Florida Fossil Horse Newsletter

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What's Inside?

- Fossil Hall to open in 2004: Come celebrate with us!
- Badlands Nebraska Adventure 2003
- WebbFete a Great Success
- Tusks! Travels to Tallahassee
- The Importance of Microfossils
- Chine Fossil Mammal Excursion
- Young Diggers at Thomas Farm
- Bobcat improves Thomas Farm Drainage
- John Day Who?
- Participants Enjoyed Making Molds and Casts During Summer Lab Session

Fossil Hall to open in 2004: Come celebrate with us!

After many years of planning and hard work, the multi-million-dollar Hall of Florida Fossils: Evolution of Life and Land will open to the public at the FLMNH's Powell Hall on Saturday, 22 May 2004. This seems like a long way off, but for the Fossil Hall project team, time is passing by rapidly. Most of the 5,000 square foot exhibit infrastructure is completed, and now the

Museum Artisan, Jeff Huber, gets finger chomped off while resurrecting Titanis for
The Hall of Florida Fossils. Each skeleton in the exhibit will be accompanied by one of Jeff’s exquisite bronze statues. Tammy Johnson photo

The project team is actively involved in completing the central exhibit peninsula, models of extinct animals, skeletons, specimen mounts, and 72 graphic text panels to be installed in the Fossil Hall.

The festivities celebrating the Fossil Hall opening will feature a three-day program (Friday and Saturday will coincide with the Spring meeting of the Florida Paleontological Society), including:

**Thursday, 20 May (Powell Hall)**
- FLMNH members "Sneak Preview" of the Fossil Hall exhibit.

**Friday, 21 May**
- Day-long field trip (including Thomas Farm and other local fossil sites)
- Evening public lecture with keynote speaker Dr. Chris Brochu (University of Iowa) who will talk on "Fossil Gators of Florida and elsewhere."

**Saturday, 22 May (Powell Hall)**
- Hall of Florida Fossils officially opens to the public from 10 am to 5 pm.
- Series of hourly talks, displays on Florida fossils during day, and special children's activities.
- Evening banquet and benefit auction.

We expect this opening to be a memorable event, one that all fossil enthusiasts should put on their calendars and plan to attend.

Badlands Nebraska Adventure 2003
The 6th annual *Pony Express* trip to the Nebraska Badlands was a resounding success. In addition to the wonderful weather, beautiful scenery, and the gracious hospitality of the Toomeys, the fossil collecting proved to be excellent indeed. After our Monday trek in Toadstool Park (to see the rhino tracks, and there was no death march), we spent the entire week collecting on the Sand Creek Ranch, mostly in the Oligocene Orella Member. Many important specimens were found that will enhance our research collections. The highlight of the fossil collecting was the discovery and excavation of a virtually complete saber-toothed cat skull and associated skeleton by Suzan Hutchens. In addition to the now traditional dinner at the "High Plains Drifter Cookshack," this year's evening events included taking in a play "Lie, Cheat, and Genuflect." at the Ft Robinson Summer Playhouse.

participants included:

Helen Cozzini (Crawford, NE), Steve and Suzan Hutchens (Old Town), Robert "Hutch" Hutchinson (Gainesville), Douglas Jones (Gainesville), Bruce and Jeannette MacFadden (Gainesville), and Marcia Wright (Winter Park). All the fossil specimens collected during the 2003 trip have been shipped back to Florida and are being prepared for eventual curation into our
Suzan Hutchens points out a portion of the sabertooth cat she discovered with her uncanny ability to hone in on the smallest piece of fossil. Many people would have overlooked that find. Insert: finished skull photo by Syzan Hutchens. Robert (Hutch) Hutchinson photo.

WebbFete a great success

Dr. S. David Webb, Distinguished Curator of Vertebrate Paleontology, retired on 30 June 2003 after 39 years at the FLMNH. On Saturday, 10 May the FLMNH hosted WebbFete, a day-long celebration of Dave Webb on the occasion of his retirement. WebbFete was a resounding success. During the day, a symposium attended by about 100 people featured speakers from around the country as well as Dave's colleagues at UF. The afternoon "behind-the-scenes" tour showed 60 visitors the Powell Hall exhibit and education facilities. One hundred and fifty people attended the evening banquet that featured Dr. Clayton E. Ray, former FLMNH curator, who presented a talk "An idiosyncratic history of Floridian Vertebrate Paleontology." We thank all of the speakers and everyone, in particular Suzan Hutchens, who worked so hard to make WebbFete such a success. We wish Dave, Barbara, and family well and look forward to seeing Dave often at the FLMNH when they return from their mountain cabin in Montana.
**Tusks! Travels to Tallahassee**

The exhibit Tusks!, produced by the FLMNH staff, highlights fossil proboscideans (mammoths, mastodons, and their relatives) that lived over the past 12 million years in Florida, until they became extinct 10,000 years ago. After almost a year on display at the FLMNH, this successful and popular exhibit was installed at the Tallahassee Museum of History & Natural Science in June. Jennifer Golden, TMHNS Educational Coordinator says: "We have had a steady stream of visitors and it has helped recruit a lot of new volunteers. The dig site has added an exciting hands on element to the exhibit".

After Tusks! returns from the TMHNS in the Fall, the skeleton of the American Mastodon will be installed in the Central Gallery of the FLMNH along side the Columbian Mammoth. Both of these skeletons were collected from northern Florida, both lived at about the same time during the end of the Ice Age about 16,000 years ago, and they are destined to become icons of the museum experience at Powell Hall.

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**The Importance of Microfossils**

Most fossil sites contain a mixture of megafossils (large bones, visible to the naked eye) and microfossils (those identifiable only with the aid of a dissecting microscope). The large fossils often get much more attention simply because they are usually the first to be
discovered. The wealth of microfauna is often only suspected to be there or visible as tiny specs of bones in the matrix surrounding the megafossils. To get an accurate picture of the ancient environment of a fossil site it is important to study both the macrofauna and the microfauna (animals that weigh 2.2 lbs. or less in life). The mega-fossils tell us about the bigger picture: the habitat structure, etc. Micro-fossils are important in that they are very good environmental indicators. Since they have small ranges and live under specific conditions they can tell us much about the ancient ecology and climactic conditions. Frogs, for example tell us that at times there was water. Bats tell us about shelters, such as caves. Their short life span can give us gives us a clear snapshot of a very small time period (geologically speaking!)

Special recovery techniques are required for microfauna and these depend on the nature of the matrix in which it is found. The most popular technique is screen washing. At the Florida Museum of Natural History the matrix is placed into three nested screens of 3 sizes:

- coarse (4-mesh hardware cloth with 16 openings per square inch),
- medium (16-mesh window screen with 256 openings per square inch) and
- small (24-mesh brass screen with 576 openings per square inch).

The large screen catches any rocks, leaves and larger fossils while the two smaller screens catch the smaller gravel and fossils. The window screen may contain such fossils as frog and rodent limb bones and those small items of larger animals such as toes, tail vertebrae, and teeth. The smallest screen will contain tiny rodent, insectivore, and bat teeth (see photo) and jaws as well as tiny fish vertebrae, lizard jaws and the limb elements of these tiny creatures.

Screenwashing has been used to collect micro-fossils since the 1930's. It takes patience and perseverance. Sandy soils yield their treasure easily, but clays tend to stubbornly stick together and require a different approach. Prior to washing, all matrix should be dried thoroughly. Then it should be weighed so that the "richness" of the site (number of specimens per kilogram) can be compared to that of other sites. People often ask how many bags of matrix are needed since hauling bags and washing the matrix is very labor-intensive. The amount needed varies from site to site. The rule-of-thumb is that when your species list has leveled out (nothing new has been found for a while), you
Gary Morgan, Curator of the New Mexico Museum of Natural History (left) and Dr. Nicholas Czaplewski, VP Curator of the Oklahoma Museum of Natural History (right), are continually adding to the bat list of Thomas Farm. Recently they have described two new species, *Karstala silva* and *Primonatalus prattae*. They have applied for a grant renewal to continue their research. Erika Simons photo

Drying clay matrix is also helpful in breaking it down. It is then washed and dried alternately for several turns until the clay washes through completely. An alternate way to break down the clay after drying is to soak it in water using a little Calgon. When screen-washing, it is extremely important not to push or squeeze the matrix through the screen, as this will crush the tiny delicate fossils. Overloading the screen can also cause difficulties. A moderate amount of matrix should be washed through until it is reduced to a few grains of sand mixed with the fossils. Aiming a gentle flow of water up through the screen from underneath can assist if the matrix is slow in washing through. The resulting mixture of fossils, sand grains, and tiny bits of vegetation is called concentrated matrix.

If the concentrated matrix contains a large amount of plant matter, this can be further separated by floatation. By placing the matrix in a container filled with water and running water over it the lighter plant matter will float to the top and run off while the heavier fossils and sand grains will remain.

After the concentrated matrix is dried, it is ready to be sorted with the aid of a dissecting microscope. Small amounts are placed in a petri dish and sorted under medium magnification using very light tweezers. Limb bones and other post-cranial elements are then stored in pill capsules. They are kept loose so that proper measurements can be taken. Teeth are mounted on the heads of pins affixed to a small cork with the occlusal surface level and steady for measuring length and width accurately. The mounted specimen is stoppered into a vial for safe storage. The specimens can be handled safely on their mounts without risk of damage.

The Thomas Farm fossil site has yielded a rich variety of microfossils. Many specialists have contributed their knowledge to build the following faunal list. Most of the specimens were obtained from screen-washed matrix among the many animals recovered are numerous species of frogs, toads (5 families), salamanders (2 families), snakes (2 families), lizards (7 families including a recently discovered gila monster), a rich variety of bats (4 families) and rodents (2 families). A great number of the Thomas Farm microfauna species are extinct and were first discovered at this fossil site.

*Erika H. Simons*

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**Chinese Fossil Mammal Excursion**
In August Bruce MacFadden traveled to China as part of a research group from Florida State University, University of Florida, and Institute of Vertebrate Paleontology and Paleoanthropology, Beijing PRC. During this trip Bruce toured fossil localities and the rock column exposed in the extraordinarily rich region of Linxia, eastern Qinghai Province, central China. From this region the local farmers have for years collected Neogene (Miocene through Pleistocene) extinct mammals. These have been used as "dragon bones" for medicinal purposes (sold in drug stores throughout China). More recently these fossils have been collected for the international paleontological market. The locals are exceedingly adept at fossil-hunting, and even develop tunnels going far into the ground surface to collect rich concentrations.

To celebrate the wealth of paleontological resources of the Linxia region, the local government has established a fossil mammal museum at Hezheng, which opened in September. This museum will provide storage for a world-class collection of fossil mammals, including hundreds of extinct horse and rhino skulls. This facility also has excellent displays showing off a fraction of this extraordinary collection, as well as interpretive dioramas and beautiful murals.

After the first part of the trip in more rural central China, Bruce traveled to the IVPP in Beijing where he presented a seminar on his research. This was an excellent rip and quite an eye-opener to the wealth of paleontological resources and wonderful culture of China. Bruce extends his sincere appreciation to Dr. Yang Wang of FSU for inviting him to be a member of this research group and Dr. Deng Tao of IVPP for all of the courtesies extended to us while we were in China.
Young Diggers at Thomas Farm

Editor’s note: Although the Thomas Farm fossil dig is open to participants ages 16 and older, the diggers are usually a more mature group. It is always refreshing to see young people participate and enjoy themselves. Over the past fifteen years we have had a smattering of teens participate in our excavations. Some had waited not-so-patiently for many years before they reached the required age. In the past two years three enthusiastic young people livened up our group. These were Kelzey Betancourt of Fort Meyers, Amanda Floyd of Louisiana and Caroline Lenard of Texas. The young ladies caught the infectious enthusiasm from their family members who had been telling them exciting stories about their digs at Thomas Farm. Amanda wrote, "Caroline and I anxiously waited for years to turn sixteen and go to Thomas Farm". Amanda and Caroline submitted diaries of their experiences at Thomas Farm last April 10-13, 2003. Due to space restrictions and the similarity of content only one article will be published in full with excerpts from the other.

My Thomas Farm Diary

The Thomas Farm site, located near the small town of Bell, Florida, was discovered in 1931. The fossil site is 18 million years old and was a sinkhole filled with fossils of animals that fell into it and were trapped. The three different species of three-toed horses found at Thomas Farm are Parahippus leonensis, Archaeohippus blackbergi, and Anchitherium clarencei. The most common of the horses is Parahippus, which is less than half the size of the present-day horse (Dr. Bruce MacFadden). 80% of the horses at the site belong to Parahippus. Archaeohippus is a small rarer horse that counts for only 10% of the fossil material found. The rarest and largest three-toed horse is Anchitherium, which accounts for only 1% of all the horse material found at the Thomas Farm site. Among the horses, you would also find remains of Camels, the famous "bear-dog", bats, turtles, rhinoceros, long-tailed dogs, and deer-like mammals.
The University of Florida owns the Thomas Farm site. All the fossils found at the site are taken to the Florida Museum of Natural History where they are prepared, catalogued and placed in the fossil collection. The fossils are studied by paleontologists, in their research. Graduate students pursuing advanced degrees in Zoology, Geology, Vertebrate Paleontology and other related natural sciences also use the fossils.

**Thursday, April 10, 2003** Today we left the hotel and began our journey to Thomas Farm, near Bell Florida, where the dig will take place. When we arrived, Amanda and I had to set up our camp. This was my first time to camp, so I learned a lot today. Uncle Bill took Amanda and me down to where the excavation took place. While I was looking through the spoil pile, with in five minutes I found an *Archaeohippus* tooth; I was extremely proud of myself. Afterwards, Dr. Bruce MacFadden, Associate Director of the Florida Museum of Natural History, had everyone introduce him or herself. Then, we had a magnificent dinner! After supper everyone united around the campfire where Dr. MacFadden, told us about the fossil site and filled us in on the site's background history. Today was full of adventure; I can't wait for tomorrow.

**Friday, April 11, 2003** It was my first day as a "Paleontologist". I didn't find anything big, but I did find a *Parahippus* snout, a magnum (wrist bone) of a *Parahippus*, and other microscopic bones. Although I was able to make one plaster jacket around a possible carnivore jaw, it was not easy to identify because it was in many pieces. Tonight Dr. Doug Jones, Director of the Florida Museum of Natural History, came out and gave a fascinating presentation about how magnetic forces relate to the migration of Monarch butterflies. I was very intrigued with his lecture. Afterwards, we gathered around the campfire and had S'mores. It was a blast.

**Saturday, April 12, 2003** Today was a very productive day. I found a carnivore humerus (upper arm bone), a complete vertebra, a whole pelvis bone, femur and another pelvis. The bones were in a large pile so it took me a couple of hours to uncover and have them identified. I skipped lunch and still didn't finish. After dinner today Erika Simons, our field supervisor, gave a slide presentation about her trip to Costa Rica to see an arribada (the mass nesting of Olive Ridley sea turtles). I really enjoyed her lecture, too. After her presentation the whole group went to gather around the fire for the last time. Thomas Farm is a great place for people to get away from city life. This was a night I
will never forget.

**Sunday, April 13, 2003** Today was the day I dreaded for the last couple of days because I really enjoyed my surroundings here, and I actually enjoyed learning material that comes from Biology. Dr. MacFadden invited me to come down to the University of Florida this summer. I am extremely honored by his invitation.

*Caroline Lenard*

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**bobo** Helps Improve Drainage at Thomas Farm

When the Thomas Farm fossil site was discovered in 1939 it was only a slight depression in the ground, a filled-in sinkhole. In the 1950s, after years of fossil digging, the sinkhole deepened again and it became apparent that a drainage ditch was needed around the active site. Today, 53 years later the site really looks like a sinkhole again and the drainage problem needed to be addressed once more. In 1997 Mark Swan, of B&M Equipment Rental and Sales, Inc. of Gainesville, came out with a small bulldozer and scooped out a portion just to the north of the active site, realizing that that was just a quick fix to our increasing problem with standing water.

At the request of the *Pony Express*, Mark came out during a hot summer weekend (July 19-20, 2003) and began excavating a new drainage ditch that tied into the 1950's ditch. During a future visit he will complete the process by deepening the 1950's trench, thus allowing many more years of dry fossil digging at Thomas Farm.

The Florida Museum of Natural History extends its deepest gratitude to B&M for the free loan of the backhoe and our sincere thanks to Mark for the donation of his time and hard work in this worthy effort.
John Day Who?

For all its relative obscurity to the American lay public, John Day Fossil Beds National Monument (JODA) in central Oregon is a unique treasure to Cenozoic paleontologists. In a dramatic landscape dominated by the intense volcanism of the Pacific Northwest lies one of the most important fossil beds in the world, providing an almost continuous 40-million-year plant and animal fossil record from the Eocene to the mid-Pliocene.

In May I had the great pleasure of volunteering with National Park Service staff at JODA to work in the prep lab learning preparation and molding skills under the expert guidance of Matt Smith, a former UF zoology student, Florida Museum paleo lab worker and now a senior fossil preparator with the NPS. It was a thrill to interact with the professional staff under the direction of Ted Fremd, a highly regarded mammal paleontologist. I felt privileged to help Scott Foss excavate a Miocene chalicothere (Moropus cf. oregonensis) scapula from its bed of lithified volcanic ash and sediments, and to prospect for botanical fossils with paleobotanist Regan Dunn and technician Karon Decker. My singular contribution was to find and excavate a trackway not far from the scapula. I choose to believe the prints are those of a chalicothere, though staff identified them as probably ancient canine tracks. I’m looking forward to volunteering again in 2004, when the JODA Paleontology Division will be moving into the Thomas Condon Paleontology Center, an exciting new building with greatly expanded visitor displays and lab facilities.

The exhilaration of the beauty of the John Day River basin dominated all my experiences for four weeks. The steep slopes of red, blue-green and beige ash contrast starkly with the dark cap rock of Miocene Picture Gorge basalt 1000 feet above, named for the dramatic gorge cut by the river surging through the basalt. Life is very simple in nearby Dayville, a hamlet of perhaps 100 friendly
people with no radio reception (NPR withdrawal pangs), very limited TV and no cell phone service.

The three widely separated units of JODA total 14,000 acres, bounded by privately owned active cattle ranches and some BLM lands. Each of the units is unique in paleontology as well as visual beauty. The most northern, the Clarno unit, records an Eocene tropical to subtropical forest with an outstanding sample of fossil seeds, nut, fruits, leaves, and woody materials. The plants and mammals, such as brontotheres and hyaenadonts, were trapped in a great lahar (mudflow from a volcano) some 37 million years ago, now visible eroding out of cliffs. The Painted Hills unit, about an hour west of the Visitor's Center, has rounded hills of volcanic ash weathered into rust, bronze and black. There paleontologists have found remnants of an Oligocene and early Miocene deciduous forest and more than 100 groups of mammals. The Visitor's Center overlooks emerald pastures in the Sheep Rock unit, through which sparkles the John Day River. The Mascall and Rattlesnake Formations exposed on the slopes of the valley detail a Miocene mixed hardwood forest gradually developing into a Pliocene grassland as North America's climate cooled and dried. The layering of episodic volcanic material through all the formations allows paleontologists to assign accurate radiometric dates to their fossil finds.

But who was John Day? Oregon Department of Transportation wants us to believe he was an early American explorer. In fact, he was a teamster in an 1812 wagon train who, with his co-driver, became lost somewhere along the Columbia River. He was robbed of everything by Indians, and was found by settlers wandering nude at the confluence of the Columbia, and the river that now identifies much of central Oregon as the John Day Basin. Gee, didn't anyone have a camera?

Phyllis Park Saarinen

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**Summer Lab Session**

For the past 6 years our summer lab sessions were workshops in the curation of fossils. Participants learned how to repair, identify and label fossils as well as prepare fossils out of their protective plaster jackets.

This year our staff has offered a different workshop based on feedback from previous participants. Russel MacCarty, our Senior
Preparator, has kindly offered to do a class in mold making and casting techniques.

Participation was restricted to 6 participants due to space restrictions in the pre-lab and the need for one-on-one assistance from the instructor.

Following tradition the lab began with a reception and orientation on Thursday evening at our Education and Exhibit building, Powell Hall. Friday and Saturday were spent in the prep-lab at our Collections building, Dickinson Hall, making molds and casts.

After a continental breakfast on Friday morning, the class gathered in the prelab where they learned how to make a simple pour-in mold using the cast of a Jurassic pterosaur imbedded in matrix. They produced an attractive cast and were instructed on painting techniques with washes and dry-brushing. At 3:30 p.m. when the last cast had been released we drove out to Thomas Farm for a picnic dinner and some surface collecting of fossils washed out of the newly deposited spoil piles during our drainage ditch operation, two weeks earlier (see page 7). We carried out more mud than fossils that day.

On Saturday the class learned how to make a two piece mold using a Cacharodon megalodon tooth as a simple, relatively easy subject. Care was taken to insure proper preparation of the fine serrations of the teeth. After completing a cast from this new mold the class was dismissed. Everybody packed up their new creations and handouts with how-to notes and materials sources so they could try their new-found ability on another object.

We thank Russell McCarty for donating his weekend and presenting a memorable educational workshop.

Erika H. Simons

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**Pony Express**

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The purpose of this newsletter is to communicate news and information and disseminate knowledge about fossil horses, particularly in Florida, and to develop a state-wide constituency that will support and enhance the research, exhibition, and educational programs offered at the FLMNH that pertain to fossil horses. Contributions to the Fossil Horse Fund are deposited into an account at the University of Florida Foundation, Inc., a tax-exempt entity, and will be used for the purposes stated here.

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