

AQUATIC RODENTS OF THE FLORIDA PLEISTOCENE

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Species of the mammalian order RODENTIA (rodents) have invaded virtually every ecological situation. Water is no exception, and the faunas of both North and South America have a number of aquatic rodent species. The term "aquatic" implies here simply that the forms presumably spend most of their time in the water, even though their sleeping, breeding, and in some cases feeding areas may be out of water. Beavers, muskrats, and capybaras are the most widely known, and all were present in Florida at some time during the Ice Ages (Pleistocene). This issue presents brief resume' and discussion of some of these creatures.

Family CASTORIDAE

Castor canadensis

Beavers presumably had a rather widespread distribution in Florida during Recent time, as their remains are found in Indian middens throughout the center of the state. The naturalist William Bartram noted living beavers in the lower reaches of the St. Johns River in 1792. Since that time their range has dwindled considerably, and beavers are now found only in the northwest, or panhandle, of Florida.

Beaver remains are common in late Pleistocene deposits of the Ichetucknee River, Columbia County, about 60 miles south of the beaver's present southern limits. A few teeth of this species have been found in the Santa Fe River, Gilchrist County (Figure 1).



LOWER 4th PREMOLAR  
Ichetucknee River



UPPER 3rd MOLAR  
Ichetucknee River

FIGURE 1.-- Castor canadensis (Natural size).

Castoroides ohioensis

One of the most remarkable of the Pleistocene rodents is the extinct giant beaver, Castoroides ohioensis. This huge rodent was about the size of a black bear when adult. Although most records are from the northern states, the giant beaver was widely distributed in Florida, both chronologically and geographically. Its remains are common in the Santa Fe River and have been found as far north as the Chipola River, Jackson County, and as far south as Melbourne, Brevard County. Though most of the records are late Pleistocene, the Blancan (early Pleistocene) Santa Fe River 1B beds have produced the oldest material in North America referable to the genus Castoroides. Teeth of C. ohioensis, especially the grooved incisors, are easily identifiable (Figure 2).

Family CRICETIDAE

Ondatra zibethicus

The muskrat no longer lives in Florida. The nearest place it occurs is around Mobile, Alabama. Pleistocene

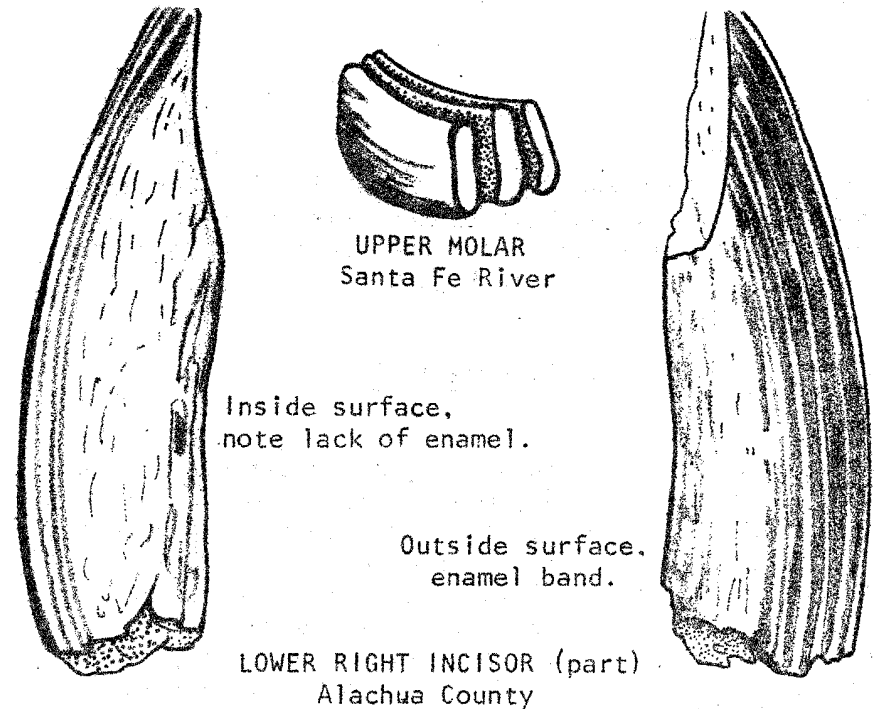
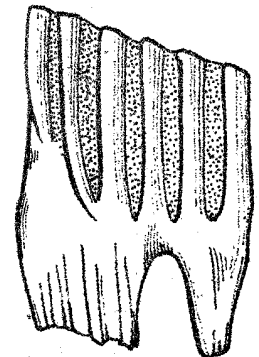


FIGURE 2.-- Castoroides ohioensis teeth (Natural size).



top  
view

LOWER FIRST MOLAR



side view  
(note roots)

FIGURE 3.-- Ondatra zibethicus, Ichetucknee River  
(4 X).

remains of this species are common in the Ichetucknee River, Columbia County, and have also been found in Devil's Den, a sinkhole in Levy County. A tooth of this species is shown in Figure 3.

Neofiber alleni

The round-tailed muskrat is now restricted almost exclusively to Florida, with outlying populations in the Okefenokee Swamp of southern Georgia. During the Pleistocene the genus occurred in Kansas and Texas. Neofiber alleni is distinguished from the common muskrat of more northerly regions by its round, scaly tail, smaller size, and rootless cheek teeth, one of which is shown in Figure 4. A common element in Florida Pleistocene faunas, N. alleni is known from more than 15 locales.

Family HYDROCHOERIDAE

Hydrochoerus and Neochoerus

These are the capybaras, of which one genus, the giant capybara, Neochoerus, is extinct. Living capybaras, Hydrochoerus, which now range south from Panama into South America, are the world's largest living rodents, some of them weighing 50 kg (about 110 pounds). Neochoerus was half again as large, almost the size of Castoroides.

Both Hydrochoerus and Neochoerus were present in the Pleistocene of Florida. Species names are omitted because fossil representatives of this group (including all the Florida specimens) are presently being revised. Fossilized remains assignable to one or both genera have been

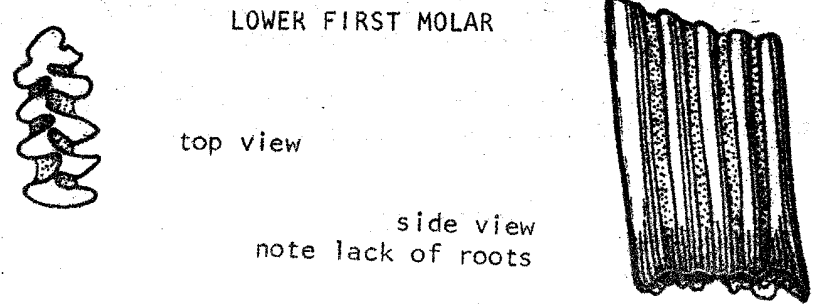
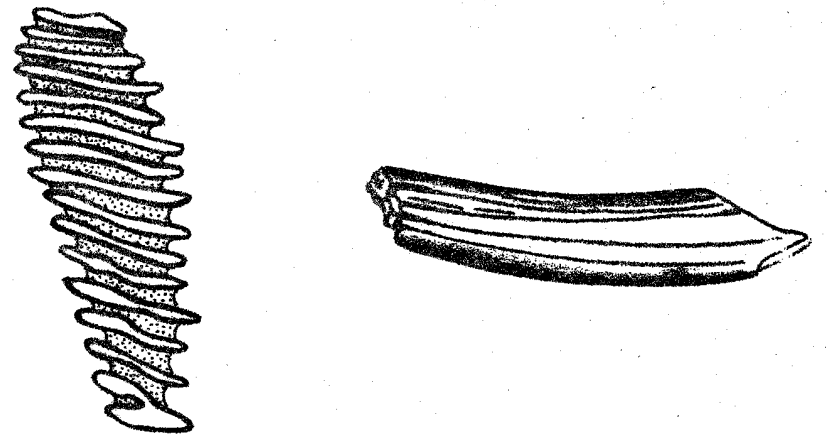


FIGURE 4.-- Neofiber alleni, Maximo Moorings, St. Petersburg (4 X).



UPPER THIRD MOLAR  
Ichetucknee River

NEOCHOERUS

LOWER INCISOR  
Santa Fe River

HYDROCHOERUS

FIGURE 5.-- Hydrochoerus cheek teeth resemble those of Neochoerus, except that they are about half as large.

recovered from the Ichetucknee River and deposits as far south as Vero Beach in Indian River County.

Incisors and other teeth of these animals are the commonest characteristic remains (Figure 5).

#### DISCUSSION

The aquatic rodents are of special interest to the paleontologist because, if present in a fossil deposit, they give direct evidence of the presence of fresh water in the immediate area of fossil deposition. Like their living relatives, these aquatic rodents presumably did not inhabit salt or even moderately brackish water. In some coastal sites they may have lived in fresh water outlets near the marine zone, as the living muskrat does in swamps along the Gulf Coast of Louisiana.

Fossilized remains of the large aquatic rodents of Pleistocene age have been recovered from both Gulf and Atlantic coast deposits, such as Melbourne, Vero Beach, and Seminole Field. These deposits were inundated during the known interglacial stages (see Figure 6). The presence of the large aquatic rodents, especially Castoroides, Nechoerus, and Hydrochoerus, which could not have existed there during interglacial flooding, show that these regions enjoyed major fresh water drainages during the glacial periods. These fresh water systems may have been extensive fresh water swamps, large ponds, large streams, or lakes. The amount of energy needed in terms of food, plus the minimum depth of water necessary for, say Castoroides, rule out small streams or shallow bogs as possible habitats. A change to shallower waters in the latest Pleistocene may have been a major factor in the extinction of these animals, at least in coastal regions.

NORTH AMERICAN PLEISTOCENE FAUNAL AGES	YEARS AGO	NORTH AMERICAN GLACIAL SEQUENCE	SEA LEVEL	
			HIGH	LOW
RECENT		POSTGLACIAL		
RANCHOLABREAN	95,000	WISCONSIN		
		SANGAMON		
IRVINGTONIAN	$0.8 \times 10^6$	ILLINOIAN		
		YARMOUTHIAN		
		KANSAN		
LATE BLANCAN	$1.8 \times 10^6$	AFTONIAN		
		NEBRASKAN		

Figure 6. Time scale of Pleistocene events.