

correct.. The weight of the animal, taken soon after its death, was 765 pounds; as much, perhaps, as the half dozen specimens I have alluded to would average.

It follows, therefore, that these were but a little more than half grown, or that 1200 pounds, the estimated weight of an adult, as given by Dr. Holbrook, is much too large. A further examination of the specimen, which was fortunately secured by Prof. Cope, will, doubtless, decide the matter. In the meantime, a few of the more prominent characters pertaining to the animal may be profitably referred to. For instance, the mode of respiration in *Sphargis* is peculiarly marked. This is apparently effected by inflating the throat with air until it is much enlarged, and then by closing the nostrils and contracting the throat, suddenly forcing the air back into the lungs. That this pumping process is common to all the Testudinata is known, but that it effects respiration is denied by Drs. Mitchell and Morehouse, who ascribe this function to the axillary and inguinal muscles.

A much wider difference is found in the skeleton. Thus, in *Sphargis* the vertebral column is entirely independent of the carapace, while in other genera it is co-ossified. It differs also in having the carapace disconnected with all the other parts of the skeleton. Another peculiarity consists in the carapace being composed of a vast number of small bony irregular tesserae joined by minute suture. The plastron is also more rudimentary than that of other turtles, being represented by a mere oblong ring of bones. Of course these embrace the more prominent features. It is not improbable, however, that a careful study of the animal will develop other points of equal interest, in which event the cause of science will be profited.

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WERE THEY MOUND-BUILDERS?

BY S. L. FREY.

THE question as to whether the mound-builders extended their occupation as far east as Eastern New York is an open one; and while some relics recently discovered have led some writers¹ to the conclusion that they had, I think that we need much stronger proof before we are warranted in drawing this inference.

It is but fair to conclude, however, judging from analogy, that

¹ Wm. L. Stone, *Magazine of American History*, September, 1878; Prof. Geo. W. Perkins, Portland Meeting of the American Association; Smithsonian Contributions, 11, p. 58.

some people occupied this section of country before the advent of the Iroquois, for we cannot think that previously to that time, this fertile land, abounding in fish and game, was entirely without inhabitants. Who these tribes were, Hurons, Shawanoes, or some more advanced people, is but a matter of conjecture. It is an interesting subject for investigation, and it may be the good fortune of some one yet to discover relics that will lead to an elucidation of the mystery.

In this paper I wish to call attention to and describe some ancient graves, and their contained relics, which I have recently opened and examined, leaving it for others to conclude from the premises which I shall furnish, whether these were simply Indian graves of an old date or those of another people.

I have known of the place, examined for many years, and had, with others, previously done some superficial digging, finding at one time, in a grave, thirty arrow-heads and a small copper awl. The latter, of which Fig. 1 is a drawing, might have been used for piercing holes in buckskin garments, but as implements for



FIG. 1.—Full size.

this purpose were usually made of bone with the point rounded and sharpened in a similar manner, and as these were obtained with comparative ease and were equally serviceable for sewing purposes, I think that possibly this copper implement had a different, or at any rate an additional use. According to many early writers the natives at the time of the discovery, were found in possession of ornaments, necklaces, &c., of pearls, the perforating of which was done with a heated copper spindle. The square shape of this implement indicates that it has been set in a handle, and the point being very smooth, shows use of some kind. That it was intended for a drill of this description seems not improbable, when viewed in connection with certain shell relics subsequently found, and which are described in this article.

Aside from the above, as far as I have been able to learn, little had been found by others digging at this place. It is known as an "Indian burying-ground," and was originally an extensive knoll of sand and gravel with an upper stratum of loamy soil about four feet in thickness, mixed with angular fragments of sand rock. It has a southern exposure, and is abutted on the north by a precipitous rocky hillside. Unfortunately, however, the most of this old graveyard was removed years ago to make an

embankment for a railroad, and tradition says that many skeletons and relics were unearthed at this time, the bones being buried under the roadway, and that the relics, through the customary ignorance of the workmen, were destroyed and lost.

In Fig. 2 I have given a section of the place which shows the original form and what remains of the graveyard sufficiently well;

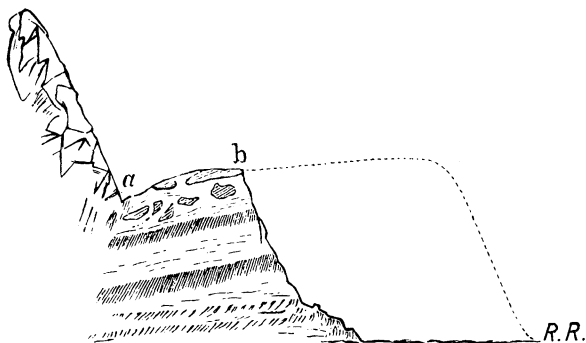


FIG. 2.

the point between *a* and *b* is where the graves which I opened were found ; its conformation and the character of the soil suggested that it might have been somewhat artificially altered.

So much digging had been done previously to little purpose, that I had little faith that any graves remained undisturbed, but a friend of mine accidentally hearing that a curious pipe had recently been found, we visited the place one afternoon in November, too late, however, to do more than a little hasty and superficial digging. Examinations of places of this kind, containing graves of an ancient date, should of course be made with care, else will most of the bones and interesting relics be destroyed, or at any rate no satisfactory conclusion can be arrived at in regard to the manner of burial, probable age, &c.

Although our digging at this time was hasty, and done a little recklessly, I was fortunate in finding one grave, from which we obtained several relics of interest ; the most curious being a tube, the shape and general appearance of which is represented by Fig. 3. This tube case, being covered with a dark earthy deposit, we were led at first to think was made of clay, but upon closer examination with a powerful magnifier, I am inclined to think that it is of stone, steatite perhaps. Under the glass there is none of that appearance of pounded shell or stone so generally observed in all early fictile fabrics. The rings and marks made by the boring tool are also plainly seen in all of them.

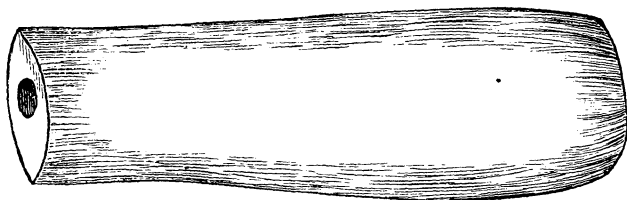


FIG. 3.—One-half natural size.

This tube is four and a quarter inches long, the perforation has at one end a diameter of one-quarter of an inch, gradually enlarging until it reaches at the other end a diameter of three-quarters of an inch.

Besides the tube, we found at this time a sea shell, somewhat modified for a drinking vessel, its longest diameter being four inches, a beaver's tooth, several bone awls, three arrowheads, a number of flint flakes, pieces of a tortoise shell, some fragments of deer horn implements, the bone gouge, Fig. 4, and a large wing bone of a bird.

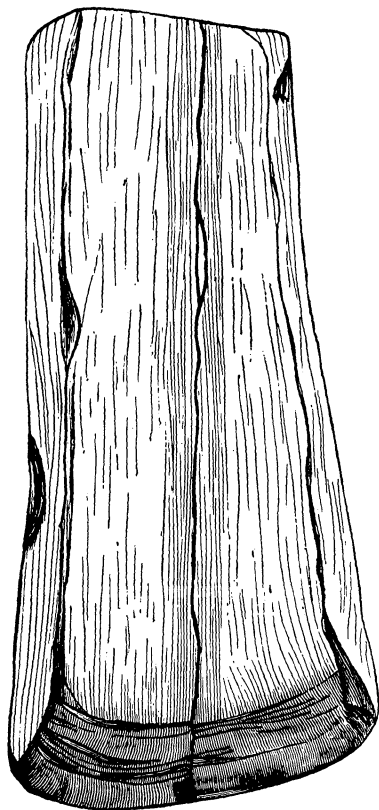


FIG. 4.—Bone Gouge, full size.

examined were of this kind. Large boulders and angular pieces

A few days after this I again visited the place with a couple of workmen, and prepared to give it a pretty thorough examination. I commenced digging at the grave we had previously found, and cleared off a space several feet wide immediately below it, so as to be able to determine the manner of burial. I found that there had been two bodies buried in this grave, side by side, in a sitting posture, facing the east, a pit having been dug about three feet in depth and lined with flat stones previously to the interment. This manner of lining the grave I have not before seen, but all the graves

of sand rock had, however, in some instances been rolled into or on top of the grave, a protection, perhaps; against wild beasts. The bones were very much decayed, so that it was impossible to save even the skulls.

In addition to the relics previously described I found another tube; it appears to be of the same material as the one already figured, but differs from it in shape and length. It is eight and one-half inches long and one inch in diameter, having a bore of five-eighths of an inch at one end and two-eighths of an inch at the other. It is smoothly made but has no polish at present, being covered with an earthy coat, and in patches with a thick concrete of lime and sand. With this tube were found lying side by side, three hornstone implements; they are respectively five and one-half, six and one-quarter and six and one-half inches long, and about one-quarter of an inch thick in the center, beautifully chipped and of perfect proportions, the material approaching nearer to flint than any other specimens found here, the conchoidal fracture being even and perfect, and the edges semi-transparent.

The mineral seems to have been selected out of regard to its beauty, the points of all of them being lighter colored than the rest of the implement. In the largest one, Fig. 5, appears a small nucleus, around which

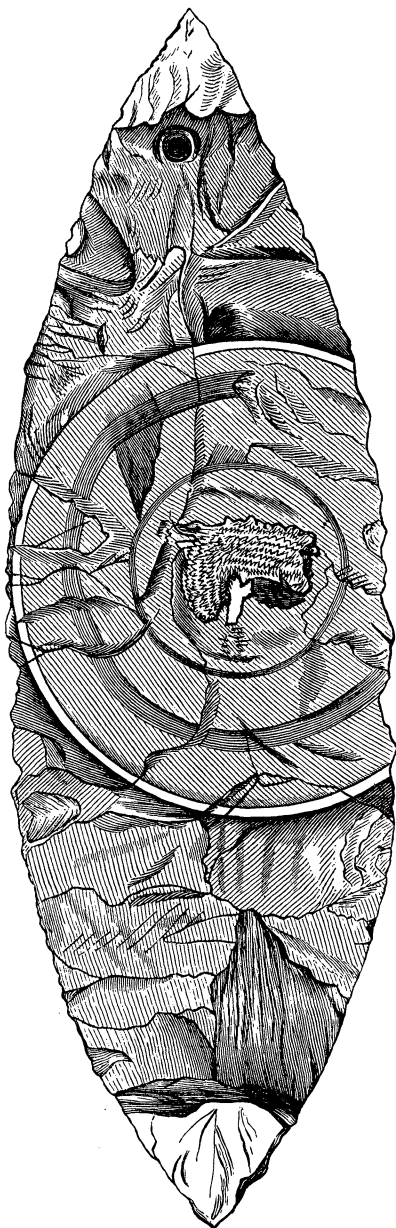


FIG. 5.—Hornstone Implement, full size.

the mineral formed in concentric circles, shading off from the center to the circumference, and very much resembling some of the hornstone disks made from the material at Flint Ridge, in Ohio. The upper side of these implements was partially covered with the same kind of concrete which adhered to the tube. I have endeavored to show this in the engraving.

Proceeding into the side hill about six feet I came to another grave, the first indication of which was the red color of the surrounding earth; the body was at the same depth as the last, and the grave lined with stones in a like manner. Although the bones were too badly decayed to judge with certainty, I believe this to have been an extended burial, as the skull seemed to be in place, and on the same level as the pelvic and leg bones. The body had been buried with the head toward the west. The first object found was a piece of "slaty graphite" about five inches long, four inches broad and two inches thick, the surfaces of which are deeply grooved and furrowed, apparently with sharp flint-flakes or other stone tools. For what purpose these irregular grooves had been made it is difficult to say; they resemble those in the so-called sharpening stones, but as this material is soft it could not have been used for such a purpose. I think it probable they were made to obtain the powdered black lead for purposes of decoration, or in the manufacture of a pigment of some kind. This piece of ore and the ground for some distance around was covered with a red earthy deposit several inches in thickness, which had colored the earth and stones, as I first observed, as well as the bones and contained relics. In none of the other graves was so much of this red substance found, and none at all in some of them. It is without doubt red hematite, placed in the grave for some purpose.

Imbedded in this red ore I found two tubes, similar to those before described but longer, the perforation large at one end and small at the other, and the striæ and drill marks, showing plainly on the inside, indicate that the material is stone; they were nearly ten inches long and an inch in diameter. If the uses of these tubes were known, we might be able to conjecture why two so similar should have been buried in one grave.

Near the tubes, and also imbedded in the hematite, I found what had apparently been a necklace or head-dress, composed of copper and shell beads; the former were badly oxydized, and had

been made of thin sheets of copper rolled into tubes. That they had been worn around the head or neck was evident, for one side of the skull and the lower jaw-bone were stained a dark copper color. Many of the shell beads were also stained by the copper; those so colored retaining their original polish, being hard and glassy, like ivory, while those not so stained were brittle, many of them falling into a white laminated powder. The shell beads were fifty-nine in number, besides those that were too badly decayed to handle, and were from half an inch to one and three-quarter inches in length, and averaged about half an inch in diameter. They were of that kind so fully described by the early writers, made from the columellæ of large sea shells and rubbed and ground smooth with great labor, and afterwards drilled through their longest diameter with greater labor still. They were known by the names of "roanoke," "peak" and "wampum," and were worn by the southern Indians as nose and ear jewels, necklaces, etc. The drilling of these hard shells when iron tools were unknown, must have required patience and industry, and we may well look at them with wonder, and as evidences of the possession of these virtues by their unknown makers. The drilling had been done in most cases from each end, the holes meeting in the center. In some of the shorter ones, however, the perforations were made from one end, being of uniform size throughout. The spiral grooves where the whorls of the shell wound round the hard central column, can be seen in all of them. In addition to the beads and probably forming a central pendant to the necklace, there was found an elk's tooth. It is stained a beautiful copper color and highly polished.

On the same level as the last grave, and about six feet to the west of it, I came to another, similar in all respects, lined with flat stones. The body was apparently extended, with the head toward the south; the bones were nearly all decomposed. The relics found were the remains of a necklace of shell beads, little copper tubes and small sea shells about half an inch long, with a hole drilled in the large end. The only way that these latter can be strung is with a "waxed end" tipped with a bristle, such as shoemakers use. This follows the whorls of the shell, and it is the only way, apparently, in which they can be utilized as beads. Their makers may have had some other way, but I have not been able to discover it.

In addition to what has already been described, the workmen found two graves further to the east and lower down on the hill-side. The first contained merely a skull and a few large leg bones, the interment being unlike the others. The skull rested face down on the other bones, the ends of which had apparently been gnawed by some carnivorous animal, the tooth marks being plainly visible. From these circumstances I think the bones may have been collected on the surface and buried as I found them. The skull, although too much decayed to be taken out except in small pieces, was fully twice as thick as the others, with the ridges largely developed. The marked anatomical differences and the burial, so unlike the others, there being no relics found, would indicate that this man belonged to another people. At any rate little respect seem to have been paid to his remains.

The second grave contained nothing but the moldering skeleton of an individual who had been buried facing the west.

A few days after this I made another examination of this place, accompanied by a friend. At this time we found but one grave. It was a short distance west of the others, and similar to those already described, with the same lining of flat stones. The bones were at a depth of four feet, that being the deepest grave of any found. It was apparently an extended burial, the skull rested on a stone a little above the level of the body and faced the west. In this grave I found two shell beads and one hundred and eighty-nine arrow-heads; the latter were all of one type, leaf-shaped with truncated bases. They vary from one inch to two inches in length; the material is chert or hornstone; and they are sharp and chisel-like at the base, with serrated edges and sharp points. These one hundred and eighty-nine arrow-points to a savage people meant far more than we are qualified to appreciate. It was so much wealth, so much food-producing material rendered unavailable. What a vivid picture this old grave and the decaying bones of its occupant give us of the poverty of these stone-age people.

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RECENT LITERATURE.

GEOLOGICAL SURVEY OF INDIANA.¹—These reports embrace descriptions of the geology of Wayne, Crawford and Harrison

¹ *Eighth, Ninth and Tenth Annual Reports of the Geological Survey of Indiana, made during the years 1876, '77, '78.* By E. T. COX, State Geologist, assisted by Prof. JOHN COLLETT and Dr. G. M. LEVETTE. Indianapolis, 1879. 8vo, pp. 541, with maps.