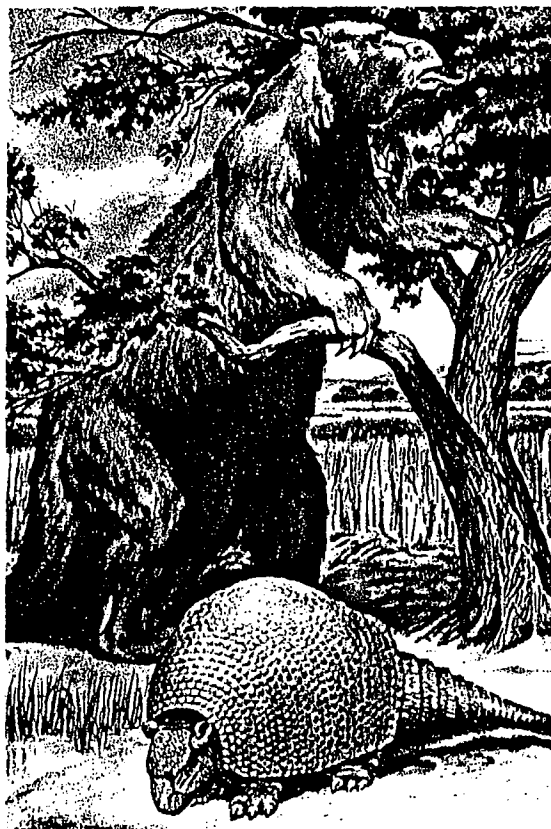


THE AMAZING STORY OF FLORIDA'S PREHISTORIC ANIMALS



Picture reprinted with permission from Erv Lampert
from his book "Guide To Prehistoric Animals"
from Winner Enterprises

By
Ed Winn
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Shown in the illustration on the previous page is a great sloth (Megatherium) and an armadillo-like animal called a Glyptodont. Many sketches of prehistoric animals will be included in this story to attempt to acquaint the reader with the animals that lived before our time. Our first people, the Paleo-Indians, hunted some of these giant animals over a two thousand year period beginning about 12,000 years ago.

I would like to dedicate this historic animal story to my great-grandson, Alden Winn. At the time of this writing his age is six, and he already shows great interest in the books I have given to him with pictures of our beautiful animals and birds.

I wish to thank my old friend, Erv Lampert for permission by letter to use pictures from one of his many publications, and the book entitled "Guide To Florida's Prehistoric Animals" by Robert Anderson and Winner Enterprises which prints many small books numbering thirty-two in 1999. All their books give excellent exposure to early Florida animals. I referenced information from a book of absolute excellence entitled "The Fossil Vertebrates Of Florida" edited by Richard C. Hulbert, Jr. This is an incredible book and should be purchased by anyone who wishes to learn about our fossils in detail. Briefly used also was "Golden Guide Book of Fossils" from Martin's Press. It is a small and inexpensive book featuring the importance of the Mesozoic and Cenozoic periods. Excellent guides. Let's start our incredible journey into the past to learn about animals and birds before our time - 99% of which are now extinct.

Our world's last great Ice Age began about 1,800,000 years ago and lasted until about 20,000 years ago, and with the heat of the sun, the earth slowly rid itself of a million years of ice. It took 10,000 years for the ice that covered one third of our earth up to two miles thick to melt and run into the seas in great torrents.

This phenomenon was not the only thing that happened during this melting period. The change in temperature created a natural land bridge, and somewhat over 12,000 years ago it had a temperature of about 50 degrees at times allowing grass and plants to grow there. So literally millions of Asian and European animals came across the bridge crossing into Alaska and Canada and through to the United States into Central and South America. These animals came so rapidly it is suggested it only took about a thousand years for some of the migration to reach as far south as the tip of South America. Some of the animals later started migrating back northward.

Florida was to receive a rich and varied assemblage of these early mammals. It must have been quite a sight 12,000 years ago to see herds of prehistoric small Asian horses, camels, mastodons, saber tooth tigers, mammoths. There were giant aquatic rhinoceros that had to be large enough to escape Florida's huge prehistoric alligators. From Central America came giant armadillos that were 9 feet long and 4 feet high and giant ground sloths that could eat leaves out of a tree 20 feet high. There was even a type of wolf very much like our Florida wolves that eventually died off in the early 1900s. There also were some small animals like guinea pigs and many, many others. For about 2,000 years our early people hunted and killed the huge animals, and then for some unknown reason, the animals mysteriously disappeared about 10,000 years ago. Most all of the animals including the horses that had left Asia and came into our continent migrated back into Asia. As you read further a more detailed account will cover some of these historic animals.

Please note that we live in an age of mammals that started only a scant 70 million years ago. The dinosaurs that lived about 200 million years ago ruled the earth for 120 million years. Like the other prehistoric animals, the dinosaurs mysteriously disappeared from the face of the earth.

PART 1 THE BEGINNING

A long, long time ago, even before memories, the strip of land that was to become our precious Florida ripped and slipped away from what is now the coast of Africa as part of the shifting of the Continental Plates. Our land moved and shoved its way under what is now the Atlantic Ocean and came to rest as an appendage to the continent above. The shell dunes of Brevard County show splintered remnants of the ancient continent of Gondwanaland or what now is Africa. This continent has long been gone, but its existence is accepted as scientific theory.

In John Eriksen's book "Brevard County, A History To 1955" he writes, "Far below the high ridges of Central Florida lie sandstone and marine fossils that form the prehistoric cornerstone of Florida. Across the Atlantic, northwestern Africa rests on the same rock. Once common ground, the early Florida and African bedrock were split roughly 500 million years ago when "Gondwanaland" began to break up and drift south. The shifting land divided the supercontinent of "Pangaea" and gave birth to the Atlantic Ocean. As the continents divided, a small sliver of the African land mass lingered."

The North American continent as we know it now goes back several billions of years. The same bedrock that is under Florida does not appear under the mainland states. These rock formations are what make Florida so fragile. This unique phenomenon of sandstone and lime rock is part of our aquifer where our pure water is stored.

As the continents divided, a small bit of this African landmass lingered, and now as millions and millions of years passed by, some 195 million years, Florida remained submerged. It was during this time that strange animals and reptiles evolved and then suddenly disappeared. One of the earliest mammals to inhabit our underwater, our seas, was the sea cow. Existence of remains of sea cows dates back nearly 45 million years.

About 25 million years ago, a relatively short time in eternity, our state emerged from the ocean for the last time – at about twice the size it is now. For millions of years, the only sounds heard on our peninsula were the crashing ocean waves and the thunder of the tropical storms passing over and drenching the land with fresh water. No birds came to sing. There were no trees to rustle in the breeze. Florida was a great sandbar. But as time passed by so quietly, birds did begin to appear at last, dropping seeds; and the winds brought more seeds and plant spores. And as the heavy rains washed the soil, they filled the lakes, and the lakes made rivers, and the underground reservoirs filled with sweet, fresh water. Green plants began to grow and grow until Florida was covered with dense growth of plants and animal life. Then, 20,000 years ago when the Great Ice Age was coming to an end, the ice began to melt in the heat of the sun. Fully one third of the Earth was covered in an ice mass up to two miles thick. For 10,000 years this ice melted. At first there were just small streams, and they became rivers, and finally torrents of water our minds can't even begin to imagine, and the seas began to rise; and for ten thousand years, those torrents of water raised the oceans, until roughly one

half of Florida's width disappeared under the oceans. Only a scant 21 ½ million years ago (250,000,000), the great tectonic plates created a new bridge that joined the South and North American continents, now known as Central America, and over it came new species of animals in great numbers. They were later joined by the huge animals and Paleo-Indians who crossed the natural bridge from Asia to Alaska across what is now the Bering Sea.

When winter came in Florida during the Ice Age, glaciers were as far away as Illinois and snow only rarely dusted the peninsula. Paleo-Indians, escaping the harsher weather in the north, lived on Florida's peninsula, along with giant sloths, camels and a less hairy version of the woolly mammoth and many other animals beginning about 12,000 years ago.

There was an armadillo the size of a small car. It is called a Glyptodont, and could whack predators with a tail resembling a spiked club. Saber-tooth cats sported nine-inch fangs, the largest of any feline in Earth's history. Beavers weighing up to five hundred pounds could "outchomp" them with teeth up to a foot long.

During the Ice Age, as mentioned, one-third of the planet was covered in glaciers, but Florida had temperatures only 5 to 10 degrees cooler than today's, and an even bigger perk – virtually no humidity. It was a perfect place for a wide variety of animals.

The temperate climate and unfrozen water lured mammoths and mastodons which were hunted by the Paleo-Indians who needed food. Floridians who think the state's coastline is disappearing today should look back to the Ice Age, when lower sea levels would have made most current-day coastal cities miles from the beaches. Even 10,000 years ago you would have to walk from our present Gulf shoreline 100 miles west to be at water's edge.

If you were here 25,000 years ago, you could walk out into the Gulf of Mexico almost half the distance to Louisiana. Likewise, if you lived here 100,000 years ago, during one of the warm stages of the Ice Age, Miami and Tampa are would have been underwater.

Years ago the weather was much colder than now, and water was often scarce. Early Florida must have looked like a giant zoo with more species of animals living here than can be imagined. A few will be discussed in this story, but we will only present the tip of the iceberg of the hundreds and hundreds of both very large and small animals that made Florida their home. Most all of the prehistoric animals left Florida about 10,000 years ago, but the great sloth left about 8,000 years ago. Only a handful of these animal species remained after ten thousand years ago. Why did this happen? No one knows, but it was possibly due to a radical change in temperature. I do not believe they were over-hunted. Actually, many returned to Asia.

When the first people arrived in Florida 12,000 years ago, they saw a state that would seem unrecognizable to today's inhabitants. Tampa Bay was a valley with a little stream running down the middle of it.

The Paleo-Indians drifted throughout the state, moving with the seasons and following their food supplies. Using weapons made of stones, bones, antlers and ivory, they hunted giant mastodons and mammoths, as well as smaller animals such as rabbits. They were pretty sophisticated. They were using spear throwers to launch big darts or spears, but they also carried primitive stone knives.

The Paleo-Indians lived in small groups of ten to thirty people and had about the same appearance and intellect as humans today. Scientists hypothesize that they might have hunted mastodons and

mammoths to extinction. Again, either that, or climatic changes or illnesses caused the demise of the six ton creatures.

The weather was so temperate that the woolly mammoths stayed farther north where they needed a heavy coat to keep warm. In Florida, the lesser-known Columbian mammoths, which were probably much larger, and much less hairy, roamed the landscape as far south as they ever were.

Our Paleo-Indians would live with the saber toothed tigers, mammoths, mastodons, giant beavers, large wingless birds such as ostriches, cave bears, camels, Asian horses, the huge armadillos, wolves, giant alligators, rattlesnakes 12 foot long, tortoises, 4 foot high water hippos and countless other animals – over a thousand species.

Florida never had any dinosaurs. It is believed Salem, Alabama is as far south as they every came.

PART 11

FLORIDA'S FOSSIL VERTEBRATES

Now let's look at Florida's fossil vertebrates. More than 1,100 different species have been recorded in our Florida, which is more than in any other place in the world, from middle Eocene or earlier. (The dates of the Periods are covered later).

The first appearance of some of today's major mammalian groups – like bats, artiodactyls, whales, elephants, perissodactyls - occurred during the Eocene period (54 to 38 million years ago). Florida's Eocene fossil record is derived only from marine rocks. From here we find shark's teeth, ray mouth pieces and fish bones. These were the most common vertebrate fossils of this period. Less abundant are the sea turtles, marine crocodiles and large sea snakes that were related to the pythons.

A finding in a small sinkhole in north central Florida demonstrates that terrestrial life flourished in Florida at a time when Florida was supposed to be under the sea. Discoveries here include a diverse array of amphibians, reptiles and small mammals. With the coming of the Miocene period (24 to 5 million years ago), the Florida peninsula was no longer covered with water. During the Miocene period it was covered with tropical and subtropical forests with frost-free winters. The herbivores (leaf eating animals) were mostly browsers. They were short legged and lacked mobility. They were located mostly in the northern half of the state in areas that were higher in elevation than south and central Florida. The amphibians and alligators were present along with many mammals, birds, snakes and turtles. These mammals were decidedly different. The common snakes were boas and pythons. Song-birds were very rare. There were also some small rodents that are now found in southwestern deserts. There were also members of the ungulates (hoofed animals) such as the small camels, oreodonts,

rhinos and three-toed horses, and the largest carnivores were the bears, dogs, foxes, coyote-sized dogs and saber-toothed tigers.

There was a type of manatee related to the Pacific dugong, not our modern manatee. About 12 million years ago (middle Miocene) localities in northern Florida supported a mixture of grasslands and woodlands. Temperatures remained warm year round, and there were annual wet and dry seasons. This Period attracted the large herbivores (grass feeders) especially the proboscideans. Herds of horses, camels and antilocaprids also came. There were large rhinoceros and a very large long-necked camel. The dominant carnivores were the hyena dogs. Florida had numerous species in common with Texas. There were also some notably different animals such as the very large land tortoises, long snouted crocodiles and birds such as lily trotters and crowned cranes.

In the ocean realm were the long-snouted dolphins, small baleen and sperm whales, and from the mega sharks there was a great white shark that grew up to be fifty-two feet long. On land were peccaries, and camels and the proboscideans, the mammoths and mastodons along with the shovel tuskers. From Asia came giant dogs, giant cats and saber tooth tigers and giant bears like the cave bear. Two kinds of sloths arrived from South America. The giant sloths stood twelve feet high, and were leaf eaters. By the late Pliocene period, about 7 to 2 million years ago, the weather changed again and was similar to that of Nebraska, Texas and Arizona.

The Isthmus of Panama rose above the sea somewhere between 2 ½ to 3 million years ago directly connecting (for the first time) South America and North America. We believe the first large migration of men and animals came across about 30,000 years ago, but may have been much later. The Isthmus of Panama gave sanctuary to many South American animals moving northward and

eastward. For the first time animals were coming into Florida from both the north and the south.

At the advent of the Pleistocene period (2 million to 10,000 years ago), some small animals appeared such as the ground squirrel, hog-nosed skunks, scrub jays and prairie chickens.

The last Great Ice Age beginning 1.8 million years ago lowered sea levels during the Glacier Period by as much as four hundred feet in some places. Drier conditions now drove animals to sink-holes to find water. (For additional reading on this, review The Aucilla River Project). The common herbivores during this period are the sloths, tapirs, one-toed horses, llamas, peccaries, deer, bison, woolly mammoths and mastodons. These animals had to contend with the major carnivores (meat eaters) such as the jaguar, the wolf and the saber toothed tiger. In addition came the American lion and cougar in the Pliocene era, about 2 million years ago. Other birds and animals joined the parade – storks, condors, giant tortoises, capybaras, large aquatic animals, porcupines, cheetah-like cats, huge wingless birds bigger than ostriches, and vampire bats. The porcupine, cheetah-like cats, armadillos, wolves, bison, deer, the condor and the vampire bats and a few others somehow survived to the present time.

Evidence from Greenland's ice core demonstrates that over a very short time span of maybe only forty years, there was a great change in climate 11,650 years ago. This temperature change may have been the reason, otherwise unexplainable, for the disappearance of the prehistoric animals as previously mentioned.

Florida's current checklist of our animals and birds shows that Florida contains 1,159 total species; 42 species of sharks and rays, 113 ray-finned bony fish, 49 amphibians, 486 reptiles (149 traditional reptiles), 337 birds and 469 mammals.

Next let's look at Florida's reptilia. This order includes turtles, alligators, crocodiles, gavials, birds, lizards and snakes. The oldest fossils of the Amniotes which include the reptiles, birds and mammals date back to about 300 million years ago. Florida's oldest vertebrate fossil is a small marine turtle dating to the Cretaceous period (146 to 65 million years ago). It was collected 9,210 feet below the surface of Okeechobee County by a petroleum drilling company. Four major groups of turtles are known from Florida. First the alligator snapping turtles, next the sea turtles, then the soft-shelled turtles and finally the pond turtles along with the land turtles, the box turtle and the land tortoises. The sea turtles have a very long fossil history extending to the Jurassic period (208 to 146 million years ago). Early arrivals into Florida found and hunted the now extinct giant tortoises.

The crocodilian branch includes the crocodile and alligator. Both are found in Florida. The crocodiles in Florida are near extinction living only in the southeast Everglades area while the alligators are at a large population to be dangerous in parts of Florida. Some ancient crocodiles once lived entirely on land and others specialized in living entirely in the ocean. An ancient crocodile grew to fifty feet long and preyed upon dinosaurs. Some aquatic crocodiles similar to our present species have existed since the late Jurassic period. They somehow escaped the mass extinction even about 65 million years ago that devastated their dinosaur contemporaries. All crocodiles and alligators are carnivores, but they will eat both living and dead flesh. Their skulls have remained about the same structure for about 20 million years. The skulls of alligators and crocodiles differ in shape because the alligator skull snouts are always broad, while the crocodile has an elongated snout. There is no difference in the operation of their jaws.

Florida's now extinct lizards came from North America, the Caribbean and perhaps Asia. Only two species of our native

lizards still exist: our beautiful green anole and the scincidae (skinks). Skinks are a large cosmopolitan group of short legged and long tailed lizards. Others we have here are imports.

Fossils of snakes in Florida show there are several types of prehistoric snakes that are now extinct in our state. One was the family of blind snakes although some still live in Texas and the West Indies. The palaeophidae is the extinct group of large marine snakes that were related to the boas and pythons. The colubridae is the largest group of living snakes, and it contains about 75% of the described species of the world, and most of these snakes are harmless, non-poisonous snakes. The elapidae include the poisonous snakes with erect, fixed fangs such as the cobras and the coral snakes. The coral snake is the only elapidae to have inhabited Florida. The viperidae is a group of highly specialized poisonous snake with large folding fangs. This group includes the cottonmouth moccasin, the pigmy rattlesnake, the diamondback rattlesnake, and in the far north of the state the copperhead and the timber rattler. They are found in all continental areas except Australia.

The late Miocene period (24 million to 5 million years ago) saw the arrival of our nonpoisonous snakes (see above - the colubridae). Many of these non-poisonous snakes live in Florida today. They are the garter snake, the black racer, the king snake, the ringneck snake, the short-tailed snake, the indigo snake, the coachwhip, the mud snake, the rat snake, the crayfish snake, the hognosed snake, and there are four modern water snakes, the green water snake, the brown water snake, the red bellied snake and the banded water snake.

Let's look at sharks. Because sharks have no bones other than their jaws, the cartilage is soon gone after their death, so it is the teeth of the shark that show us what kind of shark that had them and what period of time the shark lived in and where. During the

period about 5 million years ago to the Pliocene Period (7 million to 2 million years ago) lived the carcharodon megalodon, a giant shark with front teeth that measured eleven inches long. They were the youngest and largest of a whole series of mega (giant) sharks. They grew to be more than fifty feet long and weighed in excess of sixty tons. They preyed mostly on whales and other large marine mammals. The great white shark is a distant and modern relative. (Please review the picture of sharks' jaws and teeth in Part III). The picture is from our outstanding Florida Museum of Natural History at the University of Florida in Gainesville.

There were many other varieties of sharks present in the Miocene period also (24 to 5 million years ago). The period of the mega tooth sharks for the shark enthusiasts are well worth studying. These teeth today can be worth \$500 to a collector. It is the teeth of our prehistoric sharks that our modern day scientists study to help identify and understand about the massive sharks' world.

Let's look at our present day sharks, of which we have about 200 species. Most inhabit our coastal areas around Florida. Sharks are found frequently in tropical or warm waters. We will begin with the shark that is the easiest to identify, the modern hammerhead shark. It grows to be a large formidable shark often prized by fishermen. Its "hammer head" is unlike any other shark extending out both sides of its head with its eyes embedded in the extension of its head. Next is the well-known tiger shark. These large sharks grow up to 20 feet long. They are known to be a wide rangers in warm waters. Their diet is extensive. They have been known to eat garbage and human junk. Our present day tiger sharks can be about 10 feet long. They are heavily bodied but not aggressive, shallow water sharks, and are found in tropical waters. They mainly are fish eaters. The gray sharks comprise a group of about 30 living species and are for the most part primarily coastal

inhabitants. They are found mostly in tropical and warm temperatures. Of these 30 species, 11 or 12 live in Florida's waters and several of these are among the state's most abundant medium to large size sharks. These include the bull shark, sandbar shark, blacktip, dusky shark and the silky shark. These sharks are commonly found in shallow waters such as bays, estuaries and rivers. The diet of these sharks is mostly fish. The sharpnose sharks, small in body, are locally abundant in the Gulf of Mexico and the Caribbean. They frequent very shallow water usually close to land also.

Now it's time to take a look at Florida fossil Sawfish, guitarfishes, skates and rays: This is a group of animals that are characterized by flattened bodies, expanded pectoral fins, vertically located gill slits and dorsally located eyes. These animals go way back, originating in the Jurassic period (208 to 146 million years ago). The animals were and some still are found in shallow coastal water such as bays and estuaries. The sawfish family (pristidae) contains two types of living genera, and are now rare. They are spectacular to look at with their flat heads and saw-like extension. The saw extension is lined with saw-like teeth which are really not teeth but specialized dermal spines. Sawfish use their long spine bearing rostrum to stun or kill fish by thrashing it back and forth quickly in dense schools of fish. The saw fish body is shark-like in structure.

The aforementioned guitarfish are no longer found around Florida, but still exist in the Indian Ocean and parts of the Pacific Ocean. There are two families of the guitarfish known to exist.

Florida is still home to some living skates. They are placed in the genus *raja*. They are bottom dwellers that move by undulating their enlarged pectoral fins (wing-like). They lack the large tail spines found in the ray, but do have variously arranged rows of small spines or thorns on the dorsal surface of the body and on the tail.

Florida's stingrays are very well known and greatly feared and respected. They have a narrow whip-like tail that usually contains one or more very poisonous barbed tail spines. These spines are the stingrays' protection, as many swimmers and fishermen have learned after stepping on them. When these spines enter a human body they can cause horrible wounds which are painful and long lasting.

Sturgeon and paddlefishes are the only living North American representatives of an ancient group of bony fish of the class chondrichthyes. Of special note are the two living genera of gar fish. Both fish appeared in the Cretaceous period which was 64.3 million years ago to 146 million years ago. As expected the modern day mudfish or bowfin are the only living genus and species of the order Amiiformes. These fish were common in the Pleistocene period. There are just too many species of fish to list them all, but each family is strangely unique and very interesting. Just think how wonderful nature is to have created these fish that have survived through millions and millions of years.

You have to go back over 200 million years ago to find the beginnings of some of our first crustaceans, mollusks and worms. Beginning in the Paleozoic period the invertebrates appeared - the fish and scorpions were followed by myriapods and later the reptiles and amphibians including turtles and dinosaurs. (No dinosaurs in Florida).

After the reptiles came our birds and frogs. Moving forward to the Cretaceous period, we find a wide assortment of mammals and different species of reptiles, marsupials and salamanders. The Eocene period which was 54 million to 38 million years ago gave us new species of mammals, birds, snakes, lemurs, bats, hogs, horses, sea cows and 145 foot whales. Forward to the Oligocene period 36 million to 26 million years ago the ungulates (hoofed

animals) emerged – three-toed horses, rhinoceros and sloths. Forward to the Miocene period 24 to 5 million years ago, and here we find the elephants, cats, tigers, monkey, larger horses, the saber toothed tigers, bears, cows and deer. By the Pliocene period 7 to 2 million years ago we find the giant animals like the mammoth, larger deer, apes, dogs, camels, and early man. Next the Pleistocene period from 2 million years to 10,000 years ago we see large populations of modern size horses, camels, deer, mammoths, glyptodonts (giant armadillos) and advanced man. Next comes the Holocene period 11,000 years ago to now and this is us. Let's see how long we last.

If the reader of our early animals and fossils is really interested, go to the information gathered in the dives made in the sink holes and deep water holes of North Florida. The University of Florida and Dr. S. David Webb, Department of Vertebrate Paleontology, published the Aucilla River Times about the skeletons found in the bottom of these deep water holes in 1996-1998. The findings are unequaled and astounding. Complete skeletons of a mastodon and a mammoth are standing side by side in the lobby in the Florida Museum of Natural History at the University of Florida in Gainesville.

PART III

Pictures in Part III give the reader a much better understanding about how our prehistoric animals looked and specific information about each animal shown.

The next 11 pages will show pictures of a few of our outstanding prehistoric animals. Shown first is the glyptodont, second is the saber toothed tiger, third is the mammoth, fourth the Eocene whale, fifth the mastodon, sixth the tertiary shark, seventh is a mammoth being attacked by Paleo-Indians, eighth is a cave bear being attacked by the Paleo-Indians, ninth is the evolutionary changes of our modern horses, tenth is a Florida cormorant, a still living water bird, eleventh is a picture of the jaws and teeth of six sharks compliments of the Florida Museum of Natural History at Gainesville. The twelfth page is a simplified chart that briefly shows time periods when some prehistoric life emerged.

The most famous prehistoric animal found in Florida was the elephant-like animal called a mastodon. It was of mammoth size – some standing over twelve feet high and weighing up to 20,000 pounds. Its tusks jutted out in front of its head for some distance often more than ten feet. When angered it swung its head from side to side. Its range was enormous. Its bones have been found in Africa, Asia, Europe and a good part of North America. Our first people, the Paleo-Indians, were mammoth hunters and may have followed them across the natural bridge from Asia to Alaska. Many of those hunters must have died trying to kill this swift and huge animal that was well-equipped with very large tusks to protect itself.

These last few pages let us glimpse several charts that may be of interest.

Well, we have now come to the end of a brief overview of Florida's prehistoric animals. What Florida did have of the prehistoric animals was breathtaking. We had hundreds of varieties of animals, some very small, others weighing 20,000 pounds. We had animals from Africa, China, Asia, Russia, various parts of Europe all coming into North America followed closely behind by the human hunters. From Central and South America there was an array of animals that came through the Isthmus of Panama into North America and eastward into Florida.

It is my hope that this brief glimpse into our past will cause the reader to seek more information about our prehistoric beginnings.

Be sure to visit our Florida Museum of Natural History on the University of Florida campus in Gainesville where you will see the awesome skeletons of a mammoth and a mastodon as you enter.

Again I strongly suggest that any reader of this brief story read "The Fossil Vertebrates of Florida" edited by Richard C. Hulbert, Jr. for a more scientific study of our fossil vertebrates and prehistoric animals. For the casual reader, please review the small book "A Guide to Florida's Prehistoric Animals" by Robert Anderson from Winner Enterprises.

Before you view the charts of geological history, please note the time tables of our planet's early life as given below.

Explanations of the time tables for prehistoric life

(There are differences of opinions as to the exact beginnings and ends of each of the periods).

The Holocene period is our present period. In Florida, it's a period of man beginning with the Paleo Indians 12,000 years ago followed by other people to present.

The Pleistocene period started 2 million years ago and lasted to 10,000 years ago, and there was the presence of man, horses, camels, deer, mastodons, mammoths, dogs and cats.

The Pliocene period extends from 7 million to 2 million years ago. Here we find apes, giant deer, sloths and camels. It is questionable if man lived in this period.

The Miocene period extends from 24 to 5 million years ago where we find elephants, saber toothed tigers, cats, bears, cows and giant deer.

The Oligocene period extends from 34 to 24 million years ago. There were the hoofed mammals such as the 3 toed horse, rhinoceros and the pike.

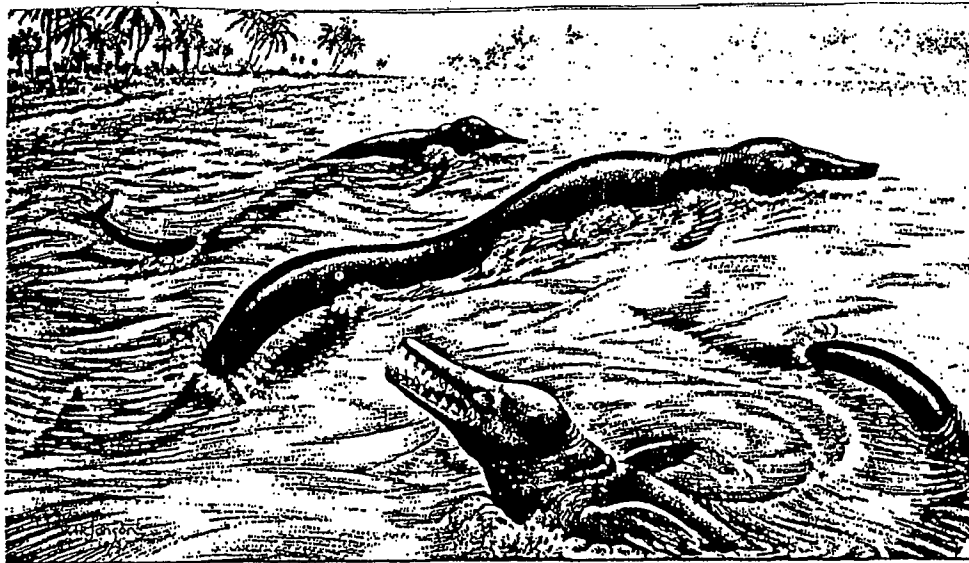
The Eocene period is from 54 to 38 million years ago. Appearing in this period are the snakes, lemurs, bats, hogs and horses.

The Cretaceous period extends from 146 to 64.3 million years ago. Here we find the first appearance of mammals - birds, reptiles, marsupials and salamanders.

The Jurassic started 200 million years ago with reptiles, dinosaurs, some birds, crocodiles. Earlier periods before the Jurassic are not shown.

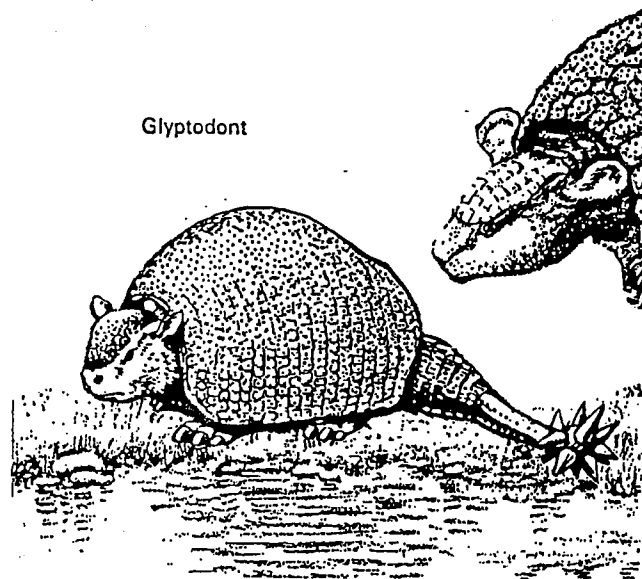


EOCENE WHALE
(*Basilosaurus* or *Zeuglodon*)



EOCENE WHALE *Basilosaurus* or "*Zeuglodon*"

The Eocene whale which swam over submerged Florida lived about 42 million years ago. The whale-like mammals are collectively called Yoke Toothed Whales due to their yoke shaped cheek teeth that had double roots. It was a fierce whale, eating pretty much what it wanted of the surrounding fish and other marine animals.



GLYPTODONT
(Armadillo-like mammal)

It's hard to believe that our tiny armadillos are the last of the lineage of the huge Glyptodont. The large armadillo-like animal grew to be a total of nine feet. The Glyptodont unlike our modern day armadillo was without body armor. Instead nature protected the animal with a heavy skinned shell. Its protective dome was often five feet or more in length. It ate insects and some plants. The Glyptodont was a left-over from the Cenozoic period, a much earlier time. Nature gave the animal "Rights of Passage"



MEGATHERIUM
(Giant ground sloth)

Fossil remains of the large terrestrial mammal were found in the Bone Valley beds of Polk County — in Pliocene and early Pleistocene layers. Today's sloths are all tree dwellers that reside in Central and South America. *Megatherium* was a huge harmless vegetarian with a thick tail and extremely large hind legs. When sitting on its back legs and tail it could dig roots out of the ground or break branches of trees with its forelimbs. Its arms are believed to have been so strong that it could break down whole trees to get at the leaves that could not be reached from a sitting position. *Megatherium's* height was about 12 to 14 feet. Overall length was about 20 feet. Its tongue was long and flexible and was used by this beast to strip leaves from the trees. Claws were curved and very sharp and used to dig up roots and as weapons against predators. The nails on the toes were very long and had to be doubled under which made walking very awkward. In spite of its long nails, the giant ground sloth was easy prey for Florida's saber-toothed tigers.

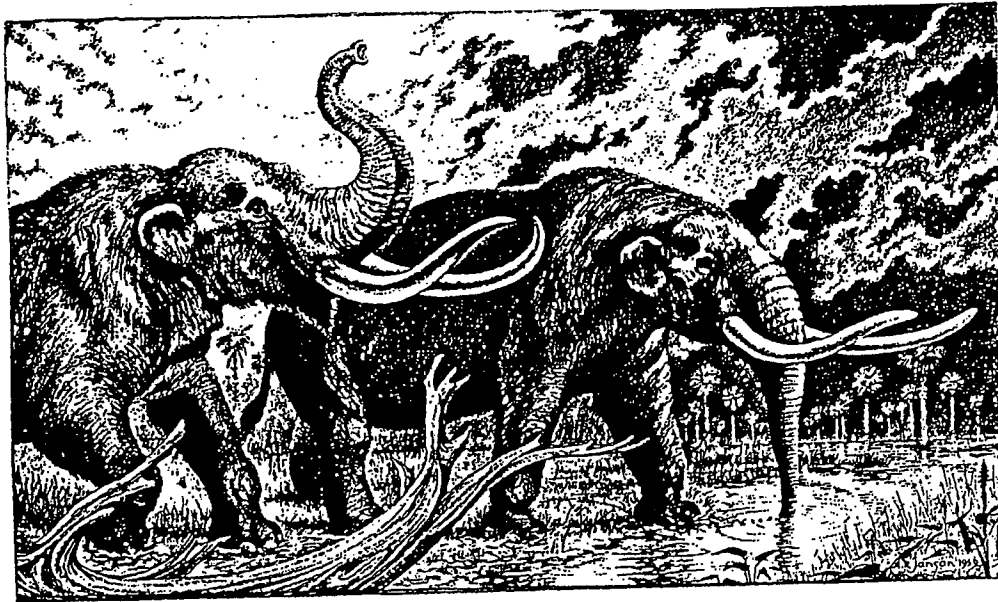
Our archaeologists and paleontologists through years of study offer our first glimpse at the river's first animals. It's hard to know where to begin, but the great sloth would make a wonderful start. This magnificent animal stood up 16 feet high. It had claws half as long as a man's arm. Its underside was covered with a thick hide with bits of bone embedded for protection — a kind of armor — which was badly needed, because of the giant Saber-toothed Tigers which prowled the river's length. These great fierce cats feasted on other large animals too, and they stood 4 feet high at the shoulders and were 9 feet long. They had 6 inch fangs that protruded from the front of their jaws. Along the riverbank ran large armadillos — called Glyptodonts. These animals stood 5 feet high and reached a length of 9 feet. Prehistoric alligators grew to be 20 feet in length. There was a variety of small Asian horses, giant anteaters, giant beavers, flat tailed muskrats, large spectacled bears, great raccoons, wolves, jaguarundi (cat). Along the drier parts of the river, the giant tortoises slowly lumbered about. These giant tortoises were equal in size to those of the present-day Tortoises found in the Galapagos Islands. There were pumas, peccaries, camels, huge bison and many more strange animals, not the least of which were the elephant-like mastodons and mammoths.



PLEISTOCENE FLORIDA'S SABER-TOOTH TIGER *Smilodon floridae*.

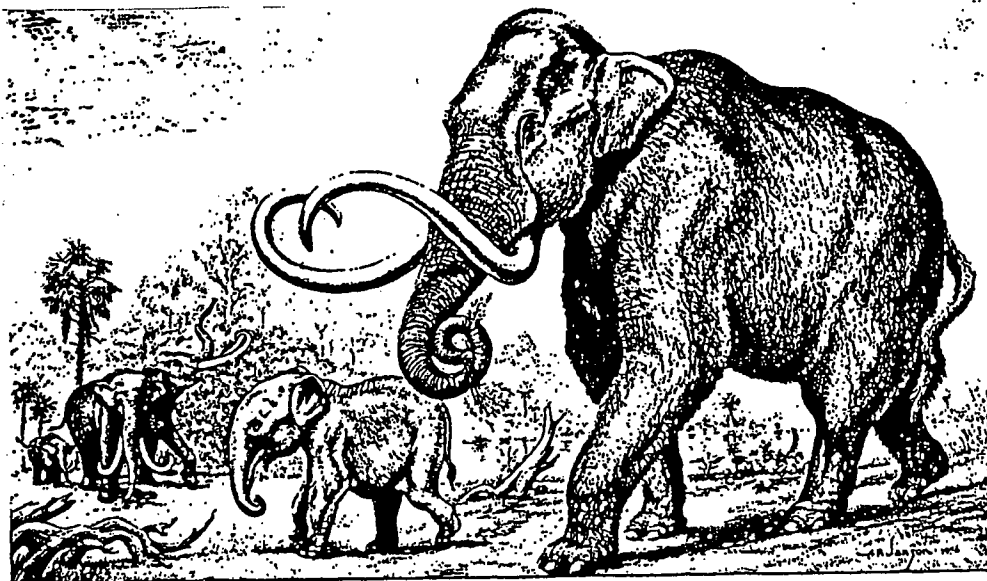
Florida saber-tooth tiger and Pleistocene horses

The remains of the saber-tooth tiger (*Smilodon floridae*), have turned up in several localities on both coasts of central Florida and the best known remains are from a sinkhole cave in Citrus County, known and recorded as Saber-Tooth Cave.

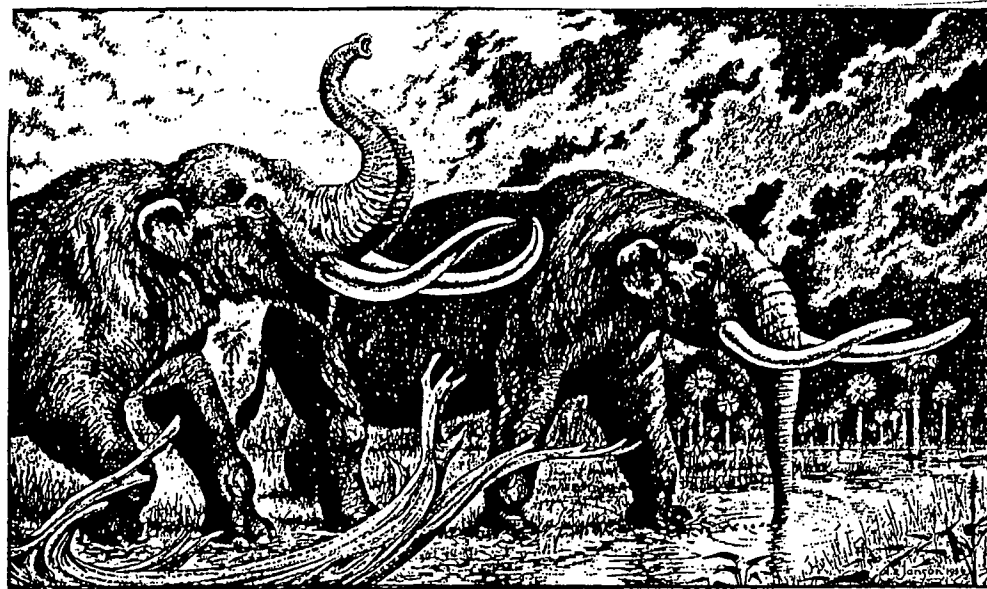


PLEISTOCENE MASTODON

The most famous prehistoric animal found in Florida was the elephant-like animal called a Mastodon. Its Latin name is *Serridentinus*. It was of mammoth size – some standing over twelve feet high and weighing up to 20,000 pounds. Its tusks stuck out in front of its head for some distance often more than ten feet. When angered it swung its head from side to side. Its range was enormous. Its bones have been found in Africa, Asia, Europe and a good part of North America. Our first people, the Paleo Indians were Mammoth hunters and may have followed them across the Natural Bridge from Asia to Alaska. Many of its hunters must have died trying to kill this swift and huge animal that was well-equipped with very large tusks to protect itself. Ten thousand years ago, they disappeared from Florida. No one knows why.



PLEISTOCENE MAMMOTH

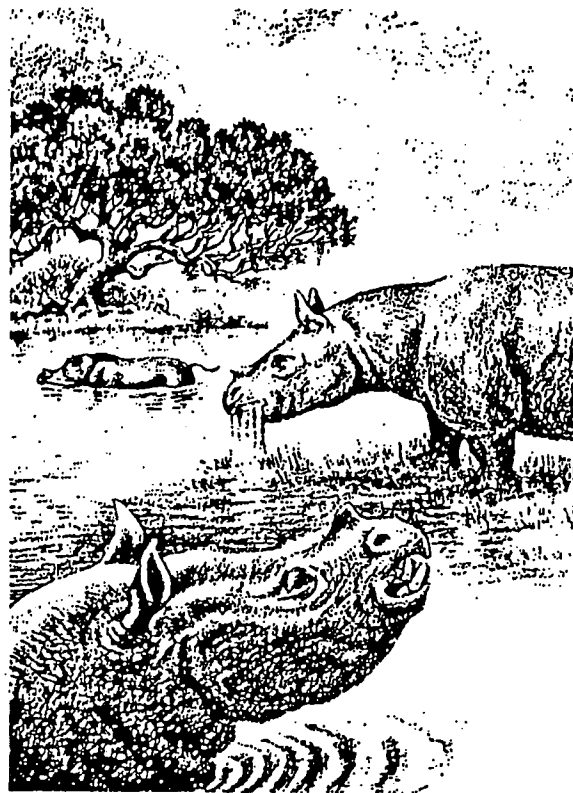


PLEISTOCENE MASTODON

The two pictures above, one of a mammoth and the other of a mastodon, show the similarities of these two animals – both elephant size.

There are a few differences in the animals particularly the tusks. Note the mammoth tusks are curled inward and the mastodon's tend to go straight out from its head.

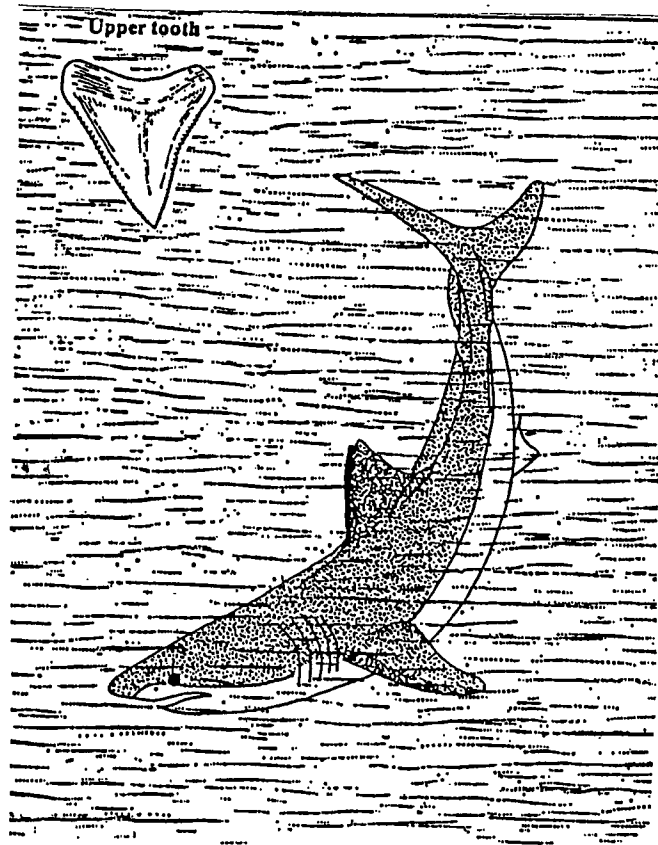
The skeletons of both of these huge animals stand in plain view when you enter the Florida Museum of Natural History in Gainesville.



AQUATIC RHINOCEROS *Teleoceras*.

PLIOCENE *TELEOCERAS*
(*Rhinoceros*)

A heavy rhinoceros with very short limbs and feet. It carried a single horn on the nose and was considered to be semi-aquatic in habit. Aquatic vegetation made up most of this mammal's diet. *Teleoceras* was a heavy bodied mammal that probably spent most of its time in swampy areas and rivers where its large size protected it from the large alligators of its time.



The giant and fierce Tertiary Shark was the beginning of the "Mega" shark with many more different Mega sharks. They shrank in size through thousands of years. The Great White Shark is the last of our Mega sharks.

The Tertiary period from 65 million to 1.8 millions years ago gave its name to this great shark which lived in that period. The Tertiary shark or Carcharodon grew to 45 to 50 feet long. His jaws were six feet or more in width and its huge teeth measured six to eight inches in length.

TERTIARY

The Tertiary period is one of the major divisions of the geologic timescale, from the end of the Cretaceous period about 64 million years ago to the start of the Quaternary period about 1.6 million years ago. The Tertiary includes five geologic epochs – the Paleocene, Eocene, Oligocene, Miocene and Pliocene. The Tertiary is sometimes divided into two sub-periods called the Paleogene and Neogene.

It covers roughly the time span between the demise of the dinosaurs and beginning of the most recent Ice Age. During the Tertiary the modern families of birds, mammals and flowering plants evolved. Marine invertebrates and marine vertebrates other than the marine mammals experienced only modest evolution.

Continental drift was modest. India broke loose from Africa and attached itself to Asia. South America attached itself to North America toward the end of the Tertiary. Antarctica, which was already separate, drifted to its current position over the South Pole. Climates during the Tertiary slowly cooled starting off tropical to moderate worldwide in the Paleocene and ending up with extensive glaciations at the end of the period.

The term Tertiary was first used by Giovanni Arduino, possibly in a letter dated 1759 (dates on the web vary). He classified geologic time into primitive (or primary), secondary and tertiary periods based on observations of northern Italy (some pages on the web add a fourth type, variously quaternary, volcanic or alluvial.). In 1828 Charles Lyell incorporated a Tertiary period into his own far more detailed system of classification. He subdivided the Tertiary period into four epochs according to the percentage of fossil mollusks that resembled modern species, using Greek names: Eocene, Miocene, Older Pliocene and Newer Pliocene. Later the use of mollusks was abandoned from the definition and the epochs were renamed and redefined.



Our first people, the Paleo Indians came to Florida between 12,000 and 13,000 years ago. They were Mammoth hunters. They used hand held spears and full length spear. The picture shows the brave hunters attacking a 20,000 pound animal with immense tusks. They killed the animals also by driving them over cliff, as the picture shows. The Mammoth, along with many other prehistoric animals, exited Florida 10,000 years ago.



A picture is worth a thousand words. Here is a sketch of one of Florida's Giant Cave Bears much larger than the Grizzly.

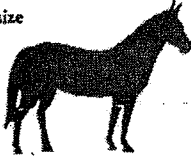






The Paleo-Indians would actually go into the caves to kill these very large brutes. Notice in the sketch a Paleo-Indian is being killed by a Cave Bear.

THE PROBABLE ORIGIN OF THE MODERN HORSE

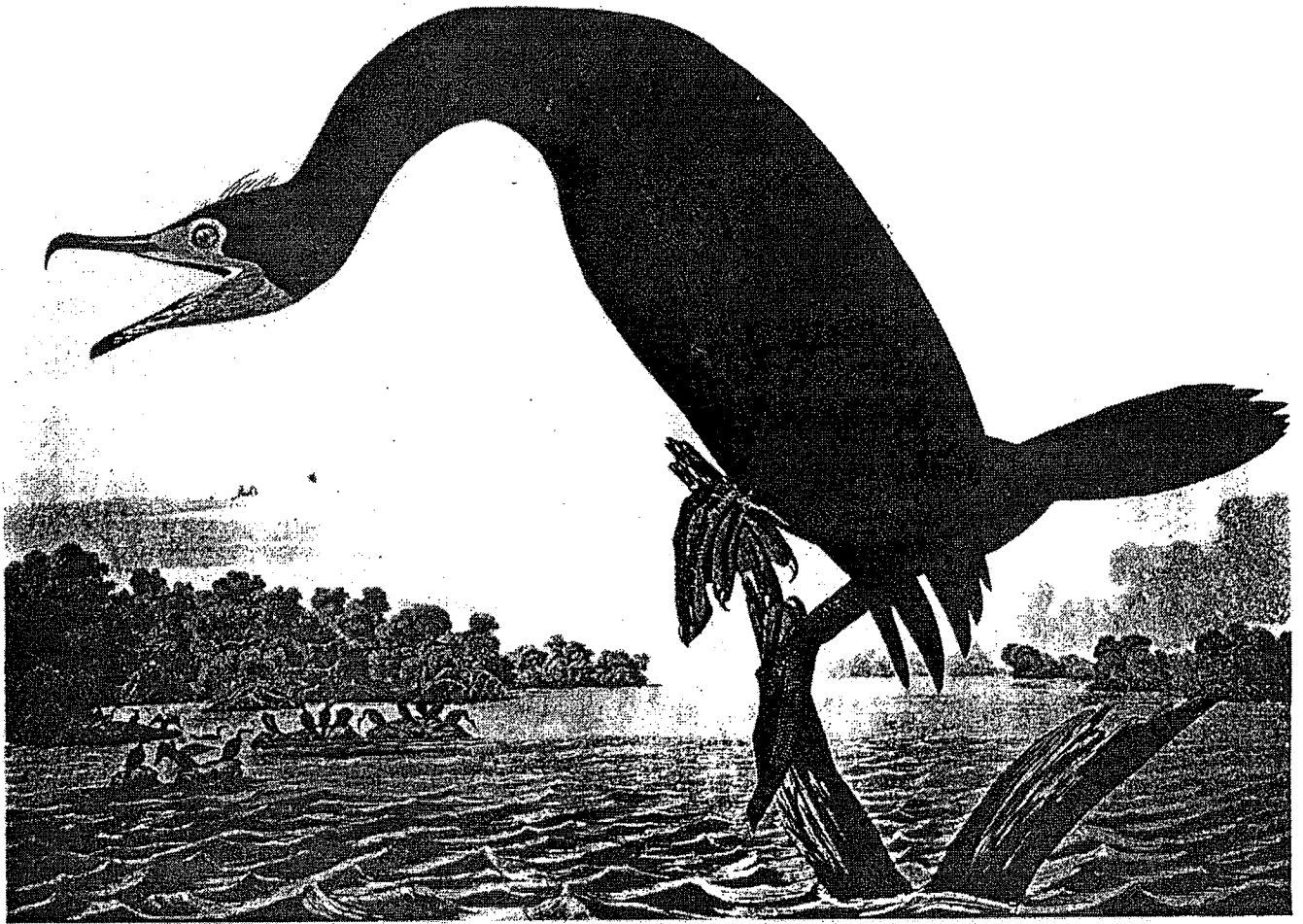
The fossil pedigree of the horse provides an excellent illustration of the process by which a species of animal undergoes changes over a period of time. The modern horse, we find, is vastly different from its early ancestors. The story of its development, which has been determined within recent years through the discovery of fossil remains in the United States, is one of the most interesting ever devised.

The story of the horse covers millions of years, beginning with the Eocene period, when most mammals were small. One of these mammals has been identified as the ancestor of the modern horse. For scientific purposes, it has been called Eohippus, which means "dawn horse". According to fossils, it was only about the size of a small terrier type dog. On each front foot it had four toes and a splint of a fifth, and on each hind foot, three toes. It had small, short-crowned teeth, adapted for chewing many kinds of food.

Eohippus was so different from the modern horse that we might be tempted to doubt its ancestral connection. However, the accumulated evidence shows an unbroken line of descent from Eohippus to the modern animal. The fossils in successive layers of rocks show how the ancestors increased in size, developed a larger middle toe as the other toes dwindled in size, and acquired longer and more complex teeth. The table that follows presents a detailed picture of the transformation that had taken place.




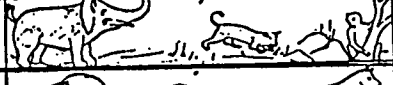



NAME OF HORSE	PERIOD OR EPOCH	SIZE
Equus	Pleistocene	Modern size 
Pliohippus	Pliocene	Almost modern size 
Protohippus	Lower Pliocene	Size of donkey 
Miohippus	Miocene	Larger than sheep 
Mesohippus	Oligocene	Size of sheep 
Orohippus	Middle Eocene	Size of large dog 
Eohippus	Lower Eocene	Size of fox terrier dog 



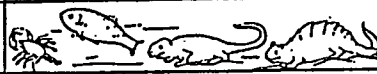

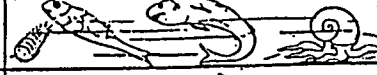


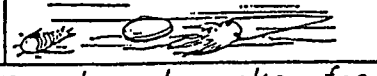
As incredible as it seems, our modern horses did not always look as they do now.. In the lower Eocene period which was 54 to 38 million years ago, the Eohippus was the size of a small dog.



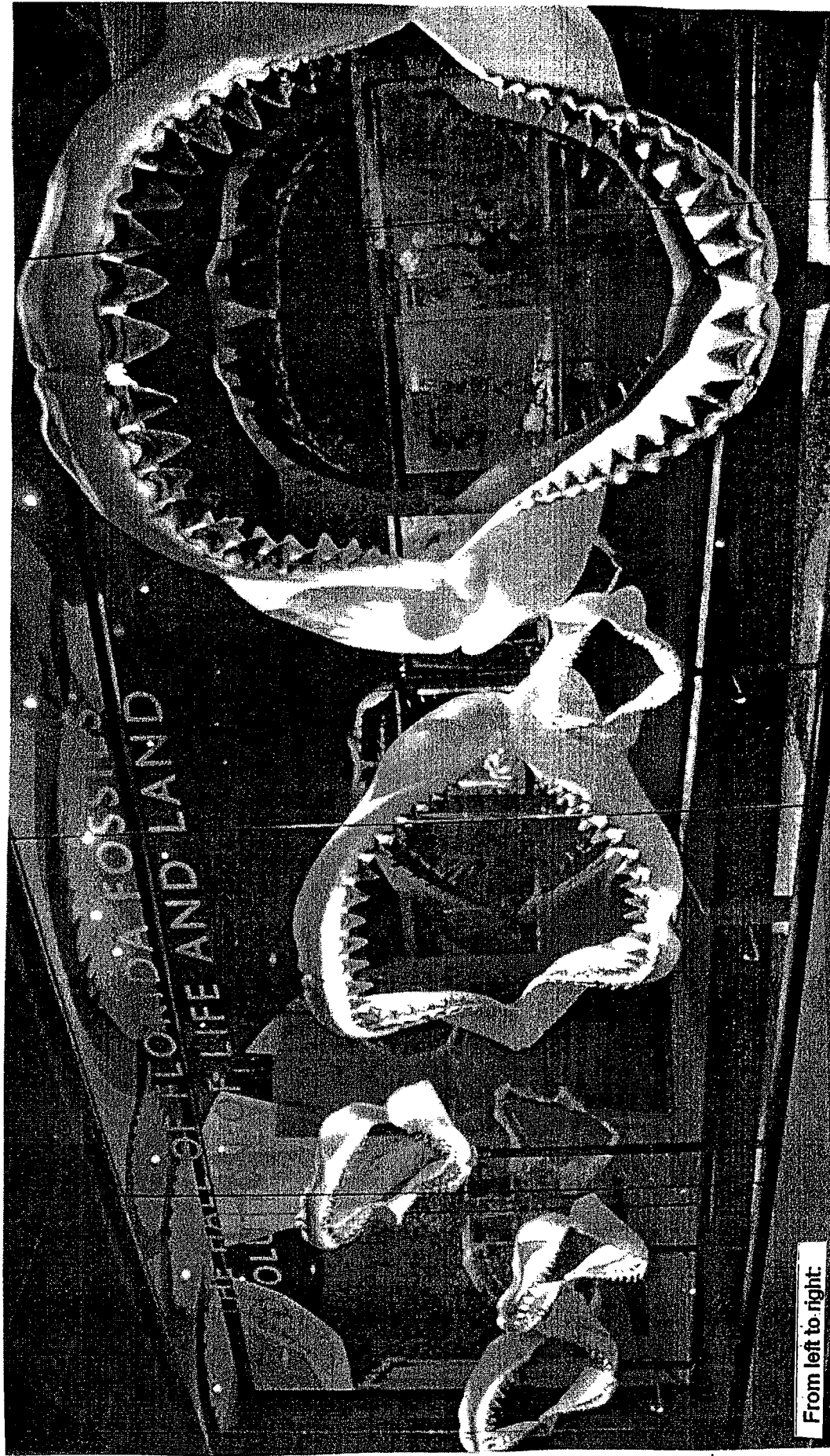
THE FLORIDA CORMORANT. From John James Audubon, *Birds of America*, London, 1837-1838. This plate was derived from a sketch made by the great ornithologist while traveling in the Florida Territory in 1831 and 1832. (See entry 169.)

Birds are Archosaur reptiles which developed the capability of powered flight in the Mesozoic era of geological history between 65 to 245 millions years ago. The birds' scientific name is Aves. Maybe they evolved from dinosaurs. In the Miocene period (7 to 26 million years ago) in the Richardson Road shell pit 1,600 specimens were found. Most belonged to a single species of Cormorants.

Geological History				
Age	Period	Characteristic Animals	First Occurrence of	
Quaternary	Recent		Man	
	Pleistocene		Mammoth, Horse, Glyptodonts.	Man
Tertiary	Pliocene		Deer, Sloth, Ape, Man.	Dog, Stag, Camel, Ape, Man?
	Miocene		Elephant, Sabre-tooth, Tiger, Monkey.	Cat, Bear, Monkey, Cow, Deer.
	Oligocene		Hoofed mammals.	Horse (lost), Rhinoceros, Pike
	Eocene		Mammals, Birds.	Snake, Lemur, Bat, Hog, Horse.
Quaternary	Cretaceous		Mammals, Birds, Reptiles.	Marsupials, Salamanders.

Mesozoic	Jurassic		Reptiles	Birds, Crocodiles, Frog.
	Triassic		Reptiles, Amphibians.	Mammals, Turtles, Dinosaurs.
Paleozoic	Permian		Reptiles, Amphibians, Fishes	Reptiles
	Carboniferous		Amphibians, Fishes.	Reptiles, Amphibians, Insects.
	Devonian		Fishes, Ostracoderms.	Myriapods
	Silurian		Invertebrates.	Fishes, Scorpions
	Ordovician		Invertebrates	Bryozoans, Echinoids, Ophiurids.
	Cambrian		Crustaceans, Molluscs, Worms, etc.	Brachiopods, Trilobites, Molluscs, etc.
Metamorphosed rocks—fossils rare.				

The two time tables shown above greatly simplify the time eras in which some of our prehistoric animals lived.



From left to right:

Carcharodon carcharias great white shark Pliocene St. Johns River, Florida	Isurus hastalis Miocene mako shark Late Miocene St. Johns River, Florida	Parotodus benedeni Miocene thresher shark Late Miocene St. Johns River, Florida	Carcharodon angustidens Oligocene megatoothed shark Oligocene Cooper River, South Carolina	Hemipristis serra Snaggletoothed shark Late Miocene St. Johns River, Florida	Carcharodon megalodon Miocene megatoothed shark Late Miocene St. Johns River, Florida
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These jawbones and teeth of sharks are displayed in the Museum of Natural History at the University of Florida in Gainesville. They are shown in the Florida Fossil Wing. This picture was provided by Dr. William Marquardt. The jaws have been reconstructed to fit the teeth found in the area of the St. Johns river and the Cooper River in a time period back to 34 million years ago (Oligocene Period) to the Pliocene Period which went back 7 million years ago.

Explanation:

The three pages following the picture of the sharks' jaws are three pages of the Randell Research Center brochure. The Center is owned by the University of Florida. The Randell Research Center is a 52 acre site at Pineland managed by Dr. William Marquardt who is also the head archeologist for the Florida Museum of Natural History at the University of Florida in Gainesville.

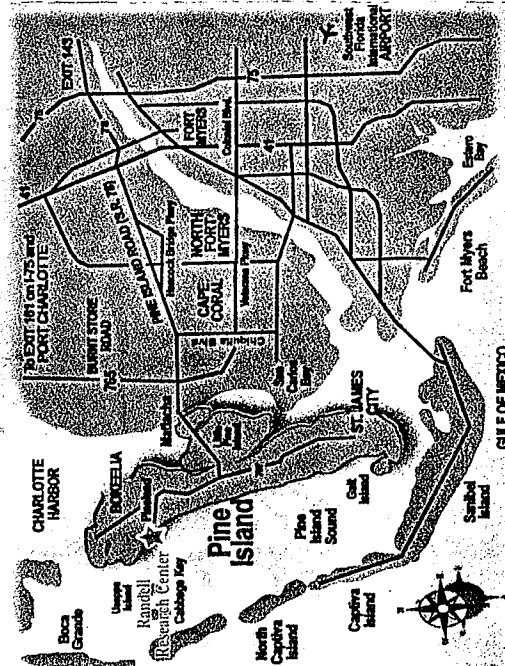
The next following two pages are taken from the Florida Museum of Natural History brochure. The shark jaws display is in the museum's fossil section. The Florida Museum of Natural History is a "must visit" place. It has become a world class museum. The Calusa Wing alone is enough to make your trip worthwhile. The museum received an \$8,000,000 gift to build a butterfly collection. It has now been built as a huge screened enclosure filled with live butterflies from all over the world and a very large collection of mounted butterflies and moths. Classrooms have been added for students to pursue their studies and education in the field of lepidoptera.



Guided tours of the Pineland archaeological site are offered on a regular basis by the RRC. Visitors have the opportunity to learn about both the Calusa Indians and their environment. Weekly tours are offered to the public on Saturdays at 10:00 a.m. during peak season (January - April). During off-season months (May - December), visitors must make reservations for this tour no later than 4:00 p.m. on the previous Friday afternoon. This same tour may also be scheduled at other times during the week for groups who make prior arrangements. Tours are also available through local tour companies such as Captiva Cruises. Please contact the RRC at 239-283-2062 to register or schedule a special group tour.

For those who cannot attend a guided tour, laminated trail guides may be borrowed from the Tarpon Lodge across the street from the main gate to the Pineland site, 13810 Waterfront Drive. Trail signs have been placed at important features of the site, and visitors can sign in and out to walk the trail during daylight hours.

Follow Pine Island Road (Hwy. 78) west through Matlacha to its end at Stringfellow Rd. Turn right and go 3.1 miles to intersection of Pineland Rd. on left and go 1.2 miles (go past the RRC headquarters next to Pineland Post Office) to end of Pineland Road at waterfront. Continue right along Waterfront Drive 0.2 miles, just past Tarpon Lodge to RRC sign and gate on right.



Mailing Address:

**Randell Research Center
P.O. Box 608
Pineland, Florida 33945**



Headquarters Physical Address:

**Randell Research Center
7450 Pineland Road
Pineland, Florida 33945**

Phone: 239 283-2062

Fax: 239 283-2080

WWW.calusa.us

Recommended donations for visitors to the Pineland site are \$5.00 for adults and \$3.00 for children. These donations help the RRC maintain this important archaeological site.

The Randell Research Center is a program of the Florida Museum of Natural History and the University of Florida.



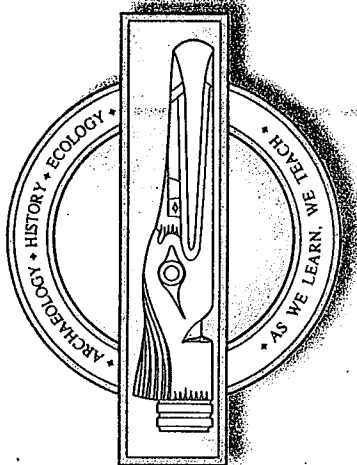
FLORIDA MUSEUM OF NATURAL HISTORY

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UNIVERSITY OF FLORIDA
www.fimnh.ufl.edu/rcc

Archaeology Tours



**RANDELL
RESEARCH
CENTER**



Site Physical Address:

**13810 Waterfront Drive
Pineland, Florida 33945**

Phone: 239-283-2062

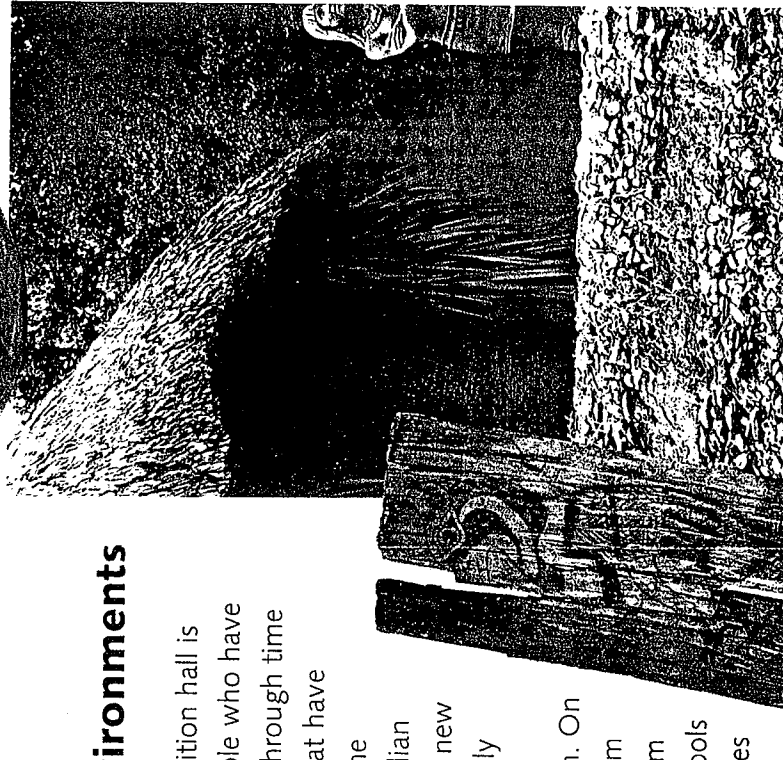
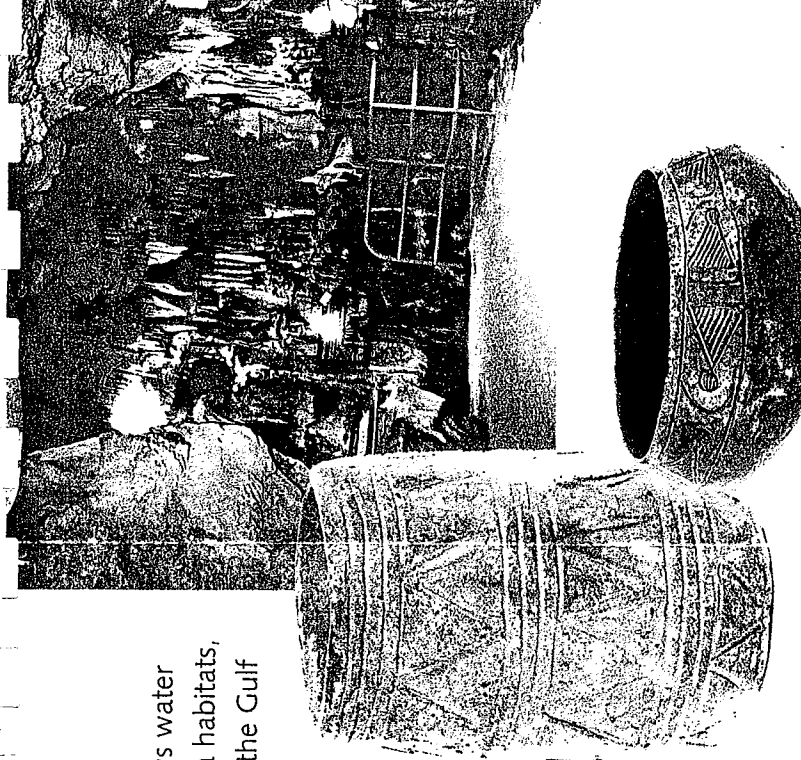
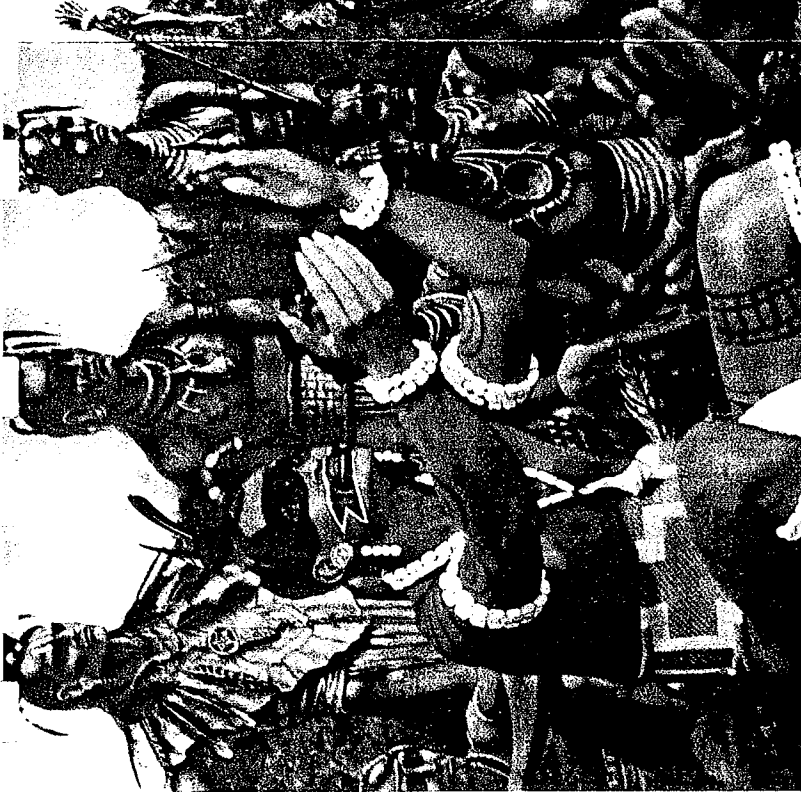
Northwest Florida Waterways & Wildlife

This permanent exhibition hall follows water as it flows through Northwest Florida habitats, from limestone caves and springs to the Gulf of Mexico. The hammock exhibit is patterned after the hardwood forest at Florida Caverns State Park during early spring and features a life-sized limestone cave. A trading scene between peoples of the Fort Walton culture and the Etowah is the highlight of the river habitat gallery. The last exhibit shows a Northwest Florida coastal environment, including a salt marsh and barrier beach.

South Florida People & Environments

This permanent exhibition hall is dedicated to the people who have lived in South Florida through time and the environments that have

supported them, including the Calusa, Miccosukee and Seminole Indian peoples. The exhibit features exciting new knowledge about South Florida, largely based on the museum's extensive archaeological and ecological research. On display are more than 700 objects from the museum's collections, ranging from everyday items such as Calusa shell tools and fishing gear to artistic masterpieces such as a thousand-year-old painting



Domain of the Calusa

The Calusa were once the most powerful people in all of South Florida. For many centuries these Native Americans built huge shell mounds, engineered canals, and sustained tens of thousands of people from the fish and shellfish found in the rich estuaries west and south of Fort Myers.

Lacking local stone, they developed tools and ornaments from shell. Their painted and sculpted wooden artwork is among the best in North America. The shell mound sites dotting the Southwest Florida Gulf Coast preserve a rich legacy of this remarkable culture.

The Pineland Archaeological Site

The Pineland site complex is located in coastal Lee County, northwest of Fort Myers. The site was a Calusa Indian village for over 1,500 years. Enormous shell mounds still overlook the waters of Pine Island Sound. The remains of fifteen centuries of Indian life are evident everywhere. Remnants of an ancient canal that reached across Pine Island

sweep through the complex. Sand burial mounds stand in the woods. Historic structures representing Florida's early pioneer history also still exist at Pineland.

Native plants and animals characteristic of coastal hammocks, pinelands, wetlands, and shell mounds are in abundance. The site is listed in the National Register of Historic Places, and archaeologists have conducted research here since 1988.

Randell Research Center

The Randell Research Center (RRC) is dedicated to learning and teaching the archaeology, history, and ecology of Southwest Florida. Situated in the scenic community of Pineland on the western shore of historic Pine Island, the RRC encompasses over 50 acres at the heart of the Pineland archaeological site, a massive shell mound complex extending across more than 200 acres from the mangrove coastline. Visitors to the RRC can tour this internationally significant site and learn about

the Calusa and their natural and cultural environment. Volunteers and students are welcome to participate in the ongoing research programs of the RRC.

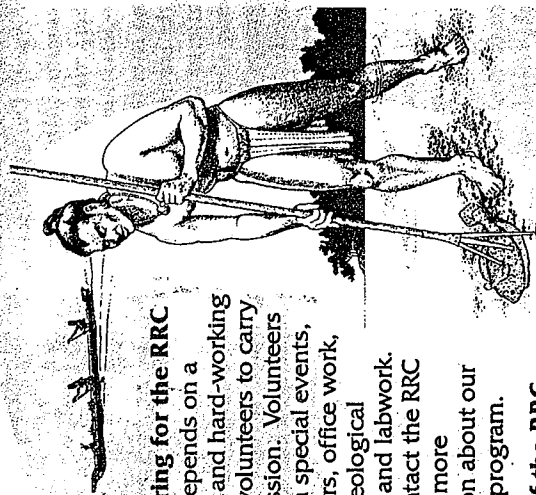
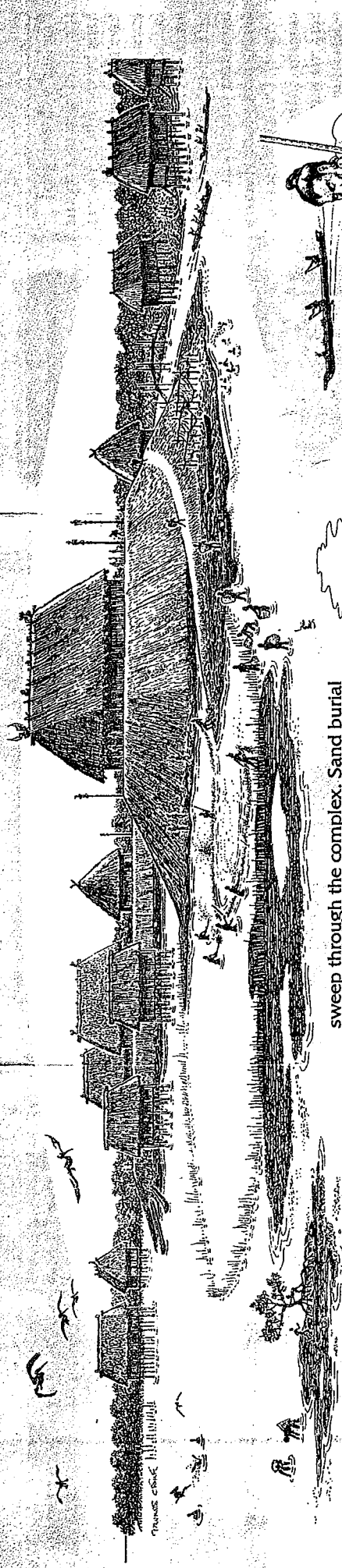
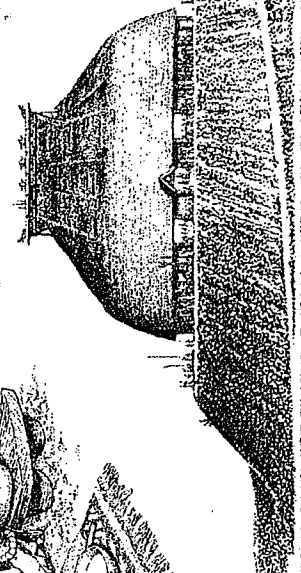
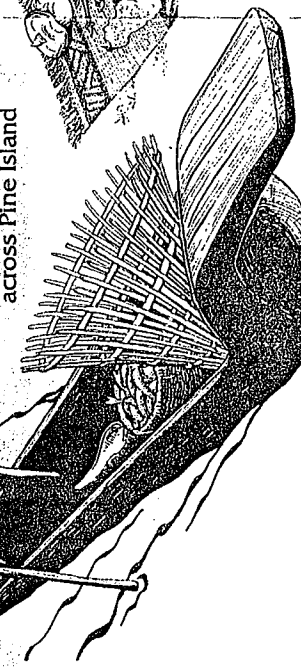
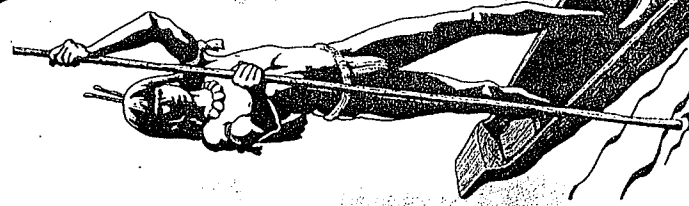
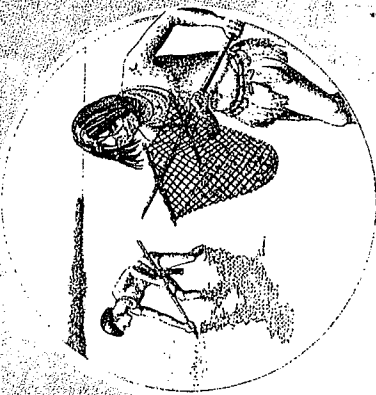
Volunteering for the RRC

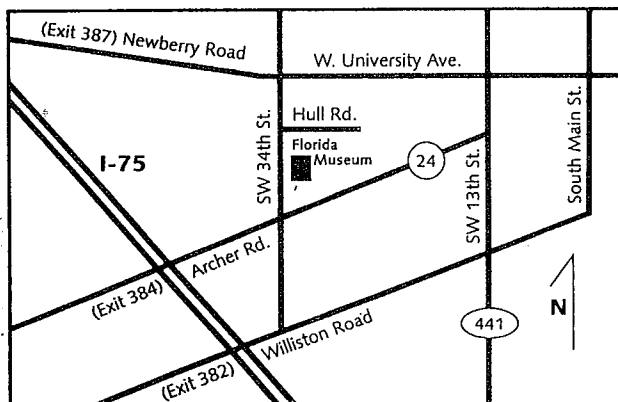
The RRC depends on a dedicated and hard-working group of volunteers to carry out its mission. Volunteers assist with special events, visitor tours, office work, and archaeological fieldwork and labwork. Please contact the RRC to receive more information about our volunteer program.

Friends of the RRC

This giving society supports the programs and activities of the RRC through its endowment and operating funds. Our Friends organization is vital to the financial stability of the RRC. All Friends of the RRC receive a quarterly newsletter. Supporters at higher levels are entitled to discounts on our books and merchandise, advance notice of programs, and special recognition.

Please join us. Contact the RRC to receive a membership application.





Florida Museum of Natural History

University of Florida Cultural Plaza
SW 34th Street and Hull Road
PO Box 112710
Gainesville, FL 32611-2710

Hours:

Monday - Saturday 10 a.m. - 5 p.m.
Sunday and holidays 1 - 5 p.m.
Closed Thanksgiving and Christmas

**Admission to the museum is free,
but donations are accepted.**

Fees may be charged for special events/exhibits.

(352) 846-2000 • www.flmnh.ufl.edu

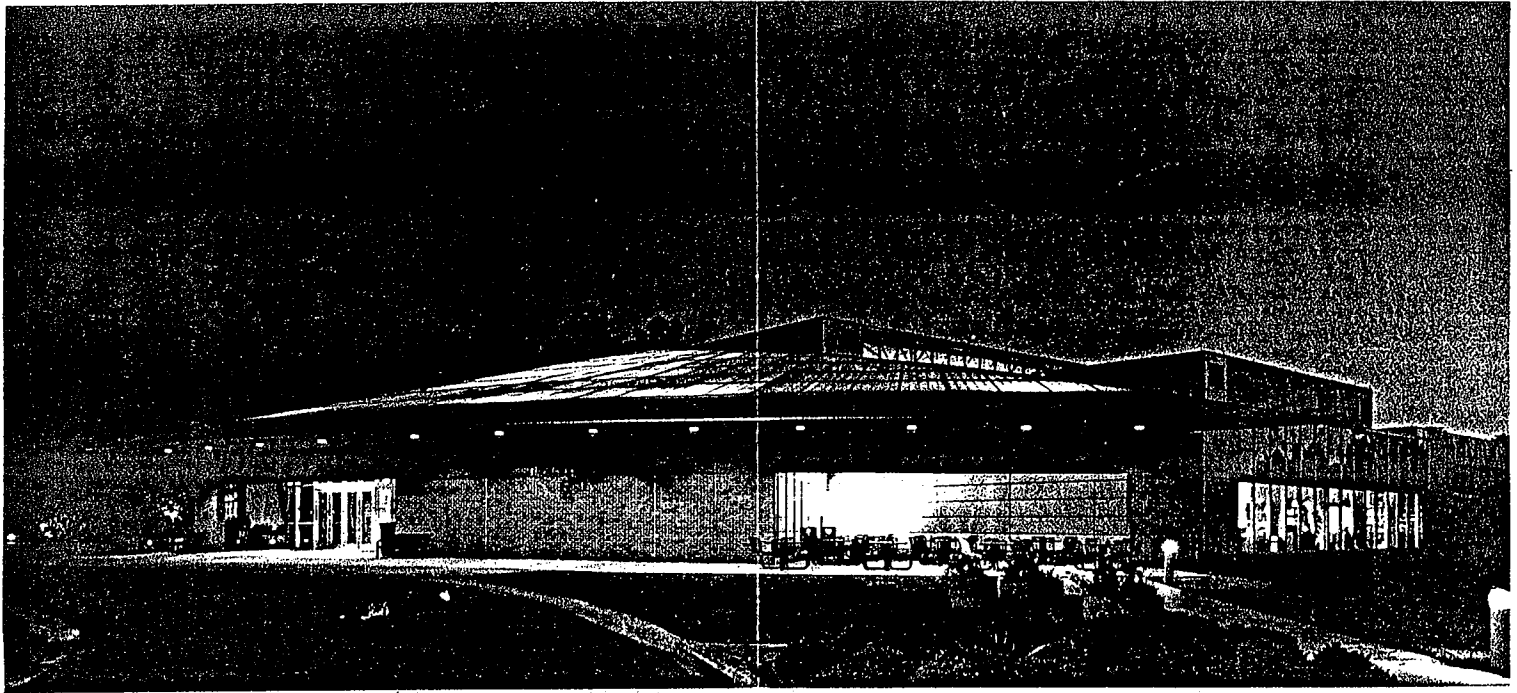
For after-hours rental information, dial Ext. 200



Photo credits: front cover, John Moran; exterior, museum,

FLORIDA MUSEUM of Natural History

**Florida's Official
Natural History Museum**



Florida Museum of Natural History

Dedicated to understanding and preserving biological diversity and cultural heritage

Chartered by the Florida Legislature in 1917, the Florida Museum of Natural History serves as the state's official natural history museum. It is the largest collections-based natural history museum in the Southeast, with one of the nation's top 10 natural history collections.

The museum's two main facilities are located in Gainesville on the University of Florida campus. Powell Hall, the education and exhibition center, is home to the permanent and traveling exhibit programs, adults' and children's classes, group tours and special events. Dickinson Hall houses the museum's research activities and vast collections containing more than 25 million natural history specimens and artifacts.

Collections, Research and Education

While exploring the natural history of Florida and the circum-Caribbean region, museum scientists make fantastic discoveries. From mammoths and miniature horses in northern Florida to pre-colonial settlements in Haiti, we share these adventures with you. So come and participate in the excitement of discovery that is the Florida Museum of Natural History!

Public Programs

Fascinating science and natural history public programs, events and lectures are offered throughout the year. The museum calendar of events is available online at www.flmnh.ufl.edu/public/calendar/

