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Featured Paleontologist: Jorge Velez-Juarbe

By Shari Ellis

This issue, we spotlight Jorge Velez-Juarbe, Curator of Marine Mammals at the Los Angeles County Museum of Natural History www.nhm.org/site/research-collections. He is also a postdoctoral researcher at the Cooper Center at Cal State University Fullerton www.jdcoopercenter.org. Born in Puerto Rico, Jorge was included on a 2014 list compiled by Qué Pasa and LatinAmericanScience.org of 30 promising scientists under 40. Jorge was part of the international team that discovered a graveyard of whales off the coast of Chile in the Atacama Desert. His research focuses on the evolution and diversification of sirenians (otherwise known as the group that includes seacows, manatees and dugongs). You can read one of Jorge's articles at www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0031294.

I read that you decided to become a paleontologist at age 8. Can you describe how that happened?

When I was about 8 I received a Panini sticker book titled "Dinosaurs." However, it wasn't only about dinosaurs, but also had stickers of extinct organisms throughout all geologic time. It also had some stickers about the people who collect and study the fossils. But most of the ones portraying paleontologists looked boring to me; they were all old white-haired Caucasian males, with white lab coats. The lack of diversity and lab coats was a turnoff. The one stamp that grabbed my attention was one of a geologist finding dinosaurs eggs in the Gobi Desert; it was then that I knew I wanted to be like that guy. I guess what motivated me was the sense of adventure and discovery, and I do a lot of fieldwork which involves those two things, and it may be a way of getting younger generations interested in paleontology as well.

By the way, many years later I realized that the illustration in the sticker book was based on a real photo of Roy Chapman Andrews who in the early 1900's led scientific expeditions to Mongolia. Interestingly, he was also interested and published several scientific papers about marine mammals, which happens to be my area of expertise.

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Featured Paleontologist: Jorge Velez-Juarbe

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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?

Amateurs can and are known to have made important, long lasting contributions to paleontology; hence they play an important role in what we do. For example, they can be our eyes in the field, since they sometimes get to spend more time out looking for fossils than us scientists.

I recently discovered your blog. Can you tell me a little about your motivations for writing a blog?

I started my blog (Caribbean Paleobiology: http://caribbeanpaleobiology.blogspot.com) in 2008 mainly because I wanted people to learn about paleontology in Puerto Rico and about fossil seacows. Over time, I've broadened the scope a little bit and it has become a very important learning tool for me. I feel now, six years later, that I can explain and write about discoveries and what I do as a scientist more clearly than I did when I started it.

Of the fossils you have discovered, do you have a favorite?

Oh yes, I have many fossils that are my favorites. As I write this, my two, most favorite, are a fossil dugong skull that I found In Puerto Rico in 2005, and fossil pygmy sperm whale that I found in 2013 in Panama. A detailed description of the fossil dugong from PR will be published at the beginning of 2015; to me that specimen is the most beautiful fossil seacow skull I've ever laid eyes upon (and I've seen a lot). As for the Panamanian pygmy sperm whale, I am currently working on a detailed description of the specimen. An important point to make is that, even though I found the specimens, these are now part of museum collections—the seacow at the Smithsonian National Museum of Natural History; the other at the Florida Museum of Natural History. That way they are properly taken care of and other researchers can eventually go and study them.

> *Amateurs can and are known to have made important, long lasting contributions to paleontology...For example, they can be our eyes in the field, since they sometimes get to spend more time out looking for fossils than us scientists.*

What research question currently excites you the most?

Right now it will be the one related to my current NSF postdoctoral fellowship. The Eastern Pacific region was once home to a variety of large herbivorous marine mammal communities that sometimes included up to three or more different species, whereas today there are none (Steller's seacow was a relict of this ancient diversity, but was driven to extinction in the 1700's). These ancient faunas included seacows, desmostylians (which were large hippo-like elephant relatives), and aquatic sloths. Because there is no modern analog to these communities, the main question I have, is what was their ecology like? So, over the next several years, I'll be looking at fossils of these different groups in order to try to answer that and other questions.

Upcoming Events:

Summer at La Brea

Guild of Natural Science Illustrators Conference

Florissant Field Course

Fossil Day at the Mound

CCMFC Lecture with Bruce MacFadden

View our full events listings

my FOSSIL

We have launched our new website. Visit us at www.myfossil.org and check out our fossil resources, including:

- Directory of fossil clubs and societies throughout the U.S.
- Fossil parks
- Workshops
- Field Opportunities
- Event listings

Club Corner: Dry Dredgers

Volume 1, Issue 2, June 2014

By Jack Kallmeyer, President

The Dry Dredgers officially organized as a club associated with the University of Cincinnati in April, 1942. The group was an offshoot of an evening lecture series started at U.C. in 1937 entitled, "Cincinnati 400,000,000 years ago." The lecture series included field trips on the weekends led by Professor Kenneth Caster. The lectures continued for at least the next four years adding the archeology of the local Indian cultures to the geology and paleontology topics. Some thirty-three enthusiasts of paleontology approached Professor Caster in April of 1942 asking him to formalize the group with him as U.C. advisor. This began our long association with U.C. that continues to this day. Succeeding Professor Caster as club advisor was Professor Richard Davis who preceded our current advisor, Professor Emeritus David Meyer.

The Dry Dredgers is perhaps the most oddly named group amongst the many amateur organizations dedicated to paleontology across the United States. We come by the name honestly through a well-recognized and esteemed early paleontologist, James Hall, who had no idea that his casual comment would inspire others to cast it in stone as the name of an organization in 1942. Hall's statement: "Geology dry dredges the sea bottoms of antiquity" (Fox, ca. 1952). Our founding sponsor at the University of Cincinnati, Kenneth Caster, proposed the name Dry Dredgers in 1942 and explained the origin as being from an 1895 Charles Schuchert quote of Hall in an article entitled, "Dry-dredging the Mississippian Seas" (Caster, 1982).

Most of the documented early history of the Dry Dredgers has been lost to what I can imagine was a very disappointed thief who absconded with our box of archival material. This box had transferred from President to President through the years. After that unfortunate incident, we established an official archive through the University of Cincinnati. Our materials are now organized and kept safe. We have rebuilt some of our early history from the donations and estates of our early members but many gaps remain.

University of Cincinnati professors David Meyer and Carlton Brett working with Dry Dredgers member Ron Fine on his newly discovered fossil of unknown affinity. Nicknamed "Godzillus" by Fine, the discovery made international news.

Members of the Dry Dredgers are collectors, curators, and philanthropists – men and women – young and old. From our 1942 beginning of about 33 charter members, we are now a group of around 250. For many years the membership remained around 100 until we made two additions. One of our members, Greg Courtney, observed that people with children would join and then leave after a year because our programs were too technical. After becoming Education Chair, Greg instituted a Beginner's Class held 45 minutes prior to the main meeting and program. The other change was the addition of our website www.drydredgers.org by another talented member, webmaster Bill Heimbrock. These two changes contributed largely to the increase in membership. We have very recently become active on Facebook and Twitter and have hope that this addition will bring in even more members.

We collect for as many reasons as there are members. We have members who want to know the name of a prized self-collected fossil and whether it is unique or rare. Others are not content with a basic identification and seek knowledge about the bigger picture of ancient life. Some maintain their own personal museums of exceptional specimens. Many have amassed large collections of the abundant and well-preserved Upper Ordovician fossils from the Cincinnatian – we are spoiled in this regard since collecting here should more properly be termed Ordovician beach collecting. Greater Cincinnati is world famous for the abundance and excellent preservation of the Upper Ordovician fossils found here.

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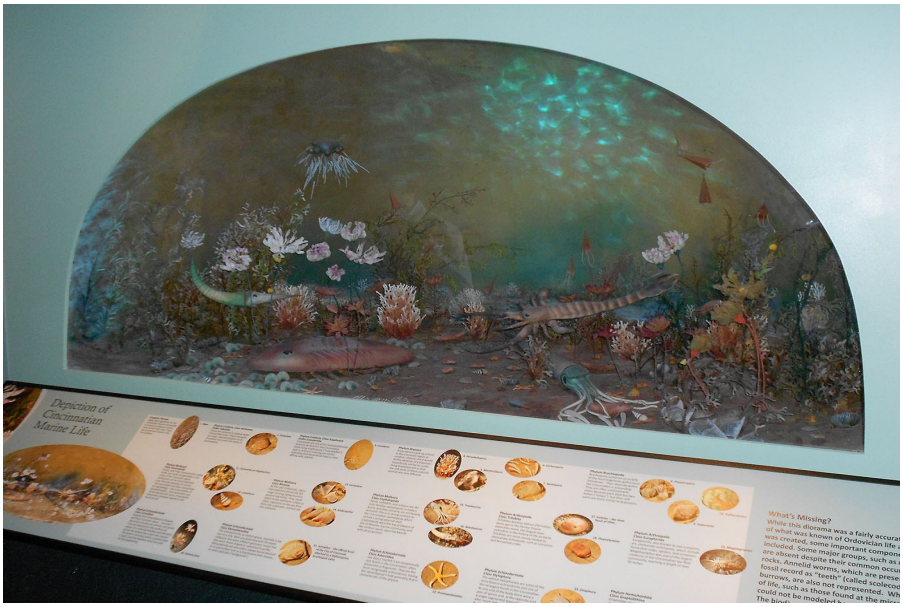
Whether new to collecting or more experienced, Dry Dredgers members are interested in advancing science. Over the many years of our existence, members have donated fossils of all types to the University of Cincinnati and to the Cincinnati Museum of Natural History. A large portion of the research collections at the Cincinnati Museum Center Geier Collections and Research Center came from Dry Dredgers (Hunda, 2014). Dry Dredgers have contributed specimens, shared localities and assisted with field work with graduate students and professional paleontologists since our early beginnings. Retired Miami University (Oxford, OH) Professor John Pope stated that, "Many of the important fossil discoveries in this region have been made by members of the Dry Dredgers" (Kallmeyer & Meyer, 1997). At least two of our members are currently working directly with professionals on research papers that will potentially introduce new species of organisms not previously known from the Cincinnatian – quite an accomplishment for an area that has been studied by many elite paleontologists for almost 200 years. The Dry Dredgers website has a listing of all publications involving the Dry Dredgers or individual members at: www.drydredgers.org/references.html.

The Dry Dredgers has become an internationally known organization through the efforts of our members. We have had dedicated and enthusiastic advisors from the professional ranks, close associations with the many curators who have been with the Cincinnati Museum Center, energetic graduate students and club members who have brought their individual expertise to the organization and running of the club. Because of the efforts of these many people, we have moved from a small club barely able to finance the bulletin mailing to one that has the ability to do philanthropic spending. Proper stewardship of these assets will allow us to continue this well into the future. The Dry Dredgers have established an endowment fund that supports the research projects of students, professionals and amateurs (The Paleontological Research Award). We contribute annually to the U.C. Caster Endowment Fund that supports graduate research. A number of Cincinnati Museum Center projects have been funded by the Dry Dredgers including the recently opened "Cincinnati Under the Sea" exhibit. Spending in these areas supports our mission of stimulating interest and promoting education in stratigraphy and paleontology and encouraging collection, preservation and classification of all fossils.



The historic 1957 Marchand Ordovician diorama restored for the new Cincinnati Under the Sea exhibit that opened June 13, 2014.

We are looking forward to participating in National Fossil Day in October and are partnering with the Cincinnati Museum Center toward that end. We will celebrate on October 18 with a Fossil Festival event at the Museum that will include many family oriented activities at the Museum plus special exhibits of private collections and a fossil identification service. The events will end on October 19 with self-guided field trips to a number of collecting localities in the greater Cincinnati area. The events are still in the planning stages.

May 2 & 3 of 2015 will be the 50th anniversary for Geofair. This fossil, gem, and mineral show is co-sponsored by the Dry Dredgers along with the Cincinnati Mineral Society. Unlike other smaller shows in the area, Geofair has a substantial educational content and is family friendly. The 2015 show will be held at the Sharonville Convention Center – see geofair.com for more information.

The Dry Dredgers legacy has been a 72 year partnership between professionals and amateurs. We look forward to continuing this tradition in the years ahead.

Refererences

Fox, Edith, 1952 quoted in an introduction to a talk presented to the Dry Dredgers by William Shideler.

Caster, Kenneth E., 1982, from a talk to the Dry Dredgers.

Hunda, Brenda, 2014, Opening remarks for new "Cincinnati Under the Sea" exhibit.

Kallmeyer & Meyer, 1997, in Geology Today, Vol 13, Number 6, "The Dry Dredgers of Cincinnati, Ohio, U.S.A."

Featured Fossil: Chimaeroid egg capsule

Volume 1, Issue 2, June 2014

Submitted by Aaron Currier and Peg Johnson of North America Research Group, Oregon

Photos by Peg Johnson

The backstory

This fossil specimen was found on a NARG (North America Research Group) field trip in August 2009. It is from the Keasey Formation (Oligocene) near Vernonia, OR. The formation is marine sediment, but we have found leaf fossils in the formation. We knew it was something unique, but what was it? We thought it might be a sea pen; another thought was a large seed pod. We asked some of the local experts, but they weren't sure. It was later identified as a Chimaeroid Egg Capsule. These fossils have been found in deposits as old as the Devonian outside of the Pacific Northwest. As far as we know, it's the first one of its kind found in Oregon. It will be donated to the University of Oregon Condon Collection where the hope is that research will reveal a new species.

Aaron Currier, North American Research Group, Salem, Oregon

The paleontologist's perspective

Sediments of the Keasey Formation crop out in the extreme northwestern part of Oregon. This rock unit consists of mudstones, silts and sandstones that are of early Oligocene age (about 30 million years old). The Keasey Formation contains exceptionally well-preserved fossils, including those of crinoids, corals and the chimaeroid egg capsule depicted here. Fossil localities consisting of exceptional preservation are referred to as Lagerstätten, a term of German origin, loosely translated to mean "mother lode." Konservat-Lagerstätten is a term used to describe localities where soft tissues are preserved. These deposits are exceedingly rare, but are of great scientific value to paleontologists.

Chimaeras are fishes with cartilaginous skeletons and they have a spotty fossil record extending back 400 million years into the Paleozoic Era. Fossils of chimeras are mainly represented by isolated tooth plates, fin spines and egg cases. Fossilized egg capsules are very rare, having been reported from only a handful of localities of Mesozoic and Cenozoic age (Brown 1946). Obruchev (1967), who reviewed the fossil record of egg capsules, reported only 31 occurrences worldwide, and only one record from the Cenozoic. This record from the Oligocene of Alaska was given the name Chimaerotheca alaskana by Brown (1946), but was referred to the genus Harriotta (spookfish) in Obruchev (1967). To our knowledge, the fossil from the Keasey Formation is the only other example of a chimeroid egg case reported from the Cenozoic.

Featured Fossil: Chimaeroid egg capsule

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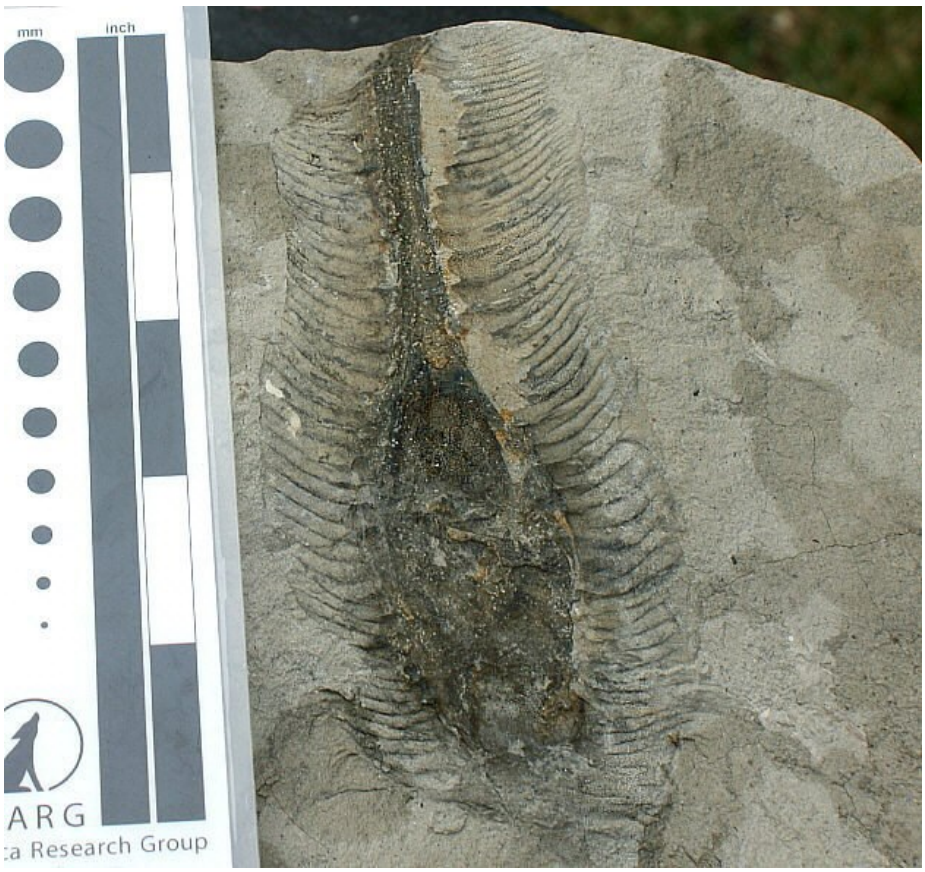

They share the cartilaginous (not bony) skeletons with sharks, and thus are classified together in the group called Chondrichthyes. Modern representatives of the chimaeras include rat fish, rabbit fish and the elephant "shark" depicted below. The elephant shark (Callorhinchus milii) is native to the temperate waters off southern Australia and New Zealand, living at depths of 200 to 500 meters and also migrating into shallower waters. Studies published just this year (Venkateash et al. 2014) of the genome of the modern chimaera (Callorhinchus milii) indicate that they are the most primitive vertebrates with jaws. Both from paleontological and genomic points of view, chimaeras and their close relatives (called holocephalians) have remained relatively unchanged for millions of years through evolutionary history. They are examples of what paleontologists call "living fossils."

The chimaeroid egg capsule from Oregon is a rare find, one of potential interest in unraveling the embryonic characteristics of these enigmatic ancient vertebrates.

Bruce MacFadden, Florida Museum of Natural History, University of Florida

Austin Hendy, Florida Museum of Natural History, University of Florida

Modern (Ghost shark) egg capsule- Callorhinchus milii
http://www.flickr.com/photos/nuytsia_pix/320399494

For further reading

Brown, R. 1946. Journal of Paleontology, Vol. 20, No. 3, pp. 261-266 http://www.jstor.org/stable/1299364

Obruchev, D. V. "Fossil chimaera egg capsules." International Geology Review 9.4 (1967): 567-573. http://www.researchgate.net/publication/232843219_Fossil_chimaera_egg_capsules

Venkatesh, B. et al. 2014. Elephant shark genome provides insights into gnathostome evolution. Nature, volume 505, pages 174-179, http://www.nature.com/nature/journal/v505/n7482/pdf/nature12826.pdf

Current Happenings with The FOSSIL Project

Volume 1, Issue 2, June 2014

By Shari Ellis

We are pleased to announce that—after months of research, interviews and meetings—we have contracted with Atmosphere Apps to build the my*FOSSIL* website!

Founded in Gainesville, Florida by a physician-in-training, Atmosphere Apps is best known for mobile products for the health care community including drug reference guides, diagnostic tools and continuing education courses. You can read more about the company at www.atmosphereapps.com. A number of criteria led to our selection of Atmosphere Apps among a pool of other viable options. We were impressed by Atmosphere Apps' track record of bringing products to market, capacity to meet deadlines and provide excellent service, experience working with the University of Florida, diverse expertise of their staff (including designers, coders and usability testers), and ability to produce a website that the community can sustain over time at reasonable expense.

Although Atmosphere Apps built its reputation on tools for hand-held devices like smart phones, they have the capability to create products for all existing platforms. Our contract with Atmosphere Apps is to build a "mobile-optimized" website, which means my*FOSSIL* will function on computers, tablets (e.g, iPads) and smart phones. The biggest change you will see between the current my*FOSSIL* website and the one created by Atmosphere Apps is increased interactivity. That is, members of the community will be able to participate in conversations, post announcements, etc. directly without going through a request process like is required now.

Participants at the FOSSIL Kickoff meeting discuss priorities for myFOSSIL, which will be designed based on feedback from users of the network. Photo by Jeff Gage.

The schedule for the development of my*FOSSIL* is as follows. Between now and the middle of July we will be in a Design and Discovery phase. During this period, Atmosphere Apps will take the "wish list" for the website we created based on input from the community provided on surveys and at the Kickoff meeting at NAPC and build a "wire-frame" (essentially a flow-chart) that maps out all the possible site components, where they may sit on the site, how to navigate around the site, the cost of each element and, of course, what my*FOSSIL* will look like. A team will then start making decisions, including which functions we definitely want to add to the first new version of my*FOSSIL* and which we will add later. Between the middle of July and early October, we will go through several iterations of website development. Members of the FOSSIL community will play critical roles throughout this iterative process, helping us test the website and providing feedback to ensure that my*FOSSIL* meets your needs and expectations.

Our goal is to unveil the new website by mid-October. In the meantime, kudos to Kassie Hendy for keeping the existing my*FOSSIL* website operable and up-to-date! And be sure to continue to send us information you want us to share.

FOSSIL Project Announcements

The FOSSIL Project is developing a lineup of distinguished speakers who are available to visit fossil clubs and paleontological societies across the country. Topics will vary. Contact fossil@flmnh.ufl.edu if you are interested in hosting a speaker.

The FOSSIL Project is excited to provide an opportunity for one club member to attend a three day field course to the Florissant Fossil Beds of Colorado at the end of July. The lucky winner will be reporting on their experience in our next newsletter.

Reflections from NAPC by Louis Stieffel

Volume 1, Issue 2, June 2014

By Louis Stieffel, President of Fossil Club of Lee County, Florida

In February, I attended, along with long-time member Al Govin, the North American Paleontological Convention (NAPC), in Gainesville, Florida. This opportunity was initiated through a new program, THE FOSSIL PROJECT. With guaranteed funding for four years, the goal of the project is to join together professional paleontologists, natural history museums, and amateur or avocational paleontologists, such as us. As the NAPC convention wound down, the participants in the FOSSIL project commenced meetings to meet and discuss ways to make this program work. We had organized workshops on various topics, such as involvement of citizen scientists with museum collections, how to best maximize communications between the professional and amateur communities, and the future of digital advances on the hobby. There were many other topics and after the round table discussions we reviewed the results as a total group, with everyone attending understanding the objectives needed to reach the goal of that particular topic.

We all stayed in the same hotel, so after-hours consisted of meeting each other and networking for future communications. There are a few clubs, in various parts of the US, that now have some Florida fossils which I sent to them. In turn, we will get some fossils from their local area, which I plan on putting into next year's auction.

How often, when on a vacation trip, have we wished we knew of a fossil location to hunt while there? This new, developing network will help us have the contacts in those places to help us do this. Want to visit a natural history museum? We just may have acquired the right contact person to help show you around. We may also get some interesting speakers for our meetings as many of these club members, and professionals, from other parts of the country visit our area. So, the direct benefit to our club is a bonus from this project and should continue to get stronger.

While at the convention, I was able to procure a number of publications which are not readily available, on paleontology. Many are now out of print. These will be going into our club library, as soon as David Sheehey (the club librarian) can curate them into the library.

Another project that is happening right now, with a direct interest to us, is the iDigBio project. This ambitious project is trying to put entire collections on the internet, using the cloud as the repository. You will then be able to see the collections hiding behind the scene, in the basements, and out of view of the general public. You can learn more at www.idigbio.org

We learned a lot about other fossil organizations, which were attending from all over the US. I hope to present some of their unique and creative ideas to our club. In the meantime, you can learn more about the fossil project at: www.myfossil.org.

I will do my best to keep you informed of continuing developments with the FOSSIL PROJECT and how it affects our club. In the meantime, check out these websites and see how interesting things are getting!

Editor's note: Kassie Hendy and Austin Hendy recently visited the Fossil Club of Lee County (FCOLC) to speak about the FOSSIL project and Paleontology in the Desert of Colombia and Venezuela. The Hendys took the opportunity to visit the Fossil & Gem Museum at the Shell Factory of Ft. Myers which was created by the members of the Fossil Club of Lee County. The Museum consists largely of specimens on loan from members of FCOLC and is free to the public. FCOLC puts on special events at the museum, and will be hosting a Fossil Fun Day on June 29th. Below are a couple of photos from the museum. Photos by Austin Hendy. You may see more on our website here.

Reflections from NAPC by Lee Cone

Volume 1, Issue 2, June 2014

By Lee Cone, Friends of the Aurora Fossil Museum

Last year the Friends of the AFM was contacted by the Florida Museum of Natural History about taking part in a national program called The FOSSIL Project. Carol presented the introductory letter to the Friends Board, and the board agreed to look into the program. As Friends President, I revisited this idea in October, and after talking to the project coordinator I felt as though it truly was a worthwhile venture to attend. This developmental program was hosted by the University of Florida and held in conjunction with the North American Paleontological Convention (NAPC), a once in four year international event, which drew presenters from 28 countries and featured in excess of 350 individual presentations over the week-long event. Getting there turned out to be quite a timing problem, since the southeast was hit by snow and ice the day before my plane departed. With the flight cancelled, improvised new plans called for an 8 hour "road trip", and fortunately I-95 was traffic free and road conditions were no problem. I cannot say enough about the organization of the University of Florida's paleontology staff at every level. The hotel arrangements, field trips, banquets, time schedule for presenters, and work sessions were carried out with amazing fluidity, punctuality, and attention to detail.

I had no idea how much information could be gained, beyond the bones themselves...

At our introductory meeting, we were informed that there were 60 organized amateur groups in the U.S., and that half were represented at the symposium spanning America from Aurora, NC to the state of Washington. As amateur paleontologists, all of the representatives of the fossil clubs, support groups, and museum societies felt honored to be able to be a part of the professional side of research presentations. We had the opportunity to format our own schedule of presentations, where professional paleontologists discussed their research abstracts in conference rooms filled with both amateur and professional paleontologists. Saturday, Sunday, and Monday were simultaneously intimidating, intellectually stimulating, reflecting, and educationally exciting. For those three days I felt as though I was back in graduate school feasting on cutting edge research and knowledge from every conceivable point of the paleontology spectrum. It was eye opening for me as an amateur collector. I had no idea how much information could be gained, beyond the bones themselves, about paleo-: ecosystems, climate, evolution, species interactions, and isotope technology.

Lee Cone at the FOSSIL Kickoff meeting

I also became acutely aware of the importance of the entire fossil site, which, understandably, may actually be more important than the specimens themselves to the professional. Herein lies one of the ravines which separate the professionals from the amateurs. It was revealed at the convention that 70-80% of all specimens in museums were collected by amateurs, thereby linking the importance of the amateur to the professional paleontologist. By counterpoint, though, I also realize how much knowledge can conceivably be kept from the paleontologist, because a complete investigation of a site was not made available to the professional. The FOSSIL Project serves as a starting point toward linking amateurs and professionals in a working network that will generate better research data for the future.

The other comment that really surprised me, made by the professionals, was that they envied the amateurs for their opportunity to be out in the field. Over and over many stated that they rarely had the chance to get out in the field, and that their lives were spent analyzing the collected data by others. Since symposium talks were given in 5 separate rooms throughout the day, I was only able to hear 20% of the total volume of presentations, but even at that small percentage, I really became aware of the importance of the small details to the professionals. These details are commonly overlooked and unnoticed by amateur collectors, as their thoughts are focused totally on the specimen.

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By networking through The FOSSIL Project it may be possible in the future to collect and share valuable data with professionals for their research. By expanding the dissemination of information both digitally and electronically, researchers are not limited to regional information filtering into museums and universities, but rather would have access to a much broader scope of information. By networking the various clubs, societies, and support groups, there will exist a connection that could be beneficial in areas of public outreach, club linked activities, digital sharing of collections and identification, fossil fairs, and engaging the knowledge that support of each other ultimately unites and strengthens the entire FOSSIL Project network from amateurs through the professional paleontologist.

The FOSSIL Project serves as a starting point toward linking amateurs and professionals in a working network that will generate better research data for the future.

It is important that the Friends of the Aurora Fossil Museum remain an integral part of this endeavor and further support The FOSSIL Project. Clearly the role of every amateur fossil organization varies throughout the country, but the architects of The FOSSIL Project hold a view that each organization will see benefits from the whole, and that FOSSIL will be driven by the needs of those that are involved. We all share a passion for fossils, and that passion is the same whether you are an amateur or a professional, or whether you are from Aurora, NC or the state of Washington.

For more about Friends of the Aurora Fossil Museum, check out Bruce MacFadden's blog on his recent trip to the Aurora Fossil Fest. The Aurora Fossil Fest is a huge annual event with concerts, a Little Miss Fossil Pageant, fossil sales, a parade, and other festivities. People descend on Aurora from all over the U.S. to attend. Aurora has one of the richest fossil localities in the world in its phosphate mines, which feature very nice specimens of Megalodon teeth. Below are a couple of photos taken by Bruce from his recent trip.

The Aurora Fossil Museum

Dig pit at the Aurora Fossil Fest

Stories of the Past by Jill Madden

Volume 1, Issue 2, June 2014

Jill Madden teaches earth and environmental science at Cesar Chavez Middle School in Watsonville, California. In July 2013, Jill and six other teachers accompanied Bruce MacFadden to Panama to engage in authentic research experiences collecting fossils along the Panama Canal. This summer, Jill is working in the education division at the Monterey Bay Aquarium. In this article, Jill describes how she incorporated what she learned into her classroom practice—and how her students responded. You can read media coverage of what happened at www.santacruzsentinel.com/News/ci_25868326/Watsonille-student-museum-offers-Blast-from

By Jill Madden

The human animal is deeply connected to story. And young people are the ones who delight the most in tales told or written. How do fossils enter into this?

Folks of any age are intrigued and delighted by fossils I think because they are a hidden treasure with many stories to tell us. By working with scientists through the PIRE Teach program, I not only collected fossils but engaged in scientific conversations with a number of paleontologists to be given the initial stories.

Students explore the fossils in their museum using resources developed by Austin Hendy for the Fossils of Panama project.

I had the opportunity this past school year to use those ancient fossils and their stories to teach my middle school students about evolutionary biology with a richness that I had not been able to offer them before. We explored the stories of the changing life on Earth through fossil evidence by studying actual fossils of marine invertebrates from the Gatun formation in Panama and the bones of ancient horses from Thomas Farm in Florida. They held, studied, illustrated and replicated fossils which led the students on deep explorations of the past. The result was 180 young people who wanted to share what they learned with other students by creating a fossil museum at our school site.

Every aspect of "The Blast from the Past" fossil museum was entirely crafted by my students from the title to each exhibit. They worked tirelessly for a three week span to make games and posters and activities to tell the stories the fossils had taught them. There were posters sharing such creatures as megalodon and saber toothed cats. There were sorting stations with tiny horse bones. And what was agreed to be the favorite activity station—a fossil bed to dig in and uncover actual fossils.

My students became docents and curators of their own museum. They proudly and with a huge element of fun devoted the last week of the school year to sharing their museum with adults and younger students. They stepped into being scientists instead of simply studying it. And the stories the fossils told taught them that science was not just something one read about but something they actively did. They connected to studying fossils in ways that were exciting and meaningful to them. As their teacher I was able to step back and smile. The stories shared through the fossil remains of ancient life had become their own.

For more on the Fossils of Panama project, go to www.flmnh.ufl.edu/panama-pire/fossils-of-panama/.

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