

PROGRESS OF FIELD WORK.

Examining the position of objects in ancient strata, the association of human remains with animal bones in caves, and the arrangement of layers at Indian village sites, the summer's research has sought to learn, independently of other observations, whether Man existed at Trenton seven thousand years ago, whether, if so, he was a stone chipper who could not polish stone (Paleolithic Man) or a stone chipper who could also polish stone (Neolithic Man) and whether, having survived the melting of the Great Glacier, he remained in the valley to change by slow degrees into the Indian or departed thence to work out his development elsewhere. The evidence of newly discovered blade quarries has been gone over with care and the story of village sites reviewed in the effort to learn how long the Lenape who met Campanius in 1643 had been here, whether coming, as he alleges, about 1390, he encountered a predecessor, or whether the valley discovered by him at that time had been for milleniums unvisited by Man.

Two to five men working twenty days at and near the ancient argillite mines on Gaddis Run, while definitely connecting the quarries with the modern Indian, discovered an apparently earlier type of Indian at an underplaced village layer close by. At the same time light was thrown upon that world-wide token of Man's earliest presence, the "Turtleback," for here were distinguished two classes of the much discussed stones, "Turtlebacks" of the quarry, (unlike the average Trenton specimens,) explainable as inchoate cache blades of the latest Indian period, and "Turtlebacks" of the riverside, (like the Trenton specimens,) not explainable as inchoate cache blades, and seeming to betoken a period of unknown duration before the working of the quarries. (See the account in full of the work herewith sent.)

The discovery, on June 23, of another argillite quarry on Neshaminy Creek, (see *Science* for Oct. 9, 1893,) prepared the way for still further elucidation of the purpose and bearing upon Man's early history of these leaf-shaped stones which still puzzle and vex the searcher.

Turning to the chance of a sudden answer to discussed questions in ancient layers, the Trenton gravel cuts were twice re-examined, and as no careful record had been preserved of the position and association of the bones found in the only two caves of importance known in the Delaware Valley, both these abodes of former men and animals were re-explored.

Three men working a week in shafts sunk at various depths in the blasted area at Durham Cave in hopes of finding original cave floors, proved that too much rubbish had fallen in the destruction of the cavern roof by the Durham iron company to surely repay search, while the record of the chief remaining side gallery, known as Queen Esther's chamber, was saved by completely removing the floor humus—which contained, besides traces of fire, the bones, often gnawed by animals, of twenty species of vertebrata, (kindly identified by Professor Cope.) Besides the extinct Peccary, (*Dicotyles Pennsylvanicus*), previously found in Hartman's Cave, (Pa. Geol. Rept., 1887, p. 8,) and whose remains are yet to be carefully associated with the surrounding facts, the Catfish, Chub, Frog, Snake (undetermined,) Rattlesnake, Bird (undetermined,) Bat, Porcupine, Marmot, Wood Mouse, Small Rabbit, Large Rabbit, Black Bear, Wolf, Fox, Raccoon, Otter and Deer had wandered into the recess to die, or had been carried thither as food by carnivora and men.

While the Durham Cave, lying close upon the river and south of the glacial moraine, had not probably been overwhelmed by ice, Hartman's Cave, on a hill-top near Stroudsburg, five miles from the Delaware and several miles north of the moraine, must have been long buried under the Glacier. This fact, marking a clear epoch in the cave's history, had its important bearing on the fossil remains of the Bison, Peccary, and Giant Chinchilla (*Castoroides Ohioensis*), found there, with human implements in 1880, for no man or large animal could have lived at the spot when it was overlaid with ice.

Information kindly furnished by the discoverer of the fossils and only previous explorer of the cave, Mr. T. Duncan Peret, showed that it was still half full of a clay deposit whose bottom had never been reached, and that, as no sure association had been marked between the bones and human remains previously found, we were justified in an attempt to recover, if possible, the story of the original relative position of layers and remains.

A trench 22 feet 3 inches by 3 feet 8 inches by 14 feet 1 inch reached the cave floor and proved, together with our further discoveries of bones, that all the fossils formerly found had come from a layer of debris lying above the clay, and when near the top of this we found a stratum of human habitation containing chert chips, arrowheads, charcoal, a pebble hammer and a charred bone, the notion of a Pre-Indian Cave Man, as suggested by the implements of bone first found, vanished, and we were confronted again with the Red Man as the contemporary, it seemed, of the Peccary and Giant Chinchilla.

October 27, 1893.

H. C. MERCER.

Dear Mr. Shoups
I hope you are well & have enjoyed the summer
we have not been idle along the Delaware
Very sincerely yours
H. C. Mercer

DEPARTMENT OF ARCHÆOLOGY AND PALEONTOLOGY OF THE UNIVERSITY OF PENNSYLVANIA.

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Further negative evidence, again illustrating the difficulties to be encountered in the search for human relics in the ancient layers of these parched water courses, was found in the deeper gorge of Indian creek, near Berclair, (Bee County, Texas,) which, like that at San Diego, had in recent years furnished shelter and stagnant drinking water to roving Indian bands. Here artificial chips and fire-fractured stones falling from the loamy crest of a fossil-bearing bluff lay not far from the teeth of the extinct American Horse in an indiscriminate talus below, while the clear, water-eroded cuts, exposing for more than a mile the stratification, (chalk and pebbles, marl and sand 6 to 18 feet and surface loam 2 to 8 feet,) showed no human relic in situ to prove that Man in southern Texas had ever been the contemporary of the Mammoth, the Broad-Horned Ox and the Fossil Horse.

Turning again to the record of caves for the traces of Man as a possible predecessor of the Indian and contemporary of an older fauna in the Eastern United States, the dry, well-lit and easily accessible Cavern of Lookout Mountain, on the left Tennessee river bank, below Chattanooga, was examined in December, 1893. Four trenches, 6 feet wide and 5 feet 10 inches to 3 feet deep, dug twice to rock bottom across its floor, proved that Man had lived there. But they surprised us by showing the absence of distinct layers of occupancy separated by crusts of stalagmite, clay, sand or breccia, marking lapses of time between his comings and goings. Here, where the cave's shelter must have been forced upon the notice of primitive people by the narrowness of the river path and the height of the overhanging cliff, but a single bed of refuse, homogeneous throughout and showing no evolution in the form, material or grade of relics discovered, rested on the cave earth and limestone. No trace of "Paleolithic Man" or "Mound Builder," "Pigmy" or "Welshman" underlaid the familiar black band, 3 feet 8 inches at thickest, that betrayed the well-known maker of shell-mixed pottery, bone awls, chert arrowheads, shell beads, drilled sandstone and clay pipes. The Indian, as known to the white discoverer, bringing with him a neolithic culture learned elsewhere, coming as high in the scale as he departed, and who had, as I found, laid the bones of his dead upon inner ledges of the cave and cast them dried and clean with arrowheads, potsherds, and broken perforated gorgets upon mortuary fires in a subterranean chasm 250 paces from the entrance, had alone inhabited the cave.

Paleontology would assert no antiquity for his occupancy as judged by the 29 living and 2 extinct species of fauna found with the refuse. Some animals, traced by their bones in the fire places, like the Spade-Footed Toad, the Bat and the Tortoise, though the contemporaries or successors of the cave inhabitant, may have found their way into the midden heap to die, while the remains of the *Unio*, (7 species,) *Io*, (2 species,) *Trypanostoma* and *Paludina*, (2 species,) and of the Catfish, Sucker, Drumfish, Land Tortoise, Water Tortoise, Soft-Shell Turtle, Wild Turkey, Marmot, Lynx, Opossum, Squirrel, Raccoon, Otter and Deer, sometimes split and scorched, generally disassociated with teeth and but once showing traces of rodent gnawing, inferred the hunter's capture of food in river and forest and his carrying of larger animal trunks decapitated to the cave feast.

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The awe-inspiring entrance of the Nickajack Cave, (left bank of the Tennessee River, Marion County, Tennessee,) though subject to partial invasion by river freshets that back the water of the cave creek several hundred yards into its channel, showed traces of aboriginal habitation as far as light penetrated. But the human refuse lay in a scattered talus on an uneven and craggy floor, about 250 feet wide, which, sloping steeply into the cave stream, was buried under masses of leached earth thrown upon it by nitre diggers in 1863-64. Where the remains of old fires were caught in hollows in the slanting ledge underlying this nitrous deposit, a trench (12 feet 10 inches long by 6 feet wide, by 2 feet 10 to 3 feet 5 inches deep,) revealed again a single homogeneous layer of human occupancy continued on an undisturbed shelf clear of the nitre heaps and containing the remains of *Unio*, (5 species,) *Paludina*, *Trypanostoma*, fresh-water Drumfish and Deer, and with its bone awls, arrowheads, chips, hammerstones and pottery, repeating the record of the Lookout Cave. Again all trace of more ancient human presence betokened by underplaced deposits was wanting. Earlier peoples, if they existed, had avoided the Nickajack Cavern, and its only pre-Columbian inhabitant had been the Neolithic Indian, who, strewing the alluvial meadows at its mouth with arrowheads and hornstone chips, had left potsherds, pebble hammers and a perforated ceremonial stone, along with the remains of the cave midden Mollusca and the Deer, Tortoise and Rabbit, at the river-side shell heaps a mile away.

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January 6th, 1894.

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Lookout Mtn., Tenn.

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