But, as observed before, there were four small real sinkings, and the only way to explain them, and Mr. Miller's statement that they had caved down in the last ten years, and that plow-horses had become entangled in similar ones in the next field, was to follow down the deepest of them, 2 feet in diameter, 3 feet deep, and extending sidewise under the roots. Our shaft 12 showed that for 14 feet down at this sink, and continuing 11 feet below its bottom, the yellow soil containing charcoal and chips has been disturbed. At 8 feet we encountered a limestone ledge and followed the traces of ancient work downward over its edge until at 14 feet these seemed to slope away diagonally out of reach of our shaft. If we are to believe James Garr, who stated that he sunk a pit in another sink about 30 feet farther to the west and found traces of disturbance to a depth of 40 feet, when he struck the limestone ledge above mentioned, we had worked into an Indian digging about 40 feet in depth and probably 100 feet in diameter that had been completely filled up by the ancient workmen.

But, without using Garr's testimony and refraining from speculation as to the real size of the pit, it is certain that the sink had fallen and we had worked through level ground already dug to an unknown depth, and whether the sink testified to a cave somewhere in the limestone below or a cavity left by the Indians as they piled in the transported earth, it told us certainly more than we bargained for and detracted nothing from the magnitude of the ancient labor.

The Diggings the Work of Indians

Having settled that the pits are artificial; that notwithstanding the limestone in the neighborhood it is not reasonable to suppose that any of them could have been in part or wholly sink-holes (since every depression has its dump and the dumps are about sufficient to level the whole area); that inferably all of the pits had been more or less filled in with excavated earth by the quarrymen; that an area now level had been worked to a depth of 14 feet at least, and that finally it may be safe to say that double the work has been done suggested by the appearance of the surface, it remains to ask when and how were the pits dug and who dug them?

An old stump with 195 rings, on the side of a pit at Vera Cruz, and a tree nearly four feet in diameter cut down by Mr. C. C. Miller at Macungie in the bottom of a depression, would put back the abandonment of work in these two shafts to about 1890-90; and that all are the work of Indians is proved by (a) two fragments of polished celts and one perfect and three broken arrowheads found by me on the edges of the diggings; (b) several small thinned-down blades found near the pits; (c) an arrowhead factory, where I found two fragments of finished arrowheads in the refuse, situated near a brook about three-eighths of a mile from the jasper outcrop; and lastly (d) by the fact that the material found and worked in the pits is jasper, a stone in continual use by early Indians, and worked fragments of which strew every village site in the Delaware valley.

The Method of Excavation

Admitting, then, that no mysterious or unknown race made the pits, vast as the work is, but the Indian, once supposed incapable of sustained labor, the Red man of the grooved stone axe, polished celt, banner stone, and gorget, as encountered by Campanius and Kalm, the next question is, how was the labor accomplished?

This can be answered to some extent, but not fully, by a study of shaft 2, sunk down to the undisturbed bottom of one of the pits (see Fig. 1). Lying on the unworked clay, at a depth of 18½ feet, was a large disc-shaped implement of chipped limestone a foot in diameter and well worn on its cutting edge.* At the fourteenth foot, among the refuse, a

* I regret that I have been unable to publish illustrations of this and the other interesting stone specimens found in shaft 2; also drawings of the oven there discovered, and of the arrangement of layers in shaft 12.