It was possible to reconstruct three vessels with a lug at one end. These were probably to be used for cups or ladles. Since one-half of each of these was found, it was very easy to reconstruct the other half and determine what they looked like prior to breakage. They measure 4 by 3 by 3½ inches in depth.

Pipe blanks

Pipe blanks in various degrees of completion were quite numerous. They run from pieces very roughly started to others completely blocked out. None of them showed the early stages of hollowing out the pipe bowl or drilling of the stem. The material used was steatite and chlorite schist. An interesting point is that while museums and collections in Rhode Island include many steatite pipes there are few complete pipes of chlorite. Below is a list of the materials together with the number of blanks of each material:

- Of chlorite schist, were found six blanks for platform pipes, well along in the process of manufacture.
- Of steatite, were found five blanks of platform type, well along in the process of manufacture.
- Of chlorite schist, roughed out in the very first stage of work, we found twenty blanks.
- Of steatite, roughed out in the first stage of work, we found fourteen blanks.
- Of steatite, roughed out for elbow type pipes, we found three blanks.

These figures indicate twenty-six pipe blanks of chlorite schist to twenty-two of steatite, or approximately equal numbers of each. We may well ask the question why we find so little chlorite schist compared to steatite on old camp sites and in collections.

No attempt will be made to report on the methods of manufacture for there seems to be no difference between the methods used at this quarry and those in vogue at Dolly Pond (see pages 20 and 21, Volume II, No. 1 October, 1940, Bulletin of the Massachusetts Archaeological Society).

Conclusions

This quarry produced vessels of all sizes and shapes in common use in this area. They were practically finished, although the final smoothing and polishing may have been done at the camp site at which they were used. The large number of lugs or handles found as broken pieces or attached to fragments of bowls or rims would lead us to believe that the majority of the completed vessels had lugs on them.

The texture and composition of the material from which these were made was variable; this accounts for the many broken pieces. A very light blow will easily shatter a piece if it strikes a line of cleavage of a softer or harder material. In some of the fragments there appear to be talc, chlorite, asbestos, and actinolite. It has been proposed that the marks of picks used in making these vessels, marks which are very numerous on all the worked pieces, may possibly have been made by a piece of antler. No stone tool that would make comparable marks has been found.

Pipes of various forms and sizes were blocked out and probably completed with the exception of drilling out the stem and bowl. Both platform and elbow pipes were made. They varied in size and in material used. Experiments showed that it was quite easy to block out blanks from steatite, using chips of quartzite, felsite or serpentine.

By using a drill made out of these rocks a bowl could be very easily and quickly drilled out. With chlorite schist, it is a different matter. Chlorite schist is harder.

One arrow point with a badly blunted edge was found. This is black in color and is of a flint-like material not native to the locality. It may have been used as a file or scraper.

The apparent differences between Oaklawn and Dolly Pond are: At Dolly Pond, there were no pipe blanks, at Oaklawn, nine blanks were abundant; at Dolly Pond, definite picks were found; at Oaklawn, nothing was definitely identified as a pick, although a few probable ones were found. Other than these differences, there seems to be a similarity between the two quarries.

Minerals Found

A great many different minerals are to be found at the quarry. They do not occur
as large quantities in a pure state but in rocks which consist of a mixture of more than one mineral. The more common minerals found associated with the quarry are: Talc, Chlorite, Serpentine, Actinolite, Tremolite, Quartz and Garnet. Talc has a hardness of one; Chlorite, two; Serpentine, three; Actinolite, five and six; Tremolite, six; Quartz, seven; Garnet, seven.

The diamond has a hardness of ten and is taken as the basis for determining the relative hardness of minerals.

Acknowledgment:

The following gave advice and assisted in various ways in making this report possible: Maurice Robbins and Earl Bryant, Attleboro, Massachusetts; Ripley P. Bullen and Douglas S. Byers, Phillips Academy, Andover, Massachusetts; Alonzo Quinn, Head of the Department of Geology, Brown University; Willard Winslow, North Providence; R.C. Hale, Greenwood; Miss Jean L. Ray, Miss Elsie M. Grant, Mr. David Straight, East Greenwich; Herman Johnson, Oaklawn (owner of the land on which the Oaklawn Quarry is situated) - all of Rhode Island.

East Greenwich, Rhode Island
January, 1945

Oaklawn Steatite Quarry: a) Quartzite core; b-c) Serpentine flakes, no secondary chipping, arrows show cutting edges; d) Core stone of serpentine; e-g, l) Fragments of bowls; h) Cup or dish with one lug; i-j) Rough blanks showing pecking; k) Successive steps in working out pipe blanks; l) Pipe blank with bowl broken off; m) Well roughed out blank of chlorite schist; n) Implement of black flint, its right side is dulled and looks as though it may have been used as a scraper or file; o) Elbow type blank, filed groove cut on both sides shows no pick marks (material talc steatite, actinolite, chlorite schist).
A CHRONOLOGY AND CLASSIFICATION OF
CONNECTICUT VALLEY PROJECTILE POINTS

William S. Fowler

Much has been written concerning arrow and spear points, as well as the usually long, well chipped projectile blades without definition as to type, and generally found in caches. Several well defined chronologies for different types of points have been suggested by some, based on many convincing grave discoveries. After reading various reports concerning material found in the East, and comparing these finds with those we have had access to from the Connecticut Valley of Massachusetts, we have reached several conclusions which will follow. Over many years of research, in which nearly all types of points have been recovered from over two hundred camp sites in this valley along the Connecticut River, we have come to have certain convictions, influenced partly by the writings and reports of others in the field. While all of these convictions are subject to change upon the presentation of new evidence, enough facts have been gathered together, we believe, to support the conclusions reached.

Ripley P. Bullen in the Bulletin of the Massachusetts Archaeological Society, Vol. IV, No.3, after checking thousands of points found in New York State, has indicated fifty distinct and different styles of chipped bases which seem to repeat quite frequently. In comparing these with those recently reported by W. A. Ritchie in his Pre-Iroquoian Occupations of New York State, it is evident that most all these types are represented in the material which has been recovered from caches in the Valley and elsewhere. We have been able to identify fifty distinct and different styles of chipped bases which seem to repeat quite frequently, with a view of classifying the material which has been recovered from caches in the Valley and elsewhere.

In examining Ritchie's illustrations of points still further, it appears that some styles of base were apparently in use during the early, as well as the latest periods and probably cannot therefore, be said to indicate one age more than another.

Going farther afield, and comparing styles of eastern bases with those from the West and even Siberia, we find many similarities where the differences are so minute as to almost merge. For instance, the Neolithic stone points from the lake Baikal region in Siberia, after Petri, as reported by H. E. Collins, Jr., (Recent Advances in American Archaeology, American Philosophical Society) have few noticeable differences from those of the East. This leads us to our first observation, that most of the well known styles of bases of projectile points were probably developed as a result of obvious requirements to meet certain conditions, which were the same in one age as another, or in one part of the country as in another. If this theory is correct, then we will have to look further than just the style of base to discover differences if any, between these points of an early age and those of a later one. This does not apply, however, where the style of the base is so distinct in its characteristics as to set it apart from all common styles.

The infrequency with which such points are found is another indication that they were better suited perhaps to some aboriginal branch at an early date, than to a later one. They may be classified either as early points, or as those which did not prove a success, or both. The following might be included among such exceptions: leaf, lozenge and eared triangular forms; all of which are found but sparingly, today, on camp sites in the Connecticut Valley.

To try and fit Bullen's fifty types into a chronology, made up of several temporal stages as close as several hundred years apart, when it may be quite possible that a large majority were used in most, if not all these stages, seems to us quite futile. We are more concerned with the intermediary stage it may have belonged. In geology, time is measured in thousands and not hundreds of years, and we believe archaeology would do well to follow a similar method of approach, when discussing the chronology of projectile points or allied subjects. With the thought of offering a plan that will simplify a classification of points for the average collector or museum, we are suggesting that all specimens from this region at least, be placed in one of two age periods, to be identified as Ancient and Recent.

These terms are being used today quite generally in the field of archaeology, and have had an increasing acceptance by many writers. It would seem therefore that they should be appropriate for our present use. After comparing the different cultural stages of development, as presented by several writers following a study of grave material, we believe a chronological division could be made at or about the time of Christ. Our Ancient period would then include all points dated after B.C., while our Recent would have those dated as A.D. To try and divide our various points into these two periods, we have used every available evidence which...
has come to our attention, from written reports and other sources. While the results are admittedly but a theoretical classification, we believe that they are a step forward, and represent a constructive effort to cut the feelings and thoughts of many into concrete form.

The method of flaking, whether by percussion or pressure, has apparently been more of a determining factor than type, in the case of those points having styles of bases that repeat more frequently. Emil W. Haury of the University of Arizona, in describing excavated material of the Chiricahua Stage, Cochie Culture of Arizona, (Recent Advances in American Archaeology, American Philosophical Society), about 3,000 B.C. or before, reports that the entire stone industry, except a few pressure-flaked projectile points, were primarily percussion-flaked. Excavators in other localities have made similar reports, with the result that it is becoming apparent that percussion-flaking probably originated in the archaic stage, while pressure-flaking was a development of later one. What seems to be a further proof of this is the material used for projectile points found on what has evidence of being a pure archaic camp site, the only one reported to date in this valley.

Inundated in from eight to twelve feet of water, about 200 feet from the present west bank of the Connecticut River, one mile south of the Mt. Holyoke Range and adjoining the historic summer fishing camp of the Norwottucks, lies site M/18/17 on what we have identified as the Outer Gravel Bar. Only in times of extremely low water can the site be reached for sifting, and even then the work must be done entirely under water. However in spite of this almost insurmountable barrier, a Society member, Edward Danzick, has retrieved from this site about fifty arrow points, as well as many other artifacts. The points were all made of white quartz or quartzite, flaked evidently from local river-washed glacial cobbles, and were apparently percussion-flaked. Many hammer stones were found among them, of which there were a number of very small ones evidently used in doing the final finishing. The following forms were represented: elongated triangular, small equilateral triangular, thick stemmed points and several with rounded stems, referred to in Bullen's chart by #2, 5, 24a and 31a. There were no notched bases among the points and none made of flint or felsite, nor in fact any chips of this material. This site has now been carefully analyzed from several different angles, but limited space does not permit us to discuss the matter in this report. Suffice it to say, that after all the evidence was in and studied, there appeared many sound reasons to show that this was undoubtedly a site of an archaic settlement. The fish weir settlement in the Back Bay in Boston, reported by Frederick Johnson, of Andover, was found by pollen analysis to date from 1700 or 700 B.C., according to the estimates of Knox or Benninghoff. It may have been the work of another branch of the people responsible for our early river occupation. The latter we have called the Norwottuck focus. From this ancient river focus we have a number of forms of points presumably in use at an early date. The absence of notched points might indicate a later date for this form unless specimens are subsequently found on this or similar sites.

Another discovery which has attracted considerable attention is at a quartz tool quarry, adjacent to a steatite quarry in Westfield, both of which have recently been excavated. Because of a well-defined diversification of specialized steatite working tools made entirely from the crystalline quartz of this quarry, an advanced stage of industry seems to be manifest. Among these tools, a single projectile point was found in a location that is believed to represent the later workings of the quarry. While the point is missing, the base clearly shows the form that was intended. This was an elongated triangular of about two inches in length, Bullen's #5. This point, fractured in the process of being chipped, was evidently being made by one of the tool makers as a diversion, and was percussion flaked as were all the tools that were made at this quarry. While not an exhibit of an actual projectile point in use, it does reveal the type of base that was in the mind of the maker and therefore presumably in use at that time. The age is still undetermined although some feel that the steatite industry belonged to a pre-eramic horizon. This would place it in an early age, but perhaps not quite early enough in this locality to entitle it to a place in our Ancient Period. However, it is quite likely that this style of point had been in use for hundreds of years, like other well known forms that have persisted down through the ages. If so, it is entirely possible that it originated in our Ancient Period. This would then account for a similar percussion flaked triangular point recovered from site M/18/17, a part of our Ancient Norwottuck focus.

Still another piece of evidence must be related, which goes a long ways toward placing the so-called bird points, made generally of quartz or quartzite, in our Recent Period. While searching for camp sites, C.F. Schuster ran onto a small site in West Hatfield, located on a slight elevation in the midst of what has been known from colonial days as the Great Swamp. In the early historical days it is well known that wild turkey abounded here and it is quite likely, therefore, that this camp was used for turkey hunts. From this small site of not more than a couple of acres were recovered over ninety quartz bird points. These had evidently been used in hunting wild turkey and has given rise to the thought.
that in this area at least this type of point was used for killing wild turkey. On the same site, apparently associated with the points, was found what had the appearance of being a miniature gravestone with crude scratches on one side. These marks were evidently an attempt to copy those from early colonial gravestones, and suggest that an Indian in colonial days tried to give proper burial, perhaps, to his child at this place after the manner of the English. If this surmise is correct, the date for bird points in this valley would be during the historical era and probably for some time previous. This would place them in our Recent Period, their non-appearance in our Ancient Norwottuck focus having already been noted. While the absence of them in this focus is not conclusive proof that they were not in use at that early date, it seems reasonable to consider them to indicate a primitive economy of the day. Coming, as these primitive pioneers probably did, in dugouts by water, they were no doubt, in search of good fishing grounds and presumably depended on fish rather than game for their survival. With no established trade routes or paths through the woods, they didn't have wandered far afield, and it may have been a good many years before they included game as an important part of their economy. Thus, while they may have been prepared to kill large game for food and protection with medium-sized points, they probably did not concern themselves with the hunting of small game, such as birds, with the smaller points which would have been required.

Now in our opinion, there are three factors that determine most of all, the age of Connecticut Valley projectile points. These are type of flaking, material from which the points are made, and the form of the base.

From all evidence to date, the type of flaking, whether percussion or pressure, is a major determining factor, and it would seem that some peoples of this valley used percussion-flaking most of all. The stage at which pressure-flaking was adopted as the preferred method is as yet undetermined, but it probably did not become at all general for a long time. In fact, not until man had reached a point in his development when he had acquired leisure time in which to strive to refine what formally had seemed to him good enough. However, it is quite evident from an examination of bird points, that many were made by percussion as well as by pressure flaking, so that if these points belong in our Recent Period, as we believe they do, then we must conclude that this method of manufacture cannot be used as the sole determining factor in the classification of projectile points.

The next most important factor is the kind of stone material used, and here we have a convincing chain of evidence, which together with the method of flaking tends to prove a great deal concerning the age of a point. The preferred stones as found locally in this area in the order of their importance are: quartz, quartzite, hornstone and basalt. Points made from all other kinds of stone were probably either traded in from other localities or blanks here from cores of traded stone material. Much of this foreign stone can be traced to its source, by comparing flakes from this valley with specimens from foreign deposits. In this way we have traced chert to the Kildersgrade escarpment in New York State, porphyry to a quarry site in Marble-head, Massachusetts, red jasper to Maine, slate to Vermont, flint - yellow, black, gray and white - to the Middle West, and obsidian to Wyoming or Oregon. There were other sources for these foreign stones but the ones we have cited will serve to indicate the long routes over which stone was transported for trade. All projectile points made of any of these stones and found in the Connecticut Valley are linked quite definitely with a trading economy, and must therefore be considered to belong to an age after trade routes had been established with other parts of the country. Obviously, the first arrivals here belonged to a simple food-gathering economy, isolated as they must have been from other localities, and were forced to use local materials exclusively for the maintenance of life. Hence, when we locate a site that seems to belong to an ancient age, because of its location, like our Norwottuck focus, and find there no trade points or trade stone materials, we have a condition that suggests an early pre-trade settlement.

This theory is based on our belief that this valley was discovered and settled by people who came up the Connecticut River in dug-outs, and that overland contacts with other localities came later, probably after a long time had elapsed.

The third determining factor, that of form of base, should be considered only as supplementary to the others. As such, our conviction is that the same or similar forms of base, in a majority of cases, have been developed in different ages and in unrelated parts of this country, as well as in foreign lands, probably to meet similar conditions in man's development. The use of different kinds of stone peculiar to the various regions, brought about some slight variations in style, but in the main, certain types were repeated in widely separated regions, having no apparent connections with each other. Obviously, trade points with forms of base different from those of any given locality must have exerted a strong influence, and in some cases actually brought about a change to the new forms in those areas. However, some of the traded points had bases of styles which could not be readily copied when local stones were used, which had coarser or finer grains as the case might be. Thus, variations in any given type
together with the method of flaking tends to prove a great deal concerning the age of a point. The preferred stones as found locally in this area, in the order of their importance, are: quartz, quartzite, horn stone and basalt. Points made from all other kinds of stone were probably either traded in from other localities or made here from cores of traded stone material. While it is not at all certain, it seems likely from the limited evidence at hand, that the following kinds of stone may have been brought into the valley from sources located outside of the district and at varying distances: certain kinds of felsite, true flint in various colors, red jasper, slate, chert, argillite, porphry and obsidian. When projectile points, made of any of these stones, are found in the Connecticut Valley, they may be associated with a trading economy, and might accordingly be considered to belong to an age after trade routes had been established with other parts of the country.

Obviously, the first arrivals here belonged to a simple food-gathering economy, isolated as they must have been from other localities, and were forced to use local materials exclusively for the maintenance of life. Hence, when we locate a site that seems to belong to an archaic age, because of its location like our Worwottuck focus, and find there no trade points or trade stone materials, we have a condition that suggests an early pre-trade settlement. This theory is based on our belief that this valley was discovered and settled by people who came up the Connecticut River in dugouts, and that overland contacts with other localities came later, probably after a long time had elapsed.

The third determining factor, that of form of base, should be considered only as related to the other two. As stated before, our conviction is that the same or similar kinds of base in a majority of cases, have been developed in different ages and in unrelated parts of this country as well as in foreign lands, probably to meet similar conditions in man's development. The use of different kinds of stone peculiar to the various regions, brought about some doubt, some slight variations in style, but in the main, certain types were repeated in widely separated regions, having no apparent connection with each other. Obviously, trade points with forms of base different from those of any given locality must have exerted a strong influence, and in some cases actually brought about a change to the new forms in those areas. However, some of the traded points had bases of styles which could not be readily copied when local stones were used, which had coarser or finer grains as the case might be. Thus, variations in any given type between different regions may be accounted for, and trade points distinguished from conies.

Most of the trade points which found their way into this valley had side-notched bases of different styles, and were generally made of flint. On the other hand, most of the locally chipped so-called flint points from this area were not made of flint, but were of chert, felsite or rhyolite, which was quarried from escarpments, not flaked from nodules as in the case of flint. In our collection is a small finely pressure-flaked obsidian point, side notched, peculiar to the Cahokia mounds of southern Illinois. Evidently, this point was made in the Middle West of obsidian from Wyoming or Oregon, and brought here by an aboriginal Illinois trader. We have another smaller point from the same Arazawam village site as that from which the obsidian one came, made of yellow flint. It is pressure-flaked, side notched and has a wide flare to the tangs, resembling closely Type III points from northeast Missouri. In our collection are two other points of about the same size as this, from the same site and having a similar shape but of inferior workmanship, partly percussion-flaked and appearing to be copies. One of these is of yellow trade flint, the other of local quartz.

W.J. Howes reported in the Bulletin of the Massachusetts Archaeological Society Vol. III, No.2, in connection with an article on stone tubes, that in a burial at South Hadley Falls, three side-notched broad-based triangular shaped points of flint were found, along side of two polished stone tubes. He also mentioned certain graves uncovered at Holyoke in the early days, near the railroad station, in which were found similar stone tubes, red paint and a steatite bowl. Assuming that both burials were of the same age on account of the tubes, we must conclude that side-notched points of the type just mentioned were in use at the time that steatite was being quarried and made into bowls. From extensive excavations at two local steatite quarries, recent indications are that these workings were pre-ancient, but post-ancient, probably preceding the agricultural era of this valley, or during the early stages of it. So far we have found no evidence to show that notched projectile points were used in this region during our Ancient Period.

There now remain for discussion, the projectile blades found generally in caches. These blades, usually flat and well flaked, have a base that is more or less oval in shape, resembling leaf-shaped points in this respect. However, they are quite frequently large, both in width as well as in length, and are almost never notched. About forty-five of these blades from a cache were turned up by the plow in South Hadley Falls some years ago, and are now in the possession of Mrs. Frank A. Brainard of that town. They are all made of porphry, probably from Marblehead, and
are about two inches in length with a suggestion of a round stem, but with little definition. Such cache blades as these are seldom found on the surface. It is our belief that they represent semi-finished projectile points, which were stored in caches awaiting finishing. We have accordingly, omitted them from our classification which deals only with finished points.

In order to clarify our two suggested periods and provide a better understanding of our projectile point classification, the names used by others for similar stages are listed below.

<table>
<thead>
<tr>
<th>Moorehead</th>
<th>Algonquian</th>
<th>Red Paint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willoughby</td>
<td>Algonkian</td>
<td>Pre-Algonkian</td>
</tr>
<tr>
<td>Ritchie</td>
<td>Owasco</td>
<td>Early Archaic</td>
</tr>
</tbody>
</table>

* The Boston Fishweir probably antedates Moorehead's Red Paint.

In order to provide an exact and a quick reference, we have arranged our projectile point classification in the form of a chart. The chronologic order is approximate as suggested by evidence collected to date and is subject to change. The repetition of certain shaped bases is meant to indicate, that these types are thought to have persisted from one period to the other, but probably with slight variations as to shape and flaking. It should be born in mind that our conclusions have been reached only after a careful analysis of points from over 200 camp sites in the Connecticut Valley, extending north from Agawam at the State Line to the Sugar Loafs at Sunderland. All reference numbers used are from Bullen's Projectile Blade Chart, Bulletin, Vol. IV, No. 3.

Holyoke, Massachusetts
July, 1945

**Projectile Point Classification**

**Connecticut Valley**

<table>
<thead>
<tr>
<th>KIND</th>
<th>Arrow Arrow Arrow Arrow Spear No Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE TYPE</td>
<td>Stem Bird Triangular Notched Notched Trade</td>
</tr>
<tr>
<td>TYPE FLAKING</td>
<td>Pressure Percussion Pressure Percussion Percussion Percussion Percussion</td>
</tr>
<tr>
<td>RECENT</td>
<td>30-A 11 3 33-A 21-B 3</td>
</tr>
<tr>
<td>A.D.</td>
<td>31-A 12 4 37-A 29-A 33-B 39-A</td>
</tr>
<tr>
<td>32-A 14 5 43-A 33-E 39-A 43-E 45-A Illinois Pueblo</td>
<td></td>
</tr>
<tr>
<td>32-E 16 6 45-A 45-D 47-D</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KIND</th>
<th>Arrow Arrow Arrow Arrow Spear No Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE TYPE</td>
<td>Stem Eared Triangular Triangular Leaf Stem</td>
</tr>
<tr>
<td>TYPE FLAKING</td>
<td>Percussion Percussion Percussion Percussion Percussion Percussion</td>
</tr>
<tr>
<td>ANCIENT</td>
<td>24-A No number available 2 44-A 24-E</td>
</tr>
<tr>
<td>30-A 31-E 32-E 35-E 45-A 31-E 45-C 45-D 47-D</td>
<td></td>
</tr>
</tbody>
</table>
In the Connecticut Valley of Massachusetts, there has been located what seems to have been an early Stone Age culture. This valley, which may for all practical purposes be considered to include that of the Westfield river as well, extends in and around several prehistoric volcanic deposits of almost solid trap rock formation. This basalt made excellent implements of all kinds and was used very generally by the early aborigines. Although their camps extended up and down the valley on both sides of the Connecticut River, the largest concentrations were adjacent to such fault block mountains as the Sugar Loaf, Mt. Holyoke and Mt. Nonotuck, as well as other small ridges.

Just when the first man set foot in the Valley is as yet unknown, but it is safe to say that it was probably thousands of years after the advent of Sandia and Folsom man in the Southwest. A Folsom point was found in Montague (now in the Amherst College museum) and another just over the Connecticut State line (a part of the Norris Bull collection), the lack of other specimens is evidence enough to place the Connecticut Valley settlement at a much later date. In 1942, after several years of study, Frederick Johnson of the Peabody Foundation at Phillips Academy, Andover, Massachusetts, and his collaborators, pronounced the primitive Fishweir, found buried thirty-five feet deep at Boston, Massachusetts as 3600 to 2600 years old, assigning it to estimated dates of 1700 or 700 B.C. This is the earliest date yet assigned to any evidence of human occupation in these regions. It may be reasonable to assume that if man had established himself in the Boston area at this early date, he had also navigated the principal rivers in this locality, the largest of which was the Connecticut. However, no stratified remains or other evidence that would tend to establish this fact, had been found, until the discovery of several eroded and inundated habitation sites in the Connecticut River, situated just south of the Mt. Holyoke Range.

Several years ago, while searching for new camp sites, Edward Danaczko, an enthusiastic member of the Connecticut Valley Chapter of the Massachusetts Archaeological Society, found evidence of habitation on the shore of the river near Bachelor Brook. Not satisfied with this, he decided to explore the river bed, a hundred or more feet out from the shore, using a shovel and sieve. After days of work he found several gravel bars, each of which produced innumerable artifacts of all kinds. He continued his work of sifting until he had collected a great many specimens, which were recorded according to the gravel bar from which they came.

Later on, further sifting and study was made by other members of the Chapter. After putting together all known facts and comparing the artifacts found, the evidence tended to show that at least one of these camps had been occupied in very early prehistoric days, probably before overland travel had brought regular trading between these people and distant tribes. As this site is the first of its kind in the Valley to have been discovered, its study becomes all the more important, with particular reference to its age and to the artifacts it has produced.

In analyzing the age of a camp site such as this, listed as M/18/117, that has been covered by water for almost a hundred years, it is quite obvious that much evidence of all kinds must be considered and weighed carefully, before any conclusion can be reached. For this purpose a contour map of the location has been drawn and reproduced in Figure 1.

The location to be considered contains what may have been three different camp sites, M/18/60, 117 and 148. These sites are located at the point where Bachelor Brook empties into the Connecticut River, and lie 100 to 200 feet out from shore in the river, submerged under three to eight feet of water.

The artifacts that once were left on each of these sites are today deposited in gravel bars which seem to retain their relative positions from year to year, in spite of the flow of the river currents. For convenience, these sites will be designated in relation to their location in the river bed - Inner Bar (M/18/60 and 148) which extends on both sides of Bachelor Brook, and Outer Bar (M/18/117) which is the farthest out from the present shore.

The general conclusion to be drawn about these inundated camp sites, after a study of the facts to be cited presently, in the order of their relative importance, seems to be about as follows. In early prehistoric days during the era when primitive man was exploring the shores and rivers of New England, in what may have been dug-out canoes, a group of aborigines made a settlement on the north side of...
Bachelor Brook, at a point where it flows into the river. This was before the river bank had been cut back by erosion to where it is today, and the then-existing bank was high enough to afford good drainage and protection from flood waters.

Whether the direction of migration was up or down the river is not entirely clear, but the lack of large permanent camp sites above Turners Falls might indicate that the movement was up river to these falls. However, it has been stated that the lack of artifacts assigned to the so called early Red Paint Culture, from Connecticut State sites of the lower Connecticut Valley, would lead to the theory that the migration came down the river from the north, being an expansion of early settlements in Maine.

Nevertheless, from this study and the facts already cited it seems more than likely that the primitive pioneers, exploring the shores of New England, naturally pushed up the Connecticut River, but failed to make permanent camps until they had come to falls and rapids where fish could be taken without much trouble. Since the first big rapids or falls they came to were at Holyoke, it seems reasonable to assume that here is where they settled, as well as at other falls farther up the river, such as the site at Bachelor Brook which was just below the Mt. Tom gorge, where the water was swift with falls and rapids.

A more or less permanent camp was maintained here for probably a long period of years, due to the excellent fishing which historians say existed at this time place even down to the time of building the Holyoke dam. However, the yearly spring floods gradually eroded the bank, (as shown in the cross section of the map), making it necessary for the removal of the first camp, now located at the Outer Bar, to a new location some hundred feet up the bank on higher ground, designated as the Inner Bar.

The inhabitants of this first camp appear to have used dug-out canoes, for they left a hand gouge behind. For food, they were dependent entirely upon game and fish, as they apparently knew nothing about the science of agriculture which was introduced by later cultures. At the time of their settlement there was evidently no overland trading of foreign stone materials for the making of artifacts, from far away places such as Maine, Vermont or New York State. They were obliged to use such stone as could be picked up in the immediate locality, which was suited to the making of their various implements. They used paint as did their descendants and were well skilled in the making of arrow points, on which they were so dependent for food.

In the actual making of points they appear to have used percussion-flaking, doing the final finishing with unusually small hammer stones, and may not have used pressure chipping at all. The points so far recovered, although well shaped and quite finely worked, seem to indicate percussion and not pressure-flaking. Just what the date of this settlement was is not known, but, as will be shown further on, it seems quite possible that it could have been contemporaneous with the already referred to Boston settlement.

On account of the yearly erosion of the river bank, which ultimately made a removal up the bank necessary, later cultures apparently were denied the use of this first camp site. As a result, the artifacts found on the Outer Bar may be considered to antedate those found on the Inner Bar and represent undoubtedly a pure culture.

In any study of this kind it is first advisable, if possible, to determine the geological structure of the area. It is fortunate indeed that a number of years ago Professor B.K. Emerson, of Amherst College, made an extensive study and report on the geology of the Connecticut Valley, and in his report a full description of conditions was made of the very area of this study. Specifically the area extends south from Dry Brook or Cook's Hill on the east bank of the Connecticut River, across Bachelor Brook and half way farther on to Stony Brook. It also includes the area from the...
flood bank on the Great River, some one or two hundred feet out toward the river channel along this entire distance. Professor Emerson's report stated, that as seemed most apparent, in the break-up of the ice pack, following the Ice Age, the large lake that then existed north of the Mt. Holyoke Range, first broke through at the east end of the range. The large body of water that rushed forth followed the valley toward what is now the Connecticut River, between Mt. Holyoke and another lesser mountain to the south. The center of this wash was about where Bachelor Brook flows today and it is likely that the valley followed by this brook results from this flow of Ice Age water. The tremendous surge of the on-rushing water, brought with it silt and pebbles, the latter being cast off at intervals to form drumlins or long narrow hills. Dry Brook Hill is the largest of these drumlins and is formed entirely of small and large pebbles. Directly south of it and for some distance down stream, silt in the form of clay was deposited, thus forming a more compact subsoil with a great deal more resistance to erosion than that of the gravel drumlin to the north. This geological difference was partly explained by Emerson, Dry Brook Hill is a drumlin made entirely of gravel, whereas the area below Bachelor Brook was a subsoil of clay. These two conditions have no doubt been the north side of Bachelor Brook than on the south, and these facts should be kept clearly in mind in order to better understand the statements which follow.

The present river level at this point is entirely dependent on the Holyoke Dam, built in 1849, which backed up the water to such a height as to flood all low areas, which formally had been dry except during the spring floods. The normal river level at Bachelor Brook, when the water is just flowing over the top of the dam, is about four feet over the Inner Bar and eight feet over the Outer Bar. The Flood Bank, just beyond the present water's edge is perhaps ten to twelve feet high and in some places has very large trees growing on it. These trees probably will collectively be fifty or sixty years old and are to be found on the south side of Bachelor Brook. In a few cases a root here or there is exposed, but, for the most part, the erosion, so far has not washed them away.

In order to better understand the condition of this location before the Holyoke Dam was built the author consulted the late Tom O'Niel of Mt. Tom, where he had lived his life of well over a hundred years. In spite of his age he had a keen memory and recounted how when he was a boy, they would take a boat and row down the Great River to the mouth of Bachelor Brook to go fishing. Here after mooring the boat, they would fish up the brook, which in those days had rapids all the way down to the river channel. On both sides of the brook was low swamp land covered with scrub bushes and a few small saplings here and there. Every year in the spring, according to Mr. O'Niel, the river would flood this low land back to the high flood bank, some several hundred feet from the river channel. He stated that the flood bank in those days was in practically the same place as it is today, except that it appeared a little rougher and sloped off a little more than now. According to this clear account of conditions at Bachelor Brook nearly one hundred years ago by an eye witness, it appears that the effect of flood erosion had cut back the flood bank only a little during this time. For a further study of this fact in our discussion it should be remembered that this slight erosion referred to, was at the mouth of Bachelor Brook, extending up and down the Great River a matter of a few hundred feet.

In discussing this river erosion, several important factors should be carefully considered; direction of flood current, formation of sub-soil, frequency of flood water and finally, historical landmarks that may be used to measure relative distances of change on the river bank. By reference to the contour map, the direction of the flood current will be noted. As a result of a bend in the river above Dry Brook Hill, the current moves against the hill and then just above Bachelor Brook swings out across the river again with a back current or eddy below the brook. As a result there is more of a tendency of bank erosion above Bachelor Brook, than there is below. As has been shown by the geological report of Professor Emerson, Dry Brook Hill is a drumlin made up entirely of gravel, whereas the area below Bachelor Brook has a subsoil of clay. These two conditions have no doubt been largely responsible for the presence of considerable erosion under Dry Brook Hill and the apparent lack of it below Bachelor Brook.

Again referring to the contour map, it will be remembered that Tom O'Neill's description of the condition of this area nearly one hundred years ago, before the Holyoke dam raised the level of the river nearly one hundred feet out toward the river channel, showed that the bank had been eroded in past centuries, from the channel to practically its present location. Furthermore, that the normal level of the river a century ago was below the low swamp land lying between the channel and the flood bank, a distance of some three or four hundred feet. Therefore, it follows that the erosion which made the low swamp land on both sides of Bachelor Brook, and cut back the flood bank to its present position, must have taken place at periods of high water. Usually there is a flood every spring and occasionally in the fall, having a smooth flow of water past this mouth with a speed of about five to eight miles an hour. This, together with the action of the ice in the spring, are the principal natural forces that have caused the erosion.

An interesting historical landmark is the old Cook's Hill Road, named after Dry Brook Hill, which was then called Cook's
Hill. R.O. Dwight, at the sesqui-centennial anniversary celebration of South Hadley in 1903, refers to this road as follows:

"In March 1827 the Commissioners of Highways, laid out a road from the Rook Ferry road, near the southerly end of Mt. Holyoke, along the eastern bank of the Connc. River, under Cook's Hill and crossing Bachelor Brook to a point north of Stoney Brook, where Lyman's Ferry was located. This road was constructed after a fashion. In June 1833 the Cook's Hill road was discontinued without objection" (probably on account of erosion under Cook's Hill). "In October, 1839 the old Cook's Hill road was relocated and altered", (probably moved higher up the hill to avoid erosion, which had partially destroyed the old road). "The next year 1840 came the great Harrison flood which undermined and washed away a large part of the new highway. By 1847 the Cook's Hill road was completely discontinued and abandoned." (R.O. Dwight, Sesqui-Centennial Anniversary Celebration of South Hadley, 1904.)

Today the bridge heads may be seen where this old road crossed Bachelor Brook. This spot is about 100 feet up from the mouth of the brook and indicates that the erosion, which destroyed the road, was up the river under Cook's Hill and not at or below the brook. Therefore it may follow that although there evidently was enough erosion during the past century to wash away the river road under Cook's Hill, this was not the case, slightly north and south of Bachelor Brook, where the erosion during this period now appears to have been quite negligible, for the several reasons already cited.

Another historical event of interest bearing on this matter concerns the Indian encampment, now designated as M/18/7. This site is today located as shown on the contour map, and is on the high bank of the river above flood water. A part of the site extends up a high knoll and, from artifacts recovered, present indications are that a considerable concentration existed at this point. During the early settlement of Hadley, in 1659, the Norwottuck Indians lived here. Sophie Eastman in her history of South Hadley states:

"In summer a favorite ground of the Indians was a little above Smith's Ferry, between the two points of junction, where Stony Brook and Bachelor's River, as it was then called, flow into the Connecticut. These Indians were called the Norwottucks." (Sophie Eastman, History of South Hadley)

Both Eastman and R.O. Dwight in 1903 make reference to the enclosure of these Indians in 1676, probably from this site, which placed the last occupancy of this camp during King Philip's war. R.O. Dwight states:

"On Friday, August 11, 1675 the last remnant of the Hadley Indians, numbering fifty or sixty warriors and a hundred women besides children, crossed the Connc. River on rafts at the foot of the great falls in Hadley." [Probably a little above the present Holyoke dam]. They fled by the ponds to the southwest and, circling Westfield, pushed on towards the ford of the Housatonic River.

From this it appears that as late as the seventeenth century the Indians camped on the site which is today known as M/18/7. This might indicate that they chose this location because it was high ground, above flood water, in preference to the low swamp land which probably existed then as in 1827, between the river channel and the high flood bank. This concludes a historical research with evidence to show that for a period of almost three hundred years, the river flood bank at the mouth of Bachelor Brook has probably remained approximately in the same location, having been cut back but a little by only a relatively small amount of erosion.

As a result of this conclusion it would seem quite likely, that the people who occupied the three camp sites, inundated today as a result of the raising of the river level by the Holyoke dam, belonged to a prehistoric race, who lived there before the location was eroded and while it was still above flood water. What kind of people these primitives were may be judged to some extent by the artifacts found on the Outer and Inner Gravel Bars. Also as the postulation of a retreat up bank from river erosion, seems well grounded in the light of this study, it should follow that any artifacts from the Outer Bar should be older than those from the Inner Bar and may represent a pure culture of the earliest settlement period. This will become more apparent, after a review of certain artifact recovery experiences that follow.

Generally it was found that the large implements, fire stones, cores, etc., lay on the top of the gravel bars and the arrow points and smaller artifacts had settled down between them. Evidently the heavier pieces, less affected by ice and flood water movements, had gradually settled as the light soil was eroded from around them, and had caught and kept the smaller artifacts from washing away. To show the relative resistance of large artifacts against the wash of spring floods a recent experience is here recounted. While searching the Inner Bar, at a time when part of it was exposed by low water, the lower half of a well-made basalt pestle was found, lying only about fifteen feet away, was the upper half, picked up ten minutes later. Apparently the fracture had occurred many years before, as the fractured surfaces were discolored as badly as all other parts. Furthermore, each half had been subjected to different conditions as one was discolored with a
green fungus, the other with a black. However, although both halves had been separated for perhaps a very long time, they were only fifteen feet apart. This might suggest the ineffectiveness of floodcurrents on the larger artifacts in moving them about to any great extent and might tend to show, that the artifacts of the Outer Bar have not become mixed with those of the Inner, because of the hundred feet or more that separate them. If this is so, then the artifacts from the Outer Bar become of value in being confined to the earlier settlement and probably represent a purer culture, as a result of a shorter occupancy than that of the Inner Bar.

Sites M/18/60 and 148 on either side of Bachelor Brook constitute the Inner Bar and so far have given up a great variety of artifacts, showing to a considerable extent a probable mixture of an early hunting culture with a later agricultural one, thus indicating a long period of occupancy. About twenty-five years ago, a collector by the name of John Gordon did some sifting on this same Inner Bar, below Bachelor Brook. He washed out eight well made arrow points from a four square yard area. He states:

"Nearly all the relics I find on this bar are of quartz. I sent a quantity of unfinished implements and quartz chippings from here to the Smithsonian Institute and they pronounced this gravel bar the site of a prehistoric workshop."

It is quite likely that this Inner Bar may have been the outskirts of the first camp on the Outer Bar and so would have artifacts as used by the earliest settlers, as well as those used by the later occupants, who followed the removal from the first camp. The artifacts recovered from the Inner Bar may be studied by referring to the Summary table. Also, those artifacts taken from the final retreat of historical camp site M/18/7 may be reviewed. Whereas on the latter are found different kinds of colored flint from which points were made, on the former is found mostly black flint, with only one or two instances of jasper and a dark gray flint appearing. As there are no known flint or jasper deposits in the Connecticut Valley area, the presence of a small amount of this material might indicate a limited contact and trading of local products with distant tribes of other localities by the people of this prehistoric camp.

Now compare these findings with those artifacts found on the Outer Bar as appearing in the table, and there will be noted a marked difference in several respects. For instance, the gouge is one that was evidently held in the hand, whereas the other gouges from the Inner Bar had grooves and were probably hafted. The presence of many small hammer stones from the outer site suggests an emphasis on percussion-flaking. The absence of any notched points and the presence of quartz projectile points with no flint points or chips is also significant. These points all seem to have been made by percussion-flaking and all told have been recovered from this outer site about twelve trianguloids, and twenty-five stem points, all of quartz or quartzite probably flaked from cobbles, presumably taken from the river bed. The absence of trade material, such as flint and other foreign stones, might give rise to the postulation that at this early date no overland trails had been established, which might further suggest that these primitive explorers came by water. The stem points, quite generally had heavy shanks; some with sharp-edged bases, and others with bases left rough and flat. Although the search still goes on, hampered only by the inability to work except at times of extremely low water, which are few, enough specimens have been found to suggest at least the existence on Site M/18/117 of what seems to have been an early primitive pre-agricultural culture.

To try to estimate the age of the settlement, in spite of all the evidence so far presented, obviously can be no more than a guess. However, by considering merely a hypothetical case, it may be readily seen, that the settlement represented by the site on the Outer Gravel Bar, might have been one of the first in the opening up of this valley to occupation. Let it be assumed that the average rate of bank erosion during the span of years has been five feet every one hundred years. With this as a premise and the space to the site from the present flood bank, a distance of about two hundred feet it is possible to compute an age of 4000 years. This would make the settlement more or less contemporary with that of the Fishweir at Boston, to which an age of 3600 years has been attributed by Knox. (2)

Summary

The foregoing data, when analyzed with respect to the chronological status of the prehistoric cultures, which occupied the area between Bachelor and Stony brooks — according to Judd's History of Hadley, the Norwottucks called these streams Sankwont and Moquomp — seems to suggest a series of...
The earliest aboriginal arrivals came by water in dugouts, apparently in search of good fishing grounds. One group, locating on the east bank of the Connecticut River at Bachelor brook, lived there for a long period of time, until the river had eroded the bank to such an extent as to make it necessary for them to remove their camp up the bank to higher ground. Today, these site locations are marked by submerged gravel bars with an outer and an inner location. Hundreds of years later, the river's continuous erosion had removed the existing bank to such an extent that the camp was again threatened. It was then moved to higher ground, which today still remains above flood water. Here are found the remains of numerous Norwottuck Indian camp sites, which were there in historical days, as reported by several early commentators.

In the long transitional period, from the aboriginal pioneers to the known occupation by the historical Norwottuck branch or tribe, there are manifest three archaeological stages. Today, evidence of the first two of these is found in the submerged gravel bars, while the third is on high ground above the flood water of the Connecticut River. While probably, the people who lived here during this span of years were not all of the same branch, there was undoubtedly less diffusion of foreign traits from outside visiting nomadic bands, who came yearly to the Great Falls at Holyoke to fish. Their camp sites may be found scattered throughout the area about the falls, but probably did not extend as far north as the Norwottuck habitation site, some six miles up the river.

Therefore, we have called the cultures of the people that lived at this site, the Norwottuck Aspect, and have divided them into three periods: Stages I, II and III. The first stage probably belongs to what we have termed the Ancient Period B.C., while the last two stages would fall in our Recent Period A.D. The artifacts from these three stages are similar to material from other sites in the Connecticut Valley, but differ in that due to natural causes, they are divided into groups with well defined chronological implications. With the lack of stratified remains in any part of the valley to date, this curious but convincing Norwottuck complex presents the best opportunity for the classification of artifacts in the Connecticut Valley of Massachusetts. Therefore, the following chart, tabulating the different artifacts recovered from the locations of the three stages, may have significance in suggesting the probable chronological order of their manufacture and use.

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**THE NORTWOTUCK COMPLEX**

**Norwottuck Aspect**

Connecticut Valley of Massachusetts

A list of artifacts recovered.

**Stage I Outer Bar — Ancient B.C.**

**PROJECTILE POINTS:** percussion flaked; quartz, quartzite, Arrow Point Styles: thick stem round stem; triangular, equilateral and small. Spear Point Styles: rounded stem; triangular elongated.

**ADZ BLADE:** Basalt, for hand use, not hafted.

**PAINT CUP:** Sandstone pebble — pecked excavation, smoothed.

**HAMMER STONES:** quartz and quartzite, diameter 1-3 inches, many small ones.

**Stage II Inner Bar — Recent A.D.**

**PROJECTILE POINTS:** percussion and pressure flaked — quartz, quartzite, black and gray flint, jasper. Arrow Point Styles: stem (all styles); triangular elongated, small and large, one with serrated edges; side notched, straight base.

**DRILLS:** black flint — wide base, long and slender with taper.

**SKIN SCRAPERS:** Black flint, quartzite — notched for hafting.

**SINEW POLISHER:** Quartzite, Basalt, flaked quartz, polished and smoothed.

**PROJECTILE ARROW POINTS:** Basalt, small polished blade, flat. ADZ BLADES: Basalt, humpbacked and straight hafted.

**WHET STONES:** Coated schist.

**WAR CLUB PROPS:** Quartz — PXANT CUP: Conglomerate pebble, matrix excavation.

**SINEW POLISHER:** Quartzite pebble

**STEATITE DISH SHERD:** Source unknown

**ABRADING STEATITE SCRAPER:** Quartzite, triangular, hafted.

**PICKS:** Basalt, flaked quartzite cobble

**POTTERY SHERD --- PEDESTAL:** Basalt --- Wood scraper: convex

**HAMMER STONES:** Quartz, quartzite, large and small

**Stage III Above flood level — Recent A.D.**

**PROJECTILE POINTS:** percussion and pressure flaked — Quartz, quartzite, flint (all colors), jasper, shale, felsite and chert. Arrow Point Styles: Stem (All styles); triangular, small and large; side notched (all styles), bird points; double notched trade point.

**ARROW SHAFT SMOOTHER:** Sand stone slab, grooved.

**KNIVES:** Basalt, quartzite, quartz and flint, small and large — FULL GROOVED AX

**GROOVELESS AX:** Basalt, completely polished.

**PAINT CUP:** Westfield steatite, abraded excavation.

**WHET STONES:** Coated schist

**STEATITE SHRED:** Westfield steatite

**PICKS:** Basalt — TRIANGULAR HOE

**POTTERY SHERDS --- PEDESTAL:** Basalt --- HAMMER STONES: Quartzite, quartz, large and small SIDE-NOTCHED KNIFE: Felsite.

Holyoke, Massachusetts September, 1945
MOTIFS OF CERAMIC DESIGN IN MASSACHUSETTS:  
A PROPOSED PLAN OF RESEARCH  
William S. Fowler

Studies of the ceramics of primitive peoples have been productive of information on sequence of cultures, as well as on culture influences and growth. Little is known regarding aboriginal ceramics in New England, despite individual studies carried on at different times and places. No attempt has been made to gauge direction or force of the flow of cultural influences nor has it been determined whether sequences within New England parallel already-established sequences in New York and New Jersey.

Research on decorative motifs embodied in designs on perfect and fragmentary pots, as well as on sherds may supply new data concerning the Indians of New England. In order to be of use in this study, a decorated sherd must be at least large enough to preserve a complete motif, as well as enough of the design to warrant reconstruction of repeated elements without drawing on imagination. In order to secure as many motifs as possible it will be necessary to draw not only on the rare complete vessels, but also on the many stray sherds picked up in various localities.

The extent of variation in ceramic design has not been estimated. So far about 30 different motifs from the Connecticut Valley have been classified, and more are to be contributed from local museums. It is interesting to note that at Trenton Dr. Dorothy Gross has recorded over 80 vessel motifs and about 20 edge filigrees.

As an example of the way in which this research may supply cultural and chronological data we cite Connecticut Valley exhibit D-8, a dentate motif from M/29/83. Except for minor variations this is identical with Owasco Aspect motif #5 from the Castle Creek focus of New York state. A recurrence of this motif in Massachusetts might serve to suggest a correlation with the Owasco Aspect, thus probably antedating those motifs traceable to Iroquoian inspiration.

It is thought by some, that the Indians of this region used inferior ceramic decorative motifs prior to the invasions of the area by the Mohawk Iroquois at about 1600 A.D. However others find it improbable that the growth and elaboration of designs either imported or inspired by the Mohawk Iroquois could have taken place within the fifty years intervening between their incursions into the area and the dominance of the colonists.

It has not yet been determined whether the sequence of decorative techniques — cord-wrapped, paddle net, dentate, punctate and incised — a sequence determined for adjacent regions, holds true for the ceramic industry of Massachusetts. In order to furnish data for a study of such traits the following plan has been tried out in the Connecticut Valley; with the approval of the Research Council, it is proposed that it be extended as a state-wide survey.

It is proposed to illustrate ceramic design motifs in ink within a frame 2x3 in the center of a 4x6 card.
1) Within the frame place sherd with sufficient design to permit a repeat by projecting its lines.
2) With pencil, outline the sherd, and then the design. Then project the broken lines to produce a repeat of the design motif and continue until the frame is full. When design is taken from a pot or large sherd it will fill space without projection.
3) With black ink, use medium lines to indicate sherd outline, heavy lines for motif within sherd, and medium lines for projected repeat outside sherd. This will restore motif to original repeat and show the way in which it was developed.
4) Note site, location and owner of sherd.
5) If a collection of design motifs is made in this way, classify motifs as to technique, i.e. cord-wrapped, paddle net, dentate, punctate or incised. Numbering is recommended, using the capital initial letter of the classified group before the number.
6) If several sherds of a similar motif appear, illustrate only one but note on the card other sources.

Mail all material to William S. Fowler 118 Central Park Drive, Holyoke, Mass. He will be glad to do all the work of project- ing and inking in designs if pencil copies of sherds are sent him. If preferred, sherds may be sent; they will be returned to the owner as soon as the work of transferring is completed. Please include decorated steatite sherds. Photostatic copies of the ceramic classification of the Connecticut Valley Chapter, to date, may be had for 70¢ each — size 8½ x 11.

D-5: Dentate
M-29/18
So. Hadley Falls
W.J. Howes

D-6: Dentate
So. Windsor, Conn.
W.J. Howes