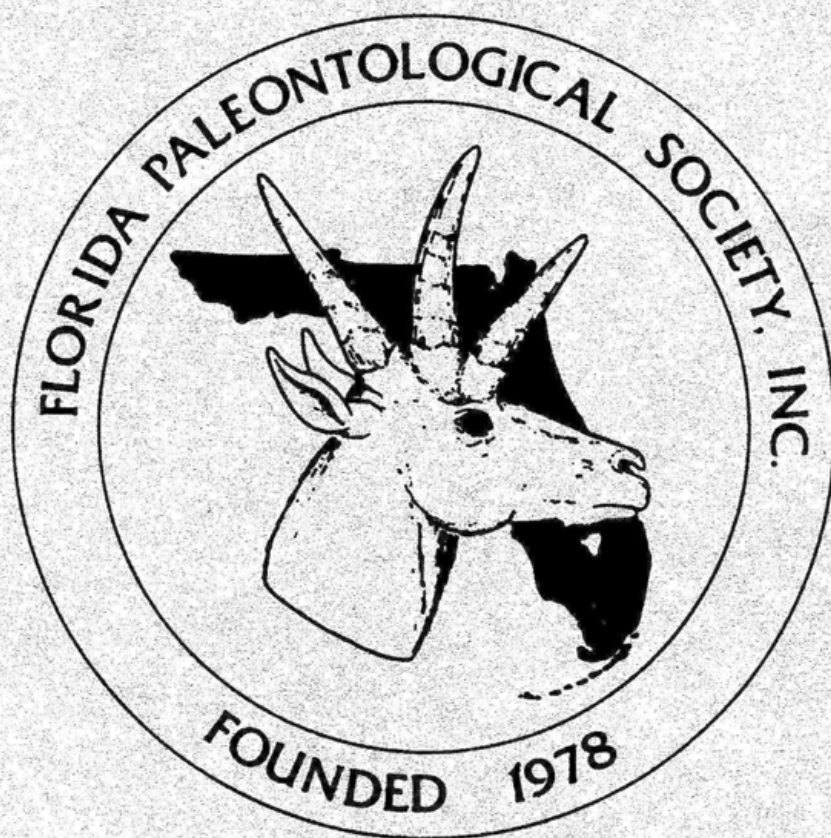


Florida Paleontological Society, Inc.
Newsletter



Volume 10 Number 3 Summer Quarter 1993

FLORIDA PALEONTOLOGICAL SOCIETY, INC.

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INFORMATION, MEMBERSHIP, AND PUBLICATION INFORMATION

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

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VOTE! FOR NEW BOARD MEMBERS (See page 7)

Announcing the
Florida Paleontological Society
Fall Meeting
November 6 and 7, 1993
Lake City Florida

Featuring:
Business Meeting
Fossil Talks by experts from the FLMNH
Banquet Dinner
Annual Fossil Auction
Field trips to several north Florida Localities

See pages 20-21 for details and registration form!



F.P.S. Happenings



From the Secretary...

by Eric Taylor

Member Notes

It is with regret that we report the death of member Kenneth Churchwell in January 1993. His wife, Julia will continue the family tradition by having the membership continued in her name.

New members

Robert Peterson of Royal Palm Beach Florida. (Robert's article on the first reported vertebrate fossils located in St. Lucie County will appear in a future newsletter. He plans to bring some of the material he found there to the Fall Meeting if he can get there)

Mike Turner from Melbourne Florida.

David and Barbara Alexander from Port Orange Florida.

Craig Oyen from Gainesville Florida. (Craig is our scholarship winner for 1993. He will be presenting his talk on his winning project in the Fall Meeting)

Juan Martinez from Surfside Florida. (Juan would be VERY interested in talking to other enthusiasts from his area who could help him get his feet on the ground.)

Junior Member **Dylan Carey** from Edgewater Florida.

Adam Henderson from Chiefland Florida.

Louise Harvey from Orlando Florida. (Lou is the President of The Bone Valley Fossil Society and is a real fossil freak! If you get a chance to go in the field with her, she'll work you to death!)

Patricia and Larry Ward from Orlando Florida.

Art Wood from Miami Florida.

Kenneth Brooker from Kissimmee Florida.

Wiley and Joyce Dykes from Orlando Florida. (Wiley and Joyce are relatively new at the fossiling game, but have gone head-over-heels into the art and science of fossil collecting.)

Martha Sehi from lake Wales Florida. (Martha is often in the company of Lou Harvey and the Dykes' family!)

George Phillips from Artesia Mississippi.

Sue Lewis from Gulfport Florida.

Martha Duncan from Frostproof Florida. (FPS has a core of folks from the Frostproof area. I have run into them all over the Southeastern United States!)

Approximately 100 members will not receive this bulletin because they have not paid their dues for 1993. A list of those folks is included in the newsletter. If you see a friend's name there, remind them!

As promised, here are some interesting tidbits from the autobiographical sketches at the bottom of your membership form:

1. **Terry Sellari** of Tampa Florida is an ardent river diver. I have had the chance to go with him once and look forward to going again. My sole complaint is that he tends to get up at 4:30 AM to go to his sites! Among the exciting finds Terry has made are two vertebra (one very recently) from a giant extinct sea-snake from the Eocene of Florida. This fossil is very rare everywhere and (I believe) was unknown from peninsular Florida until Terry found the first one, put it in his junk box, and then showed the box to Gary Morgan from the Florida Museum of Natural History's Vertebrate Paleontology Department.

2. **Thomas and Linda Arnold** of Richlandtown PA specialize in the preparation of fish fossils from the Green River formation, Badlands mammals and Devonian trilobites.

3. **Andrew S. Howard** from Spartenberg SC is co-author of *Fossil Locations in South Carolina* with member **Jerry Howe** (also from Spartenberg.) This work was published in 1978.

4. **Leon Gathany** from Toccoa Georgia is a Park Naturalist at Toccoa State Park.

5. **Larry Simpson** from Okalahoma City OK has published four papers on Permian age vertebrates from TX, OK, and KS.

6. **Chris Paulk** from Bristol FL is a airplane and helicopter pilot.

If any FPS member ever wishes to contact another FPS member in another location, simply call or write the Secretary. I will be happy to coordinate the contact.

What Happened to these Missing Members?

MEYERS, KURT- COCOA FL
KINGSLEY JR, FRANKLIN J- Ocala FL
TAYLOR, CRAIG C.- AUSTIN TX
LOUCKS, HARVEY L. - NORTH TONAWANDA NY
MCMANUS, CHARLES J.,JR. - PHILADELPHIA PA
GESENSWAY, DANIEL B.,MD - PHILADELPHIA PA
MARCUS, ANNA M. - WHEATON MD
KARPETSKY, TIMOTHY P. - RIDERWOOD MD
PUIGNAU, MARIO - HIALEAH FL
JEREMIAH, CLIFFORD - JACKSONVILLE FL
SUMMERFIELD, DONALD C. - JACKSONVILLE FL
HARRISON, H. CLIFF - TAMPA FL
HARRISON, HOLLY REED - TAMPA FL
CRING, F. DANIEL - LAFAYETTE LA
WOLFF, RONALD G. - GAINESVILLE FL
CHANDLER, DR. ROBERT M. - GAINESVILLE FL
CRABB, ALAN - INDEPENDENCE IA
HODGES, TOM - N. FT. MYERS FL
CLOUGH, DAVID H. - BRADENTON FL
CLOUGH, DAVID H. II - BRADENTON FL
CARDINALE, TOM - SEMINOLE FL
SCOTT, LEROY M. - PLANT CITY FL
WARNER, RICHARD A. - VENICE FL
BRIDGES, DIANA C. - MIAMI FL
KING, WILLIAM S. - TAMPA FL
CLARK, SUSAN - BEDFORD NH
ESCKELSON, ROGER L. - FERNANDINA BEACH FL
ROBINSON, NELLY - ST. PETERSBURG FL
MULHERN, MICHAEL - JACKSONVILLE FL
SQUIRES, DR. RICHARD - NORTHRIDGE CA
TRUITT, HEATHER - NIAGARA FALLS NY
PALMER, RANDALL W. - WINTER HAVEN FL
GARRY-CHADWICK, NANCY G - PONTE VEDRA BEACH FL
SCHULTZ, CORINNE M. - FORT MYERS FL
TAYLOR, JOLENE - WEST PALM BEACH FL
MASTER, GEORGE - DELAND FL
BURMEISTER, ROBERT W. - VENICE FL
BRINSKO, JOHN M. - Ocala FL
MATTHIESEN, DIANA G. - GAINESVILLE FL
BURMEISTER, ROBERT W. - NORTHBROOK IL
SHAAK, LESTER M. - HARRISBURG PA

CORDIER, DANIEL J. - GAINESVILLE FL
SLIGH, DEAN L. - ORLANDO FL
BLANCHARD, BETTY J. - TAVARES FL
BRAYFIELD, BILL - PORT CHARLOTTE FL
MICHAELS, CHARLES - LUTZ FL
PANKOWSKI, MARK - TALLAHASSEE FL
SERBOSEK, DON - ORMOND BEACH FL
YARGER, DR. RICHARD - PUNTA GORDA FL
BRAYFIELD, MARY JANE - PORT CHARLOTTE FL
WILLIAMS, FRED - LARGO FL
RYAN, JOHN E. - ROSEMONT PA
HODSON, IAN A. - CANADA
SILVERSTEIN, JILL - ST. PETERSBURG FL
BUTLER, JOHN J. - LEESBURG FL
CALIGIURI, NIKI - LACROSSE FL
BRANNON, DOROTHY C. - JONESBORO GA
BUCKNER, LORIN W. - FT. MYERS BEACH FL
ROBINSON, D.B. - NORTH MIAMI FL
SALANDER, ELLEN W. - ENGLEWOOD FL
SMITH, WESLEY - TAMPA FL
HOPE, MITCHELL - NOKOMIS FL
TAYLOR, ROBERT - MEXICO
MCCALL, KEITH - TALLAHASSEE FL
ETHERIDGE, WANDA JOAN - JACKSONVILLE FL
GITTLEMAN STEVEN - HUNTINGTON NY
JAMES, RODNEY W. - NORCROSS GA
BELLE, MISS B. DIANNE - LITTLE MOUNTAIN SC
TREACE, JAMES T. - LARGO FL
RIEGEL, JEFFREY - MOMENCE IL
GRAHAM, FLORENCE E. - FROSTPROOF FL
HILLMAN, DEREK R. - JACKSONVILLE FL
MACKIL, JOSEPH W. - CLEARWATER FL
SHUERGER, ANDY - ORLANDO FL
ELLIS, DENISE G. - JACKSONVILLE FL
WINNER, MARGARET J. - ENGLEWOOD FL
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PETERSON, GREGG - ORANGE PARK FL
BETHEA, DOROTHY J. - TAMPA FL
ELLIS, RYAN M. - JACKSONVILLE FL
BERSINGER, ERIC - JACKSONVILLE FL
FINLEY, GARDNER A. - PONTE VEDRE BEACH FL
MILLER, COL. DANFORTH P. - VENICE FL
LIBRARY-EXCHANGES - KONINKLIJK BELGISCH
INSVAUTIERSTR
MATHENY, HARRY R. - RUSKIN FL
HARDEN, KENT E. - BELLAIR FL
BRINEY, PAUL D. - TAMPA FL
BRINEY, DEAN A. - TAMPA FL
FLOWERS III, BILL - VALRICO FL
PHILLIPS, LURA C. - CORAL SPRINGS FL
GERVASI, CHRISTOPHER J. - HAVERTOWN PA
SIMS, STEVE - FT. MEADE FL
GRAVES, GYPSY - FT. LAUDERDALE FL
WILLIAMS, CARL J. - TAMPA FL
ZUMBRO, JUSTIN - GAINESVILLE FL
ARNALL, MICHAEL - ROYAL PALM BEACH FL
WELCH, JOSEPH H. - SARASOTA FL
ZOLG, JERALD B. - ST. PETERSBURG FL
OPPERMANN, BILL - MARGATE FL
MONTGOMERY, FRED - SPRING HILL FL
THURMAN, PAUL - TAMPA FL
MOSS, DOROTHY - MIDWAY GA
BATES, G. W. - FT. LAUDERDALE FL
RANSON, JAMES E., JR. - TAMPA FL
DILCHER, DAVID - GAINESVILLE FL
STOCKING, BRIAN - ST AUGUSTINE FL
ACREE, STEVE - ADA OK
DENNY, RICHARD J., MR. & MRS. - WINTER SPRINGS FL

Missing members, continued:

GLADHILL, ROBERT STEVEN - LUSBY MD
MOORE, MICHAEL - HOLLYWOOD FL
SOBH, DR. ATTA Y. - BERUIT LEBANON
SAYLER, KENYON - ROSEVILLE MN
HARRELL, MIKE - SPRING TX
HOEBAKE, BRUCE D. - VERO BEACH FL
OCHS, DIANE - LARGO FL
WILDFONG, CHERYL - MAITLAND FL
LEVY, PHILLIP - MIAMI FL
LEVY, JOEY - MIAMI FL
LANGHAM, MARK - PALM BEACH FL
ANDREA, MATTHEW C. - WASHINGTON D.C.

News Notes....

by Frank Rupert

New Fossil Legislation

As most of you are aware, a bill was introduced last year in the U.S. Senate by Senator Max Baucus which, as law, would have placed restrictions on amateur vertebrate fossil collecting on public lands. Many professional paleontologists and some amateurs feel that such legislation is necessary as a means of controlling the loss, through pillage or commercial exploitation, of scientifically important fossil discoveries. On the other side, a number of amateur fossil hunters, commercial collectors, and even some professionals perceive last year's proposed legislation as a further restriction and regulation of their hobby or livelihood, as well as seeming incognizant of the important fossil discoveries that amateur and commercial collectors make. There are valid arguments on each side, but the disagreement on this issue has caused some serious rifts between professionals and amateurs nationwide.

Last year's bill did not get through Congress, and Senator Baucus has introduced a new version this year. This new bill, named the Vertebrate Paleontology Resources Protection Act, is friendlier to the amateur and commercial collector. We don't have the space to completely reprint the wording of the proposed legislation here. In essence it recognizes the important role of the amateur collector in the discovery and preservation of paleontological resources. It allows casual collecting (involving negligible land disturbance and without power tools or mechanized equipment) on public lands

without a permit. It also allows more disruptive amateur and commercial vertebrate fossil extraction on public lands with an appropriate permit. Perhaps there is more in this legislation for the differing sides to get together on.

For those of you interested in seeing the draft legislation, or expressing your feelings on the subject, we suggest you contact Ms. Jan Campbell-Miller in the office of Senator Max Baucus, SH-706, Washington DC, 20510, Phone (202) 224-2651.

Problems with Permits

Some of you have also heard about the problem some amateur collectors had while diving a north Florida River. As the story was related to us, the collectors were accosted by a Florida Game and Freshwater Fish Commission officer on the river, and cited for illegal fossil collecting. The collectors had valid vertebrate fossil collecting permits from the Florida Museum of Natural History, but these were not recognized by the officer. He also confiscated all the fossils they had collected.

If this event stemmed from ignorance on the part of the Game and Fish Commission officer, then the Museum would certainly take the necessary steps to clear up the misunderstanding. Unfortunately, all the details are not known. If they haven't already done so, it is important that the individuals involved provide information to the Program of Vertebrate Paleontology at the Museum on who they are, where and when this happened, and the name of the Officer who stopped them. Only then can the matter be fully resolved.

While we're on the subject, this might be a good time to remind all fossil collectors that, while the Vertebrate Fossil Permit allows you to collect fossils, it does not cover cultural resources. It is illegal to collect indian arrowheads or other points, pottery, bone or shell tools, or any other items which could be construed to be human cultural artifacts. The second-in-command at the Game and Freshwater Fish Commission is the former State Archeologist, and he has taken a special interest in clamping down on illegal collecting. Rumor has it he has instructed his field officers to be on the lookout for artifact collectors. So be forewarned!

Upcoming Events...

- Oct. 9-10 **Tenth Annual Bone Valley Fossil Fair**, Gymnasium, Winter Haven Complex, 210 Cypress Gardens Blvd. (813-665-3426).
- Oct. 13-16 **Society of Vertebrate Paleontology Annual Meeting**, Albuquerque NM, (Spencer Lucas, 505-841-8837).
- Nov. 6-7 **Florida Paleontological Society Fall Meeting**, Lake City (see info this issue).
- Nov. 20-21 **Florida Fossil Hunters Third Annual Fossil Fair**, National Guard Armory, 2809 S. Fern Creek Ave., Orlando. (417) 859-8766 for info.

Book Bits

Many of you have placed advanced orders or are otherwise patiently awaiting publication of the new edition of the Brayfield's *Guide to Identifying Florida Fossil Shells and Other Invertebrates*. We had fully intended it to be out by now, but a series of unforeseen problems at the printer have delayed it. The most recent event, a lightning strike on the typesetting machine, totalled the machine and effectively locked the manuscript up until a new machine could be obtained. Every effort is currently being made to have the book available by the Fall Meeting in November. We appreciate your patience, and ask that you hang in there just a little while longer.



News from the



submitted by Dean Sligh

The Melbourne Pit Dig

Adrenaline pumped and sweat rolled as a small synergistic group from four different organizations raced a deadline in a salvage dig south of Melbourne this past May.

Organized by Jennifer McMurtray, Land Manager with the St. Johns River Water Management District, the dig team searched a temporary shell pit for fossils, both vertebrate and invertebrate. The purpose of the excavation was to assemble as complete an inventory as possible of the fossils contained in the pit prior to its being flooded. Shell from the pit was being used for construction of nearby roads and levees by the Water Management District. Upon completion of their project, water would fill the pit and flood the site.

Under direction of personnel from the Florida Museum of Natural History, including Gary Morgan, Roger Portell and Russ McCarty, Eric Taylor of the Florida Paleontological Society and a dozen members of the Florida Fossil Hunters spent three days in early May searching this Pleistocene site. Pumps were used to loosen the shell, sand, and clay matrix and expose the fossil material. Finds includes everything from bird bones to fragments of *Gomphotherium*. An estimated thirty five to forty species were taken back to the FLMNH in Gainesville to be studied and cataloged. Some of the vertebrate fossils included whale, manatee, at least two species of garfish, camel, deer, horse and sloth. The invertebrate material, according to Roger Portell, was fairly representative of other central Florida Pleistocene sites. The lowest unit, about 1.3 meters thick, contained the mollusks *Ostrea sculpturata* and *Aurinia* sp. from the early Pleistocene. The second unit, about 1 meter thick, contained most of the vertebrate material in a relatively thin layer with a few invertebrates. Unit three was another shell bed, about .8 meter thick. Unit four, a greenish-gold indurated layer, was only about .3 meter thick and this was capped off by unit five containing soil and organic matter.

For more detailed information on the vertebrate material recovered from this site, contact Gary Morgan; for information pertaining to the invertebrates, contact Roger Portell.

News

from the



Our ranks have been temporarily thinned here in the museum, with both Bruce MacFadden and Gary Morgan on leave. Bruce MacFadden, who will be gone for a full year, will be working for the next six months with geophysicist Theure Cerling at the university of Utah on an investigation of the paleodiets of extinct herbivorous mammals. After this, he will make a short trip to Florida and then a six month trip to Bolivia, where he will both teach and do research. Gary will not be gone so long, fortunately; he will be away for four months working at the New Mexico State Museum in Albuquerque. Dr. David Webb has gone to two conferences this summer, one concerning FAUNMAP (a project mapping the geographical and chronological distributions of Pleistocene mammals), and the other entitled "Paleoclimate, Mammals, and Man." He has also been editing papers for the forthcoming volume on the Leisey site. Bob Chandler has been to New York to help describe a new tinamou from the middle Miocene of South America, and went to Ecuador to collect both birds and fossils. He has received grant money to begin underwater work on the Santa Fe River in the hope of getting more specimens of the giant phorusrhachid bird *Titanis walleri*. David Lambert has been busy this summer working on his dissertation, which he hopes to finish in February. He submitted a review paper on the Tertiary proboscideans of North America for the forthcoming book *Tertiary Mammals of North America*, Vol. 1. David has been working with UF ecologist Crawford Holling on a project comparing the body mass distribution of late Pleistocene and Recent mammal faunas in the same

geographical locality (Ichetucknee River/modern Alachua County and Rancho Labrea/modern Los Angeles County were all examined), and plans to present some of the results at the annual meeting of the Society of Vertebrate Paleontology in Albuquerque this October.

---David Lambert---

10th Annual BVFS Florida Fossil Fair



Year of the Manatee



AT THE
WINTER HAVEN COMPLEX
IN THE GYMNASIUM
210 Cypress Gardens Blvd.

S.E. Corner of Cypress Gardens Blvd. & US 17

Saturday October 9, 1993 - 9:00 a.m. - 7:00 p.m.

Sunday October 10, 1993 - 9:00 a.m. - 5:00 p.m.

Admission:
Adults - \$2.50
School children - FREE

For Information Phone:
813/665-3426 or 813/644-3778

Mark your calendar!

Florida Fossil Hunters third annual

FOSSIL FAIR

November 20 & 21, 1993

Florida National Guard Armory
2809 S. Fern Creek Ave., Orlando

This year's theme: "Fossils in Your Back Yard"

- Educational activities for children
- Fossil pit—dig 'em up and take them home
- Presentation by Frank Garcia, Florida's own famous fossil hunter
- Fossil, mineral, gem, and artifact dealers
- Fossil raffles and silent auctions
- Awesome fossil displays

Florida Paleontological Society

OFFICIAL BALLOT

Please vote for four (4) of the following individuals as replacements for outgoing FPS Board Members.

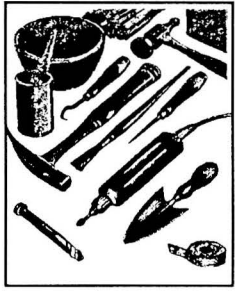
Place an "X" in each box of your choice. Please mark a total of 4 boxes only.

- | | |
|--|---|
| <input type="checkbox"/> Douglas Dew | <input type="checkbox"/> Terry Sellari |
| <input type="checkbox"/> Tony Estevez | <input type="checkbox"/> Barbara Toomey |
| <input type="checkbox"/> Bruce MacFadden | |

Please place completed ballot in the envelope included in this newsletter, seal, sign the back flap of the envelope, and mail to:

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

*All ballots must be in to the
Secretary by the Fall Meeting*



Prep Talk

by Russ McCarty

Greetings from the bone lab. Summer term is finished here at UF, and we have two wonderfully quiet weeks of zero student population---an all too short hiatus---considering the yearly pandemonium of Fall Term is about to begin.

The prep lab staff is down to myself and a few good volunteers. Pat Hylton, a mainstay for the past 4 years is a retired Naval (not navel) and civilian oral surgeon. His skills and positive attitude have been a great asset to the prep lab. If I have been the architect and engineer of the gomphothere project, Pat was the hod-carrier, mason, and plasterer who did most of the grunt work. Another volunteer who began this year is Steve Hutchens, a sculptor originally from the Tampa Bay area, now living in Old Town. Steve is an avid collector, and an excellent preparator who has been working on Bolivian notoungulate and Florida oreodont material in the prep lab. Mike Stallings, in his free time between other projects, is becoming a good moldmaker in the prep lab. David Bunger, another old standby, is an engineering student who alternates between being a paid part-time employee of the prep lab and a volunteer. Since we're broke this term, David is volunteering and working on Bolivian fossils. Sue Watts from Pine Island and Barbara Toomey from Sanibel Island were here recently for a week working on a ground sloth donated by the Toomeys.

I'm currently working on several projects: an oreodont skull from Florida, a baby

mastodon skull and jaws (it apparently fell into a cave--poor thing!), and a big land tortoise (*Geochelone*--whose genus name has been changed to *Hesperotestudo*) that was found in Little Salt Spring back in the 1970s. This is the famous tortoise that was apparently killed with a wooden stake 12,000 years ago. It was featured in a 1979 National Geographic article about Paleo-Indians. When you work with fossils for eight or nine hours a day, five days a week, year after year, if you are to retain even a small shard of sanity, you must have a number of projects going at the same time. Then, if one proves to be discouraging or frustrating, there is always another project on which to direct your energies. From the ramblings of this column, it's obvious that this is one of those alternate projects.

In the last bulletin we (Pat Hylton and I) had prepared and removed most of the gomphothere mandible. The badly crushed alveoli were left in the jacket (the tusks were missing). This point in the preparation of the gomph was one of those critical junctures in the decision making process. Did we have enough material to actually make a complete jaw? Was the material in good enough condition? Were we being realistic in our assessment of the specimen, or was it just wishful thinking on our part, and would the wisest possible decision be to just leave it as it was now and attempt no further reconstruction? But, like the proverbial fools who "rushed in where angels feared to tread", we decided to go for it. Once such a decision is made and the work is begun, it is hard to reverse. A specimen that is badly crushed but still in place can provide a lot of scientific information. Consider the specimen now in the prep lab, one of the three gomphothere skulls that were recovered along with the jaw we are describing in this article. The view from the top of the skull is dismal---everything is crushed (this specimen could be the main character in Flatland). Twenty-four to thirty inches of skull are flattened into a layer of

bone ten or eleven inches thick. Most of fragments are nickel and dime sized pieces (or even smaller). Certainly, there are a few larger pieces which could be glued together---but what then? I would have several large, possibly unrecognizable pieces pulled out of context, pieces that I could lay on top of the crushed skull, or be place in a box. A far better decision would be to clean and harden the specimen and preserve what visual information the crushed specimen can still provide---which is much more that you might think. The total length of the skull can still be determined, and important features such as the nasal openings and the location of fossae and foramina are visible. However, since the teeth and palate, and the basi-occipital area are in much better condition than the top of the skull, both sides of this skull will want to be studied, and that, unfortunately, means the specimen will have to be turned over a number of times. In order to harden the top of the skull and make it strong enough to flip over, a stronger consolidant than Butvar is needed. In addition to strength, the consolidant also needs to be optically clear so we can see the features of the skull. A clear resin which could be brushed on the specimen to fill cracks and cover the skull with a thick (perhaps 1/4 to 3/8 inch) layer would do the job. There are clear polyester, epoxy, and urethane resins. I will look for one that is non-yellowing with age.

Let's return to the business at hand, the gomph jaw. We begin our gomph restoration with two partial mandibles which have already been prepared, and a crushed symphysis/alveolus area still in the jacket. When you're working with heavy specimens (all adult proboscidean jaws are heavy), be advised to reconstruct them on a reinforced platform (I used a 1" thick sheet of plywood cut 2 1/2 feet by 6 feet and reinforced the bottom perimeter with 2" X 2" board. This

will allow the finished reconstruction, which may weigh several hundred pounds, to be moved without actually handling the specimen. Large specimens, especially those which are poorly preserved, have a nasty habit of breaking under their own weight, so the less they are handled, the better.

The partial left and right mandibles were set up on the platform in approximately the position they would be in if they were a complete lower jaw. Enough of the symphysis remained so that a good contact existed between the two mandibles. They were glued together with epoxy cement and missing or broken areas sculpted in with a mache/plaster mixture (Jonas Bros. Taxidermy mache 50%/hydrocal plaster 50%). Before sculpting in the missing areas, a V-shaped piece of Ree-Bar was placed at the symphysis with each leg of the V in one of the mandibles and the apex of the V pointing forward. The Ree-Bar was cemented in place and buried in mache/plaster (I wanted these mandibles to stay together!). Next we focused attention on right dentary area. The heavy equipment, which had been used to uncover the specimen, had damaged the fully erupted and worn 2nd molar and the alveolus area. This area needed major repair, and since only about 1/3 of the 2nd molar was present, it appeared we would have to fake a molar. In the next bulletin, learn more about fakery, and how the missing part of the molar turned up in Texas and finally returned home to be joyously reunited with its other cusps.

Please send questions, answers, or comments to:

Russ McCarty
Vertebrate Paleontology
Florida Museum of Natural History
University of Florida
Gainesville, FL 32611

Attention FPS Members...

DONATIONS NEEDED!

for

The 1993

Florida Paleontological Society

FOSSIL AUCTION

November 6, 1993

**to be held in conjunction
with the Fall Meeting in Lake City**

Give us your unwanted or extra paleo-items!

Books and Posters

Fossils

Fossil Casts

Paleo Hats, T-shirts, patches

Rocks, Minerals

Tools, washing screens, etc.

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32 papers include archaeology, history, physiography, floral communities, fauna, peat deposits, geology, natural disasters.

Fossils Are Where You Find Them

by Eric Taylor

This quarter's newsletter has more the kind of articles that we are dying to receive from the membership or other interested parties. I want to express my thanks to all the contributors and ask you to keep them coming! Anything that will help the avocational paleontologist get a better feel for what opportunities exist for work in the field in Florida is strongly encouraged!

Because of the abundance of material (and a new job that is using up my fossil hunting time!), I will confine my contribution to a follow up on the preliminary report in the last Newsletter about the new site Eric Prokopi and I had begun to develop in the Santa Fe River here in northern Florida.

As I reported, Eric and I had stumbled upon an in situ location in the Santa Fe River very near a heavily used public facility. The site is not yet completely worked so I will not divulge the exact location, but a clear picture of the major features and finds has emerged.

It appears that the location (we call it Mammoth Savings and Loan) was a spring or spring run in the late Pleistocene. The presence of numerous water worn and water stained rocks (clear springs in north Florida have limestone rocks that have been dyed a bluish color), an apparent channel and the presence of very old cypress stumps along the sides of the channel lead us to that conclusion. It seems likely that young Colombian Mammoths either became trapped (most likely) or were killed there and their bones sand to the bottom of the spring and were covered by sand and dead snail shells. We suspect that they were trapped because none of the material found shows signs of predation by either carnivores or humans and because similar occurrences have been documented in locations in South Dakota and Missouri, among others. Also, we tend to rule out predation as cause of the concentration of material because of the nature of the fossils. With the exception of land and aquatic turtles, a couple of deer bones and dead snails, the only fossils from this deposit so far have been mammoths!

As of this writing, Eric and I have recovered 18 complete or mostly complete teeth, three or four chins, several mostly complete (but poorly preserved) limb elements, numerous skull fragments, several rib heads and some partially complete ribs, numerous tooth fragments and skull fragments, and one piece of one vertebra from mammoths at this site. In addition, several bucketsfull of turtle and tortoise shell, tens of pounds of bone fragments (almost all clearly from mammoths) and a 3/4 complete carapace from the large Pleistocene box turtle have come from there.

Strange facts about mammoth Savings and Loan (called that because the deposits were made a long time ago, we didn't have to put anything in but time, can make all the withdrawals we want, and bankruptcy is certain in the future!) :

1. Only one tiny fragment of tusk has shown up. Where are they?
2. All of the animals we can identify as individuals were very young, but not newborns or little babies.
3. Two complete sets of dentition have been found. We suspect that there are four or five individuals in the deposit with one or two others possible.
4. The Santa Fe river has been searched for fossils for almost 40 years. This site proves that significant, exciting finds are still possible even in the most thoroughly investigated locations!
Remember, fossils are where you find them! (But y'gotta LOOK!)

Fossil Treasures in Florida's Creeks

by Mark Renz
Alva, Florida

To me, nothing compares to fossiling in Florida's creeks, especially those that are shallow enough to snorkel. In the southwestern part of the state where I live, these creeks contain some of the most interesting fossils to be found.

The creeks themselves offer unparalleled beauty. Their banks are often 15-20 feet high and lined with sturdy oaks, old growth cypress trees and sky-reaching cabbage palms. They so resemble eras gone by that I half expect to run face-to-face with a proud Calusa Indian or a ferocious sabercat.

While I don't tell you which southwest Florida creeks have been the most rewarding for me, I will tell you that I've been successful at finding plenty of fossils in all but one creek. If I can find a lot of fossils, I figure anybody can. But that doesn't mean it's easy. Finding the good stuff is 10% skill and 80% persistence.

I've had to hike several miles up or down creeks, in the water, along their banks, through thorns and thick saw palmetto shrubs, and over and under barbed wire fences (being careful to get permission from the landowner ahead of time). All this while wearing a steaming hot wetsuit and carrying food, water, mask and snorkel, as well as a fossil net (hopefully full of bones and teeth on the return trip).

Have you ever noticed that when your hands are full is when those pesky horseflies and mosquitoes realize you're the most vulnerable? Fortunately, the occasional alligator or snake I have encountered have not been quite as observant.

Overall, the hardships have been well worth the spoils. For instance, one creek that I have become infinitely familiar with and for which I have sweated off countless pounds of fat, almost always gives up wonderful finds. There are pockets every half mile or so that are so rich in fossil material the bones and teeth appear to have been dumped there by the truckload.

On my first day in this particular creek, in an area about the size of an average living room, I picked up 44 horse teeth, 7 glyptodont bony armor plates, 8 mako shark teeth, a Calusa Citrus Point, 25 alligator teeth, umpteen turtle shell fragments, 4 whale vertebrae, 2 whale teeth, seven

pottery sherds, 12 deer antler fragments, 7 barracuda teeth, 6 snaggletooth shark teeth, 3 great white shark teeth, 4 whale inner ear bones, garfish scales, and various other fossils. Needless to say, days like that make an amateur bonesmith such as myself ecstatic.

I have had other days equally rewarding in the same creek. However, none have been quite as exciting for me as a day in late December of 1992. I had a friend with me and we had trudged about two miles up part of the creek I had never searched. We had started out at 8:00 A.M., and it was now pushing dusk. Trees along the bank were casting long shadows over the water, making visibility difficult. When we finished, we would still have to make a two-mile trek back to the car.

We were both frustrated because we hadn't found anything, not even a modern turtle shell fragment. My friend was even more frustrated because my legs are considerably longer than hers and I tend to walk fast. Finally she told me to go ahead by myself. She would wait by a tree until I returned.

I had gone nearly a quarter of a mile and was just about ready to throw in the towel for another day when I noticed a few small bone fragments in about two feet of water just downstream from a bend. I donned my mask, laid down in the creek and began inching my way upstream.

After several feet the bone fragments increased in number and size. Still, I couldn't identify any of them. They were too badly splintered. Then, off to my left a few feet, my peripheral vision caught a large black object sticking out of the sand. Accustomed to coming across submerged tree trunks, I casually scraped the object with my finger nail. But this time, instead of sinking into soft, water-logged wood, my nails met with resistance.

Having been fooled many times into thinking I had found a large bone that turned out to be wood or metal, I still didn't get excited. Feeling a little irritated that I wasn't able to quickly confirm my suspicions that it was metal or even a smooth rock, I began to dig out around the object. Before long I had freed it from its wet, sandy grave. It was only then that I realized I had half of what

appeared to be a huge leg bone. Was it from a mammoth? A mastodon?

To date it was my largest find and the adrenaline surged through my body. I stuck my hand through the sand where I found the bone and felt something else hard that my finger nails couldn't gouge. When I worked it out and held it up, I knew right away what I had found. In my hand was a claw core, or toenail, over a foot long. It belonged to an *Eremotherium*, the largest of the sloths and the biggest land animal ever to live in Florida.

I came up out of the water screaming like a passionate lover, "Yes! Yes! Yes!"

I sprinted back to my friend, clutching the claw in my hand. "Guess what I found?" I asked her excitedly, the claw hidden behind my back. When I showed it to her, she recognized immediately that it was from the giant ground sloth.

We hurried back to the spot to see if there were more bones buried in the sand. There were, but it was getting too dark to make out anything. I hated to leave but the search would have to wait until the following morning.

That night, I slept with the claw next to my pillow. Every time I would half wake up and realize what I had found, I had to touch it to make sure I hadn't dreamed the whole thing.

We arrived at daybreak, blowing the sand away with our hands in about two feet of water. Everywhere we looked there were large black chunks of fossilized bone. By the time the day ended, we had found several hundred pounds of the animal, including two entire leg sections, another claw core over 13 inches long, individual teeth, part of the jaw with three teeth embedded, 17 vertebrae, ankle bones that resembled flying saucers, and part of its snout.

At the time of this writing, we are still making trips back to the site to recover more bones, although it's getting more difficult to find them. The sloth is spread out over an area about 25 X 25 feet square. In some areas the sand is three feet thick and the bones are resting on the hard clay bottom. The area is too remote to haul in a pump. Judging from the still-healthy-looking trees that were uprooted and lying in the water, the animal appears to have been washed out of the bank during the previous summer's rains.

I've named the sloth Three Fingered John, after a three-fingered street thug who lived in the Twenties. Normally, *Eremotherium* is found with

three toes. But a four-toed sloth has recently been discovered. I'll have to wait until I find more of its claws to know for certain which species John is. In talking to veteran slother Don Serbousek, he believes John could have been over twenty feet from head to tail. The sloth he contributed to the Daytona Arts and Sciences Museum is approximately nineteen feet. Its largest claw core is about eight inches long, while John's is thirteen and a half inches. However, if Frank Garcia could recover the entire sloth from which he found a twenty-three inch claw core, it would make both of our giants look small.

An interesting side note...scattered under the bones were a number of alligator teeth. Were they lost feeding on the sloth carcass? Or did they exist at a different time and just happen to get washed into the same spot as the sloth bones?

Also, within a mile of the site, I discovered evidence of a smaller sloth, although I don't know if it's an *Eremotherium* or *Megalonyx*. Lying on the creek bank within a few feet of each other were a leg bone, two five-inch claw cores and a curved tooth.

In the same area was the Calusa Citrus Point I mentioned earlier, as well as a very unusual *Carcharodon megalodon* shark tooth. It had a hole drilled through the root from both sides, was squared off around the edges, and had been polished smooth on both sides. Perhaps it was worn as a pendant by an early indian.

When I found the sloth, I kept hoping to find evidence that humans had somehow been involved in this kill, but nothing has surfaced yet.

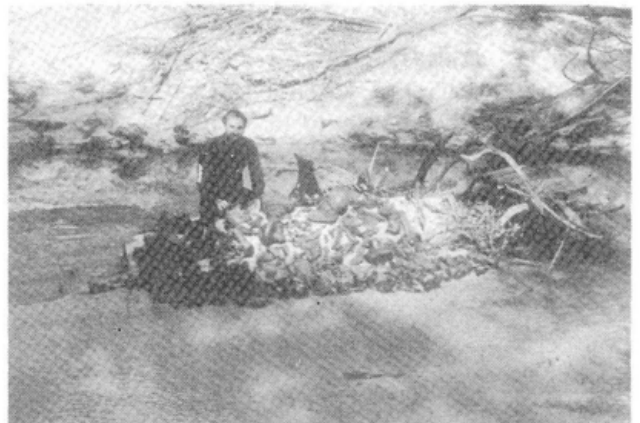
I have only been hunting for fossils for two and a half years, but it's been so educational and so much fun that I decided to start my own business. I hire myself out as a guide under the name of *Fossil Expeditions*. For a small fee, I take people to spots that have been productive for me. I show them which fossils to look for, how to look for them and how to preserve their finds. So far, it's been very successful. The people who go with me are genuinely interested in learning more about Florida's prehistoric past. I'm happy because I'm making a living doing what I enjoy. And through our finds, hopefully we'll be able to contribute just a little something to the wonderful world of paleontology.

I can't wait until tomorrow and another trip into the past.

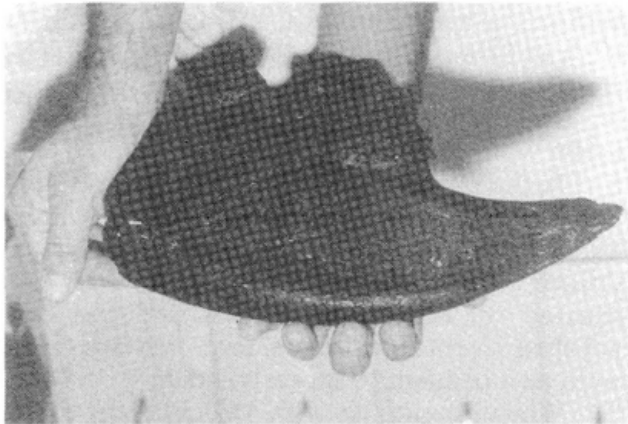
Mark Renz can be reached at 18304 S.R. 80, Alva, Florida 33920, Phone: (813) 728-3382.



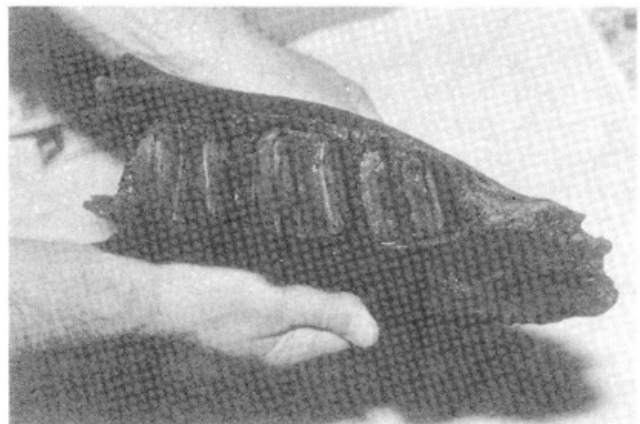
The *Eremotherium* was scattered all around the submerged tree to my right. It appeared that the creek bank had washed out during the previous summer's rains. Notice the bones beginning to pile up on the sand bar in the background.



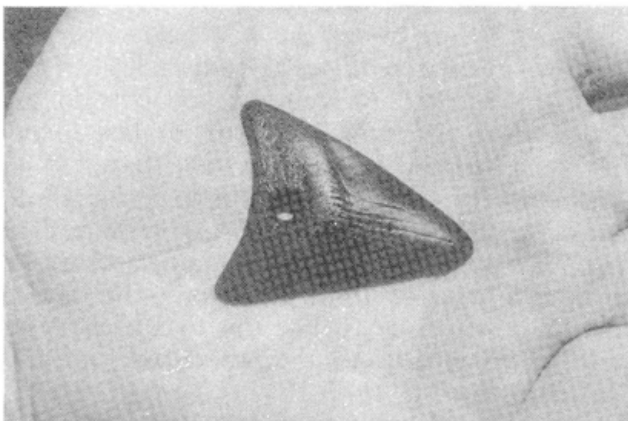
Three Fingered John beginning to take shape.



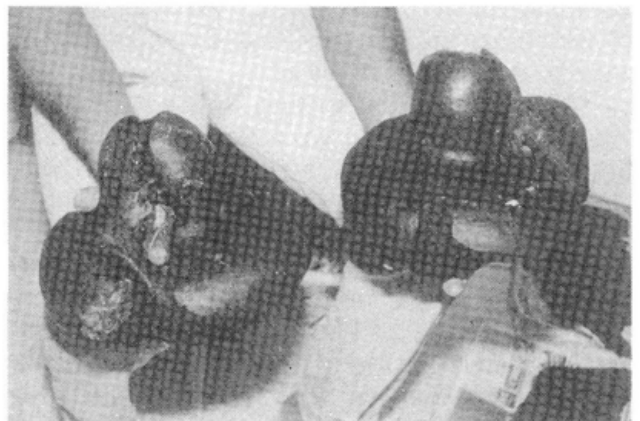
A 13.5 inch claw core, or toenail.



Jaw fragment with three teeth embedded.



A *C. megalodon* tooth found in the same creek. A hole was drilled from both sides, the tooth's edges were squared off, and both sides were polished smooth, suggesting it may have been worn as a pendant.



These huge *Eremotherium* ankle bones resemble flying saucers.

Paleontology of the Upper Pleistocene Anastasia Formation in Eastern Florida

by
Richard A. Johnson, P.G.

Introduction and Purpose

The upper Pleistocene Anastasia Formation was named by Sellards (1912) and described as a coquina of cemented to uncemented water-worn shells with some quartz sand and calcite cement. Although the formation is abundantly macrofossiliferous, comprehensive and detailed investigations of the paleontology of the Anastasia appear to be lacking from the literature. Therefore, the present study was initiated in order to examine the fossil content of the Anastasia along the eastern coast of peninsular Florida. The study area, comprised of St. Johns, Flagler, Volusia, Brevard and Indian River Counties, is depicted in Figure 1.

Occurrence

The Anastasia Formation occurs between St. Augustine, east-central St. Johns County, and southeastern Broward County beneath the barrier islands and westward a variable distance on the mainland. The formation's type area is beneath Anastasia Island in southeastern St. Johns County. Beds of unconsolidated to poorly-consolidated coquina crop out only in the northern portion of the Anastasia's occurrence, along the coast of southeastern St. Johns, Flagler, Volusia, Brevard and Indian River Counties. The Anastasia consists exclusively of hard consolidated limestone and sandstone in the southern portion of its range: St. Lucie, Martin, Palm Beach, and Broward Counties.

Methods

In the field, five exposures of the Anastasia Formation, located in St. Johns, Flagler, Volusia, Brevard, and Indian River Counties, were bulk- or mass sampled for this study (Table 1, Figure 1). These exposures were chosen for sampling because they are representative of the Anastasia and are located in an area where the Anastasia contains unconsolidated coquina beds (which are more amenable to sampling and fossil separation than is hard limestone). Approximately one gallon of shell material was obtained from the least-consolidated portion of the exposed section and was placed into a clear plastic sealable bag for transportation. In the laboratory, each sample was washed in small lots utilizing a standard sieve to eliminate quartz sand and unidentifiable sand-sized shell fragments. In addition, large mollusc fragments and pieces of consolidated coquina were removed by hand prior to picking. Identifiable (whole) fossils were picked and identified to genus and species utilizing Morris (1951, 1973) and Rehder (1981).

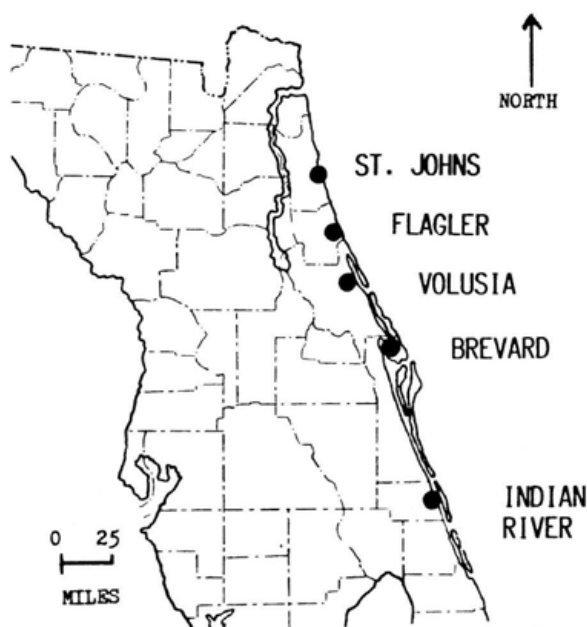


Figure 1: Study area and sample locations.

TABLE 1: Sample Data

Sample Name (County)	Section Location (Township-Range-Section)	Section Description	Sampling Interval Feet Below Top of Anastasia
St. Johns	T7S R30E Section 21	Small roadcut: Flamingo at Anastasia Park Streets, near Anastasia State Rec. Area, northern Anastasia Island, St. Augustine.	1-2
Flagler	T12S R31E Section 39	Roadcut on N side of SR100 and E of I-95 near Flagler Beach.	4-6
Volusia	T15S R32E Section 1	Small pit on N side of 8th Street at roadcut in small ridge, NW Daytona Beach.	3-5
Brevard	T20S R36E Section 19	Haulover Canal cut W of SR3 bridge - S side.	4-5
Indian River	T32S R39E Section 14	North Canal cut under US1 bridge - S side.	0-3

Results

Representatives of the Phylum Mollusca were the only identifiable fossils recovered from the five samples of Anastasia Formation. Sixteen mollusc species were identified, predominantly pelecypods (11 species). All recovered species are extant. Table 2 lists all species identified in the Anastasia, and Table 3 lists the molluscs recovered from each specific sample.

Species marked with an asterisk (*) in Tables 2 and 3 were recovered from all five of the mass samples. All pelecypods, these species are: *Anadara transversa*, *Donax variabilis*, and *Mulinia lateralis*. In addition, the most abundant molluscs by number of individuals in all samples was *Donax variabilis*, followed closely in abundance by *Mulinia lateralis*. These pelecypods live in the intertidal/beach or surf zone,

TABLE 2

All Species Recovered from the Anastasia Formation

Pelecypods

- Anadara brasiliiana* (Lamarck)
- Anadara ovalis* (Bruguiere)
- Anadara transversa* (Say)*
- Cardita floridana* Conrad
- Donax striatus* Linnaeus
- Donax variabilis* Say*
- Glycymeris pectinata* (Gmelin)
- Mulinia lateralis* (Say)*
- Noetia ponderosa* (Say)
- Pleuromeris tridentata* (Say)
- Plicatula gibbosa* Lamarck

Gastropods

- Crepidula fornicata* Say
- Crepidula plana* Say
- Diodora cayenensis* (Lamarck)
- Marginella pruinosum*
- Oliva sayana* Ravenel

TABLE 3

Species Identified by Sample

		North			South	
		ST. JOHNS COUNTY	FLAGLER COUNTY	VOLUSIA COUNTY	BREVARD COUNTY	INDIAN RIVER CO.
PELECYPODS	<i>Anadara brasiliiana</i>	●				●
	<i>Anadara ovalis</i>		●	●	●	
	<i>Anadara transversa</i> *	●	●	●	●	●
	<i>Cardita floridana</i>			●		
	<i>Donax striatus</i> ?	●	●	●	●	
	<i>Donax variabilis</i> *	●	●	●	●	●
	<i>Glycymeris pectinata</i>		●	●		●
	<i>Mulinia lateralis</i> *	●	●	●	●	●
	<i>Noetia ponderosa</i>	●				●
	<i>Pleuromeris tridentata</i>		●	●	●	●
GASTROPODS	<i>Plicatula gibbosa</i>		●	●		●
	<i>Crepidula fornicata</i>				●	●
	<i>Crepidula plana</i>		●		●	●
	<i>Diodora cayenensis</i>					●
	<i>Marginella pruinosa</i>				●	●
	<i>Oliva sayana</i>		●			

buried in sand (Morris, 1973; Rehder, 1981). Fourteen of the 16 identified species live in either intertidal or shallow-water marine environments (Morris, 1973; Rehder, 1981). *Anadara brasiliiana* and *Pleuromeris tridentata* live in the moderately-shallow marine environment (Morris, 1973; Rehder, 1981) farther offshore, and were probably commonly washed ashore by currents or tides after death of the animal. These facts, along with the worn and fragmental conditions of all specimens, confirm that the Anastasia Formation was deposited in a high-energy near-shore marine paleoenvironment. The presence of *Donax striatus*, a tropical species (Morris, 1973), probably indicates that the Anastasia was deposited under warmer conditions than at present.

The northernmost (type area) sample, in St. Johns County, is the most fragmental, containing the smallest number of whole individuals, the smallest number of identified species, and represents the highest depositional-energy conditions. The southernmost sample from Indian River County contains the most whole and

identifiable individuals, and represents the lowest depositional-energy conditions.

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- Rehder, H.A., 1981, The Audubon Society field guide to North American seashells: Alfred A. Knopf, New York, Chanticleer Press Edition, 894 p.
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FALL MEETING INFORMATION

November 6 and 7, 1993
Lake City, Florida

Approximate Schedule of Events

SATURDAY, NOVEMBER 6:

- 7:30-8:45 AM **Early-Bird Breakfast** at Quincy's in Lake City - Dutch treat (see map).
9:00-10:00 **Annual Business Meeting**, Columbia County Library (see map).
10:00-10:15 **Break**

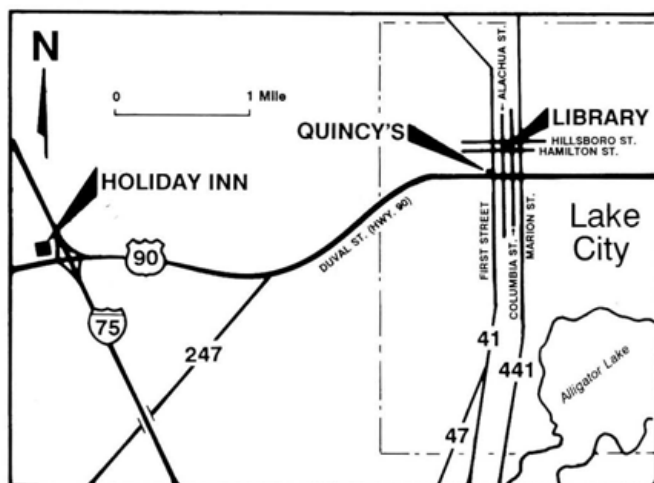
Talks:

- 10:15-10:45 **Dr. Bob Chandler** will present: *Life as I Understand It After I Finished Screwing Around With It or Additions To The Fossil Record of Titanis walleri.*
10:45-11:15 **Dr. Dave Webb** will present: *Late Pleistocene Paleontology and Archaeology of the Aucilla River.*
11:15-11:45 **Mr. Craig Oyen** will present: *Patterns of Evolution in Neogene Echinoids (Family Mellitidae) from Florida.*
11:45-12:15 **Dr. Steve Manchester** will discuss: *Ancient Forests of Florida: Fossil Leaf and Wood Remains.*
12:15-2:00 **Lunch** on your own
2:00-4:00 P.M. **FPS Board Meeting** at Library
4:00-7:00 P.M. **Free Time**
7:00-8:30 P.M. **Banquet Dinner** at Holiday Inn (see map). **PLEASE BE SURE TO FILL OUT THE BANQUET RESERVATION FORMAT RIGHT AND RETURN WITH YOUR PAYMENT.**
8:30-? **Annual Fossil Auction** at Holiday Inn *Bring your items to donate!*

SUNDAY, NOVEMBER 7:

Sunday will be devoted to **collecting trips** to a variety of sites in the Lake City Area. Members may choose which trips they want to attend at that time. There will be at least two local stream collecting trips. **Bring your sieves, washing screens, and dry clothes - be prepared to get both dirty and wet!** We will offer a trip to a Suwannee River site if the water level is down...it's too early to tell now. Plans are being finalized for a limestone quarry trip for invertebrates and/or a possible tour of the Occidental phosphate mines in Hamilton County. Bring your pails just in case! Final trip plans will

be announced at the meeting, and members may attend as many of the collecting trips as they can work into their schedules.



A word of warning...I-75 is under construction in much of its course through Alachua County. Accidents and other traffic tie-ups may occur. Although Interstate conditions are totally unpredictable, Hwy 441 offers a liesurely alternative to I-75.

Lake City Accomodations Motels

- Best Western** - I-75 and U.S. 90 W: (904) 752-3801 or (800) 528-1234
Comfort Inn - U.S. 90 and I-75: (904) 755-1344
Cypress Inn Motel - U.S. 90 and I-75: (904) 752-9369
Days Inn - U.S. 90 and I-75: (904) 752-9350 or (800) 325-2525.
Econo Lodge - U.S. 90 and I-75: (904) 752-7891.
Econo Lodge South - I-75 and U.S. 441: (904) 755-9311.
Friendship Inn - U.S. 90 and I-75: (904) 755-5203.
Gateway Inn - U.S. 90 and I-75: (904) 755-1707.
Holiday Inn - U.S. 90 and I-75: (904) 752-3901.
Howard Johnson - U.S. 90 and I-75: (904) 752-6262.
Quality Inn - U.S. 90 and I-75: (904) 752-7550 or (800) 228-5151.
Ramada Inn - W. U.S. 90: (904) 752-7720.
Scottish Inn - W. U.S. 90: (904) 755-0230.

Campgrounds

- Casey Jones Campgrounds** - Hwy 242 & I-75: (904) 755-0471.
Ginnie Springs Resort - High Springs: (904) 454-2202.
Inn & Out Camp Park - W. U.S. 90 & I-75: (904) 752-1548.
Jiffy Junction Campground - I-75 Exit 82, .5 mi. W. on 90: (904) 752-7421.
KOA Campground - N. Hwy. 441: (904) 752-9131.
River Run Campground - U.S. 27, near Ichetucknee Springs: (904) 935-1086.

Fall Meeting Banquet Reservation Form

The Banquet dinner will be an all-inclusive buffet at the Holiday Inn Saturday evening, November 6, 1993.

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Please reserve places for the following:

___ Adults X \$16.50 = _____

___ Children (under 12 yrs) X \$14.50 = _____

Total Enclosed: _____

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___Y ___N

What's in a name?

PALEOGENE
Eocene
Oligocene
Miocene
Pliocene
Pleistocene and Holocene
Smilodon SERVA
Foraminifera
WICOMICO Mio
FT. THOMPSON
LIMESTONE Pam
Miami Limes
HAWTHORN
WANNEE STRAITS
Avon Park Fm.
Eupatagus
Epoch

Editor's Note: Gary Morgan is off this quarter and, in order to keep this column going, your editor is filling in for him. Last issue Gary touched briefly on some of the stratigraphic nomenclature used in Florida. In this issue, I will expand on this theme and discuss the major near-surface stratigraphic units, particularly those of interest to fossil hunters. Perhaps in future issues we can split the state into sections, and discuss each area in greater detail.

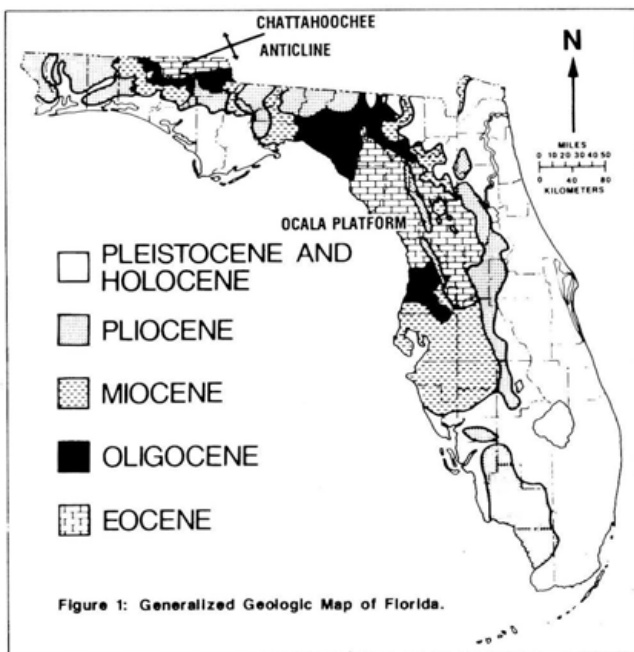
THE NEAR SURFACE GEOLOGY OF FLORIDA

by Frank Rupert

The typical visitor to our state, upon hearing mention of the "geology of Florida", might understandably exclaim "What geology...its all flat and sandy!" In a superficial sense, the visitor would be right. Florida is largely covered by quartz sand, spread over the state in a variably-thick blanket by ancient high-standing seas. However, as anyone who has spent time hunting for fossils here knows, there's more to the story. Road cuts, stream banks, manmade canals and open pit mines reveal a much more complex and interesting geology than many newcomers would suspect. But these exposures are only the proverbial "tip of the iceberg". In fact, the platform supporting Florida is composed of many thousands of feet of sediments. The vast majority are marine **carbonates** (sedimentary rocks composed in large part of the mineral calcium carbonate, CaCO_3). These rest on basement crust that geologists believe was originally part of northwestern Africa. Based on comparisons of rock composition and fossils in Florida's basement rocks with those of Africa, it has been hypothesized that the slice of crust deep beneath us was wrenched from the region of Algeria during the split-up of the huge supercontinent of Pangea, 190 million years ago. For much of the time since then, the area of present-day Florida was covered by the sea. A thick sequence of marine sediments built up, occasionally being exposed as dry land as sea level fluctuated.

Originally, Florida's subsurface strata were deposited "layer cake" style, in generally flat, progressively younger-upward layers. If this was all that occurred, we would certainly have a rather mundane geology today, and probably a more limited set of fossils available to the surface collector. However, a couple of subsurface features have made our geology much more interesting. Sometime during or shortly after the Oligocene Epoch, a relative doming of strata took place under Levy and Citrus Counties, in the central Big Bend area. This may have actually been caused by downwarping or sinking of strata around a localized stable region centered under this area. Middle Eocene rock is exposed at the crest of this dome-like feature, which has been named the **Ocala Platform**. Younger Late Eocene, Oligocene, and Miocene rocks truncate against the flanks of the Ocala Platform in younger-outward, generally concentric bands (Figure 1).

A similar stratigraphic high in the north-central panhandle, named the **Chattahoochee Anticline**, brought Late Eocene and Oligocene rocks close to the surface in Jackson and



Washington Counties. This feature is largely responsible for the existence of the dry caves at Florida Caverns, and for Jackson County's near surface limerock deposits.

The oldest rock exposed at the surface in Florida is the Middle Eocene age **Avon Park Formation**. It occurs near the surface over the crest of the Ocala Platform, in southern Levy and northern Citrus Counties. The Avon Park was deposited on a shallow carbonate bank about 45 million years ago (mya). It is named for the town of Avon Park in Highlands County. Geological units such as formations are commonly named for towns or other geographical features near where the stratigraphic unit was first described. This scheme usually works well for near surface units, and one can reasonably expect to find exposures of a particular rock near its namesake town. Don't go to Avon Park looking for Avon Park Formation though. The unit was first described in samples from a well drilled in Avon Park, and actually lies some 600 feet below the surface. The Avon Park is largely a tan-colored, muddy, recrystallized limestone (calcium carbonate) or **dolostone** (calcium-magnesium carbonate). Its main fossils of interest are the well-preserved *Lepidodendron* seagrass fossils found at the Florida Rock Industries' Gulf Hammock quarry, near Gulf Hammock in Levy County. The echinoids *Periarchus* and *Eupatagus* and rare mangrove tree leaves sometimes turn up as well.

About 38 million years ago, Florida's best known limestone was deposited on top of the Avon Park Formation in a shallow Late Eocene sea. Named for exposures in and around the town of Ocala, Marion County, the **Ocala Limestone** is a nearly-pure calcium carbonate teeming with small marine fossils. It underlies nearly all of Florida, and serves as part of an important freshwater aquifer system named the Floridan aquifer system. Like the underlying Avon Park Formation, it is found near the surface over the Ocala Platform and Chattahoochee Anticline. In these areas, this white to cream colored limestone is extensively quarried for use as roadbed material and cement lime. Portions of Marion, Alachua, Levy, Jackson, and Dixie Counties are pock-marked with open-pit Ocala Limestone quarries. The upper unit of the Ocala Limestone is a hash of large **foraminifera** (unicellular marine animals that constructed tiny calcium carbonate shells), such as the disk-shaped *Nummulites* and the potato-chip-like *Lepidocyclina*, bryozoans, small echinoids and mollusks, including the characteristic pelecypod

Amusium ocalanum. Occasionally, rare Eocene whale bones are found in the Ocala during mining. The lower unit of the Ocala Limestone, exposed in mines in southern Levy and northern Dixie Counties, is finer-grained, and contains the larger echinoids *Eupatagus antillarum* and *Periarchus lyelli floridanus*.

During the Oligocene Epoch, which encompassed the period 38 to 25 mya, two marine carbonate units were deposited in Florida. In the panhandle, the **Marianna Limestone** was laid down in the vicinity of the town of Marianna, in Jackson County. In much of the rest of the state the **Suwannee Limestone** accumulated on top of the Ocala Limestone, in a warm shallow sea about 33 million years ago. It was named for the exposures along the Suwannee River in north Florida. The Suwannee contains an abundant foraminifera fauna, different from that of the Ocala Limestone, along with mollusks and the echinoid guide fossil *Rhyncholampas gouldii*. The Suwannee Limestone is at or near the surface around the northern and southern flanks of the Ocala Platform and the Chattahoochee Anticline. It is quarried in Taylor, Lafayette, and Pasco Counties for use as road base material. These quarries commonly yield good echinoid specimens.

The Miocene Epoch began about 25 million years ago, and marked a change in the depositional regime of the Florida peninsula. Prior to this time, Tertiary sediments in northern and peninsular Florida were nearly-pure carbonates. This was due to a large marine seaway, named the **Gulf Trough**, which arched though southeastern Georgia connecting the Gulf of Mexico and the Atlantic Ocean. This seaway is thought to have effectively isolated the shallow carbonate-rich Florida peninsula from the North American mainland. By the early Miocene, this seaway had filled in with sediments, allowing continental siliciclastics (quartz sand, gravel, and clays) to flood into the peninsula. Shallow Miocene seas spread these continental sediments southward. As a result, many Miocene and younger rocks contain significant amounts of quartz sand and clay.

Carbonates were deposited in the shallow Miocene seas, but these usually were much sandier. Some good examples include the **Chattahoochee Formation** (named for exposures near Chattahoochee, Gadsden County) and the **St. Marks Formation** (a river and a town in Wakulla County); both units crop out in the eastern panhandle.

In what would become the Florida panhandle, a

series of sandy, shelly formations were laid down in the Miocene seas. The mollusc-rich **Chipola Formation**, named for exposures along the river of the same name, and most of the formations in the **Alum Bluff Group** were laid down in the central panhandle. The Alum Bluff Group was named for Alum Bluff, the state's most spectacular geologic outcrop, situated on the Apalachicola River in Liberty County. The Chipola Formation and some units in the Alum Bluff are famous for their well-preserved Miocene-Pliocene fossil molluscs. Many panhandle streams cut down through these fossiliferous beds, offering numerous collecting locales. Occasional vertebrates are also found; one find of a partial jaw of the horse *Merychippus gunteri* at Alum Bluff marked the western-most occurrence of this species in Florida.

The sandy **Bruce Creek Limestone** and part of the **Intracoastal Formation** were also deposited during the Miocene. These units are accessible at very few locations, but made-man pits in the Intracoastal Formation in Franklin County (which may contain a younger, Pliocene portion of the unit) have yielded some very nice molluscs, echinoids, and large barnacles.

Throughout northern and peninsular Florida, the **Hawthorn Group** was deposited during the Middle and Late Miocene. It consists of greenish-gray to gray phosphatic clayey sands, sandy clays and sandy carbonates. This unit was formerly called the Hawthorn Formation, but has been subdivided into different formations, and the original name elevated to group status. The Hawthorn was named for exposures near the town of Hawthorne, in Alachua County. Subsequent stratigraphic use of the name without the "e" on the end in scientific literature has resulted in the current spelling being accepted. The Hawthorn Group occurs near the surface in portions of the eastern panhandle and the northern and central peninsula. Many northern Florida streams cut down into or through the Hawthorn, providing good collecting areas. It makes up the hills around Gainesville and portions of northern Marion County. The Hawthorn is an important economic unit, and is mined for fuller's earth in Gadsden and Marion Counties, and for phosphate in Hamilton, Polk, Hillsborough, Manatee, and Hardee Counties. The Hawthorn yields a variety of both land and marine vertebrate fossils, especially in the phosphate mines. Shark teeth and dugong ribs are common in the unit statewide. The famous Tampa Bay agatized coral, Florida's State Stone, comes from a member of the

Hawthorn Group. It has also yielded horse fossils, and more exotic creatures like gomphotheres and long-beaked dolphins; one dolphin find in a creek in downtown Gainesville was described in a recent issue of this newsletter.

Beginning about 5 mya, Pliocene rivers and seas laid down a series of sandy, clayey deposits statewide. In the panhandle, the mollusc-rich **Jackson Bluff Formation** was deposited along the edge of a shallow sea. This unit was first described from Jackson Bluff on the Ochlockonee River in western Leon County. Across the northern edge of the panhandle, the reddish-colored and generally unfossiliferous **Citronelle** (named for Citronelle, Alabama) and **Miccosukee Formations** (first described near Miccosukee, Leon County) were deposited in a delta or marginal-marine setting. About the same time, the **Cypresshead Formation** (named for exposures near Cypresshead, Georgia) was laid down in the center of the peninsula. In northeastern Florida, a fossiliferous marine equivalent of the Cypresshead, named the **Nashua Formation**, was formed. It contains a molluscan fauna similar to that of the Caloosahatchee Formation, and has historically been exposed in a few places along the St. Johns River, especially near the town of Nashua. In southern Florida, the sandy limestones of the **Tamiami Formation** accumulated in a warm shallow seabed. Named for exposures along the Tamiami Trail, it contains numerous molluscs and echinoids. During the Late Pliocene, deposition of the sandy, shelly limestone of the **Caloosahatchee Formation**, named for exposures along the river of the same name, began and continued into the Pleistocene.

About 1.8 million years ago, the Pleistocene Epoch, also known as the "Ice Age", began. As huge glaciers advanced and retreated across North America, sea level oscillated between about 450 feet lower than today, and about 60 feet higher. During sea level highstands, waves and currents reworked and redeposited sands from older units, spreading a blanket of quartz sands over the coastal plain. In southern Florida, impressive deposits of molluscs accumulated in these shallow Pleistocene seas. During this time, the deposition of the **Caloosahatchee Formation** continued, and the **Bermont** and **Ft. Thompson Formations**, all named for southern Florida landmarks, were laid down. It has recently been proposed to lump these three units into a single, easily workable unit named the **Okeechobee formation**.

Along the east coast, the sandy, shelly Anastasia Formation formed in a narrow, coast-parallel band (see article, this issue). Its name derives from the coquina rock found on Anastasia Island near St. Augustine. This rock was quarried by the Spaniards to construct the famous fort Castillo de San Marcos in St. Augustine.

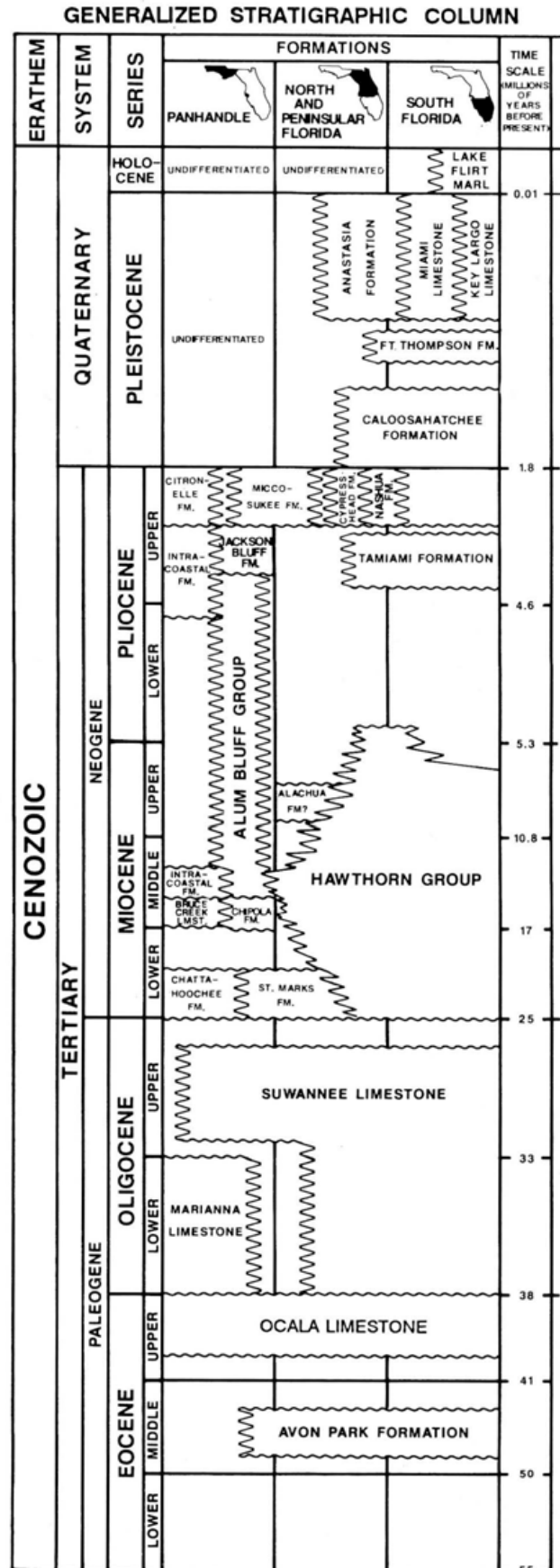
In southeastern Florida, an area more influenced by carbonate sedimentation, the Miami Limestone and Key Largo Limestone were deposited as ancient carbonate bank and reef tracts. The Miami Limestone was named for exposures in a canal in the city of Miami. It has some mollusc beds, but is generally not a fossiliferous unit. The Key Largo Limestone, named for Key Largo in southern Florida, is a limestone composed almost entirely of large, well-preserved corals.

The land mass of Florida varied considerably during the Pleistocene, but there was likely a sizable core of dry land in the panhandle and central peninsula throughout the period. Pleistocene marine deposits consist primarily of unconsolidated, unnamed sands and clayey sands. These commonly cover the sea-ward edges of the state up to an elevation of about 60 feet above mean sealevel.

Pleistocene terrestrial sediments have yielded a fascinating array of land animals, including many which are extinct or no longer live in Florida. In diversity of species, Pleistocene Florida has been compared to the modern plains of Africa. Our state may have been a refuge for many species escaping the glaciers to the north. Bones and complete Pleistocene skeletons are sometimes unearthed in south Florida shell pits. Many other bones are found in springs, sinkholes, and creeks (see "Fossil Treasures" article, this issue), where they accumulate after being eroded out of Pleistocene strata.

The Holocene, or Recent, encompasses the last 10,000 years. It was marked by the first appearance of man in Florida. Holocene sediments consist primarily of unconsolidated marine beach and dune sands, river alluvium deposits, and a freshwater marl, sometimes referred to as Lake Flirt Marl, found in some swamps, rivers and lakes. This marl commonly contains modern freshwater mollusc shells, cemented in a calcareous or organic matrix.

This whirlwind tour of Florida's shallow geologic units is only a brief introduction to the many interesting rock units found in our state. Further information is available in publications of the Florida Geological Survey. For a free List of Publications, write to: Publications Office, Florida Geological Survey, 903 W. Tennessee St., Tallahassee, FL, 32304.





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PLEISTOCENE	_____	_____	_____	_____
PLIOCENE	_____	_____	_____	_____
MIOCENE	_____	_____	_____	_____
OLIGOCENE	_____	_____	_____	_____
EOCENE	_____	_____	_____	_____
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8. LIST ANY UNUSUAL SPECIMENS FOUND, CIRCUMSTANCES UNDER WHICH THEY
WERE LOCATED AND THEIR DISPOSITION.

PLEASE USE AN ADDITIONAL SHEET IF REQUIRED! THANK YOU!

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).

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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.

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