

FISHER AND PORCUPINE REMAINS FROM CAVE DEPOSITS IN MISSOURI

PAUL W. PARMALEE
Illinois State Museum, Springfield, Illinois

ABSTRACT.—Remains of the fisher (*Martes pennanti*), a mustelid previously unknown from Missouri, are described from four cave and archaeological deposits in the Ozark Highland. A fourth prehistoric locality record for the porcupine (*Erethizon dorsatum*) in Missouri is presented.

Intensive exploration of Missouri caves, especially those located in the Ozark Highland region, by speleologists during the past decade has brought to light several significant bone deposits. The time span involved ranges from Late Pleistocene to present day, and a particular cave may contain remains of ex-

trict forms such as peccary (*Platygonus* and *Mylohyus*), dire wolf (*Canis dirus*) and tapir (*Tapir*) as well as elements of a varied modern fauna. Thus far no completely stratified deposit has been found and, consequently, animal remains from caves are insufficient to illustrate a clear-cut sequential faunal change through time from the earliest deposition to the most recent. In spite of the heterogenous nature of such bone deposits — typically the result of some form of water action and/or animal activity, the actual presence of particular species often

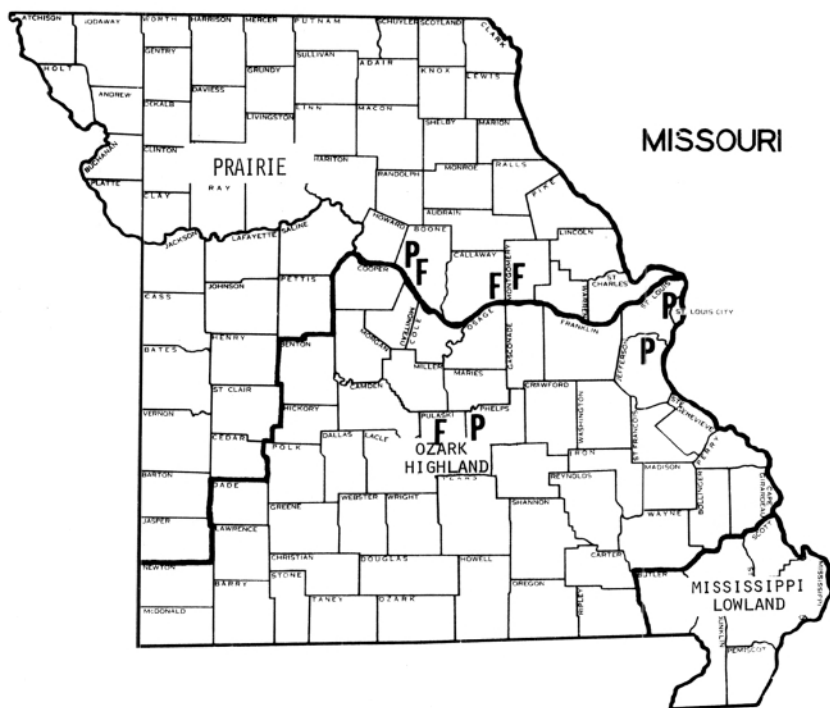


FIGURE 1. County map of Missouri showing location of fisher (F) and porcupine (P) finds.

serves as an indicator of past environmental and species composition change in an area.

Recovery of bones of the fisher (*Martes pennanti*) from four cave deposits (Fig. 1) in the Ozark Highlands is especially noteworthy. This mustelid presently occurs throughout most of the Canadian provinces and, during early historic times, was locally common in north-eastern United States with a range that extended southward in the Appalachians to North Carolina and Tennessee. Prehistoric archaeological records have shown that its range extended even farther west along the Illinois and Mississippi rivers in Illinois (Parmalee, 1958, 1960a) and south into northwestern Georgia (Parmalee, 1960b) and Alabama (Barkalow, 1961). Brown (1908) described two isolated teeth, four jaws and a skull section of the fisher that were recovered in the

Pleistocene bone deposit of Conard Fissure in northern Arkansas. This mustelid had not been previously reported from Missouri.

Two of the four records to be described here are based on elements recovered from natural cave deposits, while the other two consist of bones obtained during archaeological investigations in Graham Cave, Montgomery County, in 1966 and Arnold-Research Cave, Callaway County, in 1956. Although all four are termed "cave," the latter two represent shallow, overhanging bluff rock shelters once inhabited by peoples of the Archaic and Woodland cultures. Whether all fishers represented in the archaeological deposits were taken by the human inhabitants or were present as the result of natural causes is, with one exception, a matter of speculation.

Arnold-Research Cave, located approximately two miles north of

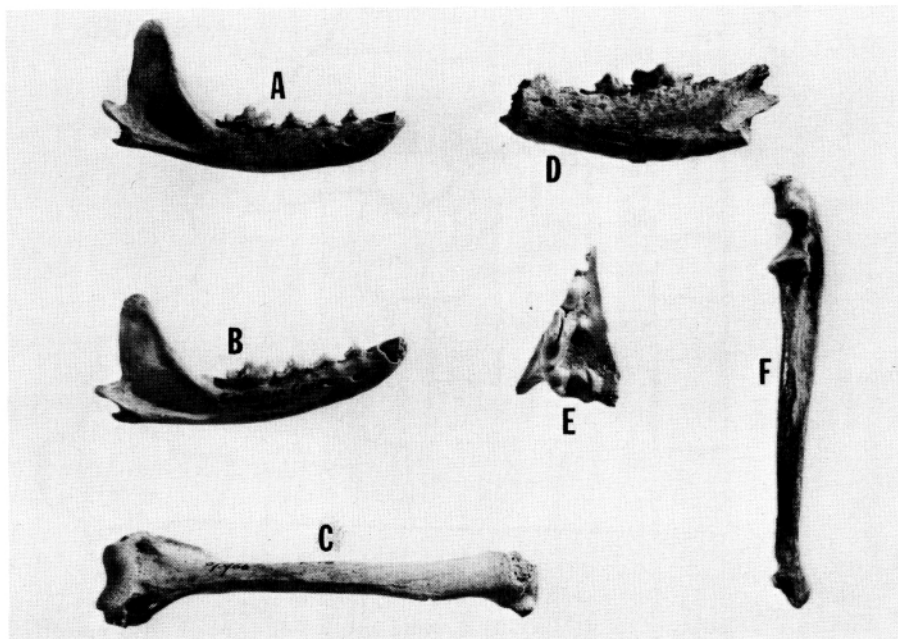


FIGURE 2. Fisher elements recovered from Graham (A-C), Brynjulfson (D), Arnold-Research (E) and Bat (F) caves, Missouri.

the Missouri River in southeastern Callaway County, was excavated under the direction of J. M. Shippee (Shippee, 1966). A total of approximately 36 species of vertebrates (all Recent forms) was identified by Mr. Carl R. Falk; and, in addition to the fisher, three other mustelids were represented (mink, badger, otter). The fisher element consisted of a section of the right maxillary containing $P^{3,4}$ and M^1 (Fig. 2). The animal was a mature adult, the teeth showing moderate wear; judging from the large size of the teeth, the individual was probably a male. Graham Cave, situated above Loure Creek approximately 15 miles northeast of Arnold-Research Cave, was excavated under the direction of Dr. Walter E. Klippel; Carl R. Falk and Paul W. Parmalee identified the bone remains which included three elements of *M. pennanti*. These consisted of two small, lower right jaws, probably females, both of which contained $P_{2,3,4}$ and M_1 's that showed only slight wear. One of these jaws (Fig. 2,A) exhibited deep cut marks between the condyle and angular process on the labial surface, plus faint skinning cuts below the alveoli of the canine and P_1 , thus indicating utilization of the animal by the Indians. The third fisher element from Graham Cave was a nearly complete right humerus of a large adult, probably a male. There appears to be three individuals represented.

During the summer of 1962, the late Dr. M. G. Mehl and a field crew of students from the University of Missouri, Columbia, excavated a horizontal cave shaft located along Bonne Femme Creek, approximately seven miles south-southeast of Columbia, Boone County. The faunal complex of this deposit (Brynjulfson Cave) included remains of extinct forms (peccary, tapir, dire wolf, giant armadillo) as

well as an abundance of Recent species. One fisher element, an incomplete lower left jaw containing $P_{2,4}$ and M_1 , was recovered. Based on the large size of this jaw section and the considerable degree of wear on the teeth, it is judged that the animal was an old male (Fig. 2, D).

A large sample of vertebrate remains was removed from Bat Cave, located five miles northwest of Waynesville, Pulaski County, periodically from 1961 to 1968; most of the work was carried out under the direction of Mr. J. R. Reynolds, R. L. Foley and Dr. Oscar Hawksley. Like Brynjulfson Cave, this cave deposit contained a mixture of remains of modern forms and extinct species such as peccary and dire wolf. Fisher was represented in the faunal complex of Bat Cave by a complete left ulna of a large (male?) adult (Fig. 2, F).

The porcupine (*Erethizon dorsatum*) is another species, like the fisher, whose range has receded from its known extremities of prehistoric times. In pre-Columbian times this rodent occurred throughout the Appalachian Mountains south to northern Alabama (Barkalow, 1961), and, in the Midwest, along the Mississippi River in Illinois (Parmalee, 1967) and Missouri (Simpson, 1949). Today, east of the Mississippi River, the porcupine is not found south of central Wisconsin, Michigan and Pennsylvania. There have been three published records of the porcupine in Missouri, all based on elements recovered in prehistoric cave or archaeological deposits: (1) Two lower jaws from Cherokee Cave (Simpson, 1949), St. Louis County; (2) Sections of a femur, one lower and two upper incisors, and a left jaw from Crankshaft Cave (Parmalee, Oesch and Guilday, 1969), Jefferson County; (3) A lower left jaw section

from Tick Creek Cave (Parmalee, 1965), Phelps County.

The most recent recovery of porcupine remains in Missouri occurred in the two Brynjulfson Cave deposits. One of these two "twin" caves, located about 100 yards apart along Bonne Femme Creek, Boone County, has been previously discussed with reference to the recovery of a fisher jaw. The sample of bones from this cave (Brynjulfson Cave No. 1) included complete and/or sections of one skull, five jaws, seven incisors, one cheek tooth, one ulna, five femora and one tibia (Fig. 3,A) of the porcupine. At least four individuals, including both adults and juveniles, were represented. An extensive faunal sample recovered by Paul W. Parmalee and Ronald D. Oesch periodically during 1968 and 1969 at Brynjulfson Cave No. 2

contained an incomplete humerus, incisor and lower left jaw of the porcupine.

Approximately one-third of the state of Missouri — the central, southern and eastern parts — is classified as Ozark Highland. This region is an old, deeply dissected plateau which now appears as hills with steep intervening valleys cut by numerous streams arising in the higher elevations (Schwartz and Schwartz, 1959). There are many limestone outcrops along the stream banks, and the original mesophytic forest cover was apparently a western extension of the oak-hickory climax characteristic of the upland deciduous forests of eastern United States. Juniper and short-leaved pine also occurred throughout this hilly region.

Hagmeier (1956) presents a thor-

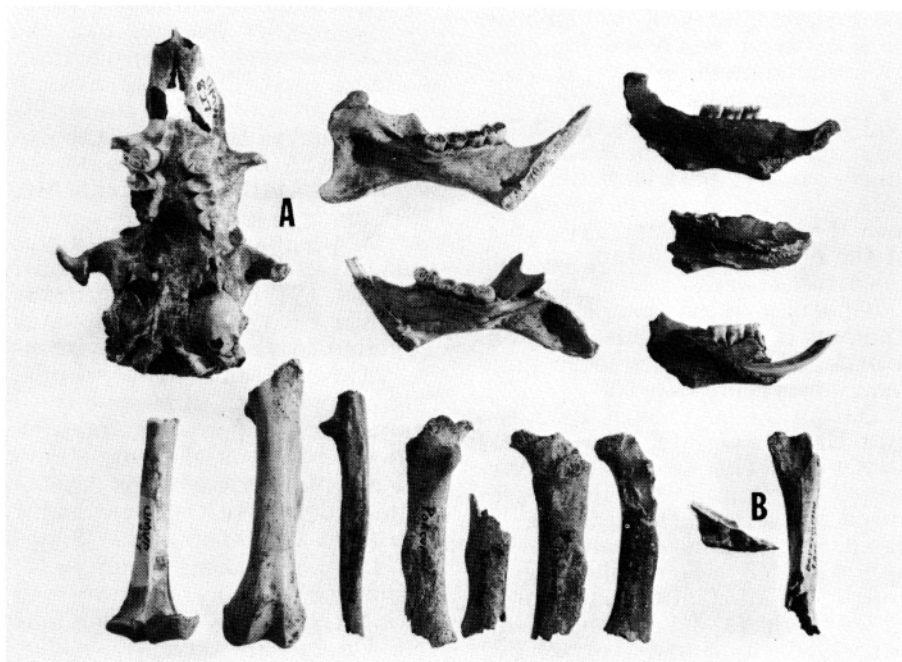


FIGURE 3. Porcupine elements recovered from the Brynjulfson Caves, Boone Co., Missouri.

ough discussion of the distribution and habitat requirements of the fisher in North America, and states that "... while they prefer heavy timber, they are frequently seen in open second-growth stands and occasionally in areas recently burnt over." Other authorities cited by Hagmeier (*ibid.*) indicate that fishers prefer low wet grounds and the banks of streams. This mustelid appears quite adaptable within a varied hilly-wooded-riverine environment; the Ozark Highland would have been well suited to its habitat requirements. This hilly, forested region of Missouri would have also provided an ideal habitat for the porcupine, a species that is dependent upon thick stands of mixed deciduous trees and conifers for food and massive rock outcrops for dens. Since the porcupine is known to be a favorite food of the fisher, there may well have been an interrelationship between the two animals, with the range extension and abundance of the fisher dependent to some extent upon the distribution and abundance of the porcupine. In any case, recovery of remains of these two species in cave and archaeological deposits has established the prehistoric occurrence of fisher and porcupine in the Ozark Highland region of north-central Missouri. Excavation of other deposits will probably bring to light new records of these species, especially in regions drained by the Missouri, Osage, Gasconade and Meramec rivers and their tributaries.

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