

CROTALUS HORRIDUS REMAINS FROM TWO CAVES IN MIAMI CO., OHIO.^{1, 2}—While prospecting for Pleistocene amphibians and reptiles in Ohio, recent animal remains were recovered from two caves in Miami County, Ohio—Thompson's Cave and Painter Creek Cave. Remains of certain snakes (*Crotalus horridus*, *Lampropeltis getulus*) collected from these caves provide information regarding present-day distributional patterns of these reptiles in Ohio. The limited excavations reported here have also yielded a relatively large amount of invertebrate and other vertebrate material.

The geology of these caves has been discussed by White (1926). Although no C¹⁴ dating was performed on the remains noted here, the taxonomic makeup of the fauna suggests that the oldest of the remains are perhaps 150 years B.P.

The molluscan fauna (obtained exclusively from Thompson's Cave) is a recent one, composed of species of clams and fresh-water and terrestrial snails present in the general area today. These are: *Sphaerium* sp., *Goniobasis livescens*, *Campe-loma* sp., *Pomatiopsis lapidaria*, *Fossaria* sp., *Mesodon inflectus*, *Stenotrema fraternum*, *Discus cronkhitei*, *Gastrocopta contracta*, *Anguispira alternata*, *Anguispira kochi*, *Helicodiscus parallelus*, *Retinella binneyana*, and *Retinella electrina*. Identification of these mollusks was by Dr. Aurèle La Rocque (The Ohio State University).

There are a large number of mammal bones in the collection, all of which represent recent Ohio species now present in, marginal to, or recently displaced from, the Miami County area. Species include the following: *Blarina brevicauda*, *Plecotus* sp., *Eptesicus fuscus*, *Synaptomys cooperi*, *Microtus* sp., *Glaucomys volans*, *Tamias striatus*, *Sciurus carolinensis*, *Rattus* cf. *R. norvegicus*, *Mustela frenata*, *Procyon lotor*, and *Lynx rufus* (mammal remains identified by John E. Guilday, Carnegie Museum). A maximum possible age for *Rattus* cf. *R. norvegicus* can be estimated from Lyon (1936), who cites a literature record for the occurrence of the Norway Rat in 1838 at Richmond, Indiana. In addition, though *Lynx rufus* is generally referred to as being recently extinct throughout Ohio, Brayton (1882) notes the occasional presence of the bobcat in the Cincinnati region ". . . as late as 1814."

Amphibian remains (*Rana* sp., *Ambystoma* sp.) were sparse. Many of these bones appeared quite new (perhaps no more than several years old).

The bulk of the collection is snake material, consisting of a few vertebrae of *Coluber constrictor* (black racer), *Lampropeltis getulus* (black kingsnake) and several hundred vertebrae and ribs and numerous skull and jaw elements of *Crotalus horridus* (timber rattlesnake). It seems likely that the caves served, at one time or another, as owl roosts and as rattlesnake hibernaculae.

Conant (1951) shows the present distribution of *Crotalus horridus* in Ohio to be mainly on the unglaciated plateau southeast of the limits of the Wisconsin Scioto Glacial Lobe (in Athens, Hocking, Ross, Vinton, Jackson, Scioto, and Adams Counties). Small isolated colonies of *C. horridus* occur on the peninsular portions of Ottawa County and on the offshore Bass Islands in Lake Erie. Smith (1957) suggests that this disjunct distribution may be the result of northeastern entrants of *C. horridus* into the Ottawa County area, rather than a northern relict of a population that retreated southward because of post-Pleistocene events. The recovery reported here, of recent *C. horridus* remains in Miami County, attests to the species' presence in other Wisconsin-glaciated portions of Ohio.

Adler (1961), in his summary of the historical records of rattlesnakes in Ohio, indicates that while *Crotalus horridus* formerly had a wider distribution (in Trumbull, Mahoning, Summit, and Licking Counties), there is only one report of these

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timber rattlesnakes occurring in glaciated areas. In this report, colonies of *C. horridus* are noted to have been present, prior to 1838, near Circleville (Pickaway County) and Columbus (Franklin County). Residents in the Columbus area are said to have used fire and hogs to exterminate the rattlesnakes.

The present distributional hiatus of *Crotalus horridus* in glaciated areas of Ohio could be explained as the result of fires and deforestation, settlements, agricultural practices, and persecution by the early settlers and their descendants. *Crotalus horridus* is a secretive snake, with a strong preference for undisturbed, hilly, well-wooded terrain. Ohio landform and vegetation maps (Bier, 1956; Gordon, 1966) show that the unglaciated and pre-Wisconsin glaciated regions are well-dissected areas, steep, hilly, and covered with mixed-oak and mixed-mesophytic forests. These portions of the state, unsuitable for extensive cultivation and settlement, offer an obviously suitable habitat for the timber rattlesnake. Since *C. horridus* appears to have been present on the Till Plains in the past, the question is whether the pressures listed above were intensive enough to cause it to retract its range to the south and southeast in Ohio. It is noteworthy that the modern distributional pattern of *C. horridus* in Indiana and Illinois is to the south of the Shelbyville moraine, the southernmost limit of Wisconsin glaciation (Smith and Minton, 1957).

Vertebrae referable to *Coluber constrictor* (black racer) and *Lampropeltis getulus* (black kingsnake) were also recovered from Thompson's Cave. Subspecies of *C. constrictor* are extant throughout all of Ohio; hence, its presence in the cave fauna is not unusual. *Lampropeltis getulus*, on the other hand, is not found on the Till Plains. Its present northern limit in Ohio is more southerly (in Adams, Pike, Scioto, Jackson, Lawrence and Meigs Counties) than is that of *Crotalus horridus* (Adler, 1961a; Conant, 1951). The habitats of the black kingsnake are diverse, and include dry rocky slopes and hills, wooded areas and ravines, dry prairies, thickets, pastures, bottomlands, floodplains, and lake and pond margins. Although the six vertebrae recovered represent only two individuals, it must be assumed that *L. getulus*, like *C. horridus*, had a more northerly Ohio distribution in the recent past. With a wider range of habitat choices and a less-feared reputation, I question whether the man-related factors proposed for the southern retreat of *C. horridus* are sufficient to have prompted a similar retreat by *L. getulus* (if, in fact, they were sufficient cause for *C. horridus*).

All the animal remains discussed here are now in deposit with the Dayton Museum of Natural History.—CHARLES J. CHANTELL, *Department of Biology, University of Dayton, Dayton, Ohio 45409.*

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