ANTHROPOLOGY.

Notes taken upon an Exploration of the Lehigh and Susquehanna Valleys for the University of Pennsylvania, in the Summer of 1892.—A careful examination of the Susquehanna region showed that there were no caves available for exploration on the river side, between Pittston and Harrisburg. Many of the caverns reported as light, dry and spacious, were rifts, not large enough to stand in, or did not exist at all. The rocky ravines of the tributaries of the Lehigh in Monroe County were equally unproductive, and though there, and along the Susquehanna, the sandstone was not adapted to the formation of caverns, there seemed at first no reason why preprecipitous cliffs should not have exposed rock shelters, such as characterize the sandstone region of the upper Ohio.

A day was lost at the rock shelter in a steep hillside near Stemlersville, Monroe County, Pa., about 6 ft. long, 8 ft. wide, and 5 ft. high, though tradition said that Indians had made the place and lived in it. Forty years ago, a man, having walled it in, had used it as a sheep pen. Nevertheless, it appeared that beyond a chance night's lodging for the passing tramp, it had probably never served as a shelter for humanity, and when we had removed a large fragment of rock on its floor and dug down two feet without finding any trace of charcoal below the surface, we abandoned the place.

It took half a day to find Girty's Cave in the sandstone cliffs along the Susquehanna, above Klemson's Island, said to have been the hiding place of Simon Girty, the ferocious Indian renegade of the last century. It was the one and only cave on that river, following the east branch from Wyoming to Harrisburg, after the shelter on the bluff, under the Shekillemy Hotel at Sunbury, had been blasted away by a railroad. Mr. McCalvey, of Girty's Notch, had to go with us to the cave, and to find it climed up a series of perpendicular ledges, said to be inhabited by rattlesnakes, overhanging the "river road." Evidently he had forgotten the site himself, for it took half an hour' search to discover it closed by a fallen rock. The evil reputation which Girty's name had given the place in the last century had been increased by events in recent years, and our guide, descending the cliff, told the horrible story of the decomposed body of a murderer long concealed in the hole, and which he had helped to find a few years

before. The cramped inaccessible rift, only large enough for entrance on hands and knees, could have been no fit shelter for man, and even if animals had chosen it for a den it had no more interest for archæology than the so-called "Indian Cave," on a mountain top near Hunlock's Creek, on the right bank of the Susquehanna in Luzerne County, Pa. There two spacious caverns were reported, but the man who led us over the bramble-covered rocks, haunted by rattlesnakes, could only find one. This was a damp, drafty fissure between large, loose blocks of sandstone. Perfect specimens of Indian earthenware have been found hidden in the crevices of rifts like this, and we hoped to have found a hidden pot, but the place was too far from water and too difficult of access to have presumably served as a primitive habitation, and we were not surprised to find no underground relic of man's occupancy when we dug down into the black mold of its floor.

A century of weather and original rough usage seems to have played such havoc with the pottery of the Pennsylvania Indians that scarcely anything is left but small sherds. If it had not been for the habit of the white man's predecessor of placing pots in small caves and rock rifts for safe keeping, we should have few earthern specimens left perfect enough to show what the old forms were. Scarce as Indian graves are in the east Apalachian region of Pennsylvania those containing perfect pots are still scarcer. As a great rarity, the Wilkesbarre Historical Society shows an almost complete pot, found by John Kern in an Indian grave on the Susquehanna River at Plymouth, near by, and another unearthed on the neighboring Kingston Flats, by Millard P. Murray; but one of their best specimens is that found on a ledge in a cave near Tunkhannock, by Asa Dana, in 1858. Mr. A. F. Berlin, of Allentown, informs us that another perfect pot was found recently, as if hidden by an Indian in precolonial times, on the shelf of a sandstone rift on Indian Mountain, near Kresgyville, Carbon County, Pa., by Alfred Keppler.—H. C. MERCER.

Reprinted from The American Naturalist, August 1st, 1895.

ARCHEOLOGY AND ETHNOLOGY.[1]

Notes on Yucatan.—The expedition sent out in January, by the University of Pennsylvania, had, for its object, the discovery of culture-layers in the caverns of Yucatan. It was thought that proof of man's antiquity in this part of Central America ought to be established by the discovery of refuse beds on the floors of conspicuous, easily-accessible caves, and a group of these shelters, situated in a mountain range, midway between many of the ruined cities, were chosen for exploration, as probably containing evidences of every race that ever visited the Peninsula.

When these cave floors were cut down to bed rock, and when the surface stratum of Maya occupation was sliced through, the work was expected to decide whether other earlier epoch-made refuse beds were to be encountered before the trenches reached rock bottom? This was the main question of the expedition, and the investigation which has, in a great degree, settled it, remains to be described in the report presently to be published by the University of Pennsylvania.

The thanks of the University are due Mr. John W. Corwith, of Chicago, for placing his time and means at their disposal in the under-

[1]This department is edited by H. C. Mercer, University of Pennsylvania.

boxes of undressed slabs, after the manner of the stone graves of Tennessee, but oftener in the open earth. If valuable trinkets of jadeite or nephrite and vases painted with hieroglyphs are not to be found in these tombs, we should hardly know where to look for them. But Herr Maler says that few graves reward search. Of hieroglyphs on vases he had seen several specimens, and showed me one such incised inscription at his house.

The mounds do not repay the explorer as they seem to promise. Instead of containing some tomb altar or enclosed chamber at their very centre, digging proves many of them to be heaps of loose boulders piled up for the purpose of erecting vaulted chambers on their sides and top. These ill-constructed structures have generally crumbled piecemeal into a loose talus that now forms the sides of the mounds, and the tumuli have become round, bramble-covered rubbish heaps, haunted by scorpions and garapatas. As a rule, with few exceptions, there are no graves inside the typical mound, which contains three tiers or steps of the buildings in question, each with its plastered terrace. In the debris of the old floors of these rooms, many interesting fragments of pottery, sometimes showing religious symbolism, sometimes imitating the forms of birds, monkeys and jaguars, have been found.

Of monkeys, Herr Maler believes that there are two or three species in Yucatan. One small earthen monkey head, which he showed me, was truer to nature and less grotesque than other miniature human busts in his collection. Of these latter, one hideous face had been presented to him by a Maya sorcerer at Bolon Chen, as a charm of great value. Obsidian flakes and flint knives, such as he showed me, were rare, since the modern Indians who found them, soon broke or lost them. The flint, of a creamy-white color, he had often found in the native state in swamps. Several earthen cloth stamps showed interesting curved designs, and two earthen whistles blew loud enough to have pleased a boatswain. Strange to say, he had but one arrowhead, but showed me several polished celts, probably of syenite or jadite, from Chichen-Itza, Cozumel, and other places. They were somewhat worn on the cutting edges, but, in my opinion, could not have been used to carve limestone.

Much light might be thrown on the history of the old inhabitants of Yucatan by a study of the modern Mayas, but Herr Maler supposed that the demonic beliefs and practices of the mystic brotherhood, known to students as Naguales, had faded away among the docile people of eastern Yucatan. The word Nagua, a familiar spirit in animal forms, is not used amongst them ; nevertheless, I suspect that interesting results

would reward the investigator of this subject who first mastered the language and then gained the confidence of these people.

—H. C. Mercer.

The Potters' Wheel in Yucatan.—While in charge of the Corwith Expedition of the University of Pennsylvania in Yucatan last month (March, 1895), and while studying the process of pottery making by modern Maya Indians at Merida, I saw a female potter reproduce the chief conditions of the potters' wheel by turning a wooden disc set on a board with her toes. The clay rested on the disc and received the impress of her tools and fingers while revolving. Though the disc was called, in Maya, *Kabal*, it may be doubted whether it is an inheritance by these Indians from their pre-Columbian ancestors and not derived from Spain ; in other words, whether its present use demonstrates the existence, till now undiscovered, of the potters' wheel in ancient America.

Doylestown, April 13, 1895. —H. C. Mercer.

Reprinted from The American Naturalist, May 1st, 1895.

ARCHEOLOGY AND ETHNOLOGY.[1]

Discovery of Shell Mounds in Chira Valley, Peru.—It was my good fortune, during the last four years, to discover in the Chira Valley in the northern Part of Peru, a vast field of antique remains hitherto unknown to the scientific world. The Chira River which is the most northernly of the important coast streams running from the Andes to the Pacific, is situated about one hundred and fifty miles from the frontier of Ecuador, and nearly six hundred miles to the north of the great Ancon necropolis, recently so exhaustively studied by Reiss and Stübel. Between the Chira and Ancon are two fields already well known—one the great Chimer and Trujillo and the other near Chimbote in the Santa Valley-–Trujillo lies some 225 miles to the south of the Chira.

Fifty or sixty miles north of the Chira is a smaller valley called the Pariñas. Between the two is a desert region extending inland to the La Brea Mountains, a distance of thirty miles. These two valleys and the intervening territory, an area of 1800 square miles, comprised my field of work. The exact locality may readily be determined upon any map of South America as it embraces Point Pariñas which is the most westerly Cape of the Southern Continent.

It was among the ruins and graves of the Chira Valley that I gathered the Collection of Antiquities now deposited in the Museum of the University of Pennsylvania. These ruins and graves occupy as a rule all the untillable land on the northern side of the valley from the town of Sullana to the mouth of the River, a distance of forty or fifty miles. The ruins are unique among those I saw in Peru. They lie in groups four or five miles apart and consist of terraced temple platforms of three stories, built of clay reinforced with conical shaped adobes. The whole edifice is about three hundred feet in length and breadth at the base and seventy-five feet in heighth. Adjoining these pyramidal structures are always found extensive traces of adobe walls, doubtless the remains of the foundations of priestly dwellings, for it is fair to suppose that these monuments had a sacred character. At the foot of the ruins are arranged numerous hillocks thickly covered with small white bivalve shells. Under the shells the soil is full of fine ashes and sherds of pottery. The surrounding plain is always crowded with graves, often three or four tiers deep to a depth of twenty-five feet. A

[1] This department is edited by H. C. Mercer, University of Pennsylvania.

barbaric peoples the new comers regarded the gleaming white shell mounds of their predecessors with superstition, attached to them a sacred significance and were not long in incorporating the shell into their own ritual. This we see in the shell *covered* mounds and burial hills of the Pariñas Valley. In the Chira Valley we find that an advance has been made, the burial mound of the Pariñas here becomes the temple platform and the shells appear on the hillocks surrounding it and in the grave fillings. It is true that these hillocks seem to have been ovens in which pottery was baked, but this in no way alters the significance of the shells which cover them. The pottery, especially the fantistic and carefully finished pieces found in the graves, must have had a ritualistic meaning and the ovens in which it was baked must also have been regarded as sacred, and when no longer used were consecrated with a covering of the revered shells.

A more difficult problem seems to present itself in the difference which exists between the remains of the Pariñas and those of the Chira. Tradition again aids us in overcoming it. There is a story that the Pariñas Valley was once thickly populated (it is now practically uninhabited), and that for some reason, probably drought or plague, the people were compelled to abandon it and seek homes in the valleys to the south. This migration probably took place prior to the epoch in which the custom arose of symbolizing the mound in the temple, and before the pottery art was so highly developed as it latterly became. This desertion of the Chira Valley at so early a period has therefore preserved for us an important link in the chain of the nation's progress.

This view of the adoption of the shell of the old kitchen mounds as a sacred token by the conquerers or successors of the primitive race, serves also to explain the comparatively limited extent of such mounds, for undoubtedly the shells of the graves and ruins were obtained from these deposits and in this way many of the old mounds were destroyed. This theory also accounts for the absence of shells in the other grave fields of the coast.

As I said before this necropolis of the Chira is new to science and is deserving of attention and exploration. It presents many unique features in Peruvian Archeology. The bodies are buried horizontally at full length, with the head resting on the left shoulder and the face turned in the same direction, whereas in other regions the body is invariably trussed up in sitting posture with the knees drawn under the chin. I also found that the use of the labret was common among the females, a custom hitherto unknown among the tribes of the coast regions of Ancient Peru.

From the tools and other implements which I brought back, Mr. Frank Hamilton Cushing of Washington has been able to prove that the lacquer art was known to those people; that the goldsmiths art, of which it is possible to show all the processes, was very cleverly practiced, and lastly he has been able reconstruct for the first time the ancient Peruvian loom and to demonstrate the methods by which all the intricate fabrics of that time were woven. It is sincerely to be hoped that before long he will be able to present these wonderful and most valuable discoveries to the world.

—Samuel Mathewson Scott.

Mr. H. A. Pilsbry, of the Academy of Natural Sciences of Philadelphia, has kindly identified the shell specimens collected by Mr Scott at these shell heaps, as *Spondylus princeps* (Brod.), Gulf of California, etc.; *Natica panamensis* (Recluz.); *Trivia radians* (Lam.), St. Elena, west coast of Columbia, *Donax radiatus* (Valenc.), Mazatlan to Valparaiso; *Terebra fulgurata* (Philippi), Mazatlan. The large thorny Spondylus would, he says, roast well. The delicate little Donax would make excellent soup, and the Natica would be found as edible by the Peruvian Indian as its Periwinkle brother has been by the North American Red Man, whose shell heaps and village sites are thickly strewn with it. The modern Londoner, as Mr. Pilsbry informs me, eats tons of the same snail yearly. Minute Terebræ and Olivæ, if not boiled for soup, might have done for trinkets.

H. C. Mercer.

The Neanderthal Man in Java.—Dr. Eugene DuBois of the Army of the Netherlands has recently published in Batavia, Java, in a brochure in quarto, an account of some bones of an interesting quadrumanous mammal allied to man, which were found in a sedimentary bed of material of volcanic origin, of probably Plistocene age. The remains consist of a calvarium which includes the supraorbital ridges and a part of the occiput; a last superior upper molar; and a femur. The tooth was found close to the skull and probably belongs to the same individual as the latter, while the reference of the femur is more uncertain, as it was found some fifty feet distant.

The characters of the skull are closely similar to those of the men of Neanderthal and of Spy, but the walls are not so thick as those of the former, and more nearly resemble those of the latter. The frontal region is, therefore, much depressed, and it is also much constricted posterior to the postorbital borders. The sutures are obliterated. Much interest attaches to the cranial capacity, which Dr. DuBois

Progress of field work in the Department of American and Prehistoric Archæology of the University of Pennsylvania.—The believer in Man's great antiquity in Eastern North America is again called upon to explain a serious doubt. The easily accessible broad and well lit shelter of the Forge Cave (1 mile below Barren Springs, left bank of the New River, Pulaski County, Virginia), as explored by us in February, 1894, has astonished us again with the modern look of the evidence furnished.

Instead of several ancient midden beds interlaid with stalagmite breccia or cave earth indicating the lapse of successive epochs and the comings and goings of pre-Columbian peoples, our six-sectioned trench, 36x24x10 feet (Section 3 to rock bottom) at deepest, showed:

(1) Red earth left by nitre leachers in 1863–64, with bottle glass, nails, domestic fowl bones, etc., 15–17 inches. (White Man).

(2) Charcoal and ashes in hearth layers, sometimes invaded by diggings from above, sometimes undisturbed, with arrowheads, chips, unglazed pottery, and bone awls, 7 to 9 inches. (Predecessor of White Man).

(3) Rough, unworn blocks of limestone, larger towards the bottom, containing, for some distance down, infiltrations from layer No. 2, resting on the rock floor, 8 feet. (No trace of human or animal occupancy).

Here then, as at the Nickajack and Lookout Caves in Tennessee (explored in December, 1893), we had found but a single stratum of human occupancy (no. 2) below the superficial glass, nails and domestic animal bones of the White Man.

While in it (stratum 2), instead of a predominance of the relics of extinct or probably ancient animals bedded in the fossil preserving charcoal, we discovered the presumably modern remains (kindly identified by Professor Cope) of the Unio, Paludina, Catfish, Tortoise, Frog, Domestic Fowl, Bird (undetermined), Turkey, Marmot, Ungulate (undetermined), Beaver, Lynx, Domestic Sheep, Elk and Deer.

Only in one instance gnawed by rodents and often interlaid between undisturbed hearths, the presence and position of the bones and shells demonstrated them to be the remains of a fauna preyed upon by Man, while the 5 potsherds (3 showing decorative incisions), the 12 bone awls, the triangular chert arrowhead and infrequent hornstone chips, found in the midden layer, proved it the work of the same Indian, who, 8 miles above had scattered his riverside camp site with bones of the Deer, and had dropped pottery, earthen pipes, a polished celt, hornstone chips, and hammer stones. At a surface feasting place twenty miles

below, I found the remains determined by Professor Cope to belong to the Unio, Paludina, Trypanastoma, Catfish, Turtle, Soft Shelled Turtle, Raccoon, Bear, and Deer.

This proof that no earlier people than the Indian resorted to the Forge Cave (and the Lookout and Nickajack Caverns), may indicate that no earlier people than the Indian ever inhabited the upper valleys of the New River and the Tennessee. But further search is needed to establish the conclusion, while objections to the final value of all such cave layer tests for Man's antiquity must be thoughtfully weighed.

The first is suggested by Professor Cope, that as the caves explored by me lack fossil remains, the old (Plistocene) ends of caves with their animal and, if we can believe it, human remains, have probably been worn away. Caves, therefore, would not tell the whole human, as they do not tell the whole animal story, since Man may have inhabited parts of caves which have disappeared.

This, if true, would exclude the alleged Tertiary Man of Thenay or Otta from caves, but would leave us our witnesses for any possible Plistocene blade chipper of Trenton and Madisonville.

Another objection to cave evidence is advanced by Dr. Brinton. Like the Veddas of Ceylon (who are supposed, on the authority of the brothers Sarasin, to have avoided rock shelters), early Man, he suggests, was probably *arboreal* and did not inhabit caves. But continual avoidance of available and conspicuous natural shelters by primitive peoples anywhere is hard to imagine. We have the trace of all kinds of Paleolithic, Neolithic and post-Neolithic peoples in caves in Europe and the evidence of explorers as to still existent savages visiting caves is scanty and insufficient.

If we are not hunting "Cave Dwellers," and if proof of Man's presence is all we want, then a few surface gathered trouser buttons and bottle chips will do for the White Man, arrowheads and bone needles for the Indian, and a breccia—let us suppose with Mylodon teeth and "Turtlebacks"—for some one else. Nothing short of cave avoidance by the savage will rob us of the evidence which a fire kindler or two in a century would suffice to furnish.

H. C. MERCER. March, 1894.

Reprinted from The American Naturalist, July 1st, 1894.