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THE ADZE AND THE UNGROOVED AXE OF THE NEW ENGLAND INDIANS

By CHARLES C. WILLOUGHBY

Under the unsatisfactory term *celt* are included two distinct classes of stone implements—adze blades and ungrooved axe or hatchet blades. In the former class the cutting edge was at right angles to the haft, while in the latter class the edge was parallel to the haft. The ungrooved axe, as a rule, is readily distinguished from the adze by its symmetrical form (compare pl. XI and XII).

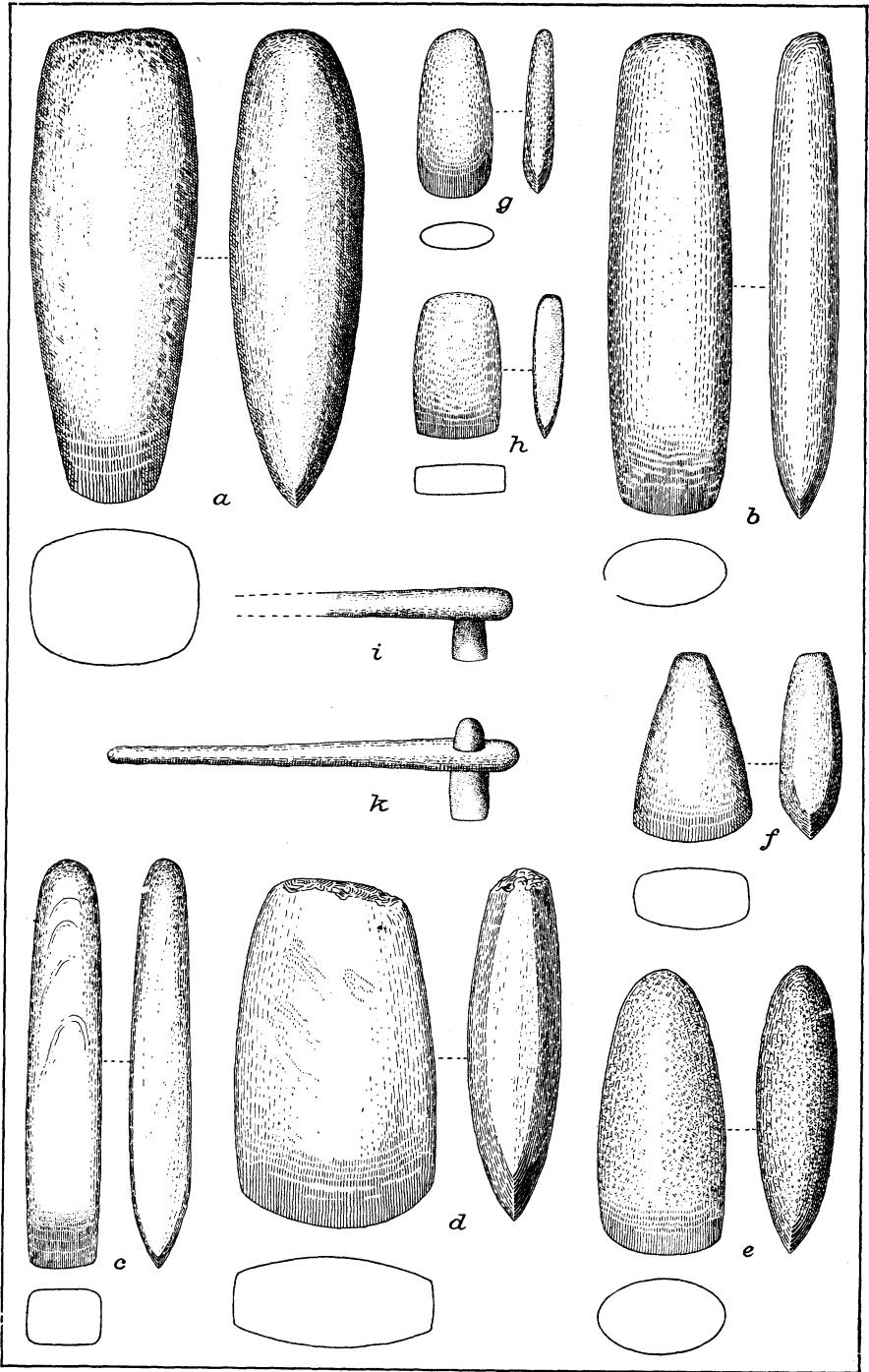
Ungrooved axes are distributed throughout a large portion of America, and are found also in many other sections of the world. So far as known the methods of hafting were similar in the various regions. In central Europe the smaller stone blades were usually inserted into a fore-haft of antler which was fitted to a hole or perforation in the wooden haft. Antler fore-hafts were sometimes used by the Eskimo and probably also by other North American tribes for holding adze blades. The larger European stone axe blades of the “celt” type were set directly into the handle. This was the method usually followed in North America.

Five prehistoric ungrooved axes from the Algonquian and Iroquoian regions, in their original wooden hafts, are known to the writer. Two of these are in the National Museum, the best preserved of which is from Richfield, Genessee county, Michigan, and is illustrated by Wilson.¹ The other is from the vicinity of Syracuse, New York. A third example is in the American Museum, New York City; it was obtained from the bed of a brook at Thorne-dale, Dutchess county, New York.² A fourth specimen, also from New York, is described and figured by Beauchamp.³ The fifth example was found in the Ohio river opposite Elizabethtown, Hard- ing county, Illinois, and is preserved in the Missouri Historical

¹ Thomas Wilson in *Report U. S. National Museum*, 1896.

² Figured in *American Anthropologist*, N. S., 1906, VIII, p. 6.

³ W. M. Beauchamp, *Polished Stone Articles of the New York Aborigines*, fig. 1.



UNGROOVED AXE BLADES OF STONE; NEW ENGLAND. ONE-THIRD NATURAL SIZE

a, b, f, g, h, Massachusetts; *c*, Maine; *d*, Vermont; *e*, New Hampshire. *a-h*, Peabody Museum, Cambridge. *i, k*, Probable Methods of Hafting.

Society's collections. The blade of this axe is set into a hole that does not perforate the handle as is the case with the other specimens.

The two methods of hafting the above axes are shown on plate XI, *i*, *k*.

Ungrooved axes were probably not uncommon among the New England Indians and adjacent tribes during the early colonial period. Champlain saw stone hatchets in general use in Massachusetts in 1605. He says: "They have no others except some few [of iron] which they received from the savages on the coasts of La Cadie, who obtain them in exchange for furs."¹ Wood² refers to the shaping of the outside of dugout canoes with stone hatchets; but neither of these writers specifies whether these implements were of the grooved or the ungrooved type.

From the standpoint of a European it would seem that a wedge-shaped stone blade set into a hole or perforation in a comparatively narrow handle would not be a very serviceable implement. The pressure of the blade in use would seem to have a tendency to split the haft. It should be borne in mind, however, that in the choice and use of wood, the Indians had acquired the highest knowledge of its natural properties and its adaptability to their simple arts. Handles of this form doubtless served all necessary purposes. It should also be remembered that in felling large trees and in general woodworking fire was often an important agent, stone axes and other implements being used to cut away the charred portion. Trees can be felled with stone axes without the aid of fire, as the writer has proved by experiment.

Of course axes of the ungrooved variety were less serviceable in heavy work than those with grooves (the form used in the above experiment), the hafting of the latter being better suited to the greater strain demanded.

The lighter ungrooved axe was probably employed both as an implement and a weapon. Johnson, in his *History of New England* (1654), refers probably to this form as follows: "They had a small number of Mawhawkes [tomahawks] Hammers, which are made of stone, having a long pike on one side, and a hole in the handle

¹ Champlain, *Voyages*, Prince Society, II, p. 73.

² William Wood, *New England's Prospect*, Boynton edition, p. 96.

which they tye about their wrists.”¹ Gookin refers to “tomahawks made of wood like a pole axe, with a sharpened stone fastened therein.”² Williams says trees were felled with a “stone set in a wooden staff.”³

Ungrooved axe blades occur less frequently in New England than those of the grooved variety. They are far less common than adze blades. Nearly all are surface finds. They have not been found in the older graves, although adze blades are very common in them. They occur occasionally with adze blades in the shell-heaps, which are probably of Algonquian origin. They are usually made of a compact metamorphose slate of fine grain, although sometimes coarser stones are used in their manufacture.

Plate XI illustrates typical forms from various sections of New England, a front and side view and a cross-section of each specimen being given. All the blades illustrated on this plate are polished over their entire surface with the exception of *e*, which is polished near the cutting edge only.

THE STONE-BLADED ADZE

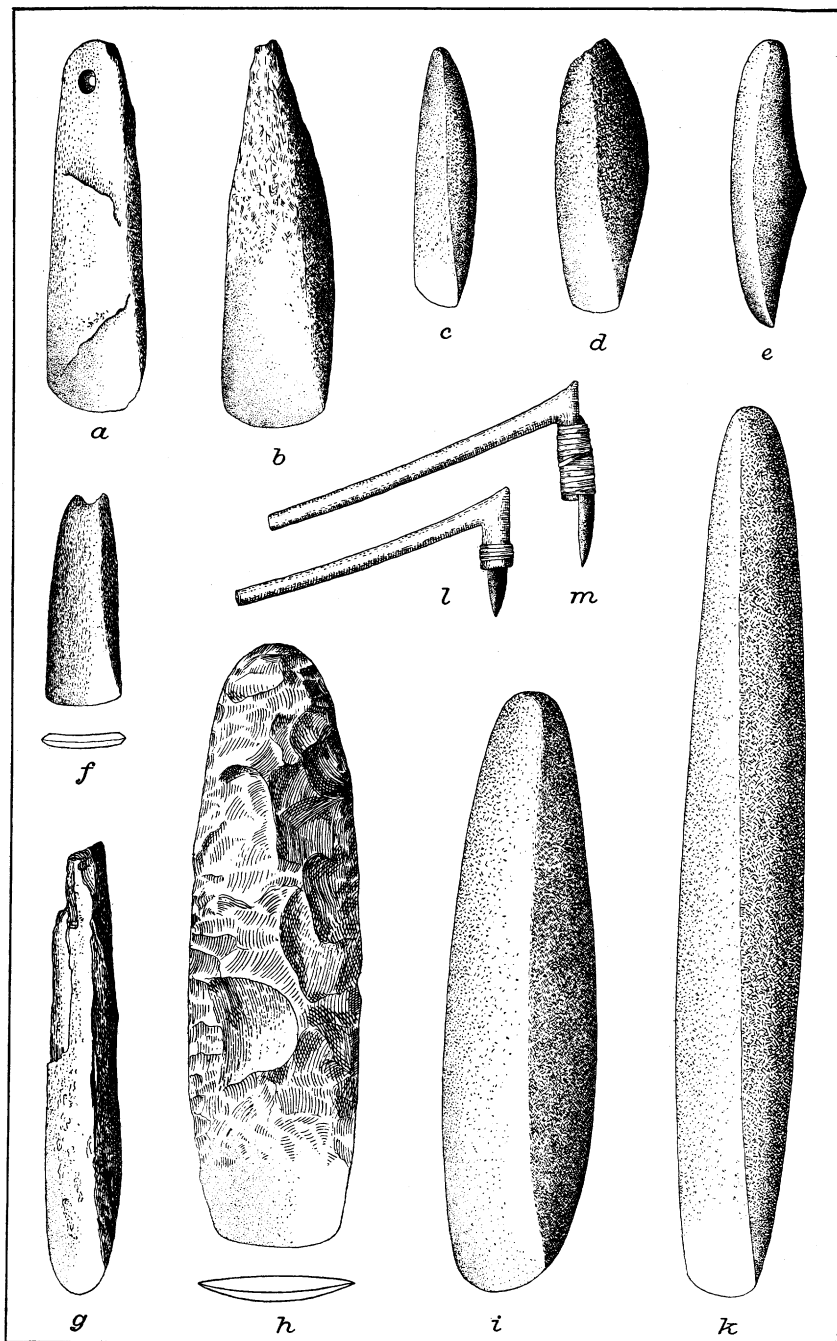
The stone-bladed adze reached a higher development in New England and the adjacent region than in other sections of America, and it is doubtful if in any other part of the world in so restricted an area a greater variety can be found. The material of which the New England blades are made is usually a compact altered slate of fine grain, although unaltered slates and a few other varieties of stone are occasionally used. In general, these implements were roughly shaped by chipping, then brought to the required form by pecking, only that portion near the cutting edge being ground smooth. A few specimens are polished over their entire surface. Blades of chipped flint or jasper ground to a cutting edge (pl. XII, *h*) occur rarely, and a few of native copper have been found (pl. XII, *f*).

The cutting edge of these implements varies from a straight line to a half-circle, corresponding in this respect to the different forms

¹ Edward Johnson, *A History of New England*, p. 114.

² Gookin, Historical Collections, *Mass. Hist. Coll.*, 1st s., repr. 1859, vol. I, p. 152.

³ Roger Williams, *Key into the Language of America*, R. I. Hist. Coll., vol. I, p.



ADZE BLADES; NEW ENGLAND. ONE-THIRD NATURAL SIZE

a-e, g-k, Stone; *f*, Copper. *a, b, d, f, g*, Maine; *c, e, h, i, k*, Massachusetts. *a-d, f, g, i, k*, Peabody Museum, Cambridge; *e*, Peabody Museum, Salem; *h*, Collection of L. E. Wells. *l, m*, Probable Methods of Hafting Blades *b* and *k*.

of the modern steel chisel and gouge. Adze blades are distinguished from the symmetrical ungrooved axe by their bi-symmetrical form. Hafts for primitive adzes are made usually of a limb of a tree and the adjoining portion of a larger limb or trunk (pl. xv, *k*). Occasionally an antler fore-haft is added. In practically all New England blades which are without a groove or knob to assist in holding the lashings in place, the upper half or two-thirds is wedge-shaped, the more carefully formed specimens tapering uniformly toward the top or point farthest from the cutting edge. The reason for the wedge-shaped upper portion is obvious, for when lashed to the haft, as shown in plate XII, *m*, each stroke of the adze tends to wedge the blade more firmly to the handle. It is doubtful if the implements with knobs or transverse grooves were as rigid in relation to the haft as were the better class of wedge-shaped specimens. In the ruder examples the upper portion is frequently roughly chipped and shows little or no pecking. Such specimens may have been inserted into a socket in the haft, as shown in plate XII, *l*. The heavy round-topped example (pl. XIV, *i*) has a nearly circular cross-section. The inner side, however, is somewhat flattened, and the cutting edge is very narrow. This is a distinct type, and is found principally in eastern Massachusetts. One would naturally infer from the shape of the upper end, which is well fitted to the hand, that the implement was used without a handle. Some blades of this type, however, have a broad shallow groove at the back for the haft lashing similar to that shown in plate xv, *f*, but broader and much more shallow. This fact, taken in connection with the somewhat flattened face and tapering upper portion of the example illustrated, indicates that all blades of this form were probably hafted.

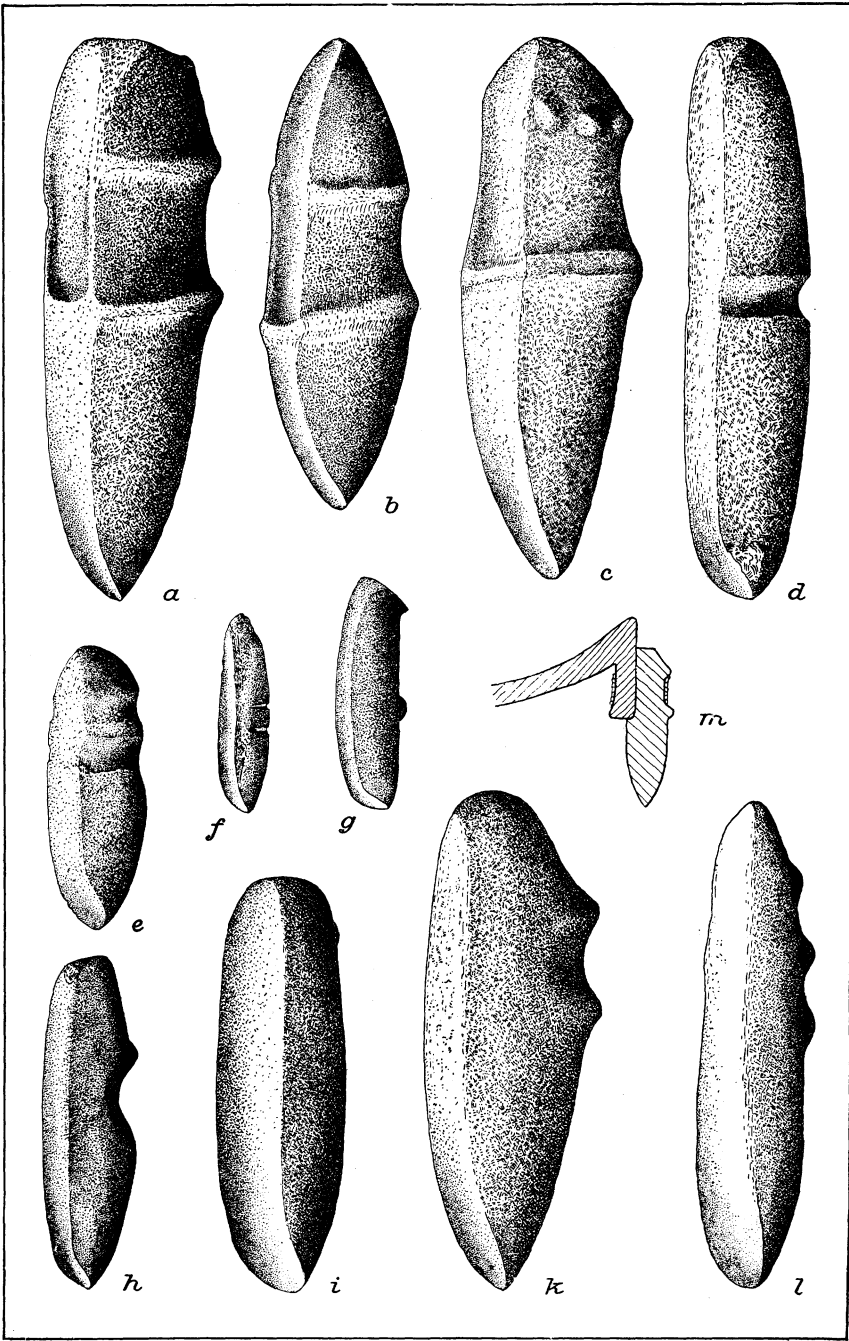
Double-edged blades are very rare. The one illustrated in plate XIV, *g*, is from Oldtown, Maine. That shown in *h* of the same plate is from Orland, Maine. These were probably hafted in the same manner as blades with a single edge, for they could easily be loosened and slipped from the lashing and reversed as occasion demanded. Occasionally an implement is found which apparently has been made over. The original edge having for some reason proved unsatisfactory, the blade was reversed and a new cutting edge was made upon the opposite end. The function of the knob,

transverse groove, and enlarged upper portion of a blade is of course to prevent slipping from the lashings when accidentally loosened. The various ways by which this was accomplished are shown in plates XIII and XV. The combination of the wedge form and the turned back or enlarged upper portion is shown on plate XV, *a-d*. In the latter specimen a portion of the face above the groove has been cut away to receive the haft, the lower edge of which rested against the ends of the slightly raised ridges upon either side of the groove. In some examples the upper portion has a groove into which the haft is fitted, the lower edge of its face resting against the transverse ridge thus formed (pl. XIII, *a, b, c, m*). This assures a firmness not easily obtained by other means.

Examples of the transverse groove as a means of securing the cord or thong are shown on plate XIII, *a-f*, and plate XV, *f*; the combined groove and knobs, on plate XV, *i*; and the single, double, and triple knob, on plate XIII, *i, k, l*. Forms similar to *k* occur among the Indians of the Northwest coast. The example shown on plate XV, *e*, has four knobs, two on each side.

In the New England adze the curvature of the cutting edge above a certain degree is produced by longitudinal grooving. In some examples this groove is very short and is produced principally by pecking, the lower portion only being ground (plate XV, *b-i*). In other specimens the groove extends the entire length of the tool, as in plate XIV, *a-c*, which is an extreme type. There is a large series illustrated by the example shown on plate XIV, *d*, in which the upper portion of the groove is shallow, the lower half being deeper and broader as it approaches the cutting edge. A considerable part of the upper portion of the groove in such specimens was probably made by the grinding stone in repeatedly sharpening the implement.

In some examples (pl. XIV, *a-c*) the groove forms a part of the original construction of the implement, but it is questionable if it had a function other than that common to the groove in the steel gouge, which is to facilitate regrinding and to allow the chips or shavings to pass unobstructed. In *c*, plate XIV, apparently more than half of the original length has been ground away in resharpening. The countersunk hole near the upper end of the groove does not perforate the implement. Blades with perforations (pl. XII, *a*) are very rare. The lashing was probably passed through the hole and tied.



STONE ADZE BLADES; NEW ENGLAND. ONE-THIRD NATURAL SIZE

a-k, Massachusetts; *l*, Maine. *a*, *d-k*, Peabody Museum, Cambridge; *b*, Peabody Museum, Salem. *c*, Phillips Academy, Andover; *l*, National Museum. *m*, Probable Method of Hafting Blade *a* (cross-section).

While all the types illustrated on plates XII-XV were probably designed as adze blades, it is not improbable that some of them may have been used occasionally without a haft. A large "gouge" in the Peabody Museum at Harvard, similar to that shown on plate XIV, *a*, has upon its back a space about six inches long and half an inch wide which has been worn and highly polished. This was apparently produced by continued rubbing upon a hard but fine-grained surface such as charred wood. Only a small portion of the implement was subjected to this continued rubbing. The same effect could be produced by using the tool without a haft in hollowing wooden mortars and bowls with the aid of fire. Another implement of this class shows a similar polished surface on the lower portion only, below the space naturally covered by the lashings. A few of the very small examples not shown in the illustrations may have been attached to straight handles and used as chisels.

The writer has found but few references to the use of the stone-bladed adze by American tribes, although the older museums have good series of these implements in their original handles from the Eskimo and a few from the Indians of the Northwest coast. The superiority of the iron blade to that of stone led to its early introduction by these people. Axes were unknown among the Eskimo until introduced by Europeans, and the earlier trade hatchets were nearly all rehafted as adzes. Nelson writes that stone adzes "are very skilfully used by the Eskimo for hewing and surfacing logs and planks, although at the present time they are being displaced by iron and steel tools obtained from white traders. In the *kashim* on the lower Yukon a plank was seen that was made many years ago by use of a stone adze. It was twenty-five feet long and four or five inches thick. The surface bore so many marks made by the hacking of stone adzes that it looked as if it might have been cut by beavers."¹

Mackenzie found the primitive adze in use in the Slave and Dogrib region in 1789, and writes: "Their axes [adzes] are manufactured of a piece of brown or grey stone from six to eight inches long, and two inches thick. The inside is flat, and the outside

¹ *Eighteenth Report Bureau of American Ethnology*, pt. I, p. 91.

round and tapering to an edge, an inch wide. They are fastened by the middle with the flat side inwards to a handle two feet long, with a cord of green skin. This is the tool with which they split their wood, and, we believe, the only one of its kind among them.”¹ This description would well apply as to form to the type shown in plate XII, *i*, *k*.

A few stone adzes were in use on the Northwest coast in Cook's time, but in that region even at this early period iron had to a great extent supplanted stone for edged tools. I know of no reference by early writers to the use of the stone adze by the New England tribes. It was, however, used by the Algonquians of this region in prehistoric times, and is found in small numbers in their shell-heaps.

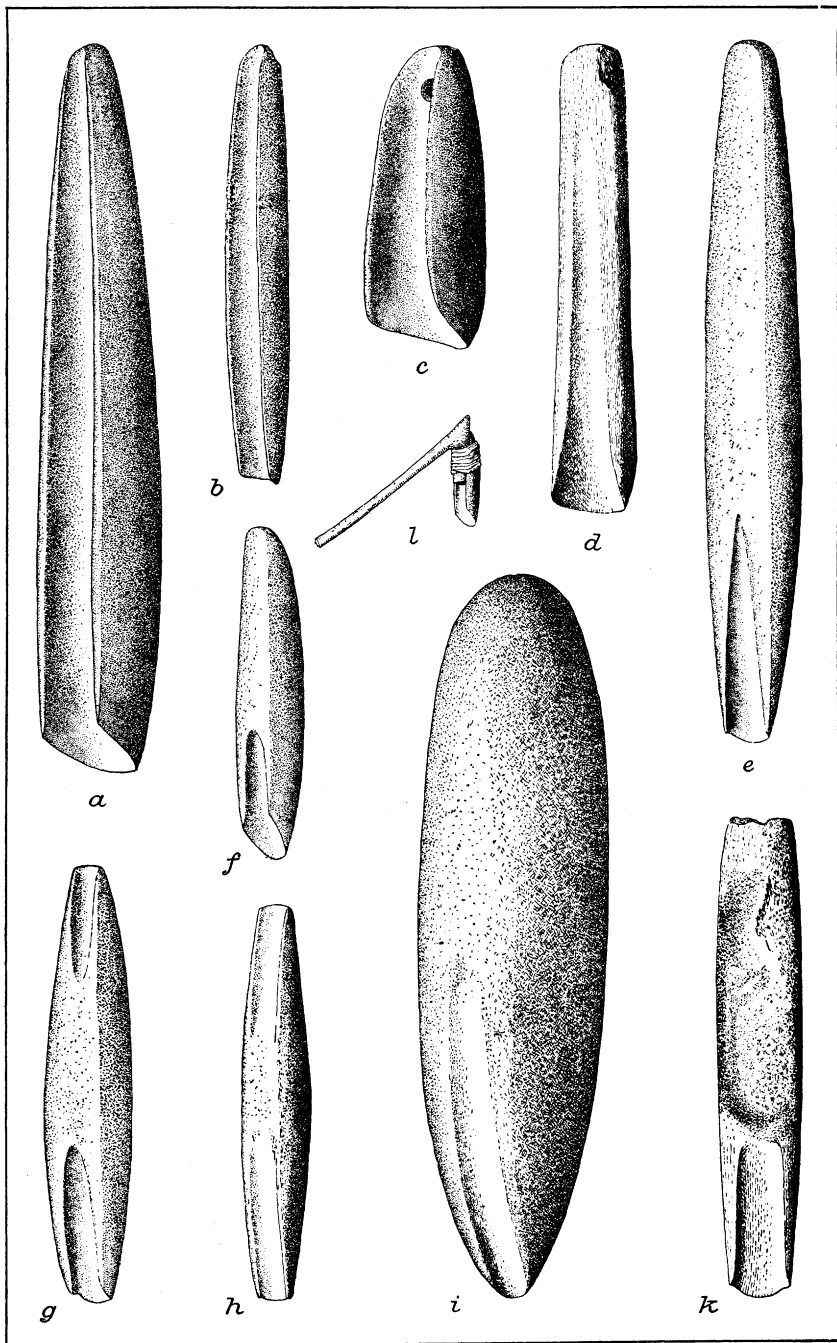
It is doubtful if the adze was used to any great extent by these Indians within the historic period, or that stone blades were replaced by those of iron, as they would have been had these implements been common. Nearly all blades with projections or transverse grooves for securing the lashings are surface finds, and practically all types from the simple straight-edged form to the elaborately finished grooved “gouge” are found under these conditions, which of course furnish little data as to the relative age of the various forms.

Adze blades are rarely if ever found in graves of the historic New England Indians. Blades with straight or slightly curved edges are found in limited numbers in the shell-heaps. Those of the gouge type rarely if ever occur in these heaps, nor does the writer know of an instance of the knobbed or transverse-grooved forms having been found in them. Artifacts in general and especially the potsherds from the shell-heaps indicate strongly that these refuse piles are of Algonquian origin. In the Whaleback mound at Darmariscotta, Maine, one of the largest shell mounds in New England, no essential difference is noticeable between the potsherds found in the upper layers and those taken from a depth of ten or twelve feet. The shell-heaps in general testify that New England was occupied by Algonquian tribes for a very long period.

The ancient burial places in the lower Penobscot region explored by the writer in 1892-1894² contained a large series of adze

¹ *Voyages*, quarto ed., p. 38.

² Willoughby, Prehistoric Burial Places in Maine, *Peabody Museum Papers*, vol. 1, no. 6.



STONE ADZE BLADES; NEW ENGLAND. ONE-THIRD NATURAL SIZE

a, c, i, Massachusetts; *b, d, e, g, h, k*, Maine; *f*, New Hampshire. *a, g*, Worcester Society of Antiquity; *b*, Maine Historical Society; *c, d, e, k*, Peabody Museum, Cambridge; *i*, Peabody Museum, Salem; *h*, American Museum of Natural History; *j*, Collection of T. J. Eastman. *l*, Probable Method of Hafting Blades *a-c*.

blades. In nearly every grave had also been placed one or more pear-shaped pendants and a set of fire stones (pyrites). The latter had undergone chemical change and left spots of iron oxide upon the blades which lay in contact with them. Finely polished slate projectile points also accompanied many of the burials. All bones had become wholly disintegrated. A considerable number of these graves were very shallow. Similar cemeteries occur in various sections of Maine, and a large number of implements have been turned out by the plow. No pottery has been taken from these ancient graves. The characteristic forms of polished slate points and certain types of gouge-shaped blades obtained from these cemeteries seem to be confined to northern New England, New Brunswick, Nova Scotia (?), and Newfoundland. These peculiar forms are not found in the shell-heaps. Evidence is accumulating which seems to indicate that the above burials may be pre-Algonquian. A series of implements collected for the Peabody Museum during the last summer by Mr Owen Bryant at Notre Dame bay, Newfoundland, the heart of the historic Beothuk region, strengthens this theory.

From the results of the exploration of the ancient burial places at Bucksport and at Orland, Maine, considerable can be learned of the relative number, sizes, and types of adzes apparently owned by individuals. From one to seven blades were taken from each of thirty-two of the fifty or more graves explored. In several instances but one blade was found in a grave and there seems to have been no uniform choice as to form in such cases. Some were large with slightly curved cutting edge, others of medium size or small, both the straight edged and the curved gouge forms being represented.

When two implements of a class were owned by an individual, in two instances the pair consisted of a large and a small blade of the gouge type. In the third instance the grave contained two blades with a straight edge, and in the fourth the pair consisted of a blade of each type.

In each of the three cases where four blades were found in a grave, two were of the gouge form and two had the straighter cutting edge. Two graves contained six blades each. From the first were taken four of the gouge form and two of the straighter edged

type, while from the second grave four of the straight edge type and two of the gouge form were taken. In the grave having seven blades but one was of the grooved or gouge type.

It is evident from the above burials that at this period of the prehistoric culture of the New England tribes the adze was a very common and necessary tool, and that two or more of different sizes and of both types with varying degrees of edge curvature were often the property of a single individual.

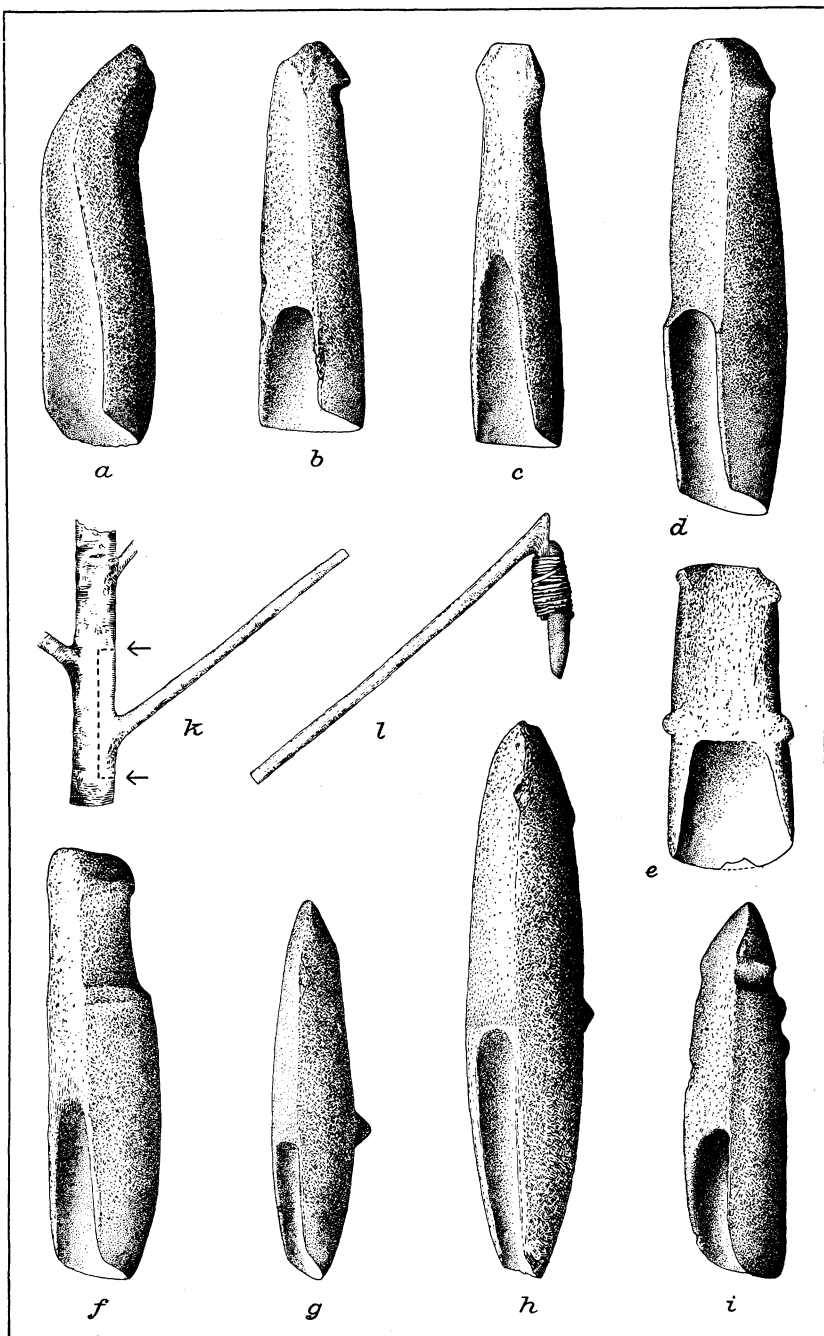
None of the blades from these burial places had a transverse groove or dorsal knob to aid in attachment to hafts. Blades having grooves or knobs for this purpose, although occurring in Maine, are more common in central and southern New England.

It seems that the ungrooved axe, although never a very common implement, was used by the Indians of New England in historic and later prehistoric times, but was unknown to the early inhabitants of this region, and while the adze was a common tool among the earliest tribes of which we have knowledge it was less common in the later prehistoric period, and its use in historic times, while probable, is uncertain.

Among historic American tribes generally the adze was used principally for woodworking. In the plains region however a small antler-hafted adze with a short iron blade set at right angles to the handle was employed in skin-dressing. It is probable that the primitive stone adze was also primarily a woodworking implement, although certain forms may have been used in dressing skins.

The historic and proto-historic tribes of New England were not extensive artificers of wood. In the construction of the larger objects, such as bowls, platters, mortars, and dugout canoes, the adze would be a useful but not an indispensable tool. The Indians of this region employed to a limited extent boards or planks in the construction of platforms and beds, and in the manufacture of cradles and similar objects. It is very probable that some of them were faced. Planks were also sometimes used for lining or partially lining graves.

In cutting logs into various lengths for the construction of dugouts, mortars, bowls, etc., and for palisades and puncheons in fort building, certain types of the stone adze would be most useful.



STONE ADZE BLADES; NEW ENGLAND. ONE-THIRD NATURAL SIZE

a, b, d-h, Massachusetts; *c*, Maine; *i*, New Hampshire. *a, b, c, e-h*, Peabody Museum, Cambridge; *d*, Collection of L. E. Wells; *i*, Collection of T. J. Eastman. *k* Shows Limb and Other Portion of Tree (enclosed by broken line) Commonly Used for an Adze Haft. *l*, Probable Method of Hafting Blade *h*.

The writer's experiments in woodworking with these implements have shown that the heavy narrow-edged forms illustrated on plate XIII, *a*, *b*, *c*, *k*, and on plate XIV, *i*, are especially adapted to this work. That they were made for heavy work is obvious, the great weight of these implements adding force to the blow. The cutting edge is very narrow, and the angle of the converging sides which produce the edge is great, to prevent breakage in use. A log can be cut in two with this type of adze, even without the aid of fire, by making two transverse grooves two or three inches deep a few inches apart and splitting off the intervening wood with wedges. By alternately grooving, and removing the wood between the grooves, the work can be done more rapidly than one would suppose. This method of wood cutting was practised by the Indians of the Northwest coast even after the introduction of iron blades. The straight or slightly curved edged blades of the types shown on plate XII would be very serviceable in hollowing out dugout canoes, dressing down planks, and in work of a similar nature if used in connection with fire.

The lighter and more delicate implements of the gouge type, similar to most of those represented on plates XIV and XV, are not suitable for heavy work but are well adapted to working charred wood, and some of them would be serviceable in skin-dressing, although it is doubtful if they were extensively used for this purpose. For removing fat from skins the Labrador Eskimo occasionally use a gouge-shaped tool, the lower portion of which is of tin curved and attached to a short wooden handle, the form of the implement being similar to the blade shown on plate XV, *b*. It seems however that this is a modern invention and in no way connected with the ancient stone blade.

Among the best examples of woodworking that have survived among the Algonquians are the wooden bowls wrought from the knotty portions of the maple. Some of the finer examples are not surpassed in durability or good workmanship by any similar utensils. These were formerly shaped by burning and scraping. In the construction of these and similar objects the more delicate gouge-shaped blades would be most serviceable.

The locality most nearly approaching New England and the adjacent territory in the development of the adze is the Northwest

coast region among tribes of expert woodworkers. Some of the blades of the Haida and the Tlingit have knobs or lateral grooves for securing the lashings and closely approach the Eastern forms, but the development of this implement on the Pacific coast was far behind that of the East.

The old adage, "The workman is known by his tools," may not hold true under primitive conditions. Nevertheless the high development of the adze in the East seems to indicate that the early prehistoric people of New England had reached a far higher degree of excellency in woodworking than our knowledge of the later tribes would indicate. It is not at all improbable that the extensive peat bogs which dot New England and which before many years will be worked for fuel may yet reveal examples of this earlier handicraft in wood.

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