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FOSSIL SECTION

The FOSSILETTER

VOL. 43 Number 4 February 2025

February Meeting

The February section meeting is on Tuesday, February 4, at **7:00 PM** Eastern Time. This meeting will be conducted as a virtual meeting on Zoom. Details on how to login in are in the accompanying email.

We will have two speakers following a brief business meeting.

Our first guest is Dr. Derek Briggs, the G. Evelyn Hutchinson Professor of Earth and Planetary Sciences at Yale University and Curator-in-Charge of Invertebrate Fossils at the Yale Peabody Museum. We are thrilled to have him return for the third time at our Samuel J. Ciurca, Jr. Memorial Lecture.

Dr. Derek Briggs

He will speak on "*Eurypterids get together*." He sends us the following notes. *"Sam Ciurca's collection includes large numbers of eurypterids on individual slabs, some of which have been attributed to mating. This, and research on rare specimens that he collected, prompts a consideration of reproduction in these remarkable arthropods."*

Samuel J. Ciurca, Jr. Memorial Lecture

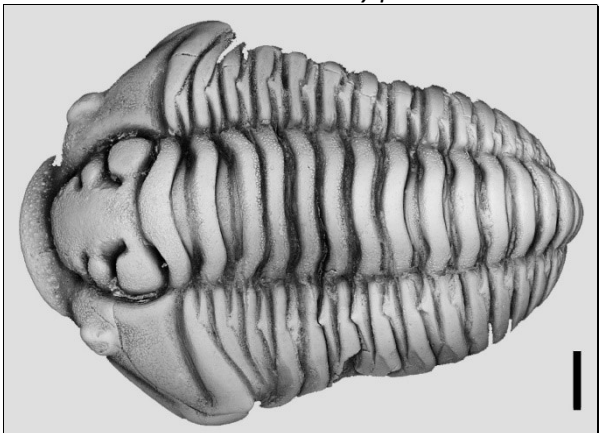
At this meeting we will have the third annual Samuel J. Ciurca, Jr. Memorial Lecture. Sam (1939-2021) was a long-time member of the RAS and such a notable collector and researcher that he was honored with the Harrell L. Strimple Award of the Paleontological Society in 2016. He was the author or co-author of thirty-three papers. He placed his collection at Yale where it is known as the *Samuel J. Ciurca Eurypterid Collection at Yale Peabody Museum of Natural History*.

Our feature speaker is Dr. Melanie Hopkins, Chair, Division of Paleontology Curator-in-Charge, American Museum of Natural History, also returning. Her talk is titled *"Hidden in plain sight: how two species stayed one for over 150 years."*

Dr. Melanie Hopkins, in AMNH collections with a slab of friendly pentamerid brachiopods. Photo from Dr. Hopkins.

Dr. Hopkins has provided the following abstract. *Over the last 180 years, there has been occasional observation that collections of specimens identified as "Calymene senaria" or "Flexicalymene senaria" comprise more than one species. This was first recognized within a year after the species was named and has been remarked upon as recently as 2002. Review of the literature reveals that this history is due to the maintenance of parallel conceptions of this species. This has been possible for a number of reasons including 1) the lack of an original type and relatively recent adoption of a neotype; 2) different strategies for illustrating specimens,*

particularly in the early to mid-1800s; 3) inconsistent availability (and some evidence for outright suppression) of potentially pertinent literature; 4) inconsistent and/or sparse provenance information for key specimens; 5) broad geographic distribution of specimens assigned to this name and others in the mid- to late 1800s. New field collections alongside examination of collections at the American Museum of Natural History, New York State Museum, Harvard Museum of Comparative Zoology, and the Paleontological Research Institution, confirmed that within the Trenton Group, there are two species of Flexicalymene *and one or more species of* Gravicalymene*, and made it possible to more precisely determine the geographic and stratigraphic range sizes of* Flexicalymene senaria *(Conrad, 1841) and the newly named species,* Flexicalymene trentonensis *(Hopkins and Martin, 2024). The clarification of this taxonomic history impacts our understanding of important faunal assemblages (Walcott-Rust Quarry, NY) and the reinterpretation of previously documented microevolutionary patterns.*



Dorsal view of Flexicalymene senaria*, AMNH-FI-29474, scale bar = 2 mm.*

President's Report *by Dan Krisher*

The Section's December meeting was scheduled for 12/3 but was canceled at the last minute due to a conflict with a Pittsford Town holiday activity. The new meeting date was 12/17 and featured our annual pizza party and show-n-tell. Members brought in a variety of fossils and each contributor gave a brief overview of the specimens they brought.

On December 28th and 29th, the Section participated in an outreach event at the Rochester Museum and Science Center. Section members John Handley, Michael Grenier, Fred Haynes, Mathew Lopez Alarcon, and Dan Krisher staffed the display which drew a crowd throughout the event.

Mathew Lopez Alarcon helped youngsters pick out souvenir fossils to take home. Photo by Fred Haynes.

Most kids like dinosaurs. Michael Grenier discussed them and answered questions. Photo by Fred Haynes.

As is tradition, the Section did not have a January meeting.

The next meeting for the Section will be via ZOOM on 2/4 and will feature our annual Sam Ciurca memorial lecture.

Spring 2025 Central NY Earth Science Student Symposium

Allie Thompson (athomp50@syr.edu), grad student chair of the CNYESSS at Syracuse University has invited us to the 2025 Symposium to be held on **Saturday March 1st** at Heroy Geology Laboratory. This showcases student

research and provides networking opportunities for undergraduate and graduate students. As in the past, we'll carpool from Rochester.

The abstract deadline is Friday, February 14th. This is also the event registration deadline. The event will run approximately from 9 am–4 pm with breakfast and lunch provided. Register here.

Schedule

9:00–9:30 AM: Registration (coffee / pastries)
9:30–10:30 AM: Oral Session
10:30–Noon: Poster Session 1
Noon–1:15 PM: Lunch
1:15–2:30 PM: Keynote Presentation, Dr. Catherine Beck from Hamilton College on reconstructing Cenozoic environments
2:30–4:00 PM: Poster Session 2
4:00–4:30 PM: Closing

Buffalo Geological Society's 55th Annual Gem-Mineral-Fossil Show

by Jerry Bastedo, Show Chairman

"Minerals of New York" are being featured at the Buffalo Geological Society's 55th Annual Gem, Mineral and Fossil Show on Saturday March 15, 2025, 9 am to 6 pm, and on Sunday, March 16, 10 am to 5 pm, at the Erie County Fairgrounds in the Grange, Market and New York State Police Buildings in Hamburg, NY. Admission is $7 for adults. Children 12 and under and scouts in uniform are FREE. A 2-day admission is $10.

This annual show provides an instant museum of Buffalo Geological Society Members' fossils, minerals, and jewelry; demonstrators; the famous Mini-Mine for young collectors; the mining operation for children and adults; mineral and fossil identification; and a variety of non-profit exhibitors. This highly educational family event affords attendees the opportunity to interact with demonstrators who work with minerals and gems.

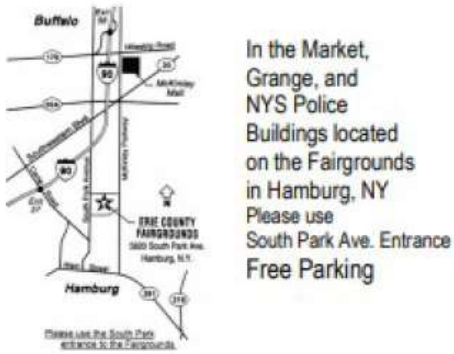
Demonstrators include fossil preparation, jewelry designers, and other lapidary artists. Sandy Cline, international renowned soapstone carver from Burleigh Falls, Ontario, Canada, will be demonstrating his art of carving wildlife forms from soapstone and will have several for sale. "Past and Present" will have some of their dinosaur models available for viewing, along with actual dinosaur bones recently acquired.

In addition, over 33 dealers will be selling gems, beads, minerals, fossils, and jewelry, from around the world. A food vendor will be on hand.

Young scientists can visit the "Mini-Mine" that offers them the chance to search for mineral specimens in a simulated mine. The operation is for young miners (under 100 years of age) who may search for minerals and fossils in a bag of sand that they wash. All who attend will experience hands-on fun and learn something new about the geological sciences. Professional Geologists will be there to discuss what geologists do and types of jobs present in the area for geologists. Boy and Girl Scouts will be able to meet badge requirements during the show. The Geology Department from SUNY Fredonia will have a stream table demonstrating how rivers behave when water flows change.

Fluorescent Minerals of Northern New York will be presented by Dino Zack, P.G., Senior Geologist/Project Manager, AECOM Technical Services, Inc. on Saturday, March 15 & Sunday March 16, 2024 from 11:00 AM to 11:30 AM in the New York State Police Building.

Last year's show drew over 4,566 children and adults. This is a perfect family field trip to learn more about geological sciences. Door prizes are drawn hourly. FREE parking. Wheelchair and stroller accessible. For additional information or questions, please contact Jerry Bastedo, Show Chairman, at jcbastedo@gmail.com.



Fossil News *edited by Michael Grenier*

Mastodon Fossil Found in Orange County

Fossil Section members who worked on the Byron Dig might be surprised by all the brouhaha in the media over the finding of a mastodon lower jaw with 4 teeth and some associated fragments of rib and toe bone. They might also have been amused by reporters who confused mastodons with their distant mammoth relatives in news reports. Still for a homeowner like this one near Scotchtown in Orange County, NY, it must have been exciting, especially when folks from the New York State Museum showed up to collect it with him. This was reported as the first find of this kind of in the state in over 11 years.

Excerpts from NYS Museum press release issued December 17, 2024.
https://www.nysm.nysed.gov/about/press/mastodon-discovery

The mastodon jaw, which belonged to an adult individual, was found protruding from the topsoil, capturing the homeowner's attention and sparking an investigation that will continue to uncover scientific insights for years to come. The discovery began when the homeowner found two

teeth concealed by the fronds of a plant on their property. Upon further investigation, the homeowner unearthed two additional teeth just inches underground.

"When I found the teeth and examined them in my hands, I knew they were something special and decided to call in the experts," said the homeowner in a statement to the New York State Museum. "I'm thrilled that our property has yielded such an important find for the scientific community."

A complete mastodon jaw was unearthed from the yard of a home in New York state. New York State Museum.

"This discovery is a testament to the rich paleontological history of New York and the ongoing efforts to understand its past," says director of Research & Collections and curator of Ice Age Animals at the New York State Museum Dr. Robert Feranec. "This mastodon jaw provides a unique opportunity to study the ecology of this magnificent species, which will enhance our understanding of the Ice Age ecosystems from this region."

With over 150 mastodon fossils found statewide to date with about one-third in Orange County, the area remains New York's premier hotspot for these ancient relatives of modern elephants.

The fossils are scheduled for carbon dating and comprehensive analysis to determine the mastodon's age, diet, and habitat during its lifetime. Following preservation and scientific analysis, the artifact will be featured in public programming in 2025.

Cambrian Predator and Prey Highlight "Arms Race" During the Rise of Animals

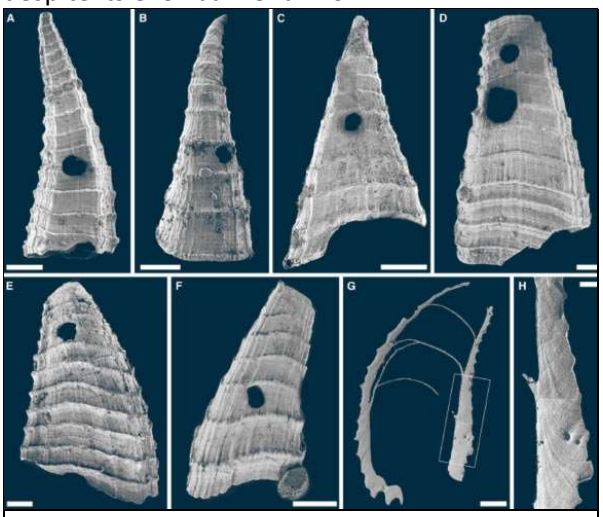
American Museum of Natural History
Press release issued January 3, 2025.
https://www.amnh.org/explore/news-blogs/cambrian-arms-race

A new study led by researchers at the American Museum of Natural History presents the oldest known example in the fossil record of an evolutionary arms race. These 517-million-year-old predator-prey interactions occurred in the ocean covering what is now South Australia between a small, shelled animal distantly related to brachiopods and an unknown marine animal capable of piercing its shell. Described today in the journal *Current Biology*, the study provides the first demonstrable record of an evolutionary arms race in the Cambrian.

"Predator-prey interactions are often touted as a major driver of the Cambrian explosion, especially regarding the rapid increase in diversity and abundance of biomineralizing organisms at that time. Yet, there has been a paucity of empirical evidence showing that prey directly responded to predation, and vice versa," said Russell Bicknell, a postdoctoral researcher in the Museum's Division of Paleontology and lead author of the study.

An evolutionary arms race is a process where predators and prey continuously adapt and evolve in response to each other. This dynamic is often described as an arms race because one species' improved abilities lead to the other species improving its abilities in response.

Bicknell and colleagues from the University of New England and Macquarie University—both in Australia—studied a large sample of fossilized shells of an early Cambrian tommotiid species, *Lapworthella fasciculata*, from South Australia. More than 200 of these extremely small fossils, ranging in size from slightly larger than a grain of sand to just smaller than an apple seed, have holes that were likely made by a hole-punching predator—most likely a kind of soft-bodied mollusk or worm. The researchers analyzed these specimens in relation to their geologic ages, finding an increase in shell wall thickness that coincides with an increase in the number of perforated shells in a short amount of time. This suggests that a microevolutionary arms race was in place, with *L. fasciculata* finding a way to fortify its shell against predation and the predator, in turn, investing in the ability to puncture its prey despite its ever-bulkier armor.



Examples of Lapworthella fasciculata *shells (under scanning electron microscope) from the Mernmerna Formation, Flinders Ranges, South Australia showing holes made by a perforating predator. Scale bars represent 200 micrometers. Photos by R. Bicknell*

"This critically important evolutionary record demonstrates, for the first time, that predation played a pivotal role in the proliferation of early animal ecosystems and shows the rapid speed at which such phenotypic modifications arose during the Cambrian Explosion event," Bicknell says.

The Bunkers Graben, Flinders Ranges, in South Australia, where the fossil shells were discovered. Photo by John Paterson.

This paper (Bicknell, Russell DC, Nicolás E. Campione, Glenn A. Brock, and John R. Paterson, 2025, Adaptive responses in Cambrian predator & prey highlight the arms race during the rise of animals, *Current Biology*), can be purchased at https://www.cell.com/current-biology/abstract/S0960-9822(24)01647-6

New twist in mystery of dinosaurs' origin

University College London (UCL) press release issued 23 January 2025.

https://www.ucl.ac.uk/news/2025/jan/new-twist-mystery-dinosaurs-origin

Currently, the oldest known dinosaur fossils date back about 230 million years and were unearthed further south in places including Brazil, Argentina and Zimbabwe. But the differences between these fossils suggest dinosaurs had already been evolving for some time, pointing to an origin millions of years earlier.

The new study accounted for gaps in the fossil record and concluded that the earliest dinosaurs likely emerged in a hot equatorial region in what was then the supercontinent Gondwana – an area of land that encompasses the Amazon, Congo basin, and Sahara Desert today.

Lead author and PhD student Joel Heath (UCL Earth Sciences and the Natural History Museum, London) said: "Dinosaurs are well studied but we still don't really know where they came from. The fossil record has such large gaps that it can't be taken at face value. Our modelling suggests that the earliest dinosaurs might have originated in western, low-latitude Gondwana, in a hotter and

drier environment than previously thought, made up of desert- and savannah-like areas. "So far, no dinosaur fossils have been found in the regions of Africa and South America that once formed this part of Gondwana. However, this might be because researchers haven't stumbled across the right rocks yet, due to a mix of inaccessibility and a relative lack of research efforts in these areas."

The modelling study drew on fossils and evolutionary trees of dinosaurs and their close reptile relatives, as well as the geography of the period. It accounted for gaps in the fossil record by treating areas of the globe where no fossils had been found as missing information rather than areas where no fossils exist.

Initially, early dinosaurs were outnumbered by their reptile cousins, including the ancestors of crocodiles, the pseudosuchians (an abundant group including species up to 10 meters long), and pterosaurs, the first animals to evolve powered flight (flying by flapping wings rather than gliding), who grew as big as fighter jets.

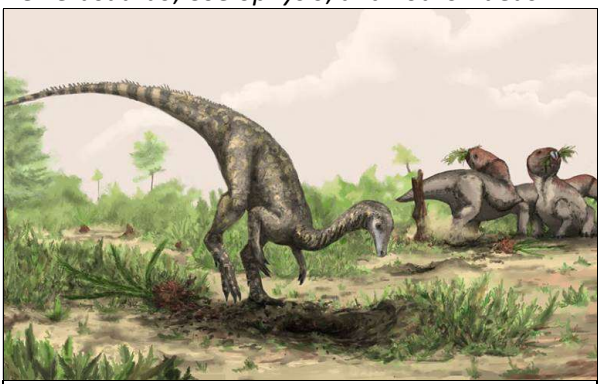
By contrast, the earliest dinosaurs were much smaller than their descendants – more the size of a chicken or dog than a *Diplodocus*. They walked on two legs (were bipedal) and most are thought to have been omnivores. Dinosaurs became dominant after volcanic eruptions wiped out many reptile relatives 201 million years ago.

The new modelling results suggested that dinosaurs as well as other reptiles may have originated in low-latitude Gondwana, before radiating outwards, spreading to southern Gondwana and to Laurasia, the adjacent northern supercontinent that later split into Europe, Asia and North America. Support for this origin comes from the fact it is a midpoint between where the earliest dinosaurs have been found in southern Gondwana and where the fossils of many of their close relatives have been discovered in Laurasia.

As there is uncertainty about how the most ancient dinosaurs were related to one another and to their close relatives, the researchers ran their model on three proposed evolutionary trees. They found the strongest support for a low-latitude Gondwanan origin of the dinosaurs in the model that counted silesaurids, regarded as cousins of dinosaurs but not dinosaurs themselves, as ornithischian dinosaur ancestors.

Ornithischians, one of the three main dinosaur groups that included plant eaters *Stegosaurus* and *Triceratops*, are mysteriously absent from the fossil record of these early years of the dinosaur era. If silesaurids are the ancestors of ornithischians, this helps to fill in this gap in the evolutionary tree.

Senior author Professor Philip Mannion (UCL Earth Sciences) said: "Our results suggest early dinosaurs may have been well adapted to hot and arid environments. Out of the three main dinosaur groups, the sauropods, which include the *Brontosaurus* and the *Diplodocus*, seemed to retain their preference for a warm climate, keeping to Earth's lower latitudes. Evidence suggests the other two groups, theropods and ornithischians, may have developed the ability to generate their own body heat some millions of years later in the Jurassic period, allowing them to thrive in colder regions, including the poles." The earliest known dinosaurs include *Eoraptor*, *Herrerasaurus*, *Coelophysis*, and *Eodromaeus*.



An artist's illustration of Nyasasaurus*, which could be the earliest known dinosaur, or else a close relative of early dinosaurs. Credit: Mark Witton/The Trustees of the Natural History Museum, London.*

This paper—Joel A. Heath, Natalie Cooper, Paul Upchurch, Philip D. Mannion. Accounting for sampling heterogeneity suggests a low paleolatitude origin for dinosaurs. *Current Biology*, 2025; DOI: 10.1016/j.cub.2024.12.053 is available for download.

CALENDAR OF EVENTS

February
Tuesday February 4, FOSSIL MEETING 7:00 PM. Virtual Meeting on Zoom. 3rd annual "Samuel J. Ciurca, Jr. Memorial Lecture. Featured speakers (two talks) are Dr. Derek Briggs, Yale University and Yale Peabody Museum, and Dr. Melanie Hopkins, American Museum of Natural History. Visitors welcome.

March
Tuesday March 4, FOSSIL MEETING 7:00 PM. Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534. Our Science Olympiad coaching session for middle- and high-school students. Please help. Visitors welcome.

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 7:00 pm. In person meetings are now held at the Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534 unless otherwise listed.

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Director (one-year term): ***Open***		
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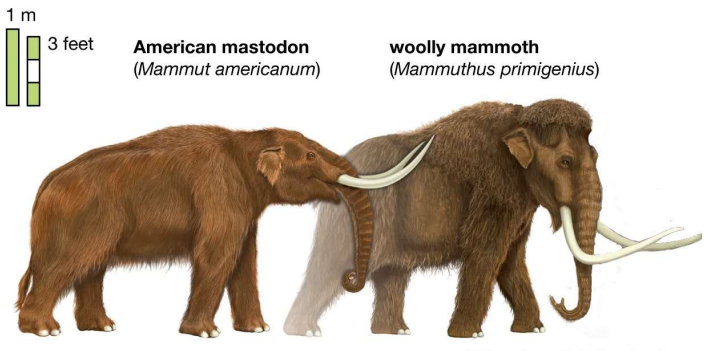
The FossiLetter is published before each meeting month of the year. Please send submissions to mgrenier@frontiernet.net or by U.S. Postal Service mail to 692 Maple Drive, Webster, NY 14580. Deadline for submissions to the Fossiletter is the 15th of the month.

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.



If these two animals look identical to you, that's OK, only a trained expert can tell them apart, the differences are so subtle. A mere 30 million years separate these two from their common ancestor. As it happens, news reporters are often not experts.