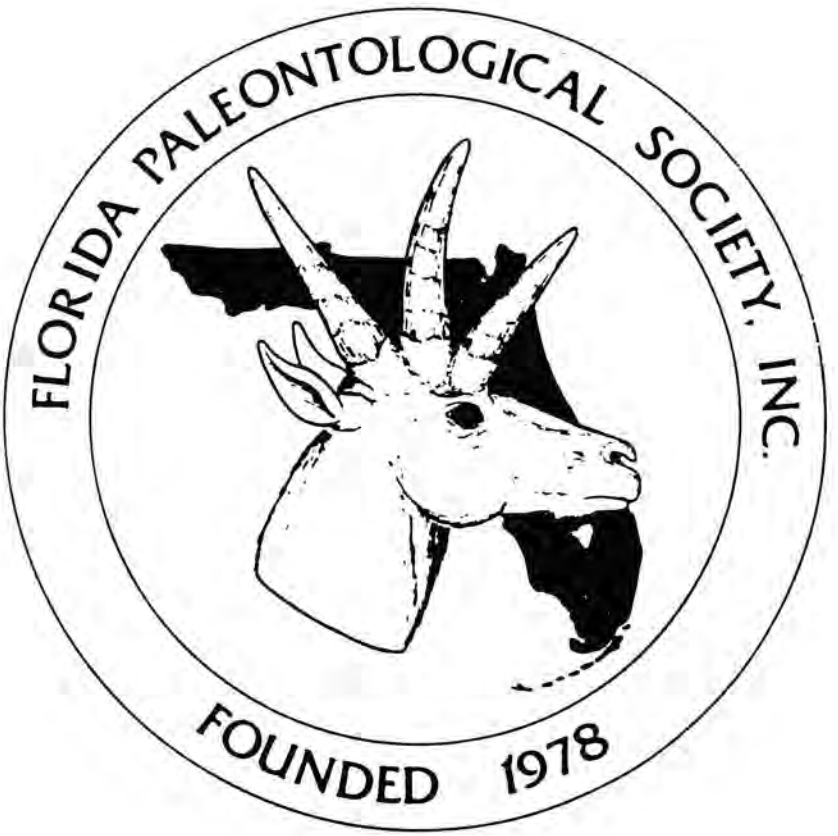
Florida Paleontological Society, Inc.

Newsletter



Volume 13 Number 1 Winter Quarter 1996

FLORIDA PALEONTOLOGICAL SOCIETY, INC.

OFFICERS

BOARD OF DIRECTORS

COMMITTEES AND APPOINTMENTS

Auction Committee:	S. Manchester
Book Committee:	R. Portell, B. MacFadden
Nominations:	Frank Rupert, Jim Toomey
Finance:	P. Whisler, R. Portell
Membership:	Eric Taylor, A. Brown, B. MacFadden
By-Laws:	A. Brown, Eric Taylor, Robyn Miller
Honorary Members and Awards:	A. Brown, J. Pendergraft
Historical:	Eric Taylor
Board of Editors:	R. Portell, F. Rupert, A. Brown, E. Taylor
Resident Agent:	Bruce MacFadden

HONORARY MEMBERS

Margaret C. Thomas Anita Brown Lelia and William Brayfield David Webb Gary Morgan
Clifford Jeremiah

INFORMATION, MEMBERSHIP, AND PUBLICATION INFORMATION

Please Address: Secretary, Florida Paleontological Society, Inc.
Florida Museum of Natural History
University of Florida
Gainesville, FL 32611

FLORIDA PALEONTOLOGICAL SOCIETY INC. NEWSLETTER

Volume 13, Number 1 Winter Quarter 1996

CONTENTS

Announcing

Paleofest96

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 7 for more details. Mark your calenders now!

1996 FPS dues are past due!

Please see page 23 for renewal form.

News Notes...

Spring Meeting Plans...

Plans for the 1996 FPS Spring Meeting are currently being finalized. The main event will be a collecting adventure to the Peace River, near Arcadia. The date is not final, but will likely be a weekend at the end of May or first part of June. Details will be provided to FPS members as soon as they are available.

Paleofest96...

Plans are also continuing for Paleofest96, a weekend-long extravaganza of special fossil displays, outstanding talks, paleo-socializing, and food and drink. Designed to correspond to the 20th anniversary of the FPS, the event will be hosted by the FPS and the Florida Museum of Natural History in Gainesville on November 8 and 9, 1996. See page 7 for more details, and mark your calendars now for this special event.

New Newsletter Column Coming...

FPS member Donna Lee Hawley, a lawyer and legal researcher, is going to write a series of articles on the subject of trespass and access. If you have any questions you would like answered or stories to relate, please contact:

Tara Legal Research and Writing
2442 N. Main Street, Unit 221
Gainesville, FL 32609-3007
Ph: (352) 373-2820 Fax (352) 378-7704

Along similar lines, the Newsletter is also continually soliciting paleontological articles from our members. If you have expertise in some branch of paleontology or just have an interesting fossil hunting story to tell, we welcome your input. David Thulman's recent series of "Whose Tooth Is This" articles are an outstanding example of member input to the newsletter. However, submissions to the newsletter need not be as long or detailed as these. Many are only a page long. Give it a try! The remaining deadlines for this year are July 15th for the Summer issue and November 15th for the Fall. Send your submissions to Eric Taylor at the Museum address or directly to Frank Rupert at the Florida Geological Survey, 903 West Tennessee Street, Tallahassee, FL, 32304.

In Memoriam...

As many of you know, long-time FPS member Mitchell Hope died in January from complications following heart surgery. Mitchell, an avid fossil collector, was a loyal supporter of the FPS. He was active in the Southwest Florida Fossil Club and also shared his knowledge and love of paleontology with children through his work with the Boy Scouts. He will be missed by all who knew him.

Mitchell's extensive collection has been donated to the Florida Museum of Natural History, where it may continue to fascinate and enlighten future generations.

Also, world-renowned malacologist Dr. R. Tucker Abbott died in November of last year from a long illness. Dr. Abbott was noted for his numerous books and articles on mollusks, appealing to shell enthusiasts of all ages. Most recently, Dr. Abbott was the founding director of the Bailey-Matthews Shell Museum on Sanibel Island, Florida. The museum is soliciting donations to establish *The R. Tucker Abbott Chair*, an annual public lectureship and educational program in conchological science. Donations toward this program may be made by check payable to:

Bailey-Matthews Shell Museum
P.O. Box 1580
Sanibel, FL 33957

Florida Geology on the InterNet...

Lithologic descriptions from nearly 4000 wells statewide is now available from the Florida Geological Survey homepage. The page provides instructions on downloading part or all of the data, which is arranged by water management district. The FGS homepage may be contacted at:

http://www.dep.state.fl.us/geo/index.html

Minutes of the March 10, 1996 FPS Board Meeting, Tampa Florida

The Board of Directors of the Florida Paleontological Society, Inc. met at the Tampa Bay Fossil Club's Fossil Fair on Sunday, March 10, 1996. The meeting was called to order by President Susan Pendergraft at 1:00 PM.

Present were:

Susan Pendergraft	President
Larry Ellis	Vice President
Eric Taylor	Secretary
Phil Whisler	Treasurer
Terry Selari	Board Member
Barbara Fite	Board Member
Tom Ahern	Board Member
Douglas Dew	Board Member
Steve Jacobsen	Member of the Society and President of the Tampa Bay Fossil Club.
Brian Ahern	Junior Member of the Society

The extent and level of participation of the Society in Paleofest 96 on November 8 and 9, 1996 in Gainesville were discussed. The Society is a co-sponsor of this event with the Department of Natural Sciences at the Florida Museum of Natural History. Significant financial resources had been requested of the Society by Dr. Bruce MacFadden who is the coordinator of the event for the museum. Following discussion, Phil Whisler moved that the Society authorize the contribution of $1,500 towards the cost of printing a commemorative poster for Paleofest 96, the expenses or the guest speaker and various administrative costs, provided that any profit so generated was allocated to the Department of Natural Sciences at the Florida Museum of Natural History. In return, the board requested that the first 100 FPS members to register for Paleofest 96 receive a free poster. The motion was seconded and carried.

Eric Taylor passed around the proposed "Memorandum of Understanding" regarding the merging of the Gary Morgan Memorial Scholarship Fund and the Florida Museum of Natural History's Britt Memorial Scholarship Fund in an endowed account to be administered by the University of Florida Foundation.

Following a recap of the items discussed at the Fall meeting in October 1995, Phil Whisler moved that the merger be authorized on the basis of the Memorandum of Understanding, provided that a signed contract be executed satisfactory to both sides. The motion was seconded and passed.

Eric Taylor reported that Roger Portell had arranged for the University of Florida Press to publish the plaster jacket book. It is expected that a contract containing a date for the completed work to be delivered to them for printing will be signed very shortly. It appears that a publication date of 1997 is likely!

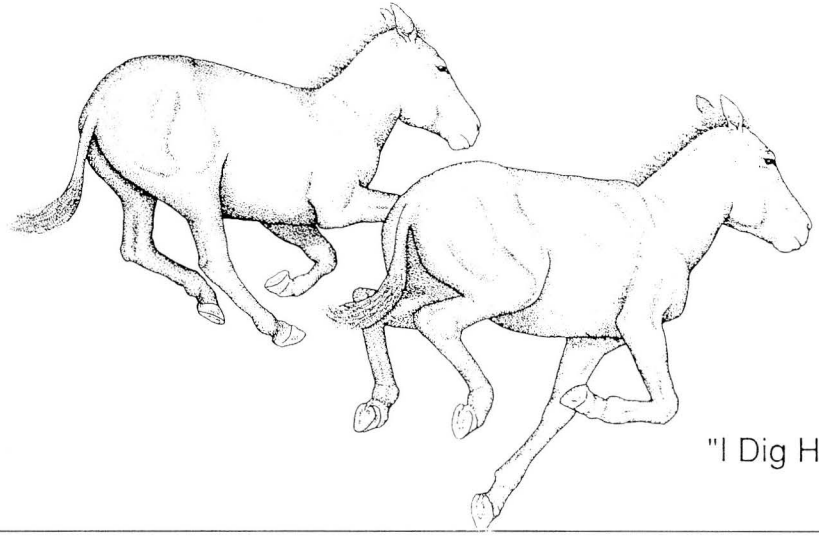
Eric Taylor also reported that new member Donna Lee Hawley of Gainesville has offered to do a series of articles on the laws of trespass and to provide a waiver form for use by the FPS in attempting to gain access to fossil sites otherwise restricted. Ms Hawley is a lawyer who specializes in research.

There being no further business, the meeting was adjourned.

Respectfully submitted,

Eric G. Taylor
Secretary

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!

Prep Talk

by Russ McCarty

Greetings from the bone lab. Spring is here early, or so it seems, but you won't find me complaining. It's the best time to be collecting fossils in Florida---for that matter, it's the best time to be doing ***anything*** outside, and I'll grab any excuse that presents itself to get out of the museum on a fine spring day. Alas, portents of the "long hot Summer" are upon us as evidenced by the recent spate of 85 degree days, so I'll soon be retreating to the cool catacombs beneath the museum to ponder mundane and chthonian matters.

Shades of Giant Ground Sloths

The Ameghino brothers, Florentino and Carlos, of Argentina, are without question the key figures in South American paleontology. Their prodigious efforts as collectors, authors, and researchers were carried out during the last two decades of the 19th Century and the first decade of this century. On more than one occasion, fragments of giant ground sloth, skin, hair, tissue, and bone, were brought to Florentino Ameghino for identification.

A few years ago, a visitor came to the museum to study giant ground sloth material in our collection. David Oren, our visitor, was an ornithologist working for a conservation group in the Amazon Basin of Brazil. During the course of his travels in the isolated backwaters of Brazil, Oren had listened to many stories from the natives about a frightening creature called the 'mapin guari', a tall bipedal beast with sharp claws and long reddish hair that roamed the countryside terrifying young and old with its eerie cries and strange visage. After doing a quick study of sloth skeletal anatomy here, Dr. Oren returned to the field in hot pursuit of his latest lead....a village where the natives had purportedly shot and killed a 'mapin guari'. With his new knowledge of sloth bones, Oren hoped the villagers could lead him to the remains of the dead creature, whereupon, he could prove once and for all that mylodont ground sloths had survived into the 20th Century A.D. **Completely farfetched....??** Not, if you think like a cryptozoologist. After all, there are vast areas of the South American continent which are still relatively unknown and new species are frequently discovered there. National Geographic gave Oren a grant to pursue the "mapin guari", and a British film company will feature him and his quest, and our VP department on a sister show to PaleoWorld.

Safety in the Field

Roger Portell, collection manager for the museum's invert paleo collection just returned from Jamaica where he was collecting Eocene fossils with Daryl Domning. In his pursuit of sun and fun, Roger suffered a broken pelvis during the collapse of a river bank in which he was excavating fossils. Fortunately, Roger is doing well, scurrying around the museum like a crab on crutches. I don't know if it's any consolation to him, but Roger did manage to find remains of one of the earliest known sea cows as well as the earbone of a primitive whale.

Roger's incident brings up the very important issue of safety in the field. Any serious collector in Florida can relate a story or two about another collector who was injured in the field. There have even been a few deaths in the amateur community. And here at the museum, we had a grad student who drowned while collecting invertebrate shells several years ago.

Safety in the field is largely a matter of common sense and adherence to a few basic rules of safety. After our grad student died, the first rule of safety for us became: **"Never go into the field by yourself!"**. The grad student drowned in shallow water when he stepped off a sand bar into a deeper hole. Had he been able to swim or even dog paddle ten feet, he would have been standing again on shallow water beach. Of course, having a companion there who could swim would have saved his life.

Cave-ins, or collapses, such as Roger experienced, are not uncommon when working in soft, friable soils and are probably the leading cause of death from field accidents.. Trenches and pits deeper than the collector's height are not advisable when working in such matrix. And as Roger can testify, river banks, can be especially treacherous. **No fossil is worth your life!**

Another common sense rule is: **"Know your own physical limitations!"** Working in the field during a Florida summer day can be extremely stressful, even for 20 year olds, and as most of you know, fossil collecting attracts people of all ages, including many in their fifties, sixties, and seventies. I've seen more than one case of sunstroke, and have, in fact, experienced two episodes myself. Health problems that occur more frequently in older individuals, such as cardiovascular problems, are certainly aggravated by heat and exertion. Again, to use myself as an

example, after a heart attack six years ago left me with a blocked artery, and by-pass surgery not advisable in my case, I have angina pain upon exertion. I can still go into the field and work, but I pick and choose my times and always carry nitroglycerine tablets with me. Heat related problems can be minimized by drinking plenty of water, resting frequently if you're really humping it, wearing hats and other protective clothing against sun exposure, working under a tarp, or by just avoiding the field during extra hot, humid days (also by doing field work in Alaska!).

Before going into an area to collect you should know a few things about the area in which you are going to collect. **Know the terrain!** If you're walking into a one thousand acre tract which is new to you, it is wise to have a topographic map with you. After the map has informed you that you are lost, it can tell you, not only how to get out, but where you might find water and where the quicksand is located so you don't step in it. Are you collecting in a mining area? If so watch out for heavy equipment and be sure to wear a hard hat. In quarries, the vertical face of rock left over from mining is often unstable and can fall with little or no warning. When I'm in a limerock quarry, I am always very cautious around the vertical rock walls. Look at any ten and you will see evidence of collapse in most of them. Caves---well, if you're collecting in a cave, I assume you're a member of the Speleological Society or some caving club and have proper training in caving techniques. If not---you're probably going to become a fossil and should read the poem at the end of this article. In this day and age, there's probably another very valid question to ask about the terrain and that is: 'Is the area a toxic waste dump?' Unless, you fancy yourself the "Toxic Avenger" and look forward to bouncing those two-headed grandchildren on your knee, toxic waste is not something to muck about in safely. Toxic waste can be inhaled, absorbed through the skin or eyes, or ingested, so learn about the area before you go digging into it.

Another thing to know about the area is: 'What **kind of critters am I going to encounter here**?' If you're going to collect on Sea Horse Key off of Cedar Key, you will definitely want to wear snake leggings or boots and carry a snake bite kit, since Sea Horse Key has more water moccasins per acre than any other place on this planet. So, when you're in a area of poor visibility or a likely area for venomous snakes, be prepared. Likewise, if you're allergic to wasps or bee stings, or ant bites, take precautions and be sure to carry medication with you. Of course you will want to avoid large carnivores which can make a meal of you, but as a general safety rule you should avoid any wild animal which is acting strangely, and any nocturnal animal which is out in the daytime. Avoid any bats on the ground. Such behavior is a symptom of rabies. Let me see---how else can I scare you? Well, for starters, serious respiratory diseases, all caused by airborne funguses, such as blastomycosis, coccidioidomycosis, cryptococcosis, histoplasmosis, and mucormycosis can be contracted by breathing spores in dirt. By wearing masks and wetting the dirt these problems can be minimized. The possibility of contracting mosquito and tick-borne diseases such as encephalitis, tick fever, and Lyme Disease is higher in some areas and should make you take a few precautions. In a tick infested area, check frequently for ticks. Keep pants tucked into socks and wear light colored clothes so ticks are visible and can be picked off. Wild mice, rats, other rodents, and rabbits can carry, through their excrement, fleas, and body parts, deadly diseases such as plague, hantavirus, and tularemia. You may contact the Centers for Disease Control for information about bio-hazards which may be present in the area in which you intend to do fieldwork. As a last few words of advice I would say always carry a first aid kit in the field with you, and have a least one person in your field crew who is trained in first aid and CPR.

Now, if you've followed all of my advice you should be prepared for any misadventure that might befall you (and you'll probably never go into the field), but please give it some serious thought before you go into the field this year. As the old saying goes, "an ounce of prevention is worth a pound of cure."

This classic Ogden Nash poem was floating around the museum and I thought I share it:

Last night in the museum's hall
the fossils gathered for a ball.
There were no drums or saxophones,
but just the clatter of their bones,
a rolling, rattling carefree circus
of mammoth polkas and mazurkas.
Pterodactyls and brontosauruses
sang ghostly prehistoric choruses.
Amid the mastodonic wassail
I caught the eye of one small fossil.
Cheer up, sad world, he said, and winked---
it's kind of fun to be extinct.

Ogden Nash, "Carnival of the Animals"

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

FLORIDA MUSEUM OF NATURAL HISTORY

Department of Natural Sciences
Museum Road, University of Florida
Gainesville, FL 32611-2035 U.S.A.

Main Museum Phone: (352) 392-1721

Paleofest96

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!

Avocational Paleontology: The Best of Both Worlds

by Dean L. Sligh
Florida Fossil Hunters
Space Coast Fossil Hunters

Nine to five, Monday through Friday, their feet are firmly anchored in the late 20th century. Their minds are committed to survival in today's complex and highly competitive society; and their time and energies are almost completely expended in that effort. Then, as a new weekend is born, the avocational paleontologist slips off the shackles of conformity and enters the world of way long ago. SCUBA diving in the Santa FE, beach hunting on the Gulf coast, searching the phosphate mines of Bone Valley, or exploring shell quarries of the Atlantic coast, today's non-degreed paleontologists are truly citizens of two worlds.

The earth does not easily give up its secrets of the past and the professionals have relatively little time available for "exploring". The weekend fossil hunter, on the other hand, is able to pursue his or her labor of love with a fierce determination bent on finding the biggest, the best preserved, the greatest number, and yes, the *previously unknown*!

Only in the "amateur community" can ***14 year old*** fossil hunter Jeremy Smith, member of the Florida Fossil Hunters, find a six inch shark tooth on the outskirts of Orlando, giving proof of the existence of the world's largest sharks swimming over what is now downtown Orlando. And earlier this year ***7 year-old*** fossil hunter Gregory Crompton of the Space Coast Fossil Hunters found a nearly perfectly preserved Tilly Bone, which will become part of the permanent collection and on-going study of these strange manifestations in bony fish at the Smithsonian.

And of course the "frosting on the cake" occurs when the Avo-paleost, through hundreds of hours of OJT and self-education, has gained the respect of professionals. At this point synergism takes over and the results are truly greater than either group can achieve alone. A perfect example of this is the excavation last summer of the fossil whale material from the Melbourne land fill site. The professionals at the FLMNH did not have sufficient time to allocate for a field project of this size. And without knowledge gained in past excavations, numerous lectures by the pros, and on-going advice by FLMNH's Russ McCarty, the Florida Fossil Hunters group would not have been able to achieve the recovery of this significant material. After viewing the material last December, marine mammal expert Dr. Larry Barnes of the L.A. County Museum of Natural History estimates there are at least six individuals represented, including probably four species both toothed and baleen, two about 50 feet in length and one 75 to 85 feet.

And picking up where the FFH left off, the newly-formed Space Coast Fossil Hunters are systematically exploring the Brevard County area for additional fossil sites. In the past two months they have been able to determine that the numerous Tilly Bones found at the whale site are not an isolated occurrence but are known in various shell quarries in the Brevard area. Also, the group has discovered a large oyster bed with preliminary age estimates of 1.5 to 2.0 MYA.

Avocational paleontology is unquestionably a Win-Win situation.

New Species of Planorbidae and other freshwater mollusks from Pleistocene Lake Okeelanta, Southern Florida

by Brian L. Schnirel
Department of Geology
Florida Atlantic University

Editor's Note: *Brian was one of our annual FPS Student Research Award winners.*

Lake Okeelanta, recently discovered and named (Petuch 1988, 1992) underlies the present Everglades basin of southern Florida. Having formed during the Kansan glacial time of the mid-Pleistocene, this freshwater lake was over three times larger in surface area than modern Lake Okeechobee and contained areas over six times as deep. Based on canal dredging from the depocenter of the paleolake, the area is characterized by charophyte calcarenites (calcareous marls). Composed of chara algae phytoliths varying from a fine-grained, light colored, somewhat sandy matrix to an extremely fine-grained (approximately 1/16 mm) chocolate brown to gray matrix.

Present day development activities, including canals and road construction, have revealed rich deposits of Lake Okeelanta mollusks. Foremost among these was a previously unrecognized species radiation of the gastropod genus *Seminolina* (Family Planorbidae). To date only a few random collections of Lake Okeelanta mollusks have ever been studied.

Of the many species of *Seminolina* recognized in the Okeelanta calcarenite beds, nine were found to be new to science and are described here. These new additions to the Florida Pleistocene freshwater gastropod fauna include the planispiral taxa *Seminolina myodiscus* n. sp., *S. petuchi* n. sp., and the scalariform taxa including *S. alessandrae* n. sp., *S. ameliannae* n. sp., *S. cocythus* n. sp., *S. keratoconus* n. sp., *S. pietropauli* n. sp., *S. susanae* n. sp., and *S. viperean* n. sp. Two Lake Okeelanta species groups are recognized: the discoidal group and the high-spired cylindrical group.

Of the three species of the gastropod genus *Viviparus* extant in the Okeelanta calcarenite material, two are new to the scientific community. The new additions include *Viviparus howardjohni* n. sp., and *V. alessandrae* n. sp. Accompanying the existing species of Okeelanta apple snail (*Pomacea paludosa*) is the new species *P. ductor*. At present, there are two gastropod species of the genus *Stenophysa*: *S. meigsii* and *S. alessandrae* n. sp. There appears to be at least one new species in the genus *Fontigen* - *F. johnstoni* n. sp. Unfortunately, due to the diminutive aspects and fragility of these specimens, *Fontigen* fossils are uncommon in the Okeelanta record.

In addition to the gastropod fauna of Lake Okeelanta, there exists at least two species of marsh clam, family Mactridae. One has been named *Rangia blakei* n. sp. Also, the number of species of *Corbicula* clams has increased to two with the addition of *C. duovicesimus*.

WHOSE TOOTH IS THIS?

Carnivora Part II

by David Thulman

This installment describes the teeth of Canidae (wolves and foxes), Ursidae (bears), Procyonidae (raccoons), Lutrinae (otters), Phocidae (seals), and Odobenidae (walruses). Unless otherwise noted, measurements are in millimeters and are listed as mesial-distal (front-back) Length of crown x Height of crown x labial-lingual Width of crown.

Phocidae (true seals)

In the Pleistocene, this family includes the monk seal (*Monachus*) and at least on other smaller genus. Their diet consists of a variety of fish and invertebrates, hence they have a more generalized dentition. They lack pronounced carnassials and the post-canine teeth are similar to one another.

Monachus tropicalis (late Pleistocene)

Figure 1 is a cast of a left mandible. From left to right the dimensions are 10x6x8, 13x6x7, 16x6x8, 16x6x8, 13x6x7. The teeth are notable for their distinct striations

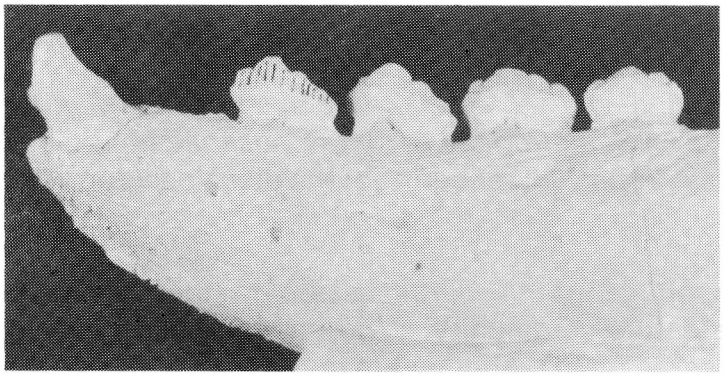


Figure 1.

running from the top to the base of the crown (enhanced on the second tooth), and a prominent ridge encircling the base of the crown.

Odobenidae (walruses)

Walruses have large ever-growing upper canines (tusks) which may reach a meter in length. The post-canine teeth are similar to one another and are more peg shaped than blade-like.

Trichecodon huxleyi (very early Pliocene)

Figure 2 (UF154283) is a section of a tusk. The surface has parallel deep grooves (arrow) and the cross-section is ovate, 91mm x 55mm.

Procyonidae (raccoons)

Procyon lotor (raccoon) (middle to late Pleistocene)

Raccoons have an omnivorous diet which is reflected in their dentition. The molars are more broad and low-crowned and they lack pronounced carnassials. The raccoon dental formula is 3/3, 1/1, 4/4, 2/2. **Figures 3 and 4** (UF95078) are a modern raccoon. C^1 is 14x8x5, while the crown of c_1 is 12mm high. The arrows indicate where the canines are occluded. M^1 (arrow A) is 8x8x5. All the crowns on the molars and premolars are 5mm or less in height.

Mustelidae (weasels, skunks and otters)

The Florida fossil record contains a variety of small mustelids which may be quite difficult to distinguish without a comparative collection. Their diet is omnivorous, though mustelids are primarily flesh-eaters. Most mustelids have more pronounced carnassials than procyonids.

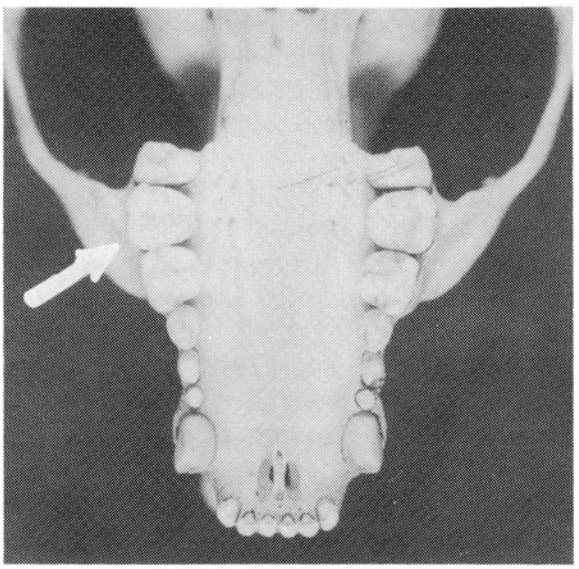
Lutra canadensis (river otter) (late Pleistocene)

River otters have a diet consisting mainly of fish and invertebrates. The otter dental formula is 3/3, 1/1, 4/3, 1/2. **Figures 5 and 6** are a modern otter. C^1 (arrow A) is 11x8x5, p^4 (arrow B) is 12x5x12, m^1 (arrow C) is 9x5x11, c_1 (arrow D) is 11x5x5, m_1 (arrow E) is 14x5x7.

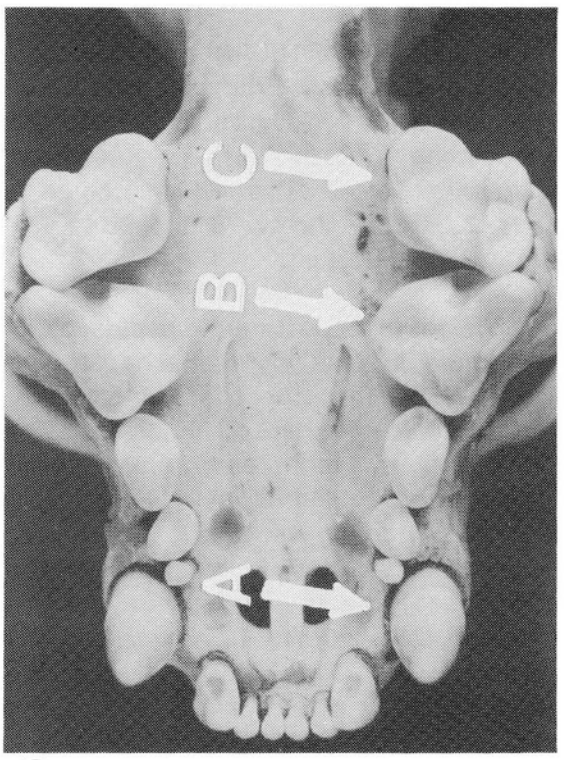
Canidae

The canids in the Pleistocene of Florida can be divided into the foxes (*Urocyon* and *Vulpes*) and wolves and dogs (*Canis*). The dental formula of canids is 3/3, 1/1, 4/4, 2/3.

Figures 2 - 6

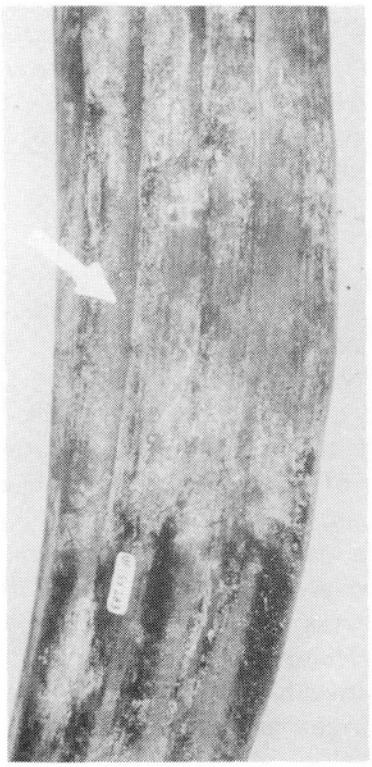


3

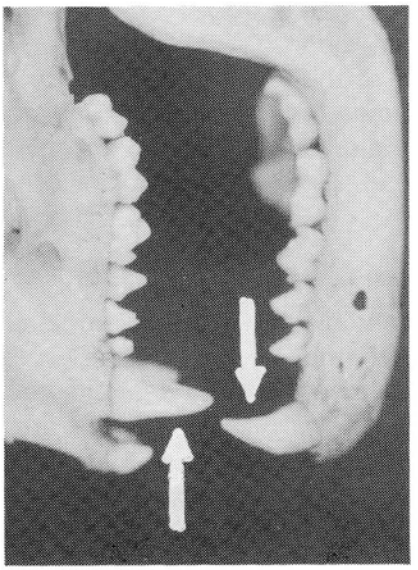


5

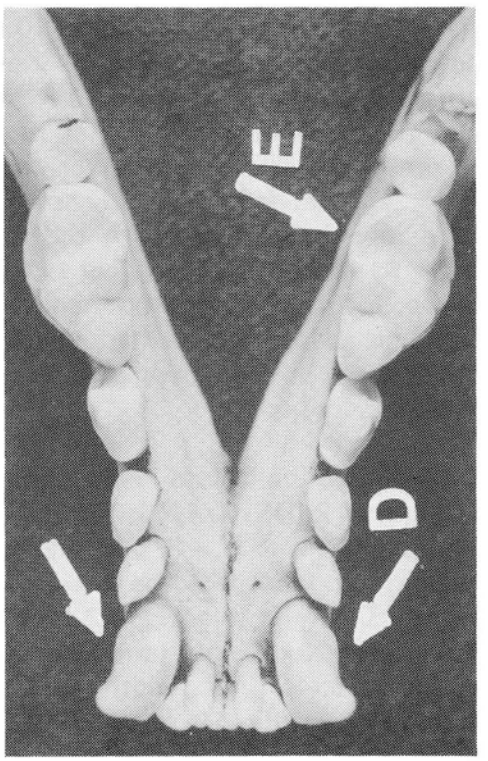
2



4



6



Urocyon cinereoargenteus (gray fox) (late Pleistocene)

Figure 7 (UF18060) shows a lower mandible of fossil *Urocyon*. M_1 (arrow) is 12x4 (no width). **Figure 8** (UF150685) are the loose teeth of a modern *U. cinereoargenteus*. The largest canine (arrow A) is 22x5x3. Arrow B indicates m_1 and arrow C indicates p^4.

***Canis* sp.**

The teeth of different species of wolves have more or less identical shapes but vary size. While the Checklist of Florida Fossil Vertebrates by Richard C. Hulbert, Jr. (1992, FPS Papers in Florida Paleontology No. 6) lists eight species of *Canis* (including coyotes and domestic dogs) from the Pliocene and Pleistocene, I have illustrated only two examples of the more common wolves: *C. dirus* and *C. edwardii*. *C. edwardii* is found in the early Pleistocene and *C. dirus* in the late Pleistocene. The teeth of *C. dirus* are about 50% larger than those of *C. edwardii*.

C. edwardii (early Pleistocene)

Figure 9 is the left mandible from the buccal, or cheek, side. **Figure 10** is an oblique view of the same mandible from the lingual, or tongue, side. The vital statistics: P_1 is 6x5x4, p_2 is 10x6x4, p_3 is 12x6x4, p_4 is 13x7x5, m_1 is 24x12x9, m_2 is 10x4x7. The A and B arrows in **Figure 10** show the chewing surface on m_2 and the posterior surface of m_1. **Figure 11** (UF63623, UF62566) shows a m^2 (labial side towards the top of the photo) and lower canine (labial side). Viewed from the side, m^2 is shaped like a low-slung chair, with the lingual side (arrow A) of the tooth hugging the side of the maxilla. Arrow B on the canine shows a diagnostic ridge (which has been enhanced with a black line) running the length of the crown in canids.

C. dirus (dire wolf) (late Pleistocene)

Figure 12 (UF17717) is the right mandible from the labial side. The arrow shows the shearing surface of the m_1, the lower carnassial. P_1 is missing, p2 is 15x9, p_3 is 17x7, p_4 is 20x10, m_1 (arrow) is 36x17, and m_2 is 19x4 (no width measurements recorded). **Figure 13** (UF81672, UF52851) shows the difference between a *C. edwardii* and *C. dirus* m_1. The arrows shows a small cusp useful in distinguishing canids from felids. **Figure 14** (UF80662, UF3986) shows the difference between a *C. edwardii* and *C. dirus* p^4.

Ursidae

Four bears roamed Florida in the Pleistocene: the tremarctines, *Arctodus pristinus* and *Tremarctos floridanus* (short-faced bear); and the ursines, *Ursus americanus* (black bear) and *Ursus arctos* (brown bear). The spectacled bear of South America is the only extant tremarctine. The ursid dental formula is 3/3, 1/1, 4/4, 2/3. The diet of bears is omnivorous. The cheek teeth are low-crowned with broad rounded cusps. The bears lost all of the shearing function of their carnassials, so that the p^4 and m_1 function as grinding teeth. Except for the canines, the teeth of bears are easily distinguishable because the crowns are relatively flat.

Arctodus pristinus (early late Pliocene, very late Pliocene to early Pleistocene)

Figure 15 (UF81692) is a right mandible. P_4 is 11x7, m_1 (arrow) is 26x15, m_2 is 26x12 (no width measurements recorded).

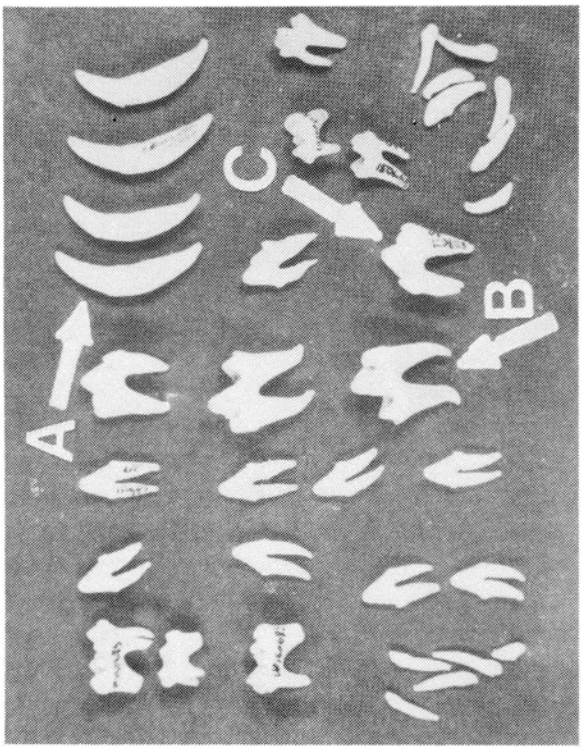
Ursus Americanus (black bear) (late Pleistocene)

Figures 16 and 17 and 18 (UF3250) are a modern female. C^1 is 16x24x10, p^4 (arrows) is 8x6x7, m^1 is 18x6x13, m^2 is 24x6x15. C_1 is 14x24x10, p_4 (arrow) is 6x5x5, m_1 is 17x6x9, m_2 is 18x6x11, m_3 is 15x5x11.

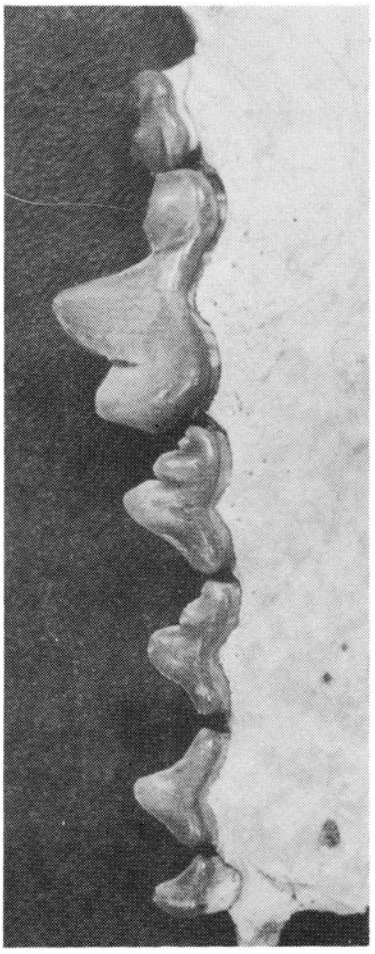
Discussion

Now for the challenge: how do you identify individual teeth? As always, size is an important diagnostic clue. Although the premolars of many carnivores have a similar shape, the size of the tooth will likely eliminate most of the potential candidates. Likewise, the age of the deposit will narrow the potential choices.

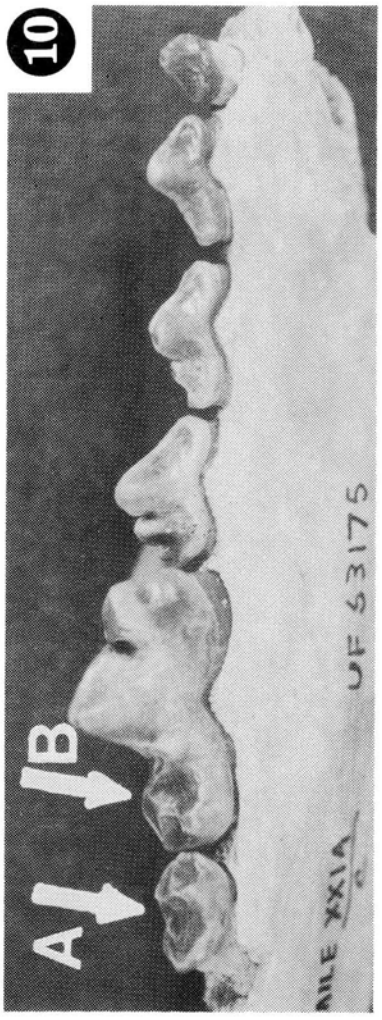
Canines. The canines of felids, canids and ursids are similar. **Figure 19** (UF5690, UF12154) are canines from *Arctodus* (arrow) and *Felis onca*. There are serrations on *F. onca* which are invisible but you can feel them with your fingernail. The root of the



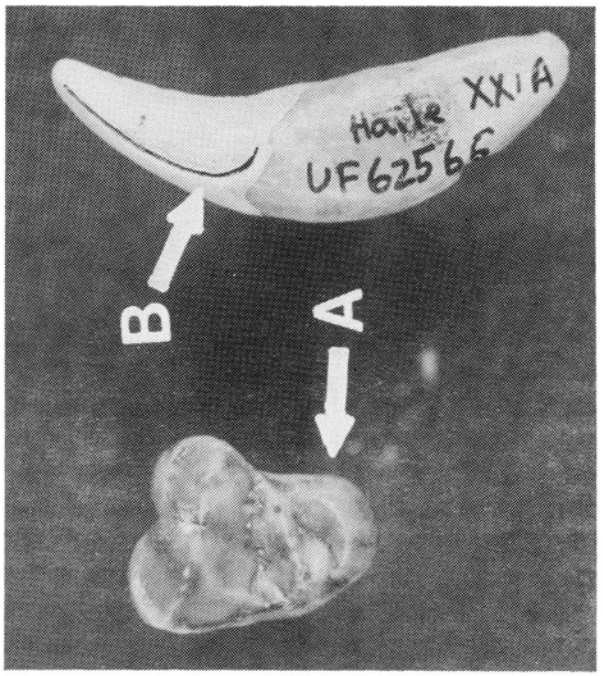
8



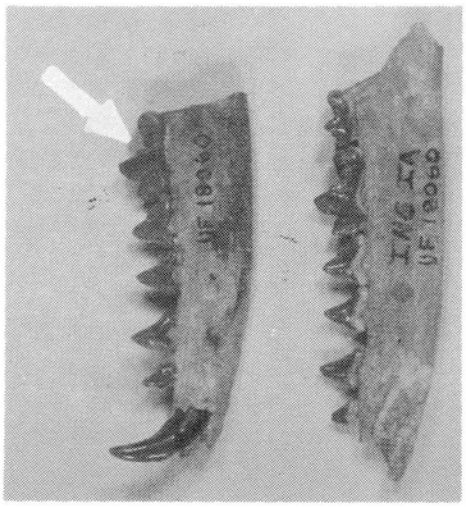
9



10



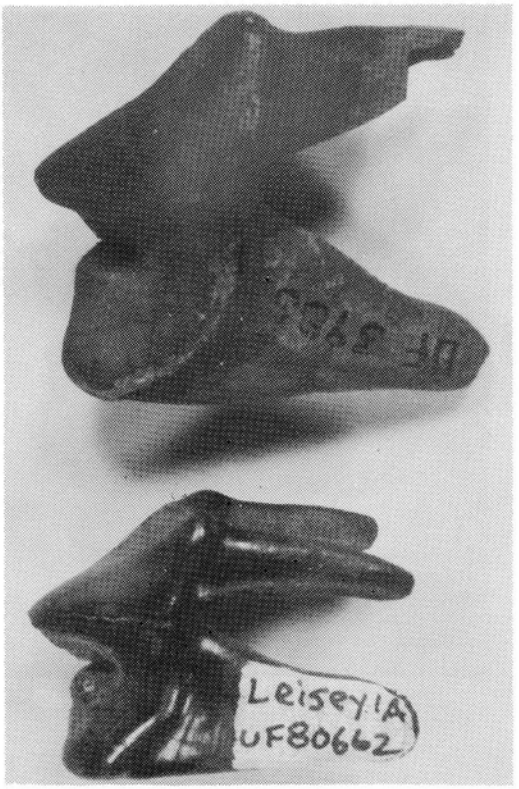
11



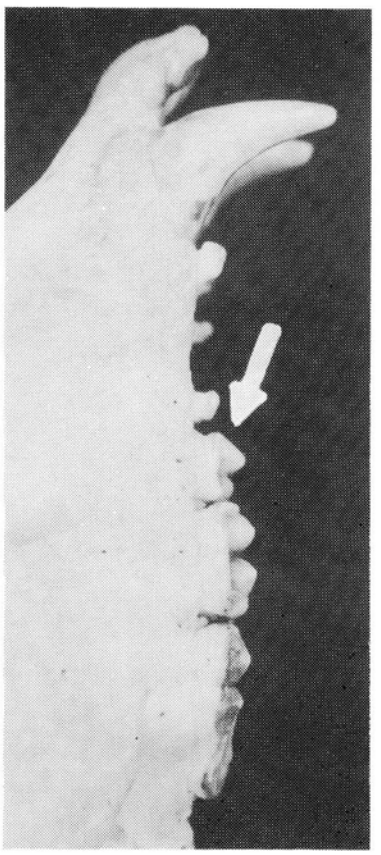
7

Figures 7 - 11

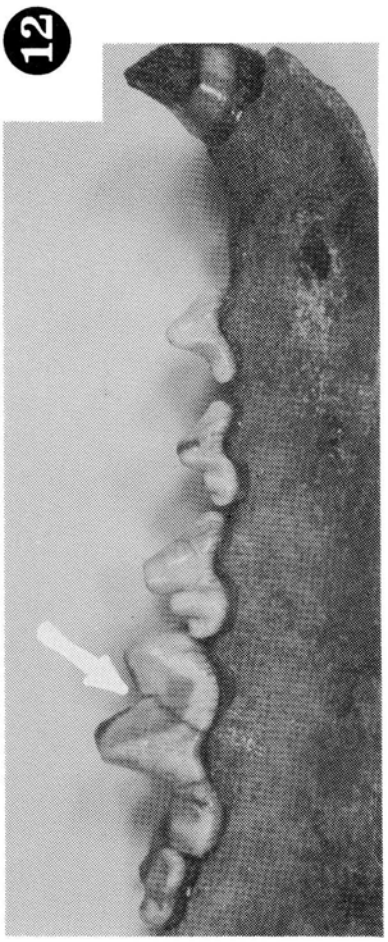
Figures 12 - 16



14

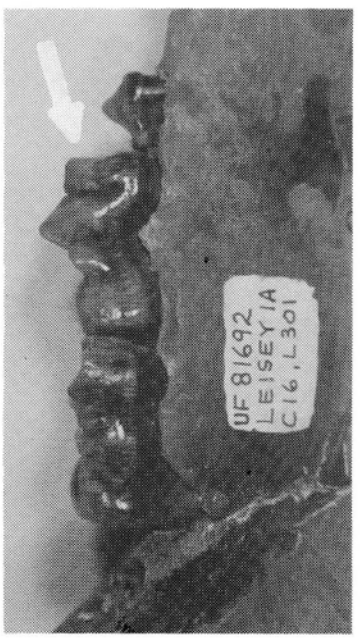


16



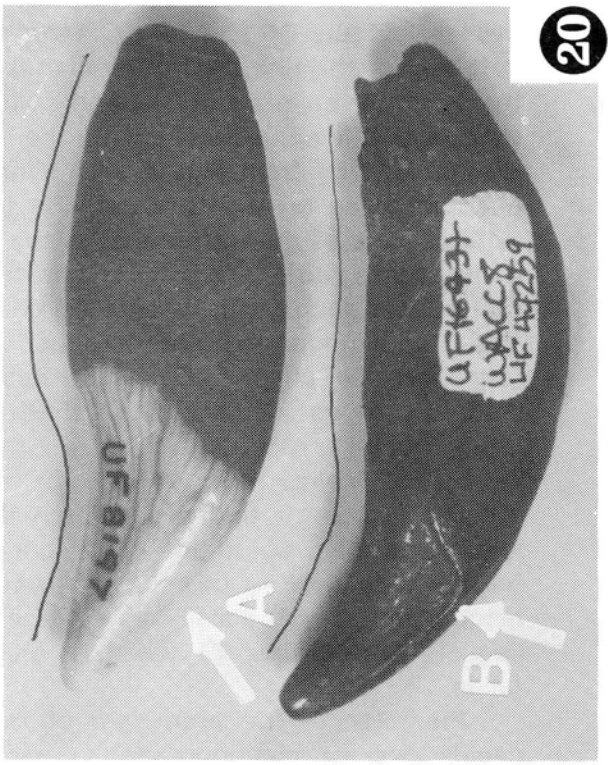
12

13

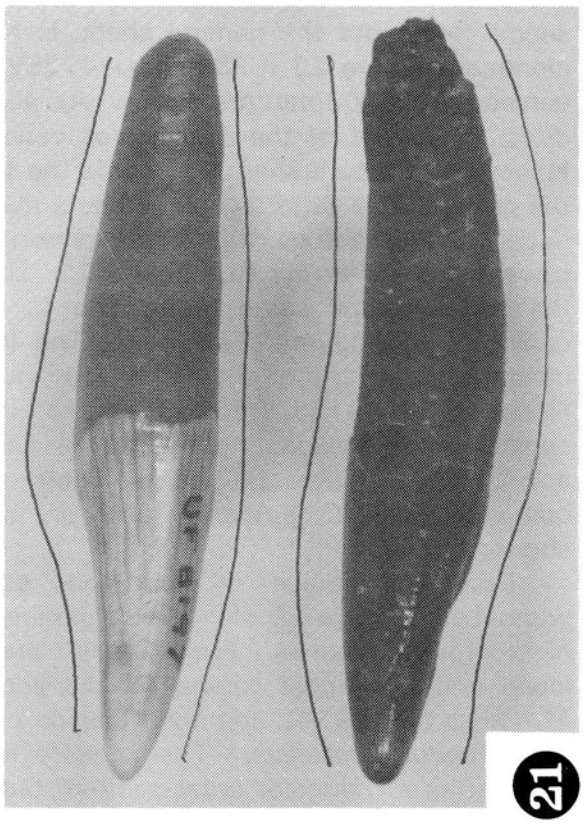


15

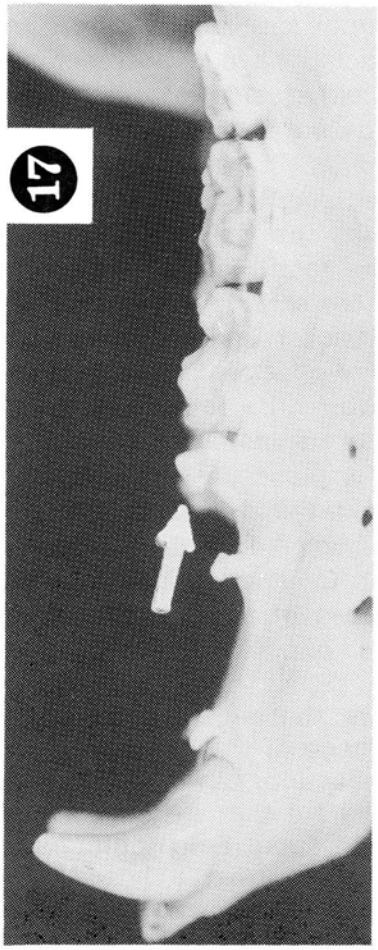
Figures 17 - 21



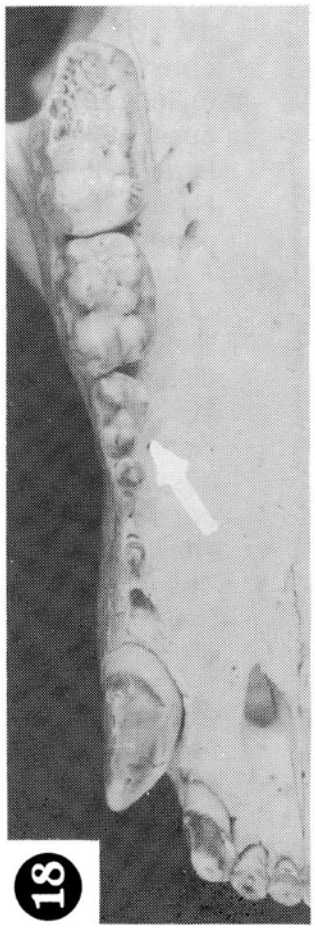
20



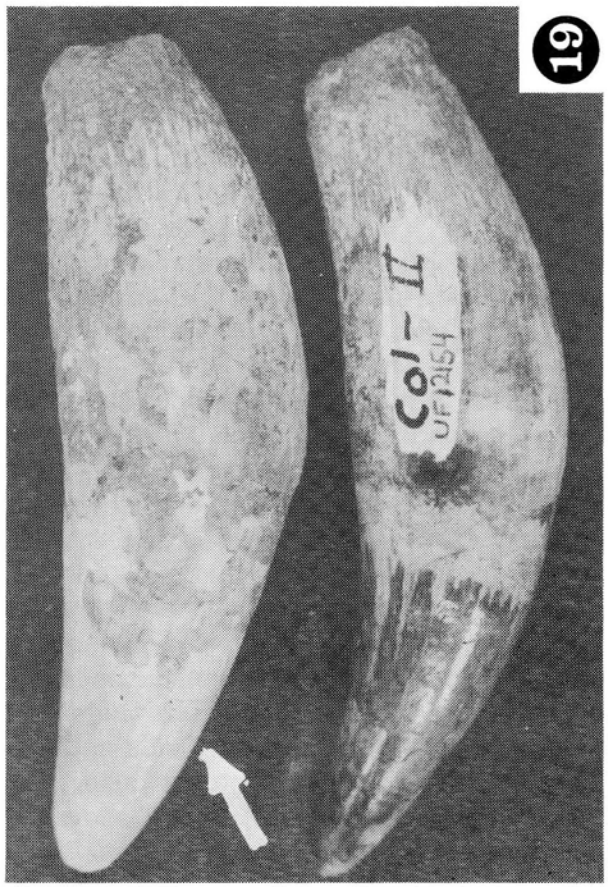
21



17



18



19

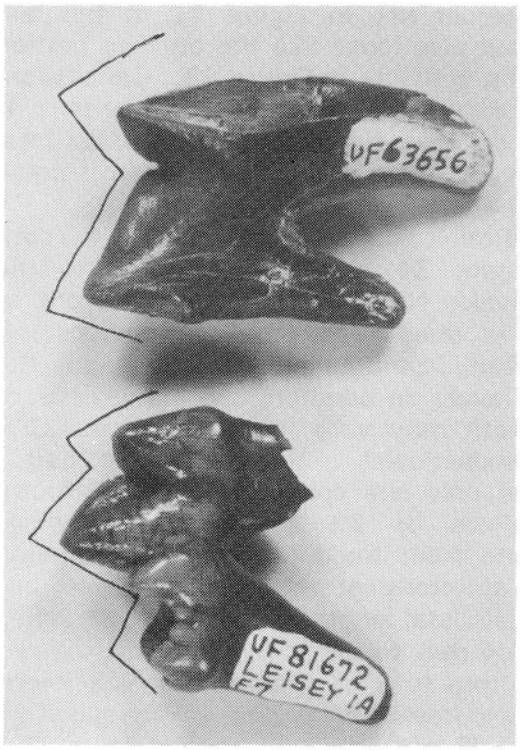
Arctodus canine is more robust and the crown seems larger but the general shape is nearly identical. **Figure 20** (UF8197, UF47259) are canines from *Tremarctos* (arrow A) and *C. dirus*. The root of the *Tremarctos* canine is bulbous and tapers sharply towards the tip of the crown. The *C. dirus* canine has a distinct ridge running across the lower crown and toward the tip (arrow B). **Figure 21** shows the edges of the same teeth. The *C. dirus* canine is slightly more sinuous. The lower canine of *F. atrox* (not shown) is also sinuous. **Figure 22** (UF84188, UF62566) shows lower canines from *Smilodon gracilis* (top) and *C. edwardii*. *S. gracilis* has a short ridge compared with *C. edwardii* (arrows), and a shorter crown.

Don't be fooled by carnivore canine wannabes. **Figure 23** shows four canines of herbivorous mammals. From the left are the lower and two upper canines of the peccary *Mylohyus* (UF12518), and lower canine of the tapir *Tapirus veroensis*. The peccary lower canine has a triangular cross-section, but the cross section of the upper canine is oval with a thin root cavity running lengthwise. The tapir lower canine has a short crown and two flanges (arrows) and a small circular root cavity. Alligator teeth can also be confused with the canines of carnivora, but generally have less well developed, hollow roots.

Molars. The molars of ursids can't be confused with the molars of canids and felids, since they have more flat crowns with rounded cusps designed for grinding and not shearing. On all carnivores the lower carnassial is m_1 while the upper carnassial is p^4. The carnassials of felids and canids are readily recognizable because they have a blade-like occlusal surface and sharp edge, strikingly similar to the cutting edges of a pair of scissors. The felid m_1 has a distinctive M-shaped silhouette, when viewed from the side. The m_1 of canids has a flat posterior cusp attached to the M-shaped cusps. This posterior cusp is missing on felids. The anterior cusp of m_1 of both felids and canids is lower than the next-posterior cusp. **Figure 24** (UF81672, UF63656) which shows a *C. edwardii* (left) and *Smilodon gracilis* m_1, demonstrates this difference. The right (anterior) edge of the *S. gracilis* tooth is missing. **Figure 25** shows a *C. dirus* right m_1 (left side of the photograph), which is missing the posterior cusp (arrow A) and some of the root, and the opposite view of the same *S. gracilis* left m_1 from **Figure 24**. Without the posterior cusp on the C. dirus, the two look similar. One of the differences is the location of the tooth roots. *S. gracilis* has two large roots under each cusp, while *C. dirus* has two large roots under the anterior cusp and the posterior flat cusp. *C. dirus* also has a distinct groove running the length of the anterior and posterior edges of the roots (arrow B). Felids may or may not have this groove (I couldn't find a specimen that was loose and had an intact root, but I don't believe they do), so this may or may not be diagnostic. *C. dirus* also has a small anterior lingual cusp (arrow C) which is missing in felids.

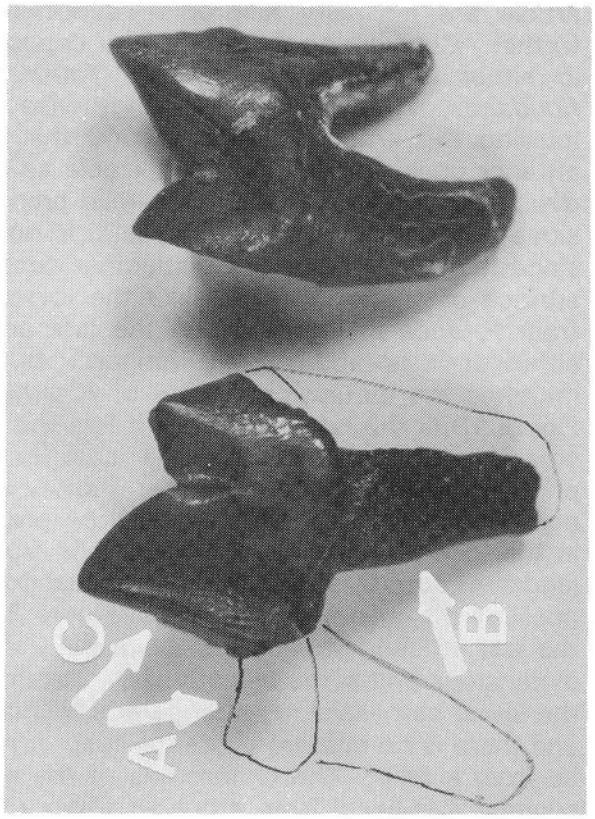
Premolars. The premolars of felids and canids can be distinguished, in general, by comparing the anterior edge. Felids usually, but not always (see p^3 on **Figures 16, 18 and 19** in the last article), have a posterior and anterior cusp on either side of the central main cusp. Canids are missing the anterior cusp. On the *C. dirus* p^4, the groove on the large root runs the length of the inner edge. **Figure 26** shows the top view of p^4 of *Felis onca* (jaguar - white tooth) and *C. dirus*. The *F. onca* tooth is more sharply triangular. The *C. dirus* tooth is thicker and more rounded. The shearing edge of p^4, the upper carnassial, distinguishes it from the other premolars (arrows). The p^4 of canids and felids can be distinguished by the presence of the anterior cusp. **Figure 14** from the last article shows *F. onca* p^4 while **Figure 14** from this article shows the p^4 from *C. edwardii* and *C. dirus*. The occlusal surfaces of these teeth are on the opposite side of that shown in the photographs.

How useful are these diagnostic clues? **Figure 27** shows many of the carnivore teeth in the Thulman collection, all of which I am fairly certain came from the late Pleistocene. The teeth are shown about twice actual size. **Tooth A** is obviously a from a bear. It is broken and has a flat, low crown. The crown is well-worn and so the specimens in this



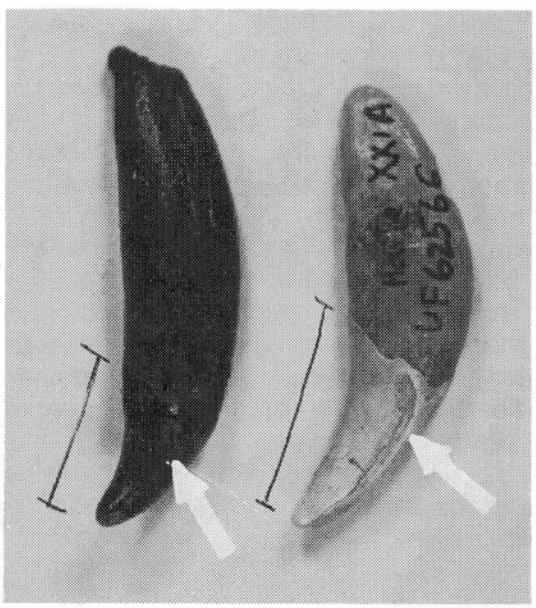
24

25

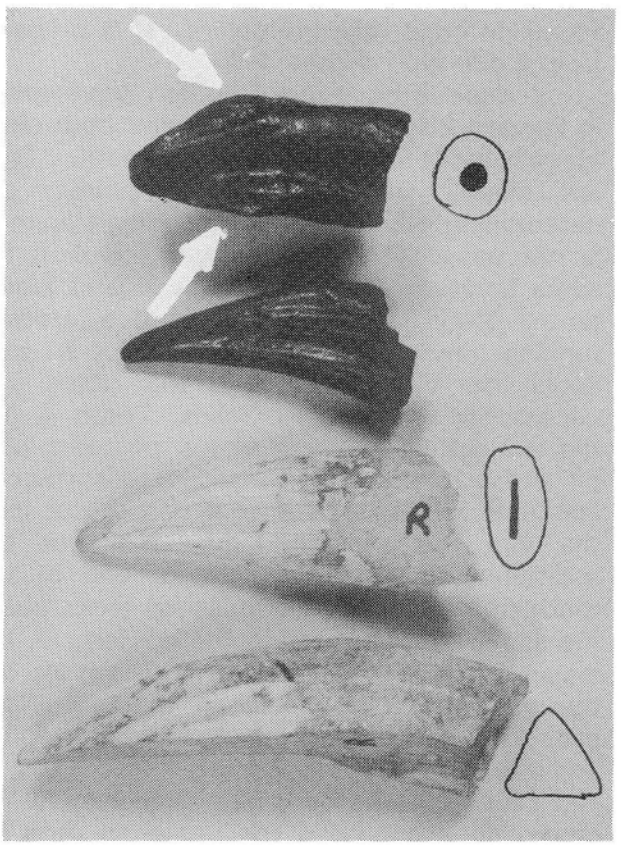


Figures 22 - 25

22



23



article are not very helpful in identifying it further. Considering the age of the deposit, it is either *Ursus americanus* or *Tremarctos floridanus*. **Tooth B** is split lengthwise and missing the anterior flat cusp and the little anterior cusp, but is still recognizable as a *C. dirus* m_1. **Tooth C** looks like a felid premolar since it has the two small cusps. It is not p^4 since it doesn't have the distinctive occlusal surface or shape. It looks like the lower p_4 from *F. onca* in **Figure 12** in the last article although it is about 3mm longer. It also matches the dimensions of p_3 of *F. atrox* in **Figure 19** in the last article but it has the two smaller side cusps, while the cast in the photo appears to have only one. I know from post-cranial material that jaguars are present in this deposit, so I would guess it is from a jaguar. **Tooth D** is likely another jaguar tooth, possibly p^4 (mislabeled as m^1 in **Figure 13** in the last article). It seems to have the correct dimensions and same basic shape. **Tooth E** is the lower carnassial m_1. Since it is M-shaped and there is no missing posterior cusp, it must be from a felid. The dimensions of the tooth suggest it is likely from a bobcat (*Lynx rufus*) (see **Figure 17** from the last article). **Tooth F** is half of a premolar and is most likely from a canid since it is missing the smaller cusp found on most felid premolars. It is probably from a dire wolf (**Figure 12**).

A more difficult identification is presented in **Figures 28 and 29** which show both sides of two badly broken and worn teeth. They are clearly fragments of carnivores, but determining which teeth from which animals is not easy. They were both found in the same location as other dire wolf and jaguar teeth. They both have distinctive grooves running down the inside of the root so they could be dire wolf, but this does not necessarily rule out the felids. **Tooth A** has the distinctive upsweep at the posterior of a p^4 and a fragment of the occlusal surface is apparent (arrows). The root is stubbier than the dire wolf p^4 in **Figure 14**, but the estimated size of the posterior end of the tooth (the upper edge is missing) looks about the same. In **Figure 14** in the last article, the jaguar p^4 root looks closer to **Tooth A**, but the posterior end looks too graceful. My guess is that teeth roots are fairly variable and it is a broken dire wolf p^4.

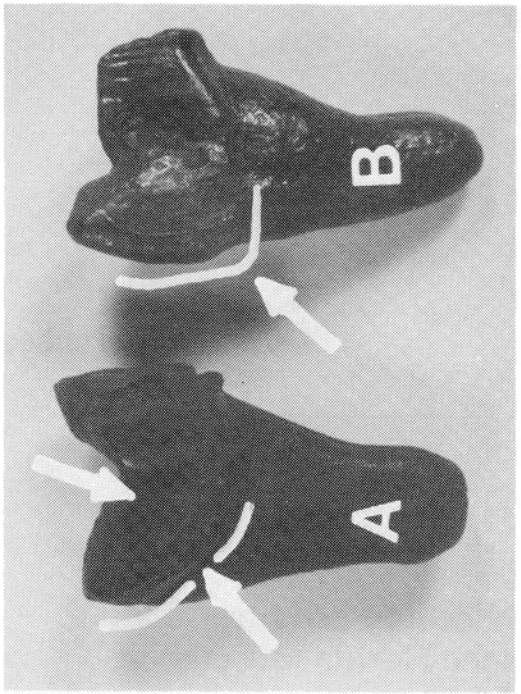
Tooth B is harder still. The base of its crown does not have the upsweep of a p^4 (arrow). It looks somewhat like the left half of the jaguar m_1 in **Figure 12** in the last article, but also looks like the anterior portion of the dire wolf m_1 in **Figure 13**. Conclusion: it is probably the anterior fragment of m_1. If the root grove is diagnostic, then it must be a dire wolf. If it isn't diagnostic, then it could be either animal.

Final tally: out of eight teeth only Tooth B in **Figure 24** was unidentifiable to the family-level. Not bad, however, a word of caution is due. Many teeth, especially if fragmented, cannot be identified to the species level. In addition, the dimensions of these teeth may vary by as much as 30% among individuals! For the most part I looked at only one specimen for each tooth. An analysis of 23 *Smilodon californicus* specimens from the La Brea tar pits found that the anterior-posteror diameter (what I call the mesial-distal length of crown) of p^4 varied from 33.4 mm to 46 mm, while m_1 ranged from 25 mm to 32.1 mm. In 15 specimens of *F. atrox* from the tar pits, p^4 ranged from 35 mm - 45 mm, and m_1 ranged from 27.1 mm to 33.9 mm. There was also individual variation in the number of roots on p4 in *S. californicus*. Carnassials are probably the most useful for species level identifications, but metrical analyses may be necessary to distinguish the teeth of species which are morphologically similar.

Final notes. In researching this article I stumbled upon two terrific references for felids and giant sloths in the basement of the FSU science library: The Felidae of Rancho La Brea by John C. Merriam, (Carnegie Inst. of Washington 1932), and Cenozoic Gravigrade Edentates of Western North America by Chester Stock, (Carnegie Inst. of Washington 1925). Both books have extensive discussions and beautiful photographic plates, if you like pictures of bones and teeth.

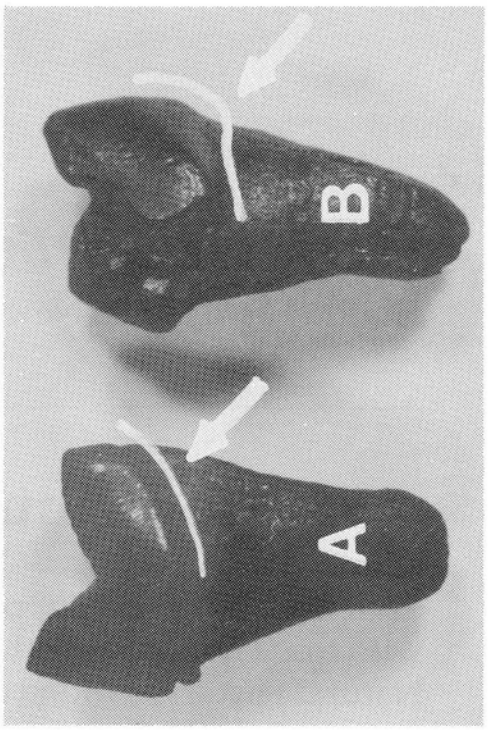
I want to especially thank Marc Frank for taking his time to edit and make suggestions on all these articles. Along with letting me wade through and photograph the museum's collection, he's responsible for the interesting scientific tidbits, accurate nomenclature and proper sentence structure.

Next installment: The cud-chewers - Artiodactyls!



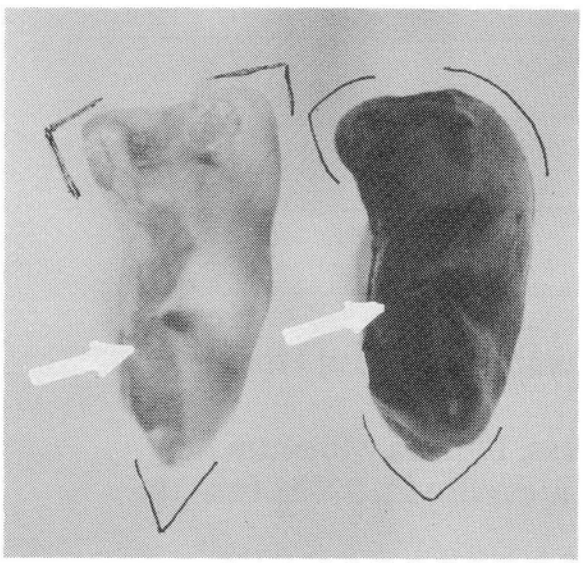
28

29

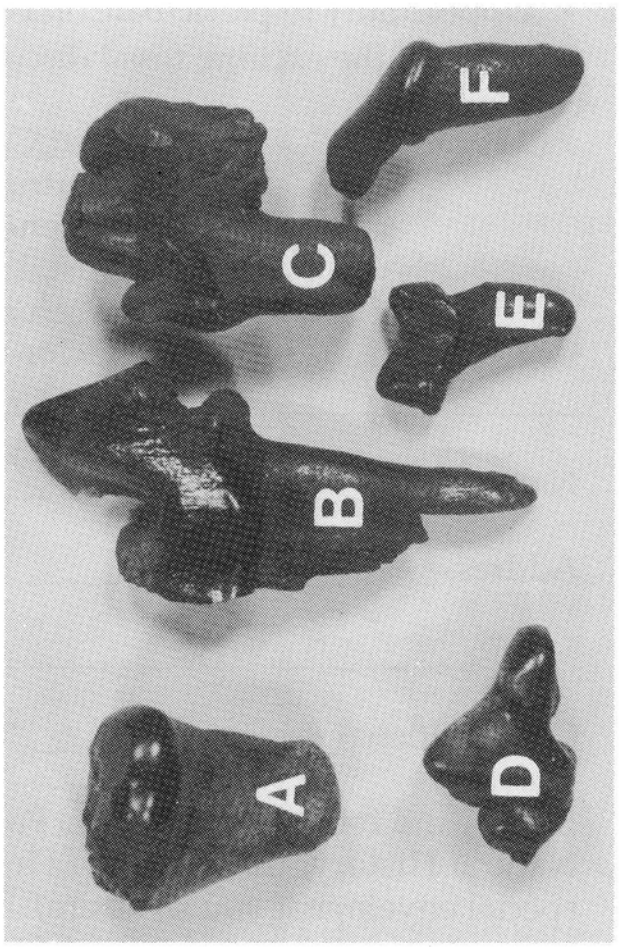


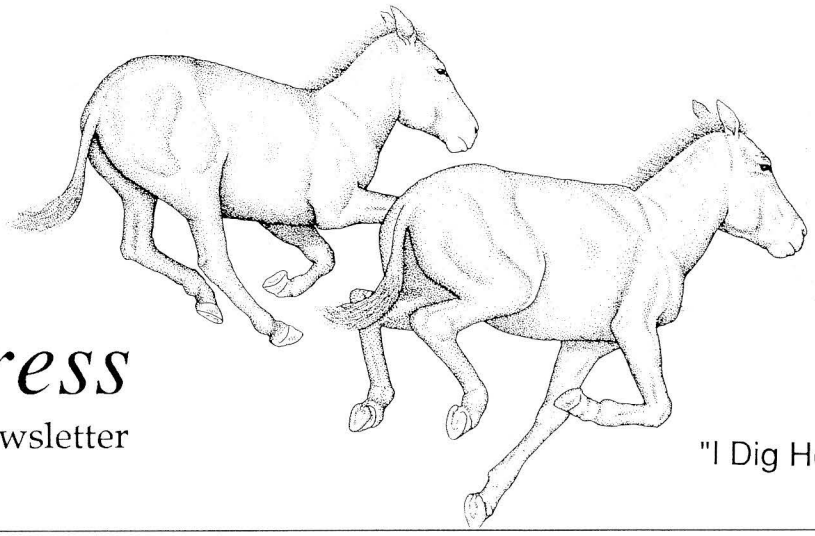
Figures 26 - 29

26



27





Pony Express

Florida Fossil Horse Newsletter

"I Dig Horses"

Contribute to the *Pony Express!*

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:

- Subscription to the *Pony Express* Newsletter
- Opportunity to participate on Fossil Horse Digs and related activities
- Learn of the exciting fossil discoveries made throughout Florida

Support Categories--1995-6
Contributor--$20-99
Friend--$100-$249
Sustainer--$250-499
Patron--$500-$999
Benefactor--$1,000 and above

Name_____ Phone:_____

Address_____

_____Zip_____

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)

Gone Fishing, Wyoming Style

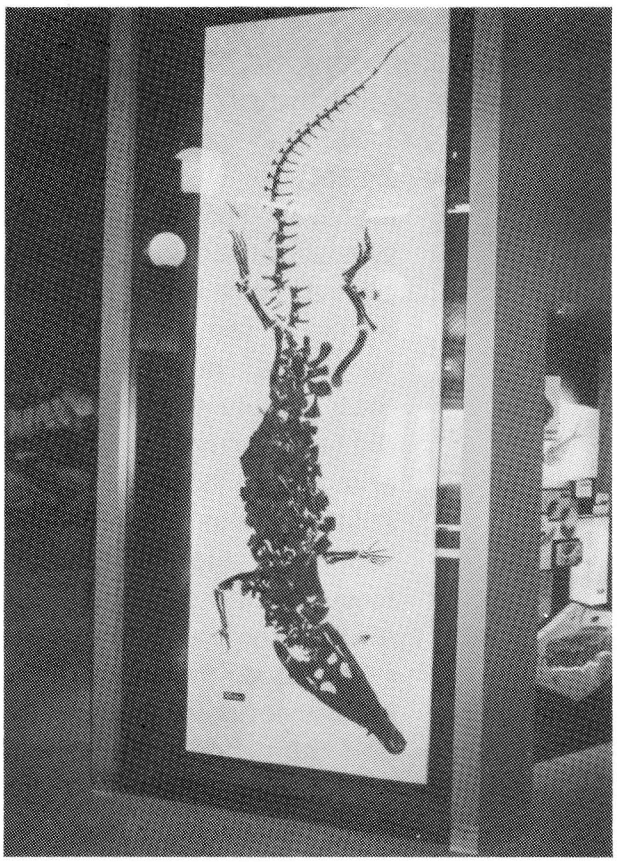
by David and Barbara Alexander

One of the highlights on our summer 1994 trip was hunting fish fossils in Kemmerer, Wyoming. On July 3rd we drove from our motel in Rock Springs via I-80 and US 30 to Diamondville, going south on Route 189 six miles to the turnoff to the Warfield Springs Fossil Quarry (Box 316, Highway 189, Thane, WY 83127; phone 307-833-2445). The drive from highway 189 to the quarry was another long 8 miles on a dirt road. The entrance fee was $25 each for a half day of hunting; they supply the tools. We did not arrive until noon, and four hours of rock-splitting was plenty. We found several *Knightia* (a few multiples), a six inch *Mioplosus*, and two *Pharaodus* (one about 9 inches long in four pieces, and the other is the anterior 12 inches of an 18 inch fish, with the skull still covered). We hope to restore both, but would appreciate any information on preparation (and tools used) of these types of fossils. Before we left, I also bought a complete fossilized crab specimen from the Washington State gift shop for $90.

Barbara splitting rocks at the Warfield Springs Fossil Quarry.

Our next stop was a visit to Fossil Butte National Monument, which is about ten miles west on highway 30. The visitor center is a "must see". On display is a complete large alligator, stingrays, snakes, birds, turtles, dragonflies, and other specimens. As you turn into Fossil Butte there is privately owned Ulrich's Fossil Gallery, also a "must see". His specimens include fish eating fish, fish with fish in their stomachs, a large gar and other unusual combinations. Many of the specimens are pictured in *Paleontology of the Green River Formation, with a Review of the Fish Fauna* by Lance Grande. Ulrich has quarries to hunt for a fee of $55 each for approximately three hours. You can fill a pallet which is prided and keep any size *Mioplosus*, *Pharaodus*, *Proscacara*, *Knightia*, *Diplomystus* and *Notogoneus*. However, any rare and unusual specimens are retained by the quarry owner. For further information you can call (307) 877-6466. Ulrich was one of the original promoters of the area and he can provide an abundance of local information.

Our next "fishing hole" was at Stevens Studio, which is five miles west of Kemmerer on Highway 30. Peter and Robbie Severns are considering opening their quarry on a commercial basis next year (please call 307-877-9402 and encourage them). We bought a great *Priscarara* from Peter for $35.



Alligator on display at the visitor center in Fossil Butte National Monument.

Also worth a stop is the Car Wash Rock Shop in Kemmerer for examples of the area's abundant petrified wood. The famed "Blue Forest" is located around nearby Opal, Wyoming (we bought a fine specimen here), and the owner of the rock shop said if we came back he would show us some good areas to hunt. He also showed us two feathers he had obtained from the Green River shale. Another stop in town was Tynsky's, 716 JC Penny Drive. Their sign on highway 30 advertised "hunt your own", but they no longer allow it. They appeared to be over-priced and provided no information. They did, however, have an outstanding turtle on display. Tynsky is also one of the first to make major finds in the area. The Kemmerer Museum and Chamber of Commerce is located across the street.

We greatly enjoyed our fishing expedition in the Kemmerer area, plan to return for an extended visit, and we highly recommend it.

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.