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FOSSIL Project Updates Fall 2016

By Eleanor E. Gardner and Bruce J. MacFadden

Personnel Updates

We are delighted to announce that Dr. Ronny Maik Leder has been appointed the Director of the Naturkundemuseum Leipzig (Natural History Museum of Leipzig), located in his hometown in Germany. He will start as Director on December 1, 2016. In his new position, Ronny will be in charge of a staff of two dozen and charged with re-inventing the museum from the ground up. We have mixed feelings because although we are happy for Ronny to have his “dream job,” we will lose an active member of the FOSSIL Project team. As a postdoc on the project, Ronny has helped in so many ways to advance our objectives and is a charismatic and valued member of the team. We wish Ronny and his family the very best, and to him – great success in this new venture in his professional career. We also hope that he will, as time permits (we realize he will be very busy!), remain connected to FOSSIL and link us with amateur clubs and societies in Germany. Congratulations, Ronny!



Dr. Ronny Leder

We are additionally happy to announce that in August, Lisa Lundgren passed her PhD qualifying exams. Lisa is a science education graduate student at the UF College of Education and FOSSIL’s social media specialist. Now officially a PhD candidate, her research in informal science education explores how people learn on social media and how to design social media messaging to enhance learning. Congratulations, Lisa!



Lisa Lundgren

FOSSIL Webinar Series

The FOSSIL Project’s first monthly webinar series, “Fundamentals of Fossils,” has gotten off to a great start. For those who haven’t yet heard of our webinar series, it is free, open to anyone interested in fossils and paleontology, and co-sponsored by the Paleontological Society as well as the iDigBio project at the University of Florida. Participants do not need to be registered as a myFOSSIL community member, although additional benefits accrue to our members (see below).

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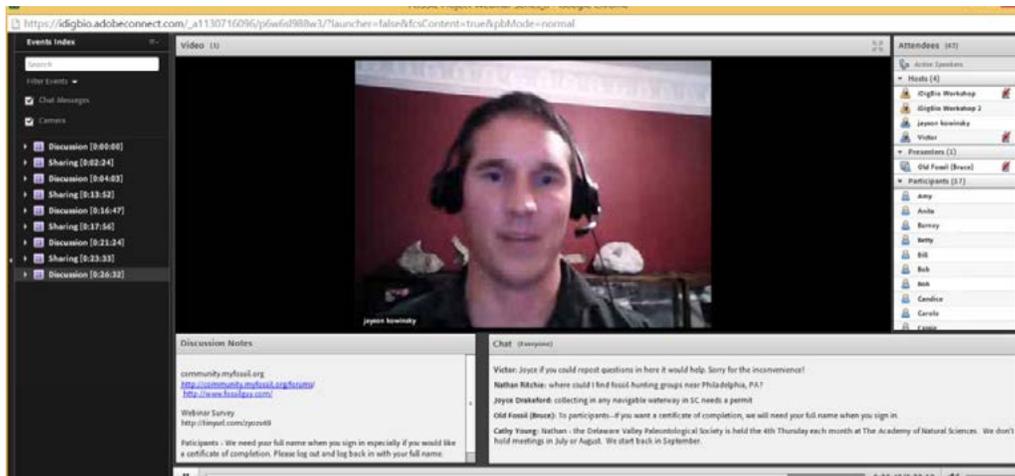
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Jayson Kowinsky presenting in the first webinar

On August 31st, high school teacher and amateur paleontologist Jayson Kowinsky (The Fossil Guy, www.fossilguy.com) presented on “Fossil Collecting: Where, How, & When to Find Fossils.” For more detailed information about Jayson’s webinar, please see Joyce Drakeford’s article in this newsletter. On September 29th, FOSSIL project director and professor/curator Bruce MacFadden presented on “Field Notes 101.” Each hour-long webinar was delivered via the AdobeConnect online platform that provides a venue for presentations and real-time chats and Q&As. Both webinars had about 70 participants, and we look forward to more attendees joining us for the October and November webinars.

The two remaining webinars in our four-part introductory series will be hosted at <https://idigbio.adobeconnect.com/a1130716096/fossil-webinars/> and will feature:

- Oct 19: Excavating Fossils with Dava Butler of Montana State**
- Nov 30: Fossil Prep Basics with Rachel Narducci of UF/FLMNH**

We are finding out that learners of all ages are attending the webinars. Recent feedback from Stephanie Killingsworth, a middle-school teacher from Palm Beach County, stated:

“I want to send a thank you for allowing my students to participate. They didn’t even know what a webinar was until a couple of weeks ago. They absolutely loved interacting and asking questions. This will be all the talk in class tomorrow!thanks again for being so inclusive of the novices and inviting new members into the paleo world.”

The FOSSIL Project will be providing a Certificate of Completion for those members of the myFOSSIL community who attend (or watch recordings of) all four webinars in the series. Additionally, educators can earn CEUs for attending all sessions; contact Eleanor at fossil@flmnh.ufl.edu for more information on how to register for CEUs.

If you are interested in any of these webinars, but missed one or two in real-time, don’t worry because they are recorded and can be accessed in the Resources section of the myFOSSIL website at: <http://community.myfossil.org/video-tutorials/>.

Building on this initial interest, we have decided to move forward with planning for a second series of webinars during the first half of 2017. This series will be focused on the theme of “Women in Paleontology,” and will feature speakers with diverse backgrounds and professional paths. As some of the clubs (e.g., Florida Fossil Hunters) have done via in-person events, we are excited to be able to promote this important topic through our webinar series. The webinars provide an excellent opportunity for participation regardless of a person’s location as long they can connected to the internet.

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We also have a webinar forum on our website—for discussion, ideas, or other feedback, in the Upcoming Opportunities forum: <http://community.myfossil.org/forums/topic/fossil-webinar-series/>. Please send us your ideas and feedback!

FOSSIL @ GSA

The FOSSIL Project team was very busy at the annual national meeting of the Geological Society of America in Denver, CO. On September 23rd, FOSSIL hosted a 4-hour short course that presented a hands-on program covering four “case studies” on (1) the value of metadata, (2) digitization, (3) citizen science (and utilizing social media), and (4) NGSS-aligned paleontology themed lesson plans. Sixteen participants interested in paleontological outreach and education – ranging from amateur paleontologists to PhD students to tenured professors – attended the short course. The course was fast-paced and accidentally had no bathroom breaks (!), but all the participants appeared to have had a good time and learned something new. Feedback about the course and the myFOSSIL website was positive and encouraging, and we plan to hold similar ‘short courses’ at other conferences in the future.



The FOSSIL Project Short Course at GSA 2016

Just like at last year’s national GSA meeting, FOSSIL had a booth in the huge exhibit hall as part of “Paleo Alley,” where all the booths of paleontology-focused organizations are located. We were thrilled that our local partner for this year’s booth was the Western Interior Paleontological Society. Many thanks to WIPS members Susan Passmore, Paul Belanger, and Christian Thurner for helping to ‘man’ the booth from September 25th-28th and, of course, for interacting with LOTS of visitors! We are very happy to report that over 70 people at the conference registered for the myFOSSIL community website, and we made connections with folks at a variety of museums, institutions, universities, and fossil clubs. A huge shout-out also goes to our enthusiastic student volunteer, Megan Johnston, who is studying at the University of Colorado-Denver. We look forward to next year’s meeting in Seattle, WA!

The FOSSIL Project team gave a number of research presentations at the GSA meeting, which were all well received. Bruce MacFadden gave a talk on the benefit of international paleontological research experiences for K-12 STEM teachers; Victor Perez, Ronny Leder, and Lisa Lundgren presented a poster on the FOSSIL Project’s first ‘PaleoBlitz’

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event; Ronny and Victor also presented a separate poster about a new method for estimating body length of *C. megalodon*; and Eleanor Gardner presented a poster on preservation trends in the avian fossil record. Data presented in the PaleoBlitz poster are part of a larger manuscript which will soon be submitted for publication at a peer-reviewed journal; we hope it will appear in print and online within the next year.



FOSSIL Members in the Exhibit Hall at GSA 2016 (above). Victor Perez at the poster session (below)



Project Origin

1. The FOSSIL Project team joined amateur paleontology for a collecting field trip to Belgrade Quarry in North Carolina.
2. Amateur paleontologists from throughout the U.S. were invited to participate in a two-day PaleoBlitz, in which participants would catalog fossils from Belgrade.
3. Participants were strategically chosen to include 'experts' and 'novices' to facilitate mentor-mentee relationships.

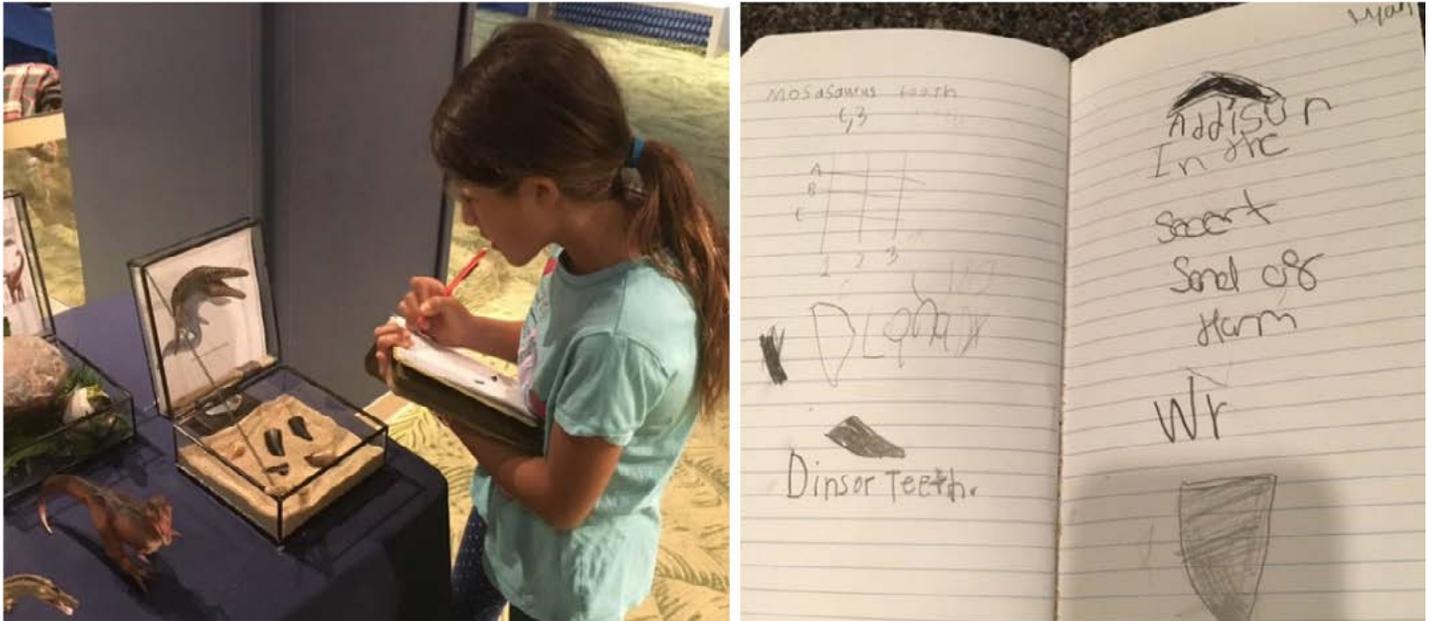


Objectives

Promote Best Practices: Educate participants about the entire museum curation process, from recording field notes to digitizing and curating a collection.

Support the Practice of Paleontology: Understand what motivates and supports individuals in the practice of paleontology.

Refine PaleoBlitz Design: Refine the structure of PaleoBlitz through participant feedback and staff observations.



Florida Fossil Hunter Event at the Orlando Science Center

The FOSSIL Project funded airfare for Dr. Sandra Carlson of UC-Davis (and past-president of the Paleontological Society) to speak at the Southern California Paleontological Society in early October. We look forward to a report on Dr. Carlson's visit from the vice president of the society, to be published in the December edition of our newsletter.

Upcoming Events

October 1, 2016 – National Fossil Day at the South Florida Museum in Bradenton, FL. The FOSSIL Project is sending Victor Perez and Michelle Barboza (Bruce's new graduate student) to host a display table and paleontological activities for kids. Stay tuned to our social media accounts for live updates from this event.

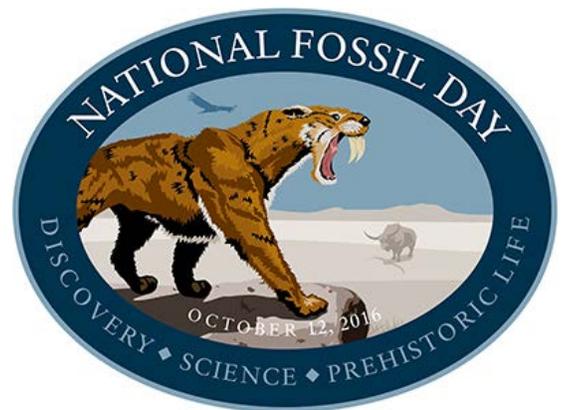
October 12, 2016 National Fossil Day

Visit <http://community.myfossil.org/events/> to find events or to add your own!

October 19, 2016 – Third webinar in the FOSSIL series, hosted by Dava Butler of Montana State University. Dava will present on fossil excavation best practices, ethical collecting, and other interesting topics relevant to the paleontological community. 7-8pm Eastern time.

October 22, 2016 – 'Pop-Up' on Fossil Sharks at the Florida Museum of Natural History. Victor Perez from the FOSSIL Project will help educate visitors about fossil sharks from 11am – 3pm. Enjoy a unique, participatory experience between the Florida Museum and the community. We need YOU to make it happen. All ages are welcome. Come prepared for learning and fun! For more information, contact Dr. Betty Dunckel, bdunckel@flmnh.ufl.edu or 352-273-2088.

November 30, 2016 – Fourth webinar in the FOSSIL series, hosted by Rachel Narducci of the Florida Museum of Natural History. Rachel will present upon the basics of fossil preparation – including tools, adhesives, and techniques. 7-8pm Eastern time.



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January 3, 2017 – Abstract submission deadline for inclusion in the FOSSIL-sponsored theme session at the 2017 GSA Joint Section (Northeastern and North-Central) Meeting. In order to present a talk or poster in our special theme session entitled “FOSSIL Collaborations: Enhancing Paleontology through Professional and Amateur Partnerships,” you must write up a short abstract that gives the basic ‘who,’ ‘what,’ and ‘why’ of your presentation. Need help crafting an abstract? Contact Eleanor at fossil@flmnh.ufl.edu.

March 19-21, 2017 - GSA Joint Section (Northeastern and North-Central) Meeting in Pittsburgh, PA. This promises to be a fun regional GSA meeting where amateurs and professionals can network and build relationships. The FOSSIL Project is hosting a special theme session (see title above) at this meeting, and co-organizers of the session include Cathy Young of the Delaware Valley Paleontological Society, Jayson Kowinsky of www.fossilguy.com, and Daniel Krisher of the Rochester Academy of Science – Fossil Section.

The session’s description is as follows: “Partnerships between professional and amateur paleontologists have always been important for growth within the field of paleontology. Despite a push for increased recognition and acknowledgement of amateurs, their efforts are still often overlooked or forgotten. Since 2014, the FOSSIL Project has facilitated enhanced communication, networking, and collaboration among amateur and professional paleontologists. This session would provide a forum for the paleontological community to showcase and discuss partnerships that produce high-quality research, educational initiatives, and/or outreach endeavors.” Preliminary information on the meeting can be found at <http://www.geosociety.org/Sections/ne/2017mtg/>. If you’d like to present in the special theme session (or simply attend), please contact Eleanor at fossil@flmnh.ufl.edu for more details.

AMATEUR SPOTLIGHT: LORRIE MCWHINNEY AND ANGELA MATTHIAS

Editor's Note: This issue we highlight Lorrie McWhinney & Angie Matthias, members of the Western Interior Paleontological Society (WIPS). Lorrie and Angie are co-authors on one of our research articles this issue. You can find the formal report of their research in the June 2016 issue of the International Journal of Paleopathology.

Q: How did you first discover your passion for fossil collecting?

Lorrie: As a young girl I dreamed of working with Louis and Mary Leakey in Africa. Those dreams faded away over time; I got married and had a child. But a friend of mine kept talking about digging dinosaurs. My long-ago interests in anthropology soon developed into interests in paleontology. With no education in this field, I was not qualified to assist in any projects. However, my friend from Kaiser Permanente who was also a field volunteer with the University of California Museum of Paleontology, Dr. Jay Grimaldi, told me about a possible opportunity to join a Montana dinosaur field trip. The excitement I felt burned deep. I realized that being the first person to discover something new was the basis of my drive all along. In July 1994, I joined Dr. Jack Horner of Montana State University and Dr. Desmond Maxwell of University of California Museum of Paleontology with their crew that included my friend Dr. Grimaldi, at a site made famous by influential paleontologist Dr. John Ostrom. In 1964, Dr. Ostrom had discovered more fossil material of a dinosaur originally found by the paleontologist Barnum Brown, which was later named *Deinonychus antirrhopus*. The passion I found for paleontology while on this field opportunity was just a beginning of a lifetime of discoveries.



Lorrie

Angie: My passion for fossils first started with archaeology. I watched a documentary on Illinois archaeology in 1971 taking place in Kampsville, Illinois. It got me very interested in digging and I soon began volunteering as an excavator at the prehistoric Koster settlement site (<http://users.stlcc.edu/mfuller/koster.html>). Then, after I moved to Billings, Montana, I volunteered with a team that excavated a bison butchering pit. When I moved to Denver, Colorado, I did a little excavating at Lamb Springs Archaeological Preserve, but I was working full time and raising two sons. After my husband and I became empty nesters, I joined the Denver Museum of Nature and Science (DMNS) and completed their (now discontinued) Paleontology Certification program.



Angie

Q: How long have you been collecting fossils (i.e., when did you begin)?

Lorrie: In 1994, I helped in the collection of various dinosaur material from a site in Montana. Since then, I have assisted in many other field trips in the states of Montana, Colorado, Utah, Nebraska, and Wyoming.

Angie: I went on my first paleontology field trip in 1994 through the Denver Museum of Nature and Science (DMNS) and started collecting Eocene teeth of tiny mammals to add to the museum's collection. At the time, the chief curator's primary interest was Eocene primates.

Q: How do you identify/organize your fossils (i.e., which texts or other resources do you use, or which professional paleontologists do you consult)?

Lorrie: After the field trip in 1994, I contacted the [Denver Museum of Nature and Science](#) (DMNS) to inquire about possible education and volunteering opportunities in the Earth Sciences department. I was told of the (now

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discontinued) Paleontology Certification program that was available to the community. Through this program and with additional classes through the museum, I learned skills necessary to assist in the complete process of finding, cleaning, and curating fossils. I volunteered in the museum's fossil lab until 2012. Through my acquired skills and access to museum resources and paleontologists, I was able to identify and curate the fossils I found.

Angie: I gained my identification knowledge through the excellent paleontology certification program at DMNS. The program conducted weekly lab identification exercises using the specimens at the museum, plus we had several reading assignments each week. There were quite a few classes that were required for certification, so there was a lot of training. One of the classes was on curation of fossils, which is where I learned most of my ID skills. As for a personal fossil collection, I do not have an extensive private collection (and what I do have are all invertebrates). The federal laws are very strict here about collecting on public lands, and I get to see beautiful fossils at the museum anyway, so I prefer to volunteer for projects and field trips.

Q: When did you begin working with the Western Interior Paleontological Society? How many projects have you done in collaboration with professionals affiliated with the society?

Lorrie: I joined WIPS in 1994. Some of the projects I worked on included 'Bones Galore' with Dr. Russ Graham in New Raymer, Colorado, 'Comanche Grasslands' with Dr. Bruce Schumacher in La Junta, Colorado, 'Porcupine Cave' with Dr. Elaine Anderson, as well as projects with the United States Forest Service (USFS) in Chadron, Nebraska.

Angie: I joined WIPS in 1996 while volunteering for the 'Porcupine Cave' project which was a joint venture of WIPS and the DMNS. I have participated on several occasions over the years with the United States Forest Service in Chadron, Nebraska, in addition to working on the 'Comanche Grasslands' project in La Junta, Colorado, and at Custer State Park in Pringle, South Dakota. The Custer project started out as a joint venture with Pennsylvania State University because WIPS supplied the volunteers.

Q: What is your most favorite fossil that you discovered? Why?

Lorrie: I do not have a favorite fossil, for I love them all! But I must admit that the discovery of "Lorrie's Site" was really exciting and I have many cherished memories from the years that DMNS ran field trips to the site.

Angie: My favorite fossil would be a multituberculate P4 molar. Multituberculates were rodent-like early mammals with distinctive teeth. I have never discovered one but the tooth is so unique and so primitive. The most dramatic fossil I discovered was a maxillary of an Eocene rhinoceros with a deciduous P3 molar. When I gently yanked on the tooth, I discovered the permanent tooth underneath!



Lorrie protected from sun and dust

CLUB CORNER: NORTH CAROLINA FOSSIL CLUB

by **Linda McCall, President**

In preparing to write this article, I reviewed other articles on fossil clubs, and it struck me again how very similar, yet individual, fossil clubs/societies are. For the most part we are all 501c(3) organizations, formed between the '60s and '80s by amateurs with a passion for fossils and fossil collecting. We all have by-laws and mission statements, elected officers and a board of directors, hold regular meetings with guest speakers, produce newsletters, do lots of outreach, and collect in the field as often as we can get there. Most also have an annual "show," a website and social media presence, and award grants, scholarships, and donations to students, professionals, and non-professionals. Many have an ethics policy, carry liability insurance, have professional advisors, and are affiliated with various other professional and non-professional organizations.



Linda McCall



Member Trish K. at Castle Hayne

Club/Society members all across the country are an eclectic group of individuals who share a passion for paleontology and come from all walks of life: artists, doctors, plumbers, painters, computer geeks, soccer moms, retired folks (you name it, we've got it) and these folks bring with them a wide range of skill sets and abilities – some are good at outreach, some at organization, some at leading field trips, some at publishing, photography, technology, etc. – which all combine to create effective and impactful organizations. A member's fossil knowledge can range from beginner level to those who work with professionals and are published in peer-reviewed journals. All are welcome.

So what about the [North Carolina Fossil Club](#) (NCFC)? I needed help with this article, as I have only been a member here for the past 6 years (a newbie), having moved from another state. The North Carolina Fossil Club is a 501c(3) organization, chartered on September 9, 1977, by passionate amateurs John Everette, Charles P. Green Jr., and Jack P. Gulley "to engage in a progressive program of planning and action designed to advance knowledge and interest in the study, collecting, and enjoyment of fossils; to bring fossil collecting enthusiasts together to share information on identification and collecting; and to distribute educational information." The Club has tried to keep money out of the mix, emphasizing contributions to science, a focus on education, encouraging outreach, and keeping activities as free and open to the public as possible.

From those early days with a membership of about 35 in 1977, the club swelled to over 200 by the early 80s, in large part due to frequent access to Lee Creek Mine (then Texas Gulf). Though the mine stopped allowing access in 2009, our membership has remained stable and even increased thanks to the dedicated leadership of those before me – we have grown beyond just being collectors to being a group interested in the science of paleontology as well.

Today the NCFC is a fairly large club, hovering around 300 members, with about two-thirds being from North Carolina and the rest from 15 other states as well as Canada. Benefits of membership include:

- Access to the members' only section of the website
- Access to current and past issues of JANUS online
- Voting privileges in Club business matters
- Eligibility to go on Club-sponsored field trips (with signed waiver)
- Discounted price on club publications



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Amateurs and professionals of all ages comprise our membership, and people with all degrees of knowledge about fossils are welcome. Due to our state-wide pull for members, we meet every other month – with meetings being held at 1:30PM on the third Sunday of January, March, May, July, and September at the [North Carolina Museum of Natural Sciences](#) in Raleigh. Our November meeting coincides with our annual Fossil Fair and is moved around the state to different venues. Each meeting (excluding November) includes a guest speaker (generally a professional or knowledgeable club member) or other fossil related program, followed by a break (socializing and snacks), a general business meeting, a "show and tell" session (more socializing and finish off the snacks), and ends with a door prize give-away where many members receive fossils and fossil related items donated by other club members – a fun way to swap specimens from different localities among each other. The general public is always welcome. If a speaker has traveled a significant distance to be with us, we offer a donation to help them defray the cost of travel. Meetings usually draw between 35 and 60 members, though occasionally we pull 100+.



Fun at the Fossil Fair

The NCFC has built long-lasting relationships with various professional organizations, including the Smithsonian and the North Carolina Museum of Natural Sciences, which have both been the recipients of many thousands of donated specimens over the years. Vince Schneider, a founding member of the NCFC (and still active member) is also currently the Curator of Paleontology for the museum. We also have deep ties to the [Aurora Fossil Museum](#), [Schiele Museum of Natural History](#), [Durham Museum of Life and Science](#), North Carolina State University, and Appalachian State University – to name just a few.

Our newsletter is called "JANUS" and is published quarterly. It contains dates and information on upcoming club events and fossil related articles. Our website is fast becoming the primary means for club communication, and is usually our first point of contact with the general public. Our homepage contains our history, information on our outreach activities and events, our education and research support endeavors, as well as current news, a link to our online store, and a list of upcoming events. Tabs at the top include our calendar, contact info, membership info, trip reports, fossil ID section, and a link to our publications – as well as a members' only tab that is visible once you become a member, which gives you access to all the past issues of JANUS, a current club roster, copies of our by-laws, Rules of Procedure, Code of Conduct, and a map to area collecting sites.



Fossil Fair at the NCMNS

The North Carolina Fossil Club organizes, facilitates, and encourages educational outreach by members to schools, museums, and public events. We are the face of paleontology to the general public in our communities. During the spring and fall, some members lead school groups into coastal quarries to collect fossils and learn about the conditions under which those fossils formed. Members also give presentations to scouting and civic groups. Other members frequently take programs to schools, providing hands-on opportunities to find fossils, and learn about geologic history. Many club members regularly display at a number of annual fossil events in North Carolina including: Dino Egg Hunt at the Museum of Life and Science in Durham, NC; the Schiele Museum Fossil Fair in Gastonia, NC; the Aurora Fossil Festival in Aurora, NC; and Norwood Arbor Day and Fossil Fair in Norwood, NC.

Our largest outreach event of the year is our annual [Fossil Fair](#). Unlike most club/society annual events that are held in the same place every

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year, our Fossil Fair moves around the state to different venues, allowing underserved communities the opportunity to experience paleontology and fossils up close and personal – sometimes for the first time in their lives. Our members exhibit fossils from their own collections, answering questions and interacting with the public on a one-on-one basis. Our partners from the Smithsonian, Aurora Fossil Museum, folks from the Schiele and from Appalachian State, etc. also frequently attend and provide fossil identification and education to club members and the public, while in turn, these visiting experts gain information on fossils discovered in NC. The public is encouraged to bring in things that they have found to be identified. Educational speakers make presentations on topics of interest throughout the day. All of these events and activities are lots of fun for all ages!

The NCFC really shines when it comes to club-originated publishing. Three fossil identification guides authored by two club members have been available since 1994. Presently, fifteen club members are assisting editor Richard Chandler in writing Volumes I – IV of Fossils of North Carolina, currently in press. These books are the culmination of 15 years of ongoing effort, photography, and research – and are on par with many professional publications. Volumes I, II, and III have already been released, with Volume IV hopefully coming out in early 2017.

We also partner with the professional paleontological community. The Smithsonian, NC State, and others have benefited greatly from the thousands of specimens NCFC members have donated over the years. Becky and Frank Hyne and Pete Harmatuk were honored in a ceremony by the Smithsonian for their extensive donations, and innumerable publications based on these specimens and those donated by many other club members have been written. Club members Becky Hyne, Pete Harmatuk, Mike Milton, Judy Schneider, Vince Schneider, and Bob and Judi Mefford all have had one or more species named for them. Several club members are also active researchers who assist and collaborate with professional paleontologists. A number of members have co-authored papers that have been published in peer-reviewed journals. Members Gerald R. Case, Peter J. Harmatuk, and Peter LeGrand Smith received the Strimple Award given by the Paleontological Society – the highest award an amateur can receive. In addition, we frequently donate money to aid in research, travel, or to other needs of our professional affiliates. Last but not least... Collecting in the field is what got most fossil clubs/societies going and the NCFC is no exception. We have two organized collecting seasons, Spring (lasting from mid-March to early June) and Fall (lasting from late September to early December). Intrepid individuals within the club collect all year round. Due to all the rain and groundcover in North Carolina, most collecting is done in quarries and along creeks and rivers. The majority of these are in-state single day trips, but occasionally we venture further afield, to South Carolina, Maryland, Pennsylvania, New York, Alabama, Florida, Arkansas, Kentucky, Indiana, Illinois, and Ohio. Once a year or so we head out west to Texas, Arizona, Utah, Colorado, or the like.

Our hobby, beyond being a fascinating one, adds to the body of knowledge we have about our planet and its history, instilling in us a sense of responsibility as well as a zeal to collect. As do other clubs/societies, we strongly believe that educated responsible amateurs can contribute greatly to the field of paleontology. North Carolina is unique in having strata dating from the Ediacaran to the Pleistocene – a span of 525 million years. We are uniquely positioned to be the eyes and ears of the professionals in the field, with the time invested and the experience in our respective areas to make a real difference and bring to light many specimens that otherwise would deteriorate to dust and be lost to science forever.

What are we waiting for? Time to get back in the field!

To learn more:

Visit the club website at <http://www.ncfossilclub.org/>



Club members ready to collect at Castle Hayne



On behalf of The Paleontological Society, I am very pleased to announce the establishment of a new regular-membership category for amateur/avocational paleontologists. This category, which formally takes effect at the start of 2017, carries all the privileges of the existing regular-membership category, but at a discounted annual rate of \$30. This membership category was formally ratified by The Paleontological Society Council last Spring at its midyear meeting in Atlanta, and is the first stage in what will become a multifaceted effort on the part of The Paleontological Society to better serve the interests and needs of the amateur/avocational community, and to enhance interactions among professional and amateur/avocational groups (see: <http://www.myfossil.org/the-paleontological-society-would-like-to-hear-from-you/>).

Member benefits are enumerated at <http://paleosoc.org/benefits-of-membership-in-the-paleontological-society/>, and include free online access to The Society's two journals, the Journal of Paleontology and Paleobiology. You can join online or download a membership form at <http://rock.geosociety.org/membership/paleo/>.

Stay tuned in the coming months for additional news! In the meantime, feel free to send me an email if you have any questions or thoughts.

Arnie Miller

President of The Paleontological Society

Professor of Geology, University of Cincinnati

arnold.miller@uc.edu

FEATURED FOSSIL: ANCIENT BISON TOOTH--OR NOT? INTRODUCING THE “BURN TEST”

by Erin Petersen Lindberg

A weekend beach outing-October 24th, 2015

Last October, my family joined Bruce MacFadden and Sean Moran on a guided tour of a local Santa Cruz beach. As we toured the beach, I collected a few shells to add to our collection at home.

A tooth, not a shell!

The next day, while rinsing the shells, one in particular took on a familiar shape, it was a tooth, not a shell! A week or so prior, I might not have recognized this as a tooth, but I had been implementing a fossil horse tooth lesson in my 6th grade class with PhD student Sean Moran from the University of Florida, and as a result had some familiarity with teeth.



First day back to class after the tooth discovery

I immediately showed Sean my find. Sean said he thought that this was an ungulate of some sort and he snapped some photos to send to Bruce MacFadden, a paleontologist at the University of Florida. Bruce quickly replied, with a hopeful, “ perhaps this is an extinct bison tooth?” and please keep it in a safe place until we meet again. Bruce’s colleague Richard Hulbert thought that we had to be careful in our excitement, a test was needed.

What is this tooth found among the shells? Photo courtesy of Sean Moran

The desk drawer

My mother’s classroom desk, which now belongs to me, seemed the safest place to keep the tooth. Over the course of the next few months the tooth came out of hiding as I marveled at the possibilities of it being a bison tooth! Students loved to hold it, and wonder as well!!!

Florida calls- June 2016

The day before I was scheduled to head out to Florida to participate in a paleontological dig, Dr.MacFadden sent a text, “ do not forget the tooth”, to which I replied, “ already packed!”

The Burn Test

Little did I know how excited Bruce and colleagues were about this test!

Our wrap-up meeting for the dig included the Burn Test.

Our group moved outside and circled around Victor Perez , another PhD student at UF, to learn how to test to see if the tooth was fossilized, or not.



The test! Photo courtesy of Jeff Gage

The Burn

My heart was pounding.

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You could feel the excitement in the group. Bruce stood next to me as I fired the tooth, then smelled it....no smell. I think he was hopeful that this was Bison, so was I!



Photo courtesy of Jeff Gage

Test 2

I burned the tooth a bit longer this time. The tooth scorched and smelled of burnt hair. If it had been mineralized there would not have been any scorching or smell of organics and thus would have been a fossil. Bruce leaned in and said he was sorry, and I said that it was not a problem. Richard Hulbert said that the tooth was conceivably Mission Era, so 100's of years old.

What is it's antiquity?

Bruce said that if I really wanted to know how old the tooth was, that I could have it radiocarbon dated, for about \$750-\$1000; this would go back about 50,000 years or so.

A scientific process

Was it the tooth of a cow or a fossilized tooth of an extinct bison, that was the question.

The initial discovery that my shell was indeed a tooth was exciting. What is this?? This inquiry led to asking for expert opinions, as well as showing the tooth to students and colleagues so they could ponder the questions as well. The burn test was great, because it is something I can show and do with my students. What a fantastic journey, bison or cow, it did not really matter. The process was an exciting learning opportunity about science.



Erin performing the test. Photo courtesy of Jeff Gage.

RESEARCH: MOSASAURS: COLD OR WARM-BLOODED

by [Alberto Perez-Huerta](#)¹ and [Celina A. Suarez](#)²

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Thermoregulation, the ability of organisms to regulate their own body temperature, has been a subject of great interest in paleontology for more than a century. It is unknown precisely how and when endothermy (“warm-blooded” or the ability to self-regulate temperature) evolved in different lineages of vertebrate organisms, including mammals. Whether it evolved before the mammal-lineage broke off from their reptilian ancestors, or whether endothermy evolved within the reptilian lineage is debated. For example, fish and reptiles are considered as cold-blooded organisms, but several studies have shown that leatherback turtles and some fish, such as tuna and shark, can have some active control over body temperature (Holland et al., 1992; Thums et al., 2012; Casey et al., 2014). Dinosaurs are evolutionary related to archosaurian reptiles, with cold-blooded modern representatives, but birds that are warm-blooded evolved from a dinosaur lineage and it is believed that many dinosaurs were able to regulate their temperature (Amiot et al., 2006; Eagle et al., 2011). The goal of our project, initiated by Dr. Lynn Harrell of the University of Alabama as part of his dissertation research, was to investigate the thermoregulating capabilities of the swimming reptiles, mosasaurs, by analyzing the oxygen isotopic composition of their teeth and comparing them to the oxygen isotopic composition of coeval warm-blooded sea birds, and cold-blooded fish and turtles.



Alberto Perez-Huerta



Celina A. Suarez

Oxygen is found in the mineral apatite, the mineral that makes up vertebrate bones and teeth. There are three types of oxygen based on the number of protons found in their nucleus. These different numbers of protons result in different masses of oxygen called oxygen isotopes. An analogue to this would be milk. Milk can be full fat milk, 2%, or even skim. It is still milk but whole milk is “heavier” than skim milk. This mass difference allows oxygen to partition itself in different ways based on temperature. Thus, temperature is a major control on which types of oxygen are incorporated into the mineral. At higher temperatures, the lighter isotope is incorporated into apatite, in cooler temperatures the heavier isotope is incorporated into apatite. These values are preserved in teeth and bone and allow paleontologists and geochemists to investigate thermoregulation in extinct animals.

A study published by Bernard et al. (2010), attempted to explore thermoregulation in the most iconic marine reptiles – ichthyosaurs, plesiosaurs, and mosasaurs – that lived in oceans and seas during the Mesozoic. The main conclusion was that ichthyosaurs and plesiosaurs could have controlled their body temperature, but mosasaurs were cold-blooded. This study only had access to a limited number of fossils, which did not cover the whole spectrum of body sizes in mosasaurs, and only cold-blooded organisms (e.g., fish) for comparison. Thus, we initiated a more complete study of mosasaurs using the rich collections of the Alabama Museum of Natural History. After a careful scrutiny of fossil preservation, we analyzed the oxygen isotopic composition of teeth and bone at the University of Arkansas under the supervision of Dr. Suarez. Results were published in the journal *Palaeontology* early this year (Harrell et al., 2016) and remarkably show that mosasaurs regulated their temperature. Based on oxygen isotope composition of Cretaceous birds, we calculated body temperatures (~38 °C) very similar to those of modern pelagic seabirds. Mosasaurs oxygen isotope values were independent of size, and were more similar in composition

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to birds rather than fish. This suggests that they precipitated their apatite at higher body temperatures. Based on estimated oxygen isotopic composition of sea water calculated from the turtle oxygen isotopic composition, mosasaur body temperatures were > 30 oC, much higher than seawater temperatures of ~28 oC suggesting some ability for thermoregulation. Independence between body size and oxygen isotopic composition may also imply that body temperature control is not behavioral but rather a characteristic of the group itself. Our findings provide a better understand of the fossil record of mosasaurs. Their thermoregulating ability may have allowed their dispersal to cooler waters which is supported by the fossil record of at high latitudes. Thus, their ability to thermoregulate influenced their evolutionary success during the Cretaceous, allowing them to disperse and occupy a wide variety of ecological niches.

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To learn more:

Alberto discusses how the research unfolded and the importance of the Alabama Museum of Natural History in this recent [Science Daily article](#).

Learn more about how rare earth geochemistry is used in dinosaur research in this [video](#) with Celina (from the Discovery Channel 2008)

Alberto was involved in [this project](#) that used clumped isotope technique to learn what dinosaur eggs reveals about the body temperatures of dinosaurs.

Read about Celina's early interest in paleontology--which she shares with her twin sister Marina--in this [news release](#) from the University of Kansas where they received their doctoral degrees and about their discovery of a new species of dinosaur in their [hometown newspaper](#).

RESEARCH: PATHOLOGICALLY-PITTED ANKLYOSAUR FOSSILS

by **Lorrie McWhinney and Angela (Angie) Matthias of the Western Interior Paleontological Society (WIPS)**

This study slowly developed and changed over 17 years. The discovery of “Lorrie’s Site” in 1999 was a byproduct of prospecting for eggshell material for Darla Zelenitsky, then a PhD student from Canada, who is now an Assistant Professor at the University of Calgary. At that time, Dr. Ken Carpenter (director and curator of paleontology at Utah State University Eastern Prehistoric Museum, in Price, Utah) had two sets of volunteer teams prospect in the Cedar Mountain Formation. My co-author, Angie, and Brenda Johnson went in one direction, while Darla Zelenitsky and I (Lorrie) headed toward an exposed area of the Ruby Ranch member of the Cedar Mountain Formation. No egg shell, but Darla and I found bone fragments littering the ground. Darla decided to search another area for eggshell while I stayed behind. Since I was prepared to find tiny eggshell fragments, I didn’t bring anything bigger to put larger specimens in for collection. Therefore I selected a few specimens and held them in my hand as I continued prospecting for eggshell material. When both teams returned, Dr. Carpenter asked about our findings. No one had found fossil eggshells. However, since I had collected some of the bone fragments, I handed him my findings. Dr. Carpenter instantly recognized what I had found: ankylosaur armor fossils called osteoderms. He asked me to name the site. I said that the name could be the ‘Lady Luck Site’ – I wanted to credit both Darla and me. Unfortunately, this name was overruled and “Lorrie’s Site” stuck instead.



Bottom row from left is Lorrie McWhinney in tank top. Second from left is Dr. Ken Carpenter (dark hair and glasses), our museum curator and trip leader. Second row first from left with dark hair and glasses is Angie Matthias.



Normal osteoderm



Pitted osteoderm

The preparation process in the lab revealed that numerous ankylosaur armor samples appeared pathological. With the encouragement of Dr. Carpenter, I was given the opportunity to investigate why we were finding “pitting” on the exterior of the bone. I used to work for Kaiser Permanente, and so I had a lot of disease resources available to me. It soon became apparent that more samples were needed for a proper investigation. Each subsequent field season increased the number of pathological specimens. After Angie joined me in this investigation, we looked at other museum collections, interviewed many professionals in different fields of expertise, and reviewed endless amounts of publications. Despite the fact that pitting or cratering on ankylosaur osteoderms has been noted by various authors, our study was the first detailed analysis of such pits based on a large sample size of osteoderms. We ended

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up examining over 1100 osteoderms that exhibited a peculiar pitting with different shapes and sizes. Data on the pits were collected with digital calipers, thin-section analysis, SEM, and non-destructive X-ray computed tomography. The comparative data on pitting in modern relatives, such as crocodiles, was collected from veterinarians as well as from observations of recently-dead alligators.

Some of the ankylosaur osteoderm pits pierced the cortical bone down to the trabecular bone and some did not. Because there is no one-size-fits-all description of this pitting, we implemented the Istanbul Protocol (Appleby et al., 2015) which gave us some leeway when trying to describe and diagnose the cause of this pitting. The Istanbul Protocol is a slightly modified system of describing imprecise characteristics of lesions so that all levels of forensic disciplines can understand, without a doubt, each other's descriptions locally and across the world. In applying the Istanbul Protocol, we ranked the various potential causes of pitting, with ulcerative dermatitis (seen in modern crocodiles) as the most consistent. Because these are fossil specimens, the direct cause for this pitting remains unknown, but our paleopathological interpretation is that osteodermal pitting commonly seen in ankylosaurs may be a result of secondary infection from insects feeding on blood.

References:

Appleby, J., Thomas, R., Buikstra, J., 2015. Increasing confidence in paleopathological diagnosis—Application of the Istanbul terminological framework. *International Journal of Paleopathology*, 8, 19–21.

To learn more:

Matthias, A. E., McWhinney, L. A., & Carpenter, K. (2016) Pathological Pitting in Ankylosaur (Dinosauria) Osteoderms. *International Journal of Paleopathology*, 13, 82-90. <http://dx.doi.org/10.1016/j.ijpp.2016.02.006>

Read about the discovery of "Lorrie's Site" in this 2000 [Denver Post article](#).



by Susan Butts, Yale Peabody Museum of Natural History; Talia Karim, University of Colorado Museum of Natural History; Chris Norris, Yale Peabody Museum of Natural History; and Dena Smith, National Science Foundation

About iDigPaleo

First let's deal with a common misconception - [iDigPaleo](#) is an educational and outreach site developed by the [Fossil Insect Collaborative](#) TCN (FIC-TCN) and not just the paleo version of iDigBio. [iDigBio](#) is the national hub

for digitized biological collections (including paleontological collections data). It aggregates collections data fed from institutions, provides a national portal for collections discovery, and feeds data to third parties including GBIF. iDigPaleo also aggregates specimen data from institutions, and much of those data overlap with iDigBio.

But iDigPaleo is specifically designed for use by the K-12 community and is also a great resource for avocational paleontologists. Our team of paleontologists is developing curricula based on Next Generation Science Standards and will bring collections-based research to the classroom using the activities and tools found on iDigPaleo.

The pilot version of iDigPaleo was developed as part of the FIC-TCN with the aim of including all the digitized records of fossil insects from the partners in the project – eight funded through a grant from the National Science Foundation, together with two federal institutions. We included modern insect specimens from some of our collaborators' collections as well, because they allow students to do classroom activities that compare modern and fossil insects. Although the current version of iDigPaleo is focused on insects, it's intended to grow to include other paleontological projects. We are about to begin work on incorporating specimens and developing educational activities for a new project, the Cretaceous World TCN. This focuses on the marine vertebrate, invertebrate, and microfossils of the Cretaceous Western Interior Seaway. The classroom activities that will be developed for iDigPaleo for the Cretaceous World TCN will examine food webs and help students understand the complex ecological dynamics of a sea filled with plankton, clams, ammonoids, fish (including the giant Xiphactinus), huge turtles, and predatory mosasaurs, at the time when T. rex ruled on land.



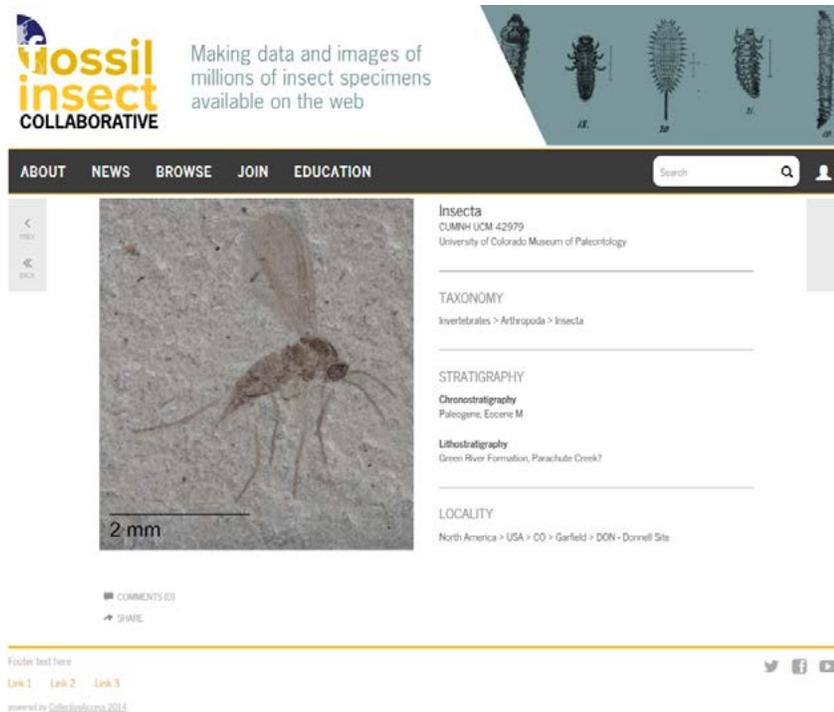
Yale Peabody Museum specimen #584531 - Diptera (fly) from the Green River Formation (50 million years old) of Colorado, collected by Jim Barkley.

Using iDigPaleo

To start using iDigPaleo, the first thing you'll need to do is register. It isn't mandatory – you can explore the collection online, just like any other web portal, but registering is free, and lets you save and share your own collections of specimen records and also gives you access to tools that let you do things like measure and annotate specimens. Once you've registered, you can browse our collections (click on BROWSE) in the same sort of way that you might browse the collections in person—by type of insect (we've included common names to make it easier), geologic period, or geographical region for example. You can limit your search to either fossil or modern insects, or include both. You can choose to explore all specimen records, or just those that have images using the built-in filters (filter by "has media" for only those records with images).

If you hover over a record in your results, you'll see a tiny suitcase icon. Clicking on it will add that particular record to a group of records – a collection that you can save and return to. Clicking on the gearwheel next to your results tally at the top allows you to add all the records in the results in one go. You can create different virtual fossil collections and image galleries in your account. We call these collections "assignments", since the main use for this iDigPaleo tool is to allow students and teachers to make sets of records for classroom activities.

Clicking on a fossil record also brings up a larger image of the fossil, plus a map showing the fossil collection locality (if the coordinates haven't been provided by the museum). If you click on the image, you'll have the opportunity to share



Viewing an object record in idigbio.org. This record is for University of Colorado Museum of Paleontology specimen #42979.

the fossil with friends by email (we plan on adding social networks soon).

You'll also see a menu that give you access to a set of tools that lets you add notes and text to images and make measurements of either the whole fossil or particular features. Some examples how of a class could use galleries and annotation are:

1. Find and make collection of this type of fossil.
2. Find and mark these features on the fossil and make notes describing the feature.
3. Where do you find these fossils? What does this tell you about past environments?
4. Measure an insect morphological feature. Compare it with those on modern insects.

When teachers register to use iDigPaleo, they get access to the collections that their students create (this is set up during the initial registration process) and can create and share their own collections with the class. Fossil collectors can use iDigPaleo in the same way and can share either individual records or collections. So, if you are part of a fossil club, you could create a gallery of fossils known from the location of your next field trip and share that gallery; iDigPaleo also has tools that let you create a PowerPoint presentation of your specimen images, a PDF handout, or a checklist. You could also make a gallery of museum representatives of the species in your own collection.

High school interns from the Yale Peabody Museum's EVOLUTIONS afterschool program have created a video introduction to iDigPaleo. Fiona, one of our summer 2015 interns, has a [quick introduction](#) to iDigPaleo and the Fossil Insect Collaborative and discusses [why we digitize fossils](#).

To learn more:

Follow us on [Facebook](#)—look for the Fossil Insect Collaborative-Digitization Project.

Explore iDigPaleo at [iDigPaleo.org](#). We'll be adding new fossil insects regularly as the digitization aspect of our project progresses. We hope you visit us soon!

PALEOART: JURASSIC ART AT THE NORTH DAKOTA HERITAGE CENTER AND STATE MUSEUM

Editor's Note: This issue we interview Jessica Rockeman, [State Historical Society of North Dakota](#), and Becky Barnes, [North Dakota Geological Survey](#), who offered a summer class in Jurassic art for young teens.

What are your backgrounds in art and paleontology?

JR: Paleontology is exactly like my art hobby. It's an entirely enthusiastic, self-driven education.

It is probably an odd sort of hubris to go about drawing dinosaurs and other extinct things, but I've met some of the most amazing people doing it. Bringing a creature back to life is part of it, but the real magic for me happens when people connect with a piece. I think you can

tell when an artist or author genuinely likes people. They may not know it, but they are stimulating new thoughts that others can share. Do you remember when you made someone laugh because of something you drew or used a word you shouldn't have in class? Moments like that are potent. They taught me valuable lessons. That words and pictures have power. I never forgot that.

BB: I have my Master's degree in paleontology, and a Minor in art. When I was younger I had to make a decision on which field I wanted for my career, and which for my sanity. For a long time I studied both, but paleontology eventually won out as my primary path. While I do a lot of art for work, it's not my main focus. For art, I do a lot of drawing and illustrating, but I'm actually a big fan of woodworking, sculpting, and carving. It makes for a good balance.

What inspired you to offer the classes?

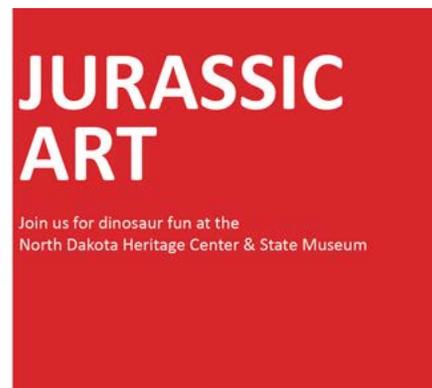
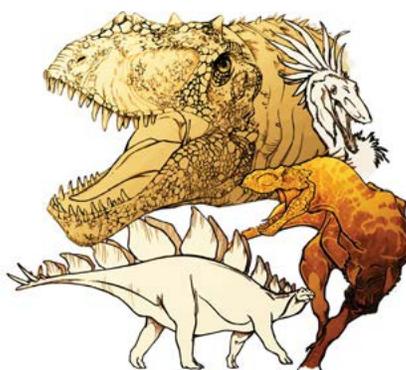
JR: Becky and I were gambling that the universe had more than two art-crazy kids. We came up with a series of classes that included molding, sculpting, puppets, and drawing and we couldn't have asked for better students. The chance to get your hands on real art supplies and talk to a real paleontologist is rather rare. It's been a terrific opportunity to be able to do a program like this, free for students, and we're looking forward to next summer at the Museum.

BB: Jessica came up to me and said, "We should do this! Want to do this?" and I said "Sure!" Paleo is always looking for ways to bring fossils to the public, and this was an opportunity we couldn't pass up. We just had to figure out what activities we could do in a short amount of time.

How many kids participated and their ages?

JR: We cap the classes at 20 students and we advise a range of 11-16 because the classes are two hours. When you are trying to wrangle art supplies, explanation, and have time for a student to create a great project, two hours is not a lot of time.

BB: I'd say our average was around 12-13 year olds. It's hard finding big chunks of time in the summer, so two-hour class times were about the maximum we could do.



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Why is it important to connect the disciplines of paleontology and art for kids?

JR: Paleontology and art are intriguing connections for any age group. Sometimes you can perfectly accrue the information and problem solving you need, but more often, your precious hours may be spent managing surprises no one expected. Most people are already curious about dinosaurs and saber toothed cats, they just need the support for their scientific curiosity. And sometimes the process of learning might look like puppets and comics. It's about having fun and making that connection

Whether you're a kid going through a phase or an adult with a half hidden passion for paleontology, art makes that connection where science meets creative license. There are scores of internet dwellers ready to pounce the moment you get something wrong about their pet interest -- some polite, some not so much -- fix what you can and give yourself permission to reach for better than what you had the day before.

BB: A lot of people think that paleo-art stems from the field of science. There are times, however, that artistic license and imagination has provoked scientific questions. Maybe one artist draws a dinosaur with a feathery headcrest instead of scales. Did the animal actually have a feathery headcrest? Maybe a fossil found in the future will tell us -- but this give us questions to ask! Blending science and art is a great way to make things stick. I study a lot of bones and skeletons in my field -- but they don't really *stick* in my brain unless I draw them. So... I do a lot of drawing.

To continue what Jessica said above, when you do artwork, FINISH a project. I don't care if you think it's terrible -- finish it, and put it aside. Start again. Finish another. With every piece you do (drawing, painting, carving, whatever), you'll learn new things. You are your own worst critic -- it took me a long time to learn that.

To learn more:

Read Becky's [blog](#)



Jurassic art clay tile

REVIEW OF FOSSIL WEBINAR: FOSSIL COLLECTING WHERE, WHEN & HOW TO FIND FOSSILS

Editor's Note: Joyce Drakeford will be writing summaries of each of the four webinars in our fall series.

by Joyce Drakeford (member, Special Friends of the Aurora Fossil Museum)

On August 31st I had the privilege of joining the first webinar sponsored by the FOSSIL Project and the Paleontological Society. There were as many as 68 participants at one time attending the webinar and I chose to connect via my cell phone with Adobe Connect Mobile app on my Android phone.

Our speaker, Jayson Kowinsky is a high school teacher who also created the website www.fossilguy.com as well as several other websites. The reasons he enjoys fossil hunting include: love of the outdoors, love of nature and history, and the fact that this is one of the few hobbies where amateurs can make contributions to science. Jayson was encouraging about the hobby of fossil collecting because science needs amateurs. Seventy-five percent of donated fossils come from amateurs and they make new discoveries all the time. However, the majority of fossils are quite common and museums do not want them. For instance, a quarry in Ohio where trilobites can be found regularly grind up fossils with aggregate to go into cement.



Lisa Lundgren & Joyce Drakeford

In the beginning, after being brushed off while trying to identify his finds for around 16 or 17 years, he decided to create his own site. (This was before information was readily available via the internet.) Jayson stated that the internet and social media has positively influenced the fossil hunting culture by helping people find correct information about finds, locating fossil sites, and being able to better collaborate with professionals. The negative impact has been the destruction, by unethical collectors, of some of those sites made available.

What most people don't realize is that they are about 10 minutes away from a fossil at any given time. To learn how and where to collect fossils, Jayson suggests joining a local fossil club and reading fossil-related books such as *Vertebrate Fossils: A Neophyte's Guide* by Frank A. Kocsis, Jr. He also recommends using Google Maps, websites like myFOSSIL, and searching the internet, but to also be aware of websites with misinformation. When using Google Maps please seek permission on private lands and follow all laws and permit regulations for each area.

If you missed Jayson Kowinsky's webinar, you may watch it at community.myfossil.org. The series will continue with three additional free webinars on September 29, October 19, and November 30.

by Victor Perez, Florida Museum of Natural History

I recently had the great pleasure of visiting the North American Research Group ([NARG](#)) for their annual Fossil Festival and some fossil collecting near [John Day National Monument](#). The Fossil Fest was held at the [Rice Northwest Museum of Rocks and Minerals](#) just outside of Portland, Oregon. Nested within a small forest, this museum contains an exceptional collection of rocks, minerals, and fossils, with a particularly amazing collection of silicified wood. Just outside the museum a ring of display tables were set up with a variety of fossil exhibits and activities for visitors to appreciate.

Every year, the Fossil Fest has a paleontology-related theme—this year's theme was teeth. The theme was reflected in the display tables and through two presentations by Dr. John Bershaw and myself. Dr. Bershaw spoke about utilizing isotopes in fossil teeth to determine altimetry in past environments. I spoke about using fossil teeth to determine the evolution of *Carcharocles megalodon* and how we've incorporated 3D printing to bring these teeth into K12 classrooms. I certainly hope to make it back next year and strongly encourage everyone else to visit as well!



MacKenzie Smith running a children's activity booth, in which visitors are given a pamphlet of questions called 'An Epoch Journey' and must use the other exhibits to find the answers. Once they've completed the activity, they get to spin the wheel and receive a prize.



Trailhead sign in John Day Fossil Beds National Monument, reminding visitors that collecting fossils and/or artifacts is prohibited within the park.

The rest of my trip in Oregon was spent just outside of the Painted Hills Unit of John Day Fossil Beds National Monument. Although the monument is protected land, the surrounding land is operated by the Bureau of Land Management, which means you can collect fossil invertebrates and plants without a permit.

I was accompanied by Aaron Currier (president of NARG), Robert Rosé (NARG board member), and MacKenzie Smith (NARG board member). We spent three days in the high desert collecting fossils to be used in K12 educational kits. We were particularly focused on finding *Metasequoia* leaves. However, within the first half-day we found over 300 *Metasequoia* leaves (much more than we needed). So we spent our remaining time looking for ammonites at a Cretaceous site and fish scales along a roadcut. Overall, it was an amazing experience, during which I made some great new friends and discovered some incredible fossils. I can't wait to return and visit the Oregon coast for another flavor of fossil collecting in Oregon.

Thank you to everyone who made the trip such a memorable experience! If you want to see more pictures from my Adventures in Oregon, visit [The FOSSIL Project Facebook page](#).



Fossil locality exposing the Bridge Creek Flora of the John Day Formation. Shown here are Aaron Currier and Robert Rose, collection leaves for educational kits. Every slab or rock you see has at least a fragment of a fossil in it.



An impression and counter-impression of a *Metasequoia* leaf from the Oligocene (~31 million years ago) of Oregon.



The iconic Painted Hills

RAISING FUNDS FOR YOUR CLUB OR SOCIETY

by **Bruce J. MacFadden and Eleanor E. Gardner, Florida Museum of Natural History**

Most fossil clubs and paleontological societies generate funds to support their activities and awards. Such funds are critical to the success of these organizations and their capacity to advance their goals and objectives. These funds are typically generated by member dues, auctions, raffles, and net proceeds from other activities like fossil fairs. These are all time-tested ways for your club to sustain itself.

In this short article we want to focus on examples of other successful ways to raise additional funds for special programs, activities, and new initiatives. We are therefore highlighting two such fundraising efforts that have been recently successful in Florida—from the Southwest Florida Fossil Society (Port Charlotte) and the Florida Fossil Hunters (Orlando).

Through personal connections, the president of the [Southwest Florida Fossil Society](#), Chuck Ferrara, became aware of the Community Foundation of Sarasota that supports local non-profit organizations in the southwest Florida area. Partnering with them, the SWFFS undertook a 24-hour online fundraising drive for their society. Donations totaling \$1800 were received during this time interval, and with the match from Community Foundation of Sarasota, the net proceeds totaled \$4750. These funds will be used for worthy causes like increasing the amount of the annual student scholarships provided to the University of Florida and other regional universities, as well as new initiatives that advance the mission of the SWFFS (particularly focused on youth learning about fossils and paleontology). While we realize that not all fossil clubs and societies will have a local foundation available for matching funds, it never hurts to do some background research to see what might be available and with a mission that would align with the goals of your organization.



In March of this year, Cindy Lockner, Bonnie Cronin, and Russell Brown of the [Florida Fossil Hunters](#) and Eleanor Gardner of the FOSSIL Project partnered to write a grant proposal for consideration by the Paleontological Society's "Outreach & Education" grant committee. They were successful in convincing the [Paleontological Society](#) to award \$2,500 toward the FFH's efforts to increase participation by underprivileged minority K-12 girls in the annual Women in Paleontology Day event in Orlando, FL. Each year the PS provides a number of grants (up to \$2,500) to support programs and activities involving educational outreach and community engagement. According to the PS website, "potential fundable projects include, but are not limited to, field trips to fossil sites and/or museums for teachers and pre-college students, educator training and curriculum development, participation in local community initiatives, development of educational materials for classroom use, and website or other online material development." Many fossil clubs/societies around the US have similarly worthwhile endeavors that the PS may be interested in supporting. For further information about the PS Education & Outreach grants, see <http://paleosoc.org/grants-and-awards/paleontological-society-outreach-and-education-grant>. If your club or society needs grant writing tips, contact Eleanor at fossil@flmnh.ufl.edu – she has co-written two successful PS outreach grant proposals in addition to four successful research grant proposals.



We are certain that there are novel ways that other clubs have used to raise funds, and we would like to hear from you so we can feature these successes in our newsletter as well!