The PLASTER JACKET is a newsletter. 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 six issues per 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.

This public document was promulgated at an annual cost of $2500 or $0.17 per copy to circulate authoritative material on Florida paleontology and to foster communication among enthusiasts of this subject.

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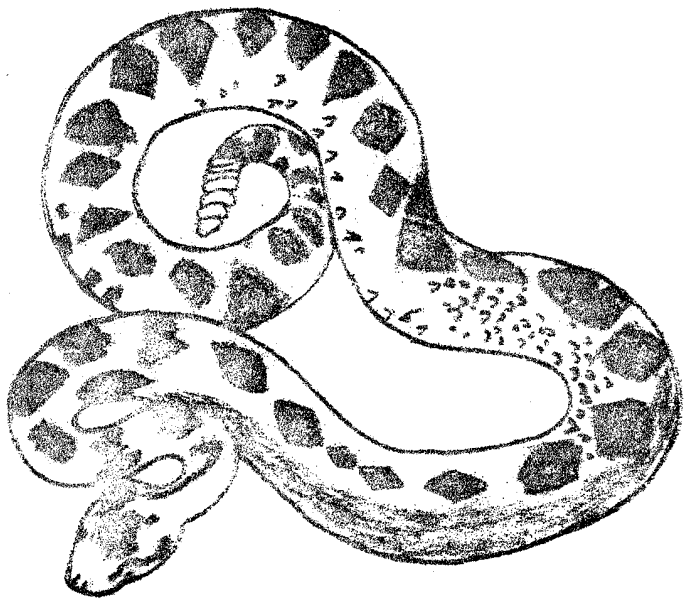

THE FLORIDA STATE MUSEUM

THE SUPPOSED GIANT EXTINCT RATTLESNAKE OF FLORIDA

by

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Throughout the history of life as shown by the fossil record, extinct animal species have usually been replaced by other species. Only rarely have large assemblages of organisms died out without leaving any ecological replacements. However, animals which became extinct in Florida at the end of the Pleistocene (such as mastodons, ground sloths, camels, saber-tooth cats, and giant land tortoises) left no replacements. Interestingly, these extinct animals are not merely a random assemblage of the entire Pleistocene fauna. On the contrary, most were large herbivores and the carnivores that fed upon them. The causes of this selective mass extinction are still argued. Some claim that climate during the last third of the Pleistocene may have been unsuited to many species; others that prehistoric man hastened extinction by reducing population densities to a level too low to sustain the species. The answer is probably a combination of these and other factors.

Perhaps in support of the prehistoric man overkill theory is the fact that only large mammals and land tortoises died out at the end of the Pleistocene. No aquatic turtles, no birds, no lizards, and no amphibians are known to have become extinct during the Rancholabrean stage of the Pleistocene in Florida. However, there is a single species of snake that is thought to have become extinct at the same time as the large mammals and land tortoises.

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This snake, Crotalus giganteus (the "extinct giant rattlesnake"), is believed to live right along side the modern diamondback rattler, Crotalus adamanteus. Fossil vertebrae of both species are known from Sabertooth Cave, Citrus County; Hornsby Springs and Haile, Alachua County; and Eichelberger Cave, Marion County.

When Crotalus giganteus was described, it was said to have reached a length of twelve feet, with the bulk of "a modern boa constrictor." Many subsequent authors have repeated the supposed giant size that this snake attained. The original vertebra upon which this species was described (the holotype) was 0.48 inches long from the inside of the cup to the ball of the centrum.

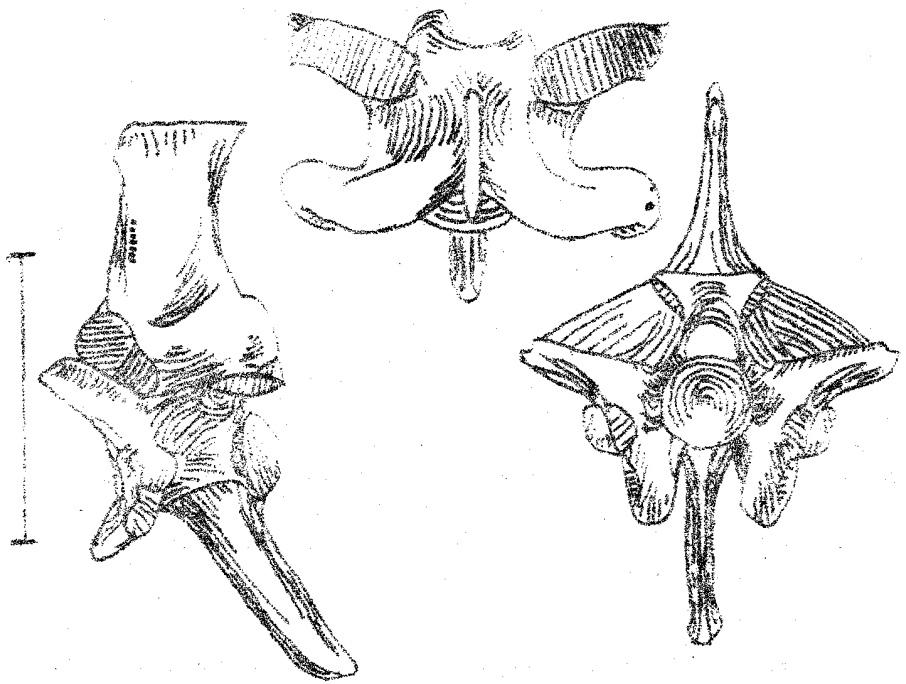

FIGURE1.-- Vertebra of Crotalus giganteus = C. adamanteus.

If we measure the mid-body vertebrae of some modern rattlesnakes of several species, and plot these values on a graph with body length, we get a straight line. Thus there is a direct relationship between the length of a mid-body vertebra and body length in species of the rattlesnake genus Crotalus. There is no reason to suppose that C. giganteus, which is identical to C. adamanteus in all respects except size, should not also have the same relationship.

Of course, a snake's vertebrae are not all the same size. In fact, the neck vertebrae are the smallest, gradually becoming larger until mid-body, where they gradually become smaller again towards the tail. We have no way of knowing exactly which one of the long series of vertebrae in a snake's body the holotype vertebrae of Crotalus giganteus represents, but we can place it with certainty in the correct region based on comparison of detailed features in modern rattlesnake skeletons.

After measuring all the vertebrae in each of several rattlers, I found that the largest (i.e., midbody) vertebrae average 1.69 times longer than the smallest. In addition, the largest vertebrae average 1.17 times longer than the "average" vertebrae. So, if we make the assumption that the holotype represents the smallest vertebrae in the snake from which it came, we can predict the length of the largest to (0.48) (1.69) = 0.81 inches. By similar reasoning, if the holotype were the "average" length, the largest would be 0.50 inches long.

These values can now be plotted on the graph in Figure 2, and we can extrapolate estimated body lengths. When this done, we get a maximum length for the holotype of Crotalus giganteus of 8 feet, 8 inches; a minimum length (based on the assumption that the vertebra was the largest in the snake) of 5 feet, 8 inches; and an estimated length based on the average of 6 feet, 4 inches.

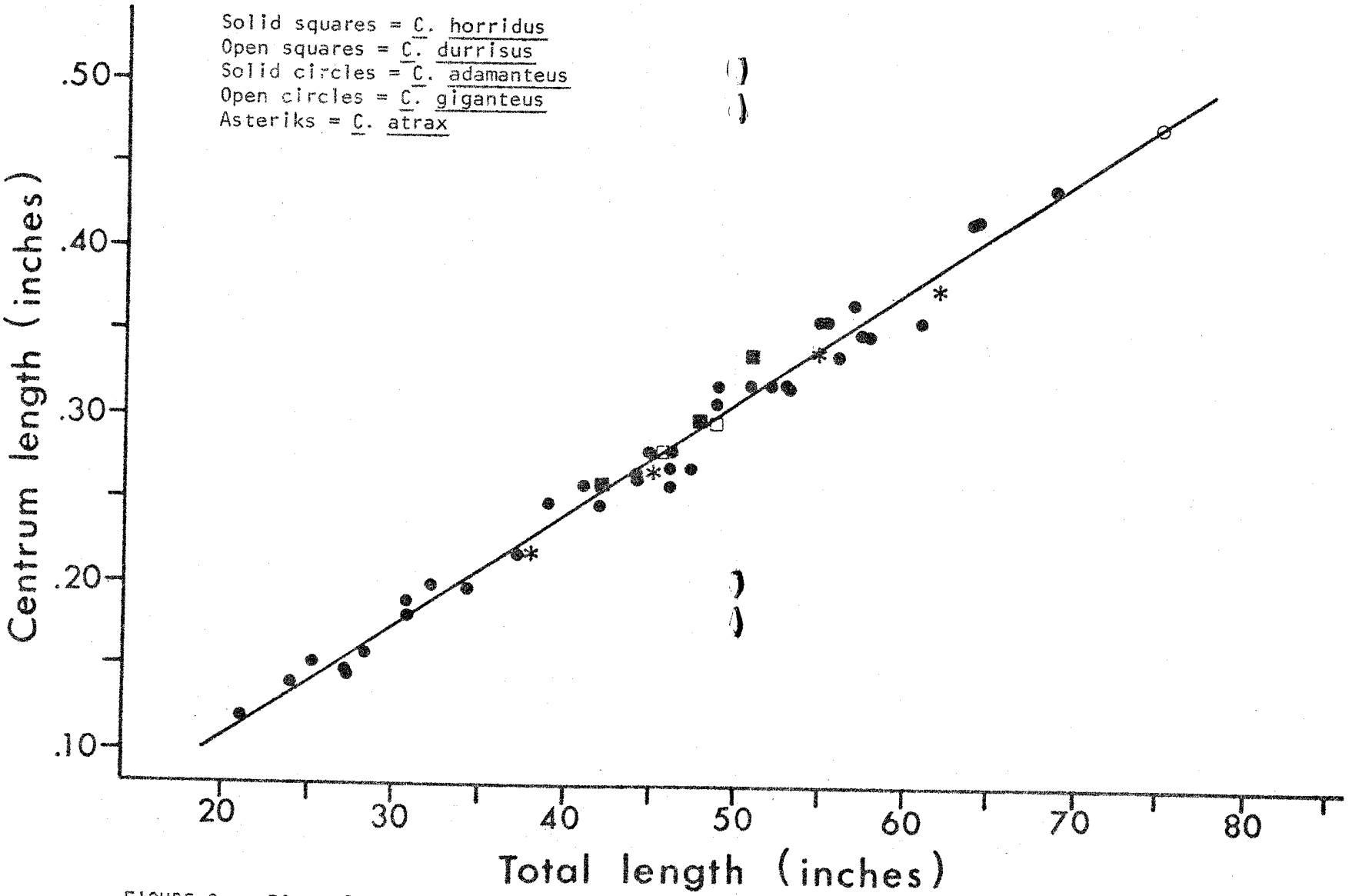

FIGURE 2.-- Plot of centrum length versus total snake length of five species of rattlesnake.

Our conclusion from this line of reasoning is that the holotype of Crotalus giganteus (the largest specimen thus far collected) came from a snake between 5 feet, 8 inches and 8 feet, 8 inches long, and probably somewhere in between. Thus C. giganteus was not really any more giant than some individuals of the modern rattlesnake. Since the only character differentiating the extinct giant rattler from the modern diamondback was size, we have to conclude that there really aren't two different species. Specimens referred to as Crotalus giganteus are actually specimens of Crotalus adamanteus.

Many animals got larger in the past than they do at the present time. Alligators are said to have reached lengths of over 20 feet, beavers were much larger, and rattlesnakes were certainly larger in the not so distant past than they are now. Records at Ross Allen's Reptile Institute indicate that the average size rattlesnakes brought in has been decreasing over the past 30 years. Man is probably responsible for the decline in maximum size of most animals in the last few thousand years. The larger an animal gets, the more conspicuous it is, and thus more likely to be seen and killed. Furthermore, the largest animals are also the oldest, and just being around longer increases the likelihood of their being found and killed. Thus it really isn't surprising that many Pleistocene fossils represent the remains of animals larger than individuals of the same species today.

The approximate length of a snake can be estimated by multiplying the length of a single vertebra (representing an "average vertebral length") by the total number of vertebrae in the snake. The approximation thus obtained will probably be accurate to within 30 percent of the actual length. With this crude method, it is possible to determine if a fossil vertebra at hand represents an exceptionally large snake or not. Table I lists some of the most commonly found snake species in Pleistocene deposits,

and their average number of body vertebrae. The centrum length in inches can be multiplied by this number to give the approximate snake length in inches, or times the centrum length in millimeters to give the approximate snake length in millimeters.

If our reasoning is correct, we should not be surprised to find occasional specimens of Pleistocene snakes which were larger than the same species gets today.

TABLE I

Snakes commonly found in Florida Pleistocene localities and their respective average number of body vertebrae.

SCIENTIFIC NAME	COMMON NAME	NUMBER OF VERTEBRAE
Coluber constrictor	Southern black racer	180
Drymarchon corais	Indigo snake	200
Elaphe sp.	Corn and Rat snakes	230
Farancia sp.	Mud and Rainbow snakes	180
Heterodon sp.	Hognose snake	130
Lampropeltis getulus	Eastern king snake	210
Natrix sp.	Water snake	130
Pituophis melanoleucus	Florida pine snake	230
Micrurus fulvius	Coral snake	210
Crotalus adamanteus	Eastern diamondback	170

NEWS NOTES

NEW PUBLICATIONS:

A full review of Florida's rich Pleistocene fossil sites and the great variety of mammals from these sites will soon be available. Pleistocene Mammals of Florida, edited by Dr. David Webb, will be published in December by the University of Florida Press. In the near future exact information for ordering your copy will be provided in the PJ, or you may inquire at your local bookstore.

The April 1973 issue of the Journal of Mammalogy contained an article by Dr. Webb on Pliocene Pronghorns of Florida, featuring Hexameryx and a new subgenus and species called Subantilocapra garciae. The new species is named for Frank Garcia who discovered the type and paratype specimens.

NEW SPECIMENS:

Mr. Bill MacDonald of Tampa donated the first Florida record of Hypohippus. This browsing horse, known from late Miocene and early Pliocene deposits elsewhere in North America, evidently survived into the Middle Pliocene in Florida. The specimen consisting of two upper premolars is catalogued as UF 18529.

A possible elephant seal tooth was donated by Mr. Melvin McClain and son of Tampa. This may be a new addition to the Pliocene fauna of Florida also.

It is curious how new or extremely rare kinds of fossils seem to come in pairs or trios. Three years ago we had never seen a beaver older than Pleistocene. Then suddenly two Pliocene and two Miocene specimens turned up. This seems to be the year for Pliocene badgers. Mr. Bill Smith of Lakeland donated a mandible with the lower carnassial of a large mustelid, new to

brought out a maxillary containing the upper carnassial and molar of a large Pliocene badger. Together these specimens provide an important addition to the Bone Valley fauna, and help correlate it with faunas in western North America.

NEW SITES:

The "high hill of Haile" is where Ken Campbell and the Florida State Museum crew recovered an exciting new mid-Pleistocene site this past summer. Even though the fossils were dumped there by quarry operators, they were abundant and well-preserved. Three kinds of ground sloths, porcupines, short-faced bears, and scimitar-cats were among the most striking discoveries. Two truckloads of small bones, including shrews, mice, frogs, and birds, are now waiting to be sorted.

Mr. Richard Ohmes of Chaires, Florida donated a large collection of fossil vertebrates, including many probiscideans, edentates, and artiodactyls, from two sites on the Aucilla River.

A whole cranium of a baleen whale was recovered from the Pleistocene sands of Sarasota by Ken Campbell, Howard Converse, and Dick Franz.

A new site in the Ichetucknee River produced an associated skull, jaws, and partial skeleton of Bison antiquus.

We welcom further brief site reports, fossil observations, or club news from Florida paleontologists.

NOTE: A year ago we purged our mailing list of anyone who did not request renewal. If you know anyone who has stopped receiving the PJ, but who would like to continue, please encourage that person simply to write us requesting renewal.