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FOSSIL PROJECT UPDATES SPRING 2017

by Eleanor Gardner

Personnel Updates

We are proud to announce that Linda McCall, president of the North Carolina Fossil Club, has joined the FOSSIL Project's steering committee. She will serve on the committee through December 2017 and help to keep amateur interests represented as the FOSSIL Project enters its final 1.5 years of funding. After her term is up, Linda will aid us in identifying another representative to serve on the committee. Linda has already provided many excellent ideas and feedback, and we appreciate her continued commitment to the Project and the myFOSSIL community.



Linda McCall

News from the Paleontological Society

As a member of the Paleontological Society Executive Committee, Bruce can report that we now have more than 50 members who have opted for the new amateur member category. The PS is very excited about this response so far, and we look forward to a continuing increase in representation from amateurs. We hope that the benefits of the PS will make membership attractive and also result in a continued positive and supportive spirit of working together to advance the study of fossils and paleontology.

Every year the PS receives nominations for the Strimple Award given to an amateur who has made sustained contributions to paleontology. The winner for 2017 will be announced soon.

Visit to Mace Brown Museum in Charleston, SC

In February, Bruce had the opportunity to visit with Bobby and Sarah Boessenecker at the Mace Brown Museum, which is part of the geology department of the College of Charleston. He toured the exhibits and got a behind-the-scenes look at the collections. Although too short, it was a great visit and Sarah and Bobby are doing terrific things to advance the museum and collections.



Bruce MacFadden with Sarah and Bobby Boessenecker

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FOSSIL Theme Session at the 2017 Northeast/North-Central GSA Joint Section Meeting

On March 19, the FOSSIL Project hosted a very successful theme session at the 2017 Northeast/North-Central Geological Society of America joint section regional meeting in Pittsburgh, PA. We had a full day session featuring 16 talks and 3 poster presentations (10 of which were talks by amateur/avocational paleontologists!). To read respective abstracts, click through each title on the webpages below:

Morning Session: <https://gsa.confex.com/gsa/2017NE/webprogram/Session41485.html>

Afternoon Session: <https://gsa.confex.com/gsa/2017NE/webprogram/Session42485.html>

Poster Session: <https://gsa.confex.com/gsa/2017NE/webprogram/Session42487.html>



Northeast/North-Central GSA Joint Section Meeting

Several talks throughout the day, including Lee Cone's on the relationships between amateur, professional, and commercial paleontologists, drew large crowds. New friendships and partnerships were established thanks to this meeting, and we look forward to further collaboration with groups such as the Bighorn Basin Paleontological Institute and the Minnesota-based Hill Annex Paleontology Project.



Field Trip to Ambridge, PA

Prior to the meeting, the Delaware Valley Paleontological Society and FossilGuy (Jayson Kowinsky) led the group on a great field trip. In the morning, we got a behind-the-scenes tour of the Carnegie Museum of Natural History with curator Dr. Matt Lamanna. Dr. Lamanna gave us a detailed look at the vertebrate prep lab, explained the

FOSSIL Participants Making a Big Impact at Montbrook Dig

The Florida Museum of Natural History has been lucky to get lots of volunteer help over the past year in excavating Miocene-aged fossils from the Montbrook fossil site near Williston, FL. Amateur paleontologists associated with the FOSSIL Project, such as Cindy Lockner (Florida Fossil Hunters), Lee Cone (Special Friends of the Aurora Fossil Museum), and Bonnie Cronin & Russell Brown (Florida Fossil Hunters), have worked hard at the site. Teachers associated with myFOSSIL have also played an important role: Tynessa Morgan-Craft (Dallas Paleo Society / Dallas Independent School District), Matthew Croxton (Southwest Florida Christian Academy), and others participated in a blitz-style excavation event in June 2016. In April 2017, the museum is excited to welcome another set of teachers to the site, including myFOSSIL member Dave Ellingson (Woodburn High School in OR).



Cindy Lockner



Tynessa Craft-Morgan

myFOSSIL Website Upgrades

Soon, we should have the ability to upload, view, and manipulate 3D fossil images on www.myfossil.org! Our web development partners, Atmosphere Apps, have been working hard to make STL file viewing an integral aspect of our website. Check back to myfossil.org soon to see it in action!



Sample STL file

Recent & Upcoming Events

In February, FOSSIL graduate student Victor Perez gave a talk at monthly meeting of the Gainesville Gem & Mineral Society. The society members were excited to learn about the myFOSSIL website and the volunteer opportunities available at the Montbrook fossil site.

If you'd like someone from the FOSSIL team to come speak at your club/society meeting, please contact the Project Coordinator, Eleanor Gardner, at fossil@flmnh.ufl.edu.

Also in February, Victor helped to organize and facilitate a FLMNH paleontology-themed “pop up” museum event at the Depot Park near downtown Gainesville, FL. Members of the Florida Paleontological Society were also present and helped to make the event a big success. Victor is continuing to work closely with the Public Programs unit of FLMNH in planning future paleontology-themed “pop up” events. If you are interested in learning about “pop up” events, please contact Victor at victorjperez@ufl.edu.

On March 18, FOSSIL team members Jeanette Pirlo and Michelle Barboza participated in the annual FLMNH “Can You Dig It” celebration of geology and paleontology. Jeanette, in particular, was instrumental in developing a new fossil screen-wash children’s activity, as well as gathering thousands of fossils for the children’s dig boxes. The event was a huge success, with over 2400 visitors! To learn more about Jeanette’s role as a K-12 paleo content specialist on the

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FOSSIL Project or to discover ways to incorporate fossils into teaching lesson plans, please contact jpirlo@flmnh.ufl.edu.



Can You Dig It event at FLMNH

Coming up on May 6th is the fourth annual Women in Paleontology Day at the Orlando Science Center. Don't miss this great event! Orchestrated by the Florida Fossil Hunters (FFH) club, this event promotes women and their contributions to the field of paleontology. This year, a diverse group of speakers – including Michelle Barboza (FOSSIL), Celina Suarez (Univ of Arkansas), Ta-Shana Taylor (Univ of Miami), Laura Cotton (FLMNH), and Rachel Narducci (FLMNH) – will inspire a new generation of girls and young women to pursue their interests in science. Thanks to help from an Education & Outreach grant from the Paleontological Society, the FFH are able to offer free admission to less privileged students. This year's WiP Day promises to be terrific – please join us!

Along with co-chairs Laura Soul (Smithsonian post-doctoral researcher) and Terry Gates (North Carolina State Univ/NC Museum of Natural Sciences research scientist), Eleanor Gardner (FOSSIL Project Coordinator) is proud to announce that we are convening a technical session 'T64 Citizen Science in paleontology: harnessing public interest to advance research and STEM education' at the Geological Society of America annual meeting in Seattle, Washington, October 22-25, 2017.

Successes and lessons learned in paleontology citizen science will be the backbone of this session. We will include academic paleontologists, educators, and non-academic speakers 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. **Abstract submission will be open from around April 1st to August 1st.** Please email Eleanor if you have any questions, and feel free to forward this information to any potentially interested groups!



This issue our featured professional is [James Thomka](#), an assistant professor in the Department of Geosciences at the University of Akron.

What research question currently excites you the most?

I have always been drawn to research areas where the traditional mindset is “there’s no story here.” This scientific field is so broad that there are surely interesting and worthwhile avenues to pursue no matter where one looks, if they dig deeply enough. Currently, three main questions guide most of my active research projects. (1) What factors control preservation of Paleozoic stalked echinoderms, generally and in specific case studies? (2) What are the primary patterns of crinoid preservation, paleoecology, and diversity during the Pennsylvanian? (3) What are the underlying controls on refined linkages between Silurian biological and paleoclimatic-paleoceanographic events? The unifying thread among these disparate topics is that these are all questions that were not viewed as worthy of focused study for much of my student-hood. People who are interested in stalked echinoderms HAVE to do systematics, not taphonomy; people who are interested in upper Paleozoic crinoids HAVE to either work on Mississippian assemblages or the Late Permian biodiversity crisis, not the “uninteresting” Pennsylvanian; people who are interested in middle Paleozoic bio-events HAVE to either work on the Late Ordovician or the Devonian, not the “stable, boring” Silurian. No!!! In reality, there is an immense amount of fascinating, exciting, and valuable paleontological insight that can be gained from addressing these questions, perhaps even more so because they have been largely overlooked for so long.

How did you become interested in stratigraphy and taphonomy? Were you drawn to fossils as a child?

I grew up in Chicago, in a highly developed area where there wasn’t an abundance of natural outcrops. I did, however, have access to phenomenal paleontological material in the form of specimens on display at the Field Museum of Natural History. So, although I wasn’t a collector “out of my backyard” as a child, I was incredibly interested at an early age about the history of the planet. I remember becoming fascinated early on with the famous Mazon Creek siderite concretions—this is what hooked me on invertebrates over the “sexier” dinosaurs and Pleistocene megafauna—and also fundamentally instilled in me the question of “how did this come to be preserved?” Ever since then, issues of taphonomy and stratigraphy, which cannot realistically be separated from each other, have permeated my thoughts. I still work on siderite concretions to this day, primarily because of excitement that was generated when I was in elementary school!



Fieldwork at the Napoleon quarry of SE Indiana, famous for the diversity, abundance, and preservational quality of diploporitan “cystoids” recovered from that site.

As an early-career professional, your publication record is impressive. What tips/tricks can you share with the myFOSSIL community about paper writing and/or the peer-review process?

Well, I’m not sure how “impressive” my publication record is, but I have always believed that one of the main ethical duties of scientists is to share knowledge. One of my day-to-day mantras is “what would happen if I got hit by a bus tomorrow?” The short answer to that hypothetical question is that anything that I knew but didn’t share would have to be rediscovered from scratch or would be lost forever. I genuinely believe that it is important to get data out to the broader community in an expedient manner, and I think this is something that can help motivate people to submit their manuscripts. If someone has never submitted a paper before, the best thing they can do is read a multitude of papers that they enjoyed or found highly readable—those stylistic elements are likely to penetrate their way into your writing in a positive way. The myFOSSIL community may be particularly useful in this way, as tentative authors might have a means to contact other individuals (academic or avocational) and ask them to look over their prospective manuscript prior to submission.

Given that the goal of FOSSIL is to link amateur groups with professionals, what are your thoughts about the role of amateurs in the science?

I think amateurs are a vital part of the science of paleontology in many situations. In fact, I generally use the term ‘avocational paleontologists’ instead of ‘amateurs,’ since a lot of the interactions I’ve had with them in the field and much of the work I’ve seen them produce is anything but amateurish. I’ve found that there are three main areas where active collaboration between academic and avocational paleontologists is particularly beneficial. First, avocational paleontologists are often the “eyes, ears, and hands” of academic paleontologists in the field, updating others on new exposures or changes in access to old collecting areas, and being able to quickly collect from or document localities that are highly ephemeral. Second, avocational paleontologists often exhaustively collect from their favorite sites for extended periods of time—in some cases decades—resulting in impressive and scientifically valuable collections that can be studied even if sites “dry up” in terms of fossil yield or are destroyed (as in active quarries). Third, avocational paleontological societies are generally willing to volunteer manpower, equipment, or other assets if a major endeavor must be undertaken in a short amount of time—that is, on a timetable that is generally far shorter than the time it takes to apply for and potentially receive a grant that would be used to hire field assistants and rent equipment. All in all, avocational paleontologists are valuable sources of knowledge, specimens, and assistance and can contribute as equals to academic paleontologists in many research projects.



Fieldwork in the middle Silurian carbonates of central Tennessee. Climbing the heights while taking stratigraphic measurements was a secondary hazard to the profundity of ticks at this locality!

To learn more:

Deline, B., & Thomka, J. R. (2017). The role of preservation on the quantification of morphology and patterns of disparity within Paleozoic echinoderms. [Journal of Paleontology](#), 1-15.

Thomka, J. R., Bantel, T. E., & Tomin, M. J. (2016). Unusual preservation of the trace fossil *Conostichus* in middle Silurian carbonate facies of Indiana, USA 1. [Canadian Journal of Earth Sciences](#), 53(8), 802-807.

Thomka, J. R., Brett, C. E., Bantel, T. E., Young, A. L., & Bissett, D. L. (2016). Taphonomy of ‘cystoids’ (Echinodermata: Diploporita) from the Napoleon quarry of southeastern Indiana, USA: the Lower Silurian Massie Formation as an atypical Lagerstätte. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 443, 263-277. <http://dx.doi.org/10.1016/j.palaeo.2015.11.034>

Thomka, J. R., & Brett, C. E. (2015). Palaeontological and sedimentological effects of micro-bioherms in the Middle Silurian Massie Formation of southeastern Indiana, USA. [Lethaia](#), 48(2), 172-187.

Brett, C. E., Thomka, J. R., Schwalbach, C. E., Aucoin, C. D., & Malgieri, T. J. (2015). Faunal epiboles in the Upper Ordovician of north-central Kentucky: Implications for high-resolution sequence and event stratigraphy and recognition of a major unconformity. *Palaeoworld*, 24(1), 149-159. <http://dx.doi.org/10.1016/j.palwor.2015.01.004>

Thomka, J. R., & Brett, C. E. (2015). Paleoecology of pelmatozoan attachment structures from a hardground surface in the middle Silurian Massie Formation, southeastern Indiana. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 420, 1-12. <http://dx.doi.org/10.1016/j.palaeo.2014.12.001>

AMATEUR SPOTLIGHT: MALCOLM W. BEDELL, JR.

Editor's note: This issue, Malcolm W. Bedell, past president and honorary lifetime member of the Western Interior Paleontological Society (WIPS), graciously responded to questions from the FOSSIL Project's Eleanor Gardner.

Susan Passmore, co-chair of the WIPS communication/outreach committee added the following: "Malcolm....has been passionate about paleontology since childhood. His professional career was in the insurance field. He developed and has run a WIPS field trip to Baculite Mesa (east of Pueblo, Colorado, Cretaceous Pierre Shale) for over 25 years. A specimen discovered from that field trip by another member turned out to be a new genus of crab.

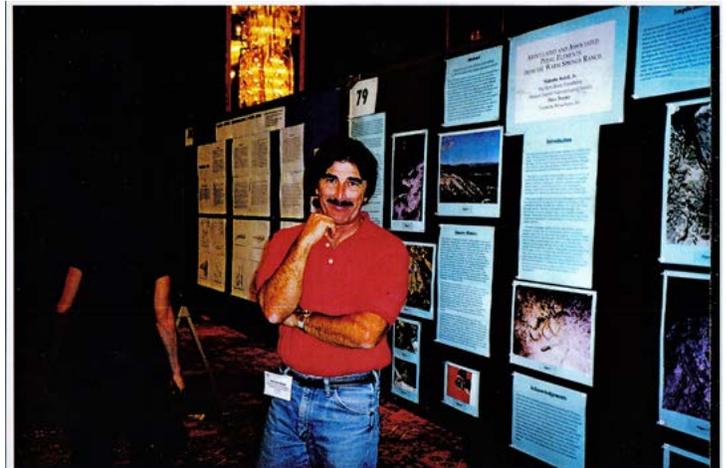
Malcolm recently co-authored with Torrey Nyborg (Loma Linda University) and others a paper on this new crab, which was part of a volume in honor of the late Bill Cobban published in Acta Geologica Polonica in 2016. As a result of his work running a dinosaur quarry in Wyoming (as a volunteer), Malcolm also co-authored a chapter in the book "Thunder-Lizards: The Sauropodomorph Dinosaurs" on the "First Articulated Manus of Diplodocus carnegii" and is working on a second paper describing a hind foot with pathology from the same quarry."

How did you first discover your passion for fossil collecting?

I would not call it necessarily a "passion for collecting," so much as a passion for the science – with collecting included. It began so long ago that it is genuinely difficult for me to determine that, but I think my parents dragging me across the George Washington Bridge to Manhattan's American Museum of Natural History may have had something to do with it. I was the kid still stuck in the first room, reading all the descriptive signs, when mom and dad were already three rooms ahead.

How long have you been collecting fossils (when did you begin)?

I have a book called *All About Dinosaurs* by Roy Chapman Andrews. Inside the cover, in pencil, is written "To Malcolm, Christmas, 1955 from Gram." My grandmother on dad's side gave me that gift presumably because I must have indicated some interest well before then (my age was single digits),so, over 60 years.



Malcolm Bedell at the Society of Vertebrate Paleontology meeting in 1999. Photo credit Denver Museum of Nature and Science

Do you have a private collection of fossils? If so, how do you identify/organize your fossils (i.e., which texts or other resources do you use, or which professional paleontologists do you consult)?

I have a large library of references, as well as reference fossils, and access to some of the most famous paleontologists in the world either through personal acquaintance, or the organizations to which I belong. I use scientifically recognized binomial nomenclature for genus and species, with information about locality and geology, occasionally with special notes.

How did you become involved with the [Western Interior Paleontological Society](#)?

Steve Jorgensen, a world-expert on certain types of Cretaceous invertebrates and WIPS' first president, along with a mutual friend then also on WIPS' board of directors, were also both on my homeowner's association board back in the late 1980s. We had gotten into discussions about paleontology enough that they suggested I become a member. When I agreed, they sponsored me.

I understand that you are an expert on the marine fossil faunas of the Baculite Mesa region of southern Colorado. Can you please tell us about this region and its paleontological significance?

The importance of Baculite Mesa, in a general scientific sense, has to do with it providing information and evidence concerning the time when “Colorado had beach front property.” In other words, a period of, all-told, about 60 million years (mid-late Cretaceous) during which a great inland sea split our continent roughly in half. It was a time of transgressing and regressing seas (moving back and forth, expanding and contracting). There were times when the shoreline ran right by the Mesa, and many others when it was hundreds of miles away. Baculite Mesa shows a good sample of what the latter part of this period was like. How marine life adapted to these changing conditions is what makes it interesting. Also, this was the area where the concept of “Biostratigraphy” (identifying time zones by the fossils contained within them when other methods are insufficient) was most closely worked out by such top paleontologists as Dr. William Cobban.

I read that you were first author of a chapter called ‘First articulated manus of *Diplodocus carnegii*’ in the book *Thunder-Lizards: The Sauropodomorph Dinosaurs (2005)*. What were the circumstances that led to this discovery, and how did it result in the renovation of the *D. carnegii* exhibit in the Carnegie Museum of Natural History?

In 1995, when I was president of WIPS, a member of the society made me aware of a new museum in northern Wyoming where WIPS members might be able to assist with excavations, and in other ways. I met the owner; we had lengthy discussions, which seemed to go very well, I did some fieldwork with them, and then brought a proposal to the WIPS Board of Directors. As a result, a small “test group” of volunteers was sent up the following year. Very little work was done on the quarry in which the important foot bones were eventually found, but the experience left everyone wanting more. In 1997, a WIPS volunteer found some bones – at what eventually became the “FS” (for “Foot Sauropod”) Quarry – that she thought were “horns.” I identified them as claws, and we were off to the races. To shorten a long story, there turned out to be several articulated (very rare) feet of a sauropod dinosaur there, one of which is the first articulated front foot (manus) of *Diplodocus carnegii*, an animal otherwise very well-known for over 100 years. We submitted an abstract with reproduced bones and other material to the Society of Vertebrate Paleontology, which was accepted and displayed in 1999. Many professionals examined all this, and we were asked by the best in that field at the time to write a deeper description, bringing to bear all the evidence we could find. That too was done (but took until 2005 to finally get accepted by peer review and published). Scientists from around the planet read it, and many comments were received. One was from the fellow heading up relevant paleo operations at the Carnegie Museum in Pittsburgh, PA, Dr. Matt Lamanna. He asked in 2006 to use our information in a renovation of “Dinosaur Hall” to occur in 2007, and we said “yes.” Scaled up to size (our animal is a sub-adult, theirs an adult), the correct front feet could now be seen on “Dippy,” as the kids call their main attraction, for the first time ever, and the work WIPS volunteers had done for years at the Wyoming Dinosaur Center’s “FS Quarry” could be seen to have described a “complete circle” – from discovery to excavation, to description, to use.

What other paleontological projects are you currently working on, in partnership with professionals?

I am collaborating as lead author on a paper with several authors about the hind foot of a dinosaur, which had osteomyelitis by unique circumstances. Also, I have been asked to be involved with the excavation and possible descriptions of other dinosaurs in several places, though I continue to work with invertebrates as well.

What is your most favorite fossil that you have discovered? Why?

Probably the femur of a mammoth from the famous “Snowmastodon” site near the town of Snowmass, CO. It was really a joint discovery, and there were many important discoveries during that project, but the euphoria of the entire enterprise, for those lucky enough to be allowed to participate by the Denver Museum of Nature & Science, was unforgettable. This is a hard choice, as I have worked on and seen many things for the first time (as has anyone in



Tim Seeber (left) and Malcolm Bedell (right) with large Mastodon femur, Snowmass, Colorado, 2011

position). Discovering bones of the Utahaptor before it was described, while working as a WIPS volunteer under Dr. Jim Kirkland at the “Yellowcat” Quarry in Utah, which was larger and more impressive than Spielberg’s fantasy Velociraptor in “Jurassic Park,” was also a thrill.

Do you have any recommendations or tips for other fossils clubs/societies who are trying to improve their level of collaboration with professionals?

First of all, don’t call yourselves a “club.” Formulate a set of scientific and ethical standards and behavior with respect to how fossils are going to be handled (this does not have to preclude collecting), and stick to that closely. Arrange and teach courses for members on all the basics, then make available if possible, or encourage, more advanced courses for those who might be interested. Offer to help understaffed and underfunded professionals. Develop MOUs with federal land agencies and be “citizen scientists” whenever the opportunity arises.

To learn more:

Nyborg, T., Bedell, M., Garassino, A., Larson, N. L., & Bishop, G. A. (2016). A new homolid crab, *Zygastrocarcinus tricki* sp. nov., from the Pierre Shale (middle Campanian), Baculite Mesa, Pueblo County, Colorado, USA. [Acta Geologica Polonica, 66\(4\)](#). (If your browser blocks access via the link, you can search for the article on Google Scholar.)

Western Interior Paleontological Society [website](#)

FEATURED ORGANIZATION: THE PALEONTOLOGICAL ASSOCIATION OF GEORGIA

by **Thomas Thurman & Ashley Quinn**

Thomas Thurman; GeorgiasFossils.com, Email: Tpangangan@aol.com; Ashley Quinn; Interim President, Paleontological Association of Georgia; Georgia College Natural History Museum; paleoga.weebly.com, Email: ashley.quinn@gcsu.edu

“A beginning is a very delicate time.” ~ The opening phrase from *Dune*, Frank Herbert, 1965.

On Saturday, January 28, 2017, over sixty Georgians gathered at the Macon Museum of Arts and Sciences with the intention of establishing a new Paleontological Association of Georgia. No such paleo group has existed in Georgia for decades.



Thomas Thurman (left) and Interim President Ashley Quinn (right) at the first meeting of the Paleontological Association of Georgia 28/January/2017, Museum of Arts and Sciences, Macon, GA

The museum is centrally located in Georgia and its Director, Susan Welsh, freely offered the use of its auditorium. She has our gratitude. Ages from 8 to 80 attended the gathering. The crowd included a healthy dose of students, faculty, and staff from at least six universities, highly seasoned professional researchers, public school educators, and some of the most respected and experienced amateurs in the state. It's off to a great start!

A lot of effort went into that first meeting, but it kicked off after Thomas Thurman and Ashley Quinn chatted at length one day about the possibility of establishing a new paleo association in Georgia based on the myFOSSIL, social paleontology, format.

Both of us recognized the need as many professionals, educators, and amateurs had lamented for years over the lack of such a group. Yet even through constant discussions over “we need a club!”, no one stepped forward to lead the effort. That changed with that conversation between Quinn and Thurman.

Thurman, an amateur, owns the website GeorgiasFossils.com which averages about 1,200 views and about 500 unique visitors per week. It's a



Image center: Dr. Burt Carter (blue jacket), Invertebrate Paleontologist and Professor at Georgia Southwestern State University. Richard Arnold (plaid shirt), Secretary, Mid Georgia Gem and Mineral Society

proud partner to the myFOSSIL Project. He'd set up "Georgia's Fossils Group" on Facebook to support the website. He'd met Ashley, a professional, while assembling the site. She's actually mentioned on the website several times.

After that fateful conversation, Ashley began researching bylaws and regulations. As the Collections Manager for the Georgia College Natural History Museum in Milledgeville, Georgia, Quinn is a solid vertebrate paleontologist in her own right. She has strong contacts in the research community and a good working knowledge of how a club is properly structured. Besides, Ashley is well liked.

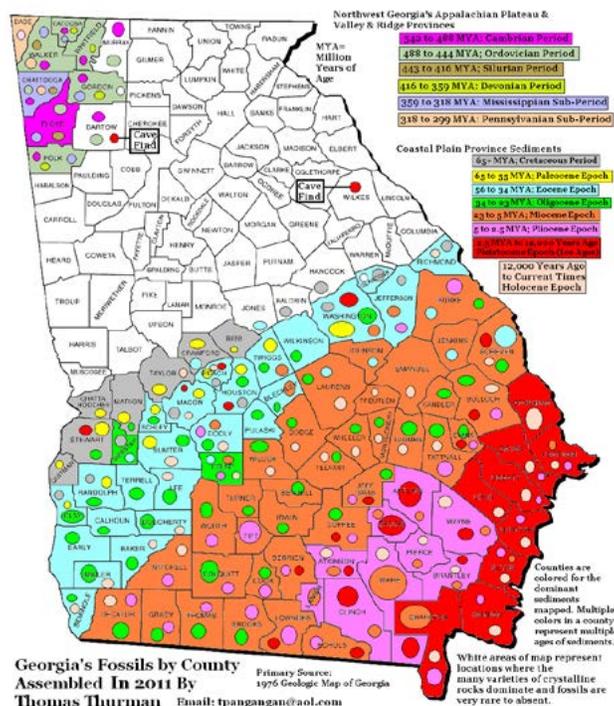
Ashley and Thomas were both instrumental during the formation of this project. Ashley concentrated more on the aspects of structuring the enterprise. Thomas focused on permissions and contacting the sizable and growing list of other paleontology enthusiasts, amateurs, and professional contacts.

Thurman strongly believed that any paleontology society which hopes to bridge the gap between amateurs, educators, and professionals needs an established professional as its president. The obvious choice was Ashley and he asked if she'd be opposed to a nomination as Interim President. Leadership would be needed and it'd be months before any real structure could be established, with voting members, officers, dues, and committees. Her nomination was quickly seconded, and Ashley was voted in as our Interim President.



Ashley Quinn, Interim President Paleontological Association of Georgia; Collection Manager, Georgia College Natural History Museum

Georgia's paleontology is rather unique; spanning over 500 million years from northwest Georgia's Cambrian trilobites to the coastal plain Pleistocene mammoths, mastodons, and giant bison which once roamed throughout the state. Dinosaurs, pterosaurs, and giant crocodilians are found in west Georgia's Cretaceous sediments. Mammal remains make their splash in central and east Georgia during the Eocene with brontotheres, entelodonts, Archaeocete whales, a mesonychid, and a *Leptotragulus*. South Georgia has a wealth of Oligocene through Pleistocene material.



Of course, each state has its unique attributes, but Georgia's fossil record takes on the aspects of a Gordian Knot; it spans such a staggering range of geologic time and paleo-climates. Much of it still isn't properly understood or mapped.

Unfortunately, after a long decline in funding, the Georgia Geological Survey was abolished in 2004 after more than a century of solid research. Through the late 1970s, 1980s, and early 1990s the survey not only produced excellent research but also kept abreast of the commercial and academic work going on across the state. As a result, it acted as an informal networking service.

When that essential network was broken, communication between institutions declined. This worsened over the years through competition for scant resources. The geography of the state, with rich northern and southern fossil beds separated by the fossil-barren Piedmont Plateau, tends to create specialists in local regions. This has led to natural history and science museums specializing in their region but often lacking basic

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knowledge of the rest of Georgia's paleontology. Additionally, precious little of our state's paleontological resources ever found their way into K-12 classrooms.

Assembling that essential network again (through a statewide association), and sustaining that network isn't easy. Enthusiasm has to be kept high while the foundations of the club are established. The self-funded amateurs continue to explore and collect, while the professionals often have to spend their time grant writing, researching, and dealing with the needs of their occupations. Educators are typically swamped with their classroom duties and requirements; they address the needs of their students with a very limited budget.

Why is an alliance between amateurs and professionals needed? A few weeks before the meeting, a sportsman contacted Thurman through GeorgiasFossils.com and explained that he'd found "dinosaur" bones along a river in south central Georgia.

Thomas explained that the fossils couldn't be dinosaur material since there were no age appropriate sediments that outcrop in that area. However, they could be anything from ancient whale to manatee, mammoth, or giant sloth. It depended on the age and type of the sediments. Thomas asked if pictures might be shared on Facebook's Georgia's Fossils Group. Professionals and knowledgeable amateurs reviewed the posts and advised the sportsman that these fossils were most likely ancient whale bones, probably the great whale *Basilosaurus cetoides*.

This sportsman attended the meeting and presented the heavily worn, large, dark bones, some still in limestone matrix. He was sure there were more in situ which had not yet been eroded by the river. He reported that the fossils had been found on public land and he was interested in donating them to an institution if they could be professionally excavated. One of the universities stepped up and offered to collect and preserve the fossils for research. . We are hoping to hear from the sportsman soon so that the excavation work can begin.



The Paleontological Association of Georgia (or PAG, although it does not have an official title yet) is a scientific, non-profit, community-based organization devoted to the study of Georgia's natural history. The goal is not financial gain. PAG's mission is to preserve Georgia's paleontological resources for education, future research, and generations to come.

David Bechler (left), Editor, Georgia Journal of Science, Thomas Thurman (middle) GeorgiaFossils.com, Hank Josey (right) advanced amateur field researcher

Responsible and legal fossil collecting is required in order to preserve the science of paleontology. PAG's vision includes hosting club sponsored field trips and digs in the near future, but between then and now there is work to be done. Once the legalities are all in place, then attention can be focused on what makes paleontology associations fun, entertaining, rewarding, and educational.

That first meeting was splendid – so much knowledge under one roof, so many interesting conversations going on, so many cool fossils to ooh and aah over... and that was only the beginning... and "A beginning is a very delicate time."

RESEARCH: HORSE TEETH REVEAL THE HISTORY OF YOUNGEST CALIFORNIA CROCS

Editor's note: Michelle joined the FOSSIL Project in Fall 2016. She comes to us from Southern California, where she produced her undergraduate research and received a minor in Geography / Bachelor of Science in Geology. She is now pursuing a certificate in womens studies and a Masters in Paleontology at the FLMNH/University of Florida with The FOSSIL Project's founder, Dr. Bruce MacFadden. Other paleo-related experiences include working as a fossil preparator at the John D. Cooper Center in Southern California, and a summer internship with UF's PCP PIRE program and the Smithsonian Tropical Research Institute in Panama. Michelle is interested in science communication and diversity in STEM; she currently hosts and produces the Femmes of STEM podcast, a bi-monthly show that highlights the stories of women in the history of STEM fields.

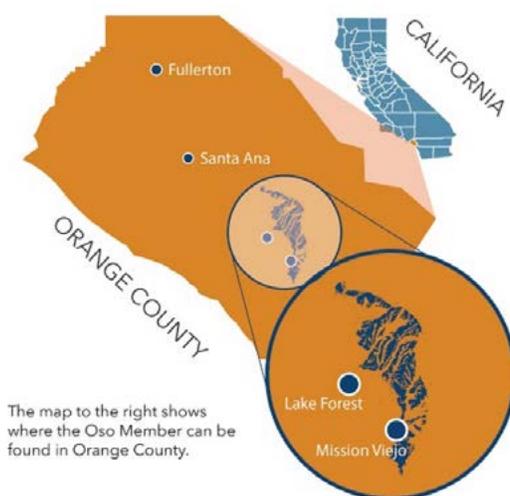
by Michelle Barboza

Let's talk about crocs! Florida, home of the FOSSIL project headquarters, is famous for them. "Wait a second," you might say, "Florida is home of the Gators, not the crocs!" Well, you would be right... if I were referring to crocodiles. However, the subject of this article is not crocodiles, but *crocodylians*, the order of reptiles which includes alligators, crocodiles, caimans, and gharials.

Now, while the home of The FOSSIL Project is known for its crocs, the home of the newest FOSSIL Project member (me!) is less easily associated with the toothy reptiles. I'm from California, and while crocs aren't part of our modern landscape, they were certainly a part of our paleontological landscape. In fact, California's fossil record shows evidence of crocs living in the Golden State in nearly all periods of the Cenozoic era!

This month's featured research article gives an overview of California croc fossils and, with the help of some horse teeth, shows their presence in the state lasted about 10 million years longer than previously recorded!

So how did this discovery come about? And what does the age of California crocs have to do with horse teeth? Well, while the paper provides an overview of fossil crocs from all over California, it initially started out as a biostratigraphic study and overview of fossils from one location - the Capistrano formation in Southern California.



Graphic copyright Gabriel Santos



Michelle Barboza holds the tooth of the youngest fossil crocodile known from California, and one of the fossil horse teeth used to determine its age.

The Capistrano Formation is a shallow marine unit exposed in Orange and San Diego counties. It has produced an extensive fossil fauna, the range of which is housed in five institutions throughout Southern California, including the Natural History Museum of Los Angeles County and the San Diego Natural History Museum. Despite the existence of these collections, the paleontology of the formation is poorly documented in scientific literature.

The nearshore facies of the formation, the Oso Member, is particularly interesting because it has preserved both marine and terrestrial fauna. Biostratigraphy with terrestrial animals allows paleontologists to correlate the member to other fossil sites using North American Land Mammal Ages (NALMA). The dating method of biostratigraphy uses presence of fossils to correlate and assign an age to the strata in which they were found. Fossils useful to biostratigraphy are those of animals that change very rapidly, or existed during limited periods of geologic

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time, and can thus serve as reliable markers of age. Among the array of specimens found in the Oso Member, including rhinos, gomphotheres, and peccaries, horse teeth were found to be the ideal biostratigraphic markers!

While other animals may have lived during a range of many millions of years, the type of horse found in the Oso Member of the Capistrano Formation, called *Dinohippus interpolatus*, was around for less than a million years. That means that the age of the Oso Member is constrained to a narrow period of time from 6.6 - 5.8 million year



Michelle examines the size of a fossil horse tooth in the vertebrate paleontology lab at California State University Fullerton

Establishing an age for the Oso Member of the Capistrano Formation put some of the other fossils found there into a new perspective. Crocs for example, were known from California. Previously published records of California crocs included specimens from three counties in Southern California - 60 million year old Paleocene age crocs from the Goler Formation in Kern County (McKenna et al, 1987), 45 million year old Eocene age crocs from six different formations in San Diego County (Golz and Lillegraven, 1977; Busbey, 1986; Brochu, 2013), and 15 million year old Miocene crocs from the Caliente Formation in San Luis Obispo County (Repenning and Vedder, 1961). However, given the newly established age of the Capistrano Formation's Oso Member, the Oso Member specimens represented the youngest record of crocs ever found!



Being that many of the myFOSSIL community are avocational paleontologists, I thought I would call attention to these specimens. You can see them for yourself on this infographic created by study author and myFOSSIL member Gabriel Santos, or in the article itself, which is open access. These publication worthy specimens are not beautiful, full skeletons, nor are they skulls. They are simply an individual tooth and single scute (a bony plate). Fossils don't need to be pretty to be important, they just need to give us good data. The data from these specimens, combined with the data from the horse teeth, let us add a new section to the story of California paleontology!

Learn more about the study:

The age of the Oso Member, Capistrano Formation, and a review of fossil crocodylians from California on Paleobios: <http://escholarship.org/uc/item/6sg3v4gs>

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California State University Fullerton News story: <http://news.fullerton.edu/2017wi/crocodile-study.aspx>

Paleobios News Story: <http://blogs.plos.org/paleocomm/2017/02/08/extending-the-history-of-crocs-in-california/>
Infographic: <http://paleoparadox.blogspot.com/2017/01/the-age-of-oso-member-capistrano.html>

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FEATURED FOSSIL: TOOTH DEFORMITIES IN MEGALODON

by Victor Perez

Tooth deformities are common in sharks, but come in many different varieties. These deformities are often referred to as pathologies; however, that is a somewhat inaccurate description. A pathologic tooth implies that the deformity is a consequence of a disease, even though many deformities are unrelated to disease. For example, feeding damage is often a cause of tooth deformation. Bones or other elements of a prey item can become lodged within the jaw of a shark, resulting in replicate deformities as the shark continues to grow and shed new teeth.

Gordon Hubbell, an amateur collector with one of the largest private collections of sharks in the world, has recognized a number of tooth pathologies in *Carcharocles megalodon* (Figure 1). Types like blistered enamel may be a true pathology (Figure 2), but many of the other deformities are more likely associated with feeding damage or disproportionate growth rates within the jaw. Alternatively, the blistered enamel could actually be partially digested teeth. It's not too far-fetched to think a shark could swallow its own tooth inadvertently, resulting in partial dissolution of the enamel from stomach acid.

In my own experience collecting and visiting museum collections, the wavy cutting edge appears to be the most common tooth deformity in Megalodon (Figure 3). When a shark tooth is developing, the enamel forms first and is somewhat malleable. Wavy cutting edges may be a result of a vertical compression of the tooth at this stage of development, prior to being infilled by dentine. Similar wavy cutting edges have also been observed in the modern Great White, however determining the actual cause for this deformity remains speculative. In reality, this is the case for most deformities/pathologies in the fossil record. Although we may never be certain as to the exact cause(s), we can certainly make educated guesses supported by an understanding of anatomy and behavior in modern analogs.



Figure 1. An exhibit highlighting the variety of tooth deformities in *Carcharocles megalodon* (from the Gordon Hubbell collection).



Figure 2. Megalodon tooth exhibiting blistered enamel



Figure 3. Megalodon tooth exhibiting wavy cutting edges

To see more images of tooth deformities in Megalodon check out the [Megalodon Forum](#) on myFOSSIL, and if you've collected deformed teeth share them with the community. Also, for a more in depth review of tooth pathologies in Megalodon check out [Chapter 10 of Megalodon: Hunting the Hunter](#) by Mark Renz.

DEALING WITH A FOSSIL ESTATE

by Jack Kallmeyer, Rocky Manning, and Rodney Wise

If you are like most fossil collectors, your family and friends know little about the value or importance of your collection. When the day comes that you are no longer of sound mind or you pass away, your heirs will need to know what to do with your collection. You need to leave a written plan for what to do with your fossils. You may want to include a donation of funds for preparing and housing the collection.

On the other hand, if you become the executor of an estate that includes a fossil collection you may be at a loss as to what to do with it.

This article will provide guidance on preparing a plan for your fossil collection and provide suggestions on what to do with an inherited fossil collection.

Create a Will and/or Fossil Estate Plan

First we will address the fossil collector's need to provide a plan. For the first part of your plan, it is best to create a Will. In this Will, you will need to clearly specify directions for dissemination of your collection. If you do not want to put this level of detail in your will or do not have a will, create a Fossil Estate Plan document stating your wishes that will readily be found by heirs when needed. The Will can refer to this document. In the case where someone is no longer of sound mind, this document will provide guidance without having to resort to reading the Will. A Sample Fossil Estate Plan is provided at the end of this article. For those fossils that you know have scientific value, you should consider donating them to a museum or university while you are alive and able. This is the best way to transfer complete information about the fossils.

Document your collection

Your collection must be well documented in order for a museum or university to have interest in it. The reason is that fossils without locality information have little scientific value. The locality allows scientists to determine the geologic formation, age, paleoenvironment, and what other fossils are commonly found there.

Also, provide as much identification as you can. Get help from identification guides, searching the internet, the online Fossil Forum or myFOSSIL website, contacting experts at the many amateur organizations around the country, or by contacting a professional paleontologist at a museum or university. Don't get bogged down trying to identify all of your specimens though. Identification is nice to have but not absolutely necessary. Locality information, however, is absolutely necessary.

There are many detailed commentaries on how to document a fossil collection. See myFOSSIL.org (<http://www.myfossil.org/forums/topic/curation-of-personal-collections-2/>) for a good starting point. The basics are:

Name of site

Location of site – GPS coordinates, address, map directions

Contact information (if needed to access the site)

Optional information: Formation, Genus/species, Dimensions, Description, and Photographs.

When applicable, a fossil's provenance, or history of ownership, is also a key piece of information, especially for legacy collections handed down to you by your grandfather or other deceased relatives and friends. Provenance is also important if you have fossils you have purchased at fossil shows, gem and mineral shows, etc. A reputable museum or university will have an ethics policy that prohibits them from accepting donations of fossils from countries that have

federal regulations regarding the exportation of fossils.

Select an institution

If you want your collection to go to an institution, it is best to build a relationship with a local university or museum ahead of time. That way you can determine what portion, if any, of your collection is of interest to the institution. This is critical. Museums and universities are not obligated to accept a collection just because the collection has been bequeathed to them in a will. If the institution does not have the resources in place to properly care for the collection, they have the right to turn down the donation.

Determine if the institution has a reference or research collection. Some museums, usually small ones, may have fossils on display but they are not committed to maintaining the collection and making the fossils available to researchers indefinitely. This means they can't be used in research papers and their collection has little scientific value. If you have a scientifically significant collection and your local museum does not have a reference/research collection, you may want to look elsewhere. The best museums housing research collections will be accredited by the American Alliance of Museums.

If you want your collection displayed, you may want to try a small museum. Large museums with a reference collection usually won't commit to displaying a collection unless it is very high quality material. Small museums may commit to display the material in order to get the donation for their exhibits, but these collections are not useful for research papers. Be advised, even small museums will not guarantee that donated items will remain on permanent exhibit.

If it is a specialized collection and no local researcher is very interested, you may ask around to find a researcher in another part of the world studying your material. They may be happy to get at least a portion of it.

You should identify the portion of your collection intended for the institution. That's because, as stated earlier, the institution may not be interested in all of the collection. The remainder of the collection might be earmarked for donation to an earth science teacher or to an amateur paleontological organization.

Many amateur paleontological organizations are well equipped to handle estate collections. Discuss your collection with these organizations to be sure their methods meet your ultimate desires. Amateur organizations may already be aligned with universities and museums where they routinely donate fossils. These organizations can make the determination as where best to allocate your collection based upon the potential scientific value of the fossils in question. It is not uncommon for a collection to be distributed to a number of institutions. For parts of your collection that have no scientific value, e.g., no locality data, the amateur organization may be able to use those particular fossils in outreach programs or in their own fund raising projects

It is important to remember that once specimens are donated to another organization, and some version of a Deed of Gift form is signed, those specimens become the legal property of the organization and the donor and their family relinquishes all rights to them.

Determine value for tax purposes

You will be able to take an income tax charitable donation deduction, if the recipient institution such as an amateur organization, museum, or university is a qualified 501(c)3 nonprofit. The receiving institution will not provide a dollar value for tax deduction purposes. If the estimated dollar value is under \$5,000.00, you do not need an official appraisal for tax purposes – but it is recommended to have some criteria established that led to the valuation. For this purpose, you could use estimates from commercial dealers or various internet sites like ebay. If the valuation is over \$5,000.00, you will need a real appraisal from a recognized appraiser. The appraiser must meet certain IRS qualifications and cannot be just any dealer or club. You will probably need to pay for the appraisal.

As mentioned above, you may donate your collection to an amateur 501(c)3 organization to help further their work. If this organization sells or auctions off all or part of your collection, the actual proceeds received for your collection becomes your tax deductible contribution. This is what happens when you donate a car to Goodwill for example – you can only deduct what Goodwill gets for the car at auction, not what you think it is worth. The organization should be able to give you a statement for tax purposes. This statement will have a brief description of what was sold and the amount of money your collection brought to the group. The statement should contain wording that “you received no benefit” from your donation, as any benefit received would be deducted from the dollar value of the auction or sale. An example is the PBS fundraising programs wherein you get a DVD for your \$100.00 donation; your tax deduction would be \$80.00 because the DVD is valued at \$20.00 (your benefit from the donation).

You want to sell it

Selling your collection is outside the purpose of this paper. If you must sell it, it is recommended that you at least show it to a professional paleontologist first to see if there is anything of particular scientific value. You might then donate that material.

You Are in Charge of Dissemination of a Fossil Estate

In the case where you are responsible for dissemination of someone’s fossil collection, here are some suggestions:

- If the collector left a plan, follow the plan as far as it goes.
- If family or friends are interested in any of the remaining material to continue the collection, give it to them as long as the plan allows for that.
- Contact an earth science teacher or amateur paleontology organization to help determine the scientific value of the rest.
- Anything of scientific value is best donated to a university or museum.
- If the collector did not leave a plan, contact a local museum, university, or amateur paleontological organization for help determining the scientific value. The amateur organization may be your best bet. They can contact professionals. See myFOSSIL.org (<http://www.myfossil.org/paleosocieties/>) for a list of amateur paleontological organizations.
- If you must sell it, first consider donating any scientifically significant items to a university or museum. There may be an opportunity to sell the fossils on ebay, through an estate sale, to an auction house or to a reputable dealer in fossils; however, this type of dissemination is beyond the scope of this paper.

Sample Fossil Estate Plan

Fossil Estate Plan for John Doe

In the event of my death or that I am not able to disseminate my fossil collection, these are the steps I would like to see carried out.

Fossils X, Y, and Z have scientific value and should be donated to ABC University. Professor A is the contact. \$5,000 should be donated to ABC University for support of their fossil collections.

Fossil D should be given to Person A and Fossil E to Person B as they always admired these fossils.

If any family members or friends are interested in continuing my collection, they may take any of the remaining fossils providing they disseminate them in a manner similar to this plan, when they are no longer able to continue the collection.

The fossils in Container A should be offered to University A and Museum A as there may be something of value.

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The rest of Container A and the remainder of the collection should be donated to the local amateur organization AAA Paleo Group for final dissemination. Some of the collection may be suitable as educational specimens for local schools. Other suggested uses are: display fossils for events, practice media in fossil preparation classes, fund raising items in auctions, and drawings and give away boxes.

The fossils will be found in display cases throughout the house and in boxes labeled "Fossils" in the second bedroom closet and the garage. Each box will include a list of the contents and each specimen will have the following identification label:

Item #	1361		
Date Found	27-Feb-17	by John Doe	
Location	Lost Lake Res, Jacksboro	GPS	33° 14' 11.29" N
County	Jack County, TX		98° 7' 14.68" W
Common Name	Brachiopod		
Tech Name	Composita ovata		
Notes	Found near the bottom of the ridges on left side, near largest mesquite tree		

In addition, each specimen will be listed in an excel spreadsheet that has the number, name, and location listed. An example is below:

869 UR	regular urchins 2	Unid	Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
870 UR	Leptosalinia texanus 6		Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
871 PL	Percyostys globularis 6		Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
872 CL	Clams 6	Unid	Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
873 CL	Trigonia 3		Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
874 SN	Nerinea roemeri	Large	Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
875 UR	Urchins 45		Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
876 CL	Deer Heart Clams 6	Long	Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
877 CL	Deer Heart Clams Med	7	Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
878 SN	Tylosoma 3		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
879 CL	Small Clams 3		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
880 CL	Trigonia		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
881 OT	Burrows		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
882 OT	Shark Vert		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
883 UR	Leptosalinia texanus 2		Spring Branch Walmart	Comal Co., TX	29°48'11.50"N	98°25'21.67"W	7/22/16	John Doe
884 CL	Large Deer Heart Clams Artica		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
885 CL	Artica		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
886 UR	Phymosoma		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
887 CL	Neitha		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
888 CL	Clam		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
889 UR	Heteraster (5)		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
890 SN	Tylosotoma tumidum		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
891 SN	Turnitella in Matrix		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
892 CL	Pinna Comancheana		Granbury	Hood TX	32°22'21.07"N	97°47'41.15"W	8/6/16	John Doe
893 OT	Burrows/Plate		Kerrville	Kerr Co., TX	30°2'31.25"N	99°9'24.65"W	7/22/16	John Doe
894 CL	Clams 3		Meridian Road Cut	Bosque TX	32°0'36.78"N	97°42'45.15"W	10/8/16	John Doe
895 UR	Heterasters 3		Meridian Road Cut	Bosque TX	32°0'36.78"N	97°42'45.15"W	10/8/16	John Doe
896 CL	Oyster Shells		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
897 OT	Quartz Crystals		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
898 UR	Urchins 4	Red Zone	Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
899 CL	Devils Toenails		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
900 AM	Oxytridoceras		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
901 CL	Trigonia		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
902 SN	Gastropods 2	small	Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
903 CL	Clams 3		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
904 AM	Oxytridoceras		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
905 AM	Idiohamites heteromorph		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe
906 AM	Oxytridoceras		Clifton Quarry	Bosque TX	31°41'41.10"N	97°35'0.12"W	10/8/16	John Doe

Thank you for following my direction. My hope is that my collection will further the knowledge and experience of others in the field of paleontology.

With my deepest thanks.

Signature of John Doe

NEW CHARACTERS IN A LONG HISTORY OF BIGHORN BASIN PALEONTOLOGY

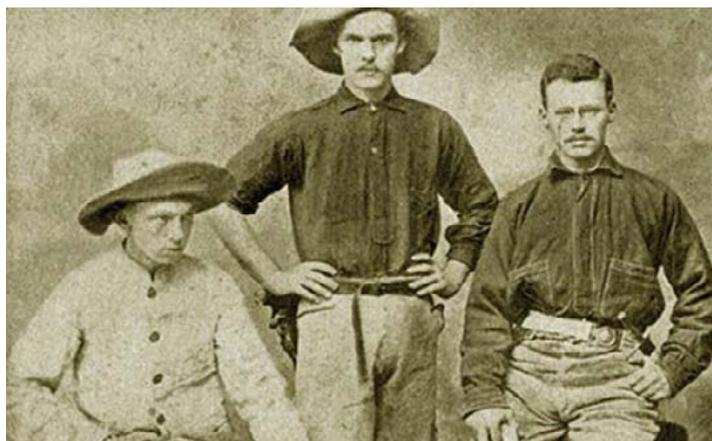
By Jason P. Schein



BBPI Assistant Crew Chief, Brittany Malinowski

The Bighorn Basin of northern Wyoming and southern Montana preserves a nearly continuous record of sedimentation from the Cambrian (520 million years ago) to the most recent Ice Age (18,000 years ago), with some rocks dating to 2.5 billion years! In the deepest portions of the basin, those sedimentary rocks reach a thickness of over 17,000 feet, while at the surface, the effects of climate and time have worked together over millennia to carve some of the most spectacular landscapes anywhere.

Thanks in large part to these features, the Bighorn Basin has long been recognized not just as a natural laboratory for geological and paleontological studies, but, in fact, among the finest laboratories in the world. For nearly a century and a half, earth scientists of all stripes have been exploring the region. Delegations from Princeton University were among the first visitors with fossils on their minds, and included some of the most distinguished personalities from the early days of paleontology. As students at Princeton, Walter Berryman Scott and Henry Fairfield Osborn were part of the first expedition to the area in 1884, followed shortly after by Scott's students William J. Sinclair and Walter Granger. Into the 20th Century other groups took an interest, but a long and continuous line of Princeton paleontologists continued to dominate the scientific efforts in the basin. Even long after the university moved away from paleontology, former students continued to carry the torch, even into the second decade of the 21st century.



Oscar (L) and Scott(R), 1887

Enter 2017, and a new team is helping to lead the charge of Bighorn Basin paleontology. The Bighorn Basin Paleontological Institute is a new nonprofit organization dedicated to paleontology and earth science research and education. It is our mission to “collaboratively study, actively preserve, and dynamically interpret the paleontological treasures of the Bighorn Basin and the surrounding region, as well as to promote paleontology and the natural sciences to life-long learners, wherever they may be.” They are professional and student paleontologists, geoscientists, and educators that believe in the power of collaborative, multidisciplinary research and citizen science. We offer people of all ages, backgrounds, and interest levels, the opportunity to work with us in the field, contributing to decades-long research projects, in one of the most rugged and beautiful parts of the world!



Field Team

The BBPI's staff have been working together in the Bighorn Basin for several years, and the new formal organization will continue their research interests: to reconstruct and understand the ecosystems preserved in the basin's strata, to the greatest extent possible. Traditionally, they have focused on the fascinating and complicated great biotic and ecosystem transitions of the Cretaceous-Paleogene Boundary. More recently, they have had tremendous success in the famously fossil-rich Morrison Formation. While heavily studied farther south, the ecosystems of the Morrison in this region are far less understood. Occasionally they even make forays into the Paleozoic, collecting early armored Devonian fish at 9,500' elevation at the beautiful Beartooth Butte. All fossils will be repositated at the distinguished Academy of Natural Sciences of Drexel University - the oldest museum in the New World!

The BBPI believes that research and education are two sides of the same coin, and we take our responsibility as science educators and spokespeople very seriously. They have already partnered with a diverse set of education-focused groups, including the Boys and Girls Club, Rocky Mountain College, and Field Station: Dinosaurs. All of these collaborations will provide opportunities for engaging public programming, both in and out of the field, and even give college students the opportunity to earn college credit.



BBPI Director of Educational Programming, Dr. Rick Schmidt, excavating a juvenile Triceratops horn and partial frill.

The Bighorn Basin has a long and distinguished history of paleontological exploration. The BBPI feels a great deal of responsibility to not only continue that tradition, but also to contribute to it in a meaningful way. Just as importantly,

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we also have a great deal of pride that we'll have an opportunity to share the paleontological treasures that the region has to offer to so many people from around the country and the world.



Participants in our summer field expedition, excavating a Jurassic sauropod dinosaur.

If you are interested in joining the BBPI's field teams, please contact Jason at JSchein@BBPaleo.org. Of course, you can always visit the website - BBPaleo.org - and follow them on [Facebook](#) and [Twitter](#).



A DINOSAUR FOR CALIFORNIA!

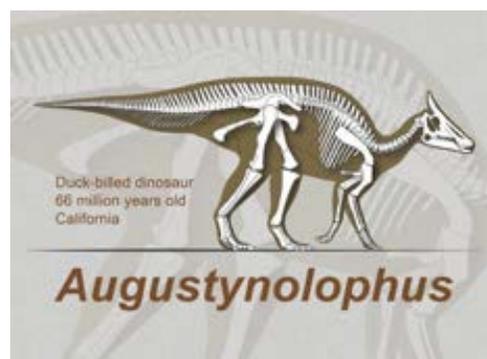
by Karol McQueary, President, Southern California Paleontological Society

California, like all states, has many symbols – the state tree (redwood), state marine fish (Garibaldi), state fossil (*Smilodon fatalis*), and even a state insect (the dogface butterfly), just to name a few. But now, thanks to an enterprising law student's idea two years ago, it looks like California will also have an official state dinosaur. This dino, *Augustynolophus morrisoni*, is a crested hadrosaur, an herbivore about 26 feet in length, and is only found in California. It dates to the late Maastrichtian Age, thus placing it as one of the last known dinosaurs before the K-T extinction. Only two specimens have been uncovered, both in the Moreno formation of the Panoche Hills of Fresno County, roughly in the geographical center of the state.

The two specimens, excavated from 1939 to 1940 by a team from the California Institute of Technology (Caltech), were thought to belong to the *Saurolophus* genus, but recent in-depth study of the fossils revealed that the cranial structure was quite unlike the other *Saurolophus* dinosaurs. A paper co-authored in 2014 by Albert Prieto-Márquez, Jonathan R. Wagner, Phil R. Bell, and Luis M. Chiappe (currently VP of Research and Collections and Director of the Dinosaur Institute at the Natural History Museum of Los Angeles) amended the taxonomy and provided a new name for the dinosaur, one honoring both a patron and supporter of the field of paleontology at NHM and other institutions, Gretchen Augustyn, and paleontologist Dr. William J. Morris.

A bill to designate this dinosaur as an official symbol of the state is currently going through the legislative process in Sacramento. This bill, AB 1540, authored by Assembly member Richard Bloom of the 50th Assembly District, passed through Assembly committee and will now be taken to the Assembly floor for a vote. From there it will go through the same process in the State Senate and then on to Governor Jerry Brown for signature. The [Southern California Paleontological Society](#) is joining the effort as a co-sponsor, and society members will be appearing before the State Senate to speak for passage of this bill. **Because one of the stated purposes of this bill is to increase children's interest in science, SCPS is asking its young members for their support in writing letters, petitions and posters in support of AB 1540.** These will be presented at the Senate hearing later in April.

The effort to designate *Augustynolophus morrisoni* as an official California state dinosaur is gaining momentum. It is a piece of bright news in an otherwise news-weary time, and we have every expectation that this will soon be a part of California history. Stay tuned for the final outcome!



NEW BOOK-GUIDE TO FOSSIL COLLECTING BY THE DALLAS PALEONTOLOGICAL SOCIETY

by Roger Farish

We are excited to announce the publication of *Guide to Fossil Collecting* by the Dallas Paleontological Society. This 256-page, full-color work was painstakingly written by 20 of the society's finest member-specialists and academic advisors. Some of the topics covered are:

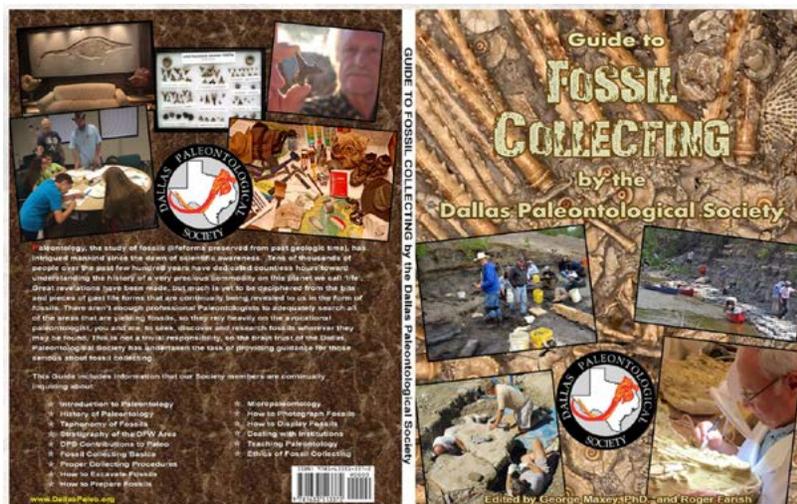
- Introduction to and History of Paleontology
- Stratigraphy of the Dallas-Fort Worth area
- Fossil Collecting Basics
- Proper Collecting Procedures
- How to Excavate Fossils
- How to Prepare Fossils
- Micropaleontology
- How to Photograph Fossils
- How to Display Fossils
- How to Teach Introductory Paleontology
- Taphonomy of Fossils
- DPS Contributions to Paleontology

The 8.5 x 11" publication debuted at FOSSILMANIA (large annual fossil festival in Glen Rose, TX) in the Fall of 2016. The book retails for \$30/book – only \$25 for DPS members! – and can be purchased on www.dallaspaleo.org.

The editors are Dr. George Maxey, retired Earth Science Adjunct Professor/Teaching Fellow from the University of North Texas, and Mr. Roger Farish, longtime member and officer of the Dallas Paleontological Society who has co-authored other texts such as *Fossil Sharks and Rays From the Cretaceous of Texas*.

Originally, the *Guide to Fossil Collecting* began as an idea from one of the society's education committee meetings. Knowledgeable members, educators, and scientists submitted articles to George and Roger for editing. Initially just four chapters, the volume grew to around twelve chapters. It was a labor of love, as the venture ended up taking six years of effort to complete! George and Roger followed through with its assembly and editing, and Heritage Auctions (through DPS member Craig Kissick) very graciously facilitated its publication in 2016.

The book is an excellent "how to" guide for those interested in learning about fossils and paleontology, especially of the Dallas-Fort Worth area. Considered an occasional paper, the society hopes to add subsequent chapters in future editions of the book. Learn more about this text, and others written by DPS members, at www.dallaspaleo.org/Store.



EDUCATION: USING RECENT PALEO LITERATURE TO ENCOURAGE STEM-BASED LEARNING

by Gina Roberti

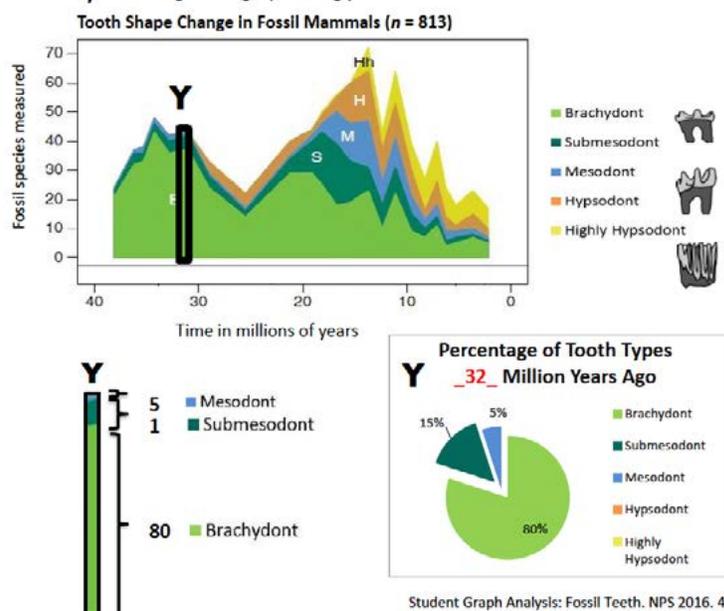
During the winter of 2015-2016, I had the incredible opportunity to live and work at Hagerman Fossil Beds National Monument as a Geoscientist-in-Park (GIP) intern, a program made possible through a partnership between the Geological Society of America® and National Park Service.

Hagerman Fossil Beds National Monument (HAFO) is small and unassuming, nestled along the banks of the Snake River in southern Idaho. A sanctuary for waterfowl and migrating raptors in the cold dry winter months, its riverside bluffs of Pliocene-aged sedimentary rocks are famous among paleontologists for preserving the greatest recorded abundance of an ancestral species of horse (*Equus simplicidens*), as well as some of the richest and most diverse fossil assemblages from the Pliocene epoch.

At HAFO, the National Park Service has a unique mandate: to preserve fossil resources, support paleontological research and “to broaden public understanding of the science of paleontology and the significance of the Hagerman fossil record.”

My mission was to take this mandate and turn it into a workable product, grounded in contemporary scientific research, usable for educators both in and out of the park. After a long period of investigation, the final product came to life when I realized that, with slight modifications, the scientific literature which I was studying contained all of the material necessary to craft a lesson that would allow students to come to their own conclusions. My ability to understand the scientific literature depended on a vocabulary developed during my training as a geologist/paleontologist. If I could break down the jargon and provide context for the data (what information was collected, how it was analyzed) the data could become accessible to a non-technical audience.

I chose a data set that was broad enough to allow students to draw big-picture conclusions: the fossil tooth data set from Jardine et al. 2012 contained information from over 800 fossil teeth, over 40 million years. I focused on graphs: modifying existing graphs and converting data tables into pie charts. Using Microsoft Excel, I simplified the graphs by eliminating jargon, labeling axes, and highlighting trends. Through graphical analysis and critical reading, students infer factors that caused the observed evolutionary adaptations and link biological adaptation to global climate change and localized habitat change. The lesson plan includes a pre-lesson with background about tooth morphology as well as extended resources for teachers including assessments and supporting documents.



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The ability to understand and interpret graphs is key to scientific literacy in an age where statistical analyses and scientific findings are commonplace in newspapers and online media. Graphical literacy is also a major component of high school and college mathematics. My experience tutoring and teaching has shown me how many students struggle to interpreting even the simplest of graphs. To teach, step-by-step, how to read a complex graph (one that is conveying multiple pieces of information) is important for our STEM generation.

My lesson plan sought to provide all of the material for students to make their own decisions. If students were taught how to read the material, they could then interpret and draw their own conclusions.

Titled [*Fossil Teeth: A Record of Climate and Evolutionary Change in the Fossil Record*](#), the lesson is designed for the National Park Service to be digitally accessible and downloadable for teachers across the country. It is intended for high school students in Introductory, Honors and/or Advanced Placement Biology in grades 9-12. Curriculum standards align with the Disciplinary Core Ideas from the Next Generation Science Standards (NGSS) and guidelines for reading and writing from the Common Core State Standards (CCSS).

This project reflects my work as an earth science educator, and interest in developing educational materials that incorporate contemporary scientific research. The lesson showcases how primary data can be made accessible and used in activities which require student synthesis. I believe this project has valuable applications for increasing scientific literacy and awareness of contemporary scientific practices in high-school and introductory college-level students, by allowing students to work with ‘real-world’ data.

Acknowledgements:

This project made possible through the Geologic Society of America® Geoscientist-in-the-Parks Program and the National Park Service. The Geoscientists-in-the-Parks (GIP) Program was developed by the National Park Service Geologic Resources Division (GRD) in 1996. The NPS partners with the Geological Society of America (GSA) and Environmental Stewards (ES) to administer the GIP Program. With thanks to the administration and HAFO paleontologist Dr. Prassack at Hagerman Fossil Beds NM.

Data for this project was derived from Jardine et al, 2012 and modified to match high-school student learning levels. Readings and data are derived directly from this and other primary scientific publications. Jardine, Phillip E., et al. Grit not grass: concordant patterns of early origin of hypsodonty in Great Plains ungulates and Glires. *Palaeogeography, Palaeoclimatology, Palaeoecology* 365 (2012): 1-10. <http://dx.doi.org/10.1016/j.palaeo.2012.09.001>

The scope of this lesson was greatly inspired by a [similar project](#) developed by the University of Florida Center for PreCollegiate Education and Training (CPET). The final version of that lesson is available online at <https://www.cpet.ufl.edu/resources/curricula/created-by-fellows/evolution/#ChewingonChange>

You can find Gina’s lesson and supporting documents in the [Resources](#) section of myfossil.org and on the National Park Service website. <https://www.nps.gov/hafo/learn/education/classrooms/fossil-teeth.htm>



To conclude a three-month long internship with the National Park Service, Gina Roberti presents the results of her education project to sophomore students at Hagerman High School. The lesson begins by asking, “What does paleontology look like today?” and teaches about mammalian tooth adaptations as preserved in the fossil record. Students learned to read a complex graph based on paleontological data published in 2012 (Jardine et al. “Grit Not Grass”).

by Aaron Bokelmann

Indiana Jones, Dr. Zahi Hawass, and Howard Carter are a few famous archeologists or not so famous archeologists that have found some amazing stuff. When I was kid, I thought the coolest thing in the world would be to go somewhere, dig for some amazing treasures and have the time of life. Maybe I would find a hidden city of gold, or the next *Tyrannosaurus rex*.

I would spend the next 30 years of my life longing to get to a place to dig and be a part of the next big find. My name is Aaron Bokelmann, and I am a high school science teacher in Bradenton, Florida. I currently teach Earth Space Science and Zoology to high school juniors and seniors. A couple of years ago, I heard about an opportunity through the [South Florida Museum and Planetarium](#) in conjunction with the Toomey Foundation of an opportunity for teachers to go to the Badlands of Nebraska and dig for fossils.

Wow I thought, could this actually happen? When I found out about this opportunity, I thought to myself, wow, I have waited my whole life for this, would I be able to go? How can I afford this? What would I find? These and many other questions popped in my mind and so I begged my wife and decided this would be it. I am going to do it. I had dug for fossils in the Peace River, and looked for fossils in dirt piles, and under rocks wherever I visited, but this was going to be big time. We had our first meeting at the museum and I learned about plaster jacketing, digging, and fossil prepping. Once I finally received basic training and learned more about what we were doing, my thoughts on archeology turned to paleontology and I am now obsessed.



Aaron with a tortoise (*Stylemys nebrascensis*)

I have had the opportunity to go out digging in the Badlands three times now and each time has been the best thing I have ever done. I do not care if I find anything, just the opportunity to look and try to find something that was living many millions of years ago is truly amazing. On each of my trips I have had some excellent guidance from some very experienced and knowledgeable people, like James Toomey and Roger Portell-Florida Museum of Natural History, that have helped me gain a better understanding of geology and paleontology of the region. For me having no connection to the outer world and sitting in the blazing hot sun with a screwdriver scraping morsels of dirt off some broken bits of bone have been the most exciting times for me. The teacher inside of me also loves being out there with rookies. I love helping these newbies learn the process of hunting, finding, digging and jacketing. The process is not always easy nor is it always simple, but it is, in my mind, always rewarding. Seeing another person's eyes light up when they find something is a wonderful thing.

In our trips to Nebraska, we have found many different types of fossils. We generally go out for a week and hunt in the morning and evening hours. We then visit a variety of local places in the heat of the day (many teachers are unable to handle the extreme temperatures and with the nearest medical facility an hour away, safety is important, so we skip the hottest part of the day. I would fossil all day and practically kill myself because the opportunity is rare, but not everyone can handle the heat, so the decision is best for the group.) We generally have good lighting in the morning and evening, so it is the best times to see the bones. We drive out to our site and then spread out, looking for bones. Once someone finds something, one of the leaders goes over and helps the newbies figure out what they have found. Then very carefully the digging begins. My tool of choice is a screwdriver and I slowly and carefully remove the matrix. Any exposed bone is covered with a varnish that helps reduce the degradation of the bones.

As a result of these trips, I have had the opportunity to dig up several tortoises, skeletons of oreodonts, and titanotheres. The place that we hunt on is leased private land, so there are new finds every year, and the amount of fossils is unbelievable. In fact, one of the skeletons I have had the pleasure of working on for several years is the skeleton of a titanotheres. I started helping dig on this animal three years ago, and we started exposing the pelvis, which was just a morsel of bone showing on the side of a hill. Over the course of several trips we were able to remove the pelvis and several vertebrae this past September. Hopefully the rest of the animal will be inside the hill, but it may be several more trips before the entire skeleton is removed. Personally I have several fossils from these trips in my classroom. The students love to look at the tortoise, the oreodont skull, as well as some of the teeth from a titanotheres. I have samples of the matrix for the students to see what we are digging in, and I have some great stories about how hard it is to pedestal and jacket these fossils. I love to show pictures of my experience out there to the students and other teachers.



Aaron with a mammal skull

So although I am no longer searching for gold, or lost cities, I have now had the opportunity of finding something so much more exciting. The animals that lived millions of years ago in the Badlands are some of the most interesting. Although I don't know what caused their demise, the ability to go out and find these fossils, has me hooked. It does not matter the temperature, the terrain, or whether anything is found. I cherish every opportunity that I have been given and am always striving to learn more and take advantage of every moment out in the Badlands of Nebraska. To bring back some fossils of ancient animals is to me better than finding that lost city of gold.

WOMEN IN PALEONTOLOGY WEBINAR SERIES: SUMMARY AND REVIEW

by Joyce Drakeford

Women in Paleontology: Tara's Take with Tara Lepore

Taormina (Tara) Lepore kicked off the second myFOSSIL webinar series promoting Women in Paleontology. If you missed this inspiring webinar, you can visit the myFOSSIL.org website and view it under the Videos & Tutorials section (<http://www.myfossil.org/video-tutorials/#tara>)

Tara is a science teacher and research associate at the Raymond M. Alf Museum of Paleontology and The Webb Schools in California. She started off by speaking about some famous historical women in paleontology: Mary Anning, Mary Lyell, and Mary Mantell. They often had to work under the names of their husbands. Supporting women from diverse backgrounds through visibility and mentoring is what women in paleontology is all about. Tara says her mentors are

Margery Coombs (UMass-Amherst) and Karen Chin (Univ of CO-Boulder).

Tara's curiosity about the natural world is what drove her, at a very young age, to write to paleontologist John Ostrom. When he wrote back to her, encouraging her to pursue her interests, it made her believe she could achieve her dream. Tara had a strong interest in biology and geology from childhood. She earned her Bachelor's degree in Biology from UMass-Amherst in 2006 and a Master's degree in Museum and Field studies from CU-Boulder in 2012. Tara is passionate about education and started teaching first at the Harmony School of Science (Sugarland, TX) and then Waltrip Senior High School (Houston, TX). Later, she moved to California where she currently teaches at the Webb Schools.

Tara's graduate research was on tissue-bearing coprolites from the Upper Cretaceous of Colorado. She was trying to answer the following questions: Why were weird impressions preserved? What are they? What animal made the droppings? Can the inclusions be classified? Her findings suggest that they were tyrannosaurid droppings. Implications for taphonomy include bacterial mat preservation associated with the coprolites.

When considering a career in paleontology, Tara states that finding a good support/mentoring network is essential. Do not let road blocks hold you up. Push through difficulties in your weaker subjects or testing anxieties. If you have to take a break, you can always come back to it. Don't get discouraged.

In conclusion, Tara says STAY INVOLVED! Volunteering can vary from museum projects to field work. Volunteering is the best way to network and get your foot in the door. You may get the opportunity to meet potential advisors and get recommendation letters. Checking out local opportunities for volunteering and internships, like Geo Corps, can be a great gateway into research. She advises checking out local fossil and geological clubs/societies for more opportunities. The more experience, the better. Beef up on your reading. Read everything you can get your hands on -- books, magazine articles, and research papers. And read every day. She also suggests staying in touch online by starting a blog or connecting on social media.

My Life as a Curator with Brenda Hunda

Brenda Hunda was the second webinar speaker for the Women in Paleontology series. If you missed this webinar, you can view it at <http://www.myfossil.org/video-tutorials/#brenda>.

Brenda is the curator of Invertebrate Paleontology at the Cincinnati Museum Center in Ohio. Her passion for paleontology initially came from a love of dinosaurs. At age three, she knew that she wanted to be a paleontologist. In





eighth grade, her class took a trip to the Royal Tyrell Museum of Paleontology and that sealed her fate: she had to become a paleontologist. She earned her Bachelor of Science degree in Honors Paleontology and a Master's degree in Geology at the University of Alberta. She then went on to earn her PhD in Earth Sciences from the University of California-Riverside, and from there went straight to her position at the museum.

Brenda's research deals with the morphology of trilobites in the Cincinnati Arch geological region.

This is done by using geometric morphometrics (in Brenda's case, trilobite head shapes) to quantify the ancient environment. This can identify water depth changes through time. She has worked on other projects with students on fossil sea scorpions and on the preservation of crinoids (taphonomy). Having given talks all over the world, she loves travel. Brenda is the lead editor of the *Journal of Paleontology* and a Council Member of the Paleontological Society.

The Cincinnati Museum Center has one of the largest Upper Ordovician collections in the world. The majority of these specimens are housed at the Geier Collections and Research Facility. Over five million objects are housed at the Geier. You can find their invertebrate collections uploaded to the digital repository iDigBio (<https://www.idigbio.org/>)

So, what is a curator? Curators are charged with preserving and presenting the regional history of an area by curation, database development, and care of collections. Brenda takes care of collection management. This is not only cataloging specimens, handling specimens on loan (and acquisitions), but also requires her to have database skills, use georeferencing, do photography, and predict future museum needs. She even handles budgeting and personnel management. Many curators also contribute to global scientific knowledge through research which involves writing grants, publishing in peer-reviewed journals, and speaking nationally and internationally.

The public often views the curator as a manager or overseer working behind the scenes with the institute's collection, never dealing with the public. Brenda explained that a good curator actually wants public interaction. They have a whole host of duties including developing and implementing educational floor programs, creating exhibit concepts, design and implementation, holding community talks about science topics, media interface for the museum, handling social media accounts, and answering public questions. Some of these duties can vary depending on the museum.

Brenda has assisted in the creation and running of STEM science programs at the Cincinnati Museum Center. One such program is called G.I.R.L.S. (Girls in Real Life Science). Though she has no formal training in the museum exhibits, she does help with exhibit development. She also works closely with local paleontological societies in the area. Two of those groups are Dry Dredgers and the Kentucky Paleontological Society. Brenda agrees that amateur collectors are invaluable to science: they donate specimens, time, and funds.

Brenda also gets help from students. Students may be eligible for internship credit, but whether for credit, pay, or volunteering, experience in collections would definitely boost one's resume. Upon concluding the webinar, she wanted to let all the young professionals that you can balance family and career – so as a woman scientist, do not think you have to compromise!

Fossil Volunteering with Cindy Lockner

Cindy Lockner was the third webinar speaker. You can view her webinar [at http://www.myfossil.org/video-tutorials/#cindy](http://www.myfossil.org/video-tutorials/#cindy)

The goal of Cindy's webinar was to encourage the viewer to volunteer for fossil-related events. Though she has no formal paleontology education, Cindy has logged over 1500 hours of volunteer work with various fossil programs since 2011. As a child, Cindy was obsessed with dirt. Her class once took a trip to the National Museum of Natural

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History and that is when she decided to be a paleontologist. As she got older, she was discouraged by school counselors who stated that paleontology was not a “woman’s field.”

Upon moving to Florida, Cindy joined the Florida Fossil Hunters group. She has performed fieldwork for the Florida Museum of Natural History at the Thomas Farm and Montbrook fossil sites. At one of these digs she was introduced to Chris DeLorey, the Director of the Academy of Natural History & Preservation teaching lab, and this is where Cindy was developed fossil preparation skills. While in the prep lab she met one of the Board of Directors from the Two Medicine Dinosaur Center in Montana. After taking their paleontology training course, she went on to be a field/lab volunteer.

There are over 400 fossils catalogued in the vertebrate collection of the Florida Museum of Natural History database that were discovered by Cindy. She has volunteered with the Florida Paleontological Society on National Fossil Day for the last three years, and she co-authored an article on volunteering that is published on the National Park Service website. Cindy also prepped an oreodont skull for the NPS Junior Paleontologist Educational Kits. Additionally, she is coordinating the upcoming Florida Fossil Hunters’ Women in Paleontology Day celebration on May 6th at the Orlando Science Center. With volunteer experiences at both the Maitland Public Library outreach day (The ‘Real’ Jurassic Park dinosaur exhibit and presentation) and National Dino Day, Cindy says she documents every hour of volunteering so she can remember the experience.



As an exceptional volunteer, Cindy was recognized in 2016 by the Florida Museum of Natural History with the Howard Converse award for contributions to Florida paleontology. She has also received a “Paleo Patron” Letter of Appreciation from the Florida Paleontological Society and the Florida Museum of Natural History. Further, the Florida Fossil Hunters awarded her with a Certificate of Appreciation and she was recognized under the Amateur Spotlight in a previous edition of the myFOSSIL newsletter.

To find a fossil volunteer opportunity, Cindy recommended that you check out your local fossil clubs, paleontological societies, universities, and museums. Whatever your area of interest may be, whether it is field research, preparation/restoration, screen washing, collections, or being at events – there is a volunteer opening for you.

The big question is, “Why volunteer?” Education and friendships are two great reasons to take the plunge. More importantly, you are helping to build museum collections so fossils may be studied and displayed for the generations to come. But overall, just HAVE FUN!

The final webinar in the series is April 26:



UPCOMING EVENTS

April 7, 2017 @ 4:00 pm – April 9, 2017 @ 5 pm

[25th Annual Venice Shark's Tooth Festival, Venice FL](#)

April 7, 2017 @ 9:00 am – 4:00 pm

[2016-2017 Paleontology Certificate Program – Anza-Borrego Desert Paleontology Society, Borrego Springs, CA](#)
recurring on Fridays through the end of May

April 8, 2017 @ 1:00 pm – 4:00 pm

[Discovery Days at the Alf Museum: Extinction, Bye Forever, Claremont, CA](#)

April 26, 2017 @ 7:00 pm – 8:00 pm EST

[FOSSIL Webinar Series Presents: Lisa White \(UCMP\) Promoting Women in Paleontology, online](#)

April 28, 2017 @ 7:45 pm – 11:00 pm

[Dry Dredgers 75th Anniversary Meeting, Cincinnati, OH](#)

May 6, 2017 @ 9:00 am – 5:00 pm

[Women in Paleontology Day, Orlando, FL](#)

May 6, 2017 @ 10:00 am – May 7, 2017 @ 5:00 pm

[GeoFair 2017, Sharonville, OH](#)

May 13, 2017 @ 1:00 pm – 4:00 pm

[Discovery Days at the Alf Museum: So You Want To Be A Paleontologist?, Claremont, CA](#)

May 26, 2017 @ 6 pm - May 28 @ 2 pm

[Aurora Fossil Festival](#)

June 14, 2017 @ 9:00 am – June 17, 2017 @ 5:00 pm

[2017 Southeastern Association of Vertebrate Paleontology Meeting](#)

July 8, 2017 - July 14, 2017

[4th International Symposium on Paleohistory](#)

[More events](#)