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CONTENTS

"RED PAINT TOMBS" IN MAINE
Douglas S. Byers .......................................................... 1

A PROPOSED ARTIFACT CLASSIFICATION
William S. Fowler ........................................................... 9

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The new classification system which is published in this number of the Bulletin was prepared by the Classification Committee of the Research Council in response to a considerable demand from our membership. It is the result of several months of intensive study and is based upon implements from several New England sites as well as the twenty odd thousand projectile points in the Museum of the Society. Sketches of complete implements have been used in place of the geometric outlines of prior classifications as many have reported difficulty with the latter method of illustration.

It is an invariable rule that whenever one offers a classification system one must hasten to disclaim any intent to present a "blueprint" from which the aboriginal flint knapper worked. At best any such system must be considered only as a means of reducing to simple form the description of any given group of stone implements. Everyone who is familiar with primitive artifacts is aware that the shape and size of these implements is a result of certain inherent limitations in the material used, in the technique of manufacture, and in the use for which the implement is intended. One can only select certain patterns which seem to be repeated again and again with minor differences and to assume that these patterns represent common types. Many aberrant forms will be found which are difficult if not impossible to include within the classification. It is thought that such aberrant forms have little significance and may be disregarded without effecting the final result of a classification. One must use this classification with restraint and judgment considering it as a guide and not as an all inclusive system. It is hoped that the individual members will make use of the terms suggested in order that future descriptions may easily and quickly be understood by all who read our articles.

We acknowledge with thanks the loan of a manuscript entitled "Aboriginal New England Pottery" by our late friend and co-worker Mr. William J. Howes of Holyoke. This profusely illustrated manuscript was submitted at our request by the estate of Mr. Howes and it is our intent to publish it in serial form in later issues of the Bulletin. Also we are holding for future publication an article by Gerald Dunn in which he describes a "grinding stone" from Maine which is very similar to those described in "The Indian Rocks of Cape Cod" by Howard Torrey; and an article by William S. Fowler entitled "Agricultural Tools of the New England Indians." The Editor will welcome additional articles by the membership on appropriate subjects.
By DOUGLAS S. BYERS

In late June of 1935, a gang of men gathering rocks for the foundation of a new highway at The Forks of the Kennebec went to the "old rock pile" in what was always called "the John Holway pasture." After they had removed a good many loads of field stone that had been thrown there when the pasture was cleared, they were startled to find laid up dry masonry of what appeared to be split and dressed stone. With growing excitement they dragged away the field stones and soon could see that they had uncovered a wall in which there were two vaulted openings (Fig. 1). What else but a tomb! Why of course! It looked a lot like the tomb in the cemetery down in Solon. Dug into a low hill. Doors rotted away since it was built. Surest thing in the world it was a tomb.

Who built it was the next question. The Ancients must have done it, because nobody remembered anything about the place except that it had always been called the "old rock pile." In the words of William B. Brown, of Madison.

"In the first place, the oldest inhabitant of this region, so far as can be learned, has no recollection or knowledge of this mysterious masonry, or that any old settler ever had an out-door oven, or built kilns in order to extract lime or iron from the elements.

"To Wilson J. Holway, the local merchant, near seventy years of age, who always lived at The Forks, this strange pile, completely covered with earth and stone during his entire lifetime, is a gruesome enigma; although he was born on this farm, and as a child, played on and about the rockheap that crowned a hidden split-rock wall 14 feet long, 5 feet high, and pierced by two stone-lined crypts.

"This rock-pile, circular in form, is something like twelve feet high, roughly cone shaped, and this pierced wall was at the bottom of the mound, somewhat easterly of the centre of its base, and, facing toward the rising sun. Last month, while hauling road material from the easterly side of a supposed rock pile, after entering and removing earth and stones for a distance of 17 feet from the edge thereof, workmen suddenly were confronted by a well-lain stone-wall containing two rock lined chambers, and extending back into the knoll, nearly eight feet.

"Now the rock strata in and about The Forks consists of calciferous slates alternating with buff limestones from one-half to a foot in thickness, but, has no outcrops of bog iron nearer than Sebac Lake. Limestone is plentiful here, as in most towns in Somerset County. But, after a white man, entailing much labor and skill, has built himself a splendid double-kiln, without smoke vents or draught openings therein, why should he obliterate his handiwork under an avalanche of earth and loose stones? There must have been something like 100 truckloads of material removed from the side of that mound before reaching these tombs. There is evidence of ancient fires at and near these openings—sacrificial fires of savages, perhaps, burning Hematite to dress the graves of the dead.

"A mysterious race known as the RED PAINT PEOPLE OF MAINE, some thousands of years ago, occupied the Kennebec Valley from Moosehead Lake as far south as Winslow and Oakland, where Red Paint Cemeteries have been opened, disclosing graves, enclosing symmetrical stone tools and weapons intermingled with powdered red ochre—a peck or more in each grave. There is no instance, heretofore, of these natives preparing other than earth burials; yet, there is a large quantity of red ochre, in and about these twin-crypts, if crypts they are; and to cap the climax, Carl Weston of Anson, well known as a relic-hunter of artifacts of the RED PAINT PEOPLE, dug out of this wall, a paint encrusted, spearhead, some three inches long, and of the leaf-shaped type similar to those found in the burial places of the famous but little known RED PAINT PEOPLE OF MAINE."

There were those in the Kennebec Valley that took a much less romantic view of the whole affair, and were inclined to believe that the structure had been a kiln or furnace, but their voices were soon drowned out. In fact the WPA publication MAINE: A GUIDE DOWN EAST, bestowed its somewhat questionable blessing on the opposing view idea by proclaiming the structure a "Red Paint (Indian) Vault."

Now all this had occurred in spite of the fact that the place was examined and pronounced not a tomb. Almost immediately after the discovery was made, Dr. Amanda K. Coomaraswamy, of the
FIG. 1
Lime kiln exposed under pile of field stones at The Forks of the Kennebec, Maine, 1935.

FIG. 2
Seven rills or ridges in front of the lime kiln.
Boston Museum of Fine Arts, wrote from his camp at Caratunk to Donald Scott, at the Peabody Museum, reporting the find. Fred L. Marshall, who owned a hotel and some very excellent cabins at The Forks, wrote the Museum by the same mail. Rev. Arthur R. Macdougall, Jr., and Mr. Robert C. Moore, both of Bingham, wrote to Mr. Moorehead. Mr. Meddo, then Road Commissioner, was good enough to hold up work, but as this was over the Fourth of July no one felt put out. Frederick Johnson and I went to The Forks on the 8th. We talked with people who had found the structure. We examined the walls, and floors of the chambers, and found what we took to be slag, burned slate, and other evidences of very hot fire. We found red ash and cinder, but no red ochre, in test pits dug in front of the doors. In the course of our examination we found no evidence of Indian activities, nor did we find any artifacts although we searched diligently for them. None of the people with whom we talked knew anything about any implements having been found. Samples of materials that might be indicative of the former use of the chambers were taken back for analysis. A mineralogist identified the samples as slag, or stone that had been greatly altered by heat. Seven rills or ridges were noted leading from the front of the structure toward the brook. We did not investigate them thoroughly, but hazarded the opinion that they were either used in conjunction with the structure, or had resulted from use of the field as a garden (Fig. 2).

There was little romance in our report. After a very long hard winter people in Somerset County seemed to want it. Our suggestion that historic records might uncover something bearing on the structure were received by romantics with a "So what?" attitude. So far as I know, no local historian ever followed up the lead. Red Paint Tomb it was, and Red Paint Tomb it probably will be for generations to come, except for the more broad-minded members of the community, who alas, are accorded very little space in the press.

On December 11, 1952, Mr. Thomas M. Pitkin, Historian, National Park Service, attached to the New England-New York Inter-Agency Committee, wrote me asking for information about the structure at The Forks. I sent him all the information that we had, and he departed for Portland, and the Maine Historical Society. Within a very short time he wrote that he believed that he had succeeded in pinning down the structure, although the evidence was entirely circumstantial. I take the liberty of quoting from his letter. After noting that there was no settlement at The Forks prior to 1822, Mr. Pitkin goes on as follows:

"In 1838 Charles T. Jackson, State Geologist, visited The Forks and examined a ledge of limestone rock on the property of Charles B. Foster. Laboratory analysis showed this rock to be suitable for producing hydraulic cement.

"In his published report Mr. Jackson listed his analysis of a sample of stone from The Forks along with more than 50 other samples of limestone from other places in Maine. In a chapter entitled 'Agricultural Geology' he encouraged farmers having useful limestone on their property to make their own kilns and burn their own lime. He supplied them with descriptions of kilns suitable for the purpose and of the necessary technique.

"It seems quite likely that there are other lime kilns of this or earlier periods in Maine that might be more worthy of attention. Lime burning began in the Waldoboro-Thomaston area along the coast as early as 1733 and still constitutes a major industry. In fact, Jackson secured sketches of kilns as used in the Thomaston area in the 1830's for his report.

"Another point worth considering in this connection is that old lime kilns in Maine or elsewhere may be again mistaken for structures of Indian, Norse, or even Irish origin. A little professional publicity for the available facts might help to forestall some romantic theorizing. Since you suggested that you might prepare an article on the structure at The Forks, I am enclosing pertinent notes from my recent research on the subject in the hope that you may find them useful.


"At the house of J. B. Smith, three miles above the Forks of Kennebec, 1½ P.M., 11th July (1838), barometer 28.790, T. 82°. The road (south from Moose River) gradually descends over a series of rounded hills, covered with mixed hard and soft
wood forest trees. A small deposit of bog iron ore occurs on the right hand side of the road.

"11th, 2½ P.M., Forks of Kennebec, Burnham's tavern, barometer h. 29.264, T. 82°, t. 27° cent.

"When we had completed our measurements, I was called to examine a ledge of rocks one hundred rods east of Burnham's hotel, belonging to Charles B. Foster, Esq. This ledge has for a long time furnished the people with whet-stones and owing to the fineness of the grit, it answers very well for that purpose. On examining the rock, however, we found that it effervesced freely with acids, indicating a large proportion of carbonate of lime. The hill is about one hundred feet high—presents an abrupt precipice, composed of alternating strata of buff colored limestone and green calciferous slate. The limestone alternates with the latter rock in strata from half an inch to a foot in thickness, and forms nearly one-tenth of the mass of the hill. The strata fall asunder when broken out, so that there is no difficulty in separating them. Mr. Foster has obtained slabs nine feet square and one foot thick, with great ease.

"It was at first supposed, from the effervescence of the rock with acids, that it could be burned for lime; but on making a chemical analysis of it, I found that although it contains lime enough for that purpose, it also contains ingredients that will run into glass at a white heat, and hence foresaw that it could not be readily made into lime. The most calcareous portions, if carefully burned, will slake into a brown lime; but I should not recommend it to be used for that purpose, since it is so much more valuable for another article, which I have discovered could be easily made of it.

"When burned at a red heat, it does not slag, but beyond this temperature, runs into a dark green glass. Burned at red heat, it does not slake with water, but when ground to powder, makes with sand a cement that hardens under water. By mixing fifteen per cent of clay and ten of manganese, the cement becomes fully equal to the hydraulic cement imported from England, which sells at from six to eight dollars per cask, in Boston. This substance is now in such universal demand for making waterproof canal locks, dams, culverts, cisterns, cellars and aqueducts, that it cannot fail to become a most important discovery to the people of Maine, to find so good a cement in the State.

"2. Jackson, Third Annual Report, pp. 174-78 (Section in a chapter, 'Agricultural Geology').

"Remarks on Limestones

"A tabular view of the chemical composition of each variety of limestone, analyzed in my laboratory during the present year, is herewith subjoined (here omitted). From this table, it is easy to fix the relative values of each kind of rock, and to learn how they will burn in the kiln . . .

"Under the description of each locality, I have made ample observations on the nature of the limestone, and shall here present some views or plans of such kilns as may be required for the conversion of the rocks into quicklime.

"Fig. 1st. Kiln built of refractory rocks, lined with clay, and laid outside with mortar - fifteen feet wide - fifteen feet high - five feet back. Arches—middle, five feet high—side arches, three and a half feet high (Fig. 3).

"This kiln is of the form commonly used at Thomaston, and the lime is burned by means of wood fuel—thirty cords of wood being required to burn the charge of rock. The operations are divided into four turns, and from three to four days and nights the fire is kept unremittingly in action. At the close of the operation, the limestone is found to be converted into caustic lime . . . It is necessary, in case the rock is liable to slag, that it should be broken into pieces of pretty uniform dimensions, or at least, care must be taken to place the larger masses near the fire, and the smaller ones more distant from it. The arches are to be built up of large angular pieces of the rock, not more than six or eight inches in diameter, and they must be laid loosely, so that the flame may penetrate freely through them, and act upon the superincumbent mass of broken lime-rock. I have seen some persons break the limestone in the kiln. This should never be done, for the small pieces fill up the interstices in the charge, and prevent the passage of flame and heated air, required for the draft of the kiln.

"In laying the arches of limestone, make them coincide with the arches of the kiln—pack the pieces so as to allow the passage of the fire, and lay the limestone in a very loose manner, until the kiln
FIG. 3
Lime Kiln for burning 300 casks of lime at a time. (Based on C. T. Jackson, Third Annual Report on the Geology of the State of Maine.)

FIG. 4
A smaller kiln. (Based on C. T. Jackson, Third Annual Report on the Geology of the State of Maine.)
Mr. Foster's structure had very small ports.

Remains of a lime kiln near China, Maine, found by Ed. Cammage.
is half full. Then you may throw in the smaller pieces in confusion, and fill up the kiln to the top. This being done, place your fuel in the arches and kindle your fires, and drive them until the lime is sufficiently burned, which may be from three to four days and nights, according to the kind of rock, and the intensity of the fire.

"A smaller kiln may be required in some towns, and in cases where the farmer burns his lime for his own use only. I therefore, herewith present a plan for such a kiln (Fig. 4).

"This kiln is of a cylindrical form, rather wider outside at the bottom than at the top, so as to give it more solidity. It is ten feet high, and five feet in diameter at the top, while the bottom internally contracts a little, so as to support the charge . . . The time required for the burning of lime, varies with the different kinds of lime-rock, and hence it is alone to be learned by experience in a particular case, and with the kind of kiln with which the lime burner is acquainted. One or two fair trials, will teach any intelligent man how to do the work in a proper manner.

"Silex, when chemically combined with the lime and oxide of iron, forming what are called by chemists silicates of lime and iron, produces a hydraulic limestone, liable to melt at a full white heat. It is frequently a valuable article for making hydraulic cement, and abounds in several places in the State, especially at Machias, and at the Forks of the Kennebec river. Many of the rocks described in the catalogues appended to this Report, as calciferous slates, will also make hydraulic lime. They may be burned at a red heat, but beyond that temperature run into a deep green glass or slag."

Although the evidence is all circumstantial, the circumstances seem to knit together very closely. Dr. Jackson's plan and dimensions fit closely with the structure at The Forks. We note that Dr. Jackson warned of the need for care in charging the kiln. We note that the structure as we found it had no flue or other opening above the chambers, but that it was filled with loosely laid slabs of stone. Finally we note the evidence of fire around the structure.

In view of all these circumstances it seems not unlikely that Mr. Foster copied Dr. Jackson's plan for a kiln, but that he made the side ports too small and omitted the central one. One might guess that he then charged it without using the care that was required, and that as a result the rather refractory stone did not burn as it should. Possibly small ports (Fig. 5) and the lack of a central one meant that there was neither enough draft nor enough fuel to complete the process. Probably the hard wood made a fire that was sufficiently hot to melt a small amount of the rock into glassy slag, but the heat did not travel well because of the poorly laid charge. Whether Mr. Foster or the fire generated the great heat that left its effects at the entrance to the chambers we will never be certain. If, as we suspect, his efforts to burn lime were unsuccessful, there is small wonder that he heaped field stones over his kiln and passed no story on to his heirs. He would want to forget it.

Other structures of this general category are to be found in Maine. Some are known, doubtless others are forgotten. Figure 6 is a photograph of one that was found not far from China, Maine. Wherever limestone is to be found one might expect such structures. As knowledge of their true use dies with the older generation they will be discovered on abandoned farms, and as Mr. Pitkin has suggested, people will build theories about Norse or Irish settlers if they can't drag in RED PAINT.
A PROPOSED ARTIFACT CLASSIFICATION

By William S. Fowler

PROJECTILE POINTS

During the past fourteen years, two attempts have been made to classify projectile points. Volume II, No. 4, Bulletin of the Massachusetts Archaeological Society published the last classification system by Benjamin L. Smith. It called attention first system by Ripley P. Bullen. Since then Vol. XI, No. 4 has become exhausted, while the demand for a projectile point classification from an ever growing Society membership continues.

As Chairman of the Artifact Classification Committee of the Research Council, I have been asked to attempt again a classification system modeled after the successful method as used for other classes of artifacts being presented in this Bulletin issue. That is, instead of using outline shapes to show the basal half of projectile points as heretofore, it is now proposed to illustrate, in full detail, representative specimens selected from some twenty-five thousand or more pieces. These points come from the Connecticut, Sudbury, and Taunton River Basins of Massachusetts, as well as from the Narragansett Bay drainage of Rhode Island. They do not specifically include material from Cape Cod and other regions of the State, although to judge from published illustrations of points from these other areas, most forms as illustrated will apply with but a few minor modifications required.

In developing this new classification, excavations during recent years have added to our previous knowledge, with the result that it now seems desirable to be guided to some extent by culture affinities as well as by styles of projectile points in determining where to draw the line between recognized type groups. This improved and simplified classification system is recommended for use in cataloguing collections and in reporting recoveries. It has attempted to disturb the Smith classification as little as possible by adhering to all type names and numbers that have been approved for inclusion; and by deleting only such items as are now found unnecessary due to slight variations that have no significance within type groups. This system has been thoroughly tested in actual reports and found to be workable without danger of confusion through multiplicity of terms and qualifying affixes.

TRIANGULAR forms are presented first for consideration. It has been found that these points may be divided into two groups, designated as Large and Small. Medium sizes seem to have no cultural significance and will be found to fall into either group depending upon their basal widths. Accordingly, it has been established that those specimens which measure 1” or less between basal points should be considered as SMALL TRIANGULAR forms, regardless how long they may be, while all those that measure more than 1” in width should be termed LARGE TRIANGULAR. In the case of the latter, variations in shape, although they occur, have no significance culturally and therefore do not need to be referred to separately; accordingly have not been numbered. However, in the case of Small Triangular points, some of the variations are culturally significant and therefore all have been numbered. In the former classification, No. 2 is believed a variation of No. 3 and has consequently been omitted. Also deleted is No. 7 because it is a questionable form; No. 8 because it is an infrequent Large Triangular variation; No. 9 because it is a variation of No. 4; and No. 11 because it almost never occurs and is thought to be intrusive.

CORNER-NOTCHED comes next, and since all variations in this category appear in the same cultural horizon, they are not considered individually important; therefore, are not numbered.

SMALL STEMMED forms have many varied shapes that are not believed important determinants. Rather, if the point has some sort of a recognizable stem even though it may be side notched, and is 1½” or less in length, of reasonable breadth, it should be considered to belong in this group. These forms, unquestionably, were arrow points intended for small sized game, and were used extensively with the introduction of the bow and arrow.
### FIG. 7
Proposed Projectile Point Classification.

<table>
<thead>
<tr>
<th>Category</th>
<th>Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Triangular</td>
<td></td>
</tr>
<tr>
<td>Small Triangular</td>
<td></td>
</tr>
<tr>
<td>Corner-Notched</td>
<td></td>
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<tr>
<td>Small Stemmed</td>
<td></td>
</tr>
<tr>
<td>Bifurcated</td>
<td></td>
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<tr>
<td>Long-Eared</td>
<td></td>
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<tr>
<td>Truncated</td>
<td></td>
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<tr>
<td>Diamond</td>
<td></td>
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<tr>
<td>Leaf</td>
<td></td>
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<tr>
<td>Fluted</td>
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<tr>
<td>Tapered-Stem</td>
<td></td>
</tr>
<tr>
<td>Eared</td>
<td></td>
</tr>
<tr>
<td>Corner-Removed</td>
<td></td>
</tr>
<tr>
<td>Side-Notched</td>
<td></td>
</tr>
</tbody>
</table>
BIFURCATED, DIAMOND, LEAF, and FLUTED types remain unchanged from the former classification.

LONG-EARED is a new heading, under which is placed the type previously termed “Bossed,” as well as a new entry showing relatively long basal ears. It now appears that the so-called bosses, referred to before, are no more than enlargement of shoulders, which in the second specimen are less pronounced, but more pointed. However, both specimens have relatively long well developed ears, and it is believed that this characteristic is the more diagnostic and should, therefore, suggest the type name.

TRUNCATED is now being used for only one style, since it seems to suggest the wrong connotation for all other forms. In the former classification, truncated No. 3 and No. 4 show unusual precision in square cut shoulders found only in rare instances and presumed to be intrusive; while No. 1 and No. 2 are now included under the new heading that follows for reasons that will become apparent.

TAPERED-STEM includes all forms that have a tapered shank regardless as to whether the basal sides are straight or convex. This type almost never has a truncated base; rather is found with an irregularly shaped base that is even rounded at times. For this reason it has been taken out of the “Truncated” class and given a new name suggested by the tapered stem that is common to all variants in this class.

EARED points are all those with well defined basal points by virtue of side notching and a slight concavity of the base. This class includes all previous numbers, as well as one additional, No. 5. This latter specimen has basal points that are less noticeable on account of the lack of side notching in most specimens. Nevertheless, the cultural position of this style with eared points in the same horizon together with occasional appearance of ears as a result of slight side notching leaves little doubt that ears were intended. When Eared No. 4 appears in a small size, it should not be classified as a Small Stemed point, for it has cultural significance as an eared point.

CORNER-REMOVED forms remain the same as formerly, except item No. 4, which has been omitted, since it is thought to merge with style No. 5 that has the dominant shape for this type in the culture horizon to which they both belong: Early Archaic. Another exception is former item No. 6, now omitted, for it is believed to merge with style No. 3; its extreme length of stem is not thought to be diagnostic except for foreign cultures. Therefore, any stem length is now considered to belong to style No. 3. Stems are slightly rounded at times, while at others, they are somewhat truncated.

SIDE-NOTCHED points follow those styles formerly classified except No. 8, which appears infrequently and is believed intrusive; therefore is omitted.

It will be observed that in numerous cases, style numbers have been repeated wherever important variations of a particular style occur. Further, it should be pointed out that for all type groups except Triangular and Small Stemed, specimens may be large or small provided they have the required basal characteristics and resemble in body proportion illustrated specimen of the type involved. In the case of a Diamond point, it differs from Corner-removed No. 8 in that it has no shoulders, whereas the latter does.

SPEAR POINTS DEFINED. For many years the question of what constitutes a spear point has been the subject of much discussion. In the wake of many attempts to identify spear from arrow points, usually by the simple formula of length, alone, we offer the following comments resulting from recent investigations. First of all, it must be remembered that there were at least three kinds of spears: jabbing spear (retained in the hand with presumably a relatively thick shaft); thrown spear (javelin in reality with a longer and thinner shaft); dart (small javelin with shortened and proportionately thinner shaft).

In determining what points would be most suitable for any of these spears, qualifications other than length must be considered. First there should be breadth of base up to about 1”, sufficient to accommodate a ½ to ¾” shaft; narrower bases of ¾ to ⅞” in width should be more suitable for arrow shafts. Then there should be a reasonable body thickness of projectile point to withstand the heavier work of spearing. Furthermore, the blade should be relatively broad in most cases, except where increased length compensates for narrower
proportions, as in the case of fish spears. On the other hand, a few blades have all requirements except their stems are narrow, for example, Corner-removed No. 5, No. 8, and No. 9. Regardless of such narrow stems, these styles should probably be considered as spear points, since they belong to the Early Archaic horizon before bows and arrows were introduced. If we could know how these points were hafted, we would then learn the reason, no doubt, for their narrow stems. (Explanation of the probable method of hafting is contained in the Twin Rivers report, Vol. 14, No. 1, Bulletin of the Massachusetts Archaeological Society). As for required length of blade, a projectile point may be only 1" long and still be a spear point if it has the desired breadth of base and body; or it may be 3½" long, as in the case of illustrated Corner-removed No. 1. As a matter of fact, of the 57 illustrated specimens, 36 are thought to be spear points. However, this should not be taken to mean that there may not be corresponding arrow point forms of those types appearing in culture horizons after the introduction of the bow and arrow; lack of space has prevented the showing of such smaller points, wherever they are not present in the Small Stemmed group.

In classifying specimens, there seems to be no need of indicating size, except in the three categories where size is a requisite. The important thing to watch is that basal characteristics and body proportions should resemble those of the type in question, for such traits determine their culture affinities. Furthermore, it will be found that body shapes follow rather closely illustrated type specimens, that is proportionately, and there is no need, therefore, to use affixes denoting arbitrarily conceived body styles as formerly suggested.

**KNIVES**

Since knives are believed to be somewhat diagnostic as related to cultures, the Artifact Classification Committee of the Research Council has considered it highly important that a classification of knives be developed in a similar way to all other classifications appearing in this Bulletin issue. Illustrations of actual specimens have been made and type grouping attempted, notwithstanding a former brief classification of knives presented by Benjamin L. Smith in Bulletin of the Massachusetts Archaeological Society, Vol. XI, No. 4. Objection has been raised to the Smith method of using type numbers for identification of classes, rather than descriptive names suggesting the appearance or end use of the type in question. Furthermore, it has seemed unnecessary to reduce the classification to such an intricate array of qualifying conditions of chipping as is required by the former method.

In general, it now seems apparent that knife contours have much more to do with separating one type from another than do conditions of chipping. Most knives should be cerated on at least one cutting edge that is usually retouched to produce the desired result. Exceptions are the Ulu (semilunar knife), which has a ground blade without cerations, and the Roughing knife with coarse primary flaking. Many specimens show wear from usage along the cerated edge, and may be identified in this way. Those with stems are usually asymmetrical with points that are usually ill formed and blunted. Most specimens are relatively thick, except when made from argillite or slate as in the case of ulus and certain chipped stemmed blades. Stone materials in most general use are: quartz, quartzite, felsite, argillite, and slate, while flint appears infrequently.

While it probably would be impossible to include all variations of the stemmed and stemless types in any classification, it is believed that illustrated styles represent those that appear most frequently. Size is not set up as a necessary requisite; any size knife, no matter how small, may belong to any classification, except possibly the Leaf and woodworking forms, provided it has the required shape. However, variation of shapes within a type group is not thought to be of sufficient significance, except for Stemmed knives, to identify them by number. Rather, reference to types by name only, but for this one exception, seems entirely satisfactory, since types rather than style variants, allowing for this single exception, have cultural significance wherever relationships are found to exist. Description of each type that follows will attempt to point out salient characteristics which determine class position. In the case of Stemmed knives, attention will be called to those variants having diverse cultural affinities.
FIG. 8
Proposed Knife Classification.
STEMMED knives form, perhaps, the most well known class for the reason that they are believed to be associated with the last two main culture periods. All variations within this class have stems that are well defined. At times they assume marked wide side notching. Generally, however, they have tapering stems of various lengths. Their points are usually blunted, although at times they are rather sharp. In most instances the asymmetrical placing of the point is quite noticeable. In this group, flint appears occasionally as a stone material; is usually absent in other classes. Styles No. 2 and 3 have been definitely linked with the Stone Bowl age and are believed diagnostic of that period.

STEMLESS blades differ most from stemmed knives in that they have an expanded base in place of a stem of any kind. Their points are placed asymetrically and their shapes are apt to be elongated. While specimens selected for illustration are medium in size to save space, much larger ones exist; are sometimes called cache blades; or expanded base knives as noted in reports from Cape Cod; or otherwise. However, if they are for the part asymmetrical in shape, regardless of size, and have a reasonable extension of blade toward the point, then they probably belong in this category.

LEAF knives are distinctive in that they are usually medium to large in size with well worked cerations, often uniform in distribution, on all cutting edges. In these respects they differ most from Stemless knives which, more often than not, occur in small sizes. Leaf blades have shapes that approximate an ovate form by virtue of a base that is frequently decidedly convex, apparently so worked to produce an eliptical curve. At times there is slight basal notching to indicate use of base as a shank, but never more than just a suggestion. Rarely the base is somewhat truncated as illustrated, but in such cases, as well as for all variants in this class, blades should be symmetrical or nearly so to qualify, with eliptical curves being described by edges that reach to the point. Knives in this class are sometimes referred to as ovate knives.

ROUGHING knives are thought to be woodworking tools for the roughing out of handles and shafts in the hafting of stone implements. I have found them essential in this respect and capable of cutting away unwanted areas of sticks when green to straighten and shape them into useful handles. They have also been used successfully by me to cut down saplings of suitable shaft and handle dimensions, and have been found more suitable for this work than stone axes, as described in “Stone Age Woodworking in the Connecticut Valley of Massachusetts,” Bulletin of the Archeological Society of Connecticut, No. 20. These blades have rough cerated primary flaking; relatively thick with thinning sides; and may occur in most any shape in which they may have originated in blank form.

ULU, or as previously called semi-lunar knife, is a ground thin slate blade. Chipped forms occasionally occur and are thought by some to be ulus in the making that have failed to reach the final process of grinding. This unique knife carries the name of its Eskimo cousin which is somewhat similar but without a well defined enlargement of the backbone. The New England ulu may be of several shapes as shown, but invariably has a sort of handle or enlarged ridge along the top. When this is well cut out in sharp relief, sometimes decorated with cross-hatch or otherwise, it is referred to as a comb-back. However, there frequently appears in its place an enlargement that is left in the rough, showing original pecked over area. Another variation occurs in instances where instead of an enlarged backbone, or in addition to it, there appear two or three perforations either drilled or cut out by rubbing, apparently used in the attachment of knife to handle by thong lashing. This knife comes in all sizes although medium sizes have been selected for illustration for lack of space.

NOTCHER is a specialized woodworking tool that I have identified as having been used most likely in notching the ends of spear and arrow shafts, as well as handles for the insertion of stone artifacts when being hafted. These woodworking knives usually have but one well defined cerated edge, not too carefully retouched, which is comparatively straight, $2\frac{1}{2}$" in length, or longer. Usually, blades are flaked into definite shapes that at times seem to repeat, but not always. The most frequent style has a more or less triangular shape which may or may not be pointed. Blades are relatively thin depending upon the width of stone artifact to be hafted; and when used, exhibit extreme wear on the cerated cutting edge. Relatively thin quartzite
pieces furnished the blanks from which most of these tools are made, as illustrated, although other stones such as quartz and sandstone have been used on occasion. In general, it may be said that there should be at least one truncated end to serve as a finger rest and thus provide the proper grip for hand use.

It is believed that these few knife types represent the chief categories into which all variable knife styles may be placed. Therefore, the Committee recommends their use in classifying and cataloguing specimens.

**DRILLS**

For some time there has been a growing demand for a feasible method of identification by which various groups of artifacts might be more easily recognized. The Research Council of the Society has now deemed it advisable to introduce through these pages illustrated classifications of artifacts which it is hoped will be readily understood and remembered by Society members. We believe that these suggested artifact classifications are practical proposals, and it is hoped they will be favorably received. It is our desire to present a system of artifact identification in each case that may be readily used by different members as a standard, in an effort to effect mutual understanding during discussions and comparisons of artifacts.

Acting as chairman of artifact classification, and with the approval of the Research Council, I have undertaken, first, the classification of drills, or as they are sometimes referred to, perforators. In 1943 Ripley P. Bullen offered a proposed drill classification in Bulletin of the Massachusetts Archaeological Society, Vol. 4, No. 3. However, since this system does not adequately illustrate the various styles, nor in fact include certain important types and variations, it seems advisable to offer this new more complete classification as a replacement of the former.

By way of explanation of (Fig. 9), it should be said, that while drill illustrations are faithful copies of actual specimens from New England, they may not, of course, match in every detail all available specimens of any given type. Nevertheless, each illustration represents a classic example of a distinct style of drill with certain diagnostic traits that should occur in other specimens to permit them to qualify. Such type indices are not to be found in length, breadth, or width of bit, but rather in the outline characteristics of drill bases. Furthermore, when making comparative analyses, slight variations of form should be overlooked while attention should be focused instead on salient lines of base shapes. In this proposed classification, ten different drill types are recognized with a few variations in each case. While it is probable that these may not include all possible variants, it is felt that they represent the most outstanding forms of each type.

Perhaps a description of each drill type will help clarify their chief diagnostic characteristics, and will tend to prevent possible misunderstandings. In connection with this, it should be said for the purpose of clarification that, while there is no record extant known to the writer showing unmistakable evidence of drill forms having been used as perforators, certain associated evidence has convinced most scientists that this was their functional use. For many years, they have been considered as tools with which holes were drilled in such stone products as gorgets, boatstones, pendants, ulu, and some stone pipes. And it must never be forgotten that a great many wooden products, long since destroyed through decomposition, undoubtedly required holes in the course of their fabrication. Then too, it is well known that savage peoples of today in many parts of the world practice drilling, and seem to have inherited knowledge of their tools and techniques from earlier days. Furthermore, if pipe reamers were used for hollowing pipe bowls, as seems to be the case to judge from the voluminous evidence at Oaklawn steatite quarry and elsewhere, in which many pipe forms have appeared in close association with reamers, then it would seem that smaller holes in other stone artifacts may have been made by rotating drill bits of corresponding sizes, some of which show unmistakable wear, especially since such holes are beveled with perceptible ridges in most instances.

**CRESCENT DRILL.** The base of this perforator has either a wide flare as in the case of style No. 1 with outstretched excursive horns, or a narrow one as shown in style No. 2. In both instances the base line is more or less concave, producing the appearance of a crescent when the bit is excluded. Extreme concavity is sometimes present, and this produces the illusion of a crescent...
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FIG. 9
Proposed Drill Classification.
even more convincingly. For example, when the drill is shaped like a shark's tooth, as is occasionally the case, a crescent-like base is most apparent.

SIDE-NOTCHED DRILL. This type contains three variations, each displaying different degrees of side notching. That is, the base is side-notched either with wide, medium, or narrow notching, and is terminated by a comparatively straight base line. It is quite likely that this type of drill was contemporaneous with side-notched projectile points, although this report does not attempt to establish such a link.

T-BASE DRILL. In the case of this drill, the base line is nearly straight with arms projecting on opposite sides of the bit. This produces the effect of a T when the bit is taken from the stem. The two indicated variations differ only in the degree by which the base is undercut in forming the bit.

PLAIN DRILL. This type of perforator may be distinguished by virtue of the absence of any prominent expansion of the base. The bit extends into the base with only slight enlargement of its breadth; and terminates in either a stubby point sometimes a little rounded, or in a truncated base that is occasionally concave like style No. 2.

EARED DRILL. In this category are three variations. All have projecting basal points resembling ears, although in style No. 3 the ears are ill-defined. They are formed as a result of sharp side notching, except in style No. 3, and are emphasized by a slight concavity of the base. In this important respect they differ from side-notched drills whose base line is generally straight. Furthermore, they differ in that the ears in style No. 1 project beyond the breadth of the base, while in style No. 2, as also in style No. 1, they exhibit an apparent intent of the makers to form rounded ear-tips of small proportions; a characteristic not evident in side-notched specimens. In style No. 3 the ears may appear to be hidden at times, although they are frequently evident and apparently were intended. Again, it seems likely that eared drills and eared projectile points have a coeval relationship, but proof of such a link is not herein attempted.

CROSS DRILL. Numerous variations are to be found in drills of this kind, but in the main they seem to fall within one of two shapes as shown by styles No. 1 and 2. In the case of the former the projecting base is roughly truncated, while in that of the latter it tapers to more or less of a point. In both instances a cross is formed by reason of prominent projections either side of the base to form in effect the crossbar, while the base that projects beyond, when taken with the bit, forms the upright beam. However, a word of caution should perhaps be injected at this point: do not expect the form of a cross to be too well defined, for symmetry is lacking in some cases; cross-beams are often irregular and out of alignment.

EXPANDED DRILL. This kind of perforator should not be confused with those having unworked bases when made from flakes. On the contrary, it should be noted in this type, that expanded bases are well worked into either an elliptical form, style No. 1, or one that is more or less rounded like style No. 2. While ill-defined base shapes may occur at times, in general, all variants will be worked and should be found to equate with one or the other of these two styles, although there may be a wide variation in size.

DIAMOND DRILL. The base of this perforator has been reworked to form one side of a diamond, while the corresponding side disappears into the stem of the bit. This shape is not to be confused with a naturally formed flake base that may happen to have a similar diamond shape as shown in the next classification entitled "Flake." The difference lies in whether or not the base has evidence of secondary chipping; and if it has, then it should be placed in this "Diamond" category.

FLAKE DRILL. In this class should be placed all perforators having a relatively narrow bit, but whose bases are rough and unworked for the most part. Specimens may be long or short but must be made from a rough flake to qualify. It is presumed that this type of drill was held between the fingers, while all others were probably hafted at the end of spindles and oscillated between the hands.

PIPE-REAMER. It may now be confidently stated that this type of perforator is a reality; has frequently occurred at steatite quarries, especially at Oaklawn, Rhode Island, in close association with fractured pipe forms of steatite and chlorite. Having thus been identified at the source with the manufacture of stone pipes, this tool may now be recognized as a pipe reamer when appearing on
A PROPOSED ARTIFACT CLASSIFICATION

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FIG. 10
Proposed Gouge Classification.
habitation sites. Reamers are of two styles, either with a pointed or a truncated bit that in both cases taper slightly. Usually, the bit measures about 1" in width at the start of the taper, although there are other reamers that are somewhat narrower. These smaller forms were undoubtedly useful in reaming the lower extremities of pipe bowls, as well as in the manufacture of small pipes. Most bits usually taper for a distance of about 1\(\frac{1}{2}\)", and often this is the only part of the tool that exhibits finished workmanship, especially with those specimens recovered from steatite quarries. Quite to the contrary are those found on camp sites, whose bases are frequently finished while bits are more carefully worked, as shown in style No. 1. Identification in general should be concerned most with the relatively large proportions and gradual taper of the bit with no regard being paid to the shape of the base, as this varies greatly. For those specimens found at steatite quarries, style No. 2, the base appears only as a thick roughly flaked stone that may be conveniently gripped by the fingers. However, in the case of most other specimens from village and camp sites, the base is as carefully worked as the bit, and may assume a truncated or a more expanded shape depending upon the whim of the maker. Some of these more refined specimens could have been hafted on spindles to speed up the work of reaming.

In conclusion, may I say that this system of classification has been thoroughly tested and found workable. It is simple and direct; uses descriptive terms that require no multiplicity of qualifying affixes to confuse the memory. The Research Council hopes that it may be adopted as a means of identifying drills in connection with site reports, so that future studies of relationships between drill types and culture horizons may be standardized and placed on a uniform basis.

GOUGES

Of the several different kinds of heavy cutting implements, gouges form an important group. At least two types, and possibly three, seem to have significant culture affiliations; probably are diagnostic of different culture occupations in New England. However, this report does not attempt to establish such culture relationships. Its main purpose is to present the outstanding characteristic differences, through illustration and description, that exist between the several types, and at the same time furnish a simple understandable nomenclature for ready reference. This has been accomplished by using terms that quickly suggest the determining differences of stem construction, which are believed to best identify the four different types.

In general, gouges seem to represent preferred tools that were made and used in at least three well defined culture periods; and have all the earmarks of implements that were made to scoop or gouge in hollowing softer-than-stone manufactured products like wooden objects. In this respect, they appear to be forerunners of the modern scooping chisel; and when hafted, more properly the Colonial adz. It is presumed by many, although no historical or archaeological evidence is extant to show beyond a reasonable doubt what their end use was, that they were employed to hollow out wooden products, principally, dugout canoes. Related stone implements appear to be adz blades made in various shapes and sizes, although they are not as widely distributed as gouges. As a rule, such blades resemble gouges in most particulars except they never have scooped out bits; always have flat faces, instead, of which one is beveled. As a group, adz blades quite generally have a transversally grooved stem as do grooved gouges, and are presumed to have been hafted similarly, and used correspondingly.

The haft for these blades may have followed in general the pattern as displayed by iron cutting chisels, resembling adz blades, attached to the end of suitable handles, and employed during the last century by natives of the South Sea Islands and of the Northwest. The blade may be attached to the forked end of a stick, of which the larger stem becomes the handle. The smaller stem is cut short to engage the implement, so that when attached, its bit lies at somewhat of an acute angle with the handle, and under it, pointing toward the workman. The native iron adzes just referred to were used, among other things, for hollowing logs in the manufacture of dugouts. Since their hafted proportions would seem similar to those of stone gouge and adz blades, it is thought by many that the functional use of the latter should correspond to that of the former.

In order to clarify what constitutes the most important identifying characteristics of the different
types of gouges, a description of each follows with illustrations of actual specimens (Fig. 10). In general it should be said that size is not a determinant in any case, for small as well as large specimens occur in all types. Instead, variations of the stem and scooped out portion of the bit provide the necessary indices.

**Grooved Gouge.** In the case of this gouge type, the term “grooved” refers to a transverse deep or shallow groove with rounded trough that extends around the back, and part of the two sides of the blade near its head. Usually, there is only one groove, although occasionally, two grooves appear. Their function seems to have been for the purpose of holding thongs in place that were used in attaching the implement to its handle. The bit usually has only a shallow scooped out area, although at times in certain specimens that may have been imported, the area is more deeply scooped. An important trait determinant is the general contour of the blade as contrasted with most of the plain stem gouges. Blades of grooved gouges have a tendency to avoid a flare at the bit, although at times a slight flare occurs. However, in most instances, their sides tend to converge toward the bit in varying degrees. The shaping of this grooved type seems to have been as a result of a totally different concept than that which inspired the designing of plain gouges; therefore is presumed to have had a different origin. The grinding of the scooped out area of the bit is usually superficial, and seems to be incidental to other characteristics.

**Knobbed Gouge.** This gouge type is made up of blades whose bits have a tendency to flare, sometimes by virtue of foreshortening of the blade through normal wear. They have a small rounded knob, or knobs—as many as three or more at times—that project on the back of the stem; were evidently used to hold hafting thongs in place. Gouges usually occur with shallow but well ground scooping of bits; resemble grooved gouges most in displaying a fretted poll to keep hafting thongs in place.

**Channeled Gouge.** In the case of this gouge type, there appears either a deep (style No. 1), or shallow (style No. 2) pecked out lateral area on the back and sides of the stem. This so-called channel is always relatively wide, much more so than the groove found on grooved gouges. Furthermore, it does not have a rounded trough like the latter. Instead, its trough has a tendency to be wide and flat. As a result of this lateral channel, that which is left of the head projects at the end in a prominent ridge that runs around sides and back. This is intensified by the more or less truncated termination of the head that does not tend to be rounded as in the case of most other gouge types. A prominent characteristic of this gouge consists in the tilt of its sides. They tend to flare moderately to sharply from the lower end of the channel to the bit; in some instances are more or less parallel. The scooped out area of the bit is always deep and well defined extending up the blade and terminating just below the channel. These blades are made from flat pieces of stone for the most part, and exhibit uniform pecking and fine grinding.

**Plain Gouge.** In this type category are at least five well defined styles. All of them have plain stems, which characteristic is their chief determinant. All but style No. 3 exhibit bits with a perceptible flare, whose sides taper gradually to the head. They are usually made from relatively thick stone blanks, although at times an isolated specimen occurs with a somewhat thinner body. Style No. 1 has deep scooping of the bit that extends up the blade but a relatively short distance; and this area is always meticulously ground smooth. Style No. 2, on the other hand, has only slight scooping of the bit that extends up the blade a short distance only; usually appears to be superficially ground. Style No. 3 is similar to style No. 1 except the blade has sides that taper toward both ends from the center. Here again, the scooped out bit represents deep uniform grinding. Style No. 4 is somewhat different in proportion. It is relatively short, triangular in shape, with a sharp flare to its bit. Generally, this has a superficially scooped out area that extends about 2/3ds the way toward the head. Style No. 5 has deep uniform scooping well ground that extends the entire distance of the blade from end to end, and from side to side as well.

Bronson Museum
Attleboro, Mass.

Beginners in archaeology have long felt the need of a single handbook which would set forth clearly and simply the methods of field-work and excavation. With the publication of R. J. C. Atkinson's "Field Archaeology" in 1946 the need was, for perhaps the first time, squarely met. Unfortunately the edition soon passed out of print. The publication of a revised edition should be welcome news.

While the text has been prepared primarily for British readers and uses British examples, the principles and methods are of general validity. These methods run the entire range from the elementary use of the eye and the trowel to the newest techniques—electrical resistivity surveying, aerial photography, chemical soil analysis and the like.

Attention is focussed on smaller sites and the problems of the amateur. In Mr. Atkinson's view, future progress in archaeology will be increasingly dependent on the efforts of amateurs.

He adheres to the traditional British approach to archaeology, which is at variance with ours as might be expected. The American approach has been conditioned by contact with living tribesmen and the collecting of the ever present arrow-heads to be found in field and stream. The British approach, some two centuries older, derives from the interest and curiosity aroused in intelligent and observant countrymen by the monuments and scars they noted in the landscape. The contrast in the two approaches can be pointed up by comparing those New England cases where a typewriter and an opinion have been considered sufficient equipment for disposing of various scars, mounds and monuments noted on the landscape; with Mr. Atkinson's remarks, "How to search for and record ancient monuments in the field can only be learnt by practise, with the help of constant observation of known monuments in all stages of decay and obliteration. The field-worker must be familiar not only with the appearance of ruined ancient structures, but also with more recent traces of human activity; he must be able to identify a field bank from which the hedge has been grubbed up, a ruined field-wall or sheep-stell, or the overgrown foundations of a cottage or croft, and he must be able to distinguish these from basically similar structures of earlier date".

However, where so much is shared, it would be a mistake to over-emphasize differences. The general reader will find Mr. Atkinson's "Field Archaeology" interesting and informative. The serious amateur will find it indispensable.

Frank Glynn