

Florida Fossil Horse Newsletter

Volume 12, Number 1, 1st Half 2003

What's Inside?

- Miocene Rhino Tusks from Panama and Florida
- South American Pleistocene Horse Skull Discovered
- Florida Paleontological Society Publications
- Paleo Math: Thomas Farm 10 million years = Tyner Farm
- Museum Evolution Project
- Dr. S. David Webb
- WebbFete

Miocene Rhino Tusks from Panama and Florida

Bruce MacFadden has been studying middle Miocene land mammals from Panama collected during the 1960's by Canal Zone geologists and Smithsonian paleontologists. This collection contains a rodent, dog, possible bear or bear-dog, oreodont, deer-like mammal, two horses (*Anchitherium* and *Archaeohippus*), and two species of rhinos. Despite its distance from the North American continent, and its close proximity to South America, this collection has distinctly northern affinities. This fossil occurrence confirms previous evidence that during the middle Miocene, some 15 million years ago, the Isthmus of Panama had not yet formed a dry land bridge connecting North and South America.

The fossil rhinos from Panama are somewhat fragmentary, but there is a well-preserved lower incisor tusk that, along with one from Thomas



Lower incisor tusks of the Miocene rhino Floridaceras from Panama (A) and Thomas Farm, Florida (B) Erika Simons photo

Farm, Florida are the key to identification of the extinct species. Based on the size and overall shape of the Panama rhino tusk, it compares very well with a tusk of *Floridaceras* from Thomas Farm, collected by Sheila Brodbeck during the *Pony Express* digs in 2000. Without the specimen collected by Sheila, we would not have been able to make the comparisons that allowed identification of the Panama rhino to *Floridaceras*.

The Panama fossil collection. including the rhinos, will be described in an upcoming paper by Bruce MacFadden. In related research. Bruce and his postdoctoral research assistant, Penny Higgins, are currently

analyzing the carbon



Lower incisor tusks of the Miocene rhino Floridaceras from Panama (A) and Thomas Farm, Florida (B) Erika Simons photo

content of the Panama fossil teeth, including the rhinos and the other mammals listed earlier. Mammals that live and eat plants in dense forests today have different carbon content incorporated in their teeth than other mammals that live in more open woodlands or grasslands. Scientists question whether the rainforests of the world are stable ecosystems (supporting high diversity) or do they "come and go" with changes in the global environment. By analysis of the teeth from Panama, Bruce and Penny will be able to determine if the tropical rainforest that is found in Central America today existed during the middle Miocene in what is now Panama, some 15 million years ago. (*Bruce J. MacFadden*)

Bruce



Bruce Shockey (left) and Rodolfo Salas-Gismondi (right), excavating a skull of a Pleistocene Equus from Peru. This photo shows the left side, with the orbit to the right, the nasal region to the left, and the wellpreserved premolar and molar cheek teeth. Eric Sargis photo

Shockey, former UF paleo grad student, now a biology professor at New Jersey City University and Rodolfo Salas-Gismondi, vertebrate paleontologist from Lima, Peru, led an expediton to southern Peru where this skull of a Pleistocene horse, *Equus*, was excavated. This exceptional fossil was discovered by Mario Urbina, an extraordinary field paleontologist of Peru. Shockey noted that: "Mario had found a sloth femur sticking out from a road cut, so we went there to excavate and explore. Upon removing the sloth femur, we found the horse skull." At another nearby locality, Mario found a complete *Equus* skeleton that was also excavated by the team. These specimens are now in the collections of the natural history museum at the Universidad Mayor de San Marcos in Lima.

Horses, like *Equus*, dispersed into South American after the closing of the Isthmus of Panama during the Great American Biotic Interchange. Pleistocene *Equus* is known from numerous localities in South America, but well-preserved skulls like the one depicted here, are indeed rare. *Equus* became extinct in the New World during the late Pleistocene at the end of the last Ice Age. There is some question about the number of *Equus* species that existed in South America. This newly discovered skull should facilitate comparisons with previously reported *Equus* discoveries from more northern localities (such as in Ecuador and Colombia) as compared to classic southern sites (e.g., in Bolivia and Argentina). (*Bruce J. MacFadden*)



The Florida Paleontological Society (FPS) has issued some very informative publications on invertebrate and vertebrate paleontology. Each issue is written in easy reading format and is accompanied by many beautiful line-drawings and life sized (1x) photographs. Published bi-annually, these issues are a great reference for fossil enthusiasts. The length ranges from 10 to 30 pages. These issues are available free of charge to FPS members and for purchase by the general public. The longer booklets (20-30pages) sell for \$7.00 each and the shorter (10-20 pages)sell for \$5.00 each.

Below is a list of publications now available and some up-coming issues:

Florida Fossil Invertebrates - Roger W. Portell, editor

- Part 1 Eocene Echinoids (June 2001)
- Part 2 Oligocene and Miocene Echinoids (January 2002)
- Part 3 Pliocene and Pleistocene Echinoids (June 2002)
- Part 4 and part 5, to be published in 2003 will cover crabs, shrimps and lobsters.

Fossil Species of Florida - Richard R. Hulbert, editor

• *Mammut americanum* - Jeremy L. Green

Upcoming issues will be on the tapir *Tapirus veroensis*, the rhino *Aphelops mutilus*, and the tortoise *Hesperotestudo incisa*.

For information on membership or to purchase FPS publications please e-mail: fps@flmnh.ufl.edu or write to:

Florida Paleontological Society Florida museum of Natural History P.O. Box 117800 University of Florida Gainesville, FL 32611-7800

Paleo Math: Thomas Farm - 10 million years = Tyner Farm

Eighteen million years ago, a large, sinkhole formed in northcentral Florida. Gradually it filled with sand, clay, and limestone boulders, as well as the bones and teeth of thousands of animals. This, of course, is the familiar story of the origin of the Thomas Farm fossil site. Ten million years later, a similar sinkhole formed 20 miles southeast of Thomas Farm. It too preserves a rich sample of the vertebrate life from the surrounding landscape. This locality is called Tyner Farm, after the landowners and initial discoverers of the fossil deposit. As the location and geologic setting of these two sites are so similar, it is interesting to compare the two and see what happened to north-central Florida's fauna after 10 million years of evolution and migration.

The most abundant large mammal at both Thomas Farm and Tyner Farm is a member of the horse family Equidae, *Parahippus*

leonensis at the former and *Nannippus aztecus* at the latter. Both were small horses by modern standards, weighing about 150 to 200 pounds. *Parahippus leonensis* was the general ancestor for the great Miocene adaptive radiation of advanced members of the Equidae (Hulbert and MacFadden, 1991). This radiation resulted in three major groups or clades of horses: the equins, which include the living genus *Equus*; the protohippins; and the hipparionins, which include *Neohipparion*, *Cormohipparion*, and *Nannippus*. During the late Miocene, when the Tyner Farm site formed, hipparionins were the most diverse and abundant horses in Florida, followed by the protohippins; equins were much rarer and not found at most sites. Note that for convenience in this essay I will refer the Tyner Farm sample of *Nannippus* to the species *Nannippus aztecus*; future discoveries and research may reveal that it actually belongs to a new species closely related to *Nannippus aztecus*.

Nannippus aztecus, like other hipparionins, was tridactyl (threetoed) like *Parahippus leonensis*, with complete lateral digits ending in small hooves. Relative to *Parahippus leonensis*, *Nannippus aztecus* bore a much greater proportion of its mass on the large, central digit. While the lengths of the humerus and femur, the two limb elements closest to the body, were only slightly longer in *Nannippus aztecus* relative to *Parahippus leonensis*, the more distal limb elements, especially the metapodials and phalanges were much longer (see figure 1). Elongation of the distal limb elements is a classic adaptation for running. Thus, in terms of pure speed, *Nannippus aztecus* would have been much faster. Also, even while walking, its stride length would have been greater, allowing it to more efficiently wander the countryside in search of water and



Fig. 2. Sideview of upper molars of Nannippus aztecus (A) and Parahippus leonensis (B) Erika Simons photo

food.

Relative to contemporary horses of the early Miocene, *Parahippus leonensis* had tall teeth. But when newly formed and unworn, the premolars and molars of *Nannippus aztecus* and other late Miocene horses were two to four times as tall as those of their ancestor (see figure 2). The natural life span of a herbivore such as a horse is limited by how long it takes for the



Fig. 1. Metatarsal 3 and proximal phalanges of Nannippus aztecus (A) and Parahippus leonensis (B) Erika Simons photo

individuals to wear out their teeth, which is a complex function of the plant species it ingests (how abrasive are they), how much dust and grit coat the ingested plants, and the original crown height of its molars and premolars. Traditionally, the differences in tooth height between horses such as *Parahippus leonensis* and *Nannippus aztecus* were explained by diet, with the former assumed to have eaten more browse and the latter more, if not exclusively, abrasive grasses. Recent studies by MacFadden and co-workers (1999) on the isotopic composition of tooth enamel and by Hayek and co-

workers (1991) and Semprebon and Solounias (2002) on microscopic scratches and pits on the chewing surface of the teeth suggests that the diets of early and many late Miocene horses were more similar than previously thought. While a slight increase in the amount of grass in the diet probably was a factor in the differences in tooth height between *Parahippus leonensis* and *Nannippus aztecus*, more important were that the latter lived during a period of drier climate, creating more dust and less rain to wash it off plants, and it had a life span that was about 50

percent longer than that of Parahippus leonensis.

Some fossil horses have distinct depressions on the side of the skull in front of the opening for the eye (the orbit); they are deep and well developed in both Archaeohippus and Anchitherium from Thomas Farm. However, Parahippus *leonensis* has a very shallow, indistinct depression (fossa) that starts quite near the orbit. In the 1970s, Morris Skinner and Bruce MacFadden



Fig. 3. Reconstructed skull of the Tyner Farm Nannippus aztecus clearly showing the distinct facial fossa that served as muscle attachments for the lips. Erika Simons photo

emphasized the use of the location, shape, depth, and size of the facial fossae as characters to determine the evolutionary relationships among hipparionin horses. They recognized that some North American hipparionin species had a single, large, deep, keyhole-shaped fossa located far in front of the orbit, and grouped these species as a new genus *Cormohipparion*. At the time, no middle to late Miocene skulls of *Nannippus* were known. Skulls of *Nannippus* from the Pliocene lacked facial fossae, suggesting that *Nannippus* was not closely related to *Cormohipparion*, but instead was closer to *Neohipparion*, which also lacked deep facial fossae. Unfortunately, the skull bones in and around the facial fossa are thin and fragile, so that in a crushed skull details about the fossa are lost, and often you cannot not tell if a fossa was even present.

In the 1980s, I noticed that some middle Miocene horse teeth from the Bone Valley Phosphate Mining Region had the small size and some features of *Nannippus*, but in other ways were miniature versions of *Cormohipparion* teeth. At the American Museum of Natural History in New York I found specimens from Nebraska of the same age that matched the Bone Valley teeth in size and dental characters. But the Nebraska sample also included a couple of partial skulls that had the deep, keyhole-shaped facial fossa characteristic of Cormohipparion. This raised two possibilities for the middle Miocene sample: (1) they were a dwarf form of *Cormohipparion* that had nothing to do with late Miocene and *Pliocene Nannippus*; or (2) they were an early form of *Nannippus*, that *Nannippus* and *Cormohipparion* were closely related, and that over time the species of *Nannippus* had decreased and eventually lost the facial fossa (this is known to have occurred in other horse lineages, including the one leading to Equus). In the late 1980s, excavations at a fossil locality near Ocala recovered a partial skeleton of *Nannippus aztecus* that included a portion of a badly crushed skull. Although very incomplete, the skull included some of the bones in front of the orbit, and one fragment appeared to be the posterior rim of a facial fossa. Based on this admittedly limited evidence, along with clues I gleaned from the teeth, I published several papers in the early 1990s in which I favored the hypothesis that Nannippus and Cormohipparion were closely related (e.g., Hulbert, 1993).

In the spring of 2002, a badly crushed skull of *Nannippus aztecus* lacking only the front of the muzzle was found at Tyner Farm. Realizing that this specimen was our best opportunity to show whether or not this species had a distinct facial fossa, we had the crushed skull painstakingly reconstructed by Steve Hutchens (see figure 3). Although not all preserved, enough of the facial region on the right side clearly indicates the presence of a deep fossa with a distinct posterior rim located far in front of the orbit. This specimen supports the hypothesis of a close relationship between *Nannippus* and *Cormohipparion* and that *Nannippus* lost the facial fossa over the course of its evolution.



At least two other horse species are found at Tyner Farm,



Fig. 6. Perfectly preserved humerus (A), tibia (B), and Distal phalanx (C) of the ground sloth Thinobadistes from Tyner Farm. Photocomposite by Richard Hulbert

Fig. 4. Two small deer, Parablastomeryx (A) from Thomas Farm and Pseudoceras from Tyner Farm. (B) photo-composite by Erika Simons

Cormohipparion plicatile and *Calippus hondurensis*. Both have been found at other late Miocene sites in Florida and are much rarer at Tyner Farm than *Nannippus aztecus*. The second most abundant large mammal at Tyner Farm is the very large rhino *Aphelops mutilus*. It is a close relative of *Floridaceras*, the large Thomas Farm rhino. Although the species are different, the two fossil sites are similar in producing a peccary, several species in the camel and llama family, and a small, hornless, deer-like artiodactyl. But two of

the large mammals at Tyner Farm have no counterparts at Thomas Farm, the shovel-tusked gomphothere elephant Amebelodon and the large ground sloth *Thinobadistes*. *Gomphotheres* dispersed into North America from Asia, and are first known from Florida in the middle Miocene, about 13 million years ago. They continued to be an important part of the herbivore fauna through the Pleistocene. *Thinobadistes* was one of the first of many ground sloths to enter North America from South America. These two "megaherbivores" undoubtedly affected the late Miocene vegetation and landscape of Florida in ways that no early Miocene herbivore could.

Meat-eating mammals (carnivorans) are very rare at Tyner Farm, unlike Thomas Farm. So far we have only found a few, mostly partial limb bones and a couple of teeth of carnivorans. At least two species in the dog family Canidae have been found. But a very notable difference between the two sites is the presence of members of the cat family Felidae at Tyner Farm. One is very large (tiger or lion size), while a second is smaller, about the size of the Florida panther. No cats have ever been found at Thomas Farm. Like gomphotheres, they came to North America from Asia in the middle Miocene. Unlike gomphotheres, which essentially had no direct competition among the native North American mammals, the newly arrived cats had to compete directly with members of a number of carnivoran families that had evolved to become meat-eating specialists (called "hypercarnivores" by ecologists). Cats prevailed at almost every level of this competition, except in the smallest body-size categories which was taken by the weasel and mink family, the Mustelidae.

Like Thomas Farm, the bones and teeth of smallbodied vertebrates are also abundant but are usually recovered by screenwashing. At the museum, Art Poyer has screenwashed over two tons of Tyner Farm matrix. The most abundant small vertebrates are toads, lizards, and snakes. It will take a specialist to identify these and make detailed comparisons with their counterparts at Thomas Farm. But one major difference is readily apparent. The most abundant Thomas Farm snakes are boas. No boas occur at Tyner Farm, only members of the snake family Colubridae, the group that makes up the vast majority of the state's modern snakes.

Small rodent teeth are rarer at Tyner Farm than at Thomas Farm (but that could also be said for almost any Miocene site in the world!). Altogether Art has recovered about 25 rodent teeth, most belonging to a small mouse. But six belong to a tree squirrel (see figure 5). Two species of squirrels are known from Thomas Farm, a chipmunk and a flying squirrel (Pratt and Morgan, 1989); neither are members of the tree squirrel tribe of the family, which includes the familiar denizen of the suburbs, the gray squirrel Sciurus carolinensis. Tree squirrels have a surprisingly poor fossil record in North America. The fossil teeth from Tyner Farm are the only ones known from this continent during the late Miocene. We also have found some rabbit teeth and bones at Tyner Farm. No rabbits have ever been recovered at Thomas Farm, one of the odder absences in an otherwise rich fauna.



Fig. 5. Upper 4th premolar from a Tyner Farm squirrel of the family Sciuridae. Richard Hulbert photo

Thomas Farm has been excavated for many decades and its fauna studied by several generations of paleontologists. Even so, new discoveries are still being made, especially about the rarer members of its fauna. In contrast, Tyner Farm was discovered only two years ago and basic field work is still our primary emphasis. Many of its fossils remain in plaster jackets, awaiting preparation. Detailed scientific investigations have not started. But we already know that it, like Thomas Farm, will open an important window onto Florida's prehistory. *Richard C. Hulbert*



During a busy day at Tyner Farm many volunteers helped excavate, take measurements and record data for each bone fragment of dimentions larger than 1 cm. Tammy Johnson photo

REFERNCES

- Hayek, L., R. L. Bernor, N. Solounias, and P. Steigerwald. 1991. Preliminary studies of hipparionine horse diets as measured by tooth wear. Annales Zoologici Fennici 28:187-200.
- Hulbert, R. C., and B. J. MacFadden. 1991. Morphologic transformation and cladogenesis at the base of the radiation of hypsodont horses. American Museum Novitates 3000:1-61.
- Hulbert, R. C. 1993. Late Miocene *Nannippus* (Mammalia, Perissodactyla) from Florida, with a description of the smallest hipparionine horse. Journal of Vertebrate Paleontology 13:350-366.
- MacFadden, B. J., N. Solounias, and T. E. Cerling. 1999. Ancient diets, ecology, and extinction of 5-million-year-old horses from Florida. Science 283:824-827.
- Pratt, A. E., and G. S. Morgan. 1989. New Sciuridae (Mammalia: Rodentia) from the early Miocene Thomas Farm local fauna, Florida. Journal of Vertebrate Paleontology 9:89-100.



Special thanks to Alan Tyner and his family for their generosity and active participation in the dig. Erika Simons photo

 Solounias, N., and G. Semprebon. 2002. Advances in the reconstruction of ungulate ecomorphology with application to early fossil equids. American Museum Novitates 3366:1-49.

Since its discovery in the spring of 2001, Tyner Farm has yielded a large volume of fossil and hundreds? of beautiful scientific specimens (see figure 5). With out the help of over 150 volunteers who put in many hours of hard labor this would not have been possible. The Florida Museum of

Natural History thanks each and every volunteer for their dedication during this effort. Among the people who worked so hard are some of our faithful Pony Express participants. They are as follows:

- Sheila Bilak
- Tabitha Cale
- Catherine and Joel Carr
- Wiley Dykes
- Marge Fantozzi
- Valerie First
- John Freund
- Holly and Walker Hillegass
- Steve and Sue Hutchens
- Carol Lahy
- Phyllis Saarinen
- Barbara and Reed Toomey
- Mary Lynch
- Marcia Wright

Museum Evolution Project

Bruce MacFadden and Dr. Betty Dunckel Camp, Assistant Director in Charge of Education at the FLMNH, recently received a grant from the National Science Foundation entitled: "Enhancing Natural History Museum Visitor Understanding of Evolution: A National Conference."

As most readers of the Pony Express already know, there has been considerable debate over the past several years about teaching evolution in schools. Several large national projects have been undertaken that enhance and promote teaching evolution in K-12 formal education. In contrast, relatively little is known about natural history museum visitors' perceptions of evolution. Our project is aimed at this audience.

In March 2003 a steering committee consisting of museum professionals from the FLMNH, University of Kansas Museum of Natural History, University of California Museum of Paleontology, Denver Museum of Nature and Science and Los Angeles County Museum of Natural History, and external science education consultant Lynn Dierking (Institute of Learning Innovation, Annapolis, MD) met in Gainesville to develop an evolution questionnaire and to plan for the national conference, to be held in 2004. During this 2004 conference at the FLMNH, a national group of two dozen museum scientists, educators, administrators, and external consultants will meet to evaluate survey data collected from museum visitors about their knowledge of evolution. We will use these data and national conference to establish recommendations about the most effective means to enhance visitors' understanding of evolution through natural history exhibits and programs.

(Bruce J. MacFadden)

Dr. S. David Webb

Dr. S. David Webb, Distinguished Research Curator of Vertebrate Paleontology, will retire from the FLMNH on 1 July 2003 after being a faculty curator since 1964. Dave is an



Dr. S.David Webb proudly holds a mastodon tusk excavated from one of the many sites worked during the Aucilla River Prehistory Project (ARPP) Gene Rowe photo

internationally recognized paleontologist and specializes in the evolution of mammals from the Americas during the past 25 million years. During his five-decade tenure at UF, Dave has led the development of the vertebrate paleontology program from a small regional collection to more than 300,000 specimens which is now in the top 10 nationally. Dave has been instrumental in public museum outreach as popular lecturer, founder of the Florida Paleontological Society, and as the leader of Thomas Farm digs in 1980. He is the author of more than 200 scientific articles and monographs, has been the mentor to more than 50graduate students, and is an enthusiastic and popular teacher. Of relevance to the *Pony Express*, through his scientific work Dave has done much to advance an understanding of fossil horses, their associated faunas, and ancient communities in which they lived.

During his career Dave has received more than three million dollars in outside grants and contracts from

agencies including the Florida Department of State and the National Science Foundation. For more than a decade Dave led the Aucilla River Prehistory Project which advanced our understanding of ancient faunas and humans in prehistoric Florida. Dave has received many honors and distinctions during his career, including President of the Society of Vertebrate Paleontology, Guggenheim Fellowship to Germany, Visiting Professorship at Yale, and as Distinguished Visiting Curatorship at the Field Museum in Chicago.

A native of southern California, Dave received his undergraduate education at Cornell University and his Ph. D. in Paleontology from the University of California-Berkeley. Dave and his wife Barbara are avid equestrians and are active members of the Union of Concerned Scientists and Sierra Club. They love the outdoors and in addition to their horse farm in Archer, they have a cabin in the Montana Rockies where they spend their summers.

We salute Dave, thank him for all of his contributions to the FLMNH and wish him and Barbara the best upon his retirement.

WebbFête

You are cordially invited to attend

Saturday, May 10, 2003 Florida Museum of Natural History, Powell Hall University of Florida Cultural Plaza Gainesville, Florida The favor of a reply is requested by April 25

Schedule of Events 8:30 to 4:45 - Symposium, with 30-minute talks to include the following speakers: (free and open to general public)

- Farish A. Jenkins, Harvard University
- Dan Fisher, University of Michigan
- Jason Lillegraven, University of Wyoming
- Bruce J. MacFadden, University of Florida
- Malcolm C. McKenna, American Museum of Natural History
- H. Greg McDonald, National Park Service
- Brian K. McNab, University of Florida
- Neil D. Opdyke, University of Florida
- David Steadman, University of Florida
- Richard H. Tedford, American Museum of Natural History
- Michael O. Woodburne, University of California--Riverside

4:45 to 5:30 - VIP tour of the Florida Museum of Natural History's exhibition and education center at Powell Hall.

6:30 - Cocktail hour (with banquet dinner)

7:30 - Gourmet Dinner presented by Cacciatore Catering (\$50 per person) (special vegetarian meal upon request)

After Dinner - "An idiosyncratic History of Floridian Vertebrate Paleontology" talk given by Clayton Ray, Curator (Retired) Natural Museum of Natural History History, Smithsonian Institution

Pony Express

Florida Fossil Horse Newsletter Volume 12, Number 1 1st Half 2003 ISSN# 1065-285X; Indexed in the Zoological Record

Editorial Staff:

- Bruce J. MacFadden Program Director
- Erika H. Simons, Editor and Program Coordinator

Direct all Correspondence to:

Pony Express

Exhibits & Public Programs Florida Museum of Natural History Powell Hall -- P.O. Box 112710 Gainesville, FL 32611-2710 Phone: (352) 846-2000 extention 255

You can receive future issues of the *Pony Express* with an annual member fee of \$25 (individual) or \$35 (family) made payable to the **UF Foundation**

Contributions and Support: All supporters receive *Pony Express* and invitations to related activities that promote the research, exhibition, and education about Florida fossil horses.

Support Categories

- Member, Single \$25
- Member, Family \$35
- Contributor \$40-99

- Friend \$100-249
- Sustainer \$250-499
- Patron \$500-999
- Benefactor \$1000+

Membership and other contributions should be made payable to: **UF Foundation** and sent to the address listed above

Editor's email address: esimons@flmnh.ufl.edu

Pony Express--Statement of Purpose:

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.

Donations to the Fossil Horse Fund - 2002

All contributions received between March 1, 2002 - August 1, 2002

Benefactor

• MacFadden, Bruce: Gainesville

Friend

- Synergy Design Group: Tallahassee
- Claussen, Earlene: Salem, OR

Contributors

- Bilak, Sheila: Gainesville, FL
- Cozzini, Helen: Crawford, NE
- Hall, Gail H.: Indianopolis, IN
- Hutchens, Suzan & Stephen: Old Town, FL
- Juergensmeyer, Margaret: Ithaca, IL
- Maier, Joseph T.: St. Petersburg
- The Meisel Family: Gainesville, FL
- Miller, Robyn R.: Jacksonville Beach
- Saarinen, Phyllis & Arthur: Gainesville, FL
- Sinibaldi, Robert W .: St. Petersburg
- Tatum, Jim C.: Lutz, FL
- Thayer, Laura: Jupiter, FL
- Warren, Jacquelyn K.: Gainesville, FL

PONY EXPRESS BACK ISSUES AVAILABLE!

Printed back issues of this newsletter are available at a cost of \$8.00 per volume, or \$3.00 per issue. Issues 1 and 2 of Vol. 1 are only available as photocopies. Other issues, which are available in their original printing, are: Vol. 1, # 3, 4; Vol. 2, # 1-4; Vol. 3, #1-3/4; Vol. 4, # 1 and 2; Vol. 5, # 1 and 2; Vol. 6, #1 and 2; Vol. 7, #1 and 2; Vol. 8 # 1 and 2; Vol. 9 #1; Vol.9 #2; Vol. 10 #1, Vol.10 #2, Vol.11 #1, Vol.11 #2, Vol.12 #1 Please make checks out to **UF Foundation** and send your request to Erika H. Simons, editor and *Pony Express* Program Coordinator at the above address.

Erika Simons (*Pony Express* Program Coordinator) at (352) 846-2000 ext. 255 or e-mail: esimons@flmnh.ufl.edu

Your tax-deductible contributions keep this highly popular program alive!

All contributions at any of the above levels are valued and your support is sincerely appreciated. If your employer has a matching funds program your contribution can work twice as hard.