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NEWS FROM THE PALEONTOLOGICAL SOCIETY

by Bruce J. MacFadden, President Elect, Paleontological Society

Since our last news, there is much to report from the Paleontological Society (PS). In particular, as you likely know, in 2016 the PS instituted a new avocational member category. Since that time, more than 60 members have signed up as avocational members; this bodes well for the future. The PS has also added a member of the amateur/avocational community as an advisor to the PS Council. We are pleased to announce that Jayson Kowinsky of the Pittsburgh, Pennsylvania area and founder of The Fossil Guy web site has agreed to serve a two-year term. Jayson is otherwise known to members of myFOSSIL in several capacities, including as the first speaker in our 2016 webinar series, and as a presenter at GSA 2015 in South Carolina and 2016 in Pittsburgh, the latter where he also led a very successful field trip collecting Carboniferous plants. We are excited that Jayson has agreed to serve and we look forward to both his input and representation of the amateur fossil community.



Jayson Kowinsky

Douglas S. Jones Elected to be a PS Fellow

Dr. Douglas S. Jones, Director of the Florida Museum of Natural History, has been elected as a Fellow of the Paleontological Society. PS Fellows are recognized for their long-standing contributions to paleontology. Among his many contributions to the field of paleontology, Dr. Jones was elected for his pioneering work on sclerochronology (the study of incremental growth), as co-editor of the journal *Paleobiology* (2011-2015), and his national leadership in the natural history museum community. On the faculty at the University of Florida since 1979, Dr. Jones is also Curator of Invertebrate Paleontology. Upon learning of his election, Doug noted that: "it is indeed an honor, and I am most grateful to be recognized as a Fellow of the Paleontological Society."



Doug Jones
Photo credit Florida Museum

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Dry Dredgers 75th Anniversary

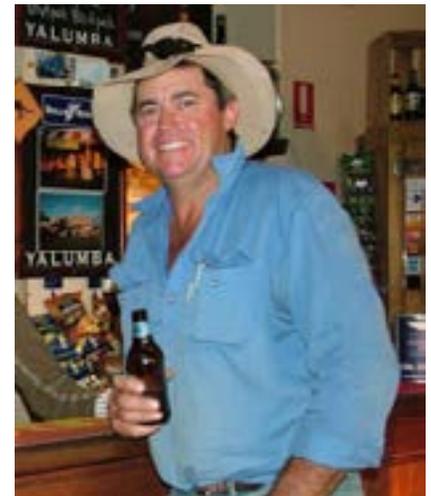
On Friday, April 28th, 2017 the Dry Dredgers fossil club from the Cincinnati, Ohio area celebrated their 75th Anniversary. The Dry Dredgers are the oldest continuously-organized fossil club in the United States. About 115 members and guests attended the celebration at the meeting held on the campus of the University of Cincinnati. At that time, the PS President, Arnie Miller, awarded a PS Presidential Citation to the Dry Dredgers, which was accepted by their President, Jack Kallmeyer. Former Cincinnati Museum curator Nigel Hughes gave a keynote talk at the meeting about the importance of amateur and professional collaborations. About this celebration, Jack noted: "The meeting was a true tribute to the spirit of the Dry Dredgers organization with ten professional paleontologists, numerous graduate students, and members from age 7 to 90 in attendance." I would like to thank the Dry Dredgers for their continued support of the FOSSIL project and for their leadership as a model club. It also was an honor for me to attend their celebration.



Arnie Miller & Jack Kallmeyer
Photo credit Nancy Swartz

Ross Fargher receives the Strimple Award

Each year, the PS presents the Strimple Award for outstanding achievement in paleontology by an amateur (someone who does not make a living full-time from paleontology). The 2017 Strimple Award was presented to Ross Fargher of Nipern Station, South Australia. Nominator Mary Droser of the University of California-Riverside noted that Ross has been instrumental in helping to conserve the world-class localities on his property that produce the Ediacara Fauna from South Australia. The science of paleontology can only advance with the combined efforts of people interested in fossil protection and preservation. Ross Fargher is exemplary in this regard and, as such, richly deserves the recognition provided by the Strimple Award.



Ross Fargher
Photo credit Ross Fargher



FEATURED PROFESSIONAL: AMY C. HENRICI

This issue our featured professional is Amy C. Henrici, [Collection Manager of the Section on Vertebrate Paleontology](#) at the Carnegie Museum of Natural History in Pittsburgh, Pennsylvania. Amy was kind enough to provide thoughtful answers to questions asked by Eleanor Gardner, FOSSIL Project Coordinator.

Where has your field work taken you? I noticed that you have been describing early amphibians and reptiles from a Lower Permian quarry site in Germany. Can you tell us more about your research there, and what the field work is like?

Over the years I have collected a variety of fossils from the United States and Germany. Fossils collected include fish, amphibians and reptiles from the Early Permian of the southwestern United States; the dinosaur *Coelophysis bauri*



Amy in Elko, Nevada

and other fossils from the Triassic of New Mexico; frogs and mammals from the Tertiary of Wyoming, Montana, and Nevada; and mammals from the Pleistocene of West Virginia. One of the more exciting field and research programs that I have been involved in is the Bromacker Quarry locality in central Germany. This project began in 1993, shortly after the reunification of Germany when the Carnegie Museum of Natural History (CMNH) hosted for six months Dr. Thomas Martens from the Museum der Natur, Gotha, Thuringia, Germany. Martens in 1974 had discovered some interesting Early Permian vertebrate fossils in the Bromacker Quarry that resembled taxa formerly known only in North America. At this time Thuringia was part of communist East Germany, so Martens was not able to travel outside of the Soviet bloc countries. Because Martens was trained as an invertebrate paleontologist he knew he had to contact an expert on Early Permian tetrapods from North America to help him identification and publication of the Bromacker fossils. After the reunification of

Germany, Martens began a collaboration with Dr. Dave Berman, a curator at CMNH who specializes in Early Permian vertebrates. I became involved in this project, because I was Berman's fossil preparator, but he later invited me to become a co-author of some of the research papers.

Berman and I, along with other colleagues, would join Martens in the field for three and a half weeks each summer to excavate at the Bromacker Quarry locality. The quarry is located in a large field that also serves as a summer pasture for cattle. Typically, a bobcat was rented to remove overburden, and then we used hand tools, such as hammers and chisels and pry bars, to work through the fossil-bearing rock layers. Once a fossil was discovered, we removed it using the standard technique of encasing it in a plaster and burlap jacket. The work was laborious and at times tedious, especially if fossils were not being found. The weather was variable with some summers being cold and rainy (a

Scandinavian summer) or very hot and humid (an Italian summer), or sometimes a mix of both. The quarry would often be flooded when we arrived in the morning after a night of heavy rain, so we would have to pump the water out with a small motorized pump run on a gasoline generator. We stayed at a local hotel, where we were treated like family. The international field crew would gather for dinner each night either at the hotel or one of the restaurants in the numerous villages dotting this rural area.

Twelve different types of amphibians and reptiles are known from the Bromacker Quarry area. All but one was collected from the Bromacker Quarry, with the other discovered during the construction of a market in a nearby town. The fossils were deposited in an upland, internally drained basin, the Tambach Basin. Sheet flooding events

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were most likely the cause of death and rapid burial, leading to fossilization. The fossil animals from the Bromacker represent a unique upland terrestrial ecosystem with a high number of herbivores supporting a small number of top carnivores. A more typical Early Permian assemblage tends to have a high number of carnivores and only a few herbivores. To date, no aquatic vertebrates have been discovered at the Bromacker. Some of the fossil genera were previously known only from the western United States, whereas others are unique to the Bromacker. One of the more interesting discoveries is the bolosaurid parareptile, *Eudibamus cursoris*, which is the earliest known bipedal runner. Not only was *Eudibamus* bipedal, but it ran in an upright posture, rather than a sprawling gait used by today's bipedal lizards, such as *Basiliscus basiliscus*, the common basilisk.



Amy at Bromacker, 1998 field season

What is a typical work day like for you? What are some of your favorite parts of your job? Your least favorite?

My typical day begins with checking my email, and this often sets the course of the day. Somedays I might have a couple of emails, whereas on others I may have over 20. I often receive via email requests for loan of specimens or for information about the collection. I typically try to answer these as they come in. If I have no immediate requests to fill or collection visitors, then I'll work on a grant project funded by the Institute of Museum and Library Services. This grant involves consolidating the section's holotype fossils into new cabinets purchased by the grant. Each fossil is cleaned, repaired, photographed, and a support mount is made of conservation-grade materials. I am currently photographing holotype specimens and making drawer and cabinet labels. When I am not working on this project, then I am putting away specimens that had been collected by one of our Scientific Preparators who recently passed away. Occasionally I participate on an exhibit committee. My role on exhibit committees is to provide lists of potential specimens for use in the exhibit, clean and repair the selected specimens, and assist with specimen installation. I sometimes am called on to edit and/or write label copy.

My favorite part of the job as a Collection Manager is to work with the specimens, whether it is to clean and repair them or to make specimen mounts. One of the things that aggravates me the most are improperly packed specimen loan returns, in which the specimens arrive broken. I also have little patience for computer malfunctions.

Do you have a favorite fossil discovery?

My favorite fossil discovery is the diadectomorph *Orobates pabsti*. I discovered what became the holotype specimen and is the most complete specimen known of this taxon. In the summer of 1998, I was with colleagues at the Early Permian Bromacker Quarry locality in central Germany excavating for fossils. I was working near the back wall of the quarry and near the bottom of the fossil producing unit when I picked up a piece of rock, turned it over, and saw a nearly complete foot preserved in it. I knew from past experience that if an articulated foot was found, the whole animal should be preserved in the rock. The rest of the crew heard the exclamation I uttered when I discovered the foot, and when they saw that I was staring intently at something, they quickly gathered around me. We examined the foot, but we could not tell if it was a front foot or a hind foot. One of the crew members removed another piece of rock from close to where I found the foot and saw what looked like a piece of shoulder girdle, so then we had a better idea



Discovery of the *Orobates*

as to how the animal was oriented. Fortunately, the long axis of the body paralleled the over six-foot-high back wall of the quarry, rather than penetrating it. A film crew from a local television station had visited us in the morning, so after hearing the good news they asked if they could come back for more filming. At their request, I reenacted the fossil discovery so they could film it. Because it was late in the day by the time the film crew finished, we covered up the fossil with rocks to hide it from anyone looking for fossils in the quarry after we left for the day. It took us the better part of the following day to excavate the fossil from the surrounding rock and encase it in a plaster and burlap jacket. After the field season ended, the fossil was shipped to the Carnegie Museum of Natural History where I spent over a year preparing it. The specimen is articulated and almost complete, lacking only the distal phalanx of one toe.

I was a co-author in the publication that named and described the new fossil as *Orobates pabsti*. The generic name is derived from the Greek, *Oros*, mountain, and *bates*, walker, referring to the paleoenvironment that the holotype specimen inhabited, a terrestrial upland basin. The trivial name *pabsti* is in honor of W. Pabst for his pioneering work on fossil trackways from the Bromacker Quarry locality. *Orobates pabsti* is a primitive member of the Diadectidae and was an herbivore. The fossil has since been returned to the Museum der Natur, where all of the fossils from the Bromacker Quarry locality reside.



Orobates pabsti fossil

To learn more:

Read about a 2010 discovery at the Bromacker Quarry in Germany at <http://www.dw.com/en/paleontologists-uncover-300-million-year-old-reptile-skeleton-in-central-germany/a-5916596>

Berman, D.S., Henrici, A. C., Kissel, R. A., Sumida, S. S., & Martens, T. (2004). A new diactid (Diadectomorpha), *Orobates pabsti*, from the Early Permian of central Germany. *Bulletin of Carnegie Museum of Natural History* Number 35 :1-36. [https://doi.org/10.2992/0145-9058\(2004\)35\[1:ANDDOP\]2.0.CO;2](https://doi.org/10.2992/0145-9058(2004)35[1:ANDDOP]2.0.CO;2)

AMATEUR SPOTLIGHT: GEORGE MARTIN

Dr. Dana Ehret nominated George Martin to be this issue's featured amateur. Dana describes some of George's contributions to paleontology in his introduction. Then Eleanor Gardner summarizes her interview with George.

George Martin, of Auburn, has been donating fossils to The University of Alabama Museums since 2005 when he first brought in a partial fossil sea turtle shell and pelvis from the late Cretaceous of Alabama. A retired soil scientist from the US Department of Agriculture- Natural Resources Conservation Service (USDA-NRCS), George says that he has been interested in geology and paleontology his entire life. His job as a soil scientist has taken him all over the southeast, including Alabama and Louisiana, and has allowed him the opportunity to learn the local geology while keeping his eyes peeled for fossils.

Since retiring in 2007, George has more time to focus on his fossil-collecting hobby. In addition to collecting fossils here in Alabama, he has volunteered on numerous fossil digs for the Florida Museum of Natural History. George's collecting expertise has led to many important donations and contributions, both vertebrate and invertebrate paleontology from the southeastern US. He has donated specimens not only to the Alabama Museum of Natural History (ALMNH), but also to the American Museum of Natural History, the Florida Museum of Natural History, and the Mississippi Museum of Natural History. George has been honored for his discoveries by having an early Paleocene (~60 million years ago) crab from Alabama named after him, *Stevea martini*, which he donated to the Florida Museum of Natural History. In addition to his great eyes in the field, George is also a great fossil preparator and even has a lab set up in his home.



George at a fossil dig with the Florida Museum of Natural History. Photo courtesy of George Martin

Recently, George has been contributing many wonderful specimens to the Alabama Museum of Natural History, including fossils of elasmosaurs, turtles, sharks, fishes, snakes, and crabs. In addition to his generosity, he also accompanies me to sites throughout the Black Belt to collect fossils for the museum. On a recent collecting trip the day of the Iron Bowl, George and I found the first state record of the shell-crushing shark *Ptychodus rugosus* from Alabama! Despite in-state rivalry on the football field that day, two scientists, one from Auburn and one from Tuscaloosa, came together to make an important discovery in the Paleontology field.

The University of Alabama Museums thanks Mr. George Martin for his continued generosity and support. --Dana Ehret

What is fossil hunting in the southeast like?

As compared to what? The southeast is the only place I've hunted for fossils! I hunt mostly creeks, walking the streams -- don't even have to sift! I tend to collect Cretaceous material because that is what's around me. Often in the southeast, it is too hot or too wet to collect, so you always have to watch the weather reports. I also enjoy hunting road cuts and generally wherever rock is exposed, specifically limestone, marl, and chalk. Also, I'm always happy to have opportunities to collect at places like the Harrell Station Paleontological Site (a 140-acre research site for the Alabama Museum of Natural History). That site is kind of like the Badlands out west: there are deep gullies and you mostly do surface collecting.

What are the keys to successful fossil collecting in the southeast?

Perseverance. Keeping your eyes peeled, as well as getting them acclimated for a particular search image (like a crab claw or a turtle bone). I like to return 3-4 times to site, particularly after it rains. I try to collect as much as possible at each site, to get a good representative sample of the fauna. I want to collect as many different species as possible.

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How did your experience as a soil scientist inform your hobby collecting fossils?

It definitely played a large role because I was often outside looking at the ground, thinking about parent rocks and resulting soils. Actually, I wanted to be a geologist in college and really always had an interest in geology, but ended up majoring soil science. Being a soil scientist gave me access to road cuts and other sites that later turned out to be fossiliferous. It worked out rather well!

How did you first come to donate fossils to museums?

My first donation was really neat. I was working along a creek and noticed something dark. Upon collecting it, I recognized it was probably bone, so I brought it to the attention of Dr. Ed Hooks (the previous curator of vertebrate paleontology at the museum). He said it was turtle and encouraged me to go back and collect more of it. I went back several times and managed to collect one of the most complete specimens of this particular new species of turtle. The specimen is currently being studied by a PhD student at the University of Alabama at Birmingham.



George holding a partial Bison leg bone he excavated while volunteering with the Florida Museum of Natural History. Photo courtesy of George Martin



George holding rare erasmosaur paddle bones he donated to ALMNH, now on view at Smith Hall. Photo courtesy of George Martin

I enjoy donating my finds to museums because I know the specimens will be used for research and help to further our understanding of earth history. Also, the more I donate, the more I get invited to participate in university and museum fossil digs! Besides Dana Ehret at the Alabama Museum of Natural History, I work closely with George Phillips at the Mississippi Museum of Natural Science. In fact, just last week I was in Mississippi with George collecting material from a Cretaceous field site. I've also donated to the Florida Museum as well as the American Museum of Natural History in New York.

What were the circumstances of the discovery of *S. martini*?

I was collecting at a roadcut and began noticing that a variety of crabs of different sizes were preserved in the rocks. I collected samples of each size of crab and kept them for later. During a volunteer dig at Thomas Farm in Florida, I brought the crab specimens out in the parking lot area and showed them to Richard Hulbert, who suggested that I get in contact with Roger Portell in the invertebrate division. After showing Roger the crabs, he recognized that one of them was a new species – and that's how we got *S. martini*!

What tools would you recommend for someone just getting into fossil preparation?

It all depends on what they're working on. All I had at first was an old dremel tool, but it didn't work especially well, so then I got dental tools and sculpting tools. I make my own tools, too – like grinding down a screw driver or turning a wooden handle into a probe. Dental picks, screw drivers, probes, and such are all nice tools for working with soft fossil material. In recent years, I purchased an air scribe and a sand-blaster for working on harder material. For beginners, though, I'd recommend hand tools: X-acto knives, probes, and dental picks.

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Any special tricks of the trade that you've picked up along the way?

My “trick” isn't much of a trick – just patience! If you don't have patience, you'll mess the fossil up more than you'll fix it. Also, it helps to have a ready tube of superglue! Lastly, I tend to keep a picture or a reference book with nice images of fossils on hand. I get a lot of the printed pictures from journal articles (open access, or from my professional contacts, or through library access).



George preparing a Cretaceous ammonite he collected in Alabama in his home prep lab. Photo courtesy of George Martin

How did you and Dana meet?

I had already been donating to the UA museums (through Ed Hooks and previous curators), when I heard that Dana got the job at the Alabama Museum of Natural History. I just emailed him and told him about my interests, and generally introduced myself as a collector and as someone Dana could rely on for donations or help in the field. We got to know one another via email and then I made a trip up to Tuscaloosa and met him in person. We correspond frequently and Dana invites me when he's going collecting somewhere, and vice versa. I have the same kind of relationship with George Phillips in Mississippi. It's nice.

What is your favorite find thus far?

Gosh, my favorite fossil find? I love them all! If pressed to choose, I'd say the sawfish rostrum I found several years ago. It is Cretaceous in age and about 58 cm long; these aren't preserved very frequently and it turns out the one I found is one of the more complete specimens in the world. So I guess it's my favorite because it is rare.

To learn more:

More info on the Harrell site: http://blog.al.com/good-things-growing/2017/05/explore_the_harrell_station_pa.html

CLUB CORNER: NORTHWEST PALEONTOLOGICAL ASSOCIATION

by Paul Kester, Past NPA President, pkester@comcast.net

The Northwest Paleontological Association (NPA) serves the Pacific Northwest region of the United States. Formed in 1994 to bring vocational and professional paleontologists together for mutual benefit and to advance the science of paleontology, the NPA is affiliated with The Burke Museum of Natural History and Culture (burkemuseum.org) – located on the University of Washington campus in Seattle, Washington.

Today the NPA has grown to a membership of over 80 active members. Our membership includes everyone from beginners to professional paleontologists. All members are brought together by a common interest – to understand the paleontological heritage of Washington State and the Pacific Northwest. Membership in the NPA is open to individuals and families who are interested in the science of Paleontology.

The NPA meets at 1:00 pm, the third Sunday of January, March, May, July, September, and November, in the Burke Room at the Burke Museum of Natural History and Culture. Lectures are given by professionals, members, and graduate students from the Biology Department. Recent talks include:

Animals of the Arizona Petrified Forest in the Earliest Days of the Dinosaurs by Dr. Christian Sidor, Vertebrate Paleontologist Burke Museum

The Life of the Adolescent Paleoindian Female from Hoyo Negro, Quintana Roo Mexico by Jim Chatter, Applied Paleoscience



May Meeting of the NPA

Workshops and field trips are provided throughout the year. This September, the NPA, will join with the Paleobotany Department of the Burke Museum to conduct a week of field work within the Cretaceous beds of the Methow Valley in northeastern Washington.



NPA members working with young paleontologists during 2017 Dino Days at the Burke Museum

The NPA remains close to the Burke Museum assisting on many projects including “Dino Weekend” in March. Other activities include preparing fossils for exhibit, collecting specimens for the museum’s collections, and research. Members have also published research articles in scientific journals.

Members of the NPA assist with The Discoveries in Geosciences (DIG) Field School (digfieldschool.org) a unique, nonprofit professional development program for K–12 teachers created by University of Washington Burke Museum paleontologists. Under the guidance of Dr. Greg Wilson, UW biology professor and Burke Museum Adjunct Curator of Vertebrate Paleontology, the DIG Field School is designed to connect K–12 STEM (Science, Technology, Engineering, and Math) teachers with scientific research and researchers through ongoing professional development and teaching curricula. Fossils spark student (and teacher!) interest and provide an enjoyable and exciting way to engage with science; including field research methods, critical thinking skills, and the

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examination of evidence. The DIG Program provides teachers with a hands-on, immersive learning experience through a four-day program at an active field research site in the Hell Creek area of northeastern Montana, as well as year-round educational support. This “real world” professional development is a critical component of increasing teacher effectiveness and student engagement.

NPA members have supported DIG by leading and assisting graduate students who are doing field work. They have also helped with the prepping of vertebrate fossils for display including an Edmontosaurus, a Triceratops, and the recently discovered Tyrannosaurus rex. Members have also sorted microfossils for storage in the Burke collection.



NPA outreach with John Rogers Elementary School, Seattle, Washington



Association members sorting sediment and microfossils from Hell Creek, Montana

To further interest in paleontology, many NPA members provide outreach to local schools; by participating in science fairs, individual classroom presentations, and leading field trips to fossil localities. Besides bringing age appropriate activities into the classrooms, outreach volunteers give each student fossils that have been donated by the NPA membership throughout the year.

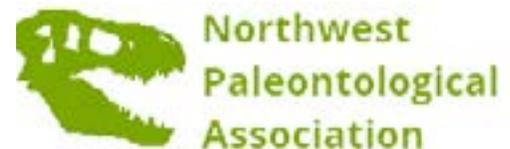
NPA members assisted the Bellevue Park and Recreation Department in managing paleontological resources within the Coal Creek Nature Area. A presentation, “Forest of Stone, Coal Creek Ancient Forests,” was prepared along with the recovery of a large specimen of *Metasequoia* petrified wood for display in the Lewis Creek Interpretive Center.

NPA members maintain a close working relationship with the Stonerose Interpretive Center, in Republic, WA (stonerosefossil.org). NPA members have served on the Board of Directors, conducted workshops, and assisted with field collection and research.

The association publishes a bimonthly bulletin called *The Aturian*. *The Aturian* features articles about fossils and fossil collecting, national and international paleontological findings, association events and activities, and other items of interest to its readers. The NPA also maintains a paleontological library. Items in the library are available for checkout by current members of the organization.

For further information or to check for upcoming events visit the NPA website at nwpaleo.org.

All photos courtesy of Tom Wolken, current NPA President



RESEARCH: RECENT STUDIES ON THE VERTEBRATE PALEONTOLOGY OF ORANGE CO., CA

by James F. Parham, John D. Cooper Archaeological and Paleontological Center, Department of Geological Sciences, California State University, Fullerton, CA

The student-led research in my lab at Cal State Fullerton is largely based on a wealth of unstudied, fossils recovered from development mitigation projects around Orange County, California over the past 30 years. This important resource (the Orange County Paleontology Collection) is managed by collaboration between Orange County Parks and Cal State Fullerton called the John D. Cooper Archaeology and Paleontology Center (“Cooper Center”). The Cooper Center fossils range in age from the Jurassic to the Pleistocene, although the majority of the specimens are from the Miocene (~23-5 Ma) and especially from three marine formations that span ~16.5-6 Ma (The Topanga [~16.5-14.5], Monterey [~15-7.], and Capistrano Formations [~7-6]). My student collaborators and I are busy curating, describing, and interpreting the fossils from this time period and we are particularly interested in comparing how assemblages of marine vertebrates change through time.

There are many aspects of the fossil record of Orange County that make it an attractive area for comparative study. For one, Orange County is rich in fossils. The sheer amount of fossil material provides ample opportunities for research projects on a variety of species. We have active projects on sharks, turtles, walruses, seals, sea lions, desmostylians, crocs, and seabirds. Second, the rich fossil record of Orange County is in a small geographic area, so we do not have to consider latitudinal differences when we compare sites. Third, the main time period of interest (~16.5-6 Ma) represents a period of great change in the Eastern Pacific, and around the world, with global temperatures dropping from the Middle Miocene Climatic Optimum to the glacial-interglacial cycles we exist in today. In California we also see the development of enhanced nutrient upwelling systems, and in Orange County we have generally shallowing upward sequence of marine rock units. The overarching theme of our research is to interpret the unstudied marine vertebrate record of Orange County in light of these related physical drivers (climate, currents, and sea level).



Peter Kloess studied over 500 seabird fossils from the Miocene of California, almost half of which were from Orange County. Photo credit Eric Holt



The skull of an extinct flightless auk from the Late Miocene of Orange County (Cooper Center specimen). Kloess and Parham (2017) show that these birds became much more abundant in California at the end of the Miocene. Photo credit Daniel Weiherer / James Parham

Earlier this year, two studies from our lab were published. The first study was “A specimen-based approach to reconstructing the late Neogene seabird communities of California” (Kloess and Parham 2017). Peter Kloess, a graduate student in my lab (now in PhD program at UC Berkeley), examined over 500 seabird fossils from around California, almost half of which were from Orange County. We used this dataset to look at the diversity and abundance

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of fossil seabirds through the Miocene to test patterns that were originally based on surveying the literature. Among other things, our specimen-based approach demonstrated that a group of flightless auks (mancallines) showed a major increase in abundance during the latest Miocene. This striking pattern is certainly influenced by the preservation potential of their relatively thick bones combined with more nearshore environments preserved in late Miocene rocks, but we also note that it coincides with stable nutrient upwelling that have also been invoked as drivers of fish morphology and pinniped speciation. Our study on seabirds is the most rigorous and quantitative analysis of marine vertebrate community changes in the East Pacific and sets the stage for future studies of faunal change in the Neogene of coastal California.

In order to compare fossils from different sites and formations it is crucial to have accurate and precise ages. That is why, along with documenting the species from Orange County, we are also looking at refining the age of different rock units. The second study we published this year addresses that issue for the Oso Member of the Capistrano Formation, a nearshore fossiliferous rock unit that includes both terrestrial and marine vertebrate fossils. Although many specimens have been recovered from the Oso Member only one study on vertebrate fossils had been published. Michelle Barboza, an undergraduate student in my lab (now in MSc program at the University of Florida), led a biostratigraphic analysis of fossil horse teeth that allowed us to refine The Oso Member's estimated age from 7.7-5.3 Ma to 6.6-5.8 Ma. Working together with other students and Dr. Velez-Juarbe of the



Undergraduate Michelle Barboza studied fossil horse teeth to refine the age of the Oso Member and also reported on crocodylian specimens from throughout California (Barboza et al. 2017). Photo credit Gabriel-Philip Santos

Natural History Museum of Los Angeles County, we provide the first faunal list of the Oso Member. We also note that the Oso Member includes the youngest crocodylians from the western USA. As we prepared our study we found that the fossil record of crocodylians in California was underreported in the literature and so we reviewed and figured specimens from throughout the state.

These two studies are important chapters of the story about how assemblages of marine vertebrates change through time in California. Similar studies are planned over the next few years along with standalone studies on that reveal new data about the paleobiology of extinct species or describe new taxa and evolutionary trees. Aside from the two studies highlighted here, there are other recent studies on the vertebrate paleontology of Orange County, including Cooper Center fossils, that show it's emerging potential for significant scientific contributions (Boessenecker and Churchill 2015, Santos et al. 2016, Velez-Juarbe 2017).

Works Cited

Barboza, M.M., J.F. Parham, G.-P. Santos, B.N. Kussman, J. Velez-Juarbe. 2017. The age of the Oso Member, Capistrano Formation, and a review of fossil crocodylians from California. *PaleoBios* 34:1-16. <http://escholarship.org/uc/item/6sg3v4gs>

Boessenecker, R.W., M. Churchill 2015. The oldest known fur seal. *Biology Letters* 11(2):20140835. <http://rsbl.royalsocietypublishing.org/content/11/2/20140835>

Kloess, P.A., and J.F. Parham. 2017. A specimen-based approach to reconstructing the late Neogene seabird communities of California. *Palaeogeography, Palaeoclimatology, Palaeoecology* 468:473-484. <http://www.sciencedirect.com/science/article/pii/S0031018216309282>

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Santos, G.-P., J.F. Parham, and B.L. Beatty. 2016. New data on the ontogeny and senescence of *Desmostylus*. *Journal of Vertebrate Paleontology* 36(2):e1078344. <http://www.bioone.org/doi/abs/10.1080/02724634.2016.1078344>

Velez-Juarbe, J. 2017. *Eotaria citrica*, sp. nov., a new stem otariid from the “Topanga” Formation of Southern California. *PeerJ* 5:e3022. <https://doi.org/10.7717/peerj.3022>



The geographic and temporal distribution of fossil crocodylians in California. Barboza et al. (2017, Figure 6).

EDUCATION: SCORPY, THE GIANT SEA SCORPION'S IOWA ADVENTURE!

by Tiffany Adrain, Paleontology Repository, Department of Earth and Environmental Sciences, University of Iowa, Iowa City, Iowa

This summer, the University of Iowa's Mobile Museum is rolling out across the state of Iowa with a brand new Museum icon aboard – “Scorpy,” Iowa's Giant Sea Scorpion! The 6-foot-long, life-size model of the recently discovered and described new species of Ordovician eurypterid (sea scorpion), *Pentecopterus decorahensis*, is the star of the exhibit, “Delving Deep: Scientific Discoveries from Iowa's Ancient Sea.”

The University of Iowa Mobile Museum launched in 2014 as a partnership between the Office of the Vice President for Research and Economic Development, the Office of the State Archaeologist, and the Pentacrest Museums. It inspires visitors to understand the world by bringing exhibits with cutting-edge research, one-of-a-kind artifacts, and interactive digital media to Iowa's communities statewide. It promotes interdisciplinary partnerships and collaborations to present UI research and stimulate understanding, appreciation, and pride for the University of Iowa and the state.

Delving Deep

The “Delving Deep” exhibit tells the amazing story of the discovery of an Ordovician sea scorpion, the world's oldest and the largest for its time, and its surprise association with a meteorite impact crater. In 2005, the Iowa Geological Survey (IGS) discovered a shale outcrop in Decorah, Iowa, with the help of a local geologist, as part of their state bedrock-mapping program. They had been looking for rocks that matched an historic account of a shale that was so rich in organic material that it could be burned like coal, which the locals of the time believed (and hoped) it was. The shale was inconveniently submerged in the river on the outskirts of Decorah, but when one of the geologists fell in after peering too closely, he managed to collect some good samples. Later, with the help of funding from the National Science Foundation, a part of the riverbank was dammed temporarily for more intense collecting. UI students spent hundreds of hours over several summers splitting the shale samples, leading to the discovery of unusual fossils, different from those in similar age rocks in the surrounding areas. Other Ordovician formations in Iowa preserve fossils such as gastropods, brachiopods, trilobites, crinoids, cephalopods, algae and other common bottom-dwelling organisms. In contrast, the shale contained an entirely different suite of fossils: conodonts (microscopic jaw parts) still associated with the conodont animal, shrimp-like phyllocarids, coprolites, early jawless fish, algae, and large pieces of organic cuticle from the oldest known eurypterid. This 465-million-year-old fauna is so unusual, rare, and well preserved, it was given the name of the Winneshiek Lagerstätte. The eurypterid remains were studied by James Lamsdell, Postdoctoral Associate at Yale University, who described them as a new species; *Pentecopterus decorahensis* - a penterconter is a Greek warship, and -pterus means “wing,” Decorah is the town where the discovery occurred (Lamsdell et al. 2015).

Making an Impact

The research did not stop there! The question remained about why this shale with its special fossils was there in the first place. The IGS and the U.S. Geological Survey investigated, taking rock cores, and using aerial geophysical surveying. They discovered that the shale unit was present in a 3.5 mile-wide circular area, surrounded by deformed rocks and underlain by a breccia of angular broken rocks. The presence of shocked quartz was the final clue that the



Scorpy (left) with Herky, University of Iowa mascot

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Winneshiek Lagerstätte sits in a meteorite impact structure! This is only the second impact structure discovered in Iowa (the Manson Impact Structure is the only other one known). The crater left in the Ordovician sea-floor by the meteorite impact provided a deeper, quieter environment unsuitable for common Ordovician organisms, but perfect for the undisturbed preservation of giant sea scorpion molts.

Scorpy on TV!

When James Lamsdell and his co-authors published their paper about the new sea scorpion, National Geographic got interested and included the story in their TV show *The Strange Truth*. I was lucky enough to be invited to participate as Collections Manager of the University of Iowa Paleontology Repository, Iowa City, where the Winneshiek Lagerstätte specimens are housed. Very early, one cold November morning, I headed off to Decorah with IGS geologist Paul Liu to meet his colleague Bob McKay and be interviewed for the show. I was quite excited but also terrified! The film crew was great (and very good at editing, thankfully)! After we did our serious-scientific-interviews-in-a-darkened-room, we had a bit of fun in store for the town of Decorah – Scorpy’s homecoming! Dennis Wilson of Pangaea Designs in Denver had been commissioned to make a life-size model of the sea scorpion and brought it to Decorah for its debut! And so, for one afternoon and morning, after a chilly unveiling at the river bank with the IGS geologists, film crew and the landowners who had permitted the excavations, “Scorpy” (the film-crews’ name for the model) was brought to life and driven around the town of Decorah, visiting the local pizza parlor for eurypterid-shaped pizza, and the local high school for his own personal homecoming! The NatGeo show aired in January 2016 – we’re famous!

On the road again!



University of Iowa’s Mobile Museum 2017

Now, for the summer of 2017, Scorpy is back on the road in the UI Mobile Museum, thanks to the generosity of Dennis Wilson, who donated a new model especially for the “Delving Deep” exhibit. In the exhibit, visitors can also see examples of typical Ordovician fossils, replicas of the delicate Winneshiek Lagerstätte fossils, and meteorites from the UI Department of Earth and Environmental Sciences collections. Other exhibits in the UI Mobile Museum are “Speaking of Work: The Iowa Labor History Oral Project” and “Oneota Archaeological Connections.” Two interactive digital touchscreens with several digital exhibits let visitors learn about research and creative activity happening in a variety of UI units. The UI Mobile Museum is available for free to tour schools across Iowa from April through the end of October. A staff of highly experienced educators from the Pentacrest Museums and the Office of the State

Archaeologist are collaborating to create associated guidelines and activities to enrich the Mobile Museum experience for students. The UI Mobile Museum is also available for community events. If you are in Iowa this summer, check out the calendar of events at <https://discover.research.uiowa.edu/mobile-museum> and maybe you’ll get to meet Scorpy!

References

Lamsdell, J. C., Briggs, D. E. G., Liu, H. P., Witzke, B. J., and McKay, R. M. 2015. The oldest described eurypterid: a giant Middle Ordovician (Darrivilian) megalograptid from the Winneshiek Lagerstätte of Iowa. *BMC Evolutionary Biology* 15:169 DOI: 10.1186/s12862-015-0443-9.

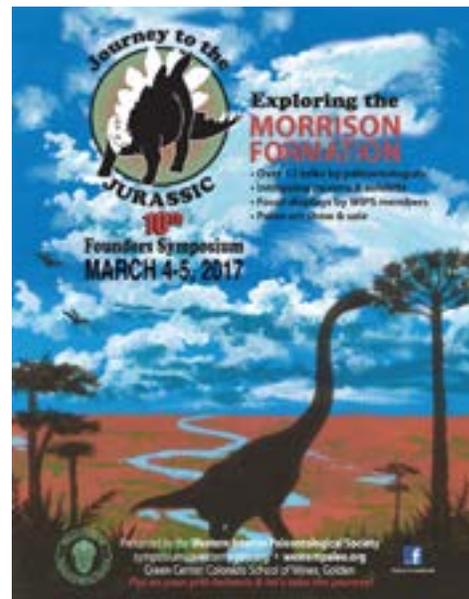
WIPS' 10TH FOUNDERS SYMPOSIUM: JOURNEY TO THE JURASSIC

by Susan Passmore, Western Paleontological Society (WIPS)

The Jurassic Morrison Formation was the focus of the Western Interior Paleontological Society (WIPS) Founders Symposium on March 4 and 5, 2017 at the Colorado School of Mines. Held every other year, the WIPS Founders Symposium honors the Society's founders, Jordan Sawdo and the late Bryan Cooney, and all the individuals who guided WIPS in its early years. The idea to hold a WIPS symposium began with paleontologist Dr. Lou Taylor, who moderated the 2017 event. First organized in 1999, the Founders Symposium has been held biennially ever since.

One of the goals of the symposium is to promote the exchange of information and ideas between the amateur/avocational and professional paleontological communities. It is an educational event open to anyone who's interested in learning more about paleontology and earth science, bringing together fossil enthusiasts, scientists, and artists. Proceeds from the Founders Symposium help fund WIPS' grants and scholarships to support research and education in paleontology.

The 2017 speakers took participants on a journey through the Morrison Formation, from its geology to its dinosaurs. Speakers and their presentations were:

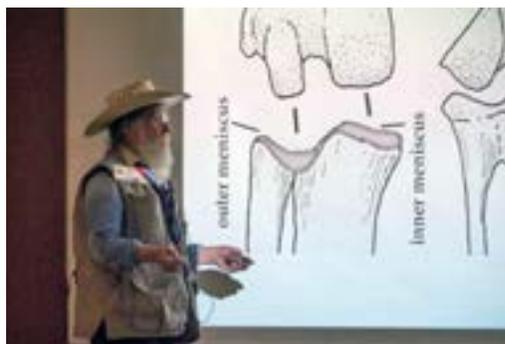


Robert Bakker, PhD (keynote), Houston Museum of Nature Science, Stegosaur Martial Arts: a Morrison Formation Allosaur Stabbed and Killed by Stegosaurus

Brent Breithaupt (keynote), Regional Paleontologist, Bureau of Land Management, Big Wonderful Wyoming: The "Lost World" of Jurassic Dinosaurs

Christine Turner, PhD (keynote), Emeritus, US Geological Survey Paleoclimatic, Paleohydrologic, Paleoecologic, and Sedimentologic Reconstruction of the Extinct Ecosystem of the Upper Jurassic Morrison Formation: How Dinosaurs Thrived in a Dry Climate

Martin Lockley, PhD, Emeritus, University of Colorado-Denver, A Review of Vertebrate Tracks from the Morrison Formation, Western USA



Dr. Robert Bakker was a Keynote Speaker



BLM paleontologist and symposium speaker Brent Breithaupt with BLM exhibit



Denver Museum of Nature & Science paleontologist Dr. Joe Sertich speaking to the crowd

Joe Sertich, PhD, Denver Museum of Nature & Science, Extreme Theropod Richness of the Morrison Formation and the Unusual Theropod Specimens of the Denver Museum of Nature & Science

James Kirkland, PhD, Utah Geological Survey, The End of the Jurassic on the Colorado Plateau

John Foster, PhD, Museum of Moab, The Overshadowed: What Microvertebrates of the Morrison Formation Have Revealed to us about the Late Jurassic

Judith Totman Parrish, PhD, Emeritus, University of Idaho, Reconstructing Plant Ecosystems Semi-arid Paleoenvironments, with Reference to the Morrison Formation

Matthew Mossbrucker, Morrison Natural History Museum, Revisiting Arthur Lakes' Lost Quarries: Initial Survey of Undescribed Yale Peabody Jurassic Morrison Fossil Material Collected from Morrison, Colorado (1877-1879)

William Hay, PhD, Emeritus, University of Colorado-Boulder, Rethinking Mesozoic Environments

Erin LaCount, Dinosaur Ridge, The Dinosaur Ridge Quarries of Arthur Lakes

Malcolm Bedell, Western Interior Paleontological Society, Jurassic Podiatry: What Articulated Sauropod Feet Can Teach Us

Christopher Weege & Dave Schmude, Western Interior Paleontological Society, Jurassic Giants of the Powder River Basin, Wyoming: Recent Finds From the Morrison Formation

Beth Simmons, PhD, Metropolitan State University of Denver, Naming the "Morrison Formation"

Elliott Smith, University of Utah, A New Trace Fossil Assemblage Interpreted to be Produced by Social Insects from the Upper Jurassic Morrison Formation of Eastern Utah

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More than 150 people attended “Journey to the Jurassic: Exploring the Morrison Formation,” which also featured an art gallery with work from more than 20 local natural science artists, exhibits from earth science organizations and government agencies, and displays of fossils from WIPS member collections.

An open-topic poster session is also part of each Founders Symposium. The poster session offers a forum for WIPS members to share information about their projects, for students in paleontology to gain experience developing and presenting scientific posters, and for recipients of WIPS Karl Hirsch Memorial Grants to report on their research. This year, The FOSSIL Project provided a poster, “FOSSIL – Social Paleontology Through Amateur and Professional Collaboration.”

WIPS hopes to make its symposium proceedings available online in the future. You can check out some video highlights of the 2017 symposium at: <https://www.youtube.com/watch?v=N25V-ir-FWY&feature=youtu.be>

The next WIPS Founders Symposium will take place in 2019. Watch for updates on the WIPS Founders Symposium Facebook page (<https://www.facebook.com/WIPS.Founders.Symposium/>) and the Western Interior Paleontological Society Facebook page (<https://www.facebook.com/WesternInteriorPaleontologicalSociety/>).



Wayne Itano’s display on Helicoprion: The Spiral-Toothed Shark



The PaleoZone, WIPS’ club for young paleontologists, provided a display of favorite fossils



Dinosaur fossils from Johnson County, Wyoming, complementing the talk by WIPS members Chris Weege and Dave Schumde

FEATURED FOSSIL: MONTBROOK OTTER

by Alex Lounders

For some backstory on this fossil as it was originally given to me--this specimen was originally thought to be a series of 6 articulated otter tail vertebrae from a 5 million-year-old site near Williston, Florida. A previous volunteer left this specimen roughly a quarter of the way through its prepping process, leaving it partially exposed outside of its plaster jacket. I've learned that it is not uncommon for museums to have a backlog of fossil finds to be prepared. Lack of funding and people to do the work is a perennial problem in case there are any fossil philanthropists out there that may happen to be reading this. Back to the otter specimen, this particular fossil is also a contender to be one of the oldest recorded otter fossils ever discovered in North America. So a certain degree of caution and precision was needed to fully prepare and extract the fossil from the dirt in one piece.

As the specimen's top half was already polished and showing plenty of bone, my first task was to carve around any exposed sections in the hopes of finding any other pieces that happened to be further below. After that, I had to flip the fossil over in a sand box and work through roughly 2 inches of sand on its opposite face. Two important factors for this section included the sand pit which cradled the exposed bone to keep it intact, and the slow process of digging through the opposite side's layer of sand. While the fossil did not appear to reach that far down, and simply ripping off large chunks of sand would have been faster, it was still possible that some pieces had shifted away from the main body. Digging through all this sand required more than a dental tool, as it was soaked with a B-72 glue to keep everything in place. A brush of acetone made quick work of the glue and easily swept the sand away.



Ventral view of 6 articulated vertebrae from a 5 million-year-old otter, *Lontra* sp.



Ventral view of 6 articulated vertebrae from a 5 million-year-old otter, *Lontra* sp.

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After both sides were much more visible, it came time to bring the fossil under the careful scrutiny of a microscope. Using a microscope made distinguishing sand from bone much easier and made the tedium of wiping away grains of sand less tedious. The magnification made each brush stroke reshape mountains. After an extended period of microscopic fine detail work, the fossil was given a candy coating of B-72 to keep everything in place and then taken to one of the supervisors of the vertebrate paleontology department. Upon seeing the specimen, the supervisor let out a dismayed groan in shocked horror! Quickly explained, the vertebrae were not actually part of the tail as originally thought. The set contained the axis vertebrae which rests very close to the skull. It was an incredible shame that the skull was not found with the rest of this fossil, which explained the supervisor's dismay. Even so, the fossil still proved to be a fine specimen. Through comparison with modern otter vertebra, we were able to confirm the identity as the genus *Lontra*.



More information from Rachel Narducci, volunteer coordinator at the Montbrook site and a fossil preparator at FLMNH:

Comparison between the axis vertebra of a modern otter, *Lontra canadensis lataxina*, and the fossil otter

The specimen was discovered by a former UF graduate student on October 11, 2016 at the Montbrook Fossil Locality in Levy County, Florida.

The site is set up as a 1 meter by 1 meter square grid system. The preservation in this particular square is abnormal compared to the remainder of the site. The layers dip steeply towards the north with a hard limestone/sand concretion, underlain by thin layers of thick black mud and white sand. This square also produced a large portion of the swan and both species of otter (*Lontra* sp. and *Enhydritherium terraenovae*) fossils discovered throughout the site.

The specimen was discovered two days after this picture was taken in the square to the right of the woman in the green shirt, volunteer Cindy Lockner. Also pictured are student Natasha Vitek and volunteer Kara Ericson in the blue shirt.



To learn more:
Read about the Montbrook site [here](#).

Site of the discovery. Photo credit Jonathan Block

PARK PALEONTOLOGY NEWSLETTER RETURNS

by Justin Tweet

National Park Service (NPS) staff have resumed publication of the "[Park Paleontology Newsletter](#)" after a hiatus of 13 years. An earlier version of this newsletter was published from 1991 to 2004 over 8 volumes, with partial archives available at [here](#). This first version began as a physical newsletter mailed to subscribers. Both the original and the reborn series are the creations of NPS paleontologist Vince Santucci. Vince began the newsletter as a way to communicate information about NPS paleontological resources to concerned audiences within the NPS and in the greater scientific community. A typical issue might contain short articles on such topics as new findings, ongoing and upcoming research projects, new paleo staff, legislation and management, and new exhibits or other outreach and education efforts.

The new edition follows in that tradition, although it was not designed as a physical document. Instead, the new version gathers several online articles created especially for it. The topics of this first new edition include a new exhibit at Big Bend National Park, type specimens from NPS units, Geoscientist-in-the-Parks intern Emily Thorpe's work at Salinas Pueblo Missions National Monument, John Day Fossil Beds National Monument's new Chief Paleontologist Nick Famoso, dinosaur tracks at Rio Grande Wild and Scenic River, and the history of the newsletter itself. We plan to produce new issues twice a year. If you have any questions or comments, or are interested in contributing an article, please contact Vincent L. Santucci, NPS Paleontology Program coordinator, via the email link at the main page of the newsletter.

To view all of the articles in the Spring 2017 issue, please visit

<https://www.nps.gov/articles/series.htm?id=4C7C6693-1DD8-B71B-0B8FEA6686353721>



ONLINE FOSSIL PROJECTS SEEK VOLUNTEERS

Fossil Atmospheres

Zooniverse is an online platform that makes it possible for volunteers to contribute to scientific research through crowdsourcing. For example, in the "Bat Detective" project, volunteers listen to and classified the sounds bats make for echolocation and social purposes. In "Floating Forests," volunteers scan satellite images to search for large masses of giant kelp in coastal ocean environments, and in "Science Gossip," volunteers help digitize drawings from periodicals published during the Victorian Age. Volunteers in "Fossil Atmospheres" will be helping researchers at the Smithsonian National Museum of Natural History! The scientists are investigating how the cells of leaves on Ginkgos have changed over time, and whether we can use them to learn about climate change and the ancient atmosphere of the Earth. Why Ginkgo? Ginkgo trees evolved before the dinosaurs, survived three mass extinctions, and one species is still living today. The activity you will do is count cells on modern and fossil leaves. The site provides training as well as lots of information about the science for those who are interested. The direct link to the project on zooniverse is <https://www.zooniverse.org/projects/laurasoul/fossil-atmospheres>



Miniature Fossils Magnified

Not into counting? Well, you can also digitally volunteer at the [Natural History Museum](https://www.naturalhistorymuseum.org) (London) by transcribing (typing) specimen labels for slides of tiny marine fossils, otherwise known as foraminifera, preserved in thin slices of rock. Most of the fossil material was collected by scientists during the 20th century as part of oil exploration in the Middle East. This volunteer opportunity is available on the Notes from Nature site which supports transcription of all kinds of written documents. The site provides very clear instructions and background information about the fossils. The direct link to the project on Notes from Nature is <https://www.notesfromnature.org/active-expeditions/Magnified>. (You may get an alert that no projects are available; just wait a second and the project will pop up.)



DIGITAL PHOTOGRAPHY 101: MANAGING CAMERAS, LIGHTING, & WORKSTATIONS

by Danielle Brennan

I found myself very fortunate to have been chosen to attend a workshop sponsored by the FOSSIL Project and iDigBio, hosted by the University of Florida on digital photography, managing cameras, lighting and imaging specimens. This opportunity allowed me the chance as an amateur photographer and fossil hunter to better experience the paleontological struggle that exists with collecting the, “best scientific specimen photo” available. I got to meet several local members from different backgrounds of the museum world and discover the different avenues available to each when it comes to photographing their specific media, whether it be invertebrates, fish, herbarium sheets, Lepidoptera, paleovertebrates or mammals.

This class allowed me to better understand my basic knowledge of digital photography from fossil hunting when it came to dealing with such media as paleo vertebrate fossils while enjoying the lesson plans presented by Mrs. Joanna McCaffrey and Professor Gil Nelson PhD, and Mr. Zack Randall on proper management of the DSLR camera's potential. The lesson plans were evenly distributed so that the educator and the educated were capable of engaging each other with questions and answers ensuring knowledge of the subject was properly conveyed while being demonstrated during the labs provided.

Day one, we were introduced to the DSLR camera setup and given a presentation breakdown of the types of DSLR cameras available, subtle differences between brands and how to utilize your camera's full menu functions. We were taken on a tour of the different imaging stations used at the university for the various media being studied. During these tours, we were shown ideas on how to capture your specimen's full photographic potential while adjusting for lighting, background color and distance to your subject between foreground and background using squeeze tanks, light boxes and copy stands. Our final event of the day was a field trip to the Sweetwater Wetlands Park to begin demonstrating the techniques we had just learned. Several photographs of wild birds, alligators and fauna were readily available around the park. A side trip to the Alachua Trail Park was made by myself and my husband where photographic opportunities involving alligators, birds, rabbits, field mice, snakes and wild horses abounded.



Day two was spent studying the software side of taking photographs with a DSLR camera. Professor Nelson and Ms. Stephanie Leon gave presentations discussing the different types of post processing software available and the best ways to implement using this software to your advantage. Ms. Kristen Grace gave a presentation discussing Metadata and the importance it serves in preserving your photographs.

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As a teacher, I have been using the lessons learned in this class to better educate my students whether it be in the classroom setting of marine biology or while being involved in the NOAA B-Wet PUP (Preserving Underwater Pastures) program currently being hosted by The Florida State University, in which I, three other teachers and seventeen students are conducting underwater research on several different dive sites. We are gathering data on fish counts, coral growth and impacted damage caused by human interaction with the underwater environment. Because of my taking part in this course, my students are getting firsthand knowledge on how to photograph subjects such as fish and invertebrates using a squeeze or photo tank while gathering their data which is crucial to the program. The knowledge learned has also allowed me to create lesson plans based on photographing and logging data in relation to different media studied.



Danielle practicing her technique on Eocene crocodile vertebrae from her collection

This was a great experience that allowed me the opportunity to engage with members of the paleontological society and gain from their experiences when it comes to photographing specimens of different types and sizes. I would like to say, thank you to all those from the FOSSIL Project and iDigBio who made this event possible, especially Professor Gil Nelson PhD., Ms. Joanna McCaffrey and Mr. Zack Randall. To those fellow attendees, I say thank you for letting me be a part of your world, experiencing the trials and tribulations you must endure in the task of preserving these great collections from the past and present for future generations to enjoy. The skills I have learned during this class will be put to great use both in my professional educational career as well as my private journeys as an amateur fossil hunter and photographer.

Slides and other information from the workshop are available at:

[https://www.idigbio.org/wiki/index.php/Digital_Photography_101: Managing Cameras, Lighting, and Workstations for Specimen Imaging.](https://www.idigbio.org/wiki/index.php/Digital_Photography_101:_Managing_Cameras,_Lighting,_and_Workstations_for_Specimen_Imaging)

by Joyce Drakeford

The very first reference book I purchased, because I live in Virginia, was ***Fossil Sharks of the Chesapeake Bay Region*** by Bretton W. Kent. It was written about fossil shark teeth found in a particular stratigraphy local to the Chesapeake Bay, but because of the overlap in the fossil time line, it can be applied to several areas. (With over 50 species of fossil shark teeth found just in the Aurora mine spoil piles, I have heavily referred to this book.) Unfortunately, this book is no longer in print but it can be found on Amazon, EBay, used book stores, and possibly in your local library.

Dr. Bretton W. Kent is the Director of Undergraduate Studies for the Department of Entomology at the University of Maryland. His primary research is on fossil sharks of the Neogene with specialized research in biomechanics of teeth and diets and how that relates to modern day sharks.

Fossil Sharks of the CBR is very useful for amateur and intermediate fossil collectors. It goes through terminology, stratigraphy, anatomy, and prepping fossil shark finds. The meat of the book goes through each shark by group as well as an Appendix with dentitions. Each shark group gives a description of identifying characteristics and an examination of the teeth. The teeth are shown in detailed, hand-drawn images. It also reviews the hot debate about the lineage of mega toothed sharks and where our modern Great White shark descended from. Additional Appendices include definitions of terminology and stratigraphic details which are very important scientifically.

I find the book to be well organized and with the perfect amount of detail. It will help the novice learn without being overwhelmed and be a continual reference thereafter.

For my next reference I have chosen ***Vertebrate Fossils: A Neophyte's Guide*** by Frank A. Kocsis, Jr. As this book states, it is "a book by non-professionals for non-professionals." Mr. Kocsis, Jr. grew up in western New York but moved to Florida in the 1980's. He eventually joined the Tampa Bay Fossil Club.

This reference is great to have handy because it doesn't exclusively focus on sharks, although there is one dedicated chapter. It also goes through chapters on rays, reptiles, birds, cetacea and mammals (large, small and hoofed). It doesn't list every single fossil that can be found in the aforementioned categories, of course, but it gives excellent examples from each one. Also, it isn't just about teeth. It reviews several anatomical fossils that can be found with many of the listings. There are nice detailed black and white photos of each fossil to help with identification.

Sadly, this reference book is no longer in print but it can also be found on Amazon, EBay, used book stores or may be located in your local library. Again, this reference can be applied to several locations with overlapping time periods so this book has been useful to me in that context.

The third reference book I have chosen to write about in this article is ***The Fossil Vertebrates of Florida*** by the Florida Paleontological Society and edited by Dr. Richard C. Hulbert, Jr.

Since there were many contributions to this book by Florida's state and regional club members, there is detailed information for each listed after the Preface. An Authorship page follows the group list. Dr. Hulbert is the collection manager for the Division of Vertebrate Paleontology at the Florida Museum of Natural History in Gainesville.

I find this to be a more intermediate collector's reference. *The Fossil Vertebrates of Florida* goes more into extensive terminology and lineage of fossils but has great detailed visualization. It not only has wonderful black and white photos of actual member fossils, it has intricate detailed illustrations. Like book two, this one also goes over a variety of fossils from Florida from the wee Vole to the massive Ground Sloth. You will find a section on fossil shark teeth and the mega toothed shark controversy. Again, some listings from FVF can be used in other areas.

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This book is still available for purchase. It can be located on Amazon and the Florida Museum of Natural History at the University of Florida website, both with listings of \$39.95.

I started with the listed three books because they do come highly recommended. The second and third books were originally recommended to me by Mace Brown of the Mace Brown Museum of Natural History at the College of Charleston in South Carolina during a visit a few years ago. If you are following the myFOSSIL.org webinars, you will have heard Vertebrate Fossils: A Neophyte's Guide recommended by Jayson Kowinsky (The Fossil Guy).

I've personally used all three books for reference from the state of Maryland all the way down to Florida, and not only enjoyed reading them but have learned a great deal. Hopefully, you will too!

Sources:

Kent, B. W. Fossil Sharks of the Chesapeake Bay. Egan Rees & Boyer, Inc. Columbia, Maryland, 1994, 146 pages

Kocsis, Jr., F. A. Vertebrate Fossils: A Neophyte's Guide. 2002, 184 pages

Florida Paleontological Society. The Fossil Vertebrates of Florida. The University Press of Florida, 2001, 350 pages

Editor's note: Other books of interest include the recently released [Guide to Fossil Collecting](#), [Color Guide to Pennsylvanian Fossils of North Texas](#), and [Footprints in Stone: Fossil Traces of Coal-Age Tetrapods](#).

REVIEW OF FINAL WEBINAR IN THE WOMEN IN PALEONTOLOGY SERIES: LISA WHITE

by Joyce Drakeford

We were honored to have Dr. Lisa White as the fourth and final webinar speaker for the Women in Paleontology series by myFOSSIL. If you missed this webinar or would like to view it again you can visit the myFOSSIL.org website and click on 'From Microfossils to Museums' under the [Videos & Tutorials](#) section.

Dr. White started out by explaining her background and how she came to paleontology. The education course Lisa originally took wasn't something you would think would lead you to Paleontology. She began studies in art. She grew up in San Francisco and attended San Francisco State University. As an undergrad, she enrolled in a geology course. It was the same year that Mount St. Helens erupted. That year she interned at the USGS. This is when Lisa became interested in science. She graduated with a BA in Geology and a minor in Photography and Art. She attended University of California Santa Cruz for her Ph.D. in Earth Science and upon graduation in 1990 returned to San Francisco State as a member of the faculty. In 2012, Lisa was appointed Director of Education and Outreach for the Museum of Paleontology at UC Berkeley.

Lisa's primary research focuses on diatoms and diatomites of the Monterey formation. This material is Miocene in age and runs along the coastline of California and around areas of the Pacific Rim. With high resolution paleo-environmental indicators, she is able to research what was going on in the environment at that time. It explains what was happening with the climate. Diatoms and other fossils are proxies for understanding geological history. To help with her research, she had the opportunity to go out on the research vessel, JOIDES Resolution, with the International Ocean Discovery Program. She has also done field research studies in Alaska, Japan, China, Korea, Mexico, Costa Rica, and Russia.

Among Lisa's outreach efforts are SF ROCKS (Reaching Out to Community and Kids with Science) and METALS (Minority Education through Traveling and Learning Sciences), both of which she started. The goals of both programs are to bring kids back to learning in nature and the outdoors and to create environmentally and culturally meaningful experiences for the students.

Lisa's current role as at UC Berkeley is to shape data into information useful for educators and others. Examples of this are the "Understanding Evolution" and "How Science Works" [online exhibits](#) at UCMP. A new exhibit, "Understanding Global Change," will go live in 2018. Lisa is also part of the team receiving grant funding to help digitize fossils of the Eastern Pacific invertebrate communities of the Cenozoic ([EPICC TCN](#)). Nine natural history museums will unite to help with the digitization. This will make 1.6 million specimen records available online. She is additionally helping to make the "Virtual Field Experience" a reality.

Lisa recently participated in the [Bearded Lady Project](#), a documentary film and photographic project highlighting the challenges and obstacles women in the field of earth science. Lisa has also been honored by receiving the Geological Society of America Bromery Award for Diversity in the Geosciences.

Lisa's current path finds her continuing to partner with diverse urban and youth populations to raise awareness of our natural world and changing environments. Also, Lisa plans on joining expeditions at sea for additional fossil studies in the future.



Lisa White

by Eleanor E. Gardner

Personnel Updates

It is with a mixture of both happiness and sadness that we announce the project coordinator, Eleanor Gardner, will be leaving FOSSIL. She recently accepted a position with the University of Kansas Biodiversity Institute & Natural History Museum. Eleanor will be the new Outreach and Engagement Coordinator at the KU museum. She and her husband will move to Lawrence, Kansas, on August 10, 2017. The project team is actively searching for a new coordinator who will manage FOSSIL's activities and events during the no-cost-extension year of NSF funding. At this time, Eleanor is working hard to ensure a smooth transition for whomever replaces her. Jeanette Pirlo, who joined the FOSSIL team in October, will serve as an interim coordinator in the event a suitable replacement cannot come on board and be trained before Eleanor leaves. Eleanor has greatly enjoyed being a part of the FOSSIL community and she will miss the many friends she has made over the past two years – but note that she plans to stay in contact and involved in the project from Kansas!



Eleanor Gardner

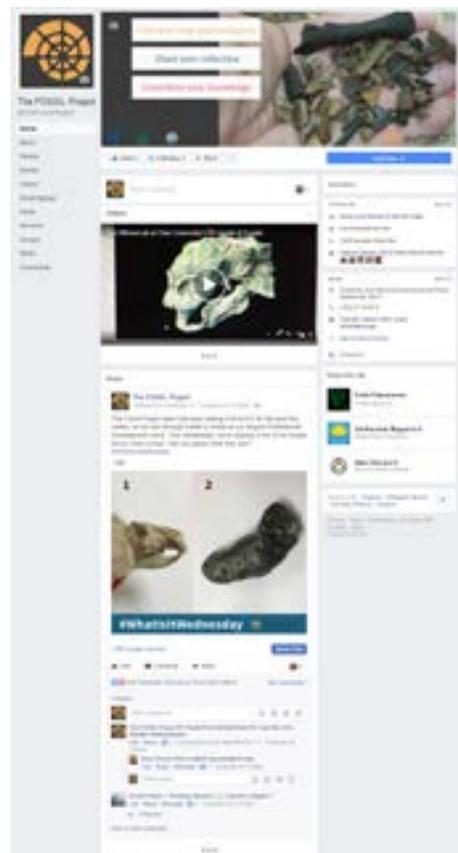
More new faces will be joining the FOSSIL team in the Fall 2017 semester. Two graduate students, one in paleobotany and one in science education, will become involved in project activities and events starting in mid-August. Keep your eyes peeled in future newsletters for articles introducing these new team members!

Search for Social Media Strategist Intern

The FOSSIL team would appreciate help in spreading the word about a new internship opportunity for an upper-level undergraduate student located in north-central Florida. This intern would help to expand the project's social media presence beyond the Facebook and Twitter platforms.

To engage with informal learners around the world, the FOSSIL project team utilizes social media as well as our social paleontology website, www.myfossil.org. We have a robust social media plan in place, with a protocol and evaluation methods. We are currently looking to hire a social media intern for the remainder of the project, through September 30, 2018. Ideally the intern would be an upper-level undergraduate student in a marketing, communications, or journalism major and with science interests. We are especially interested in hiring someone with experience in YouTube and Instagram. The intern would need to attend weekly planning meetings with the rest of the social media team, attend monthly project steering committee meetings, utilize Hootsuite to schedule content in advance, and be available for the occasional Skype/phone call.

Interested students should submit a 1-page resume, 2-page portfolio showing social media style, and contact information for at least one reference to the project director, Dr. Bruce MacFadden, at brmacfadd@flmnh.ufl.edu.



Upcoming FOSSIL Webinar Series

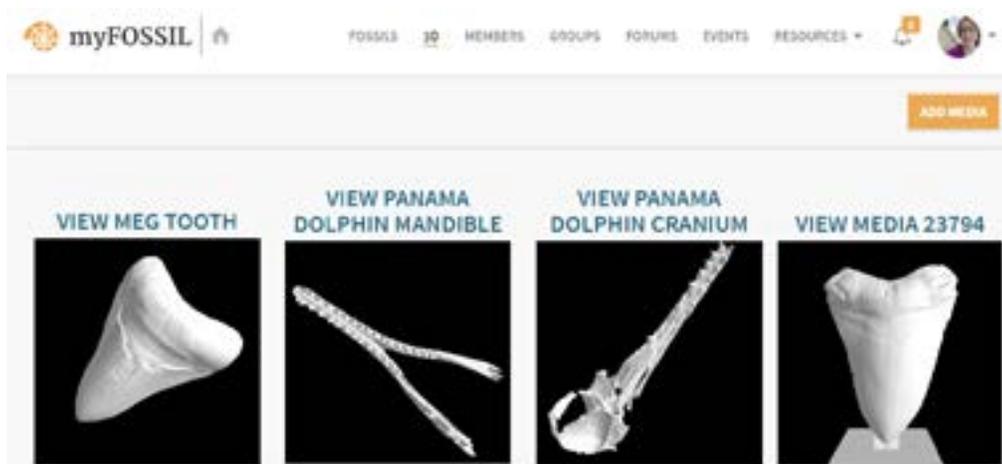
We are in the planning stages for the Fall 2017 webinar series, which will focus on fossil identification and be loosely modeled upon PBS' "Antiques Roadshow." A practice run was conducted on July 5th to test the new format and timing, as well as to uncover any unforeseen issues. We envision selecting four fossil clubs to "highlight" via five interesting and/or representative fossils. Each amateur would have about five minutes to discuss their fossil with a professional paleontologist and receive information about identification resources. Webinar attendees would also be provided with time for a Q&A session after each fossil. Although the fossil images will be displayed via a myFOSSIL-branded powerpoint presentation during the webinar, there will be live webcam feeds of the interacting amateurs and professionals. We hope this format will provide our webinar participants with a more dynamic experience.



If you think your fossil club would be a good match for this webinar series, please contact Eleanor Gardner at fossil@flmnh.ufl.edu before August 1.

Each webinar will be accessible via the iDigBio AdobeConnect software platform at <http://idigbio.adobeconnect.com/room>. The webinar episodes will begin at 7pm Eastern time on the following dates: September 20, October 18, November 15, and December 13.

myFOSSIL 3D Gallery is Live!



In June, a 3D gallery was released to the myFOSSIL website: <http://www.myfossil.org/ac-media/>. This gallery allows users to view, upload, and manipulate 3D fossil images. STL files up to 50MB can be uploaded directly within the website, and files up to 120MB can be uploaded via a hotlink (such as a Dropbox hotlink). Please explore this new feature and provide us with your feedback! To send feedback, use the orange "Send Feedback" button in the bottom right hand corner.

Recent & Upcoming Events

On May 6th, FOSSIL participated in a highly successful 'Women in Paleontology' event hosted by the Florida Fossil Hunters (FFH) as part of the Women in STEM Day at the Orlando Science Center. Over 1800 guests participated in the day's activities! A diverse group of speakers, including Michelle Barboza (FOSSIL), Celina Suarez (Univ of Arkansas)

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via Skype, Ta-Shana Taylor (Univ of Miami), Laura Cotton (FLMNH), and Rachel Narducci (FLMNH), inspired a new generation of girls and young women to pursue their interests in paleontology. Eleanor Gardner and Jeanette Pirlo from FOSSIL interacted with children and families all day long at the myFOSSIL activity tables. A set of women in STEM themed coloring books made for very popular door prizes! Thanks to help from an Education & Outreach grant from the Paleontological Society, the FFH were able to offer free admission to underprivileged privileged students. Overall, the event was a great success! We thank Cindy Lockner, Bonnie Cronin, and Russell Brown for inviting FOSSIL to participate in this wonderful annual event.



Ta-Shana Taylor



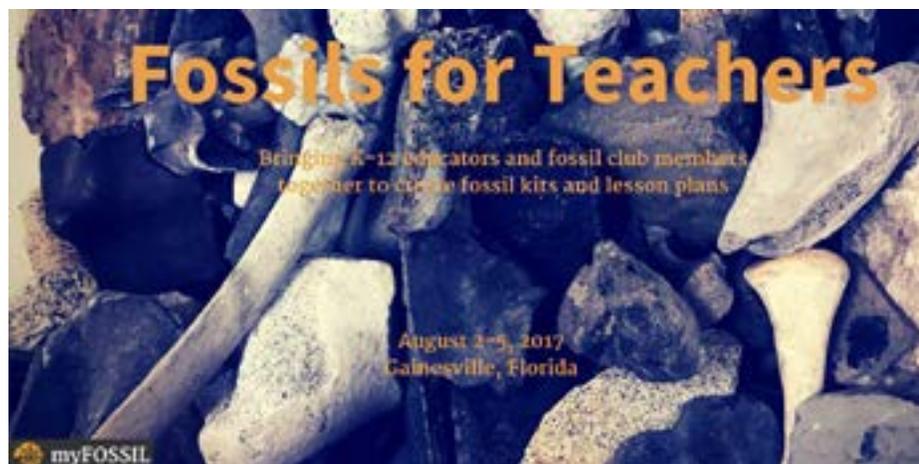
Jeanette Pirlo



Michelle Barboza

Also in May, FOSSIL affiliate and FLMNH graduate student Sean Moran gave a talk to the Fossil Club of Lee County in Fort Myers, FL, at their monthly meeting. Sean was presented with a scholarship from the club to help support his continued research during the second year of his PhD studies.

Over 30 participants have been selected for the upcoming 2017 Fossils For Teachers Professional Development workshop taking place August 2-5. Planning is underway and the FOSSIL team is growing more excited by the day to see what results from connecting K-12 teachers with fossil club members, and throwing a bunch of donated fossils into the mix! We have thousands of fossils available for the teams of teachers & club members to lesson plan with and to create classroom kits with. If you are interested in participating in future events like this, please contact Jeanette Pirlo at jpirlo@flmnh.ufl.edu.



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From October 22-25, the FOSSIL Project will participate in the 2017 Geological Society of America national annual meeting in Seattle, WA. If you'll be there, be sure to come check out the myFOSSIL table in the exhibit hall (and get some awesome myFOSSIL swag!). Several team members will also be presenting research talks and posters at the meeting.

We highly encourage members of the FOSSIL community to submit talk abstracts to the GSA 2017 topical session 'T64 Citizen Science in paleontology: harnessing public interest to advance research and STEM education.' Abstracts are due by 11:59 Pacific time on August 1 at <http://community.geosociety.org/gsa2017/science-careers/sessions/abstracts>.



In the citizen science in paleontology session, successes and lessons learned will be highlighted. Academic paleontologists, educators, and non-academic speakers are invited to: (1) present examples of strong citizen science projects; (2) discuss effective strategies for improving informal science education through citizen science; and (3) showcase the potential of citizen science to educate the public in paleontological research themes relating to evolution, climate change, and biodiversity. Through a combination of case studies, theory presentations, and question-and-answer sessions, we hope to encourage more paleontologists of all levels to understand citizen science as a viable means for addressing research questions, and to provide a rewarding science experience for members of the public.

Please email Eleanor at fossil@flmnh.ufl.edu if you have any questions, and feel free to forward this information to any potentially interested groups!

On November 3 & 4, the Florida Museum of Natural History will host a National Fossil Day celebration. All Florida-based fossil clubs are invited to participate in the exciting events. On November 3rd at 4:30pm in the Harn Museum of Art auditorium, a distinguished speaker of the Paleontology Society, Dr. Jonathan Hendricks, will give a fascinating and fossil-centric public lecture as part of the iDigBio project's annual summit meeting. Then, on November 4th from 10am – 3pm, Florida fossil clubs will participate in FLMNH's National Fossil Day festivities. To help facilitate participation for those traveling long distances, FOSSIL will provide up to two hotel rooms per club for the night of November 3rd. FOSSIL would like to thank Paul Roth of the Florida Paleontological Society for his leadership in planning and organizing much of the November 4th NFD activities. If you have questions about the Nov 3 talk, please contact Jeanette Pirlo at jpirlo@flmnh.ufl.edu and if you have questions specific to NFD (Nov 4) please contact Paul Roth.



UPCOMING EVENTS

July 10 – July 12

[4th International Symposium on Paleohistory](#)

August 1, 2017

[GSA Abstract Deadline](#)

August 2 @ 8:00 am - August 5 @ 5:00 pm

[2017 Fossils For Teachers Professional Development Workshop \(Gainesville, FL\)](#)

August 12 @ 8:00 am - 4:30 pm

[Fossil Dig: Discovery and Excavation \(Petrified Forest National Park, Arizona\)](#)

August 12 @10:00 am – 4:00 pm

[Northwest Fossil Fest “Fishing the Past” \(Hillsboro, Oregon\)](#)

August 23 @ 8:00 am - August 26 @ 5:00 pm

[Society of Vertebrate Paleontology annual meeting \(Calgary, Alberta, Canada\)](#)

September 20 @ 7:00 pm - 8:00 pm

[FOSSIL Project Webinar: Fall 2017 Series – Fossil Identification \(online\)](#)

[More events](#)