

ARNOLD ARBORETUM
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INDIAN RELICS OF THE ARNOLD ARBORETUM. WITH more than three centuries of recorded history intervening between the present and the indefinitely long period when the region that is now Boston was occupied by the Indians it is interesting and not a little surprising to find that evidences of these earlier inhabitants and examples of their work can still be found here. For at least half of this historic period it is probable that no Indians have lived here under the primitive conditions of the stone age, nor have any of the implements been made that we find on their old hunting and camping grounds. During much of this time, and especially since the middle of the nineteenth century, Indian relics have been collected assiduously, and yet a diligent searcher even in such a frequented place as the Arnold Arboretum can still find abundant traces of former Indian occupancy in the indestructible stone implements made and used by them in the chase and in war and in their domestic life.

Beginning with a chance find several years ago I became interested in looking for Indian evidences here, and a persistent search carried on at odd times in walks through the Arboretum has resulted in the building up of an interesting little collection, a part of which is shown on the accompanying plate.

Aside from the sentimental and romantic interest of these bits of prehistoric art, their chief value lies in the deductions that can be made from them in regard to the life and customs of the people who made them and in locating the sites of habitations occupied probably long before the coming of the first white colonists. And this in turn helps us to reconstruct some picture of what the local conditions must have been in those times and of the significance of the changes that have ensued.

The variety of artifacts remaining on the site of any prehistoric settle-

ment after the lapse of centuries, at least in a climate like that of New England, is naturally quite limited and includes only objects made from the most indestructible materials, such as stone, or perhaps under more favorable circumstances, of shell, bone, or clay in the form of pottery. And it is also highly probable that in a thickly settled and much frequented locality such as the Arboretum, most of the larger and more conspicuous objects originally left on the site would have been found and carried away long ago by earlier collectors. But even with the very limited material that can still be found on these old camp sites it is possible to learn much about the habits and culture of the Indians who occupied them, and a number of deductions can safely be made as to what the physical conditions must have been that induced them to select certain places for their camps or villages.

Most of the Indian artifacts that have been found recently in the Arboretum are of chipped stone and would popularly be called arrow heads, although probably only a few of the smaller ones were used for that purpose. Some of the larger and heavier ones may have been used for lance or spear heads and others for knives, scrapers or digging tools. A few of the rougher pieces that show evidence of chipping were probably unfinished or rejected objects. Besides the chipped implements, a few pieces have been found that were fashioned by pecking or grinding into hammer-stones, celts, scraper, and other objects, some of them of doubtful use.

Stones accidentally shaped by natural agencies, such as small round boulders or sharp chips and flakes of the harder rocks, were no doubt made use of by the Indians with little or no improvement on their original condition, and in a few cases it might be difficult to say whether a particular object should be regarded as an Indian relic or not. But it is nearly always possible for the experienced archaeologist to distinguish between even the roughest object of human handicraft and natural or unworked stones of similar shapes by the evidence of fine chipping or pecking found on the former and because of the obvious design shown in all the lines of fracture or polishing.

In selecting material for his work, the ancient craftsman, guided by experiment and experience, used as a rule only the best that was readily available for his purpose, but in emergencies inferior stones or other materials were sometimes employed. For the manufacture of chipped stone implements some hard fine grained variety from which small flakes could be struck off without shattering the whole mass was essential, and the finest points with a keen cutting edge could only be fashioned from a stone that broke with a clear conchoid fracture.

Hard stones are abundant in the Boston area, although the material available to the Indian artisan here was not as good as that found in many other parts of the country. And all the relics found in the Arboretum, with one possible exception, are made from local material or from such as may be found in eastern Massachusetts.

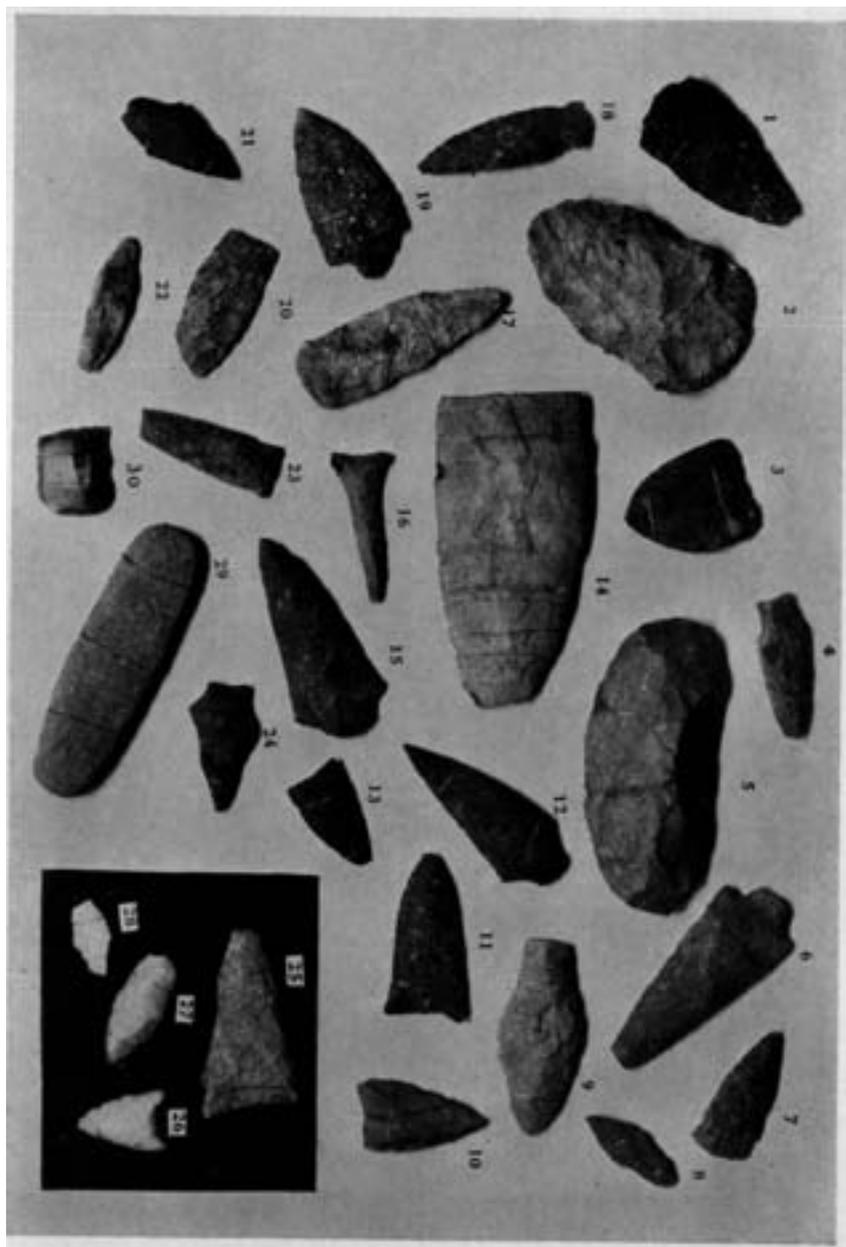
The material most commonly employed here in the manufacture of chipped implements, judging by the Arboretum collection, was porphyritic basalt or felsite. These two crystalline rocks without the porphyritic structure, as well as quartz, quartzite, chert, and argillite or slate were also used for making projectile points and cutting instruments. Slate, mica-schist, sandstone, greenstone and granite furnished material for the pecked or abraded implements. Porphyritic rocks are those in which crystals, usually either of feldspar or quartz, large enough to be detected with the unaided eye are imbedded in a groundwork or matrix of finer or microscopic crystalline structure. The felsites are of a light color, usually pink, flesh-color or gray; basalt, or trap-rock as it is popularly known, is of a dark slate-color or black on fresh fracture, although often turning to a lighter color on weathered surfaces. Both of these classes of rocks are found in a number of places in the vicinity of Boston, occurring in dikes and ledges and as loose material derived from them, as well as in detached masses in glacial deposits. The harder and finer grained varieties, either with or without porphyritic structure, furnished a very satisfactory material for the fabrication of chipped implements, as is shown by the fine workmanship, sharp points, and keen cutting edges of some of those found in the Arboretum. In other cases the material was not of so good a quality, and as a result the fracture was hackly and the implements thicker and rougher. Quartz is another vein or dike material found abundantly in this region, both *in situ* and as rubble, and also as pebbles or boulders in the glacial drift. When broken it sometimes produces a very keen cutting edge and it was highly prized by the Indians for this quality. But it usually shatters too readily to have been used for any except the smaller implements. Quartzite, which is also common locally, was used sometimes for both chipped and abraded implements, but only the harder and finer grained varieties could be chipped successfully, and most of the points made from this material are rather rough and crude. A few artifacts of chert have been found, although this material was not abundant nor generally of a good quality in this vicinity. Slate furnished a very indifferent material for chipping, but it was sometimes used, though perhaps only in emergencies. It was one of the most easily worked materials for grinding and it was used commonly in this way

for a variety of purposes.

Of about sixty implements, either perfect or broken, in the collection made in the Arboretum, a little more than half were probably used as projectile points, either for arrows or spears. A number of the others, having a sharp edge but often a blunt or rounded point, may have been used as knives. But in some cases it is impossible to distinguish definitely between those two classes of tools, since some of them could have been used for either purpose. One of the pieces shown in the illustration (no. 2) is a small hatchet or celt. Number 5 is a rather rough piece, plain on one side and bevelled on the other, that may have been used as a scraper in preparing buckskin and other hides. There is at least one other scraper in the collection. The largest chipped piece so far found (no. 14) measures in its present broken condition ten centimeters in length and five centimeters in greatest width. The color of the material was originally black, but it has been altered on the surface to an ashy gray by long weathering. Small chips struck off accidentally by the tools of the workmen who unearthed it show that the oxidation has penetrated to a depth of about one millimeter. The break is a very old one, as the truncated end is discolored as completely as the rest of the surface. This piece may have been used as a digger or as a skinning knife. Number 16, a drill or reamer, has undergone a similar alteration in color from the effects of weathering. Such drill points are comparatively rare, at least in a perfect condition, as they are fragile and easily broken. They are supposed to have been hafted and used for drilling holes by being turned with a swift rotary motion.

Amongst the arrows shown in the photograph, numbers 7, 10, 13, 26 and 27 were probably war points. Three of these are of the triangular unnotched type and the others have only a trace of side notches or stem. Such points easily became detached from the shaft and so could not be removed from a deep wound, which was therefore likely to prove fatal.

Number 29 is a flat piece of slate with rounded ends and bevelled on either edge following a natural cleavage plane which may have been ground to a sharp edge to make it serviceable as a scraper. Another interesting piece, not shown in the illustration, is a fragment of coarse gritty sandstone eight centimeters long by about two centimeters in width and a little less in thickness. It is roughly rounded on one side and has a shallow longitudinal groove on the other. This was used in smoothing arrow shafts, much as we would use sandpaper today. Number 30 of the illustration is not Indian work, but is a relic of the white pioneers. This is a gun flint, used in flint lock guns before the inven-



tion of percussion caps. The material is horn flint from the Cretaceous chalk deposits of England, where the quarrying and manufacturing of flints both of this sort and for domestic use with steel and tinder was at one time an important industry. Two other specimens of gun flints have been recovered in the Arboretum.

Most of the relics in the collection were found on the surface in the cultivated strips and beds where groups of shrubs are planted, or in the small plots dug up about individual trees and shrubs. This does not necessarily mean that they are most abundant in such places, but it is only when the covering of grass, weeds, and leaves has been removed that they can usually be seen. As the ground is turned up by the forks of the workmen the implements buried to a shallow depth are brought to the surface, and after a rain the earth may be washed off of them sufficiently for a sharp eye to detect them as they lie partially concealed amongst the other bits of stone and gravel. Although only a small part of the Arboretum is cultivated in this way the spots are well distributed, giving a sort of cross section of the whole area. And this has been sufficient to show that there are certain localities in which the relics are most abundant. Interpreting this with some knowledge of the needs of barbarian life, and with a survey of the present topography and allowance for the changes that we know have been made in it in recent years, it becomes possible to locate with considerable certainty the homes of these first inhabitants of the Arboretum area.

The most pressing needs of Indian life and the considerations that influenced them most in selecting sites for camps and villages were a near-by supply of drinking water, food, and fuel. Considerations of safety, comfort, and economy of labor also induced them to seek a place that was comparatively open, well drained, and as free as possible from rocks and brush that would have to be cleared away. A situation with a fairly level but not too flat surface, near a perennial spring or running brook, shaded by large trees, and with an unobstructed view for some distance in all directions, would offer the maximum of advantages.

Any spot offering most of these attractions was almost certain to have been chosen as a camp site at some time. And if in addition it were situated on some bay, lake, or navigable stream, affording ready means of travel by canoe and an abundant food supply, it was quite likely to have been occupied by a permanent village. Looking over the land today and taking all of the factors into consideration, the trained eye of the archaeologist can locate such places, and he can generally pre-

dict with a considerable degree of certainty that Indian relics will be found there even before he has had an opportunity to search for them.

While scattered specimens of Indian relics have been found in a number of places in the Arboretum, the great majority of them have come from a few limited areas that were evidently occupied as camp or village sites. Nearly half of the pieces in the collection, were picked up within the space of a few acres along Bussey Brook near the center of the Arboretum.

A slight rocky elevation, the upper part of which is still covered by a remnant of the native forest of deciduous trees, extends from the boundary formed by Centre Street towards the brook. Ledges of Roxbury conglomerate outcrop in many places at the higher elevations near the street, and farther east the formation again comes to the surface, crossing the Valley Road and connecting with Bussey Hill. A perennial spring issues from the rocks at a point near the road forming a small rivulet that flows away across the meadow to join Bussey Brook. Towards the brook and in the triangle formed by the channels of the two streams the hill flattens out into a comparatively level bench or small plateau a few acres in extent, which is now occupied by plantings of various conifers and the Juniper group. Some distance back from the main brook there is a depression that may have been a ravine or the bed of another small rivulet, and the surface rises gradually again from this lowest point towards the brook, with the conglomerate coming to the surface at a few points and forming a low bluff or ledge along the narrow valley, with the north slope of Hemlock Hill on the opposite side. The drainage in this triangular area is good; the soil though thin in places is fertile, and under primitive conditions it was probably covered with open oak or mixed woods. A good outlook could be had up and down the little valley and across to Hemlock Hill, while a little farther up, the valley widened into what was evidently a small swamp or bog.

Such a place offered many advantages for a camp or small village site, and it seems to have been the center of an Indian settlement within the Arboretum area. The relative abundance of relics and fragments found here seems to indicate that it was occupied with some permanency. For even more significant than the finished implements are the small flakes or spauls of the different varieties of stone used by the Indians that have been picked up here. These spauls, having a characteristic conchoid fracture, were struck off from the small mass of stone in the process of manufacturing the chipped implements, and they afford an indubitable proof that such an industry was carried on where they are found.

The location of other Indian camps or lodges at several points in the Arboretum is indicated by the number of relics that have turned up. For although a stray arrow or spear may have been lost almost anywhere on a hunting or foraging expedition, such an accident could not account for the presence of a number of relics near one spot, especially when they include implements of domestic use or spauls. After the Spring Brook Village site just described, relics have been found in the largest number along the slopes bordering the low meadow from near the Administration Building to the wooded hills beyond the Linden and Horse-chestnut groups. Until comparatively recent times much of this low ground was occupied by a shallow lake or bog fed by several perennial brooks that have now, with one exception, been obliterated and the water carried under ground through sewers and conduits. Even now the lower part of this area is quite swampy and it becomes flooded in wet seasons, with the water table near enough to the surface to afford homes for muskrats, no doubt the direct descendants of those that were trapped and hunted along with other game by the Indians who once camped along the borders of the bog and lake.

Another Indian camp seems to have been located on the level ground at the east end of Hemlock Hill near the South St. gate and extending across the street. The construction of roadways and other changes have obliterated most of this site, but several relics and fragments have been picked up in a small cultivated area just within the Arboretum wall and in the nursery across South Street. Scattered relics have also been found near the top of Peters Hill, on Bussey Hill, in the shrub collection, on the wooded ridges above the horse-chestnuts, and at several other places.

There is a strong appeal to the imagination in ancient objects with human associations, and the question is often asked as to how old they are. Naturally, this cannot be answered definitely in regard to such relics as those found in the Arboretum. The hard stones from which most of the chipped implements were made are practically indestructible or at least they yield very slowly to the disintegrating forces of time and weathering. The depth to which oxidation has penetrated some of the specimens indicates a considerable antiquity for them. Perhaps some of the pieces are no older than the time when the first white settlers began coming into the country or when the Indians abandoned their crude stone tools for the more efficient metal ones obtained by barter from the Europeans; others may have been made centuries earlier. All that we can say is that they are very old.

ERNEST JESSE PAIMER

EXPLANATION OF THE INSERT

1. Projectile point (base and point broken). Material, basalt-porphry. Top of Peters Hill.
2. Celt. Material, felsite-porphry. Foot of Hemlock Hill, east end.
3. Knife? Material, basalt-porphry. Spring Brook Village site.
4. Arrow point. Material, felsite-porphry. Spring Brook Village site.
5. Scraper. Material, chert. Border of meadow, near lindens.
6. Projectile point or knife. Material, quartzite. Hickory group.
7. Arrow point. Material, basalt-porphry. Top of Bussey Hill.
8. Arrow point. Material, argillite (slate). Along brook northeast of Administration Building.
9. Knife. Material, felsite-porphry. Spring Brook Village site.
10. Arrow point. Material, basalt. Spring Brook Village site.
11. Projectile point. Material, basalt-porphry. Centre Street border.
12. Projectile point. Material, basalt. Upper bench, Spring Brook Village site.
13. Arrow point. Material, basalt-porphry. Glacial esker, North Woods.
14. Knife or digging tool (broken at both ends). Material, chert? Meadow near Administration Building.
15. Projectile point. Material, basalt-porphry. Border of Meadow, near horse-chestnuts.
16. Drill or reamer. Material, chert. Upper bench, Spring Brook Village site.
17. Knife. Material, felsite-porphry. Border of meadow, near lindens.
18. Projectile point or knife. Material, felsite-porphry. Border of former brook along Meadow Road, near corkwood.
19. Projectile point. Material, felsite-porphry. Spring Brook Village site.
20. Knife (point broken). Material, chert. Spring Brook Village site.
21. Arrow point. Material, basalt-porphry. Spring Brook Village site.
22. Arrow point (point broken). Material, chert. Upper bench, Spring Brook Village site.
23. Knife (point broken). Material, felsite-porphry. Spring Brook Village site.
24. Arrow point. Material, basalt. Foot of Hemlock Hill, east end.
25. Knife. Material, quartzite. Hickory group.
26. Arrow point. Material, quartz. Centre Street border.
27. Arrow point. Material, quartz. Centre Street border.
28. Arrow point (point broken). Material, quartz. Foot of Hemlock Hill, east end.
29. Knife or scraper? Material, argillite. Border of meadow, near lindens.
30. Gun flint. Material, horn flint. Border of meadow, near horse-chestnuts.