Florida Paleontological Society, Inc.
Newsletter

Fall Meeting
Preliminary Announcement
inside

Volume 14 Number 2 Spring Quarter 1997

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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FLORIDA PALEONTOLOGICAL SOCIETY INC. NEWSLETTER

Volume 14, Number 2 Spring Quarter 1997

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First Announcement

1997 FPS Fall Meeting

November 1st and 2nd, 1997

Powell Hall

University of Florida
Gainesville. Florida

Tentative Schedule of Events:

Saturday, Nov. 1st:

12:00 - 1:00PM - Registration and Fossil ID sessions
1:00 - 2:00 PM - Business Meeting
2:00 - 3:00 PM - Board Meeting
3:00 - 5:00 PM - Bat Show
5:30 - 6:30 PM - Tour of Lubee Bat Center
7:00 - 8:00 PM - Food and Drink
8:00 PM - 9:00 PM - Fossil Bat talk by Gary Morgan
9:00 - 10:30 PM - Fossil Auction

Sunday, Nov. 2nd:

Field trip (TBA)

News Notes

From the Secretary....

Just a reminder, if you haven't paid your 1997 dues, please do so as soon as possible. Delinquent members will not receive their newsletters, *Papers in Florida Paleontology*, and other special meeting announcements.

Spring Meeting notes....

The Florida Paleontological Society's spring meeting was held in Tampa Florida on May 3 and 4, 1997. The members of the Tampa Bay Fossil Club and the FPS who organized the meeting did a fine job and those who were able to attend had a great time!

The meeting kicked off Saturday with a coffee social at the University of South Florida and a fine presentation on the evolution and probable lifestyle of the many species of sabre-toothed cats that have lived in North America over the past 30 million years or so. We were lucky to have this talk presented by the best known expert in this area in the U.S., Dr. Larry Martin, Professor of Paleontology at the University of Kansas and with a fine assist by amateur paleontologist John Babiarz from Mesa AZ. Dr. Martin's free-wheeling style, wide ranging knowledge, humor, and love of controversy made this presentation a joyful experience for all.

Following the meeting, the Board of Directors of the society met and in fairly rapid fashion made some significant changes in the way meeting announcements will be handled in the future, contributed $1,000 to Britt Memorial Scholarship fund at the FLMNH and scheduled the next three meetings as to location. Those who did not attend the Board Meeting visited museums in the area that were featuring horned dinosaurs and rare large cats.

In the early evening, participants were treated to an outstanding Italian meal (catering arranged by the Tampa Bay Fossil Club) and immediately following an auction of fossil related material run in superior fashion by President Elect Terry Sellari. This auction raised $660.00 for FPS projects and included everything from Pleistocene fossil teeth to casts of a saber-toothed cat!

Following the auction, the members of the FPS were invited to attend the Tampa Bay Fossil Club's meeting during which David Letasi from the Museum of Science and Industry gave an interesting and wide ranging talk on carnivores and carnivore skeletal morphology.

The next day, several members participated in a collecting trip to the Vulcan limerock mine near Brooksville. This mine usually turns out a variety of interesting invertebrate specimens for the collector, including several species of echinoids and some beautiful calcite crystals.

Eric Taylor

Spring Board Meeting Minutes....

Florida Paleontological Society, Inc.
Board of Directors Meeting
May 3rd, 1997, Tampa, Florida

The Board of Directors of the FPS convened at 1:10 PM 5/3/97 at the Spring Meeting site in Tampa Florida on the campus of the University of South Florida. Present were:

Gordon Hubbell	President
Eric Taylor	Secretary
Tom Ahern	Vice President
Susan Pendergraft	Past President
Joyce Bode	Member of Board
Barbara Toomey	Member of Board
Barbara Fite	Member of Board

Terry Sellari	President Elect
Douglas Dew	Member of Board
Roger Portell	Member of Board
David Letasi	FPS member
Stephen Jacobsen	FPS member
Brian Ahern	FPS member

The Tampa Bay Fossil Club and the members of the Spring Meeting committee were thanked by President Hubbell for the fine job they did in assembling a worthwhile meeting under adverse circumstances. Eric Taylor explained that the newsletter containing the information on the meeting, while late, had been mailed approximately two 1/2 weeks before they were delivered! The U.S. Post Office strikes again!

All members expressed dissatisfaction with the way that meetings had been handled over the past few years and as a result, it was decided that meetings would be scheduled as to location at least a year in advance and that preliminary information would be disseminated in both the newsletter and in separate mailings.

This fall's meeting will be held in North Florida (probably at the museum and park near Ocala and Silver Springs) on an October weekend that will not conflict with other activities. A separate flyer will be mailed to announce details. President Hubbell appointed Barbara Fite, Tom Ahern and Joyce Poulton to the committee to organize and publicize the meeting.

The Spring Meeting in 1998 will be held in the Jacksonville area. Joyce Poulton, Doug Dew and Robyn Miller were appointed to organize this meeting. The meeting will also be announced through the mailing of a separate flyer. In the fall of 1998, there will almost certainly be another PaleoFest in Gainesville and our meeting will coincide with that activity.

Barbara Fite suggested that the FPS be involved in providing a speaker's bureau service and should be active in promoting the involvement of amateurs in the science. Dr. Hubbell suggested that she write an article and provide a questionnaire on these subjects for the newsletter.

A motion was made by Terry Sellari to give some type of award to any member who serves two consecutive terms as a board member or officer of the Society. The motion passed after discussion and Terry was appointed permanent awards chairman.

At the request of Roger Portell, a motion was made to donate $1000 to the Britt Memorial Scholarship Fund at the Florida Museum of Natural History to allow this fund to be endowed through the University of Florida Foundation. Motion carried.

President Hubbell was directed to send of letter of appreciation to David Thulman of Tallahassee for his fine series of articles in the Newsletter on fossil teeth.

The meeting was adjourned at 2:10 PM.

Respectfully submitted,
Eric G. Taylor
Secretary

Upcoming Meetings and Talks....

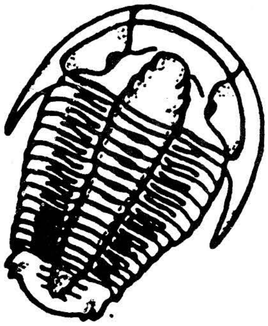
August 9-10 Annual Sharkstooth and Seafood Festival, Venice, , FL.

Nov. 14-16 11th International Mineral, Gem, Jewelry and Fossil Exhibition, Hotel Royal Olympic Athens Greece, ph. Int. 30-1-9226-411.

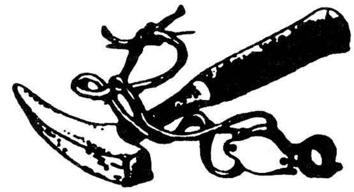
Your Newsletter Needs Articles...

Hey folks!...times are slow here at the editorial desk. How about taking this opportunity to write that newsletter article you've always been meaning to? Club news and show advertisements are also welcome. Send items to:

Frank Rupert, FGS
903 W. Tennessee St
Tallahassee, FL 32304



Reminder!



The

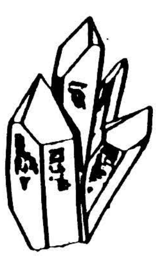
FPS Fall Auction

to be held
November 1st, in Gainesville, FL

Needs your Donations

Items that have been popular
at past auctions include:

Fossil specimens, fossil casts, fossil hunting equipment, paleontology books and reprints, fossil club hats and shirts, paleo-posters, mineral specimens, specimen boxes, unique and hand-made paleo items.
Be creative, and if in doubt, bring it along anyway!



Please bring your donatable items to the Fall Meeting or send them with a friend.

ADVENTURES IN SCIENCE
(or Better Paleontology through Chemistry)
by David Thulman

Winter is science fair season in Tallahassee and two projects were submitted from my home to the local elementary school. Unfortunately I missed the age cutoff by a hair under three decades and missed out on a chance for a blue ribbon. Instead I decided to take up Russ McCarty's challenge to experiment with thioglycolic acid and report the results. So, in the true spirit of science fairs everywhere I present my experiments and results.

My earlier attempts to clean fossils with acid ended in disaster. I used undiluted muriatic acid (in the strength used in swimming pools to lower the pH). Muriatic acid is merely dilute hydrochloric acid. After a couple of seemingly successful initial experiments I placed a nice baby mastodon molar in the acid and watched as the deposits which obscured the enamel bubbled and boiled away. Adhering to a paraphrase of the old adage "If a little time in the acid bath is good, a long time will be great!" I watched as the true beauty of the little tooth was revealed. I finally took out the tooth which was now white but pitted and dull where it should have been smooth and shiny. The acid greedily ate the discoloration and scavenged the apatite in the enamel. Eventually, the acid would have turned the entire tooth into solution[1].

Many fossils and artifacts (I can say "artifacts" out loud since it is now legal to possess artifacts so long as you properly report them) from Florida rivers are encrusted by varying degrees with mineral deposits. The common wisdom is that an iron compound known as goethite is responsible for the pimply deposits found on some fossils and artifacts. This is a common problem in northern Florida rivers where the ground water is full of iron. The iron forms the goethite in the rivers and the red clay hills around Tallahassee. In my experience, the thickest deposits seem to form on teeth and bones. I haven't found similar deposits on stone artifacts, although these are commonly covered with a thick coating which obscures the finer details. Fossils and stone artifacts may also be discolored with a dusty but tenacious patina ranging in color from milk chocolate to dark chocolate which is not composed of nodules.

Attempts to remove these deposits by scrubbing or picking away with dental picks may damage the specimen. Ideally, there is a treatment in which you could dip a rusty fossil and remove a white bone (like a Tarnix treatment for tarnished silver)! Could thioglycolic acid be the Holy Grail of Florida river paleontology?

EXPERIMENTAL PROCEDURE

The first problem was obtaining the acid. I called Fisher Scientific and Sigma. Fisher told me they were out, but neither Sigma nor Fisher would send it to me at my home. I had to get someone to order a bottle from Sigma and have it delivered to a business which would be likely to use the chemical. (In other words, they would not deliver to a food preparation business.) 100ml cost about $23 including shipping. The acid should be refrigerated, but it shouldn't be stored in the family fridge. I keep it in a sealed container in a cool area of my home.

Using a 5% solution I treated artifacts, bones and teeth for one to five days. I used specimens which had varying degrees of deposits and discoloration. I used various glass containers such as a Pyrex baking dish and a mason jar. Whenever I would look at the specimens to see how they were doing, I'd give the jar a swirl or two to agitate the acid. This seemed to help. After I removed the specimens, I gave them a quick rinse, poured household ammonia over them and swirled it around. Then I rinsed them under running water for a few minutes. When the ammonia neutralizes the acid it turns a rosy red.

The 5% solution can be created by mixing 19 parts water and 1 part acid. I used a stainless steel teaspoon since Walmart was fresh out of metric measuring spoons and graduated cylinders. A teaspoon is equivalent to 5ml. Two teaspoons acid will mix with one cup (less two teaspoons) of water to make a 5% solution. (Remember: Add acid to water like you oughter.) 100ml is enough to make 20 cups (1 gallon and one quart) of 5% solution.

This is very strong acid and like all acids, should be handled carefully.[2] Rubber gloves are highly recommended.[3] Copious amounts of hydrogen sulfide are generated during the mixing of the acid and while it works on the specimens,[4] so I left the glass containers outside. The temperature varied from the mid-70s to the mid-40s. Higher temperatures should speed the reaction.

RESULTS

In general, the stuff worked great and exceeded my expectations. However, in all cases I had to scrub away the residues; they did not entirely dissolve and couldn't always be wiped away. The residues have to be scrubbed away while still wet, otherwise they dry and can't be removed. Sometimes the acid left a shiny residue, probably because it either wasn't properly neutralized or rinsed. Each type of specimen had its own idiosyncrasies.

Artifacts: I think there is no deposit that will not eventually come off stone tools given enough time. Even the stubborn milk chocolate patina on some Bolen-age points I treated eventually dissolved away, revealing surprises underneath. A couple of tools I retreated in fresh bath of acid after a few days. The second bath always did the trick.

Caveat: One of the tools I treated had tiny fractures which soaked up the acid and continued to leach hydrogen sulfide for days. Every time I retreated it with ammonia, a rosy discharge leaked from the fractures. It was like the tool had stigmata. Eventually the aroma disappeared but the acid left a brown residue on the stone.

Teeth: Teeth cleaned fairly well. The enamel on mastodon, camel, horse and tapir molars came fairly clean, however, they all required some scrubbing. I feel certain additional time in the acid would remove the rest. I also treated sloth teeth: two Eremotherium fragments and a Megalonyx molar. Since these are dentine and not enamel I was curious about whether they would react differently. The patina was removed on all the teeth revealing the detail underneath, but one of the Eremotherium fragments turned grayish-white, while the other remained tan. Finally, I treated a piece of ivory. This was the most disappointing. Although the details were revealed, the dark stain was only lightened a little.

Caveat: One of the roots on the camel tooth broke while I was cleaning it and some of the dentine on the mastodon molar flaked off. The white sloth tooth broke in half and a piece broke off the Megalonyx molar. This breakage may have been due to the acid weakening the dentine, or the re-immersion in water, or both. Since all the specimens required some scrubbing, you should treat the teeth gingerly.

Bone: I treated a broken calcaneum, sloth claw core tip, and a whole horse toe. The goethite deposit was like foundation makeup, smoothing over the details and imperfections. Once it was removed all of the details were revealed. A couple of pieces also lightened up.

Caveat: The hydrogen sulfide lingered for days on those specimens where the acid soaked into the exposed calcareous bone, which is the spongy interior. It would probably be best to treat whole bones. Even the whole bones retained some hydrogen sulfide stench.

CONCLUSION

This is great stuff. However, it should be used with discretion since it is expensive and can be dangerous. Really, the hydrogen sulfide smell is the only significant downside, but after a couple of months even that will finally disappear. There are many more experimental combinations which I could have tried, but I ran out of patience and acid before I could try them all.

1. See upcoming recipe on Mastodon Molar Soup.
2. See upcoming article on The Effects of Thioglycolic Acid on Clothing and Carpets.
3. See upcoming article on The Effects of Thioglycolic Acid on skin.
4. See upcoming articles on Methods for Removing Hydrogen Sulfide from Fingers, and The Effects of Hydrogen Sulfide Residue on Your Sex Life.

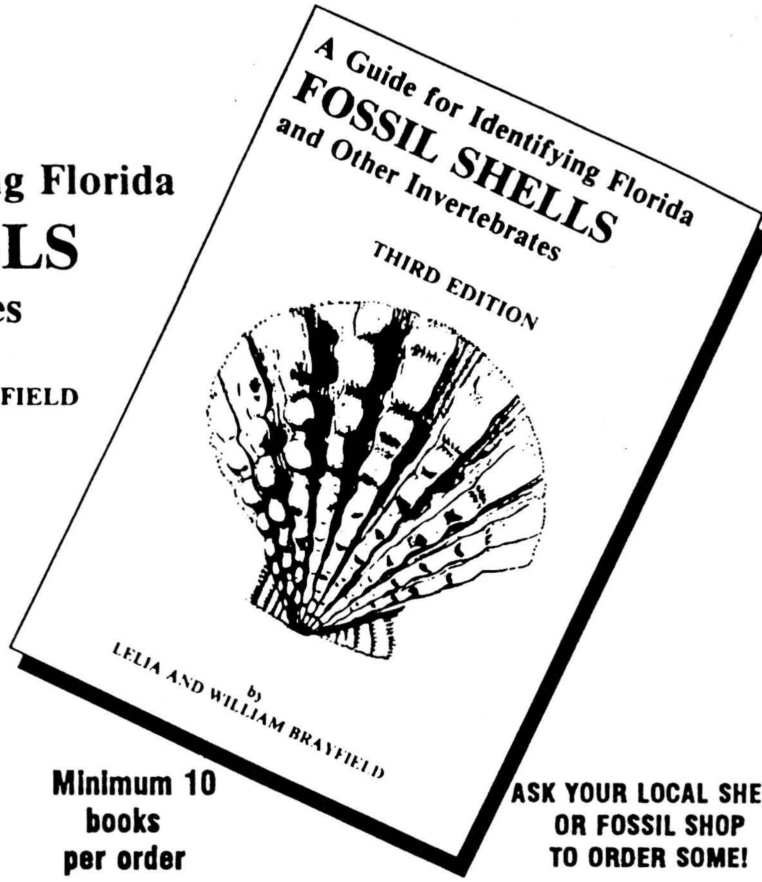
New Edition!

A Guide for Identifying Florida FOSSIL SHELLS and Other Invertebrates

by
LELIA AND WILLIAM BRAYFIELD

Updated by the staff of the Invertebrate Paleontology Division, Florida Museum of Natural History.

"Our hope is that collectors of Florida fossils will continue to enjoy the Brayfields' book, find this edition more useful than ever in identifying their specimens, and feel that we have been faithful to the authors with our revision."
Dr. Douglas S. Jones, Roger W. Portell and Kevin S. Schindler.



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Geologic Maps in Florida

Prospecting tools for the Fossil Hunter

by Frank Rupert

A geologic map illustrates the distribution, nature, and age relationships of rock units at or near the earth's surface. It is a blueprint of the composition and structure of the shallow substrate of our world. Such a map is important in a wide range of human endeavors, from locating mineral and water resources (or, in our case, fossils) to finding suitable substrate for building foundations or waste dumps, to understanding the basic foundation of our natural earth systems and resulting ecosystems.

A Brief History

Geologic maps of Florida have been around for over a hundred years. The earliest maps were produced in conjunction with the first phosphate mineral surveys conducted in the late 1800's. At that time, the concept of the geologic units present and their respective ages was simple and poorly refined. This was due in large part to lack of extensive subsurface data and modern age-dating techniques. The rocks that we now know as Eocene Ocala Limestone, Oligocene Suwannee Limestone, and Oligocene to Pliocene Hawthorn Group were, for example, at one time all considered Oligocene in age. Interestingly, various fossils were once used as the primary identifying feature for many formations, a practice now discouraged by the modern code of stratigraphic nomenclature.

The first statewide color map, showing some limited geology, was produced by Sellards (1913) in his report on Florida's phosphate deposits. This and most subsequent geologic maps of our state were produced by the Florida Geological Survey (FGS), the only state agency mandated by law to study and report on Florida's geology. True geologic maps of the state were produced in subsequent years by the Sellards and Gunter (1922), Cooke and Mossom (1929), and Cooke (1945). Later maps by Puri and Vernon (1959) and Vernon and Puri (1964) contained most of the familiar units we know today. The latter map served well as a basis for many cursory geologic studies and as an aid in understanding the complexities of the state's regional geologic settings. In the thirty-plus years since its printing however, much new geologic data has been obtained from well cuttings and cores, and many of the early geologic units have been discarded or refined. Brooks (1982) published a well-presented geologic map of Florida, which unfortunately departed in many areas from the generally-accepted rock unit interpretations and nomenclature. For the past ten years, the Florida Geological Survey has undertaken the task of re-mapping the state's geology in light of much new data and modern interpretations of the various geologic units. Digital geologic maps are now available for every county, and these will soon be merged into a statewide 1:750,000 scale map.

The basics of geologic mapping

Anyone looking closely at Florida's surface geology first notices the abundance of sand. Carried south from the eroding Appalachian Mountains by rivers, streams, and ocean currents, most of this sand was worked and deposited by high-standing seas which once covered our state. A variably-thick layer of sand blankets the state today, masking the older bedrock. Rarely, except in stream valleys and sinks, do you find older, more geologically interesting rock units naturally exposed at the surface. If a geologic map of Florida was constructed based only on what lies at the surface, all but a few small areas of the state would be colored solid "yellow", representing undifferentiated quartz sands. The older geologic units, which contain the economically important minerals, or as in our case, the fossils, may lie inches or feet below the surface. To understand what comprises the shallow geology of an area, we must get below the sand layer. This is why data from well cuttings and cores is especially important in Florida. Rock samples, taken mostly during water-well drilling or during specific geologic coring studies, allow us to observe the down-hole sequence of geologic units. Data from a variety of other sources is also used in geological mapping. Besides well data, outcrops in sinks, mines, stream beds and roadcuts are examined to determine what geological formations are present at shallow depth. Each data point is recorded on a base map, and once all the information is gathered, lines delineating each rock unit from adjoining units on the mapped are sketched in.

The rock units shown on geologic maps are termed *lithostratigraphic units*. A lithostratigraphic unit, in its simplest sense, is a body of rock that consists dominantly of a certain rock type (e.g., limestone) or combination of types, or has other unifying and laterally-mappable lithologic characteristics. Lithostratigraphic units have a binomial, or "two-name" designation. This name generally consists of a geographic name from its type area (where the unit was first described) combined with a descriptive term (e.g. *Ocala Limestone*), or else a place name with the appropriate rank term (*Hawthorn Group*). Lithostratigraphic units are classified according to the following rank hierarchy:

Group
Formation
Member
Bed

The fundamental lithostratigraphic unit is the *formation*. A formation is a body of rock strata that consists dominantly of a certain lithologic type or combination of types. A *Group* comprises two or more formations. Formations may, in turn, be subdivided into *members*, which comprise some specifically developed portions of the formation. A *bed* is the smallest lithostratigraphic unit. Beds are generally found in sedimentary rocks, and each is distinguishable from beds above and below it; beds typically range from a centimeter to a meter or two in thickness.

Any level of lithostratigraphic unit may be shown on a geologic map. Different units are commonly depicted on geologic maps by different colors, patterns or labels. Rock units of similar age are typically shown in different shades of the same color. For example, all the lithostratigraphic units of Miocene age might be depicted on the map by different shades of green. Symbols denoting the strike and dip of beds, or other structural symbols such as fold axes, may also be included on the map. In a region of structureless horizontal rock strata, only the uppermost rock unit would be shown covering the entire map. Since most sedimentary rocks were deposited during specific periods of geologic time, geologic maps also have a time connotation as well. This is applicable in Florida, as many of the shallow units correspond closely to the major epochs of the Tertiary and Quaternary Periods. Simplified geologic maps of the state commonly show the distribution of rock units deposited during the different epochs of the Cenozoic Era (see Figure 1).

Florida's shallow rock units are all sedimentary rocks, which were deposited "layer-cake" style, with progressively younger units covering older units. These strata are basically flat-lying, particularly when compared to geologically complex areas such as the Appalachians or the western U.S. However, Florida's rocks do have a low-angle dip, regionally southwestward and eastward away from the center of the peninsula. In some areas of the state, natural forces have tilted, folded, or domed up the local rock strata so that, once they are planed flat by erosional forces, two or more different rock units are exposed at the surface. In addition, high-standing seas of the past have carved landforms out of once more extensive formations, leaving "islands" or elongate ridges of younger rock resting on older bedrock. As a result, Florida's geology does show complexity as we shall see below.

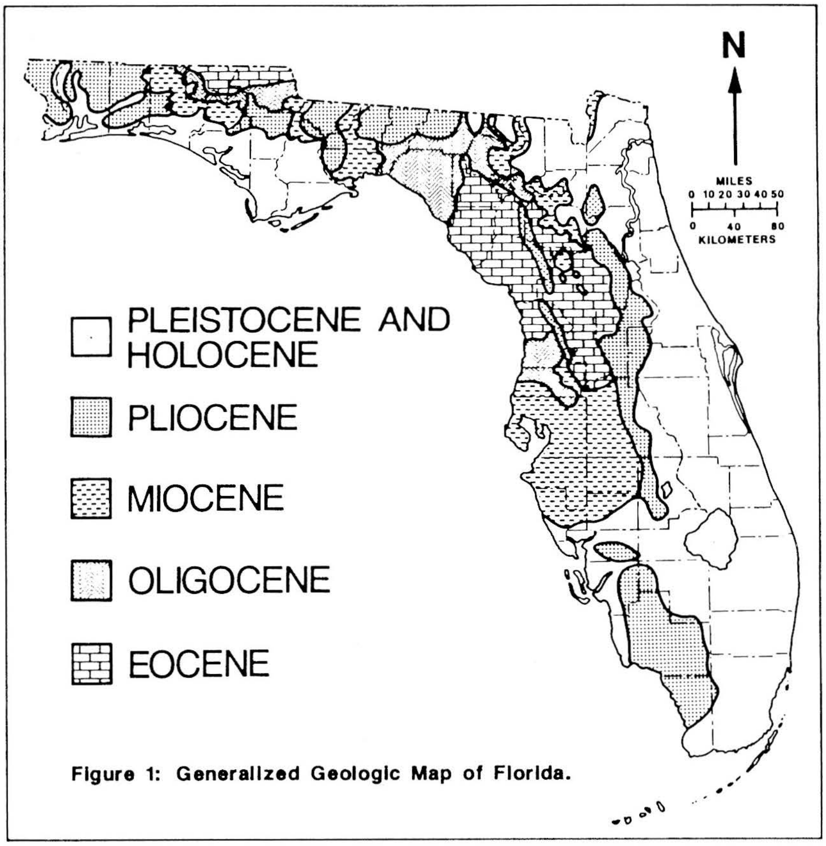

Figure 1: Generalized Geologic Map of Florida.

Illustrated in Figure 1 is a generalized geologic map of Florida. Rocks of differing geologic age are shown as different patterns on this map. Note that the very oldest rocks in the State are exposed in the Big Bend region of Florida's west coast. This older, Eocene rock is bordered by younger, Oligocene strata, which is, in turn, bounded by still younger Miocene rocks to the northwest and southeast. This dome-like pattern in Florida's Big Bend region was formed as the originally flat-lying strata settled (downwarped) around the periphery of a higher, more stable area called the Ocala Platform (somewhat analogous to draping a handkerchief over an up-turned glass. The top of the dome shaped structure was then, over millions of years, planed smooth by erosion, leaving the pattern of rocks seen on the geologic map today. The carbonates which lie close to the surface over the Ocala Platform generally dip away from the structure, and are overlain by progressively younger sediments outward from the flanks of the platform. Miocene through Pleistocene siliciclastic sediments comprise the highlands in the northern panhandle and central peninsular regions, while Quaternary undifferentiated sands cover the coastal lowland areas of both coasts. In southern Florida a series of late Tertiary and Holocene carbonates, shell beds and sands wrap around the terminus of the central highlands, and comprise all of the shallow units in the southernmost peninsula and Keys.

In constructing a geologic map, some conventions, or standard ways of doing things, must be adopted. Since sands cover most of the state, sometimes in substantial thicknesses, some means of mapping the significant sand units while still showing the presence of older units was necessary. During the FGS's mapping of Florida's geology, a thickness of 20 feet was used as the arbitrary depth for mapping an area as sand versus mapping it as whatever geologic unit first occurs under the sand. For example, if a Quaternary sand was determined to be over 20 feet thick in a particular area, the area was mapped as sand. If, however, some other formation was less than 20 feet below the surface, despite the presence of sand, the area was mapped as that formation. Figure 2 is a geologic map of Polk County, Florida, and illustrates this concept. As the cross section indicates, areas in which the Quaternary sands (denoted by the symbols Qu, Quc, and QTd) are 20 or more feet thick are mapped as sands, while areas with Hawthorn Group sediments (Thpb) occurring less than 20 feet below land surface were mapped as that unit. In most areas of Florida, the sands are less than 20 feet thick, so this method allows the

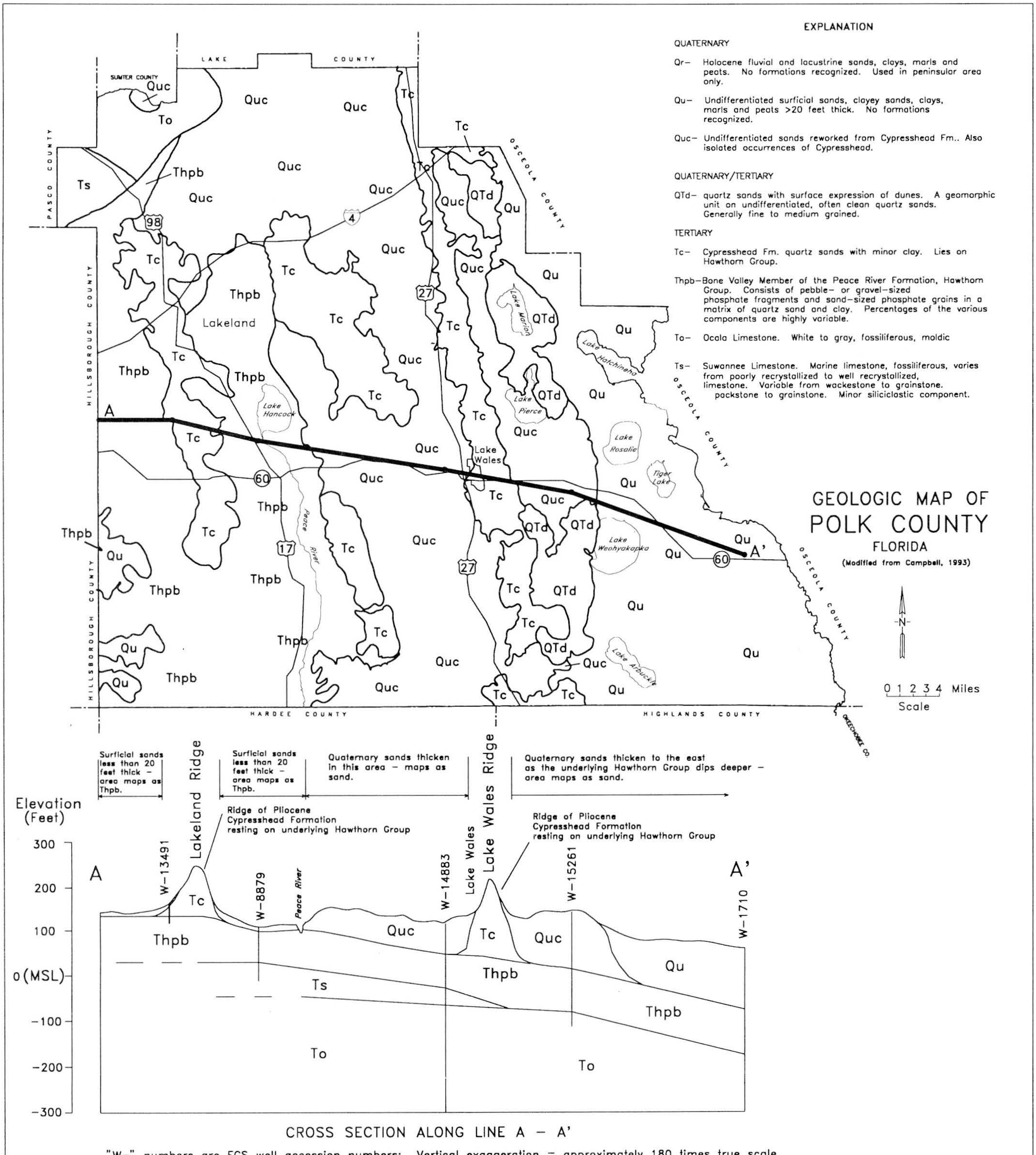

Figure 2. Geologic Map of Polk County, Florida with Cross-Section illustrating the relationships between the mapped rock units and the underlying geology. The shallow geology of the eastern part of the county consists of thick Pliocene and Quaternary sediments. In the western portion, older Hawthorn Group sediments, including the famous vertebrate-fossil-rich "Bone Valley" deposits, approach within 20 feet of the surface, and are mapped in the areas labeled Thpb. Ridges of Pliocene Cypresshead Formation trend northwest-southeast through the region.

maps to show the areas of significant sand deposits while allowing the shallow bedrock geology to be mapped in most regions as well.

Florida's Fossiliferous Units

The rocks of most interest to fossil hunters are those fossil-bearing units that are accessible at the surface, in stream cuts, road cuts, or mines. In Florida, these consist of about a dozen different named rock units. They are summarized below, from oldest to youngest. Many have variable lithology and fossil content. The predominant rock type and fossils are shown in the table.

Age (million years ago, MYA)	*Unit Name*	*Primary Rock Type*	*Predominant Fossils*
Middle Eocene (approx. 45 MYA)	Avon Park Formation	Limestone/Dolostone	Abundant foraminifera, echinoids, some mollusks, seagrass and other rare leaf impressions.
Upper Eocene (approx. 36 MYA)	Ocala Limestone	Limestone/Dolostone	Large foraminifera, echinoids, mollusks, bryozoans, crustaceans, rare vertebrates
Oligocene (approx. 33 MYA)	Suwannee Limestone	Limestone/Dolostone	Foraminifera, echinoids, mollusks, vertebrates.
	Marianna Limestone	Limestone	Foraminifera, rare vertebrates.
Miocene (25 - 5 MYA)	St. Marks/Chattahoochee	Limestone/dolostone	Foraminifera, echinoids and mollusks.
	Hawthorn Group (Includes various formations, from Late Oligocene to Early Pliocene age)	Clays, sands, carbonates	Foraminifera, abundant vertebrates, rare mollusks.
	Alum Bluff Group (includes various formations)	Clays, sands, shell beds, carbonates	Foraminifera, mollusks, corals, echinoids vertebrates.
Pliocene (5- 1.7 MYA)	Intracoastal Formation	Sandy limestone	Foraminifera, abundant mollusks, echinoids and barnacles.
	Tamiami Formation	Sandy limestone	Foraminifera, echinoids mollusks, barnacles, and rare vertebrates.
	Caloosahatchee Formation	Sandy shell beds	Foraminifera, mollusks, corals, vertebrates
Pleistocene (1.7 - .1 MYA)	Undifferentiated shell beds (includes Ft. Thompson, Bermont Fm., and others).	Sandy limestones and shell beds	Foraminifera, mollusks, echinoids, corals, barnacles, and vertebrates
	Anastasia Formation	Sandy mollusk coquina.	Mollusks, echinoids and rare vertebrates
	Miami Limestone	Limestone	Rare Mollusks
	Key Largo Limestone	Limestone	Corals, mollusks

Geologic maps and fossil hunting

Geologic maps are useful to fossil-hunters in several basic ways. Scanning a geologic map allows quick identification of regions where fossiliferous rocks are at or near the surface. In this sense, a geologic map is first and foremost a time-saving tool because, as an example, there would be no use in searching for Eocene echinoids in an area mapped as Hawthorn Group. However, if the mapped unit is not thick, mines, quarries, or other excavations might expose deeper fossiliferous strata.

Used in conjunction with topographic maps, geologic maps may help locate areas where natural and man-made exposures of fossiliferous strata may occur. For example, bluffs, deep stream valleys and sinkholes may expose in their walls fossiliferous strata that is otherwise buried by younger sediments. This is especially apparent on geologic maps of terrain dissected by streams; the older geologic units commonly follow the stream valleys upstream in a finger-like pattern, intruding into younger mapped units. Topographic maps also show locations of mines which may cut deep enough to reach fossiliferous strata normally buried by non-fossiliferous units. Topographic maps also give clues as to the dip of the underlying fossil-bearing rocks. If a fossiliferous unit on a geologic map disappears underneath a sand body, it is often possible to compare the elevation of the land surface over the fossil-bearing unit to that of the sand and tell if the sand is thicker due simply, say, to the presence of a high-standing paleo-dune field or ridge, or because the fossiliferous unit is actually dipping deeper under the sand. Such an observation could help determine whether it is worthwhile to check out a mine within the sand region to see if it cuts deep enough to reach the underlying fossil-bearing formation.

One simple way to use topographic and geologic maps together is to reduce the topographic map to the same scale as the geologic map, and overlay the two. The size reduction can be accomplished on most photocopy machines, and the overlain maps may be viewed on a light table. This technique allows comparison of the topography and geology of any region of interest.

Sources of Geologic Maps

The older geologic maps of Florida are mostly in literature that is now out of print. Copies may be available in your local university or community libraries. Since these older maps typically do not use modern formation nomenclature, they may not relate well to more recent literature on fossil-bearing lithostratigraphic units in Florida. However, since much of the classic invertebrate paleontology literature is of the same vintage as the older maps, they are potentially useful in understanding the extent and relationships of the geologic units which were in vogue at that time.

Digital county geologic maps are available from the Florida Geological Survey at a scale of about 1:126,720 (one inch = two miles). The maps are $3.00 each, which includes postage and handling. They may be ordered by county name from the following address:

Florida Geological Survey, Publications Office
903 West Tennessee St.
Tallahassee, FL 32304
ph. (850) 488-9380

References

Brooks, H.K., 1982, Geologic Map of Florida: Gainesville, University of Florida, Institute of Food and Agricultural Sciences.

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(cut out and return form)

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)______

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TYPE OF MEMBERSHIP

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2. SUBSCRIBER ($15.00)________
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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!

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.