The PLASTER JACKET is a newsletter about fossil vertebrate animals of Florida. Its purpose is to circulate authoritative material on vertebrate paleontology and to foster communication among the growing number of enthusiasts of this subject.

Questions, announcements and other communications are solicited from all readers. Information of general interest will be included in future issues.

It is our intent to produce this series at the rate of about one issue per quarter year. We hope to add as many genuinely interested paleontologists as possible to our mailing list. If you are interested, please send your name and address to the PLASTER JACKET. These issues are distributed free of charge to all interested people.

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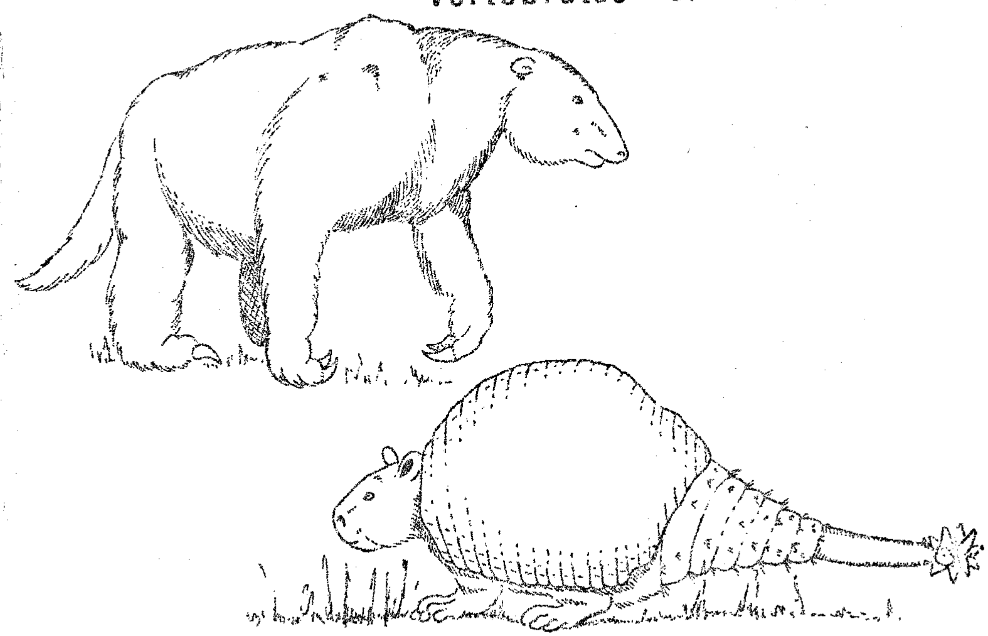
The PLASTER JACKET

--about fossil vertebrates of Florida



- FLORIDA STATE MUSEUM
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FOSSIL XENARTHRANS OF FLORIDA

by
S. David Webb

INTRODUCTION

Florida's fossil record is remarkable for the diversity and abundance of this order of strange mammals. The living xenarthrans include tree sloths, anteaters, and armadillos. Most of them live in South America, many with ranges extending into tropical Central America; only one species of armadillo, _Dasypus novemcinctus_, now ranges into southern United States (including Florida). The Tertiary fossil record of the xenarthrans in Patagonia and other parts of South America is quite extensive and there can be no doubt that their origin and principal radiations are South American. For this reason, the remarkable diversity of this group in Florida's fossil record lends it an exotic Neotropical air.

The order Xenarthra was named for the "strange joints" by which the thoracic and lumbar vertebrae articulate. The extra processes (xenapophyses) that cause this strangeness are shown in Figure 1. The strangeness of the xenarthrans is by no means restricted to their vertebral articulations; indeed, paleontologists familiar with other groups of mammals often recognize xenarthran bones merely by their "weirdness". By way of illustration, the following features are cited as particularly diagnostic:

a) no hard outer layer of enamel on teeth; usually two distinct tracts of dentine surrounded by a layer of cement. (See Fig. 4).

b) no teeth across front of jaws, space occupied by long heavy tongue that protrudes through spout-like symphysis.

c) scapula (shoulder blade) heavy with acromion and coracoid processes long, strong, and usually united.

d) sternum heavy with numerous bony joints for ribs.

e) pelvis long, with extra process of ischium often fused to ilium.

f) feet broad and heavy, with strong claws.

All of these features are correlated with the heavy-bodied, slow-moving manner of the xenarthrans.

A fundamental division of the xenarthrans separates forms covered with bony shells like the armadillos (suborder Cingulata) from unarmored kinds like the sloths and anteaters (suborder Pilosa). Each suborder includes several families now wholly extinct, as well as some families with living members.

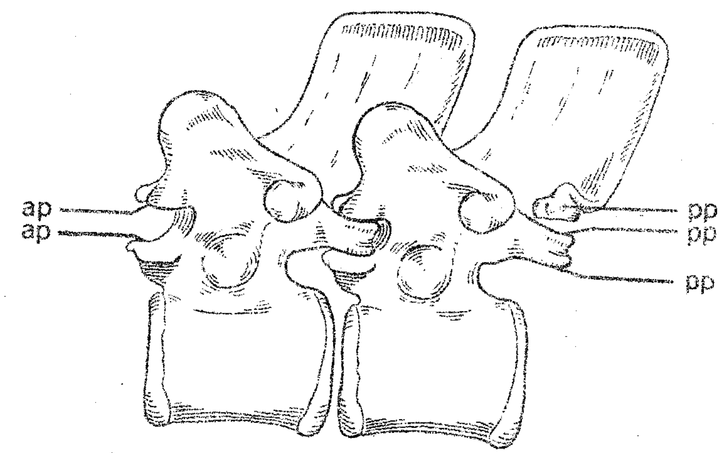

Figure 1. Two posterior thoracic vertebrae of the Great Anteater exhibiting the extra processes; each vertebra bears two anterior processes (ap) and three posterior processes (pp). Side view, natural size.

Cingulata

Three groups of shelled xenarthrans are known: the glyptodonts, the chlamytheres, and the armadillos. All three lived in Florida during the Pleistocene. Only the armadillos live here now.

The glyptodonts resemble giant tortoises or tanks in overall appearance. The armor consists of a large number of polygonal bony plates fused into solid shells, one on top of the head, another much larger one over the body, and several on the tail forming a series of overlapping rings, often culminating in a mass of bony spikes at the tip. The individual polygonal plates that make up the armor remain recognizable even after they grow together, and the rosette-like pattern of sculpturing on each plate tends to be consistent over most of the large body-shell. Moreover the rosette pattern generally differs in different kinds of glyptodonts. For this reason, fossil glyptodont genera and even species often can be recognized from isolated bony plates.

The teeth of glyptodonts are readily recognizable by their considerable height, 3-prism pattern, and narrow internal dentine layer. The molars and several premolars form an impressive grinding battery, presumably for consuming coarse vegetation. Although the teeth are diagnostic for certain genera, they have not yet become widely used in taxonomy.

In Florida, two genera are known: Brachyostracon from the early Pleistocene and Boreostracon from the late Pleistocene.

Most plates of these genera are readily distinguished as indicated in the following Table and in Figure 2.

	Brachyostracon	Boreostracon
Size of Plate	Greatest diameter generally more than 40 mm; thickness more than 12 mm.	Greatest diameter generally less than 35 mm; thickness less than 12 mm.
Central Figure	More than 1/3 diameter of plate.	Less than 1/3 diameter of plate.
Marginal Figure	Divisions sharp and numerous (10 or more); porous texture.	Divisions less distinct and less numerous (6 to 9); radiating fibrous texture.

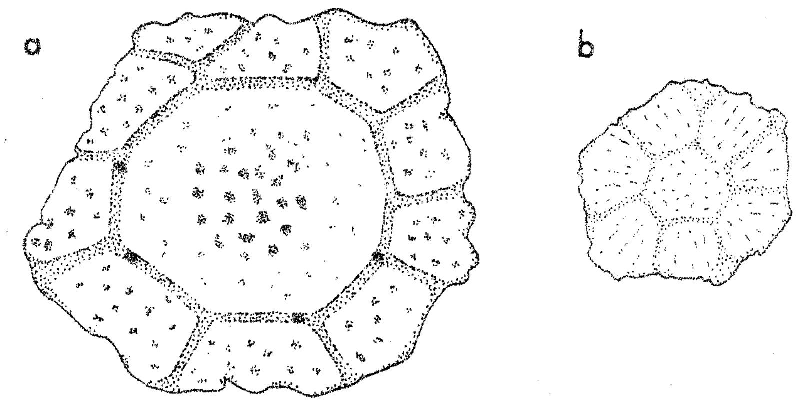

Figure 2. Rosette plates of a) Brachyostracon and b) Boreostracon. Dorsal view; natural size.

The armadillo family, Dasypodidae, includes an impressive diversity of living members in South America. The nine-banded armadillo, Dasypus novemcinctus, ranges into southern parts of the United States. It was accidentally introduced in east Florida about 40 years ago, but has now spread through the state. An extinct relative, Dasypus bellus, lived in Florida during the Pleistocene. It differed little from the nine-banded species, except it was about twice as large.

Armadillo shells differ from those of glyptodonts in having several movable bands of armor (nine in the "nine-banded" species) that permit free movement of the underlying vertebral column, especially curling up into a protective ball. As in glyptodonts each section of armor is composed of many smaller bony plates fused together. Many of the bony plates in the immovable parts of the armor distantly resemble glyptodont rosette plates, but the plates of the movable bands are long and rectangular with one end excavated where the next band overlaps (Fig. 3a, b).

The skull of an armadillo has a narrow tubular snout and a wider but also tubular braincase. The numerous teeth are simple and peg-like. The very long muscular tongue helps the animal obtain its main foods: ants, termites, and other insects. The powerful limbs and very strong claws, especially on the front feet, enable the armadillo to dig its food and its burrows.

The chlamytheres are a peculiarly specialized group of armadillos that may be classified as a distinct family. They also appeared in Florida early in the Pleistocene and remained here to the end of that epoch. They were larger than typical armadillos, with a head one foot long and total length of more than 6 feet. Their teeth, instead of simple pegs, were bilobate or figure 8-shaped, thus providing a more elongate chewing surface. The bony plates that made up the immovable bands of armor were somewhat more like those of a glyptodont in outline, but there is no central rosette, only a broad porous central surface with a narrow beveled pitted edge (Fig. 3c, d). The movable plates are long rectangular and overlap as in typical armadillos. The rest of the body was much like that of a large armadillo, though the limbs were proportionally heavier.

Pilosa (Haired Xenarthra)

The anteaters, Myrmecophagidae, apparently never ranged north of Central America. Their specialized diet, consisting almost exclusively of tropical mound-

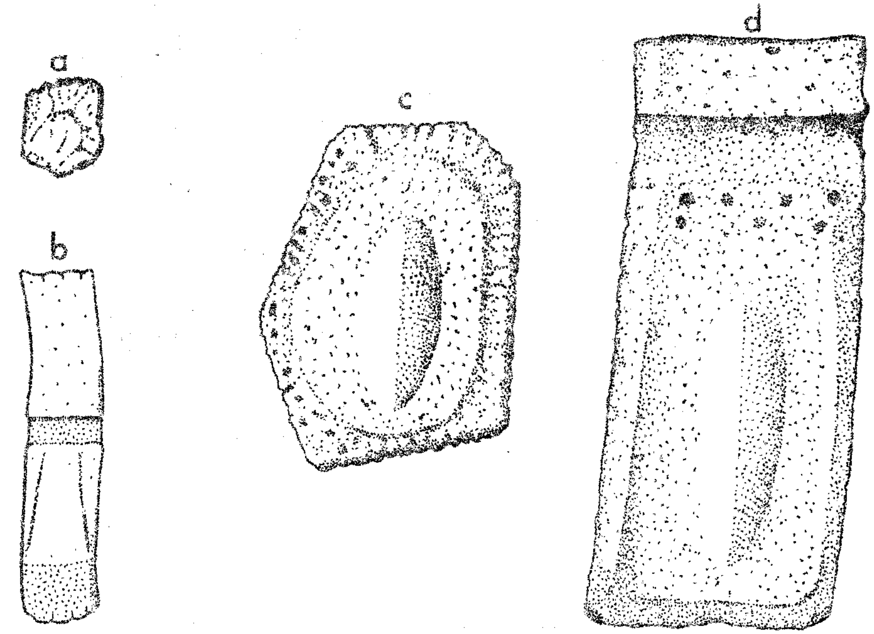

Figure 3. Bony plates from the shells of: Dasypus bellus, a) rosette plate from immovable part of shell and b) rectangular plate from movable band; and a chlamythere, c) rosette plate, and d) rectangular plate. Dorsal view, natural size.

building termites, has probably prevented them from attaining wider distribution. The fact that they are completely toothless also makes their discovery as fossils more difficult.

The only sloths living today are two genera of cat-sized tree sloths, inhabiting dense tropical forests. They eat little besides leaves, and seldom venture down from the forest canopy. They do not range north of Central America. However, a great variety of ground sloths, most of them much larger than tree sloths, lived in South America up to the end of the Pleistocene. Thomas Jefferson, who studied the first specimens of ground sloths from North America, supposed they might still live out in the western territories. Unfortunately this supposition now seems unlikely.

The ground sloths had short deep skulls as compared with those of armadillos or anteaters. The deep jaws supported very high-crowned teeth, presumably for chewing leaves and other vegetable matter. No more than 4 or 5 teeth occur in each jaw. The cheek bone is elaborately developed toward the front, supporting strong jaw muscles; yet the back end of the cheek bone fails to attach to the skull as it does in most mammals.

The feet of ground sloths attained extraordinary size and supported huge claws. The feet were peculiarly rotated onto their sides and outer toes, thus helping the animal keep its claws out of the way. The tail was very strong and evidently helped support the sloth when it stood up on its hind limbs.

Three principal families of ground sloths developed in South America. The most distinctive were the Mylodontidae. One kind of mylodont, Thinobadistes, reached Florida during the Pliocene and was replaced by another, Glossotherium, in the Pleistocene. Most mylodont teeth are easily recognized by their twisted triangular or bilobed shapes (Fig. 4a). The only exceptions are the first teeth, which are prominent triangular biting teeth that sharpen uppers against lowers.

Mylodont claws are heavily built, much broader proportionally than in any other ground sloths or tree sloths (Fig. 5a). The Florida mylodonts had bodies about the size of large bulls, but with much heavier tail and hind quarters.

The family Megalonychidae also appeared in Florida during Pliocene times represented by the genus Pliometanastes, an- reappeared in the Pleistocene represented by Megalonyx. These sloths reached about the size of black bears. The cheek teeth of megalonychids are nearly square in cross-section (usually one side of the square is concave), but the crown wears to an irregular, concave surface (Fig. 4b). The first upper and lower teeth are small, pointed, and pencil-like in Pliometanastes, but large with flat-wearing crowns in Megalonyx. The claws are sharp and compressed laterally (Fig. 5b).

The third ground sloth family, the Megatheriidae, reached Florida late in the Pleistocene. The genus Eremotherium, some 20 feet long and very massively built, was the largest land animal that ever lived in Florida, exceeding even the mammoths. Its great teeth are nearly square in cross-section. The crown wears with a deep transverse V-shaped valley, the front and back edges form high transverse ridges, the center a deep valley (Fig. 4c). The ridges of the lower teeth fit into the valleys of the uppers and vica versa, forming a powerful mechanism for chopping vegetation. The first teeth are somewhat smaller and more rounded than the others, but do not function differently as they do in the megalonychids and mylodontids. Megathere claws are sharp and compressed like those of megalonychids, but are vastly larger and relatively deeper.

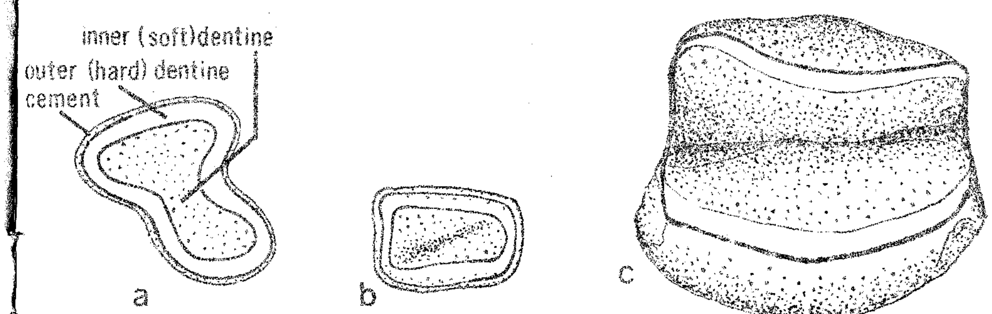

Figure 4. Cheek teeth of ground sloths. a) Glossotherium, b) Megalonyx, and c) Eremotherium. Crown view, natural size. Anterior sides up.

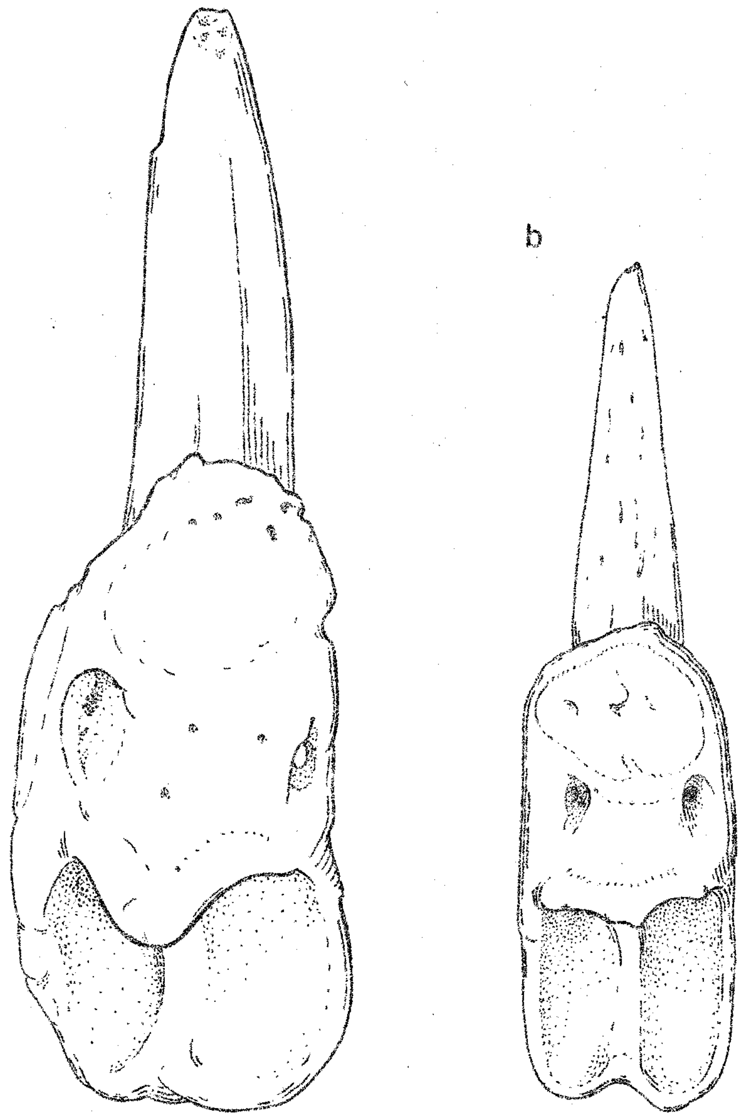

Figure 5. Claw cores of ground sloths. a) Glossotherium and b) Megalonyx. Palmar view, natural size.

Museum Notes

Dr. Walter Auffenberg and family are nearing the end of their year's stay on Komodo Island. At last report they were still happy, healthy, and deeply involved in studying the famed "Komodo dragons", large monitor lizards.

The new Museum building on the UF campus is now 95% complete, and we plan to move in during July. Unfortunately, the collections will be largely inaccessible until about September.

Recent visitors to the Museum include a number of vertebrate paleontologists. Morris and Marie Skinner from the American Museum of Natural History, and Roy and Helen Burgess visited the Museum and toured the Bone Valley District. Franz-Otto Neuffer and Eckehard Bahlo, graduate students at the Paleontological Institute, University of Mainz, Germany, studied at the Museum during the month of April. Bill Akerston, University of Michigan, and Jim Quinn, University of Arkansas, also studied here recently. John Kaye, Professor of Geology, University of Mississippi in Starkville, brought a very interesting collection of cretaceous dinosaurs and Pleistocene mammals here for study. Norm Tessman returned from the University of Arizona to prepare his "Revision of the Fossil Sharks of Florida" for the press. Phil Kinsey of Jacksonville Beach dropped by to further his fascinating study of a new Blancan peccary. Dick Ohmes of Tallahassee visited us here and also showed us his remarkable collection.