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THE BIOSTRATIGRAPHY OF PECCARY CAVE, NEWTON COUNTY, ARKANSAS

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Peccary Cave was discovered in January, 1965, when Jack McCutcheon of the Cave Creek community in Newton County, Arkansas, fashioned a rope ladder and lowered himself into a pit on his property. At the bottom of a 32 foot vertical descent, he discovered a passage into a large cave. There were few indications that people had preceded him into the cave although he did find two unfamiliar names scratched into the cave wall in a remote passage and one broken stalactite set upright on the cave floor. Some strange bones that were lying on the cave floor and the cave formations hanging from the ceiling and walls prompted him to dig a horizontal adit into the cave. We have continued to enlarge this artificial entrance until today it offers easy access to the cave.

The first bones that Mr. McCutcheon collected were referred to the Geology Department of the University of Arkansas for identification, and a small grant was secured from the University Research Committee for some exploratory excavation. On the strength of the material that was thus recovered in 1965, the National Science Foundation funded the present project which began in September, 1967.

Although there are more than 1000 feet of passages in Peccary Cave, most of the excavation has been near the two entrances. In the map of this area of the cave (Figure 1), the excavated portions are enclosed by dashed lines and the important trenches numbered.

A profile of the strata in the area around Trench 1 involves a top layer of dirt, as much as 20 inches thick, containing bones, gravel, peccary droppings, and thin layers of limestone. Beneath this is nearly 14 inches of limestone in fallen blocks that overlies granular red and yellow clays with scattered calcite layers and few bones. The limestone layer may vary in thickness and depth of burial or be expressed as several thinner units, but throughout its occurrence it appears to have been a single fall of rock for blocks are not piled one on another. There is a vastly greater number of bones above this layer than below it.

The peccarys for which the cave is named are Western Hemisphere animals and are considered to have diverged from the "true" swine stock in Oligocene time. However, they still retain some of the habits of domestic swine such as the selection of a restricted area for defecation where they occupy a confined space. Where the fallen rock layer is buried deepest, the top foot of the cave floor contains a large number of still recognizable droppings. In Trench 8, some

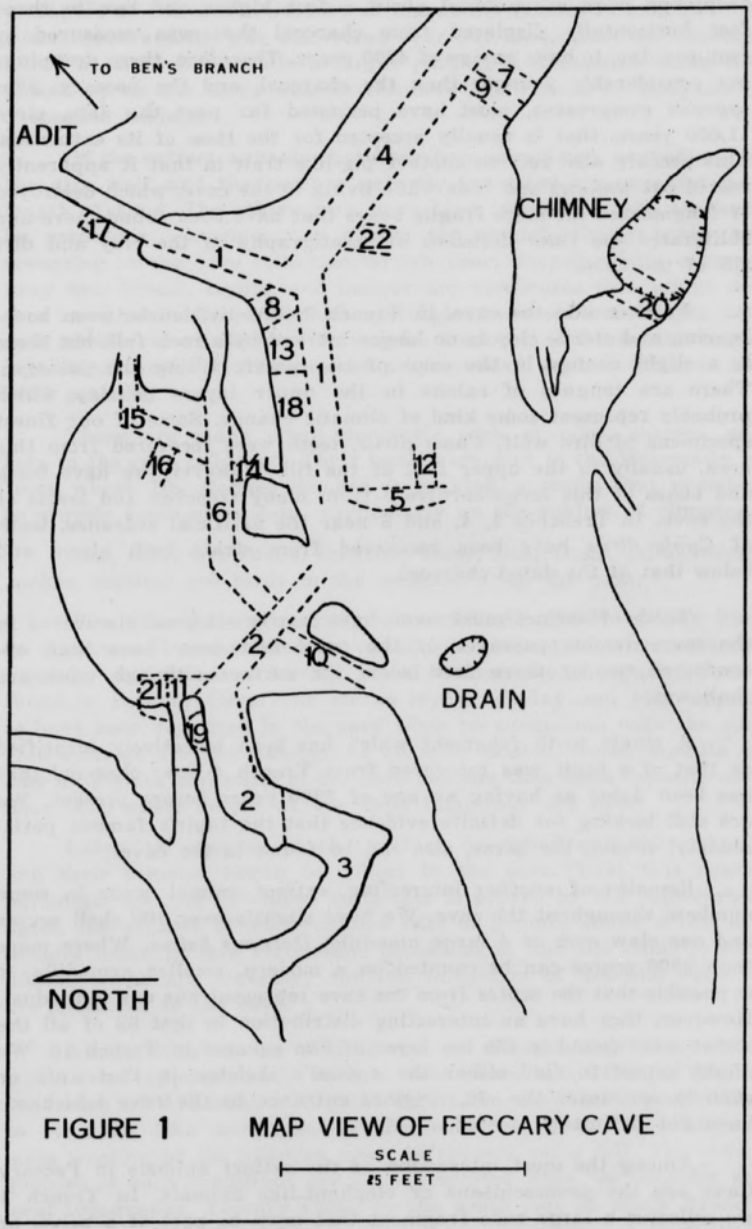

FIGURE 1 MAP VIEW OF PECCARY CAVE

SCALE

25 FEET

droppings were encountered about a foot higher and two to three feet horizontally displaced from charcoal that was measured by Isotopes, Inc. to have an age of 4290 years. Therefore, these droppings are considerably younger than the charcoal, and the peccary, *Platygonus compressus*, must have persisted far past the date, circa 11,000 years, that is usually accepted for the time of its extinction. This peccary also retains another pig-like trait in that it apparently rooted out wallows and beds while living in the cave, which destroyed or fragmented the more fragile bones that have been found there and obliterated the finer divisions of stratigraphy in the clay and dirt fill of the cave.

Farther into the cave, in Trench 3, the division between bone-bearing and sterile clay is no longer marked by a rock fall, but there is a slight change in the color of the matrix filling the passages. There are tongues of calcite in the upper layers of clay which probably represent some kind of climatic change. Some of our finest specimens of dire wolf, *Canis dirus*, teeth were recovered from this area, usually in the upper foot of the fill. However, we have teeth and bones of this large carnivore from many trenches and levels of the cave. In Trenches 1, 4, and 8 near the artificial entrance, teeth of *Canis dirus* have been recovered from strata both above and below that of the dated charcoal.

Teeth of extinct musk oxen have nearly all been discovered in the more remote passages of the cave, and some have been encountered two or three feet below the surface although most are shallower.

A single tooth fragment which has been tentatively identified as that of a tapir was recovered from Trench 4 near charcoal that has been dated as having an age of 2980 years before present. We are still looking for definite evidence that the tapir's famous perissodactyl cousin, the horse, also can be found in the cave.

Remains of another interesting, extinct animal occur in some numbers throughout the cave. We have slightly over 100 shell scutes and one claw core of a large amadillo, *Dasypus bellus*. Where more than 3300 scutes can be counted on a modern, smaller armadillo, it is possible that the scutes from the cave represent but one individual. However, they have an interesting distribution in that 82 of all the scutes were found in the top layer of two squares in Trench 15. We might expect to find either the animal's skeleton in that area or even to encounter the old, original entrance to the cave which we have not definitely located.

Among the most interesting of the extinct animals in Peccary Cave are the proboscideans or elephant-like animals. In Trench 1 we collected a large bone fragment that must be part of a pelvis or

a scapula of either a mastodont or mammoth. A chip of enamel from a mastodont's tooth was discovered near but lower than the charcoal dated at 4290 B.P., while a larger part of a mmmoth's tooth was picked up on the dump outside the cave and cannot be assigned to a specific horizon.

Of the extinct animals that have been mentioned, probably only the dire wolf and the peccary actually inhabited the cave for any length of time. The others may have been introduced into the cave by predators, scavengers, or floods. Of animals living today but occurring in the cave collection, brown bear, striped skunk, raccoon, gray fox, bobcat, coyote, and badger are carnivores that might den in a cave, while the woodchuck, porcupine, and opossum might also seek shelter there. Deer, elk, beaver, musk-rat and squirrel might have been carried to the cave as prey or been washed there as the otter probably was.

There are many small mammals such as mice, shrews, and bats in the cave collection. Their teeth were sent to the University of Iowa where Dr. Holmes Semken is making a study that promises to provide much more data, particularly on the subject of climate.

Also, there are snails, crayfish, seeds, fish, frogs, salamanders, snakes, turtles, and birds in the material from the cave.

When the general scarcity of vertebrate fossils of any kind in Arkansas is considered, a nearly unique set of circumstances must be envisioned as having acted to assemble the varied fauna found in Peccary Cave. The sterile layers of clay and rock appear to have been deposited in the cave when no connection with the surface suitable for the passage of animals existed. Some deposits of clay on shelves and walls in the cave indciate that these deposits may have been much deeper at one time than they are now.

Later, an opening to the surface developed and the animals and their remains began to collect in the cave. That this nearly horizontal opening developed quite late is proved by the radiocarbon dates, the absence of sabre-toothed cats or ground sloths which are usually found in late Pleistocene assemblages, and the climatic conditions which are necessary for the formation of deposits such as are contained in the cave.

At the time of the Altithermal or Climatic Optimum which lasted from approximately 7000 to 4000 years ago, Newton County and much of Arkansas was more desert-like than most people like to visualize. The accompanying discontinuous plant cover allowed mass wasting of the hillsides when infrequent rains fell. The consequences of such conditions can be appreciated when we consider the local topography. Peccary Cave, on the south side of Ben's Branch, is in strata of middle and upper Ordovician limestones at an altitude

of 840 feet or about 25 feet above the present bed of the branch. Two and one half miles west of the cave on George Mountain near the head of Ben's Branch, there is an out-crop of Imo shale of latest Mississippian age at an altitude of 1600 feet. In this shale are fossils, particularly gastropods and cephalopods with a distinctive type of preservation in which the animal's shells are quite black. Identical fossils may occasionally be collected in Peccary Cave and are usually found below the layers containing the peccary droppings.

From this evidence we may infer that after an entrance to the cave developed, stream flooding carried alluvium from Ben's Branch, bearing the mollusc fossils and any animals that might have been encountered and began to fill the cave. That the cave was not sealed by alluvium and land sliding until near the end of the Altithermal is indicated by the presence of anmials such as the beaver, otter, and muskrat which prefer permanent water in their habitat. That the peccarys continued to utilize the cave as a watering hole, shelter, or farrowing ground right up to the time that it was sealed, is suggested by the undisturbed droppings and by the presence on the cave floor of bones that were never gnawed by rodents.

Certainly a major factor in the preservation of the bones in this cave has been the influx of alluvium which covered the animal remains that were present there and insulated them from those factors, physical and chemical, which would normally have destroyed them long ago.

Until 1965 the cave had only minor contact with man as shown by a few bones that might have been burned, a very few possibly human bones, 6 teeth, 8 or 10 carved shell beads and one stone artifact. It is a green chert scraper about 2½ inches long and is not diagnostic of any culture. The chimney through which Mr. McCutcheon entered has played only a minor, modern role in the cave's development. Much of Peccary Cave's value lies in the fact that once it was sealed, it remained a "time capsule" until relatively recent times.

I wish to thank the Research Committee of the University of Arkansas and the National Science Foundation for the funds that made possible the excavation of Peccary Cave. Special thanks are due Dr. James H. Quinn, Chairman of the Department of Geology at the University of Arkansas, for his guidance and unfailing interest in the project. Mr. and Mrs. Jack McCutcheon have given access to the cave and their home for two years, and I am very appreciative of their generosity and assistance.