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Unusual Accumulation of Bat Remains from an Ozark Cave

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Table 2. The average calculated total lengths (mm) of carp from Beaver Reservoir.

Year Class	Annulus Number 1	2	3	4	5
1963	229	364	451	508	578
1964	287	389	434	497	529
1965	265	363	421	537	-
1966	282	387	455	565	-
1967	283	387	465	-	-
1968	299	416	-	-	-
Weighted Average	282	384	444	527	554
Number of Fish	127	123	45	8	2

We wish to thank Mr. Louis E. Vogele, South Central Reservoir Investigations for reviewing the manuscript.

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ADDITIONS TO THE FISH FAUNA OF PINEY CREEK, IZARD COUNTY, ARKANSAS

Notice is given of the addition of three species to the known ichthyofauna of Piney Creek, Izard County, Arkansas. Matthews and Harp (Proc. Ark. Acad. Sci., 28:39-43, 1974) reported a total of 44 species from the watershed. On 17 October 1975, we collected one small adult specimen of *Salmo gairdneri* (Rainbow trout) from a swift pool on Piney Creek in SE¼, Sec 5, T 16 N, R 10 W (Station P-1 of Matthews and Harp). This locality is approximately 1.2 km upstream from the confluence of Piney Creek with White River, from which the specimen doubtlessly migrated. Piney Creek is too warm in the summer to permit survival of salmonids. The next day we collected two specimens each of *Notropis greenei* (Wedgespot shiner) and *Labidesthes sicculus* (Brook silversides) approximately 0.3 km upstream from the previous location. The creek at this locality consisted of alternating gravel-rubble riffles and shallow pools. The specimens of *S. gairdneri*, *N. greenei*, and *L. sicculus* are deposited as collections number 4894, 4896, and 4897, respectively, in the Arkansas State University Museum of Zoology.

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AN UNUSUAL ACCUMULATION OF BAT REMAINS FROM AN OZARK CAVE

A total of at least 10 species representing six genera of vespertilionid bats has been identified from 1445 skulls collected from the floor of a limestone cave in the Sylamore Ranger District, Ozark National Forest, Arkansas (Table 1). This accumulation of skeletal material was found in a passageway divided into two distinct zones on the basis of constant or fluctuating temperatures. Fluctuating temperatures were encountered at the anterior end of the passageway and were obviously related to ambient temperatures at the nearby entrance; constant temperatures were recorded throughout the remainder of the passageway. The passageway was dry and ranged from one to two meters in height. Bat remains varied from skulls coated with calcite (calcium carbonate) crystals to decomposing carcasses and included several mummified specimens. Of the 10 species identified, four are considered tree bats and are recognized to rarely enter caves; the remaining species typically utilize caves as habitat during some portion of their annual activity cycles.

Table 1. Species, number, and temperature zone of bats collected in an Ozark Cave.

Species	No. Collected	Temp. Zone
Pipistrellus subflavus	617	Constant
Myotis grisenscens	369	Cons. & Var.
Myotis lucifugus	100+	Cons. & Var.
Myotis sodalis	2+	Constant
Myotis keenii	1+	Constant
Myotis spp.	197	Cons. & Var.
Eptesicus fuscus	3	Variable
Lasiurus borealis	140	Constant
Lasiurus cinereus	6	Constant
Nycticeius humeralis	9	Constant
Lasionycteris noctivagans	1	Constant

Myers (1960, *Lasiurus* from Missouri caves. J. Mamm. 41:114-117) noted that although cave bats such as *Myotis*, *Eptesicus*, and *Pipistrellus* commonly used caves in which lasiurine (tree) bats were found, rarely were any of these true cave bats found dead in the caves. Interestingly, the opposite is true in this observations, since 89% of the remains were of cave dwelling species.

Of additional importance was the recovery of two species of tree bats rarely encountered in caves. Nine specimens of the evening bat, *Nycticeius humeralis*, were recovered from the constant temperature zone of the cave. These specimens represent the largest aggregation of evening bats reported from a limestone cave in Arkansas. On only two other occasions have evening bats been reported from caves of Missouri and Arkansas (Easterla, D. A. 1965. A nursery colony of evening bats in southern Missouri. J. Mamm. 46:498; McDaniel, V. R. and J. E. Gardner. 1977. Cave fauna of Arkansas: vertebrate taxa. Proc. Ark. Acad. Sci. 31:68-71).

One specimen of the silver-haired bat, *Lasionycteris noctivagans*, was removed from the constant temperature zone and represents the only specimen of this bat taken from a limestone cave in Arkansas. According to Barbour and Davis (1969. Bats of America. Univ. Kentucky Press, Lexington. p. 107), the silver-haired bat rarely enters caves, and there are published records of only six specimens found in caves (Krutzsch, P. H. 1966. Remarks on the silver-haired and Leib's bats in eastern United States. J. Mamm. 47:121).

Skeletons of two other tree bats, *Lasiurus borealis* and *L. cinereus*, were numerous, but their presence in caves has been reported earlier (Beer, J. R. 1954. A record of the hoary bat from a cave. J. Mamm. 35:116; Quay, W. B. and J. S. Miller. 1955. Occurrence of the red bat, *Lasiurus borealis*, in caves. J. Mamm. 36:454-455).

The presence of such large numbers of bat remains in a cave is intriguing, particularly in light of the abundance of cave bat remains. While tree bats might conceivably enter the cave environment, go into torpor, and in the absence of normal epigean stimuli, fail to ever come out of torpor, cave bats obviously should not suffer such a fate. Additionally, the abundant cave bat remains and the relative proximity of the cave entrance discount the possibility of the tree bats simply becoming lost in an unfamiliar area. Although we cannot readily explain the presence of the tree bats in this cave, our studies on swarming activities at the mouth of this cave reveal an abundance of these species at the cave mouth. The large accumulation of cave bat remains appears to be related to a peculiarity of the entrance of this cave. The entrance is a sinkhole that often floods during spring rains. It appears that many years the entrance remains flooded for extended periods, not allowing bats to exit. Apparently these periods of prolonged flooding have coincided with normal spring emergence and the bats, with energy stores critically depleted, were unable to survive without access to food during this period.

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GEOCHEMISTRY OF A CARBONATITE IN MONTGOMERY COUNTY, ARKANSAS

In a previous paper (Wagner and Steele, 1977) the chemical compositions of carbonatites in Conway and Perry Counties of Arkansas were compared. No large differences were found except those due to varying amounts of weathering. This paper reports on a lone carbonatite in Montgomery County (sec. 11, T4S, R23W) that has not been mentioned in earlier publications on igneous rocks of Arkansas (Croneis and Billings, 1930; Stone and Sterling, 1964). It is located 92 km southwest of the nearest Perry County carbonatite, 53 km west of the Magnet Cove igneous complex and 50 km northeast of the Murfreesboro peridotite. Table 1 compares the composition of the Montgomery County carbonatite to its nearest carbonatite neighbors. Its chemical composition is very near to that of the Perry County carbonatite. Notable exceptions are its lower Na, K and Sr and higher Ni contents. Major elements are similar in percentage to the average for the Perry and Conway County carbonatites. There are fewer xenoliths in the Montgomery County carbonatite.

Only a few square meters of a highly weathered portion of the Montgomery County carbonatite are exposed. Soil and stream sediment samples from a limited area around this weathered exposure were analyzed in an effort to determine geochemical indicators of the carbonatite. Figure 1 shows the location of the sampling sites and the weathered intrusive area. Table 2 lists the analyses.