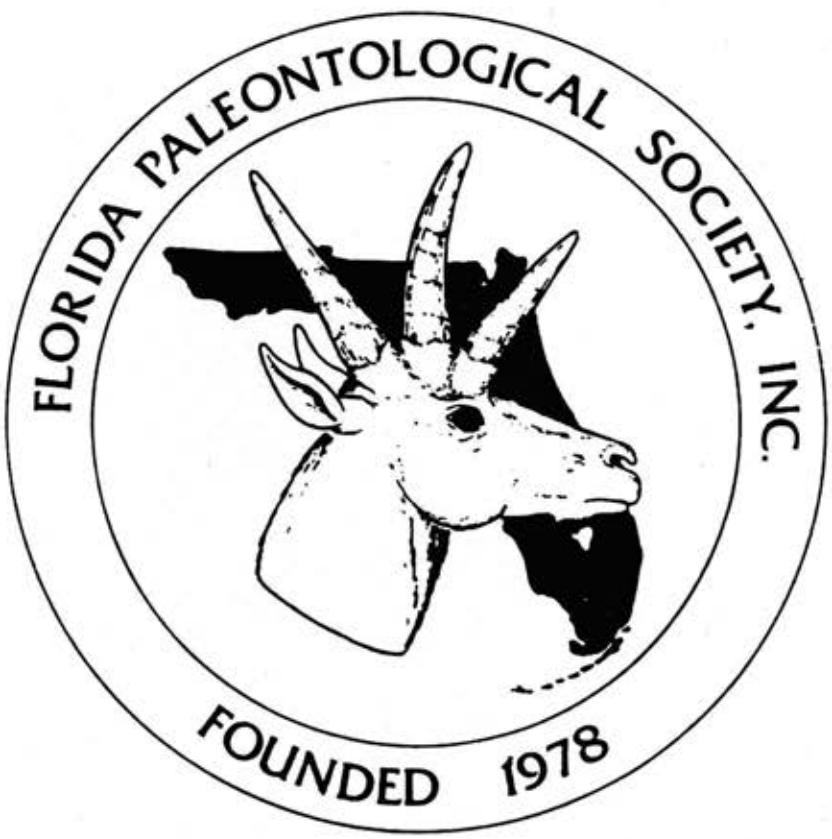
Florida Paleontological Society, Inc.

Newsletter



Volume 12 Number 4 Fall Quarter 1995

FLORIDA PALEONTOLOGICAL SOCIETY, INC.

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FLORIDA PALEONTOLOGICALSOCIETY INC. NEWSLETTER

Volume 12, Number 4 Fall Quarter 1995

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FLORIDA MUSEUM OF NATURAL HISTORY

Announcing

Paleofest96

FLORIDA PALEONTOLOGICAL SOCIETY, INC. FOUNDED 1978

A Festival Celebrating Florida Paleontology

8-9 November, 1996, Gainesville, FL

Co-Sponsored by the
Florida Museum of Natural History & Florida Paleontological Society

See page 13 for more details. Mark your calenders now!

1996 FPS dues are due now!

Please see page 27 for renewal form.

News Notes...

Fall Meeting Highlights...

This year's FPS Fall meeting was held on Saturday and Sunday, October 28th and 29th in the Tallahassee area of northern Florida. Despite some troublesome rain the preceding Friday, the weather turned out perfectly for our weekend events.

Saturday morning featured two field trips; Roger Portell lead an invertebrate collecting trip to the Dell Quarry in Mayo, and Eric Taylor took a group of vertebrate enthusiasts to the Steinhatchee River, south of Perry. The quarry offered numerous large foraminifera, mollusks, and echinoids. With an ownership change imminent, this trip may well have been the last to this quarry.

The vertebrate group, wading and snorkeling the Steinhatchee River, located a rich bone deposit in an tributary creek. They showed up at the afternoon talks with boxes of very interesting Pleistocene bones to show off to the rest of the meeting attendees.

Saturday afternoon the group convened at beautiful Wakulla Springs State Park, the site of the main meeting activities. The Park was created from the land holdings of the late Edward Ball, a Dupont heir and former manager of Dupont's St. Joe Paper Company. Mr. Ball maintained the land around the spring in a natural state, preserving the wildlife and precluding extensive development. He built a tourist lodge there in the late 1930's, which still serves as a popular attraction. The centerpiece of the park is the huge, pristine Wakulla Spring, which forms the headwaters of the Wakulla River. The spring and adjoining river are steeped in both paleontologic and human history. Numerous vertebrate fossils have been removed from the spring and the cave feeding it, suggesting the area may have been a watering hole for Pleistocene fauna. Paleoindian remains from the spring and surrounding park lands also show the area was popular with early man.

Phil Whisler, who single-handedly planned most of the meeting, served as our MC for the afternoon talks. Four informative talks, on different aspects of the area's biology, paleontology, and geology were presented at the afternoon session. A synopsis of each follows.

Paleobotany of the Florida Panhandle

Dr. Steve Manchester of the Florida Museum of Natural History presented an interesting summary of the paleobotany of the Florida panhandle. Northern Florida today is in a mixed zone of temperate and tropical living plants. The fossil plant record allows us to determine how this mixture has changed over time. Alum Bluff, on the Apalachicola River in Liberty County, Florida, is the classic fossil plant locality in the state. The flora from Alum Bluff were first described by Berry in 1916. These fossils provide a glimpse of what northern Florida was like 15 million years ago. One common species found here is *Sabellites aplachicolensis*. It is typically represented by frond imprints in the Miocene Hawthorn Group equivalent sediments cropping out at the bluff. In general, collectors should look for fossils showing the frond attachment points, as this is most useful in species identification. Other plant fossils found at Alum Bluff include possible buckthorn, elm, and poplar; however, in the absence of fossils of the seeds or other plant reproductive parts, species identification is uncertain.

Another potential plant fossil site in the panhandle is in outcrops of the Middle Miocene Shoal River Formation near the Shoal River in Walton County. Organic material, including some wood, fruits, and seeds, is interbedded in the clayey, sandy strata of this unit. Upon extraction from the sediments, the organics are preserved in a mixture of 1/3 water, 1/3 glycerin, and 1/3 alcohol. Walnut nuts found here are a new find in Florida. Preliminary analysis of the organics suggests other plant species are present, and much more work is needed.

The paleobotany lab at the Florida Museum of Natural History is continually seeking input and information from the amateur community on fossil plants in Florida.

Paleomagnetics and Monarchs

As part of our butterfly weekend theme, Dr. Doug Jones of the Florida Museum of Natural History presented a summary of the monarch butterfly's life history and current magnetometer research on the species at the University of Florida.

Monarchs (*Danaus flexippus*) are the milkweed butterflies. The larvae and adults feed exclusively on the milkweed plant (*Asciepias*). During the summer, they live all across the United States and

into southern Canada (roughly corresponding to the range of the milkweed plant). In the fall, monarchs migrate southward to central Mexico. Those who summered in the eastern United States migrate to the same small area of the Yucatan. Colonies from west of the Rockies migrate to southern California. Large monarch flocks pass through the eastern Florida panhandle in the fall. They are easily observed on the foliage in areas of the St. Marks Wildlife refuge, south of Tallahassee.

In the spring, the monarchs return to the United States and Canada to feed on milkweed, reproduce, and die. The new generation then migrates south in the Fall to the same area and commonly congregating on the same tree as its now-dead ancestors.

In an attempt to explain their remarkable migratory and navigational skills, scientists have theorized that the butterflies must be able to follow the earth's magnetic field. University of Florida researchers are working on a project to test the magnetic moment of the butterfly body. Monarch butterfly bodies were placed in the U of F magnetometer and were found to have minimal magnetism. When magnetized with a large magnet, the same bodies acquired a stronger magnetic moment. The butterfly bodies may contain the naturally-magnetic mineral magnetite. Most of the magnetism was concentrated in the head and thorax portions of the body.

In an attempt to determine in which phase of life the butterflies obtained their magnetic moment, bodies of various ages were tested. Researchers collected monarch eggs, hatched them, and measured the magnetism of the developing larvae over time. The larval stage had no magnetism. The researchers found that the butterfly's magnetic moment developed in the pupae phase, and increased steadily into adulthood.

Pleistocene Vertebrates from the St. Marks River

Mr. Tim Young, a Ph.D graduate student at the University of Florida, presented the results of his Master's thesis study of the vertebrate fossils in the St. Marks River, Wakulla County, Florida. Prior to his study, little work had been done in this river. In 1870, Joseph Leidy described a mammoth from this locality, and in the 60's, Stores Olsen collected some vertebrate material here. Tim collected the St. Marks in 1987 using SCUBA. He selected several sites near US 98, both north and south of the highway bridge, to better understand the taphonomy (study of how the bones got there) of fossils in the river. No *in situ* material was found during his study.

Tim's approach to studying the taphonomy of the St. Marks River deposits was fourfold: 1) Density, 2) Element distribution, 3) NISP (number of identifiable specimens) and 4) Shipman Factors.

Some of his interesting fossil finds included the left metatarsus of *Paleollama* and the right calcaneus of a pantothere. Cracking in the llama bone suggested it had been exposed to air for some time and the panthothere bone contained parallel scratches on its surface.

Of all the fossil species Tim recovered, 36% were extinct forms. This figure is consistent with other Florida sites and suggests a late Pleistocene age. His finds included birds, alligators, snakes, frogs, salamanders, fish (mullet, gar, sheepshead, and catfish) and a variety of turtles (slider, giant box, and giant tortoise). The mammal fossils present, with the exception of one lemming bone (suggesting cooler temperature), indicate a mixed grassland-woodland setting with generally warm temperatures. The aquatic animal species suggest no real climate difference from today.

Geology of the Eastern Florida Panhandle

As the final talk of the afternoon session, Frank Rupert of the Florida Geological Survey provided an overview of the geology of the meeting area. The adjacent region contains several classic paleontologic sites. To the west in Liberty County is Alum Bluff, the most extensive geologic outcrop in Florida, spanning middle Miocene through recent time. Here are found both invertebrate and vertebrate fossils as well as some of the best fossil plants in our state. Leon County contains Jackson Bluff, a classic mollusk site as well as several scattered vertebrate localities. The Aucilla River in Jefferson County has yielded numerous vertebrate fossils and is the site of the FLMNH's ongoing Page-Ladson site project. The St. Marks River in Wakulla County was the site of Tim Young's vertebrate fossil study and still yields finds to weekend collectors. Wakulla Springs and the adjacent river have also been the source of vertebrate fossil legends, including a complete mastodon which now resides in the Museum of Florida History in Tallahassee.

Several distinct geomorphic zones are present within the Leon-Wakulla-Jefferson County region. Skirting the northern edge of the region are the topographically high Tallahassee Hills, a stream-dissected remnant of a broad paleodelta which occupied portions of southern Alabama and Georgia and extended southward into the Florida panhandle. The Tallahassee Hills are bounded on

the south by the Cody Scarp, a relict Pleistocene shoreline which represents one of the most persistent topographic breaks in the state.

South of the Cody Scarp lies the Gulf Coastal Lowlands zone. This zone is characterized by a generally flat, sandy, seaward-sloping plain, most of which was inundated by high-standing Pleistocene seas. Numerous relict marine bars, dunes and beach ridges are evident throughout this zone. Shallow coastal marshes fringe much of the modern Gulf shore. The Gulf Coastal Lowlands are subdivided into two zones, the Apalachicola Coastal Lowlands, situated west of Highway 319 in Wakulla County, and the Woodville Karst Plain east of this line.

The unique geology of the eastern panhandle is evidenced in both the landforms and the paleontology. Oligocene and Miocene carbonates rise to the surface on the western flank of the dome-like Ocala Platform which lies to the southeast of our area. In the Woodville Karst Plain, younger overlying sediments were removed by Pleistocene marine erosion, and the carbonates form the near-surface bedrock in southern Leon and eastern Wakulla Counties. Here only thin undifferentiated sands overlie the carbonate. Karst features such as sinks, springs, disappearing streams, and natural bridges are present throughout the karst plain.

West of Highway 319 land elevations increase and thin siliciclastic sediments of the Hawthorn Group, Intracoastal Formation, and Jackson Bluff overlie the carbonates. These units tend to retard downward percolation into the underlying carbonates. Karst features are less common, and the area of the Apalachicola Coastal Lowlands typically consists of sandy, poorly-drained flatwoods, swamps, and bays. The Hawthorn Group and the Jackson Bluff Formations are exposed at places along creek and streambeds and typically contain fossil mollusks and foraminifera. One classic locality is Jackson Bluff, located just south of the hydroelectric dam on the Oklocknee River in western Leon County.

North of the Cody Scarp the Miocene and younger siliciclastic sediments form the hilly terrain of the Tallahassee Hills. The Miocene Hawthorn Group is represented by the Torreya Formation. Locally this unit is comprised of sandy, phosphatic clays, clayey quartz sands, and quartz-sandy, clayey limestone and dolostone. It underlies the Tallahassee Hills and is mined for fuller's earth deposits in adjacent Gadsden County.

Overlying the Hawthorn Group is the Pliocene Miccosukee Formation. This reddish, clayey, unfossiliferous sand unit is evident in roadcuts throughout northern Leon and Jefferson Counties.

Frank finished his presentation with a short review of the history of exploration into Wakulla Spring, located a short distance from our Fall Meeting room on the grounds of Wakulla Springs State Park. Early unsubstantiated legends from the 1800's tell of finding several large mastodon skeletons in the spring. The first well-documented fossil find was the 1930 recovery of "Herman", the Wakulla Spring Mastodon from the spring pool.

In the mid-1950's local divers, working in conjunction with Stanley Olsen of the Florida Geological Survey, explored the outer 1100 feet of the cave feeding Wakulla Spring. They discovered extensive Pleistocene bone deposits and indian artifacts on the floor of the cave.

The most extensive exploration of Wakulla Spring cave took place in 1987. Cave divers with the U.S. Deep Caving Team entered the cave with modern mixed gases and diver propulsion vehicles and discovered four separate tunnels feeding the spring cave. They explored some of the tunnels a distance of over 4000 feet.

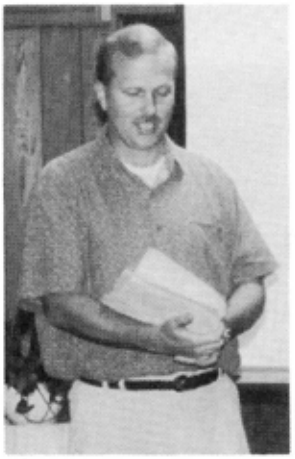
Following the afternoon talks, a short general business meeting was held. The highlight of this meeting was the presentation of the annual Howard Converse Award to Dr. Clifford Jeremiah, a long time FPS and Museum supporter. Dr. Jeremiah was also voted to Honorary Member status by the attending membership. Minutes of the general meeting and the Board meeting which followed are included elsewhere in this issue.

Saturday evening, the meeting attendees feasted on a buffet dinner at the Wakulla Springs Lodge dining room. After the meal, Tonya Van Hook presented an interesting talk and slide show on her work tagging and studying the natural history of the monarch butterfly. Much of her work is conducted within the St. Marks National Wildlife Refuge, located south of Tallahassee. Tonya's talk set the stage for our Sunday morning visit to the Refuge. Unfortunately, recent hurricane damage to the vegetation along the gulf shore of the refuge, a favorite spot for the monarchs, was extensive and few butterflies would actually be seen.

Following Tonya's talk, we held our fall auction. This year's donations included fossils, books, hats, casts, minerals, and bags of "picking" material containing vertebrate microfossils. Once again, Phil Whisler ably served as our auctioneer. Proceeds from the auction are earmarked for the Gary S. Morgan student research scholarship fund.

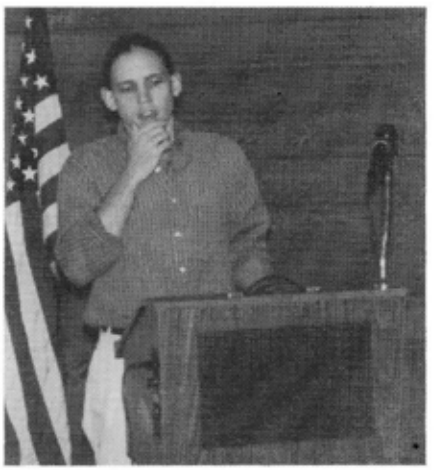
Eric Taylor and crew inspect vertebrate fossils from the Steinhatchee River trip.

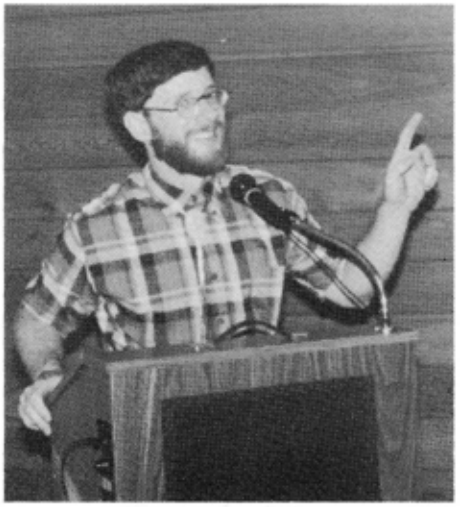
Dr. Dave Webbs presents the Converse Award plaque to Dr. Cliff Jeremiah, long-time FPS member.



Dr. Doug Jones speaks on Monarchs and Magnetics.

Tim Young fields a tough question from the audience during his talk on Vertebrate Fossils of the St. Marks River.





Dr. Steve Manchester speaking on the finer points of paleobotany.

Eric Taylor displayed his four boxes of alligator skelton .

Tonya Van Hook, guest speaker on Monarch Migration in the St. Mark's Wildlife Refuge.

Banquet dinner attendees listen attentively to Tonya's slide presentation.

Some of the auction items on display.

Monarch Butterfly

Phil Whisler served as our auctioneer.

The St. Marks lighthouse, a favorite spot for butterfly watching.

From the Secretary...

by Eric Taylor

Fall Meeting Minutes...

Following a successful and exciting series of field trips to several sites in the Big Bend area of Florida, an interesting series of talks on various subjects of interest to the membership, and the presentation of the Converse Award to Dr. Clifford Jeremiah of Jacksonville, the FPS Fall Membership Meeting was held at the Wakulla Springs Lodge near Crawfordville, Florida on October 28, 1995. The meeting was presided over by Secretary Eric Taylor, as President Susan Pendergraft and Vice President Gordon Hubbell were unable to attend.

A motion was made and seconded to confer honorary membership status to Dr. Cliff Jeremiah because of his many contributions to the foundation and success of the Florida Paleontological Society over the years. The motion was carried without dissent.

Treasurer Phil Whisler passed out copies of the financial report for this year (both are reporoduced in this issue). A motion to accept his report was passed.

Eric Taylor requested input from the membership for sites for the meetings in 1996.

There being no further business, the meeting was adjourned.

Board Of Directors Meeting...

The meeting of the Board of Directors of the Florida Paleontological Society, Inc. was called to order immediately following the General Membership Meeting on October 28, 1995 at the Wakulla Springs Lodge near Crawfordville.

Present were:
Eric G. Taylor, Secretary
Phil Whisler, Treasurer

Members of the Board:
Dr. Bruce MacFadden
Dr. Douglas Dew
Tom Ahern
Frank Rupert
Dr. Steven Manchester
Jim Toomey
Barbara Toomey

Members of the Society:
Steve Jacobs
David Thulman
Roger Portell

The first item of business was to discuss a proposal from FPS member John Babiarz to set up a fund to purchase items of scientific interest on behalf of the museum using donations from interested people to finance the fund. John also had sent $250.00 to act as seed money for such a fund. Upon discussion, it was decided that this sort of activity was beyond the expertise and intent of the FPS's charter. A motion to have Eric Taylor write a note to Mr. Babiarz informing him of the decision not to participate in such an enterprise at this time and to return the donation with thanks was passed without dissent.

Roger Portell of the Invertebrate Paleontology Division, Florida Museum of Natural History, presented a proposal for the FPS to segregate their existing $7,000 in scholarship funds and to co-mingle these funds with the Jerry Britt Scholarship Fund, which resides at the University of Florida Foundation.

Currently, the Britt Fund carries a balance of approximately $13,000, which falls short of the $20,000 minimum requirement for the fund to be considered an endowment at the Foundation. With the addition of the $7,000 from the Gary S. Morgan Scholarship Fund, endowment status would be achieved. Both the FPS and the Florida Museum of Natural History (which administers the Britt Fund) would benefit greatly from this new status. The combined fund will be professionally managed by financial experts and we can expect better rates of return than we presently receive. Both the FPS and the FLMNH would continue to award their annual scholarships of $500 without the requirement to make other investments to the total capital amount, thereby freeing the income currently allocated to this for other purposes as desired.

Following discussion, the Board voted to accept this proposal in principle. Roger was directed to prepare a formal binding agreement between the FPS, the FLMNH, and the University of Florida Foundation for the members of the Board to approve by mail vote.

Some discussion of the meeting sites for 1996 was held, but no decision was made.

There being no further business, the meeting was adjourned.

Both meeting minutes were respectfully submitted by Eric G. Taylor, FPS Secretary.

Announcing the Florida Paleontological Society's

Gary S. Morgan

STUDENT RESEARCH AWARD

FOURTH ANNUAL COMPETITION

Prospectus and General Overview

The Florida Paleontological Society (FPS) is pleased to announce the fourth annual competition for its Student Research Award. The purpose of this award is to promote a better understanding of **paleontology and the ancient life of Florida** through new research discoveries. Eligible fields of relevance within Florida paleontology include invertebrates, vertebrates, microfossils and plants. This award is open to any **college student, undergraduate or graduate,** in good standing at a Florida college or university.

For this second competition, the FPS has allocated an award of up to $500. The purpose of this grant is for expenditures such as (but not restricted to) field work, museum research travel, laboratory analyses, research materials, etc. It is not intended to fund travel to scientific meetings, indirect (overhead) costs, or salaries and wages. The **deadline** for receipt of proposals is **1 March, 1996**.

Applications must be postmarked on or before the deadline and be sent to the Secretary at the address listed below. Applications will be screened by a committee and will be judged based on the following criteria: (1) merit of the proposed research, (2) feasibility of the project, (3) clarity of expression, and (4) a letter of recommendation from a faculty sponsor. The screening/award committee shall consist of professional and hobbyist paleontologists. In order to avoid potential conflicts of interest, students whose advisor serves on this committee are ineligible to apply. The Award will be announced on May 15th, 1996 and a check for the requested amount (up to $500) will be sent by the Treasurer to the recipient.

It is expected that, during or after completion of the research, the recipients will present the results of their discoveries and additions to knowledge in the form of (1) a short article of a non-technical nature to be published in the FPS Newsletter and/or (2) a talk presented at an FPS meeting. In the event of the latter, the student's travel expenses to the meeting will be paid by the FPS (but this does not have to be included in the originally requested budget).

Application Process and Requirements:

The application process is intended to be short - thus, items 1-4 below are limited to two pages (minimum 10 point type, standard 1" margins). The application must include:

1. Title of research project
2. Name, address, and phone number of applicant
3. Current college status (where enrolled, major, degree program, anticipated graduation date).
4. Project description written in **general,** i.e., **to the extent possible, non-technical,** terms to include a description of what he/she plans to study, why it is interesting or important, how and when it will be done, and a short budget of proposed expenditures.
5. Appended to this proposal there must be a letter from a faculty sponsor who will vouch for the qualifications of the applicant as well as the importance of the project, and a statement that he/she will supervise the research.

Applications should be submitted by 1 March, 1996 to:

Eric Taylor, Secretary
Florida Paleontological Society
Florida Museum of Natural History
University of Florida
Gainesville, FL 32611-2035

News from the FLORIDA MUSEUM OF NATURAL HISTORY

Museum Hosts Sucessful Open House...

At the Museum's annual Open House, on October 1, 1995, nearly a thousand visitors made their way through the Invertebrate, Vertebrate, and Paleobotany collections. During this festive occasion Larry Rogers of Limestone Products, Inc., Newberry, was awarded a plaque for his contributions of time and equipment during museum fossil excavations from the limestone pits under his supervision. For many years museum crews have been collecting in these pits with great success.

(Right) Larry Rogers with his wife (Nancy) and daughter (Karrie) accepting a well deserved award for his contributions to Florida Paleontology.

John Arthur, a graduate student working in Invertebrate Paleontology, explains to open house visitors the probable life habits of several fossils in the large specimen storage area.

One of the many families visiting the Invertebrate Paleontology Range during Open House. A young boy's excitement is captured after he views fossils through one of several microscopes set up for the occasion.

In late October Roger Portell visited with Muriel Hunter in Tallahassee. Muriel and the late Joe Banks amassed large collections of stratigraphically arranged fossils from throughout the state while they were employed at Coastal Petroleum (1960 - 1978). Ms. Hunter donated these fossils to the Museum, and Roger occasionally goes to Tallahassee to consult with her about fossil identifications and Florida stratigraphy. Her fossils represent on of the most stratigraphically inclusive collections of Florida fossils anywhere.

Muriel Hunter, retired biostratigrapher, who along with Joe Banks amassed a huge collection of fossil invertebrates. The collection now resides at the museum.

Activity in Paleobotany at the Florida Museum of Natural History

David Dilcher has been working on some aspects of the earliest known fossil flowers and fruits in the world. Some of the material comes from Australia and he is working with **Prof. Valentine Krassilov**, of Moscow, Russia, and **Dr. Jack Douglas**, of Melbourne, Australia, on this project. Also some of the material comes from Northeastern China and he has been working with **Dr. Sun Ge** from Nanjing, China on this project. It has been interesting to study these fossil remains because our preconceptions about what the earliest or most primitive flower actually is, needs to be changed according to the results recently found. Previously the text books told us that a large complex Magnolia-type flower was the nature of the first flower but now we know that it was more similar to that of the small simple flower of the air potato. This is a big change in our ideas. We recently were happy to welcome **Juan Martinez** a member of the FPS, who flew up from Miami to visit the Florida Museum of Natural History and our collections.

Carlos Jaramillo is a new graduate student in the Paleobotany Laboratory at the University of Florida. He is interested in documenting the age and extent of the biodiversity of plants from the fossil record which once grew in the northwestern Andean mountains in Columbia. He will use pollen and spores preserved in the sediments, as the Andes were uplifted. to try to document this biodiversity

Victor Call is a graduate student in Paleobotany who is working to answer the question of why, how and when did the fruits and seeds of flowering plants develop wings which allowed them to be dispersed by the wind from their parent plant. **Mike Muller** is a graduate student in the Paleobotany Lab. who is examining the early fossil record of flowering plants. He is looking at some very early fossil flowers and fruits and also trying to understand the extent of the early evolution of changes that took place in flower form and fruit morphology in the early flowering plants.

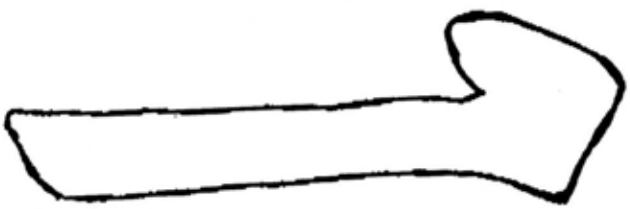
Steve Manchester is collaborating with post-doctoral associate **Michael Wiemann**, and **Dr. Elisabeth Wheeler**, Department of Paper Science, North Carolina State University, on the use of fossil and modern woods to assess paleoclimate. Steve just completed work with Dr. Wheeler on modern woods from various climates and latitudes to determine correlations between wood in the FLMNH collections.

Steve Manchester is also co-organizer for the fifth International Organization of Paleobotany Conference to be held in Santa Barbara, California, June 29-July 5, 1996. He is also currently conducting research on floral change across the Eocene/Oligocene boundary and on the fossil record of the Birch and Walnut families.

Museum Receives Ancient Spearthrowers

by S. David Webb,
Senior Curator, Florida Museum of Natural History

During the December season of gift-giving the Vertebrate Paleontology collection at the Florida Museum of Natural History received two remarkably similar contributions from two of its finest amateur friends, Eric Taylor and John Claytor. Each of these merry gentlemen provided a piece of fossil deer antler, collected under the fossil vertebrate permit system, from the Santa Fe River. Each of them suspected, however, that his specimen was no ordinary deer antler, but that it had been modified into an ***atlatl hook***.



Atlatl hook
(length: 8.5 cm)

The word *ATLATL* comes to us from the Nahuatl (or Aztec) word for a throwing implement. An atlatl usually consists of a stout piece of wood about the length of a human forearm with a hook near one end. Such a device is used to help hurl a spear. It acts as an extra segment of the human arm, vastly increasing its potential thrust. It's the same principle as used by fastball pitchers who accelerate a hardball over 100 miles an hour by snapping the wrist, the elbow and the shoulder joint in a sequence of smoothly accelerating motions along a single trajectory. The atlatl extends the wrist segment making it equivalent to the *sesta* (basket) used by Jai Alai players to propel the *pelota* at more than 150 miles per hour. The ***hook*** at the distal end of the ***atlatl*** is also valuable in providing a nice lodgment for the spear base as it is propelled from its launchpad. In the hands of an experienced operator, the extra force delivered with an atlatl sacrifices no accuracy. The amount of practice and degree of proficiency developed among human atlatl hurlers in other cultures are probably equivalent to those of baseball pitchers in our culture.

In various ancient cultures, going back into the Paleolithic in Eurasia, the hook was fashioned separately and then attached to (lodged in) the longer piece, making a ***compound atlatl***. In each of the new examples from the Santa Fe River, the hook made from deer antler is between eight and nine cms long (under four inches) and is elegantly modified from a piece of an Odocoileus virginianus antler. In side view one can see the flat upper surface leading back to the notch and above the notch the hook. Presumably the socketed bases of many launched spears polished each of these hooks smooth. The proximal end of each piece(opposite end from the hook) appears to have been snapped off, and suggests that the torque of hurling spears eventually strained this portion of an atlatl hook.

There is no exact context to these finds, and that is the scientific problem with most of the wonderful discoveries in Florida's rivers. Each specimen was found on the river bottom among the sand, silt and other clastic sediments. It is unlikely to have moved far, but its exact site of deposition cannot be determined. The bone is dark brown in one case and jet black in the other. Each is typical of late Pleistocene bones from this river. But there is no solid evidence that proves that these atlatl hooks are of late Pleistocene age. If that could be demonstrated, they would provide the first clear instance of Paleoindian atlatls in the New World. In the Old World, spearthrowers occur as early as the upper Paleolithic. Today they play an essential role in the hunting technology of male Australian Aboriginals (where they consist of very broad wooden pieces called a ***Woomera***). Two years ago in Atherton (northeastern Australia) I video-recorded an old man using a *woomera* to throw a bamboo spear (tipped with stone) half-way through a four-inch wooden post at about 50 yards.

Could these atlatls represent the first direct evidence of spearthrowers among North American Paleoindians? The Museum has now loaned the lighter colored specimen to the leading bone-dating laboratory, run by Dr. Thomas Stafford at the University of Colorado in Boulder. There he has begun the process of extracting a small sample of bone protein (collagen) from the Santa Fe atlatl hook, and analyzing the several component amino acids. If they occur in sufficient quantity he will have each amino acid separately dated by the tandem accelerator- mass spectrometer (TAMS) method. This is an expensive and possibly futile effort, but he has agreed to undertake it because the potential interest of obtaining a date from this implement is so great. Tune in again next year.

These new finds are exciting additions to the collections of the Florida Museum. We congratulate Eric Taylor and John Claytor on their outstanding discoveries. We are sending them each a beautiful replica produced by Russ McCarty's lab, along with an accession certificates. We know that they share our pride in preserving this valuable heritage for the people of Florida now and henceforth.

FLORIDA MUSEUM OF NATURAL HISTORY

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Paleofest96--First Announcement

A Festival Celebrating Florida Paleontology

8-9 November 1996--Gainesville, FL

Co-Sponsored by the
Florida Museum of Natural History & Florida Paleontological Society

With participation from:
Pony Express
Office of the Director
FLMNH Museum Associates
Florida Fossil and Shell Clubs
Other statewide enthusiasts

Co-organizers: Douglas S. Jones and Bruce J. MacFadden, FLMNH curators

You are cordially invited to join us at the FLMNH for a festive meeting of Florida paleo-folks and friends. ***Paleofest96*** coincides with the 20th Annual Fall meeting of the Florida Paleontological Society and we are taking this opportunity to invite anyone with an interest in fossils to this weekend in Gainesville. This is a non-football weekend and we will be arranging for blocks of rooms at reduced rates for out-of-town participants.

Paleofest96 Activities will include:

•Reception-social at the museum • unveiling of a new fossil horse skeleton (Leisey Equus*) • dedication of the new Eocene Sea exhibit • book-signing and public lecture by world-famous dinosaur paleontologist Dr Louis L. Jacobs III (author of "Lone Star Dinosaurs" and "Quest for African Dinosaurs"), Director, SMU Shuler Museum of Paleontology • 20-year retrospective lecture by Dr. S. David Webb • a variety of workshops on Florida fossils • Fossil club book and membership displays • awards banquet • fund-raising happy-hour and auction*

Join us starting at 8 pm on Friday night at the "Icebreaker" reception, or at 8:30 am on Saturday morning for coffee and donuts. Either way, you are sure to have an educational and enjoyable time at the ***Paleofest96!***

Registration for all activities ($20 per person plus, if desired, Banquet-$15) and hotel reservation information will be available in the Second Announcement. Until then, you may also direct inquiries via email to: **paleofest96@flmnh.ufl.edu** or access the FLMNH Home Page at **http://www.flmnh.ufl.edu**.

Be sure to mark November 8th and 9th on your calendar now!

Prep Talk

by Russ McCarty

Greetings from the bone lab! As I write, Christmas is fast approaching and the New Year in close pursuit, and since you won't read this until early 1996, I'll wish you a belated Merry Christmas and a prosperous year ahead. The focus in Gainesville, of course, is on football as the Gators prepare to do battle with Nebraska in the Fiesta Bowl, this years' arena of Natural Selection which will determine the national championship. Here, in the lab, as usual, I'm scrabbling frenetically to finish this years' unfinished jobs, both prep jobs and a half-dozen casting projects.

Oldest Atlatl? One of the interesting specimens I'm casting is what appears to be an atlatl hook that was recovered from the Santa Fe River. It appears to be fossil bone, but was cut and fabricated while the bone was still green. This is an important find that could push the earliest dates for atlatl use back from the early Archaic into the even earlier Paleoindian cultural stage.

Current opinion is that the use of the atlatl was introduced into Western Europe about 20,000 years ago. In the New World, atlatl use is associated with the early Archaic stage which began about 8500 years ago, when the end of the ice age and the Pleistocene megafauna led to the development of new tools to hunt the speedy mid-sized animals such as deer. Although, by no means a consensus, a few Paleoindian archeologists believe that atlatl spears tipped with Clovis type points were used throughout the Paleoindian stage. Of course, identification of some Paleoindian artifacts is still up to the eye of the beholder. It's somewhat like a Rorschach test, those squiggley ink blot tests where the observer tells the shrink what they see in the black images. At Little Salt Springs in Sarasota County, where the giant tortoise killed with the spear was found, archeologists also found an odd shaped piece of wood which they called a boomerang. That reminds me of the old joke: What do you call a piece of wood that comes back when you throw it?---A boomerang! (obviously!) OK, you got that. Now, what do you call a piece of wood that doesn't come back when you throw it?---A stick! (dummy!) Well, our specimen is unequivocally an atlatl hook, and scheduled radiometric dating should provide an answer to the question of its age. Exciting stuff!

A Swimming Sloth? Well...think about it! The stock answer to the question of how Miocene sloths got to Florida from South America before the Isthmus of Panama landbridge was created by volcanism during the Pliocene is that they island hopped or rafted. However, paleontologist Greg McDonald, who earned his Masters degree at University of Florida, may have provided us with an unexpected answer. In a paper delivered to the Society of Vertebrate Paleontology at the annual meeting in November, McDonald described a swimming sloth. During the past year, McDonald, who is a paleontologist at the Hagerman Fossil Beds National Monument in Idaho, and fellow diggers have discovered and excavated in Peru, nearly a dozen specimens of a most unusual sloth, *Thalassocnus natans*, which McDonald believes was adapted for swimming and subsistence on marine plants. The bones of *Thalassocnus*, which was found in Peruvian sediments 3 to 7 million years old, are mixed up with strictly marine fauna---fish, whales, sea lions, and other marine mammals. Physical evidence shows the skeleton of this sloth possessed some remarkable features. Unlike the giant ground sloths from Florida's fossil record, which had short hind limbs and long forelimbs, *Thalassocnus* had longer hind limbs, and according to McDonald showed other features of swimming mammals, including tail vertebrae similar to beavers, and a snout that may be adapted to feeding on marine grasses. McDonald has not suggested that North American sloths are descended from *Thalassocnus*, but it may show that sloths, in general were pretty good swimmers.

Removal of Iron Compounds from Artifacts and Vertebrate Fossils.....Those of you who collect in Florida's northern and central rivers have frequently encountered specimens that would be perfect except for the disfiguring hematitic (iron) stains and encrustations on them. In fact, in some rivers in the Florida Panhandle, this is the norm. Attempts to remove these stubborn deposits physically most often results in permanent damage

to the specimen, whether it is a fossil or a chert artifact.

I have reviewed two chemical methods for removing hematitic compounds. The first is a bit complex and labor intensive. The second is fairly easy and this is the technique which I will discuss.

In 1974, Francis Howie, of the British Museum described a method for removing hematitic matrices from vertebrate fossils by using a dilute aqueous solution of thioglycollic acid. Howie first coated all exposed surfaces of the bone with a resin, polystyrene, to provide a protective barrier. After the resin had cured for six hours, he immersed his specimen in a 5% aqueous solution of thioglycollic acid (19 parts distilled water to 1 part thioglycollic acid). To this solution was added 0.9% calcium orthophosphate by weight. The addition of the calcium orthophosphate is to prevent the thioglycollic acid from scavenging phosphate from the bone. Howie left his specimens in acid for 24 hours. They were then removed, allowed to drain, and then immersed in a 5% ammonium hydroxide (ammonia) solution to neutralize the acid. The specimens were then washed in several changes of water for four days. He then used gentle brushing, and air abrasive to finish removing the deposits. As you can see, even this "easy" method is fairly time consuming and meticulous. But for an important specimen , the time spent in chemical development would be repaid.

I have not tried the Howie method on fossil vertebrates yet, but I plan to early in 1996, and when I do I will report my findings to the readers. However, I have used the method to remove iron deposits from flint or chert tools from the Aucilla River, and with exceptional results, I might add..

Andy Hemmings, field manager for Dr. Dave Webbs's Aucilla River project, recovered a chert tool from the site. Unfortunately, it was so heavily encrusted with iron deposits, that it hard to discern the true nature or shape of the tool. I placed the tool in a 5% solution of thioglycollic acid made up as above---except that I left out the calcium orthophosphate. This was unnecessary since there was no bone being treated. The tool was left in the acid solution for 48 hours. It was removed, drained, and placed in 5% ammonium hydroxide solution for a few minutes, then soaked in a water bath for several hours. The iron deposits had turned to a soft, powdery film that brushed away easily with a soft toothbrush. All traces of the iron deposit was gone. From personal experience, I would recommend this treatment for stone tools, but since I have not yet tried the method on Florida vertebrate fossil material I cannot say how it works, or whether it may harm the specimen. If anyone takes up the challenge, I suggest trying the method on an unimportant specimen first.

Thioglycollic acid is available from Fisher Scientific supplies at about $25 dollars per 100ml bottle. That would make about 2000 ml of 5% solution. Of course when working with chemicals, one should always read the materials safety data sheets which the suppliers provide and follow all rules for safe usage. Thioglycollic acid produces hydrogen sulfide as it digests the iron compounds. Hydrogen sulfide is a poisonous gas, but known to all of us as the smell of rotten eggs and sewer gas. In the small quantities used for removing iron from flint tools, toxic quantities will not accumulate and a well ventilated room will suffice.

PaleoComputer Notes Just a few notes here. Check out the Florida Museum of Natural History's home page at http://www.flmnh.ufl.edu/

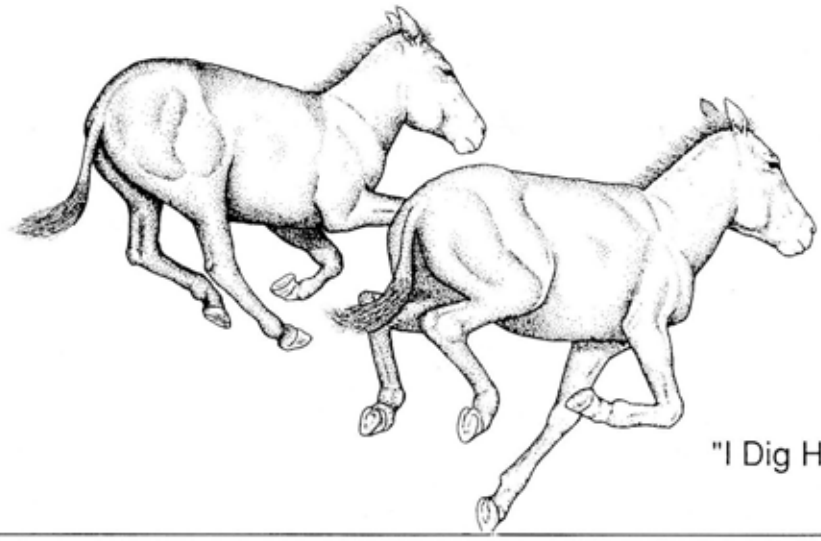
We keep expanding the material on it. Under Vertebrate Paleontology, you can see our data bases, the Pony Express Newsletter, and now the Florida fossil collecting permit brochure and application is on line. New permit applicants can print the application off of their own printers. I hope to have copies of the annual report form and other useful things as well. Perhaps in the coming year we will have preparation and conservation notes on line.

Questions, comments, suggestions? Contact Russ McCarty at the VP Prep Lab, care of the Florida Museum of Natural History, University of Florida, Gainesville, FL 32611. Telephone: (904) 392-1721. Email: Cormac@flmnh.ufl.edu

1996 FPS Newsletter Material Due Dates:

Winter - February 15th
Spring - April 15th
Summer - July 15th
Fall - November 15th

5th Annual *Pony Express* Thomas Farm Fossil Dig



"I Dig Horses

Session 1: Thursday evening, 18 April to Sunday mid-day, 21 April 1996
Session 2: Thursday evening, 25 April to Sunday mid-day, 28 April 1996

Return the Form Below to Reserve Your Place on Dig

We are again planning to hold the spring dig at the Thomas Farm site. Consider joining us for this educational, relaxing, and enjoyable event. Over the years we have had many spectacular fossil discoveries, and we anticipate the same for this dig too.

In order to provide individual attention and given the size of the site, we limit each of the sessions (both of which are identical in the planned activities) to 15 participants. Each session consists of a welcome social (Thursday evening) followed by two and one-half days (Friday, Saturday, half-day Sunday) of excellent digging, good food, and a restful (and rustic) site with a "retreat atmosphere."

Note:

- **The cost of the dig is $150 per person (same as last year)**
- **Send no money now, you will be asked to send a deposit in February during a second mailing.**
- **Your completing this attached form represents a non-binding statement of intent to allow us to plan.**

Number of Reservations_____ Session Preference (1 or 2)_____

Name(s)_____ Phone:_____

Address_____

Special Requests_____

Detach and return this form to: **Pony Express, Florida Museum of Natural History, University of Florida, Gainesville FL 32611** (use the enclosed envelope if you so desire) Send no money now!

Ice Age To Space Age

by Dean Sligh
Space Coast Fossil Hunters
Florida Fossil Hunters

Greg Compton lives in two worlds, a million years apart. Florida's Brevard County, stretching for 72 miles along the Atlantic coast, is the setting for this strange phenomenon. At a casual glance the area appears no different than its neighbors to the north and south. But contained within its borders is the top secret area from which this nation launches its spacecraft, sending astronauts to rendezvous in space with explores from other countries or to land and walk on the moon.

Greg is a part of this activity. As a hydraulics specialist on the massive crawler-transporter, he makes certain the spaceships successfully travel their last small, earth-bound journey from the VAB to their point of departure on the launch pad. This is about as far as you can go into the space age without being strapped into the space vehicle.

As Greg watches the controlled explosion that lifts the multi-ton craft from the pad he literally ***feels*** the roar of the massive engines releasing their stored energy and he is aware of the ground trembling underfoot. But his mind is beginning to make contact with the other Florida, the one that existed hundreds of thousands, indeed millions of years ago. A world he will search for in his off hours.

One-million-six-hundred and fifty thousand years ago, planet Earth began to experience a gradual cooling. Winters became colder and longer, summers cooler and shorter. More snow fell during the winter months than melted in the summers. Snow piled and piled and piled. Glaciers formed and began inching their way down the North American continent. In some places they reached a height of nearly two miles. Ahead of this slow-moving wall of ice millions of animals moved steadily southward. Although the glaciers never came any closer to Florida than about 500 miles, their impact was certainly felt. Like the winter visitors of today, millions of animals converged on Florida. They lived here and they died here, for the strange ***winter*** of the Ice Ages lasted not for a few months but thousands of years.

As world-wide temperatures began returning to a warmer period, the glaciers slowly began melting and retreating to the north. Throughout the Pleistocene Epoch, that period of time from 1.65 million years ago until about 10,000 years ago, the glaciers advanced and retreated on four separate occasions giving us our most recent **Ice Ages**. And it gave Greg Compton the opportunity to search for the fossilized bones and teeth and claws and tusks of the untold millions of animals that lived their lives in Florida during thousands of years of Ice Age winters.

Greg is President of the newly-formed Space Coast Fossil Hunters whose goal is to systematically search the entire county for the elusive fossil deposits lying only a few feet below the surface. Using maps created by the U.S. Department of Agriculture, members of the SPFH will first locate known shell and rock quarries and, after inspecting them, fill out data sheets designed to profile each site. Each site will be assigned an identification number, such as Bre ***72-1-95***. This is the site west of Melbourne which produced the fossilized whale material excavated by members of the Florida Fossil Hunters headquartered in Orlando (Bre is Brevard County, 72 is the USDA map on which the site is located, 1 indicates the number assigned to that site, and 95 is the year it was "discovered"). The data will then be stored in a computer for on-going access as additional fossil material is recovered.

Individual sites will be probed when possible by use of a small boring device used by environmental scientists to take soil samples. Data from well sample logs will be accessed and studied to try and determine the possibility of fossil deposits nearby and the depth at which they occur.

As the system of locating and exploring potential fossil-bearing sites and recording data from them is perfected, information on the database will be made available to other fossil groups throughout the state. Truly Greg and the members of the Space Coast Fossil Hunters are using Space Age techniques to search for and recover Brevard County's Ice Age fossils.

WHOSE TOOTH IS THIS?

by David Thulman

Carnivora; Part I

The Order Carnivora is comprised of many species, all of which have two distinguishing characteristics: a diet consisting predominately of vertebrates, and a pair of carnassial teeth used for slicing or shearing meat. This and the following article will describe some of the teeth of fossil members of the Order Carnivora from the Pliocene and Pleistocene of Florida. Many animals from these epochs are extant and the best way to identify their teeth would be comparison with recent specimens or reviewing publications such as *Mammalian Osteology* by B. Miles Gilbert (1990, Missouri Archeological Society) or *Teeth* by Simon Hillson (1986, Cambridge University Press). There are eight families of carnivores found in the Plio-Pleistocene of Florida: Canidae (dogs), Ursidae (bears), Phocidae (seals), Odobenidae (walruses), Procyonidae (raccoons), Mustelidae (weasels, skunks, otters), Felidae (cats), and Hyaenidae (hyenas). Most of the discussion in this and the following article will be spent on differentiating families Canidae, Felidae and Ursidae, and within those families, the saber cats from true cats, various wolves from the foxes, and the tremarctine bears from the extant species. Again, I relied on the Checklist of the Fossil Vertebrates of Florida by Richard C. Hulbert, Jr. (1992, FPS Papers in Florida Paleontology No. 6) and noted differences in nomenclature. Part I will cover only the families Felidae and Hyaenidae.

It isn't easy to identify isolated carnivore teeth to the species level, but it is relatively easy to distinguish the different families. Within the families there may be no significant structural diagnostic differences except size. Recognition of different sized species within a family may be complicated by deciduous dentition and sexual dimorphism. Besides size, the best clue to diagnosis to the species level is the age of the deposit.

Carnivore teeth are relatively rare in the fossil record. Modern carnivores make up about 3% of the animal biomass and the ratio was probably similar in the past. Carnivores don't need grinding teeth to break plant cellulose, rather, their teeth are designed to catch and consume meat. Incisors are generally small and function to nibble and scrape the last bit of tissue from bones and hide. However, i3 may be larger and more caniniform. Canines are designed to grab, hold and kill prey and to puncture skin. Premolars and molars function to shear meat and hide and to crack bone. The carnassial pair, p^4 and m_1, occlude together like scissors. The other molars are smaller than m_1 and may be missing or vestigial. To keep the article manageable, I've concentrated on the canines, premolars and molars, and not all teeth of all carnivores are discussed. Dimensions, unless otherwise noted are in millimeters and are measured length of the base of the crown, by height from the base of the crown to the highest tip, by the labial-lingual width (l x h x w). A "plus" sign (+) following a dimension means that some of the tooth was missing and the dimension was at least that large.

Felidae Dentition

The family Felidae contains two subfamilies in the Plio-Pleistocene of Florida: Machairodontinae (saber-toothed cats) and Felinae (true or conical-toothed cats). Of course, all of the saber cats are extinct, but the true cats *Lynx rufus* (bobcat), *Panthera onca* (jaguar), *Puma concolor* (puma), and *Leopardus pardalis* (ocelot) are still extant in the Americas.

Two of the diagnostic differences between saber and conical-toothed cats (besides the size of the canine) are a smaller or nonexistent cusp on p3 in saber cats and a prominent lingual (tongue-side) cusp in conical-toothed cats which is missing or very small in saber-cats. **Figure 27** demonstrates the difference; the upper tooth is *Homotherium sp.* (UF12561), the lower tooth is *Felis onca* (UF18703).

Machairodontinae

Megantereon hesperus (very early Pliocene)

Figure 1 shows the left mandible (UF22890). P_3 is 13x7x5, p_4 is 19x10x7 and m_1 is 22+x9x10. These teeth have a pronounced ridge running along the base of the crown.

Dinobastis serus (late Pleistocene)

Figure 2 shows right c^1 (UF46999). The canine is serrated like a shark's tooth on the anterior edge. The tooth has an ovate cross-section and is 145mm long while the crown is 75mm long. At the bottom edge of the crown,

the tooth is 28mm x 17mm. There is an worn occlusal surface on the inner edge, 29mm long measured from the tip.

Homotherium sp. (late Pliocene to early Pleistocene)

Figure 3 shows the left mandible (UF6000) and **Figure 4** shows the corresponding maxillary dentition. These teeth are huge and more robust than the *Smilodon populator* specimen. In **Figure 4** the canine at the base of the crown is 38mm x 21mm and p^4 is 44x26x16. In **Figure 3** the first incisor is 10x18x13 and the second is 12x24x15, c_1 is 20x26x12, p_4 is 25x22x12, m_1 is 34x24x10. The back teeth are serrated. **Figure 5** (UF12561) shows right p^4 which is 37x20x10. This tooth has a gentle curve when viewed from the edge.

Smilodon gracilis (early late Pliocene to early Pleistocene)

Figure 6 shows a right c^1 (UF87244) and left c^1 (UF87276). These canines are 145mm long with 80mm crowns. The cross-sections at the base of the crowns are 23mm x 12mm ovals. **Figure 7** compares the left mandible (UF81724) of S. *gracilis* with a cast of *Smilodon populator*. On the smaller mandible p_3 is 10x7x5, p_4 is 15x6x7, m_1 is 32x?x10. (Most of the crown of m_1 is missing.) **Figure 8** is a fragment of the right maxilla (UF87246). P^3 is 13x6x6 and p^4 is 32x12x10.

Smilodon populator or S. fatalis (late Pleistocene)

Figure 9 is a cast (UF10928) of the maxillary dentition. C^1 is 190mm long with a 42mm x 20mm cross-section at the base of the crown, p^4 is 37x20x20. **Figure 10** is the corresponding mandible. P_4 is 22x15x11, m_1 is 28x17x13.

Felinae

Felis amnicola or Leopardus amnicola (late Pleistocene)

Figure 11 (UF36614) is a right mandible. C_1 is 5x4x12, p_3 is 6x3x12, p_4 is 8x4x5 and m_1 is 10x5x5. *F. amnicola* is about the twice the size of Ed, my large *Felis catus* whose c_1 is about 7 mm long. (Ed was not interested in helping me measure his m_1.)

Felis onca or Panthera onca (jaguar) (early Pleistocene to late Pleistocene)

Figure 12 (UF12145) is a left mandible. C_1 is 20x31x14 (entire length with root is 83), p_3 is 15x9x7, p_4 is 18x15x10, m_1 is 22x16x12. **Figure 13** (UF12164) is left maxillary dentition. C^1 is 23x30+x18, p^4 is 22x12x10, m^1 is 33x15x17. **Figure 14** (UF18703) is left p^4, 29x15x?.

Felis concolor or Puma concolor (puma, panther, mountain lion) (late Pleistocene)

Figures 15, 16 and 17 (UF19077) are a recent female skull and mandible. C_1 is 11x22x7, p_3 is 12x9x5, p_4 is 14x10x7, m_1 is 16x10x7, c^1 is 10x27x12, p^3 is 13x8x7, p^4 is 20x11x11.

Felis atrox or Panthera atrox (Florida lion) (late Pleistocene)

Figures 18 and 19 are casts of the right maxillae and mandible. C^1 is 35x83x25, p^3 is 29x17x15, p^4 is 42x22x20. C_1 is 31x70x23, p_3 is 20x12x11, p_4 is 30x12x14 and m_1 is 29x20x17. **Figure 20** compares left m1 of *S. gracilis* (UF63656) and right m1 of *F. atrox* (UF24518). They are virtually indistinguishable except for size. *F. atrox* is more robust and the large root is twice the size of *S. gracilis* even though the height of the teeth are the same.

Felis rexroadensis or Lynx rexroadensis (very early Pliocene to late Pliocene)

Figure 21 (UF58308) is a left mandible. P_3 is 11x7x5, p_4 is 16x8x6, m_1 is 16x9x6. There are small shelves surrounding the posterior cusps of p_3 and p_4, and m_1 has an extra posterior cusp.

Felis rufus or Lynx rufus (bobcat) (early Pleistocene to late Pleistocene)

Figures 22 and 23 (UF150687) are a recent skull and loose canines; c^1 are on the right. C_1 is 6x14x5 and 29 long overall, c^1 is 6x16x9 and 34 long overall, p_3 is 7x5x3, p_4 is 9x6x4, m_1 is 12x8x5, p^3 is 8x6x5, p^4 is 14x8x6. Like *L. rexroadensis*, the posterior cusps on p_3 and p_4 sit on small shelves.

Miracinonyx expectata (cheetah) (very late Pliocene to early Pleistocene)

Figure 24 (UF21604) is a buccal view of a left mandible. P_3 is 12x8x7, p_4 is 17x12x8, m_1 is 19x12x9.

Hyaenidae (hyenas)

Hyenas are related to felids and the share the same basic premolar structure, with two small cusps flanking a large cusp. M_1 has an extra posterior cusp.

Chasmaporthetes ossifragus (late Pliocene)

Figure 25 (UF19297) is a left maxilla; c^1 is 31mm long, p^3 is 13x9x10, p^4 is 33x15x? **Figure 26** (UF18088) is a mandible. P_2 is 16x12x9, p_3 is 19x13x11, p_4 is 23x18x11 and m_1 is 29x17x16. These teeth are very robust and heavily worn on most surfaces. This animal looks like it gnawed on rocks.

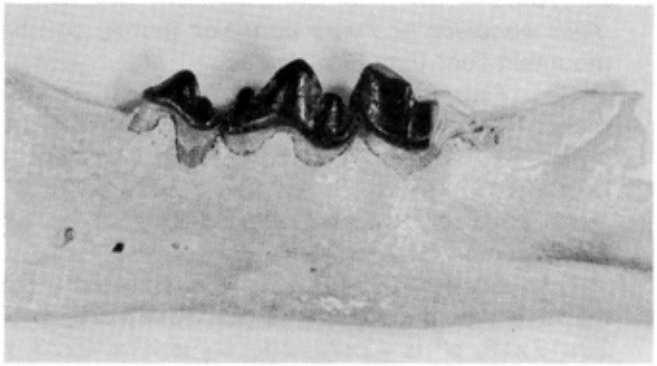


Figure 1.

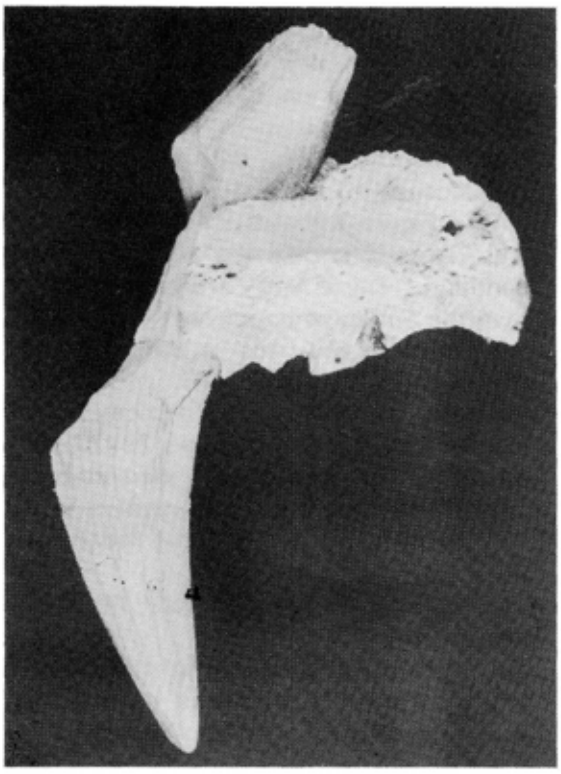


Figure 2.

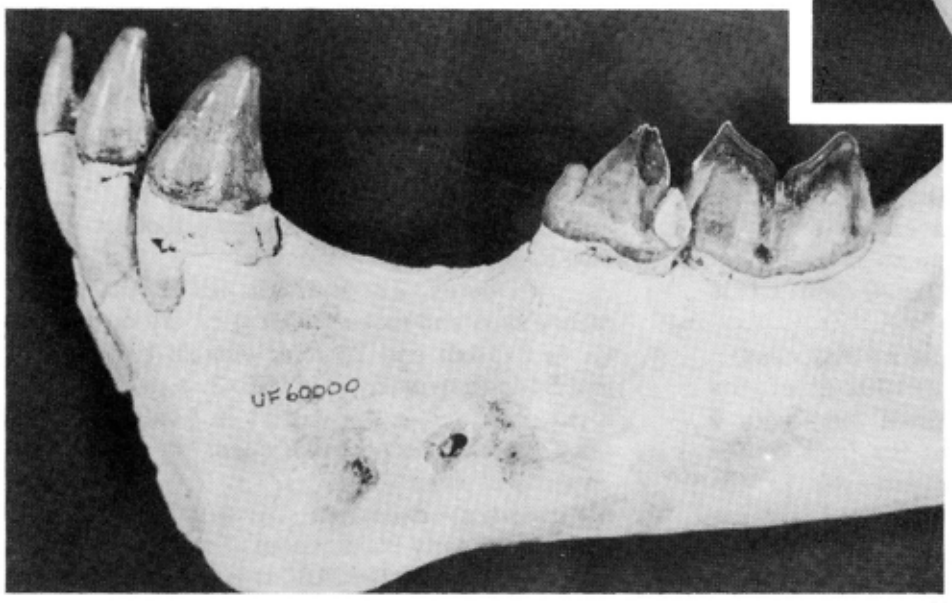
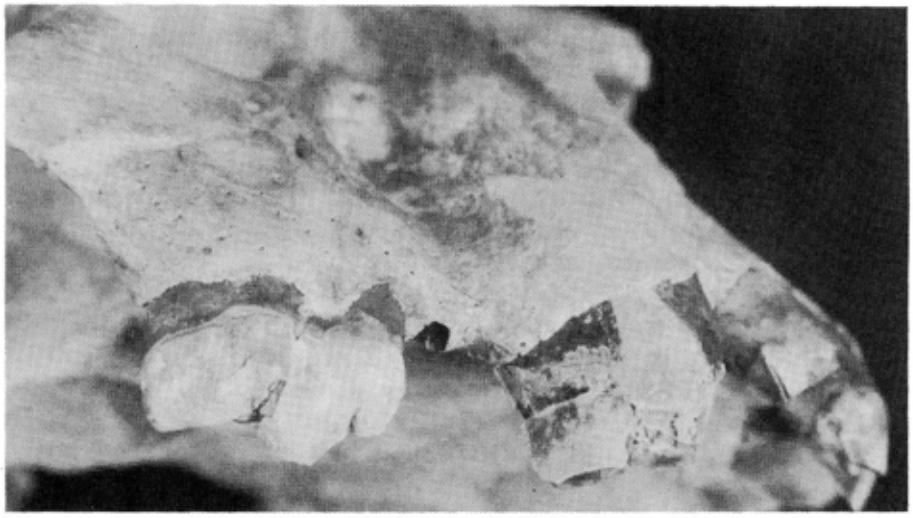
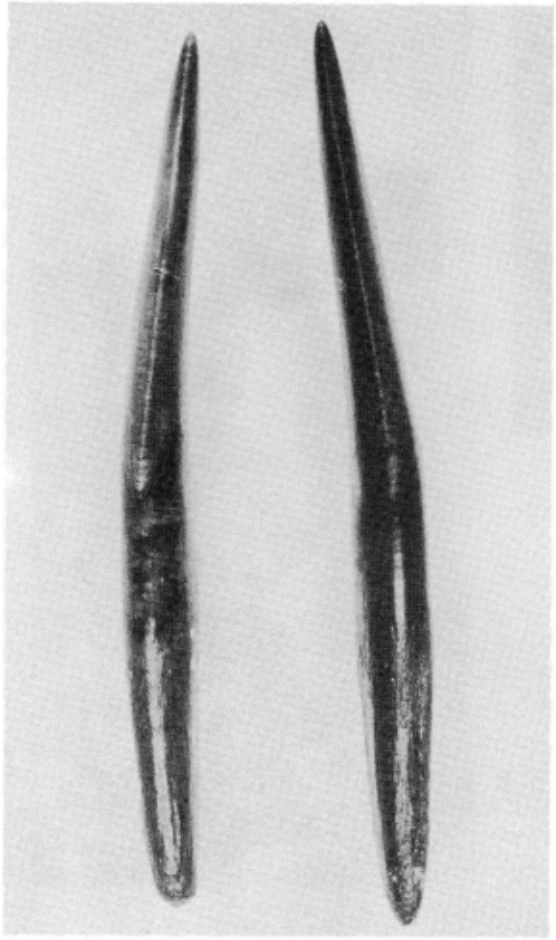


Figure 3.

Figure 4.





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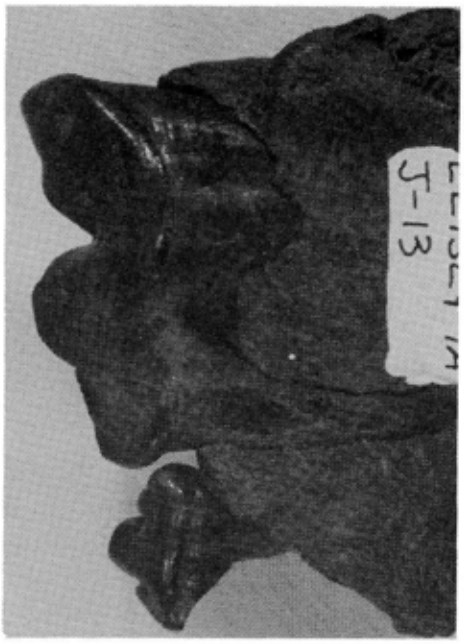

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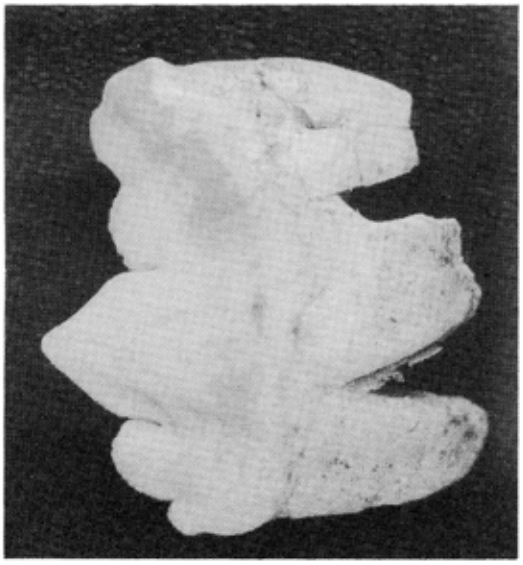

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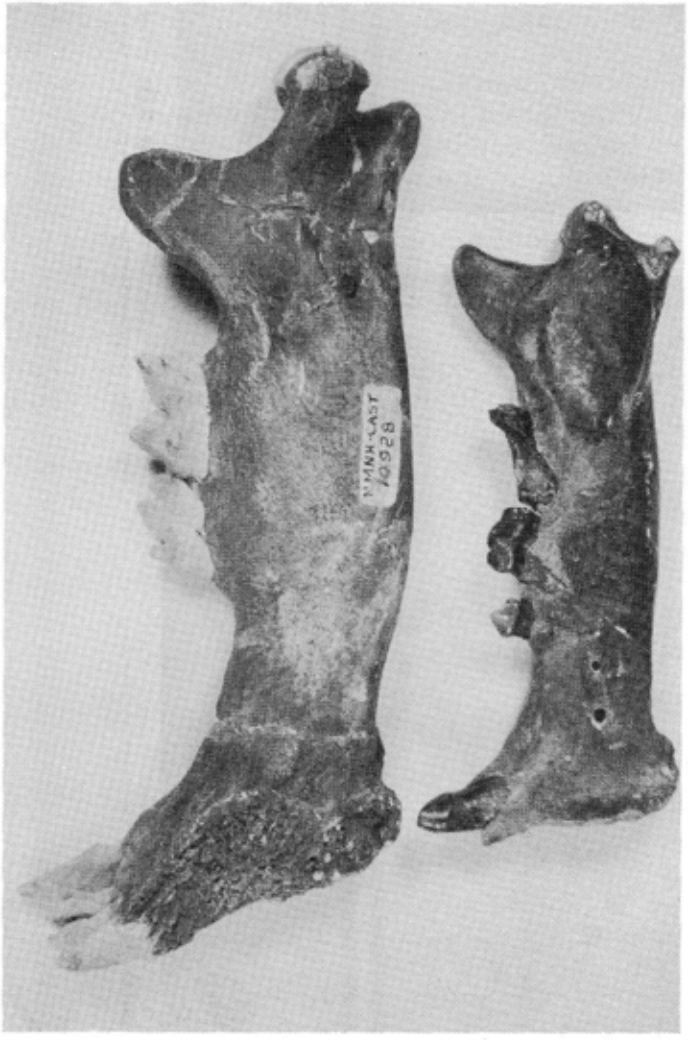

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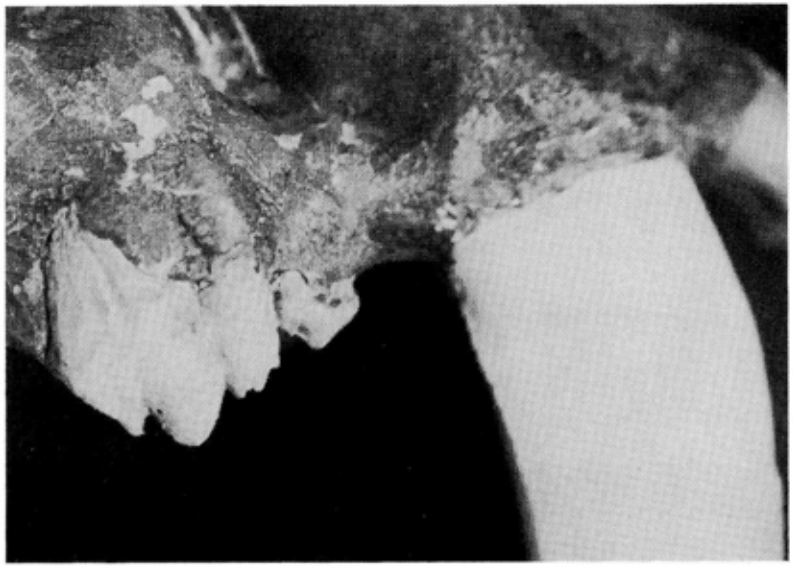

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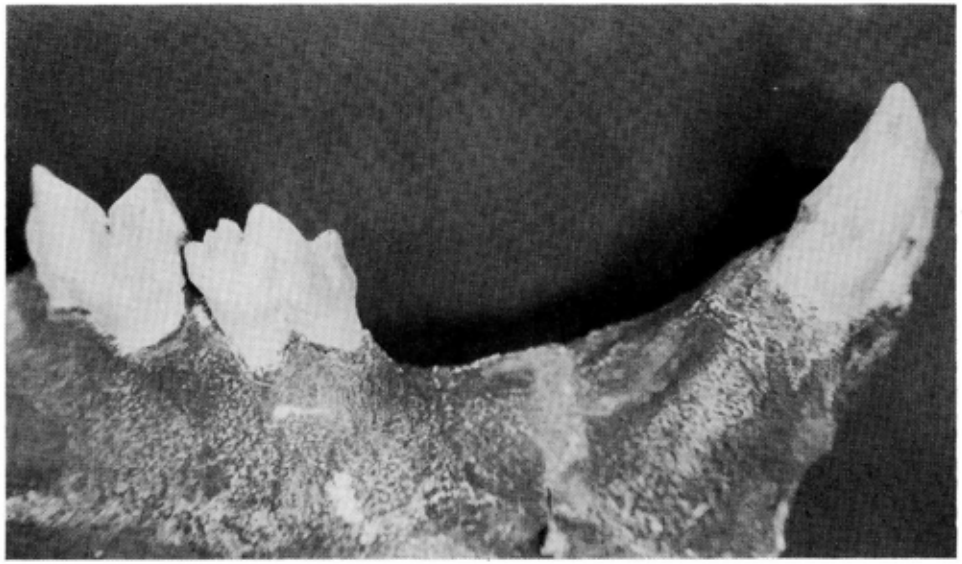

Figure 10.

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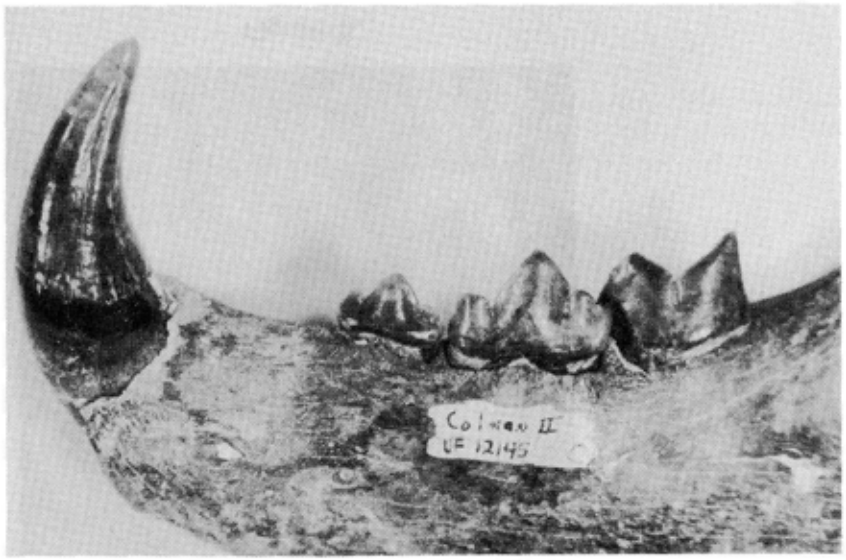

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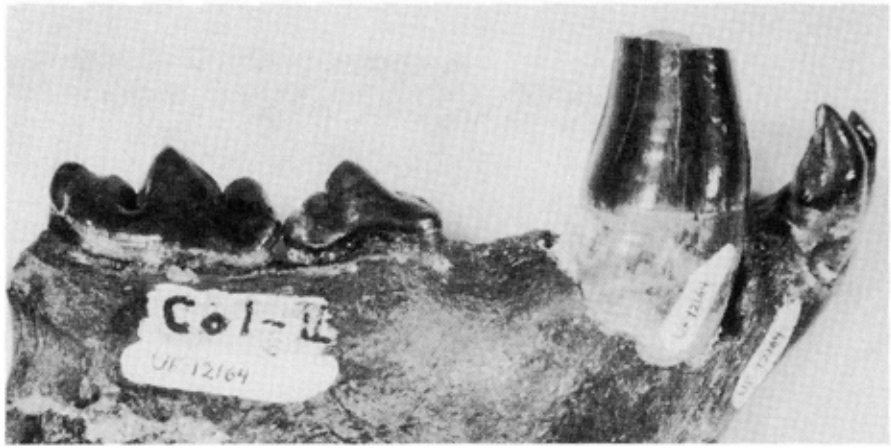

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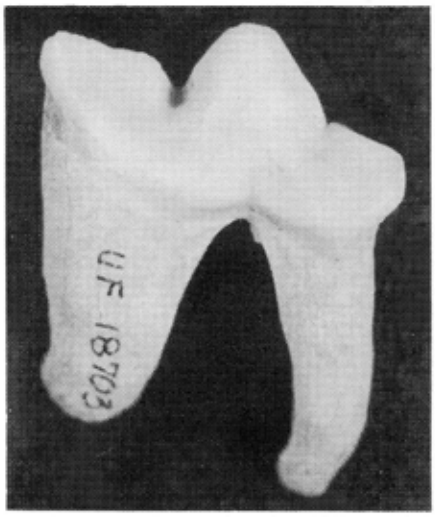

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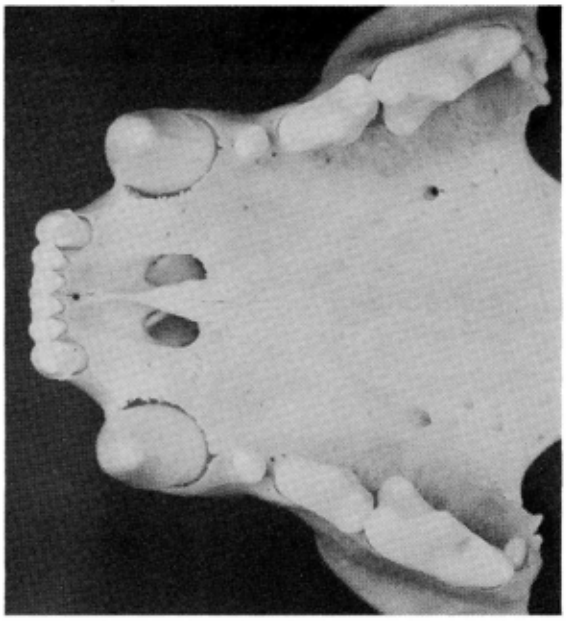

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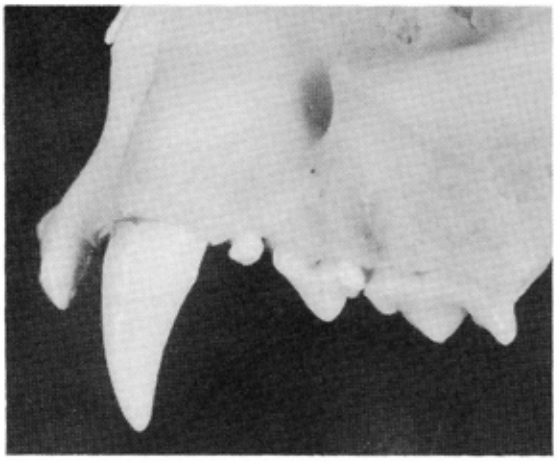

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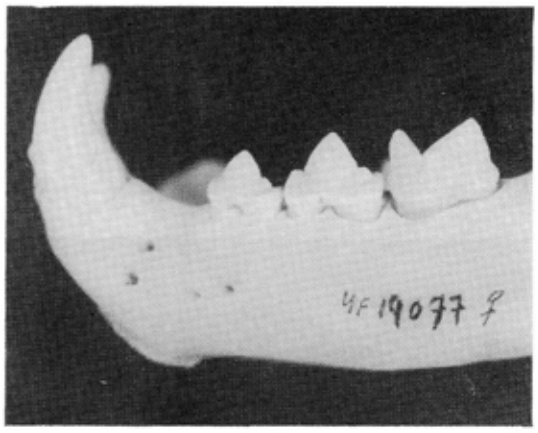

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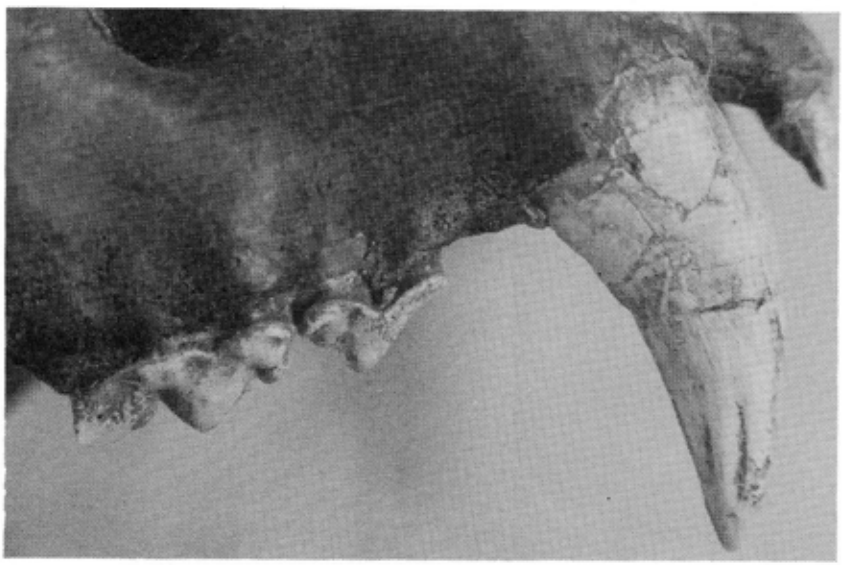

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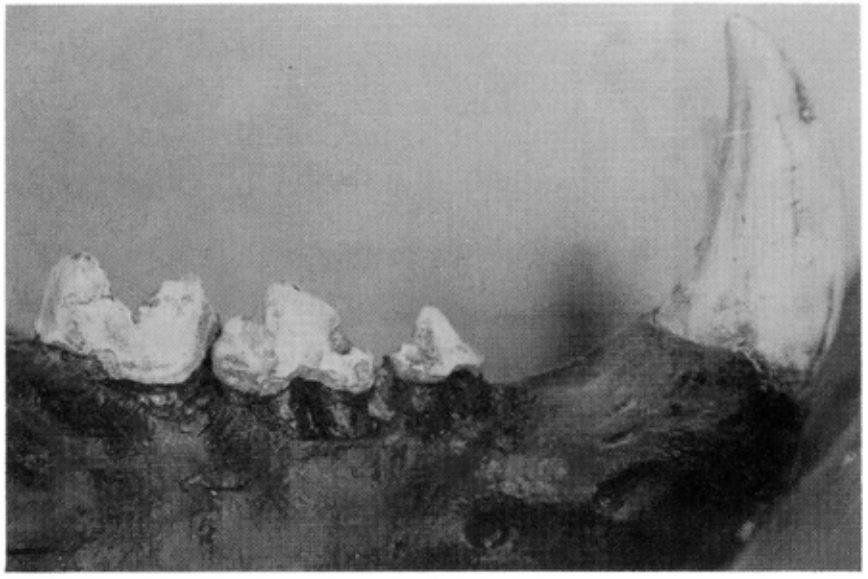
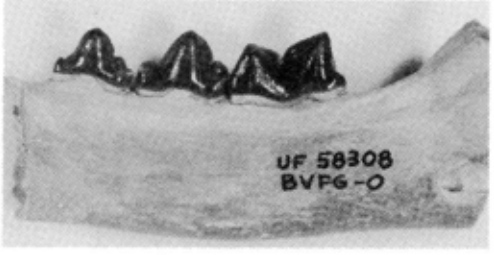


Figure 19.

Figure 20.



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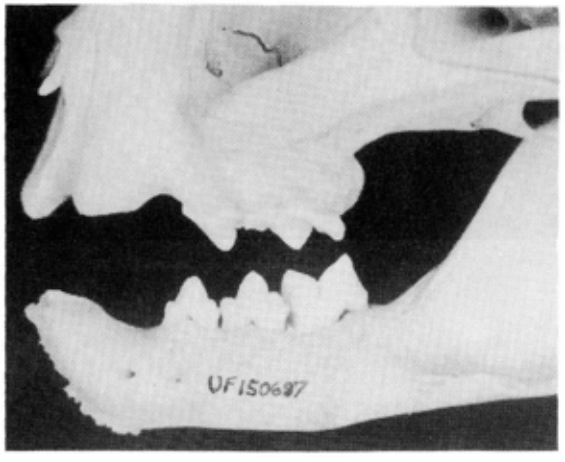

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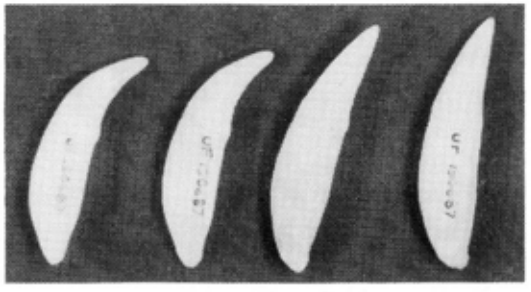

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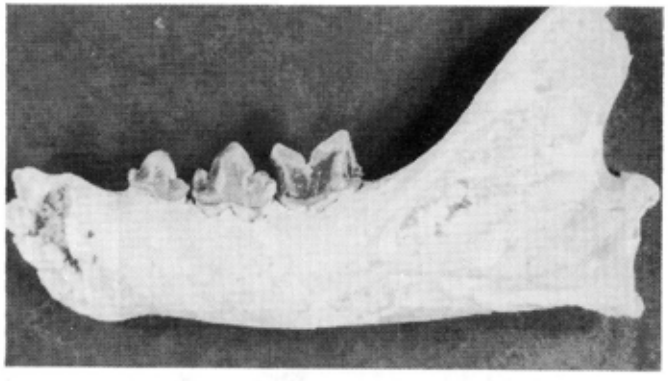
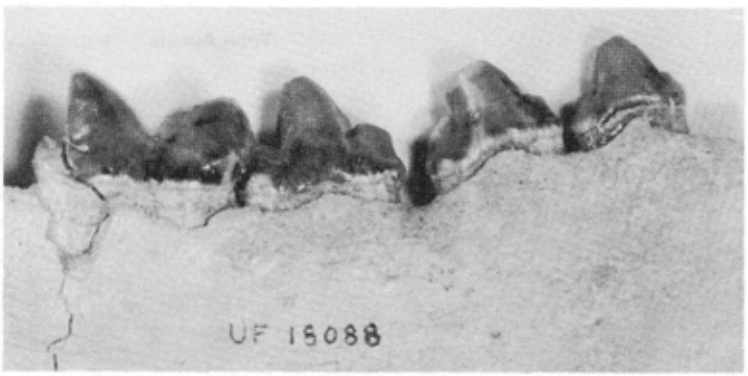


Figure 24.

Figure 25.



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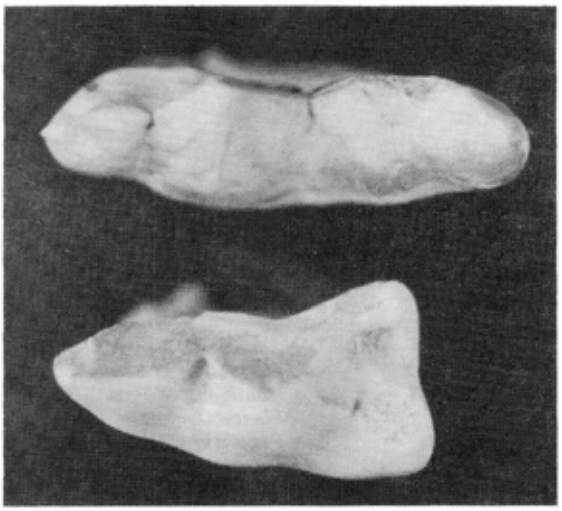

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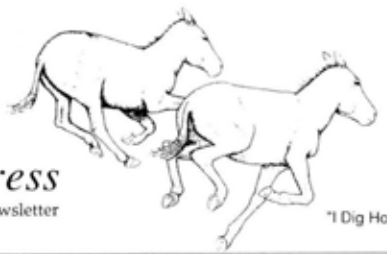

Pony Express

Florida Fossil Horse Newsletter

"I Dig Horses"

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Your donations will support the research and collections activities dealing with fossil horses and other extinct mammals at the Florida Museum of Natural History. Added benefits of your contributions include:

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Contribution $_____ Make payable to "Fossil Horse Fund"

Detach and return this form to: **Pony Express, Florida Museum of Natural History, University of Florida, Gainesville FL 32611** (use the special envelope if you so desire)

FLORIDA PALEONTOLOGICAL SOCIETY, INC.
STATEMENT OF ASSETS
27 October, 1995

ASSETS	
Cash	
Checking	$10,896.40
Savings	13,944.27
Total Cash and Credit	$24,840.67
Inventory	
Beach and Bank Collecting (2711 @ $1.14 ea.)	$3,090.54
Florida Fossil Shells (952 @ $4.36)	4,150.72
Handbook of Paleo Prep. (1332 @ $3.98)	5,301.36
Papers in Florida Paleo. (834 @ $1.50 and 59 @ $2.50)	1,398.50
Plaster Jacket (2030 @ $.50)	1,015.00
Butvar (20 lbs @ $4.52/lb)	90.40
Total Inventory	$15,046.52
Total Assets	**$39,887.19**

REVENUE AND EXPENSE REPORT
28 October 1994 - 27 October 1995

REVENUE	
Membership Dues	$5,181.50
Sales	
Publications	
Beach and Bank Collecting	6,918.75
Florida Fossil Shells	1,252.81
Handbook of Paleo. Prep.	948.75
Plaster Jacket	45.00
Papers in Florida Paleo.	87.00
Leisey Volume	1,725.00
Butvar	506.50
Miscellaneous	
Meetings	2,221.00
Auction	1,022.25
Other (refund from State)	648.00
Total Revenue	**$20,556.56**
EXPENSES	
Publications	
Beach and Bank Collecting (3504 Copies)	$3,980.03
Handbook of Paleo. Prep. (1500 Copies)	5,956.00
Papers in Florida Paleo.	93.71
Newsletter	2,551.74
Leisey Volume (200 Copies)	2,000.00
Postage	1,150.58
Miscellaneous	
Meetings	1,788.03
Office Supplies	237.74
State Filing Fee	68.75
Carpet and Installation	249.21
Filing cabinet	50.00
Other (bad checks)	80.00
Total Expenses	**$18,205.79**

FLORIDA PALEONTOLOGICAL SOCIETY, INC.
APPLICATION FOR MEMBERSHIP

Mail completed form to: Florida Paleontological Society
Florida Museum of Natural History
University of Florida
Gainesville, FL 32611

NEW_____ RENEWAL_____ MEMBER NUMBER (From Label)_____

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP CODE _____ TELEPHONE (___)-___-____

TYPE OF MEMBERSHIP

1. INDIVIDUAL ACTIVE ($15.00)_____
2. SUBSCRIBER ($15.00)_____
3. INSTITUTIONAL ($15.00) _____
4. GIFT (Mark Type) _____
5. FAMILY (3 or more. $25.00)_____
6. COUPLES ($20.00) _____
7. SUSTAINING ($50.00) _____
8. ASSOCIATE (Under 18 $5.00)_____

FAMILY AND COUPLES PLEASE LIST NAMES OF ALL APPLICANTS IF NEW.
PLEASE COMPLETE PERSONAL FACT SHEET BELOW IF NEW OR CHANGES HAVE OCCURRED SINCE PREVIOUS YEAR.

NOTE!! MEMBERSHIPS ARE FOR A CALENDAR YEAR AND ARE DUE NO LATER THAN JANUARY 1 EACH YEAR! PLEASE RENEW ON TIME!

(cut out and return form)

BIOGRAPHICAL FACT SHEET

1. NUMBER OF YEARS OF INTEREST IN PALEONTOLOGY __
2. WHICH BEST DESCRIBES YOUR STATUS: COLLECTOR__ OCCASIONAL DEALER __ FULL TIME DEALER __ PROFESSIONAL POSITION __ JUST STARTING __
3. PRIMARY AREAS OF INTEREST:

	VERTEBRATE	INVERTEBRATE	BOTANY	MICRO
PLEISTOCENE	__	__	__	__
PLIOCENE	__	__	__	__
MIOCENE	__	__	__	__
OLIGOCENE	__	__	__	__
EOCENE	__	__	__	__
EARLIER	__	__	__	__

4. LIST ANY PREFERRED TYPES (Horses, Sloths, Echinoids etc.)_____

5. LIST ANY PUBLISHED WORKS ON PALEONTOLOGICAL SUBJECTS.

6. DO YOU BUY _____ TRADE _____ FIND _____ FOSSILS?
7. LIST ANY SKILLS OR ABILITIES THAT MAY BE OF USE TO THE SOCIETY'S PROJECTS (RESTORATION, PREPARATION, COMPUTER USE, GRAPHICS SKILLS, SPEAKING, PHOTOGRAPHY, PUBLIC RELATIONS, WRITING, FUND RAISING ETC.)

8. LIST ANY UNUSUAL SPECIMENS FOUND, CIRCUMSTANCES UNDER WHICH THEY WERE LOCATED AND THEIR DISPOSITION.
PLEASE USE AN ADDITIONAL SHEET IF REQUIRED! THANK YOU!

Payments, contributions or gifts to the Florida Paleontological Society are not deductible as charitable contributions for federal income tax purposes. Dues payments may be deductible by members as ordinary or necessary business expenses. We recommend that you consult with your tax advisor.

FLORIDA PALEONTOLOGICAL SOCIETY, INC.

As stated in the Articles of Incorporation, "The purposes of this Corporation shall be to advance the science of Paleontology, especially in Florida, to disseminate knowledge of this subject and to facilitate cooperation of all persons concerned with the history, stratigraphy, evolution, ecology, anatomy, and taxonomy of Florida's past fauna and flora. The Corporation shall also be concerned with the collection and preservation of Florida fossils." (Article III, Section 1).

CODE OF ETHICS

ARTICLE IX

Section 1.	Members of the Florida Paleontological Society, Inc., are expected to respect all private and public properties.
Section 2.	No member shall collect without appropriate permission on private or public properties.
Section 3.	Members should make a sincere effort to keep themselves informed of laws, regulations, and rules on collecting on private or public properties.
Section 4.	Members shall not use firearms, blasting equipment, or dredging apparatuses without appropriate licenses and permits.
Section 5.	Members shall dispose of litter properly.
Section 6.	Members shall report to proper state offices any seemingly important paleontological and archaeological sites.
Section 7.	Members shall respect and cooperate with field trip leaders or designated authorities in all collecting areas.
Section 8.	Members shall appreciate and protect our heritage of natural resources.
Section 9.	Members shall conduct themselves in a manner that best represents the Florida Paleontological Society, Inc.

ANNUAL DUES for the FPS are $5.00 for Associate Membership (persons under age 18) and $15.00 for Full Membership (persons over age 18) and Institutional Subscriptions. Couples may join for $20.00, and Family memberships (3 or more persons) are available for $25.00. A Sustaining membership is also available for $50. Persons interested in FPS membership need only send their names, addresses, and appropriate dues to the Secretary, Florida Paleontological Society, Inc., at the address inside the front cover. Please make checks payable to the FPS. Members receive a membership card, the FPS newsletter, the Papers in Florida Paleontology, and other random publications entitled to members.

NEWSLETTER POLICY: All worthy news items, art work, and photographs related to paleontology and various clubs in Florida are welcome. The editors reserve the right not to publish submissions and to edit those which are published. Please address submissions to the Editors, Florida Paleontological Society, Inc. Newsletter, at the address inside the front cover.