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BULL BROOK: A PALEO COMPLEX SITE
WILLIAM S. FOWLER ........................................... 1

THE CATTAIL CREEK FLUTING TRADITION
FLOYD PAINTER .................................................. 6

POSSIBLE PALEO-INDIAN MIGRATION ROUTES IN THE NORTHEAST
HAROLD W. BORNS, JR ............................................. 13

PROJECTILE IMPORTS: HOW TO RECOGNIZE THEM
WILLIAM S. FOWLER ........................................... 16

SEAVER FARM SALVAGE EXCAVATION
WILLIAM B. TAYLOR ............................................. 24

RESTORING ARTIFACTS
WILLIAM S. FOWLER ........................................... 29
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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 Assawompsett 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.
BULL BROOK: A PALEO COMPLEX SITE

WILLIAM S. FOWLER

Several reports followed one by William C. Eldridge and Joseph Vaccaro in 1952, published in the Society Bulletin, Vol.13, #4, describing their discovery and excavation of this Fluted point site. The subsequent site reports were by Douglas S. Byers, two of which appeared in the Society Bulletin, Vol.18, #3, and Vol.20, #3.

The purpose of this paper is to review recoveries made at the site for the enlightenment of those not acquainted with this outstanding example of a Paleo occupation in New England. Since the earlier writings on the subject, hundreds of new members have been added to the Society's membership to whom Bull Brook is only a name. Because of this, the writer believes this an opportune time to describe the site firsthand, as a result of his experience assisting in its excavation on two separate occasions. This occurred in 1953 or 4, some time after much work had been done excavating the area by the discoverers, assisted by Nicola, Frank, and Tony Vaccaro, and several others as time went by.

It all started in the spring of 1951 near Ipswich, Massachusetts by recovery of a Fluted point of flint, which had been brought up to the surface by a bulldozer; the site was in the process of being destroyed by sand-removal operations. Not knowing where to dig at first, it was hit-or-miss work with not much luck resulting. Then rain came to dampen initial ardor, necessitating erection of a tarpaulin shelter on the inside edge of the field. With work stalled momentarily, one of the group suggested digging there under cover and out of the rain. Soon, to their utter amazement, a perfect Fluted point was recovered from a low level. Now excitement reigned, and the hunt for further evidence of early man was on.

The site lies on the northern edge of the township of Ipswich, about 3 miles inland from the ocean as the crow flies, at the edge of a tidewater salt marsh, and on a high sand plateau about 40 feet above sea level. This sandy elevation reaches northerly to the next town of Rowley, and about half way between, Bull Brook has cut a channel, through which it flows into the marsh and thence to the sea. At the base of the elevation, directly below the site and above tidewater is an active spring, evidently a feature that made this an attractive camping place over an extended period of time. Beyond this, what has taken place here over the 9,300 years — as will be shown by radiocarbon dating — that separates it from the present can only be surmised. However, a Clark University geologic study made of the area at the time of the discovery calls attention to the probability that the land rose considerably during the first several millennia, after retreat of the glacial ice pack that formerly covered the area — land at the mouth of the St. Lawrence River is still rising. Therefore, it is conceivable that at the time of the Paleo occupation this sandy plateau was somewhat lower than as of now. Also, with the lower sea level of those days, canoe travel up Bull Brook would doubtless have been above tidewater as the site was approached. Over the years that followed a foot or more of sand has been laid down by wind or water action covering the Paleo remains.

When the writer arrived on the scene at the invitation of Joseph Vaccaro, three years of excavation had explored much of the area not disturbed by sand removal operations. However, an untouched extensive area still remained toward the bluff’s edge reaching northerly through a light growth of white birch, oak, and poplar. Here, work was continued in which the writer participated. And although he was not one of those lucky enough to make a find, he did witness several recoveries of the Paleo complex in situ, of which two were photographed and now have been illustrated.

THE SITE AND ITS PALEO REMAINS

The site had loam cover to a depth of 6 or 8", which evidently had been cultivated at some time in the past. It contained occasional artifacts left by later culture occupations, including some items of the colonial period. Below it occurred an even sand deposit, which, at a depth of 10 to 15" below loam, changed to a coarser sand accumulation that appeared more stabilized. It gave one the impression of being somewhat hard packed, and it was here that the Paleo remains were found. Some artifacts appeared scattered here or there, while many were recovered from workshop areas of from 3 to 5 feet in diameter. At these spots flakes were present of the flint materials then in use. They commenced to appear at about 10" below loam, and continued down 5 or 6" into the firmly packed layer of sand. The writer witnessed excavation at this low level of one of these workshops, of which many finally were uncovered. The flakes in this case were not large, perhaps because only a small artifact was involved. It was a flint Stem scraper,
which suddenly showed up among the chips, and gave the impression of having just been made. It is shown being uncovered in the accompanying illustration (Fig. 1).

A short way removed from this feature another artifact was discovered. Obviously, it was related, occurring as it did at a similar low level, and being made of the same exotic flint as that of the workshop chips — flint has no known outcrops in New England. It proved to be a relatively long blade, well-worked all around. Thick stock was left at one end for a handle, while the opposite end was thinned to a point. The long edge of the blade was slightly concave with serrated chipping to form what appeared to be a formidable knife. Illustration of its recovery seems of interest (Fig. 2).

During the two days spent by the writer at the site another find was made of a flint Stem scraper, much the same as that from the workshop, but unfortunately no Fluted point appeared. However, during the many years of work spent at the site there have now been recovered well over 100 perfect or near-perfect Fluted points, all of flint. Following are descriptions of some of these points and various flint tools of the Paleo complex recovered in close association with them; representative specimens have been illustrated (Fig. 3, #1-28.)

**Fluted Point** (Exhibits #1-15). Fluted projectiles at this site range from 1" to 3¾" in length, and have relatively broad parallel-sided, concave bases, with only a suggestion of ears in a few instances. Basal sides are often ground, while pointed ends invariably taper; are not stubby except when reworked from a broken tip (Exhibit #14). Partly finished specimens and broken sections show the fluted technique to have followed a certain procedure. First, the base of a roughed-out form was chipped so as to produce a straight beveled striking platform. Then, two chips were removed both sides of its center, thereby forming a small projecting nipple — Exhibit #14 shows remains of the nipple. Next, an indirect percussion stroke — using a bone or other suitable tool placed against the nipple to receive the blow — was made with a hammerstone, thus driving off a long flake on one face of the point to form a flute. This process was then repeated in reverse, producing a flute on the opposite face. The length of flute in either case depended upon the quality of flint material being used; an unwanted fault in the stone would tend to prevent formation of a long flute (Exhibit #9). Finally, the preliminary form was pressure-flaked into the finished shape desired. The color of the flint stock of each illustrated point appears below the drawings, to

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**Fig. 1. A WORKSHOP AREA, Bull Brook Site. Flint chips and Stem Scraper appearing.**

**Fig. 2. FLINT PALEO KNIFE RECOVERY, Bull Brook Site.**
Fig. 3. FLINT IMPLEMENTS, Bull Brook Site. 1-15, Fluted Points; 16, Side Scraper; 17-20, Twist Drills; 21, 22, Stem Scrapers; 23, Woodworking Notcher; 24, Paleo Knife; 25-28, Gravers.
furnish some idea of the various kinds of flint that were used. Probably, most are from Hudson and Mohawk Valley deposits, while a few, such as the maroon flint items, may have been derived from outcrops elsewhere.

**Stem Scraper** (Exhibits #21,22). This tool, of which many were recovered, is quite similar to the scraper of the same name in use by all later cultures. Actually, it is an end scraper of small to medium size that has an extension of the blade at one end to form a stem. However, its snub nose scraping bit tends to be less convex than those of later ages. Its shank indicates that the tool may have been hafted, although it might simply have been held in the fingers depending upon the nature of the scraping job.

**Twist Drill** (Exhibits #17-20). Identified with this site alone, 5 or more of this unique perforator were recovered. They consist of a worked narrow stem, usually 3 sided, varying from about \( \frac{3}{8} \) to \( \frac{5}{8} \) in diameter, and from 1 to 1\( \frac{3}{4} \)" in length. The bit has a blunt-ended cutting edge, similar to its modern counterpart. Obviously, this tool must have been hafted before it could have been used.

**Graver** (Exhibits #25-28). Made from a large flint flake, this implement has at least one edge chipped so as to produce a sharp projecting point — sometimes 2 or more points are present. A suggested use for this tool, of which many were recovered, may have been that of cutting designs or pictographs in bone or wood, although, as of now, no supporting evidence has appeared in the Northeast to verify it.

**Side Scraper** (Exhibit #16). A number of blades were recovered in this category. They are made from relatively long sturdy flint pieces that have their long edges beveled for scraping, casually flaked.

**Notcher** (Exhibit #23). This woodworking tool — identified as such with later cultures — seems to be represented by several relatively broad flat-faced flint forms. They have one long edge chipped to form a neatly worked straight edge, apparently intentionally regimented. The chip scars along the edge appear evenly made in such a way as to provide a cutting tool when used like a saw. Although these blades have been called broad side scrapers by some, because of their tendency to display beveled edges, they seem too expertly shaped and serrated for scrapers, and are here considered as wood-cutting tools. Hafting of projectile points and knives at this site must have been, as with all later cultures an important function. Such a tool as a Notcher would have been required, it would seem, to notch the end of shaft or handle to receive the blade being hafted. Overlooking this essential woodworking operation, previously, when names were assigned to the various kinds of recovered blades at Bull Brook, seems to this writer to have been shortsighted.

**Paleo Knife** (Exhibit #24). Large knives like the several found at this site must have been as essential in hunting as spears; probably were treasured and carefully preserved. This may account for recovery of only several blades that seem to qualify for inclusion in this category. Certainly, the one uncovered while the writer was present, as previously described, is a fine example of a Paleo hunting knife; the only one to be illustrated. As may be seen, it is about 5" long, and has a well-chipped cutting edge, which together with a slightly incurvate blade would have made this a useful tool for a hunter.

**Radiocarbon Date.** A significant evaluation made at Bull Brook consisted of a Carbon-14 measure of a charcoal sample taken from an open hearth, appearing at the Paleo level. The sample was obtained by W. C. Eldridge in September, 1957, and was processed at the University of Michigan, M-807. It yielded a date of 9,300 ± 400 years ago. Among several other charcoal samples taken from other sources at the site, this one from the hearth is accepted as the most reliable. This well-established early date indicates that by this time, at least, and possibly somewhat earlier, the first Fluted point hunters had arrived in New England.

**CONCLUSION**

The thing that makes Bull Brook worthy of note is not only the varied assortment of flint tools, but the large quantity of Fluted points that were recovered. Still another thing of note is the impressive number of workshops, some 15 or 20 in number, spread around the site. These features are more numerous than at any other Paleo site in the Northeast. This may mean a longer period of occupancy, not all at one time, but as a result of an accumulation of individual sojourns, representing temporary stopovers, in which hunters continued to return to the site during summer months. The probability is that the summer season was short with ice returning early to drive the Paleo hunters and their game south to warmer climes. What they hunted can only be guessed at, as no kill site of those days has been discovered in this eastern hemisphere. Whether the animals hunted were mastodons, giant caribou, or smaller animals, one thing is clear, they were hunted with spears tipped with large Fluted points; bows and arrows arrived much later with the Late Archaics.
Bull Brook points cannot be said to have shapes that follow exactly the fluted Clovis or Folsom type. Instead, they probably should be considered as representing an eastern development of the Fluted point, in which the fluting skill appears to have been well-advanced. They show some signs of relationship to Fluted point recoveries at the Williamson site in Virginia and the Shoop site in Pennsylvania. Bull Brook points, unlike many Clovis points from the West, consistently have long flutes signifying skillful workmanship; the art of fluting apparently had persisted over about 3 millennia. While the site's radiocarbon date is significant in placing the Paleo occupation of this New England region in point of time, it may not be the earliest evidence of man in the Northeast. For Byers reports a radiocarbon date of about 10,600 years ago for site Debert in Nova Scotia, where Fluted points were recovered. This evidence may represent an earlier movement of Paleo hunters, who pushed north as far as Nova Scotia, moving up the coast along the Continental Shelf then exposed as a part of the mainland, the result of a lower sea level. However, as radiocarbon dates represent only one moment in time, there could well have been an earlier period at Bull Brook when the site was first occupied — the measured charcoal sample might have been associated with a later Paleo occupation.

Whatever the exact age may have been, the many different kinds of flint exhibited by Bull Brook points suggests that their owners were highly nomadic. Evidently, they had journeyed from, or through other regions where flint deposits were available, including the Hudson and Mohawk valleys, to judge from the various colored flints used for their projectiles. For instance, apple-green gray suggests Deepkill flint from Coxsackie on the Hudson, light blush-gray should be Littlefalls flint from the Mohawk, and dull and semi-gloss blacks probably are Helderberg flint from deposits near Catskill. While many of these points doubtless were made elsewhere and were brought in by the hunters on their summer treks to this area, some were made at the site from imported flint stock; many points, including semifinished blanks in various stages of development were recovered from the site's workshops, indicating on-the-spot manufacture. As no points were made of local stone materials, we should think of Bull Brook hunters as coming from flint producing areas with acquired skill in the use of this preferred stone.

How they lived at the site while carrying on their hunting activities can only be surmised. Evidently, they were little concerned with activities requiring stone hearths, for they were nonexistent. However, they did have open hearths, as is indicated by the one from which the charcoal sample was taken for the radiocarbon measure. As for their abodes, nothing is known about them, and logical reason alone must be depended upon for the answer as to what they may have looked like. We can envision rude brush shelters made from small growth found in the surrounding tundra, for there is no proof that forests had arrived at this early date. It seems probable that their huts were placed nearby the various workshops, since such activity formed a part of the framework of family living about the abode. The large number of these living areas, as indicated by the workshops, may represent repeated occupancy of the site during the summer hunting season by small groups spread over many years of Fluted point cultural existence, as previously suggested. Apparently the site had advantages that continued to attract Paleo hunters, who probably arrived by water in dugouts, paddling up Bull Brook to the sandy plateau. This form of travel would appear to have been preferable to overland movement, since a canoe will carry heavy equipment including flint stock — a necessary accouterment for hunting requirements — much easier than on one's back. Also, land travel, it would seem, would have been unfavorable as the travelers would have been confronted with finding the means for crossing wide rivers in a move up the New England coast. And, since Bull Brook site is on a navigable stream a short paddle in from the sea, it seems more than likely that its hunter occupants reached it by canoe.

As the search for Paleo sites in New England goes on, recoveries are made here and there of flint Fluted points and related implements. At Assawompsett Lake on Wapanucket 8 significant finds of this early complex have occurred, consisting of Fluted points, Gravers, Stem scrapers, and Flake knives, all of marine flint. Numerous small flint flakes including striking platforms resulting from the act of fluting were present in close association, indicating resident group activity. The center of a Paleo occupation is still being sought at this site, where further recoveries are anticipated.

Still other finds including Fluted points have been reported recently in the Plymouth area, which suggests Paleo presence on coastal sites may be expected. However, this is not the only area in New England with evidence of Paleo occupation. The writer, while sorting over an early collection of local Deerfield recoveries of stone artifacts and placing on display a quantity of them in the Indian Room at the Memorial Hall Museum, Deerfield, Massachusetts, discovered two Fluted points. One is of black flint the other of white
chrystaline quartz, both reportedly found in the Deerfield area. Another well-shaped Fluted point of dark gray felsite was recovered some years ago in a nearby field in Montague. The point is now owned by Amherst College. While these appear as strays, they indicate the probable presence of Paleo hunters in the Connecticut Valley, implying canoe travel up the river.

Bronson Museum,
April 11, 1971

THE CATTAIL CREEK FLUTING TRADITION
AND ITS COMPLEX-DETERMINING LITHIC DEBRIS

FLOYD PAINTER

This report deals with the technique of removing flutes or channel flakes from Clovis-like projectile point preforms, as practiced at the Williamson Paleo-Indian Workshop site on Little Cattail Creek, Dinwiddie County, Virginia.

The technique at this site differs greatly from methods suggested by scholars in past studies regarding other proposed fluting techniques. It is unique also in that technology and tradition can easily be identified by lithic debris alone. The author believes the Cattail Creek Fluting Tradition was the basic technology employed by Clovis Man in this and all other areas of the Continent where his lithic remains are found. The study does not include manufacturing techniques used on later variants, such as Cumberland, Folsom, and Holcombe points.

INTRODUCTION

Since discovery of Folsom fluted points in 1926, virtually every scholar of Paleo lithic material has tried his hand at describing the method or methods employed in detaching flutes from the various Paleo-Indian projectile points. Unfortunately, most of these studies were made by persons familiar with completed fluted points only, and these in a very limited quantity. The results of relatively few such studies received a wide circulation or a wide acceptance.

Deductions based upon completed fluted projectile points have little value, since much of the technical evidence concerning the fluting process has been obliterated by the final basal retouching and deepening. Obviously one needs to examine a series of unfinished points, ranging from crude preforms to nearly completed specimens, to arrive at a definite conclusion. This ideal study-collection must, of course, derive form the same site, complex, and tradition.

The writer has been privileged, for he has been able to study the well-known Williamson Paleo-Indian Workshop site for the past several years. This site is in fact the center of Paleo Man’s greatest activity as yet found in North America. It produces in great quantity blanks, rejects, and unfinished projectile points in every stage of the manufacturing process. A trained analytical mind is not required in order to arrive at the method used here to produce fluted points. The evidence is everywhere and any intelligent observer could, if he applied himself, arrive at the correct solution.

Cattail Creek chalcedony, the lithic material occurring at the Williamson site, has many impurities: geodes, bands of softer stone, and flaws of every sort. However, it was the finest workable stone available in quantity in southeastern Virginia. The early hunters valued it highly and returned to this favored lithic source for many generations. Indeed, Clovis Man used this preferred stone so extensively that the material source has been completely exhausted. The workshop site extends for a distance of more than a mile on both sides of Little Cattail Creek, and covers an area of perhaps one thousand acres. Although great concentrations of workshop debris occur in several spots, the entire area is littered with waste stone material: chips, chunks, blades and spalls, rejects, cores, and unsuitable pieces of stone. Scattered among this waste are complete and broken projectile points, unfinished points or preforms, and many tools. Without doubt, the largest assemblage of Paleo-Indian culture material discovered to date is at the Williamson site. What better place to search for answers to
the many mysteries posed by these early nomadic hunters?

Apparently the finest lithic material at the site was reserved for the manufacture of core blades. These early hunters were quite adept at striking off long, triple-faceted blades from prepared cores. The coarser grades of stone were more often utilized in making fluted projectile points and tools. Core blades were seldom used in the making of projectile points, for the obvious reason that such blades lacked the thickness and strength these hunters required for their weapon tips. The majority of points were made from thick spalls of irregular shapes and sizes. These were struck off from large untrimmed nodules and chunks of stone. Size of the original spall determined the size of the projectile point to be made from it; these points ranged from 1" to 6" in length (25 to 155 mm.).

We tend to seek the difficult and complicated answers to the many problems we strive to solve, yet the end result of our mental labors is usually a simple, logical solution. Such is the case at the Williamson site. We find ourselves amazed at the simplicity of the fluting process, for we have been conditioned by the theories of well-known scholars to expect complex methods and techniques. Once freed of these dogmas we do a mental about face, and begin seeking even simpler methods by which Paleo Man could have produced his projectile points. We ask ourselves: Why did they do it the hard way?

The early hunters at the Williamson site did make their projectile points the hard way. However, the method was not intricate or complicated in any phase of the process. These men made their weapon points in a simple, tried, and proven manner, employing a technique perfected by their ancestors and handed down with little change for untold generations. Slight evidence at the Williamson site perhaps indicates there may have been those who now and again tried innovations of technique, who may have desired to improve the method. These devious ways, however, were evidently not adopted by the majority. There were also those among them who were lazy or lacking in skill, who took advantage of thin blades or spalls by chance the right thickness. Such pieces could be shaped into serviceable projectile points without the expenditure of labor necessary to flute and work down a thicker spall. Such opportunists were probably in the minority, for fully 95% of the completed projectile points found at the Williamson site were made in the traditional or hard way.

The writer, like many students of Early Man, had held the belief that flutes were removed only in the finishing stages of point manufacture. The point sup-

posedly lacked only pressure retouching and grinding when fluting occurred. An on-the-site study of rejected material at the Williamson site changed these dogmatic beliefs. The writer was amazed to learn that flutes were removed as one of the initial steps in the manufacturing process, and that fluting was repeated, often many times, before the point was completed. The fluting process was repeated as often as found necessary to thin the basal portion of the projectile point to the thickness required by the maker. Also, the writer was surprised to learn that initial flutes were always struck from, or very near the center of the preform base, and not from either or both sides of the center. The author wishes to call attention to the accidental or unintentional by-products of the fluting process: broken or snapped-off bases, crude fluted preforms, and aborted or hinged-out preforms, and to point out their usefulness as indicators of the Cattail Creek Fluting Tradition.

The following portion of this paper will describe the step-by-step process of producing fluted projectile points as proven by evidence in the form of large numbers of rejected or broken preforms in all stages of completion. This applies only to the manufacture of Clovis-like projectile points made at the Williamson Paleo-Indian Workshop site, particularly to those made in the traditional manner. The writer does, however, propose that all classic Clovis or Clovis-like points found in North America were manufactured in much the same manner as herein described. He asks students of early man in other parts of the Continent to re-examine their specimens in order to determine if this theory is indeed valid.

MANUFACTURING SEQUENCE

After choosing a spall he deemed suitable, our ancient stone-knapper began trimming it into a rough oblong or egg-shaped preform — hereafter referred to as a blank for the purpose of simplification. Such trimming was accomplished by means of a small chalcedony or quartzite cobbles used directly against the edges of the spall. This direct percussion method removed wide, thin, conchoidal flakes, which sometimes extended halfway across the blank's face. The blank at this stage (Fig. 4, #1) was bifacially flaked and \( \frac{1}{4} \) to \( \frac{1}{3} \)" in thickness (13 to 19 mm.), while the width was between 1" and 2" (25 to 76 mm.), and the length averaged 3 1/2" (88 mm.).

The thicker, heavier end of the blank was chosen for the tip of the proposed projectile point. This was often the bulbous end of the original spall. The thinner end was used as the basal end, in keeping with the form of the completed product. The blank was
then pressed flat against an anvil of wood or stone, with the basal end projecting about ¾" over the edge of the anvil. A sharp blow of the hammerstone delivered at right angles to the blank served to break off a short section of the basal end. Sometimes this left a perfect ninety degree striking platform (Fig. 4, #2). Often the base snapped off with a short hinge extending as a flute down the face opposite the point of percussion. Now and again the blank would buckle or break an inch or more from the base, ruining or severely shortening the blank. These snapped-off bases are found in large numbers on the Williamson site (Fig. 4, #3,4).

The blank was then set upright on the anvil and a flute struck from one face. This no doubt was accomplished by means of a punch of bone, antler, or ivory. The punch was held firmly against the striking platform at, or very near the center of the base, and then struck sharply with a hammerstone. On some discarded or broken blank specimens one can determine the size of the punch tip by the small half circular cavity left in the striking platform (Fig. 4, #5,6). At this stage a flute was often removed from the opposite or reverse face of the blank. This depended upon whether enough of the platform remained after the initial flute was struck off. If not, another platform was prepared. Note in the illustrations that flutes often form a narrow neck beginning at the point of impact, while this narrow percussion bulb becomes wider as it progresses down the face of the blank. The flutes, as viewed in the illustrations show this inverted bottle-shaped outline in order to call attention to this phenomenon (Fig. 4, #5,6). In event such a bottle-shaped flute developed in the final stage of point manufacture, small flutes were removed from each side of the narrow central flute, and thus a triple fluted face was developed. However, at this early stage such trimming served no practical purpose.

Our ancient craftsman had now reached a stage where he was forced to make a decision. He must decide whether to reject this blank because of obvious flaws in the lithic material, or to continue the project because he found the stone quality to his liking. Fully 75% of the rejects recovered at the Williamson site were discarded at this stage, presumably because our craftsman did not approve of the manner in which the blade fluted, or due to his failure to remove a projection or lithic flaw of some sort. If the blank was considered suitable for completion, it was again percussion flaked (Fig. 5, #1). Wide flakes were struck from both faces and the base, thus further reducing the blank in length, width, and thickness. This flaking often nearly obliterated all previous flutes and flake scars. The blank or blade at this stage was from 3/16" to 3/8" (5 to 10 mm.) in thickness, and 1" to 1½" (25 to 37 mm.) in width. The length was reduced by ⅛" to ⅜" (6 to 19 mm.). Now for the first time in the manufacturing sequence, the blank began to resemble a projectile point to some extent. However, its pointed end was too blunt and the blank still too thick in the midsection and basal area.

At the next stage (Fig. 5, #2) the blank was again pressed against the anvil, and the base once more broken off by a well directed blow of the hammerstone. The striking platform was thus re-formed.
for the next, and most critical stage of the fluting procedure. It should be noted here that the striking platform was not always at a perfect ninety degree angle, but rather at sixty degrees or less. In this case several small chips were removed along the upper or sharp edge of the platform to increase the angle, or to make a firmer rest for the fluting punch. The angle of the striking platform often dictated which face of the blank it would be possible to flute. Often it was found necessary to repeat the platform preparing process in order to flute the opposite face of the blank. This repeated platform-making often shortened the blank considerably. Sometimes with a thin base, when further fluting was desired, a platform was prepared entirely by chip removal. At other times the thin base, or the edge of a steep platform was smoothed by grinding to facilitate resting of the punch. In some cases a small basal nipple was formed by chip removal, then the nipple was snapped off thus forming a small platform. In still other instances the nipple was smoothed or ground down to form a punch rest. These differences or refinements in technique were brought about by a desire to flute an already thin base further without making the blade appreciably shorter. Choice of process resulted from personal preference, or from a fear of ruining an almost completed projectile point by further crude, basal-snapping platform preparation.

Again the blank was set upright on the anvil and a flute was struck from one face. This time the flute was removed with great force, for it was hoped to be the final flute taken from this face. It was at this stage when many of these larger, deeper flutes hinged through the blank in the wrong direction (Fig. 6, #1, 2, 3). This, of course destroyed or shortened the blank to the extent it was useless, and added yet another bit of evidence to the discard heap. For lack of a better term, the writer calls these hinged-out blanks "aborted preforms" and considers them a reliable complex and temporal index marker.
At this point we will assume our stone craftsman was successful, as was usually the case, and he produced a long, broad flute. Let us assume also that enough of the striking platform remained to enable him to flute the opposite face without again snapping off the base (Fig. 4, #5), or preparing another platform by a different method. At this stage, if the blank met our craftsman’s requirements as to thickness of blade and depth of flutes, he could then proceed with the finishing details. If not, he would repeat steps as shown by illustration (Fig. 5, #2): this was not at all unusual. The reader is again reminded that our ancient craftsman manufactured his projectile points the hard way, and often was a perfectionist.

Let us now suppose that stage (Fig. 4, #5) met with our stone knapper’s approval. He could begin giving his product its final shaping. Once more he placed the blank upright on the anvil, and this time very carefully struck a small flute from each side of the narrow bottle-neck formed by the last central flute (Fig. 5, #3). This process was repeated on the opposite face, if a bottle-shaped flute had developed there also. Normally the central flute on one face of the blank did form such a bottle-shape, while the flute on the reverse face was wide and shallow. This shallow flute was due, of course, to the fact that this second or last flute was removed with much less force. For our craftsman no doubt feared he might flute too deeply and so hinge through and destroy a nearly completed projectile point.

We will assume all had gone well and our stone knapper was pleased with his product (Fig. 5, #3). The base at this stage was very thin, and the blade was somewhat irregular in shape — the blank lacked only its final retouching. Using a bone, antler, or ivory flaking tool our craftsman proceeded to work a shallow to medium depth concavity into the basal end of the blank by using the pressure flaking method. He was often very adept at pressure flaking, and removed small ribbon-like flakes that sometimes erased all traces of short secondary side flutes, and often evidence of the platform-making method as well. The deeper he shaped the basal concavity the more evidence of previous fluting and platform preparing he succeeded in destroying. By the same pressure flaking method of chipping, he proceeded to shape the blade’s edges and the tip until the desired configuration was attained. Then the basal concavity and lower lateral edges were abraded against a stone until they were dulled or smoothed to his liking, and the projectile point was complete (Fig. 5, #4).

This illustration exhibits the finished result of these labors, which probably consumed thirty minutes of our ancient workman’s time, far less time than was required by this modern savage to describe the procedure.

**SUMMARY**

The writer does not wish to imply that the afore described method of fluted point manufacture was rigidly adhered to by our early hunters. This description only represents the normal or average sequence of the process. Our early stone knapper was a versatile and very intelligent man, and he adapted his method to the particular piece of stone he was working. He adhered to a tradition, but this tradition was flexible enough to allow him to improvise to suit the occasion. As before mentioned, he sometimes did not flute his point at all. Rather, he took advantage of a thin flake or blade. He sometimes found he need not repeat the fluting process, since the first flutes accomplished his objective. At other times he was forced to repeat the process three or four times depending upon the thickness of the blank he was reducing. Sometimes a bottle-shaped flute did not develop on either side, so that one broad flute from each face served to make a perfect projectile point. At other times his flutes were all too narrow, and this necessitated removal of multiple flutes from one or both faces. These were required in order to thin the base sufficiently to facilitate hafting the point to a shaft. The adaptability and flexibility of the early hunter is demonstrated by the fact that seldom do we see a fluted point thinned or fluted in exactly the same manner on both of its faces. This is demonstrated further by the many platform or punch rest-preparing procedures employed by him in the final stages of point manufacture. The skill and ability of the knapper and the flaking quality of the stone he was then working governed the method or methods used to attain the traditional product. These differences in technique of manufacture are in reality all part of the same tradition, as the end result was of the most importance. In other words, the projectile point, itself, its shape and finished characteristics, is the objective or embodiment of the tradition regardless of the different methods used in its manufacture.

The writer wishes to establish in this short paper that normally our early hunter made his projectile points by a difficult but very simple method and he often began removing flutes in the crude preform stage. In some cases he was forced to flute the blank several times in order to reduce its basal thickness. Also, the author wishes to establish the fact that initial flutes were always struck from or very near the center of the base, in the hope other or secondary
side flutes would be unnecessary. Further, triple and multiple fluting was resorted to only when the initial flute failed to develop a width and depth sufficient to haft the point properly. Lastly, he wishes to record that intelligence and versatility displayed by our early hunter is revealed by his employment of several methods of fluting and platform preparation. He hopes to make clear the fact that all these techniques were utilized in the same complex tradition.

In this paper, it is the writer's intention to establish the unintentional by-products of the Cattail Creek Fluting Tradition, as displayed by aborted preforms (Fig. 6, #1,2,3); fluted preforms (Fig. 4, #5, 6); and snapped-off basal ends (Fig. 4, #2,3,4). All these can be of value when used as key or index markers of this complex and tradition. In other words, finished Clovis-like projectile points need not be found at a given site to indicate its lithic complex is Clovis-like, if these by-products of Clovis Man's fluting technology are present.

CONCLUSION

It is hoped the foregoing description of the Cattail Creek Fluting Tradition, although involved, has been made clear to the reader. If not, the writer is at the service of any serious scholar who wishes some portion of this paper explained. The writer is well aware that his description of the fluting procedure does not agree with the theories of some well known scholars of the subject. However, he feels a more lengthy disclosure on the differences between his conclusions and those of other writers is not called for. The writer believes most students of Early Man are already familiar with the various theories that have been propounded, and will be able to compare for themselves.

In conclusion, the writer wishes to state again, this paper can only describe with authority the fluting technique employed at the Williamson Paleo-Indian Workshop site. It is, however, his theory that the same method or technique was used in the manufacture of all classic Clovis or Clovis-like projectile points. He could indeed carry this a step further and declare that there could be little doubt the same technique, with certain refinements, was used by later Paleo-Indian hunters. These, of course, included Folsom, Cumberland, and Holcombe people. In truth, the lithic technology of these later hunters could all be considered within the Cattail Creek Fluting Tradition. The writer challenges anyone to disprove his theory, and to add new links to our evergrowing chain of knowledge concerning Early Man in the Americas.

We are making progress, constantly adding new evidence, but this evidence for the most part concerns lithic remains only. Our early hunters themselves have eluded us. They, who wandered over this continent far back in the mists of time are still shadowy figures without real physical substance. Who were they? Where did they come from, and where did they go?

We tend to romanticize when writing of these people, and we depict them as bold, big-game hunters. We wish to think that the fluted projectile point we have before us was used to kill a large Pleistocene mammal, a mammoth, mastodon, bison, camel, or horse. Indeed they were used for this type of game, it has been proven many times. We seldom picture them being used, however, against smaller animals, for this type of hunting has little glamour. We conjure up heroic pictures of the brave hunter risking his all to hurl his spear into the heaving side of a trumpeting, screaming mammoth. The truth is surely our early hunter was a prudent man, and in all probability attacked a mammoth only if the animal was too old, very young, crippled, sick, or trapped in some manner. Early man would probably eat anything that did not eat him first, and to constantly risk his life for a steady diet of mammoth meat was surely unthinkable. The beautiful fluted projectile points we search for so diligently, and study so carefully, probably killed more rabbits than any other game animal.

Courtesy of the Southeastern Conference Journal, Norfolk, Virginia January 15, 1972

APPENDIX

PALEO ARTIFACTS FROM WAPANUCKET 8

Excavations have been in progress for some time on the north shore of Assawompsett Lake by the Cohasset Chapter of the Society. In recent years work has been extended to an elevation overlooking Owl swamp, which in early times is thought to have been an inlet from the lake. Here at the Wapanucket 8 site evidence of Paleo occupation was uncovered in the form of hundreds of flint chip workings, numerous broken Fluted points of the period with one perfect one, small Stem scrapers, Gravers, and a number of Flake knives, one of which apparently is a large butchering knife. All of these artifacts are made of various colored flints imported from outside flint-bearing areas, such as the Hudson Valley to the west.
For the most part these recoveries were concentrated in four small spots indicating possible workshop areas of the Fluted point Paleo hunters. Beside these finds a number of fractured segments of worked flint with Paleo traits were picked up on the shore of the lake adjacent to the site, some of which were water-washed but still retained well-defined chipped characteristics.

After reviewing the excellent analysis of the Paleo fluting technique by Floyd Painter, as published in this issue, we felt that his opinion would be valuable, as to what some of the fragmented flint artifacts recovered at Wapanucket 8 might be. Accordingly, several were submitted to him, and his comments on six of them seem significant. They are included herewith along with illustrations of each (Fig. 7).

1) This is the snapped-off basal end of a large crude preform. This, too, is a classic marker of the Cattail Creek fluting tradition. I rather believe that the maker did not intend to snap off such a large portion from the preform base; he would have preferred to break off a piece about half this length. This example appears to be very waterworn; perhaps found on a beach.

2) The mid-section of a blade knife or two-edged side scraper. This is a beautiful specimen of its type. Long unifaced blades with worked edges are often found on Paleo campsites.

3) A triple-faceted blade made into a knife or side scraper; well chipped along one edge. This type of tool is often found on Paleo campsites.

4) Very well-made thumb-nail end scraper with some wear on the worked edge. Right-hand corner shows evidence on reverse face that a graver spur was once worked on the corner, since broken off. This is a fine example of Paleo-Man’s most abundant campsite tool.

5) A large blade spall that shows some indication of having been used as a knife; note tiny use-chips along sharp edges. You will note also that the end of the percussion bulb has been ground smooth. This is a feature often found on blades, and must have been an aid in blade removal, perhaps a purchase for a punch. This blade clearly exhibits the bottleneck feature often noted on blades and flute flakes.

6) This is the most beautiful example of an aborted preform point that I have ever seen. This is a classic example and a marker of the Cattail Creek fluting tradition. It has the snapped-off base, the central flute on one side only, and the reverse hinge fracture that spoiled the attempt to produce a beautiful point.
POSSIBLE PALEO-INDIAN MIGRATION ROUTES IN THE NORTHEAST
A GEOLOGICAL APPROACH
HAROLD W. BORNS, JR.

INTRODUCTION

The earliest known inhabitants of New England and the Atlantic Provinces were Paleo-Indians of the Llano Tradition. Their presence and life style is documented by artifacts belonging to the Llano Complex, first defined by Sellarde (1952). Although Paleo-Indian sites, now found across North America, have yielded artifact inventories displaying minor changes in form or presence of artifacts, the fluted projectile point remains a characteristic of the Llano Tradition. The Fluted point, typified by Clovis and Folsom types, refers to lanceolate points with straight to concave bases, often thinned by removal of longitudinal flakes from one or both faces.

Four well identified Paleo-Indian occupation sites in the region are those at Debert, Nova Scotia; Bull Brook, near Ipswich, Massachusetts; Reagen, in northern Vermont; and Wapanucket #8, on Assawompsett Lake, Middleboro, Massachusetts. The Debert site (Byers, Borns, MacDonald, and Stuckenrath, 1966), radiocarbon dated at about 10,600 years ago, was apparently occupied at this time, while the most reliable C-14 date at Bull Brook of about 9,300 years ago indicates an occupation somewhat later. Beside these sites, each of which yielded many Paleo artifacts including more than 100 perfect or near perfect Fluted points at Bull Brook, individual recoveries have been made elsewhere. For instance, Clovis-type Fluted points have been found at Ouaco Head, New Brunswick; Ellsworth and Brassua, Maine; Intervale, New Hampshire; and at Plymouth and Nantucket, Massachusetts.

As a Quaternary glacial geologist my research has centered on the history of the glacial and associated events in the Northeast during the Quaternary Period (the "Glacial Age"), a time span of approximately two to three million years. From this point of view and stimulated by my association with archaeologists, I have been asked the question: When and where could Paleo-Indians have migrated into and within the Northeast, given the limitations of the changing distribution of glacial ice, land, and sea, following the last glaciation, the Late Wisconsin Age? This last major expansion of the Laurentide Ice Sheet from central Canada began about 25,000 years ago—reached a maximum and then had dissipated by about 8,000 years ago, as illustrated (Fig. 8).

Given a geographical setting, it is now up to archaeologists to add factors of Paleo-Indian life style, such as migration habits of big game animals that must be considered in determining the details of migration routes.

METHOD

Figures 9, 10 and 11 represent approximate paleo-geographic maps of the region for three selected periods following the maximum Late Wisconsin glaciation. The information portrayed on these maps represents the present state of knowledge, and has been gathered from a number of sources, including my own research (e.g., Wright and Frey, Borns). It provides data on the chronology and distribution of glacial ice as well as the time and geographic extent of the late-glacial marine transgression. These data, integrated with currently accepted rates and magnitudes of both crustal uplifts following deglaciation, and...
with sea-level rise consequent to the melting of the Late Wisconsin ice sheets of the world, have provided the ingredients necessary to construct these maps. The three specific periods chosen for plotting the Paleo-geography were dictated by data, which allowed ice-margin and shoreline positions to be fixed. At intermediate times the available data do not allow this precision.

The last ice sheet advanced over the region and by 25,000 years ago reached its terminal position on Long Island, New York. Prior to 17,000 years ago it still covered southeastern New England and the continental shelf to the east, and continued in this position as late as 15,000 years ago (Fig. 8). At its maximum the ice sheet completely covered New England and the Atlantic Provinces with the possible exception of Newfoundland. At that time world-wide sea level was 130 meters (426 feet) lower than at present. Subsequently, in this area as the glacier melted sea level rose, and the land previously depressed as much as 1,000 meters (3,300 feet) below present sea level, relieved of the great weight of the glacier, started to rebound. The complex relationship of these factors of ice, land, and sea are depicted in Figs. 9, 10, and 11.

**INTERPRETATION**

First, attention is called to the fact that prior to approximately 15,000 years ago Paleo-Indians had no access to the Northeast.

Second, it should be noted that approximately 13,500 years ago nearly all of New England was still glacier-covered. However, Paleo-Indians were free to migrate on the exposed continental shelf of southeastern New England as far east as what is now Georges Bank. They may even have been able to negotiate the deep Northeast Channel to Nova Scotia, if it was frozen over. Northeast Channel is the passage between the Gulf of Maine and the Atlantic, which is now submerged on the continental shelf (Fig. 9); there is no documentation of use of boats by Paleo-Indians.

Third, by approximately 12,500 years ago the ice sheet had retreated from New England, and its margin lay northwest of the St. Lawrence Lowland. At this time sea level was rising more rapidly than the land rebounded. Consequently, a shallow sea flooded...
most of central Maine as far inland as East Millinocket in the Penobscot River Valley, and Bingham in the Kennebec River Valley. The St. Lawrence Lowland was extensively submerged at this time. Offshore, the land surface had completed its rebound, and the rising sea was rapidly covering the exposed shelf, thereby reducing the probability of Paleo-Indians migrating into Nova Scotia via this route. However, they surely would have had access to most of the northeast at this time via what is presently land, with the exception of central and coastal Maine, as well as the connection between Nova Scotia and New Brunswick (Fig. 10).

Fourth, by approximately 10,700 years ago, the time of occupation of the Debert Paleo-Indian site migrants would have had free access to all of the Northeast with the exception of parts of the St. Lawrence Lowland, which was still partially submerged. At that time the shore line was about 60 meters (197 feet) lower than at present, which would have extended the dry land surface of Maine offshore 5 to 15 miles further than the present coastline (Fig. 11). Subsequently, the sea has risen, reaching its present position approximately 2 to 3,000 years ago.

CONCLUSION

The migration routes actually followed at particular times by these early men were determined primarily by the limitations imposed by the changing geography, and secondarily by their life habits of hunting and gathering. Speculation has been made based on which game animals they followed into and within this region. Unfortunately, however, no animal remains were preserved in association with artifacts at Bull Brook, Debert, or other sites. Therefore, all of the evidence associating Paleo-Indians with big game animals has been indirect. Woodland caribou has been suggested as a strong possibility, and recently the partial remains of postglacial mammoth and bison have been discovered in Maine. As yet these remains are undated. However, considering the colder climate and associated but limited vegetation that probably prevailed in the Northeast in early postglacial times, it is reasonable to assume that these big game animals coexisted with, and were probably hunted by early man; this hypothesis is yet to be proven.

Given this knowledge of paleogeography, the fact that these people were migratory hunters, and
PROJECTILE IMPORTS: HOW TO RECOGNIZE THEM

WILLIAM S. FOWLER

This subject of importation of implements, especially projectile points, into the New England area from distant regions not directly associated with the cultural development of this part of the Northeast is an intriguing one. To deal intelligently with it requires not only a working knowledge of implement types indigenous to this eastern section of the country, but also a reading awareness of those found in other parts of the continent. Stone projectile points of extraneous types are admittedly the exception rather than the rule in this area on plowed or excavated camp sites. However, perhaps because of their infrequency they excite one's curiosity as to the reasons for their presence.

The major part of foreign imports into this northeastern area is conspicuously confined to projectile points, perhaps because of their importance to man's survival. Therefore, excepting the pipe import of the appendix, this paper deals with them to the exclusion of other kinds of imports. Used as implements for hunting, stone projectile points are usually present wherever an aboriginal hunter, trader, or traveler's presence is in evidence. In fact, so much reliance was placed upon them for procurement of food or other purposes that their styling from earliest times was an important part of their manufacture. Hence, type after type was created from one culture to the next to satisfy independent invention, as well as hunting - or in later times - warfare requirements. Some of these types were borrowed and passed along from one people to another, who may have continued to make them, sometimes in modified styles. However, when they occur as rarities at the end of a long diffusion, they appear more as probable imports than as the work of local artisans. Especially, this seems apparent when the stone from which they are made is not of an indigenous kind, but one from a probable distant source. This paper will attempt to expand these thoughts through drawings of projectile points recovered mostly from Massachusetts and Rhode Island. Some are so totally different in styling from local points of this area as to leave no doubt of their being anything but exports. On the other hand, others, because of their similarity to local types, are not so easily distinguished and require closer inspection as to the material from which they are made.

Appearance of these points on New England sites has given rise to speculation about the reasons for their presence, as to why and how they arrived. In connection with this, it should be pointed out that New England is somewhat isolated, and easy entry was obstructed to some extent. For example, overland movement of peoples from the west was confronted by the Berkshire-Green Mountain Range of the Appalachians. Also, for those moving in from the south by water, the Sound presented problems to interrupt free access to this area. This leaves one to wonder what influenced travel — impeded as it seems to have been — into New England from outside culture centers, as is indicated by imported projectile points.

Any study of this kind depends upon a comparison of stone points proven to be representative of New England with projectile imports having unfamiliar traits. For this purpose, the Stone Implement Classification of the Massachusetts Archaeological Society, Vol. 25, #1, the outgrowth of more than 30 years research in the field will be used to identify point types and names pertaining to this northeastern coastal area. In instances of close similarity between presumed imports in question and classified types, an explanation will follow in an effort to present the reasons why the one should be separated from, or considered as the source for the other in the opinion of the writer. As will become apparent, this comparative analysis presents an opportunity to try to understand the effects upon local cultural changes that contacts with outside people may have had. Minimal as the results of any such study may prove to be, evidence may in time lead the way to a more complete understanding of events that took place, which influenced the culture of the day either up or down. Of course the facts surrounding such culture contacts will never be known except in part. Still the writer's observation of evidence in the field during his many years of research in this New England area leads him to believe there existed here many more contacts from outside culture centers in one way or another than is generally believed. Furthermore, wherever evidence is more than that based on surface finds, it seems to indicate arrival of imports beginning during the Late Archaic and extending into the following Ceramic Age.

It will be noted from the following illustrated evidence that many of New England imports have New York State as a probable source. This is what might be expected because of the close proximity of eastern New York. Travel could have been by trails over the mountain ranges separating the two areas, although water routes may have been preferred. Certainly, entry by water was the only means of contact.
before the mountains were crossed. Imports from New York appear easy to explain, but those from greater distances pose more of a problem.

As far as trails are concerned, it is known that by protohistoric times, and presumably stretching back over some preceding centuries, two well-traveled trails reached across the mountains to the Connecticut Valley. One of course is the well-known Mohawk trail, which terminated in the Deerfield meadows. For years it was a constant threat to the river Indians, as it opened a way for Mohawk raids, by which the valley tribes were held in bondage with payment of tribute.

Another overland route from the Connecticut occurred some 30 miles down river from Deerfield. It started at Westfield in the Little River Valley and winding up over the mountains through Blandford, at length reached the Hudson probably by way of the Taconic Range. During the Indian wars several white captives are known to have been taken into captivity over this mountain trail. Based upon this historic evidence, it appears likely that these trails and probably others at convenient places through Vermont and Maine had been used for a long time as means of contact with the Hudson Valley. While it is probable that such trails were made available sometime during the Late Archaic period, travel by dugout down the Hudson and up the Connecticut might even then have been preferred for entry into this central New England area. As for other more easterly located coastal regions, imports more than likely also arrived by water routes along the coast and thence up the larger rivers and bays to inland sites. In this way canoe-carried projectile imports may have come in as early as 4,700 years ago, a radiocarbon date at Wapanucket 8 on Assawompsett Lake. As envisioned by the writer the quantity of large flint knives found in cremation burials at this site suggest their importation there by early Late Archaic settlers probably from New York. For from about 5,000 years ago groups of migrants were continually arriving to occupy sites the Early Archaic hunters had vacated in their trek north after the retreating caribou herds. Later, of course, some travel might have been overland from trail-connected Connecticut Valley to coastal sites. The fact is that however they arrived, what appear to be projectile point imports, intentional or not, are found on many sites throughout New England.

**IMPORTED PROJECTILE POINTS**

(Fig. 12, #1-28)

**New York Source.** The first group of points to be discussed (Exhibits #18-20,23,24) are probable imports and are to be found in Ritchie's class of *Meadowood* points. The small side-notched type (Exhibit #19), an excavated Late Archaic find from Rhode Island is included in the Massachusetts implement classification as Side-notched #7. It has appeared at excavated sites only twice, and each time was made of dark flint, presumed to have come from an out-of-state source, the nearest being the Hudson Valley. Therefore, it is now thought of as being an import. This feeling has grown of late with appearance of 2 large variants with expanded fan-shaped bases (Exhibits #23,24), also appearing in Ritchie's Meadowood classification. The larger specimen is of banded ivory-yellowish flint, possibly from the Whitehall Dolomite deposit in the upper Hudson-Champlain region. It was recovered from a Webster Lake site, Allagash County, Maine. Its companion point is of white quartz, possibly of local manufacture, and was excavated on a Swansea site in Massachusetts. In the Typology for New York Projectile Points, Ritchie defines the Meadowood type in part as follows: "Blade trianguloid in outline ... stem neatly side-notched, sometimes double notched. Base straight or convex, sometimes expanded in a fan shape." Two small probable variants of this point type, one without side notches, both of flint (Exhibits #18,20), are believed to be imports. Exhibit #20 with notches, probably of Little Falls light bluish-gray flint, was excavated at the Titicut site, Massachusetts, while Exhibit #18 without notches was excavated at a Rhode Island site. As both are of flint they appear as imports, and because of their extreme fan-shaped bases doubtless belong to this class of points. Similar points might have been made from indigenous stones, but if so their derivation may well have been New York.

The second type of New York points to be considered is represented by only one specimen (Exhibit #21). It is isosceles in shape with a concave base and apparently is made of Onondaga brown flint. A surface find on a Connecticut River site not far from the southern end of Old Hadley, it seems to have all the traits of Ritchie's *Madison* points. His description is brief: "small, thin, triangular points . . . base concave or straight . . . 80% isosceles . . . a majority falling between 1 and 1½" in length." . . . "In the northeast it is the distinctive Iroquoian form . . . Among the northern Iroquois the principle material employed was Onondaga flint [from] central New York." Here is one example, unquestionably, of an import that appears to fit an out-of-state source both as to styling as well as to its kind of flint; a point generally preferred by its chief users, the Iroquois.

The third group of points is displayed by 2 speci-
mens (Exhibits #15,16). The smaller one, a surface
find on the large State Line site in Agawam, Massa-
chusetts, is made of what is easily identified as Knau-
derack flint from the Mohawk Valley, the upper deposit
of Little Falls light bluish-gray Dolomite flint. It has
an ivory-tinted shade with contrasting small brownish
to pinkish weathered areas, which are distinctive
traits of this flint. The larger specimen, found on the
Taylor farm on the upper Taunton River, is made of
Coxsackie Deepkill greenish-gray flint. These two
points appear to fall within Ritchie’s Brewerton Side-
notched points. His description in part follows: “Blade
trianguloid in outline . . . Stem side-notched, basally
expanded sometimes to a pronounced degree . . . Base
straight . . . [Body] biconvex in cross section.” “This
is the commonest point of all Archaic Laurentian
complexes of New York.”

A fourth point type is represented by one point
only (Exhibit #22). Elongated and widely side-
notched, its flint material is the same ivory-tinted
Knauderack stock just described. Interestingly, it was
recovered from the same Agawam site as the smaller
Brewerton side-notched, although its type is different;
seems to belong to the Normanskill points, found
chiefly along the Hudson River and tributaries, such
as the Normanskill, Mohawk, and Hoosic rivers.
Ritchie’s description in part says: “Blade narrow and
triangular in outline . . . Stem boldly side-notched and
slightly thinned by coarse flaking from the base.
Base straight or very slightly concave.” . . . “Morphol-
ogically, it is transitional between the Lomoka side-
notched and Brewerton side-notched forms” . . .
“Materials used are local flints.” Neither this type
nor that of the third group fit any Massachusetts point
types. Therefore, they are considered to be imports
during the Late Archaic.

The fifth point type to be studied is represented
by a single specimen (Exhibit #25). Recovered by
excavation on the Taylor farm, it is a large extremely
well-shaped spear point. Made of a coarse grained
flint, it has traits that seem to fit those described for
Normanskill flint of the Hudson Valley: hard indur-
ated shale with a medium conchoidal fracture — speci-
men appears to have a fair conchoidal fracture as
though derived from a superior piece of stock — color
is gray with banded light greenish-gray or reddish
streaks. It seems to belong to Ritchie’s Snook Kill
points, which he describes in part: “Blade trianguloid
in outline; edges straight . . . or slightly incurvate.
Stem contracted, or straight . . . No true barbs.” He
reminds further that it is related to the Late Archaic
of eastern New York, especially the Hudson Valley
above Albany, and the lower Hoosic Valley. The
illustrated specimen appears to be an exceptionally
fine rendering of this point type; has all the traits,
but seems superior to the average shown by Ritchie.
Note the long excurvate-sided stem, which differs from
the shorter slightly incurvate-sided stem of New
England Corner-removed #5 point of the Early Ar-
chaic. Whether the two are related in any way is
questionable considering the wide time gap that sep-
arates them.

The sixth New York class of points observed in
New England recoveries is represented by one speci-
men (Exhibit #14), a surface find at the Taylor farm.
It has all the traits of a group of projectiles Ritchie
calls, Rossville points. Their description in part
follows: “Roughly rhomboidal . . . weak oblique
shoulders, which merge with a contracting stem, ter-
minaling in a blunt point . . . edges, slightly excursive.”
The specimen under study has a flashy deep blue-black
shade, good conchoidal fracture, and may be from a
superior vein of Helderberg flint with deposits in the
vicinity of Catskill. Ritchie gives this point’s distri-
bution as follows: “From the Chesapeake Bay area,
where it may have originated, northward through
southern and southeastern New York and southern
New England.” However, if the Taylor farm specimen
is Helderberg flint, it should doubtless be a New York
import instead of from some southern area.

A seventh type of New York points to be found
here is represented by one specimen (Exhibit #17). While
its stem seems proportionately too long for its
body length, nevertheless its characteristics in general
strongly suggest that it belongs to Ritchie’s large,
straight stemmed projectiles of medium breadth,
called Genesee points. Their description seems appli-
cable: “Blade trianguloid in outline . . . edges straight
or slightly excursive. Stem rectangular and straight
. . . Shoulders weakly or moderately developed . . .
Base straight.” Ritchie’s description continues: “Age
Late Archaic; part of Laurentian . . . Especially num-
erous in the Genesee Valley . . . A very large percent-
age are made from the characteristic mottled gray and
brown flint of the Onondaga escarpment of western
New York.” The illustrated blade was recovered from
a crematory at the Seaver Farm site, across the Taun-
ton River from the Taylor farm. The specimen was
not burned by fire, but had both shoulders broken off.
It appeared as part of a red ocher cremation complex
of the Late Archaic at this site. Beside its typical
rectangular base, and shoulders — although fractured
—that suggest a moderate development, it seems
closely associated with this class of points. Also, its
attractively variegated flint effectively described by
Ritchie as mottled gray and brown — shown quite
clearly by the illustration — seems to furnish one more
reason why it should be considered as a Genesee im-
Fig. 12. NEW ENGLAND PROJECTILE POINT RECOVERIES (probable imports). 1, Vein Fragment, Jade Green Deepkill Flint from Coxsackie; 2-9, Jack’s Reef Corner-notched; 10-13, Adena; 14, Rossville; 15, 16, Brewerton Side-notched; 17, Genesee; 18-20, 23, 24, Meadowood; 22, Normanskill; 25, Snook Kill; 26, Eccentric Object; 27, Type IV Mo. (Outline Drawings of Tri-notched Gem Points from 4 regional areas); 28, Type III Mo. - All specimens are of exotic flints except 6-8, granular grayish felsite, 11, 24, quartz, 26, fine ivory felsite and 27, black obsidian (see text for names of flints).
New England points flint sometimes appear in vessels of the same jade green flint, found in eastern Pennsylvania jasper, presumably derived from quarries in eastern Pennsylvania. Ritchie attributes this jasper to the Adena culture, whose homeland was Ohio. The best known Adena projectile type is represented by a long blade of variegated gray banded flint, probably from the Ohio Flint Ridge deposits. This, together with a smaller Adena point of white quartz (Exhibit #11), were recovered from Adena cremation burials in Brookfield, Massachusetts, and display the characteristic prominent rounded base of this point type. A small point of glossy black flint (Exhibit #10) with an extended rounded base, a Rhode Island find from the Ceramic zone, doubtless belongs to this Adena type — its stem's slightly incurvate condition on one side probably was fortuitous.

Another Adena projectile type has a leaf-shaped elongated form. It appeared in the Adena Cresap Mound in the upper Ohio Valley and seems to be well represented by Exhibit #13, a recovery from a cremation burial at the Seaver Farm site. It is made of a banded tan flint thought to be one of many variegated deposits from the Ohio Flint Ridge escarpment.

Midwest Source. A small unusual surface recovery from the Seaver farm is illustrated (Exhibit #26). Made of a creamy-ivory fine grained felsite, unknown in this northeastern area, this worked object may be a projectile point. If so, it has a most unusual form with a point resembling more the nose of a reptile than that of a projectile. It is deeply side-notched with prominent jutting prongs, which appear as the fore feet of some living object, while a deeply bifurcated base suggest rear feet. This strange artifact appears to resemble fancifully worked stones, usually of flint, sometimes referred to as ceremonial eccentrics. They have occurred in several mounds of the Hopewell Moundbuilders. However, the Seaver farm specimen seems to have enough favorable traits to make it suitable for a Bifurcated projectile point, but because of its bulbous point and deep notches appears to belong to the mound ceremonials, an import from the Midwest.

Northeast Missouri Source. The last of the New England recoveries of this report with an implied import status consist of 2 small points (Exhibits #27-28). Both were surface finds on the large well-known State Line site in Agawam on the west bank of the Connecticut River. Exhibit #27 is a side-notched thin diminutive point of black obsidian with a slight notch midway in its base — principle sources of volcanic obsidian are Wyoming and Oregon, where it was found by the writer on a nearby site in Coxsackie, obviously derived from the quarry, which seems to indicate the Taunton find as an import from eastern New York.

Pennsylvania and New York Sources. A group of points classified in New England as Corner-notched (Exhibits #2-9), mostly pentagonal from various coastal sites in Massachusetts and Rhode Island have attracted attention as having certain distinctive traits closely resembling a type of point found in both Pennsylvania and New York. Ohio Source. In this group of probable imports (Exhibits #10-13) are included projectiles attributed to people of the Adena culture, whose homeland was Ohio. The best known Adena projectile type is represented by a long blade of variegated gray banded flint, probably from the Ohio Flint Ridge deposits (Exhibit #12). This, together with a smaller Adena point of white quartz (Exhibit #11) were recovered from Adena cremation burials in Brookfield, Massachusetts, and display the characteristic prominent rounded base of this point type. A small point of glossy black flint (Exhibit #10) with an extended rounded base, a Rhode Island find from the Ceramic zone, doubtless belongs to this Adena type — its stem's slightly incurvate condition on one side probably was fortuitous.

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the preferred choice for projectile points. As for the point type itself, attention is called to somewhat similar points from four western regions: Nevada, Oregon, South Illinois, and Northeast Missouri — outline drawings of these point types will be found with illustration of the Agawam point. These points, in general, have been known as Gem points and are usually made of flint, indigenous to the regions where found, except in Oregon where obsidian is the stone most often used. Comparison of these points reveals some differences. From Nevada and Illinois the point's form before side-notching was triangular with a small basal notch appearing in Cohokia points from southern Illinois, and a deep concavity occurring in those from Nevada. In points from Oregon and Northeast Missouri the form before side-notching was more or less pentagonal, which also prevails for the Agawam specimen. However, Oregon points tend to have a deep basal concavity, while Missouri Type IV points have the same small basal notch as found in the Agawam point. Therefore, it seems probable that the point under study is an import from Missouri, with its obsidian coming from stock brought in from the far West.

Exhibit #28 is more easily placed as to its source, for it has its exact counterpart in Northeast Missouri Type III points. These tiny points are quite generally made of light creamy flint found in Missouri, similar to that of the Agawam point. They have as a distinguishing trait wide flaring basal ears, dissimilar from any known point type east of the Mississippi. Therefore, since both flint material and point characteristics of the Agawam specimen closely match Missouri small points as described, there is no doubt of its being an import from that western region.

**CONCLUSION**

The more one studies this absorbing subject the more impressed you become with the probability that foreign points found their way onto local camp sites as a result of various forms of travel. Occasionally, groups of people probably were involved, while at other times only two or three travelers may have arrived. It is known that a migration on one occasion occurred, and in later times warfare brought in raiding parties. However, outside of such forms of travel, one is left to speculate on other kinds that may have taken place. Of course, it is a proven fact that on numerous occasions choice flint stock was imported, from which local tool makers fashioned points conforming in shape to local types then in vogue. However, when both the stone used and the point shape involved are foreign to this area, the chances are that such points actually came in as imports.

Not only stone materials and point types are important evidence in any evaluation of this kind, but the cultural age of the points in question may be the means of arriving at a satisfactory hypothesis. This will become apparent in the discussion that follows, in which several theories are advanced dealing with various kinds of point imports, as illustrated. This is no casual report dealing with a few recoveries here and there, but one that has to do with sufficient exotic finds to call for serious thinking about the reasons for their presence.

In order to better evaluate the evidence, it seems important to note that all points referred to in this paper belong to either the Late Archaic or the Ceramic (Woodland) culture periods. This suggests that as living conditions changed from the earlier to the later age, circumstances surrounding imports probably varied accordingly. Now, it is evident from evidence in the field that the last 2,000 years of the Late Archaic in New England was industrially motivated by the stone bowl-making activity of the men. Quarried steatite was made into utensils for the consumption of liquid foods, while snail-shell type wigwams were large and commodious for comfortable living. With a sparse population that only slowly increased there is reason to believe that this was a peaceful period. Tribes probably were not formed until the age ended; were not needed. Therefore, any imports taking place during this long span of about 3,000 years would have occurred under peaceful conditions. Not so, however, with the next age that followed, when pottery-making by the women represented the chief industrial activity of the times. With population growth on the increase, tribes had formed by then resulting in tribal warfare, which lasted throughout the Ceramic, down to the colonial era. Therefore, point imports during this period must have met with a much different reception than formerly.

With New York the nearest source for flint imports, discussion of the evidence from this region appears of foremost consideration. Involved are 8 different kinds of points already described, of which 6 belong to the Late Archaic peaceful period: Brewerton Side-notched, Normanskill, Snook Kill, Rossville, Meadowood, and Genesee. These types, except the last mentioned from western New York, are made of various kinds of flints from the Mohawk and Hudson valleys in eastern New York. Because of this and the relative early culture date involved, possibly before overland trails existed, travel into this northeastern region might have been by water. It can be surmised that one reason for such travel may have been for acquisition of stone bowls by barter, for New York lacked steatite quarries, which forced her people to
obtain stone bowls elsewhere. Although some may have been brought in from Pennsylvania quarries partly by overland travel, the all-water part river route to New England, insuring easy transport of the heavy stone bowls must have been an inviting inducement. The few points that were left behind as evidence of the traders’ presence could have been accidentally lost. This seems more likely than as though they were used as a medium of exchange, which would have involved many more points than the few that are found.

However, as already briefly mentioned in the case of the Wapanucket 8 flint knives, there is another way that New York flint projectiles might have arrived during the 3,000 year span of the Late Archaic. It has become evident as a result of site excavations that reveal a replacement of projectiles and other implements of the Early Archaic by new types in the following Late Archaic. With no evolutionary development displayed of projectiles, there seems to have been a gradual influx of newcomers with a different tradition, who introduced new types of implements. The Early Archaic hunters are believed to have slowly moved into Canada, pursuing their principle quarry of the tundra, the caribou, as glacial ice and tundra retreated north. This exodus caused site evacuation from southern and central New England, as forests arrived to cover the former tundra expanse.

To account for the following Late Archaic, a new people must have arrived to occupy abandoned camp sites — nearby New York to the west seems to have been the most likely source of this migration. Gradually, a family or two at a time of primitive pioneers seeking a new home moved in and repopulated the camps. But what is pertinent to this discussion is that these people obviously would have brought with them a quantity of projectiles, knives, and other artifacts made of flint, equipment to which they had become accustomed in New York. And what is left of these flint artifacts is what now appear as imports. If the Genesee point from the Seaver farm is any indication, migrant pioneers came from as far away as western New York to find a new home in New England. This migration theory supports an evident eastward movement of primitive wanderers throughout the Late Archaic era, who seem to have been in search of a new life. New England became their final settlement, since the ocean prevented further advance. In due time they were obliged to accommodate themselves to the use of local stones for projectiles, and soon forgot the flints of their former homeland.

Presence of the ovoid and pentagonal corner-notched Pennsylvania points (Jack’s Reef) may also have occurred as a result of movement of people into New England during the first part of the Ceramic Age. However, at that time of tribal strife entrance probably was more of an intrusion into established tribal groups. Whatever actually took place, the evidence suggests that Pennsylvania intruders settled here, bringing with them these unique points of yellow jasper and fine-grained brownish-gray felsite. Also, they probably imported a quantity of these stone stocks from which more points were made after arrival. This hypothesis seems sound since such projectiles conform meticulously to the proportions common to this point type, as though made by Pennsylvania artisans accustomed to this work. Evidently, racial integration took place over the long run insuring continued making of these points during a long enough period to account for their frequency found on many camp sites. It is also possible that the imported stone materials involved, when made into points of local types, could have been the work of native workmen.

Still another explanation is required to account for appearance of the jade green Jack’s Reef spear point from Taunton. Being an impressive import, as shown, from the Hudson Valley, it could have arrived with a war party in protohistoric times. For, it is known that Iroquoian raids reached to the coast and vice versa. As an example of the latter, an early record relates how Chief Chickataubut of the Massachusetts led a war party of some 30 braves to the Mohawk Valley, where, at Canandaigua they were defeated. It seems probable that such raids to and from New York were overland affairs, crossing the Appalachians by mountain trails.

The Madison isosceles triangular point of Onondaga flint from Old Hadley is evidence of a Mohawk raid, this time into the Connecticut Valley by way of the Mohawk trail, one of many protohistoric raids that subjugated the River Indians. Other similar points have appeared here and there in the valley to confirm a wide-spread Mohawk domination of the river tribes from the Pocumtucks of the Greenfield-Deerfield area to the Nonotucks at the great falls, and possibly below.

Adena points, appearing as well-documented imports, were brought here by Adena migrants from their Ohio homeland. These wanderers, led by their shaman priests, eventually pushed into this northeastern area, as proven by the Brookfield burials. Ohio excavational research has exposed the probable cause for this exodus. Evidently, Hopewell people from Illinois led by their priests, intent on spreading their cult, invaded Ohio and attempted to replace Adena ceremonials with their form of worship. As is now thought likely, this forced the Adena shamans and their followers to move eastward in search of new homes, where they might worship according to their own
established beliefs. This happened as the Late Archaic was drawing to a close. As a side light, platform pipe Adena-associated recoveries from a Seaver farm cremation burial suggest what may have happened. It now appears possible that these stone pipe-smoking migrants taught the natives here how to make stone pipes at their stone bowl quarries. If so, this could have brought about a favorable integration between them and the local residents; a fascinating new diversion — smoking — had been introduced, assuring social acceptance of the newcomers.

How the remaining two small points of the evidence found their way from the Midwest to the Agawam site where recovered is a mystery that appears unsolvable. Beyond the fact that the black obsidian and tiny cream flint points probably came from Northeast Missouri, there is nothing to suggest how they reached here from half way across the continent. However, as both seem to have the same source and were found on the same Connecticut Valley site, it appears probable that they came as part of the equipment of a traveler from the West. He might have been nothing more than that, but his supply of arrows tipped with tiny bird points uniquely shaped could have fascinated the valley natives. The Agawam specimens might possibly have been traded and so left behind.

Finally, what does all the foregoing evidence have to do with the aboriginal residents of New England, beyond proving that projectile imports arrived here from outside regions? Probably nothing specific, but in general some events that may have influenced the cultural life of this area may be envisioned. For instance, the Adena migrants brought with them well-established customs and religious ceremonials, which must have proved impressive. For they seem to have introduced stone pipe-making, to mention only one significant custom. Beside this, evidence seems to point to the ready acceptance of the Adena religious cult. It appears to have included much in the form of cremation ceremonials that proved acceptable, adding new functions to cremation rites then being practiced by the native residents. A stimulating cultural uplift may have been the end result. All this preceded the period of tribal warfare that followed, which eventually nullified much of the previously acquired culture and reduced it to a decadent state. Apparently, no later migrations arrived to stop the downward course. From then on, incoming groups probably were considered as intruders, who used force to obtain their desired ends.

Bronson Museum, March 30, 1971

APPENDIX

Although projectile points, more than anything else, appear as imports from outside regions, occasionally other artifacts with foreign characteristics are found on New England sites. However, as this report emphasizes, projectile points probably are the more significant on account of their changing styles and stone materials from which they are made. Perhaps more can be deduced from them as to their sources and culture relationships than from any other class of artifacts of aboriginal man.

Nevertheless, there are times when recovery of an unusual artifact with traits that show it to be of foreign make causes one to wonder what brought it into this northeastern area. Such a find was made years ago in the Connecticut River Valley of Massachusetts. While searching the river bank in the township of Old Hadley a startling object attracted the eye of a surface hunter, doubtless brought to view as a result of water erosion from high-water flooding.

fig. 13. Mohawk Effigy Ceramic Pipe. Front, back, and side views; a surface find on the bank of the Connecticut River at Old Hadley.
It proved to be a ceramic pipe, profusely embellished with effigy clay modeling, totally different from any aboriginal New England ceramic pipe recovery known to the writer. Although the clay stem of the pipe is missing, the effigy modeled bowl is in a good state of preservation except for one fracture of its rim. It shows female faces on its front and back sides, one of which may be that of an infant with the suggestion of cradle-board plaited basket contrivance about the top of its head (Fig. 13). An exceptionally skillful piece of intricate modeling, this pipe has been identified by a New York archaeologist as being of Mohawk manufacture.

Here again is supporting evidence, along with the Iroquois triangular flint point, previously mentioned, found in Old Hadley, of a Mohawk invasion of the River Indians' domain, which stretched up and down the river between the Greenfield and Springfield areas. However, such a pipe recovery suggests domestic pursuits more than those associated with raids, which seems to imply possible residency of Mohawk intruders. Hence, this piece of evidence upholds historic reports to the effect that Mohawk groups, including both men and women, at times occupied valley sites during periods of Mohawk domination over the River Indians.

SEAVER FARM SALVAGE EXCAVATION

William B. Taylor

From then on, with the help of my two sons, David and Billy, we conducted as thorough a search of the two charred areas as time and public interference permitted. Encroachment by the housing development was ever present, but in spite of it, we kept records of our recoveries as to the soil horizon in which they occurred, their horizontal locations determined by our grid layout, and depth of charcoal overburden. However, as building operations of the development approached completion, with the final movement of loam by the bulldozer that would cover the charcoal areas we were excavating, our scientific methods had to give way to a faster salvage procedure. From then on we used a plow to hasten the work, carefully examining each furrow as the charred black overburden was cut through and our search was carried down into the yellow subsoil.

While both charred areas previously mentioned were inspected, nothing of importance was found in the smaller deposit, the first referred to at the north end of the field. Therefore, this report will concentrate on our excavation of charred deposit number 2, the larger of the two, located toward the center of the field. This proved to have an irregular area with a width of about 50 feet, extending in length on one side about 38 feet and on the other about 54. While it seemed to have a ragged edged overall oval shape, it had a sizable section in one corner, where no char-
coal existed (Fig. 14). Concluding that this blackened overburden might be the remains of a house floor, we were careful to examine its perimeter for evidence of post molds. However, not one could be found to prove the former existence of an abode.

As our work progressed, we became aware that the area contained an immense amount of a charred deposit of some kind, which had a depth of 3" in its exposed condition. However, investigation showed that perhaps another 6" had been scooped off by the bulldozer. This would have produced an overall depth of 9", before it was disturbed. Such a quantity of a charcoal deposit seems unrealistic as a house floor accumulation, which usually is barely noticeable; reliance is placed chiefly on post molds for evidence of habitation. Examination of this charred overburden showed that it consisted of crushed charcoal, free of lumps, but probably mixed with some sand. What caused its accumulation was not at once apparent, and even after working through it and under it with inspection of recovered artifacts and features could the answer be more than a hypothetical guess. In the following paragraphs I will attempt to describe our recoveries as they occurred, and will suggest possible interpretations of the evidence.

First let me say that the 3" charred overburden contained only a few artifacts, which are minimal to what lay below. But these few artifacts help identify the cultural aspect of this blackened top layer of charcoal. We recovered from it two large Stemless knives and part of a large pestle, while another member of the Society, digging in the black between our days of excavation, reports having taken from it a well-worked 14" diameter granitic mortar with about a 2" deep hollowed-out center, known as a Shallow mortar. Near it was found a Muller, and from another part of the black a Chipped ax and a crudely worked nondescript blade. Beside these recoveries, in one section of this charred surface layer appeared a number of firestones, scattered about, but no hearths.

As we entered the subsoil, just below the 3" black top layer, there appeared 2 stone hearths, one of which had a crudely worked pestle lying beside it. These hearths were composed of an indiscriminate collection of firestones. They lay at opposite sides of the area near its edges, but appeared to have no connection with the charred overburden.

Several refuse pits were encountered, some reaching depths of 3 feet below the black top layer. They were unproductive as to artifacts for the most part, containing only a few projectile points and a Grooved weight; 2 questionable semifinished stones, somewhat pestle-shaped, also came from the pits. One of the two may have been a long Plain gouge that had become fractured, or was partly finished. Most projectile points, knives, and scrapers were found outside refuse pits in the subsoil, scattered throughout the area. But that which excites the imagination most was the uncovering of red paint burials.

Lying at the central northern section of the area 4 burials appeared, each containing a heavy deposit of red powdered ocher. Three of them lay about 5 feet apart in a triangular formation, while the fourth appeared about 14 feet removed toward the center of the area. All of them were more or less similar, measuring from 18 to 24" in diameter with a deposit of red ocher about 4" deep. This red powder commenced to appear at 4" below the blackened overburden; apparently had no connection with it that could be detected. Unfortunately, no artifacts appeared in any of the burials, and no calcined bone or charcoal was present to offer clues of cultural or ceremonial significance.

Another feature that proved to be of considerable interest was a small pit, which had a discolored whitish area of about 12" in diameter. This occurred only a few inches to the west of one of the three red paint burials of the triangular formation. It appeared at about the same depth as the burials from the black
overburden in yellow subsoil with a depth of fill of 3"; was shallow like all the others. However, its contents were different, for, instead of red powdered ocher, imbedded in the ash-colored outline of the pit, fragments of some dark-colored object could be seen. Upon closer scrutiny, the matted strands of what may have been a woven mat or basket were just discernible. I carefully removed this object in four or five large lumps, which were placed in a box packed with sand. This was taken to the Bronson Museum, where, after preserving the remains with plastic spray, a sample was removed. Then, through the courtesy of Dr. William G. Colby, it was sent to Harry Ahles, curator of the Botany Museum at Amherst College for an analysis.

The report of this investigation revealed that the sample proved to be an organic leaf material of the cattail family, probably Typha Latifolia. This aquatic plant, found wild in rivers and ponds, is the tallest of the cattails. It has long, narrow, smooth green leaves several feet in length, and is known to have been used by the natives, woven into matting, hassocks, and baskets. Charles C. Willoughby, in his *Antiquities of the New England Indians*, has this to say about the making of mats: "Mats for covering wigwams were usually made of flag leaves [cattails], firmly sewed together with twisted cords of bast, the needle used for sewing being often made from one half of the split rib of a deer. Morton says of these exterior mats, some were . . . made of reeds and some of large flags or sedge firmly sewed together with needles made of the splinter bones of a cranes legge with threads made of Indian hemp, which there growth naturally'. Similar flag leaf covering mats from the Algonquin tribes of the Great Lakes region, may be seen in our larger museums. They are made of leaves of the cat-o'-nine-tail [cattail] strung on cords in such a manner that each alternate leaf lies upon opposite sides and covers the junction of two other leaves" . . . "I know of no existing example of this type from New England but there is no doubt of their extensive use in this locality." . . . "A few examples of this matting from New England that have come down to us have been taken from graves where small fragments were preserved by contact with copper or brass." . . . "used for wrapping the body . . . or as protection to the body."

In the northern and southern extremities of the area defined by the black overburden appeared quantities of quartz chips in the yellow subsoil. They seemed to represent workshop deposits, but no projectile point was found associated with them to show culture relationship. Further, because of our enforced method of wholesale excavation by plowing to effect as much salvage as possible before building operations brought our efforts to a close, stratigraphic recordings were impossible. Therefore, the most that can be expected from our excavation is recognition of artifact recoveries typologically. This would link projectile points to the culture positions to which their respective types have been found to belong at other sites, where stratigraphy counted. However, it can be said with certainty that other than those artifacts already reported as coming from the black overburden, the remaining implement recoveries were found in the yellow subsoil. In all, there are 101 recognizable typed specimens, although many are fractured.

Of the Early Archaic period, 5 Corner-removed #5 points—3 of which are beautifully serrated—and one Leaf knife appeared. By far the major part of the assemblage belongs to the Late Archaic occupation, including: 4 Corner-removed#7, 8 Eared#2, 3, 4, 15 Small Triangular#1,4,6, 5 Small Stem, 3 Side-notched#5, 1 Corner-notched projectile points; 2 Stem scrapers; 1 Flake scraper; 1 Stemless knife; 2 Oval scrapers; 1 Grooved weight; 1 Clumsy plummet; and a fragment of a Wing atlatl weight. Illustrated are representative specimens of most of these recoveries (Fig. 15).

Finally, a significant find consisted of 12 potsherds, the larger ones of which indicate that most of them probably came from a Stage 2 pot having an elemental dentate decoration, smooth both sides, and with vegetable temper. Of these sherds, 4 came from the black overburden, while 8 were found just below, probably intrusive from it due to water erosion.

**CONCLUSION**

After discussing with the Editor what interpretation might be made of the evidence, several facts seem self evident. First, since all the stone artifacts, except the few from the charred overburden, as mentioned previously, came from the subsoil, there is every reason to believe that the black overburden was a deposit made at a later date, which had no association with what lay below. Second, since no post molds could be located about the periphery of the black area, this large irregular deposit of charcoal seems to suggest something other than a house floor. For, as already mentioned, this would represent far more black habitation accumulation than has been found at other sites on house floors, which have been identified as such. And third, it would seem that the numerous stone artifacts of the subsoil were there as natural deposits of rather intensive occupations throughout the two Archaic periods. I have no doubt that a continuation of this heavy deposition of artifacts extends away from the relatively small excavated area in the subsoil, which would doubtless...
Fig. 15. SEAVER FARM SALVAGE RECOVERIES. Late Archaic - 1-4, Small Stem, 5-14, Small Stem, 15-17, Small Triangular #4, 18-21, Corner removed #1, Corner notched, 22-24, Corner removed, Eared, 25-27, Corner removed, Side notched #5, Projectile Points; 18, Flake Scraper; 19, Stemless Knife; 20, Eared Drill; 25, Grooved Weight. Early Archaic - 32-36, Corner removed #5, Projectile Points; 37, Leaf Knife.
have showed up if the whole field could have been excavated. The two stone hearths seem to have been a part of this occupational manifestation, probably the Late Archaic, for they appeared just below the black overburden, which seems to have been a later deposition.

It would appear that somewhere along the line, during the Late Archaic when the area was not being used as a camping ground, it was selected as a sacred location for four secondary red paint burials, placed together in a group. And it seems probable that they may have been related to other red paint deposits, nearby, which the bulldozer had exposed on a ridge of land to the south, but which were not dug for lack of time. No doubt the sandy soil of the area was an attraction that made this an ideal burial location. The pit containing the woven object, lying close to one of the burial pits, probably was associated with it in some way. Possibly, it contained a woven sack that held a food offering for the cremated dead.

It now remains, only, to account for the charcoal top layer, which first caught my eye and has been the reason for this report. Evidently, it had accumulated as a result of concentrated burning of wood, and in some way had been subjected to continuous treading that had pulverized it into a powdered mass, free of unconsumed lumps of charcoal. The few artifacts taken from it give some idea as to its cultural association. For instance, the Shallow stone mortar and Muller, together with the broken pestle, presumed to have been used for grinding maize, furnish reliable evidence of an activity of the Ceramic era, which includes arrival of agriculture. In support of this postulation, appearance of Stage 2 potsherds in the charcoal seems convincing evidence of pottery-making, the most significant domestic pursuit of this last culture period. This evidence provides reasonable proof of a Ceramic deposition for the charcoal, which would place it as a superimposition over the earlier Archaic remains.

But beyond its probable culture association, what could have caused this charcoal accumulation? We have already disposed of the idea that it might have been a house floor, which leaves no choice but to speculate as to other possible causes.

At several sites recently excavated evidence of crematories and cremation pits, where the dead were burned, apparently, with appropriate ceremonies, have been reported in the Society Bulletin. At Wapanucket 6 three commodious crematories were located. They were lined with slabs of stone, and contained quantities of charcoal, in which appeared calcined human bone and some burned implements. At Swan Hold in South Carver similar evidence of cremations occurred, but without stone paving. Again at Oak Island on North River a crematory appeared, somewhat smaller than those at Wapanucket 6, measuring about 4 by 8 feet in an oval shape. It contained a foot of charcoal crushed fill interspersed with lumps of charcoal and a few masses of solid charcoal. Here, like the others mentioned, there were bits of calcined human bone, and like Wapanucket 6 the pit was lined with stone slabs—in this case they were of shale. While no burned implements were found in the crematory, in a secondary burial close by appeared burned implements, presumably removed from the crematory. Finally, at Flat River in Rhode Island 4 circular cremation pits were uncovered and excavated. They measured about 30" in diameter, and had charcoal fill of from 7 to 14" in depth, with lumps of charcoal scattered throughout. These pits contained no calcined bone; probably represent the incineration of dried bones, which were completely consumed. However, the pits contained heavily burned stone implements, some of which had been completely incinerated, leaving patches of white powdered stone as evidence.

This review of previously discovered crematories, large and small, reveals different methods of cremating the dead; the larger ones with green bones partly consumed, the smaller pits with dry bones totally incinerated. The former used a stone slab lining at times, the latter, no stone lining at all. However, either closely associated or pit-contained, all produced stone implements with lumps of charcoal mixed throughout the charcoal fill. Using these last mentioned criteria—common to all—as an indicator, we may look in vain for their presence in the charcoal-stained area at the Seaver Farm. Here, no lumps of charcoal occurred, and no burned stone implements of a ceremonial nature. Instead, domestic artifacts appeared: a Shallow stone mortar, Muller, and pestle, Chipped ax, and 2 Stemless knives with no sign of having been burned. A few firestones, also, occurred, but not enough to represent the remains of a crematory. Furthermore, it seems unrealistic to consider the red paint burials, lying 4" below, as justification for the presence of a crematory in the black overburden. For, to be related, it would have to be assumed that the burial pits were dug through the 9" of charcoal fill, introducing traces of it in the burials below, where not a particle was found. Therefore, a crematory hypothesis seems unrealistic.

Looking for another possible clue to explain the charred fill of this report, I recall an article published in the Society Bulletin, Vol. 22, #3 and 4, in which a large deposit of charcoal at the Eaton site in North Reading, Mass., was described. It measured about 20
feet square with an 11" thick mass of powdered charcoal, through which were scattered charcoal chunks, some as large as 1" in diameter. A number of these showed a smooth surface on one side, as though made by a cutting tool of some kind. Recovered from the charcoal were a number of large stone tools, suggestive of some sort of heavy woodwork. Consisting of a Hatchet, Plain gouge, 2 Celts, and a Full Grooved ax, they seemed to indicate the possible making at this location of dugouts, providing reliable evidence of a dugout workshop.

Could it be that the Seaver Farm charcoal area, the subject of this report represents another dugout workshop? In support of this hypothesis, the Seaver deposit displays some similar elements to that of the Eaton site: a large mass of charcoal, 9" depth of charred fill, a powdered condition of the charcoal, and the probable recovery from it of a broken well-made segment of a large stone implement, such as a Celt. Also, the scattered firerocks found in one section of it may have been useful in this industry, as well as the Chipped ax, among those artifacts recovered from it. However, the Shallow mortar and Muller, also taken from the charcoal fill doubtless represent remains of a later occupation, after the workshop had stopped dugout-making operations.

On the other hand, failure to note scattered chunks of charcoal is a negative trait, which tends to throw suspicion on this as being a deposit similar to that of the Eaton site. Nevertheless, it is possible that later occupational activities could have crushed whatever chunks may have previously existed. Considering all phases of this discussion, it seems to me that a dugout-making hypothesis holds the most promise for explaining the charcoal manifestation at the Seaver Farm.

North Middleboro,
September 3, 1970

RESTORING ARTIFACTS

WILLIAM S. FOWLER

Anyone who has searched for the artifacts of early man, and has found them fractured with important segments missing, knows the feeling of disappointment that usually follows. If only the broken imperfect tool could be restored to its original shape and appearance is the thought that at once occurs, but is usually dismissed for lack of knowledge as to how to proceed, or for another good reason. This is the fear of committing an unorthodox act should the artifact of stone, bone, or ceramics be restored. For, many hold to the belief that a damaged find should not be altered, since archaeological evaluations are dependent upon the recovered artifact no matter how battered or fragmentary it appears. And this is correct as far as it goes. But after an interpretation has been made and the site report written, the final disposition of the damaged artifact may then be considered in a less restrained manner. For instance, when such a specimen is to be displayed in a private collection, or what is more important, to be placed under public gaze in a museum, restoration of it to its original shape is desirable whenever possible, in order that one may study it more fully. However, this should be attempted only when there is enough of the artifact available to insure an authentic replacement of the missing part or parts without resorting to conjecture. That is to say, only when by projecting the contour of the fragmented artifact's edges the missing section may be envisioned, and then only when one understands how to proceed. For this reason, and after repeated requests for descriptive information of how restorations may be carried out, the writer decided to put together this report.

While his intent is to render service to those most interested in testing their skill in this rather intricate and patience-trying work, it should be realized that he can only cover the most essential operations. He must leave divergent processing of specially shaped artifacts — of which there are an endless number — to the ingenuity of the preparator attempting the restoration. Independent invention in such cases usually
occurs. For it is expected that anyone aspiring to this exacting work will be an individual with some art ability, and with steady handling of the required tools will have sufficient skill to obtain a satisfactory outcome. Obviously, as with all such work requiring self-mastery of one's faculties, persistence will over the long run ensure improved results.

The equipment required that has been found useful in most cases will now be enumerated at the start of this discussion, in order to provide ready reference when mentioned in the course of the processing directions that follow. Essential tools consist of a small metal spatula; wire-cutting shears; and a sharp penknife of medium size. Material requirements should include: "Castone" powder (dental cement); a tube of quick-drying plastic glue; acetone liquid (a plastic glue solvent for rectifying errors); % mesh wire fly-screening; a small stick spatula, whittled from fine grained wood about 6" long with a %" diameter bit; and a whittled wooden spindle tapered at one end from %" to %" in diameter. Additional equipment is also essential: an open dish rather deep — such as a large clam shell containing water; a glass mug with handle in which to mix the cement with water; and a wet rag, to be kept wet during the restoration and repeatedly washed free of cement wipings — a water tap nearby is a necessity.

A recent exacting restoration of an elbow ceramic pipe, more than anything else inspired this report. It will be described and illustrated after two descriptions of stone artifact restorations have been dealt with. In recounting the techniques as used by the writer, he is aware that, while his methods have proved successful, undoubtedly they are not the only ones that could be followed. However, over years of labor by trial and error he has finally settled on the ones described as being acceptable. They have produced realistic restorations showing beyond a possible doubt what the fractured artifacts originally looked like. And because of this they have enabled the public to get a better conception of primitive implements and products than would have been possible from an exhibit of fragmented artifacts. Of course, perfect specimens are more desirable and are always used in displays whenever obtainable. However, this is not the case in many instances, especially for rare types of projectile points, and, as will be understood from the pipe restoration that concludes this report, for ceramic pipes that almost without exception are recovered in a damaged condition.

**Projectile Point Restoration.** Consideration is first given to these stone projectiles, since they are more numerous and are usually found in most collections. Of course, other related tools could be included in the following instructions such as, drills and knives, as they too are usually relatively thin and elongated. Restoration of all such implements should take place only when the base and some of the blade is in tact — the exception would be in the case of points, when the existing blade itself is of a type identifiable enough to denote the shape of its missing base, such as for a Fluted point.

Restoration instructions are as follows: 1) Make a pencil outline drawing of the basal section to be restored. 2) Project both edges by pencil until they meet at the tip; this drawing represents the missing part to be replaced. 3) If the point is relatively short, proceed by building upon the fractured edge of the blade with Castone cement, using the metal spatula, and wiping off any cement smears on the stone blade with the wet rag. Continue this operation very gradually, trimming and carving with a small sharp knife the cement before it hardens, to resemble the chipscarred base. If the section being constructed breaks off before the point's tip is reached, re-attach it to the stone base with plastic glue, wait for it to dry, and then complete the restoration.

If the point is relatively long, some 4 to 6", instructions would be as follows. After the drawing is made, as before, cut out a piece of wire screening to fit inside the missing section's outline drawing. Next, build up about a %" base of cement on the fractured end of the blade, spread it out and trim with spatula to the blade's thickness. Then immediately place the matching end of the screening in it. Hold it in position until cement hardens sufficiently to keep it rigid in place. From here on instructions for completion would be similar to those found in (3). Finally, painting of reconstructed parts should follow instructions found at the close of the following stone artifact restoration directions.

**Wing Atlatl Weight Restoration.** For this important and greatly sought-after artifact, restoration usually consists of duplicating one of its two wings, generally recovered either in tact or slightly damaged. Invariably, the main fracture occurs through the central %" to %" diameter hole, probably as a result of frost action in most cases. So, assuming the restoration consists of adding the missing wing, including construction of half of the drilled hole, instructions would consist of several steps: 1) First outline on paper the wing to be duplicated, then turn it over and outline it again, thereby forming a drawing of the complete atlatl weight. 2) Dampen the fractured edges about the central hole of the weight with a wet rag and proceed to delicately build them outward with cement, projecting their circular contour. As the
cement starts to harden, carefully cut away excess cement with a sharp knife down to the stone surfaces, keeping them wiped clean. With the spatula continue with the cement to build upon the drilled shell edges, which now should be nearing the point of joining. During this process carefully carve the concavity of the interior walls of the central drilling. 3) After allowing the cement to set but not to harden too much, insert the tapered spindle — first dipped in water — into the partly formed perforation and then cover it with cement, thereby attaching both sides of the shell together. As it begins to dry, carefully twist the spindle slightly, drawing it out at the same time. Extreme care must be used so as not to break the bond of the cement with the stone edges of the atlatl weight. In this way the central perforation is formed. By repeated insertion and twisting of the spindle after each addition of more cement, the hole will be smoothed and finished to size desired. At this stage it is important to keep running a water-soaked strip of rag through the hole to clean exposed stone surfaces. 4) At this point, cut a piece of wire screening of a side to fit inside the outline drawing of the wing to be constructed. Set its base end in wet cement with the correct tilt on the exposed side of the drilled shell and allow to harden. Next, build out the wing with cement, working first on one side of the screening and then on the other. Trim the edges and faces of the form with a sharp knife as the work proceeds, but before cement becomes bone dry and hard, copying by eye the contour and traits of the stone wing being duplicated. Continue in this way until wing is completed.

Painting Directions for all Stone Restorations. Before painting is undertaken, brush a coating of animal wall size — water base — over the entire artifact, of which the cemented constructed sections alone are to be painted, and allow to dry thoroughly before proceeding further. Then, on a suitable palette mix oil paints, using artist's paints thinned with rectified turpentine (high grade). Use special dull white — as used for ceiling painting — to produce pastel shades to match those of the stone. Most shades may be obtained from the following paints: burnt sienna, raw sienna, verdant green, ivory black, and ceiling white. Use of dull-drying black and white is most important to match the usual dull stone surfaces. After painted surfaces are allowed to dry for 24 hours brush a final coating of animal sizing over the entire restored artifact to prevent paint from becoming worn from handling.

Elbow Pipe, Chevron Decorated, Restoration. What at the time seemed like a most unusual pipe fragment was recovered at the Bluff site on Flat River in Rhode Island. In reporting the site in Society Bulletin, Vo. 33, #1&2, an illustrated restoration of the pipe, derived from the fragment, was attempted. After this was completed, it appeared certain that the pipe must have been an exceptional piece of ceramic craftsmanship with a four-sided rim. The illustrated restoration was, of course, the result of eye evaluation, and, although realistic in all particulars, could not be said to be as authentic as a true physical restoration would be. For restored in this way the contours of the fragment would be projected, and, as a pipe bowl is circular in shape, such projections would ultimately meet to form the true shape of the pipe bowl. Also, since the fragment fortunately was from the stem side of the bowl, its lower extremity containing as it did part of the curve where it joined onto the stem, suggested the correct elbow angle.

However, obstacles to a successful restoration seemed to make it prohibitive, as the writer looked them over. The small fragment, all there was to show the pipe had looked, revealed a constricted circumference at the base of the bowl, with less of the bowl's walls to go by toward the rim. But worst of all, these walls were only 1/16" thick, too thin to permit attachment of a wire mesh form as a support for the cement.

On the other hand, several features of the fragment gave hope for success. There was one slightly castellated corner and enough of the rim extending away from it to reveal the bowl's shape at the rim. This rim section was relatively straight, not curved as usual. Obviously, this straight length of rim would have to terminate quickly to be part of this small pipe bowl's circumference. By projection on paper it was found that these features would have to produce a four-sided castellated pipe bowl at its rim. This feature together with the fragment and elbow pipe, which was finally restored from it — details of restoration follow — have been illustrated for a better appreciation of the undertaking and of the outstanding traits of the pipe (Fig. 16).

Without a wire mesh form to build upon, the alternative was to gradually, with Castone cement and spatula project, step by step, the existing edges of the fragment, but no more than 3" at a time. First the stem was constructed at a tilt from the bowl, as indicated by the curve at base of the fragment. At the start enough of the base of the pipe's bowl was constructed to find out how large around to make the stem. And at this stage a fine whittled stick was inserted in the wet cement to commence formation of the perforation, which would in the end extend
throughout the stem. The stick, obviously, was not left in the cement, but was twisted slowly and gradually withdrawn as the cement began to dry. Then it was repeatedly inserted again and again, to keep the hole from collapsing. In this way the stem was completed.

Fig. 16. ELBOW PIPE FRAGMENT AND ACTUAL RESTORATION MADE FROM IT. 1, Pipe Fragment; 2, Projection of Rim; 3, Pipe Restoration, showing position of fragment.

Now the most difficult operation had to be faced, that of constructing the bowl with its thin 1/16" walls. These alone had to support the wet cement, patch by patch, as the bowl was cautiously constructed by projecting the curves of the fragment. At this point the small wooden spatula was used to treat the inside surface of each patch of cement. By first dipping it in water and then laying it carefully against the partly hardened cement, it re-softened the inside surface and allowed it to be spread out and smoothed without breaking the bond between the patch and the edge of the bowl's walls. Work continued of patching, which kept the cement moistened enough, so that it did not become thoroughly dried out into a hard unworkable condition. Now the small sharp blade of a penknife was used to carve the concavity of the inside bowl walls, and so reduce their thickness to the required 1/16" dimension. As an approach was made to the rim, projection of the fragment's upper section produced a perceptible flare to the bowl, which is an unusual trait for ceramic pipes from New England. Continuing in this way, restoration of the pipe was completed, except for extension around the pipe bowl of the chevron incised design, as found on the fragment.

Contrary to the regular practice of completing required design work in wet cement during restoring operations, in this particular case it was left till after the cement had become fully set and as hard as stone. This delay was necessary in order to keep the incised work under better control because of the small size of this thin-walled object. For this part of the restoration a projection of the design was pencilled in on the bowl, in which eight separate chevrons were found to be involved. Next a suitable stylus of a size to fit the original fine lines of the fragment was made. A large needle firmly set in a small wooden handle and broken off about a half inch above the handle seemed ideal. It had a few sharp concealed projections, which proved important incisors in biting into the hard cement. With a wet rag the surface to be worked was dampened, which softened it just enough to allow the stylus to make the necessary incisions. And in this manner the pipe was completed, except for the painting of the reconstructed areas. This work was accomplished using the same paints, and applying them in the same way as recommended for restoration of stone implements.

CONCLUSION

What now can be said about this unusual pipe to identify it with the culture period to which it may belong? At once we are impressed with the fine hard-fired ware of the fragment with an imperceptible fine mineral temper, if present at all. This should represent extreme skill in the ceramic arts, doubtless coming toward the close of generations of effort in the field of ceramics. And then attention is called to another outstanding feature: the four-sided bowl opening with slightly castellated corners. Such a style is seldom found among pipes of the Northeast. But still another equally unusual trait is the outward flare of the bowl from bottom to top. This seems reminiscent of the Iroquoian Trumpet pipe. And finally, the incised filled-in chevron design represents a motif frequently found on pottery of the last ceramic development, Stage 4.

When considered altogether these traits would seem to indicate a late date for the pipe of perhaps about 1600. At about this time New England pottery was Iroquois-influenced, displaying the collared castellated rim feature along with several kinds of chevron design motifs. Therefore, it would appear consistent that this tendency to follow Iroquoian art would also appear in ceramic pipe-making, presumably an industrial activity of the women, who were the potters. Perhaps the most convincing feature to suggest
RESTORING ARTIFACTS

this culture association is the flaring pipe bowl, similar to but less extreme than that of the larger Trumpet pipes of the Iroquois. However, the modified features of this report's fragmented pipe — its four-sided mouth opening and more moderate trumpet flare — would seem to suggest local work of a New England potter. Therefore, the culture to which it probably belonged is late Ceramic Iroquois-influenced at about the time of the coming of the whites.

Bronson Museum,
January 28, 1972