Pipistave Hollow Ideography
Possible Calendrical Notations from the Northeast

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Note
Excavation of the Pipistave Hollow site was conducted in the Spring of 1977 and 1978 under the direction of Dr. Richard Michael Cranly. The excavation was supervised by the author. An archaeological site, the Pipistave Hollow art site, was the subject of the excavation. An investigation of the site's contents involved the use of microscopes to examine the artifacts. The artifacts were then analyzed and documented. The site was located on Long Island, New York.

Alexander Marshall (1972) has argued that some incised designs on Old World artifacts—mainly from the Upper Paleolithic—were calendrical and, in many cases, calendrical rather than simply decorative or symbolic, in a general or abstract sense. His work, much of it involving careful examination under a microscope, sets out to demonstrate three things: that these different portions of a sequence were made with different individual tools; that the sequence show regular and repeated patterns. These patterns he sees as time-marked, many involving seasonal events, and some date to the lunar calendars.

The frequency of these time-marked designs demonstrates the type of calendrical notion was well-established in human beings by at least the Upper Paleolithic period. Prehistoric artifacts with incised designs have been reported occasionally from the middle Atlantic region of North America (Anonymous 1907; Harrington 1924; Griffin 1952; Powell 1984; Riddell 1967; Kraft and Thomas 1976). I am aware of several others not yet published, but these are, in most cases isolated finds, some lacking any secure provenience.

In 1976, however, archaeologists excavated two unusual engraved objects (artifacts A, C) at the Pipistave Hollow site, a Late Archaic habitation site on the north shore of Long Island, New York (Fig. 1). One was a section of a large whelk which had been fashioned into a pendant and, upon cleaning, revealed incised lines and what appeared to be tally marks. The other, a small, well-worn piece of deer-bone, bore similar incised markings.

The archaeological assemblage with which these artifacts were strigraphically associated, described in more detail elsewhere (Cranly 1977), consisted of an assortment of chipped stone implements with Squibnocket Complex affinities, together with large quantities of marine shell and other faunal detritus, which revealed that the makers of the incised objects were marine- and estuarine-oriented hunter-gatherers who exploited a beneficent and apparently stable middle-Atlantic coastal environment in the 3rd millennium B.C. A radiocarbon determination on wood charcoal from a feature on the site produced an uncalibrated date of 3900 ± 140 years B.P., or approximately 2015 B.C. (GX-A450).

During the course of another summer's fieldwork at this extensive and fruitful site, more incised bone artifacts were recovered (B, D, E, F). A second radiocarbon determination (GX-A4504, unpubl.2007) on marinel- shell associated with them, closely approximated the 1976 date (Cranly, pers. comm.). Several of the new pieces were parts of bone flutes or whistles. Another (D) was the small, rounded end of an object similar in every detail to the 1976 bone find. Still another (F) appeared to be some sort of 'tally stick,' but others were too fragmentary for the shapes of the complete objects to be identified.

These several Pipistave Hollow pieces, all from the same site and cultural period, constitute a very unusual assemblage. It is the purpose of this essay to describe these artifacts, to ascribe function to several of them by means of analogy to similar objects reported elsewhere, and to present arguments in support of the hypothesis that some of the pieces bear lunular calendrical notations.

THE ARTIFACTS
Artifact A (from PH 12E0, Feature 2) is one of three pendants found at the site—the other two are not incised. It is a section from the shell of a marine whelk (Busycotypus canaliculatus), a species common in the Archaic period to the shore where the Pipistave Hollow site lies. The section is roughly rounded, and is pierced from the outer (convex) side with a large (32 mm. diam.) hole. Suspension as a pendant from a thong or cord is indicated, upon magnification with a Bausch and Lomb 1.5 in.-7X jeweler's loupe, by the worn appearance of the upper edge of this hole in contrast to the rougher bottom edge. Unfortunately, the pendant is both chipped and broken, so that the design on the inner (concave) surface is incomplete. That part of the design which is preserved is crudely rendered, much more so than the designs on some of the other Pipistave Hollow engraved pieces, indicating that the pendant was not
a ‘treasure’ item, but an object of mundane use.

Short, straight ‘tally’ marks are combined on the pendant with longer lines, several of which meet to form triangles. The arrangement of these marks is reminiscent of the design on a ‘painted’ stone reported from prehistoric coastal Connecticut, at the Spruce Swamp site, no more than thirty miles northwest of Piptewa Hollow across Long Island Sound, by Powell (1964), who proposed either a ‘Southern Cult’ motif or, alternatively, the graphic representation of some meteorological or astronomical event. On analogy with certain ethnographically known solar records, he suggested that a solar eclipse may be represented on the ‘painted’ stone with triangular ‘teeth’ depicted as biting the sun.

A different interpretation is equally plausible for the similar Piptewa Hollow design. Generally following Marshack, it can be supposed that the long series of hatch-marks represents days. It is not known how many are represented, because some of the marks are missing where the piece has been broken or chipped; but it is clear that, if these marks do indicate days, then somewhat more than a month is represented. Further supporting that the marks superimposed over the hatch-marks—two horizontal lines, several vertical lines, and two triangles—may refer to some significant or special about certain of the ‘days’ represented by the corresponding hatch-marks (periods of rituals, fertility, hunting, and visibility in the open, or periods of menstruation), the whole design might be seen as a ‘calendar’; a marked object, perhaps worn around the neck.

Re-drawing the curved design on the pendant as a lunar calendar, comparing this with a simple lunar model, following Marshack (1972: 30, Fig. 3, and elsewhere), some interesting results emerge. If the superimposed marks are in some way connected to periods of lunar observation, and if the central mark in the series is significant, then a continuing calendar is suggested with the central mark perhaps representing the day of invisibility of the moon. Counting in each direction from this larger mark, and placing the full moons where they would occur [10 to 15 days either side], we find that in both cases the full moons fall directly into the areas of superimposed lines, those indicating the ‘special’ days. Moreover, one full moon falls at the mark singled out by the apex of the large V on the right, while the other falls (approximately, since a few days are missing due to the large chip) at the mark corresponding to the right side of the elongated, inverted Y on the left. The design thus lends itself well to interpretation as a simple symbolic representation of the phases of the moon. Since it is incomplete, however, one cannot go further than to suggest that it is what Marshack terms a ‘lunar phrasing.’

Artifacts B and C

Artifact B is a small, fragmentary object made from a bone of the white-tailed deer (Odocoileus virginianus), broken at both ends and now approximately 4 1/2 cm. long. Some of the interior or decorative purpose may be implied by the hole at one end: compare the bone ‘pendants’ from the Lamoka Lake site (Ritchie 1938: 1965) and the Beothuk incised bones reported by Marshall (1974). Microscopic examination reveals that the hole was drilled from both sides, and that its edges have been worn as if by rubbing against a thong. The piece is broken along one side as well as both ends.

The design looks decorative (this subjective problem is addressed below, in the Discussion), and there are many ethnographically reported artifacts—especially utilitarian objects—which bear decorative of no special significance (e.g. Woodburn 1970: 20). However, the fact that within each double triangle there appears a different number of vertical lines may imply a notational system of some kind. The fragment is too small to yield firm conclusions, but it is interesting to note that the Motki of the American Southwest used parallel zigzag lines to symbolize lightning, and the same design with vertical lines filling the triangles—i.e. the precise design of artifact B—to represent rain-plus-lightning, or a thunderstorm (Mallery 1893: 698). Because of the hole, the possibility that the artifact is part of a sighting or range-finding device must also be considered: although it is not extremely rare, these are known in the Americas; some have tally marks which may be scales for measurement (Miles 1965: 50-41). Until a future excavator unearths the remaining pieces of this artifact, however, it must remain enigmatic.

Artifact C is a heavily-engraved, handle-like object, from the limb-bone of a deer, broken at one end and the base from the Abri Larret in the Dordogne in which Marshack argues are highly polished. It was interpreted by its excavator as a tool; probably for ‘some mundane purpose,’ because of what may be indications of hafting as well as its high-polish (Grady 1977: 24). This assessment can be challenged on several grounds.

First, if it is a tool, it is the only decorated tool in the whole of the huge Piptewa Hollow tool assemblage. Secondly, although the use of deer-bone for some kinds of tools is well-documented archaeologically, its use as a substantial and often-utilized tool, in an area with a plethora of wood and stone, seems unlikely in view of the frangible nature of the material. Finally, the indications that the object was hafted are very slight. The two opposed V-shaped grooves in the undecorated side do more indicate hafting than they indicate that the object was intended to be flapped, spun, or balanced with the use of a piece of cord. Since the artifact is incomplete, it is not possible to test this idea. The grooves, however, have been smoothed by rubbing against something. One is reminded of gaming pieces, such as stick dice, known occasionally from the Americas (for instance, Miles 1965: 211-12), which were sometimes spun or flapped with a cord. Certainly the high polish on this object, which four thousand years of burial time did not obliterate, indicates that it was either purposefully rubbed or handled repeatedly.

Again this is not inconsistent with the idea of a gaming piece. The incised marks themselves, ‘tally’ marks and dots, some of which fall into regular lines, look notational, and very closely approximate the markings on an Abri Larret in the Dordogne which Marshack associates with hafted tools (1975: 50). The seventeen hatch-marks along the edge of the rounded tip, overlain by a solid line running perpendicularly to them, mimic the ‘days’ marked on the whet-shall pendant. To reinforce the suggestion that the edge-marks are a day count, in that one of the chipped and broken areas, the full count comes to thirty marks along one edge and fifteen along the other—highly suggestive of lunar phrasing. However, the artifact is sad incomplete and, so far, defies interpretation.

Artifact D is a tiny (3.5 cm.), rounded, deeply-incised and highly-polished end-fragment of a longer deer-bone object. Both edges contain hatch-marks or ‘tally’ marks. The significance of this object lies not so much in its message, for that is obviously incomplete, but in the fact that this is clearly an object of the same type, employ-
The markings on artifact E resemble the five-day counts which prisoners are alleged to make on their cell walls. This piece is a small (0.5 cm) fragment of deer-bone, broken at both ends, bearing eight groups (with the suggestion of more) of vertical marks of graduated lengths, joined by diagonal lines. The number of vertical marks in each group varies from four to seven, implying that varying-sized groups of some-thing are represented. These marks do not suggest lunar phrasing, since this typically follows a pattern more like 7-6-5-4-3-2-1-0 ... Following Marshack, this represents approximately seven days from full to half moon, approximately six days from half moon to invisibility, three days around the day of invisibility, five days to the next half moon, and so on. However, the pattern on artifact E is, along one edge, 4-5-7-4-4 ... thirteen of those marks probably represent a simple tally. It is also possible, of course, that they may be purely decorative; the design does have the elements of regularity, balance, and harmony.

Artifact F is perhaps the most interesting incised object from the Pipistave Hollow assemblage. Made of deer-bone, somewhat smoothed although lacking in high polish, this object measures 6.2 cm in length, fitting easily across the palm of the female hand. It is deeply incised along the length of one edge with markings, very few of which are alike. The other edge bears only a few marks; these, too, are different from one another. The major significance of this artifact is that here, at last, is a complete object, on which the smoothly-rounded and unbroken ends attest (it was found in two pieces, and restored by R. M. Glamly, but it does not appear that the markings were obliterated by the break). The markings do not appear decorative, nor are they scrape-marks such as might be made purposely for a firmer grip, for such would be more similar to one another and presumably would extend the length of both edges.

Along one edge are twenty-nine crudely-executed but distinctive markings in a row. None of these is precisely like any other, although five are variants on a single vertical line. The grouping of the twenty-nine marks seems to fall into a 6-1-6-2-1-4 pattern, with the vertical-line symbols falling at the '1' and '2' positions of this pattern. The number 29, of course, suggests that this piece may be a one-month calendar, on which each day is represented by a separate mark.

If it is supposed that the series of marks represents one lunar month, from the first lunar crescent to invisibility, then mid-month, the period of the full moon, should fall precisely in the middle of the series, and it might be expected that the marks for these days would be differentiated in some way from the other marks. This is exactly the case. The mid-month, or series, also reading from left to right (turning the artifact 180° in the hands), the series is too short to try to interpret in the light of the evidence we have of possible lunar notation.

**DISCUSSION**

The preceding sections of this article have proposed that several artifacts from the Pipistave Hollow site bear markings that may be notational or even calendrical. There are two main areas for discussion of this proposition: one, the problem of attempting to distinguish between notations on the one hand and decoration on the other, and two, the problem raised by drawing parallels between mainly Upper Palaeolithic Old World examples and considerably later New World examples.

Marshack recognizes, of course, that the distinction between notation and decoration is problematic (see, for example, Marshack 1972 pp. 35-6, 37, 38-9). His solutions for attempting to resolve the dilemma are two: first, the demonstration of replication of marking sequences on a number of artifacts (in particular by a notation calendar upon the longer sequences of markings) and second, his developed system of microscopic examination, which made it possible to show that some sequences were made with a whole series of different implements. For example, the Abri Blanchard bone piece bore sixty-nine markings, made with no less than twenty-four different implements. This, he argues reasonably, would be unlikely in the execution of a decorative design but likely in a notation or calendar executed intermittently over a period of time.

At Pipistave Hollow, artifacts C and D,
recovered from different loci of the site, are so similar in their markings that some specific meaning may reasonably be imputed to those markings. Further, it looks very much as if these two series of markings were not idiosyncratic, of meaning only to the maker, but intelligible to the whole community. More broadly, it may be suggested that these two artifacts, at least, are examples of a notational system widely understood in this area and period. However, it has not been possible to examine the artifacts described and discussed in this article microscopically in order to determine whether or not any or all of them were marked with more than one implement, suggesting a sequence noted over some period of time. Such detailed examination would be particularly important for Artifact F, the only complete object and therefore the only one that might carry a complete sequence.

The second major interpretative issue is of very broad significance indeed: can ancient symbolic systems be interpreted at all by cross-cultural comparison, particularly when these comparisons are across very wide gulfs of both time and space? To this reasonable doubt one may respond by referring to the critical elements of 'structural anthropology,' most notably the argument that there are elements common to the mental processes of all Homo sapiens sapiens, elements that appear to structure human thought and so to structure human symbols (e.g. Lévi-Strauss 1962, 1963; Needham 1978, 1979). Thus it follows that graphic representations of ideas are in fact limited, which greatly enhances the possibility that ancient symbolic systems can, in fact, be interpreted by modern analysts.

CONCLUSION

Although the Pipestave Hollow engraved artifacts are few in number, and although their analysis is incomplete, the considerations outlined in this article appear sufficient to argue that simple notational/calendrical systems were in use by Late Archaic times in northeast North America. It is hoped that this preliminary publication may stimulate other archaeologists to search for, analyze and publish further data on the prehistoric symbolic systems of this area.