

A publication of the **Rochester Academy of Science** FOSSIL SECTION

The FOSSILETTER

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May 2024

May Meeting

The May section meeting is on Tuesday, May 7th, at **7:30 PM** Eastern Time. We will meet at the Community Meeting Room at the NEQALS (Northeast Quadrant Advanced Life Support) building at 1030 Jackson Rd, Webster, 14580.

Dan Krisher will kick off with a brief business meeting. Then our guest speaker is Dr. James Boyle, Assistant Teaching Professor and Director of Undergraduate Studies in the Geological Sciences Department at SUNY Buffalo. His presentation is "*A victim of its own Success—The armored fish Dunkleosteus terrelli.*"

Dr. Boyle's research interests focus on the paleobiology of arthrodire placoderms, a diverse group of armored fishes which abruptly went extinct at the end of Devonian Period and on using the fossil record to study patterns of extinction while determining which features of species are most strongly correlated with the risk of extinction. Doing this requires being able to place the timing of events in geologic time precisely and his research involves developing automated biostratigraphic techniques.



Dr. James Boyle. Photo composite with head shot provided by Dr. Boyle against Titanichthys by Gabuded at [deviantart.com](https://www.deviantart.com).

Dr. Boyle sends us the following, "*Dunkleosteus terrelli* was one of the last, largest, and most

fearsome members of a group of armored fishes known as arthrodires which dominated Earth's oceans in the Devonian Period (359-419 mya). It was first recognized over 150 years ago from robust lower jaws in northern Ohio. By the early 20th century many nearly complete heads of the species were known, and it became the standard of comparison for other arthrodires. This status was cemented by a very detailed description in 1932. Up until recently further studies of *D. terrelli* have been far and few between, in part because it was "well known" and there seemed too little more to gain from further study. However, we still know little about the ecology and development of *D. terrelli*. We do not know much about how it grew, the degree of variation between individuals, how widespread it was, and why it went extinct. I will present new information from a small *D. terrelli* from Ohio and findings in Pennsylvania along with a summary of recent studies looking at *D. terrelli* that start to chip away at these overlooked unknowns and bring our understanding of *D. terrelli* into the 21st century of paleobiology."



Dunkleosteus terrelli head shield at The Cleveland Museum of Natural History. Photo courtesy CMNH.

President's Report by Dan Krisher

The Section's April meeting was on April 2nd and was a hybrid in-person/ ZOOM meeting. Vice-President Michael Grenier ran the meeting due to the President being unavailable. The meeting kicked off at 7:30 with a brief business portion. Among the items discussed were the scheduled field trips for the season, the ADK outreach event in June, the Central New York Earth Science Student Symposium at Syracuse University in April, the annual RAS Spring lecture, and the need to find a future home for our monthly meetings.

The speaker for the evening was RAS Member Dr. George McIntosh, emeritus Curator of Paleontology at the Rochester Museum & Science Center. He is a life-long researcher on crinoids and has numerous publications on these starfish relatives. The subject of his talk was "Late Devonian crinoid ghost lineages." This was an expansion on a short talk he gave at last year's Subcommission on Devonian Stratigraphy (SDS) meeting at SUNY Geneseo.

Fossil Section Election – Need Volunteers

It is once again time for the Fossil Section to nominate its slate of officers for the 2024-2025 year. PLEASE consider helping and nominate yourself to be President, Secretary, or Board member. We promise that it is not much work! If you might be interested in running for any of these positions but would like additional information as to the duties and time involved, please contact one of the current Officers or Board members. The finalized ballot will appear in the June newsletter. Current RAS Fossil Section Officers are listed on the last page of this newsletter.

Upcoming Fossil Section Field Trips by Dan Krisher

Welcome to the 2024 field trip season. The process for signing up for a trip is largely unchanged from years past. About a week or so before a trip I will send an email out to all Section members concerning the upcoming trip. All interested members should get back to me via email at least 2 days before the trip and I'll respond with additional information for that trip

as soon as I receive your email. I will send out a final email to all attendees the night before the trip. If you have any questions or otherwise need to get a hold of me, you can contact me at 585.698.3147 or DLKFossil@gmail.com. The following field trips are scheduled for May and early June.

5/4 - Split Rock Quarry near Syracuse:



Split Rock Quarry. Image taken during a 2004 SUNY Cortland Historical Geology field trip.
<https://earthathome.org/splitrock/>

This family-friendly site is a large quarry located southwest of Syracuse. The site exposes Upper Silurian and Lower Devonian strata, but the main point of interest will be the large exposures of the Onondaga Limestone. Collecting here is limited to picking up loose material scattered near the quarry walls. This will be an exploratory visit to the site as I have not visited it in 35 years.

5/18 - Road Cuts Near Cherry Valley: A series of large road cuts near Cherry Valley exposes various members of the Middle Devonian Onondaga Formation and Oatka Creek Formations. The rock is primarily limestone and contains brachiopods and corals as well as a variety of other organisms in smaller amounts.

6/1 Little Beard's Creek: (Date confirmed)



The highly productive Little Beard's Creek trip in June 2019.

This is a large shale exposure along Little Beard's Creek in a stream near Geneseo. The site exposes the Windom Member of the Moscow Formation and in addition to many brachiopods and a few trilobites, the site is well-known for the size and quantities of horn corals it produces.

See the April issue for details on the following:

6/29 – Penn Dixie

7/13 - Jaycox Run

Aside from the above trips, additional trips for late July and August are being planned.

June Picnic Meeting with Mineral Section

We will be holding our June 4 Picnic returning to the Marian and Max Farash Center for Observational Astronomy operated by the Astronomy Section of the RAS. This is in Ionia, NY, just south of Mendon at 8355 County Road 14, Ionia, NY 14475. We will have a tour of the observatory, the largest in upstate NY. We will use the large deck and gas grill attached to the Louis Wolk Education Center building for our picnic. This has a large classroom to which we can retreat if the weather is bad as well as indoor restrooms. The section provides the meats and everyone brings something to share. More details will appear in next month's issue.

FossilEra

I have bought a few pieces from this company (<https://www.fossilera.com>) over the past couple years, especially for pieces I wanted for school shows and as giveaways for kids (such as Moroccan *Acastoides* trilobites by the bag—10 or more for \$1.50 each). I also buy gifts there, such



This photo is larger than life size, which is 44 x 18 x 15mm, or 1.73" X .71" X 0.59".

as this lovely piece of Baltic amber for my wife Mary for Christmas last year. This piece is from about 44 million years ago during the Eocene. I love amber because it is a fossil itself in addition to preserving perfectly other fossils within it.

It has two ants (Family Formicidae), a fungus gnat (order Diptera - family Mycetophilidae), and some other smaller undescribed arthropods. The gnat measures about 6mm long including legs.



Specimens under magnification

Their big news is their recent purchase of the Fossil Safari quarry near Kemmerer, Wyoming. The rocks exposed in this quarry are part of the Fossil Butte Member of the Green River Formation. They were deposited at the bottom of Fossil Lake, a large subtropical lake that covered portions of what is now southwestern Wyoming 50 million years ago. The unique conditions of this lake created an environment for the exceptional preservation of fossils. Fish are the primary fossils found, but fossils of plants, insects, reptiles, birds, and mammals are also occasionally unearthed at the quarry.



Stingray fossil from Fossil Safari quarry

Carl Fechko lectured us on his experiences collecting in the Green River Formation at our November 2021 meeting. Before going, he

researched the various fee-based quarry operations and found that most confiscate any rare fossils that customers find, allowing them to keep the common ones, mostly fish. This is part of the advance agreement that clients must make. For this reason, Carl chose to collect at the American Fossil Quarry which allows collectors to keep what they find, unless they find a fossil worth over \$100,000, in which case they get half the value instead of the fossil. That is not a bad deal either. See the video of Carl's lecture on our YouTube channel at

https://www.youtube.com/watch?v=hSEF6ppX_y0.

Anyway, one of the improvements introduced by FossilEra at Fossil Safari quarry is allowing customers to keep all the fossils they find. Carl will like this. Specimens include dozens of species of fish, stingrays, gars, plants, and insects. Fossils of birds, bats, turtles, crocodiles, lizards, and mammals can also be found, but are a rare component of the Green River Formation fauna.

If you are interested in a Wyoming vacation including fossil collecting, this operation or the American Quarry where Carl collected might be just the thing for you.

Fossil Safari <https://www.fossilsafari.com>

American Quarry <http://www.fishdig.com>

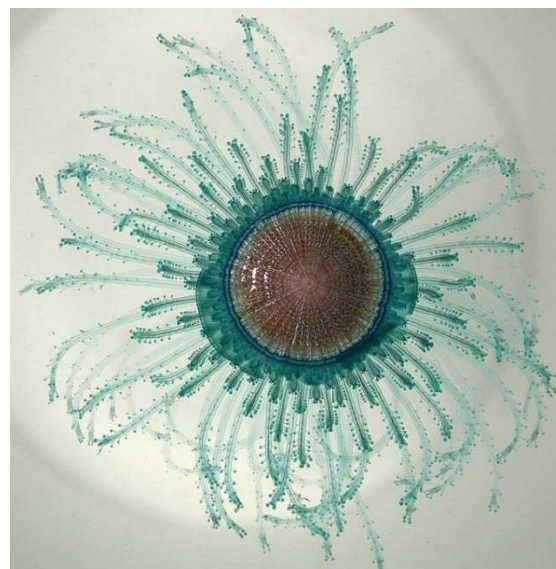
Fossil News

A hydrozoan from the eurypterid-dominated Silurian Bertie Group Lagerstätten of North America, Larson, E. and Briggs, D.E., 2023. *Journal of Paleontology*, 97(5), pp.1002-1008.

The authors, Evelyn Larson and Derek E.G. Briggs, conclude that this fossil is related to two extant colonial hydrozoans in the family Porpitidae—*Porpita* and *Velella*—in the Cnidaria phylum (which also includes jellyfish, corals, sea anemones, and the like). The only species of the former commonly seen is *P. porpita* (the blue button) and there is only one known species of the latter, *V. velella* (the by-the-wind sailor). Because they are small and oceanic, they are rarely seen at sea, even though living on the surface. They are noticed when they wash up on beaches in vast numbers.

This past March, you might have seen the headline, *Hundreds of thousands of peculiar sea*

creatures wash up on California beaches. These were *V. velella*, bright blue, gelatinous, less than 3 inches long, and with a translucent sail enabling them to drift for hundreds of miles. Blue buttons are also known to wash up on shore.



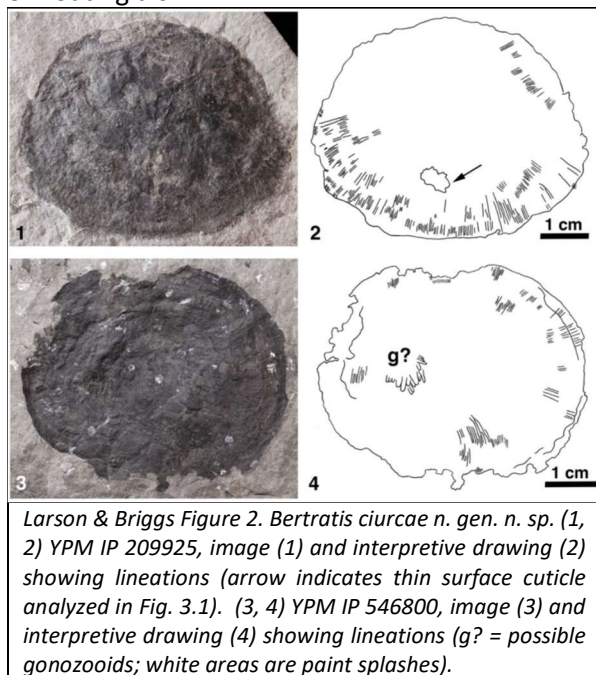
Above, *V. velella*, the by-the-wind sailor— photo from Oregon Public Broadcasting, www.opb.org. Below, *P. porpita*, the blue button—photo from Wikipedia.

Larson and Briggs offer the following summary in their paper: Living disc-like hydrozoans such as the by-the-wind sailor and the blue button are often stranded in large numbers on beaches. These animals are delicate and rare as fossils as they require exceptional preservation conditions. Here we describe a new example from the Bertie Group of upper New York State and Ontario (~420 Ma), which is famous for the remarkably preserved sea scorpions (eurypterids) that occur there. The new hydrozoan, which gets up to 17 cm across and is the second-oldest example known, adds an important new member to this

assemblage. It floated on the surface of the ocean and was occasionally incorporated into layers rich in eurypterids and other fossils.

Late RAS Fossil Section member Sam Ciurca collected six specimens of a creature he had never seen before in the Bertie Waterlime at the Richmond, Ontario Quarry. Although famed for his eurypterids, Sam collected anything he found. In their paper, Larson and Briggs describe these as a new species of new genus—*Bertratis ciurcae*—from the Silurian (Pridoli) of southern Ontario and upper New York State.

Dr. Briggs, when he spoke with us in March at our Sam Ciurca Memorial Lecture, recounted the process they went through to identify such a rare fossil. “This strange disc-like fossil, of which there are about six specimens, have a not quite circular, flattened appearance with a radial pattern, which is exposed as the fossil splits because there are patches on the surface of the outer cuticle. (See arrow on Fig 2-2 below.) Essentially, we’ve got an organic multilayer structure that looks like a kind of floating disk.”



Energy-dispersive X-ray spectrometer (EDS) analysis with a scanning electron microscope showed that the dark color of the specimens is due to elevated levels of carbon, which is also indicated by a striking contrast between specimen and matrix in back-scattered electron images.

There is no evidence that the discs are biomineralized, and they are assumed to have been composed predominantly of chitin as are the floats of extant porpitoids.

Dr. Briggs described the identification process. “There were three possibilities. The first was a jellyfish, but it doesn’t look much like a jellyfish. They do not have tough skin and are preserved as molds, showing gonads in center and concentric muscles around it, all absent here. The second was that it was some kind of Eldoniid, known from the Burgess shale and through the Devonian. It does have radial fibers, but also has a coiled coelom sack absent in the new fossil and was much more decay prone. So, we concluded that our specimens from the Bertie Group were the central disc-like structure of some kind of Porpitiid hydrozoan.”

Bertratis ciurcae n. gen. n. sp. YPM IP 250362, holotype. Etymology—genus name: Bertie, referring to the stratigraphic source of the specimens, and ratis (Latin, feminine) meaning float or raft; species name: after the discoverer Samuel J. Ciurca, Jr.

This paper is available from the editor.

Panama Canal expansion rewrites history of world's most ecologically diverse bats, Florida Museum of Natural History Press Release by Jerald Pinson, February 20, 2024.

In a new study, paleontologists describe the oldest-known leaf-nosed bat fossils, which were found along the banks of the Panama Canal. They are also the oldest bat fossils from Central America, preserved 20-million years ago when Panama and the rest of North America were separated from the southern landmass by a seaway at least 120 miles wide.

The task of widening and deepening the Panama Canal began in 2007. Paleontologists picked out fossil fragments from the rubble. The bones held clues to one of the greatest mass migrations of animals in Earth's history. About 5 million years ago, shifting tectonic plates erected a land bridge between North and South America. After more than 100 million years of separation, animals in the northern hemisphere could freely move down south and vice versa.

Most bats patrol the night sky in search of insects. New World leaf-nosed bats take a different approach. Among the more than 200 species of leaf-nosed bats, there are those that hunt insects, drink nectar, eat fruit, munch pollen, suck blood; and prey on frogs, birds, lizards, and even other bats. They're among the world's most ecologically diverse mammals, and until recently, it was thought they originated in South America.

"The theory that people have proposed is they got into South America early on, where their only competition was from insect-eating bats. So, they evolved a bunch of different feeding strategies," said Gary Morgan, curator of vertebrate paleontology at the New Mexico Museum of Natural History.

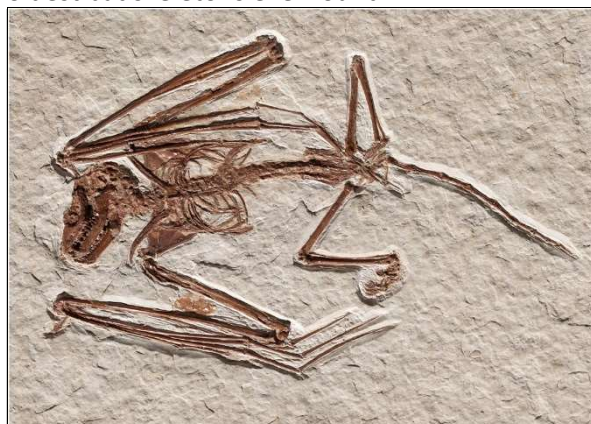
The new discovery suggests that the story may be more complicated. In an article published by the *Journal of Mammalian Evolution*, Morgan and his colleagues describe the oldest-known leaf-nosed bat fossils, which were found along the banks of the Panama Canal. They're also the oldest bat fossils from Central America, preserved 20-million years ago when Panama and the rest of North America were separated from southern landmass by a seaway at least 120 miles wide. Based on these and other fossils, Morgan thinks previous studies may have singled out the wrong continent as the birthplace of leaf-nosed bats. "We think they may have had a northern origin." For more details, see the entire press release at <https://www.floridamuseum.ufl.edu/science/panama-canal-expansion-rewrites-history-of-worlds-most-ecologically-diverse-bats/>.

Oldest bat skeletons ever found described from Wyoming fossils, American Museum of Natural History Press Release April 13, 2023. <https://www.amnh.org/about/press-center/oldest-bat-skeletons>.

Scientists have described a new species of bat based on the oldest bat skeletons ever recovered. The study on the extinct bat, which lived in Wyoming about 52 million years ago, supports the idea that bats diversified rapidly on multiple continents during this time.

In the Green River Formation of Wyoming—a remarkable fossil deposit from the early Eocene—

scientists have uncovered over 30 bat fossils in the last 60 years, but until now they were all thought represent the same two species—*Icaronycteris index* and *Onychonycteris finneyi*. "Paleontologists have collected so many bats that have been identified as *Icaronycteris index*, and we wondered if there were actually multiple species among these specimens," said Tim Rietbergen, an evolutionary biologist at Naturalis. "Then we learned about a new skeleton that diverted our attention." The exceptionally well-preserved skeleton was collected by a private collector in 2017 and purchased by the Museum. When researchers compared the fossil to Rietbergen's expansive dataset, it clearly stood out as a new species. A second fossil skeleton discovered in the same quarry in 1994 and in the collections of the Royal Ontario Museum was also identified as this new species. The researchers gave these fossils the species name *Icaronycteris gunnelli*. Although there are fossil bat teeth from Asia that are slightly older, the two *I. gunnelli* fossils represent the oldest bat skeletons ever found.



Rietbergen et al. Fig 1. Skeleton of Holotype of *Icaronycteris gunnelli* (FM.145747A) A) Dorsal view

This paper—Rietbergen, T.B., van den Hoek Ostende, L.W., Aase, A., Jones, M.F., Medeiros, E.D. and Simmons, N.B., 2023. The oldest known bat skeletons and their implications for Eocene chiropteran diversification. *Plos one*, 18(4), p.e0283505.—is available at <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0283505>.

Alaska dinosaur tracks reveal a lush, wet environment, University of Alaska Fairbanks Press release by Rod Boyce published March 08, 2024 <https://www.gi.alaska.edu/news/alaska-dinosaur-tracks-reveal-lush-wet-environment>

A large find of dinosaur tracks, fossilized plants and tree stumps in far northwest Alaska provides new information about the climate and movement of animals when they began traveling between the Asian and North American continents roughly 100 million years ago. “We’ve had projects for the last 20 years in Alaska trying to integrate sedimentology, dinosaur paleontology and the paleoclimate indicators,” U. Alaska professor Paul McCarthy said. “This new one is in a formation that’s about 90 to 100 million years old.”

Anthony Fiorillo, New Mexico Museum of Natural History, said the additional age is notable. “What interested us about looking at rocks of this age is this is roughly the time of the beginning of the Bering Land Bridge—the connection between Asia and North America,” he said. “We want to know who was using it, how they were using it and what the conditions were like.”



Fiorillo et al. Figure 5E. Standing tree trunk rooted in floodplain mudstone & sandstone (max. 58 cm diameter).

“The mid-Cretaceous was the hottest point in the Cretaceous,” said McCarthy, “The Nanushuk Formation gives us a snapshot of what a high-latitude ecosystem looks like on a warmer Earth.” The Nanushuk Formation dates to roughly 94 million to 113 million years ago in the mid-Cretaceous Period and about when the Bering Land Bridge began. In the area, Fiorillo and McCarthy found approximately 75 fossil tracks and other indicators attributed to dinosaurs living in a

riverine or delta setting. “On that landscape we found large upright trees with little trees in between and leaves on the ground. We had tracks on the ground and fossilized feces.”

Two-legged plant eaters accounted for 59% of the total tracks discovered. Four-legged plant eaters accounted for 17%, with birds accounting for 15% and non-avian, mostly carnivorous, bipedal dinosaurs at 9%.



Figure 8. Small tridactyl tracks with three slender toe impressions attributed to avian theropods. scale bar in cm

The authors point out that nearly half of North America’s shorebirds breed in the warm months of today’s Arctic. They suggest that the high number of fossil bird tracks along the Kukpowruk River indicates that the warm paleoclimate was a similar driver for Cretaceous Period birds.

The Cretaceous Thermal Maximum was a long-term warming trend approximately 90 million years ago in which average global temperatures were significantly higher than those of today. Fiorillo said. “The samples we analyzed indicate it was roughly equivalent to modern-day Miami. That’s substantial.” Of note is that the Alaska site investigated by Fiorillo and McCarthy was about 10 to 15 degrees latitude farther north in the mid-Cretaceous than it is today.

This paper—Fiorillo, Anthony R., et al. “New Dinosaur Ichnological, Sedimentological, and Geochemical Data from a Cretaceous High-Latitude Terrestrial Greenhouse Ecosystem, Nanushuk Formation, North Slope, Alaska.” *Geosciences* 14.2 (2024):36—is available for download at <https://www.mdpi.com/2076-3263/14/2/36> or can be had from the editor.

CALENDAR OF EVENTS

May

Saturday, May 4, FIELD TRIP: Split Rock Quarry near Syracuse

Tuesday, May 7, FOSSIL MEETING 7:30 PM. **LOCATION: NEQALS Community Meeting Room, 1030 Jackson Rd, Webster, 14580.** Speaker Dr. James Boyle, SUNY Buffalo on *Dunkleosteus*. Visitors welcome.

Saturday, May 18, FIELD TRIP: Road Cuts Near Cherry Valley

June

Saturday, June 1, FIELD TRIP: Little Beard's Creek

Tuesday, June 4, FOSSIL ANNUAL PICNIC 6:00 PM Location: **Farash Center for Observational Astronomy, Ionia, NY.**

Visitors are welcome to all Fossil Section meetings! For more information and the latest updates check the RAS Website (www.RASNY.org). You can also contact Dan Krisher at DLKFossil@gmail.com or John Handley at jhandley@rochester.rr.com for further information.

ROCHESTER ACADEMY OF SCIENCE FOSSIL SECTION

Monthly meetings are now held as hybrid meetings, live but also broadcast on Zoom. Meetings are held the first Tuesday of each month from October to December and from February to May at 7:30 pm. In-person meetings are now held at the NEQALS Community Meeting Room, 1030 Jackson Rd, Webster, NY 14580 unless otherwise listed.

OFFICERS

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Director (three-year term): Melanie Martin	585 413 8264	martin@nanoparticles.org
Director (two-year term): Fred Haynes	585 203 1733	fred.patty.haynes@gmail.com
Director (one-year term): Open		

APPOINTED POSITIONS

Field Trip Coordinator: Dan Krisher	585 293 9033	DLKFossil@gmail.com
FossilLetter Editor: Michael Grenier	585 671 8738	mgrenier@paleo.com

The FossilLetter is published before each meeting month of the year. Please send submissions to mgrenier@frontiernet.net or by U.S. Postal Service mail to 692 Maple Drive, Webster, NY 14580. The deadline for submissions to the FossilLetter is the 15th of the month.

For scheduling changes and the latest updates please check the RAS Website (www.rasny.org) and click on the Fossil Section link. Last-minute updates can also be found on the *General Announcements* page of the Academy Website.



A Blue Button, *P. porpita*, from the side in the sea.
Photo credit Ocean Treasures Library,
<https://otlibrary.com/blue-button-jelly/>