A publication of the Rochester Academy of Science
FOSSIL SECTION

The FOSSILETTER

VOL. 42 Number 5 March 2025

March Meeting

The March Rochester Academy of Science Fossil Section meeting is on Tuesday, March 4, at 7:00 PM. This meeting will be at Pittsford Community Center, 35 Lincoln Ave, Pittsford, NY 14534. The meeting is in Room 019, which is downstairs from the entrance. Park behind the building. Refreshments will be served.

We will again be hosting a fossil review session for Middle School Science Olympiad teams.

We are expecting between 20 and 40 students there (though there may be fewer), representing perhaps 10-20 teams from all over the region.

Much help is needed. Please check your fossil collections to see what you have from the list of items needed. We need multiple examples of each item, as spares will be required for the testing table. If you do not have fossils (or pictures) to contribute, you can still assist at one of our display tables or the testing table. Please let us know if you will be coming to help, and with which fossils. Please contact Fred Haynes at 585- 203-1733, or by email at: **fredmhaynes55@gmail.com**. Helpers should come at 6:30p.m.

All members are welcome—if you cannot help with the program, you will find it interesting to visit the tables and learn about fossils with which you may not be familiar. It will be a fascinating opportunity for you to learn more about fossils. Go to our testing table after the kids are done and see if you score well.

Bring a friend, visitors are welcome.

President's Report **by Dan Krisher**

The Section's February meeting was held on 2/4 via ZOOM. The short business portion of the meeting consisted of a call for nominations for Fossil board members and a review of upcoming meetings and outreach events for the Section.

The first talk for the evening was given by Dr. Derek Briggs, Professor of Earth and Planetary Sciences at Yale University and Curator in charge of Invertebrate Fossils at the Yale Peabody Museum. Dr. Briggs' talk was titled "*Eurypterids get together*" and dealt with the mating practices of eurypterids as shown by specimens collected by long time Section member Samuel Ciurca.

The second talk was the Annual Samuel J. Ciurca Jr. Memorial Lecture which this year was given by Dr. Melanie Hopkins, Chair, Division of Paleontology Curator-in-Charge, American Museum of Natural History. Her talk was titled "*Hidden in plain sight: how two species stayed one for over 150 years*." The subject of her talk was the convoluted nomenclatural history of a well-known trilobite and demonstrated the need for well characterized type specimens and accurate geographic and stratigraphic data.

On 2/25 two Section members will staff an outreach table at a special event at the Rochester Museum and Science Center.

The March meeting will be a training session for the area participants of the upcoming Science Olympiad. The attendees will be able to view, handle and ask questions about a wide variety of fossils which will be featured in the competition. The Meeting will be on 3/4 from 7 till 8:30 p.m. at the Pittsford Community Center.

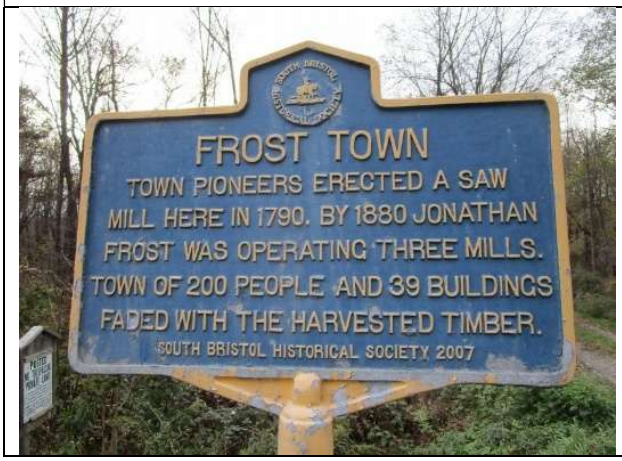
RAS Annual Meeting & Spring Lecture

The Rochester Academy of Science Annual Meeting and Spring Lecture are Tuesday, April 22, 7:00 p.m. This live meeting (with Zoom remote) will be at the Rochester Institute of Technology Chester F. Carlson Center for Imaging Science, Room 1125, 54 Lomb Memorial Drive, Rochester, NY 14623. After a brief introduction and report, the Board of Directors election will conclude the business meeting. Note that you must have renewed your membership by March 31st.

The Spring Lecture will follow the business meeting at 7:30PM. Our speaker is Dr. Alexander

Smith, professor of Anthropology at SUNY Brockport. He is head of our RAS Anthropology Section. He leads the Archaeology project in partnership with the Rochester Museum & Science Center. This project is dedicated to the excavation and better understanding of this abandoned mill town, located on what is now the Cumming Nature Center in South Bristol, NY. If time permits, he will also discuss his excavations of iron-age sites on Mediterranean islands such as Mallorca and Menorca.

Dr. Alexander Smith

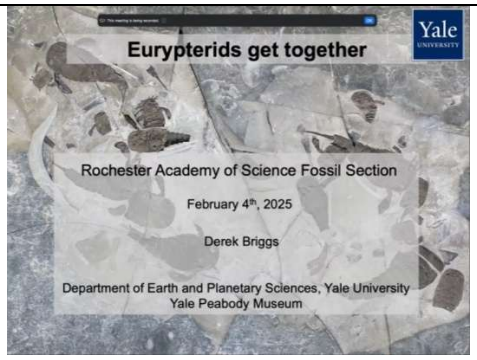


February Meeting Recap

by Michael Grenier

As noted by Dan Krisher in the **President's Report**, we had Dr. Derek Briggs of the Yale Peabody Museum and Dr. Melanie Hopkins, American Museum of Natural History at our meeting on February 4th. I invite you to view the video of the two lectures on our private YouTube channel.

Dr. Briggs' is at https://youtu.be/zLDpe8hEDDs and Dr. Hopkins' is at https://youtu.be/_O4Q6JLOXKA.



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

See last month's issue for more details. This is a reminder that the Buffalo Geological Society's 55th Annual Gem, Mineral and Fossil Show is 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.

Membership Renewal Time

Unless you have already renewed or are a life member, note that your membership expired on December 31st, 2024. Don't wait—renew now while you are thinking of it. You can get a membership form or even complete the renewal at **rasny.org/mbform.pdf**.

Science Olympiad 2025 Fossil List

Note: Indented ranks are in the rank above it.

KINGDOM ANIMALIA

BRYOZOANS (Phylum Bryozoa)
- Growth forms: branching, massive, fenestrate)
  - Genus Archimedes
  - Genus Rhombopora

CORALS (Phylum Cnidaria)
- Order Tabulata (tabulate corals)
  - Genus Favosites
- Order Rugosa (rugose corals)
  - Genus *Heliophyllum* (horn coral)
  - Genus *Hexagonaria*
- Order Scleractinia (stony corals)
  - Genus *Septastrea*

ARTHROPODS (Phylum Arthropoda)
- Subphylum Chelicerata
- Order Eurypterida (Eurypterids)
  - Genus *Eurypterus*
- Class Insecta (Insects)
- Class Trilobita (Trilobites)
- Polymerids
  - Genus *Cryptolithus*
  - Genus *Calymene*
  - Genus *Elrathia*
  - Genus *Eldredgeops* (formerly *Phacops*)
- Agnostids
  - Genus *Peronopsis*

BRACHIOPODS (Phylum Brachiopoda)
- Class Inarticulata
  - Genus *Lingula*
- Class Articulata
  - Genus *Atrypa*
  - Genus *Composita*
  - Genus *Mucrospirifer*
  - Genus *Platystrophia*
  - Genus *Rafinesquina*

MOLLUSKS (Phylum Mollusca)
- Class Bivalvia (clams, oysters, mussels)
  - Genus *Exogyra*
  - Genus *Gryphaea*
  - Genus *Pecten*
  - Genus *Glycymeris*
  - Genus *Astarte*
  - Genus *Nucula*
- Class Cephalopoda
  - Order Ammonitida (ammonites)
    - Genus *Baculites*
    - Genus *Dactylioceras*
  - Order Belemnitida (Belemnites)
    - Genus *Belemnitella*
  - Order Nautilida (Chambered Nautilus)
  - Order Orthocerida ("Orthoceras")
- Class Gastropoda (Snails) Genus Conus
  - Genus *Cypraea*
  - Genus *Platyceras*
  - Genus *Turritella*
  - Genus *Worthenia*

ECHINODERMS (Phylum Echinodermata)
- Class Blastoidea
  - Genus *Pentremites*
- Class Crinoidea (stems, columns, calyxes)
- Class Echinoidea (regular or irregular echinoids: sea urchins, sand dollars and heart urchins)

VERTEBRATES (Phylum Chordata)
- Class Placodermi (Armored Jawed Fish)
  - Genus *Bothriolepis*
  - Genus *Dunkleosteus*
- Class Chondrichthyes (Cartilaginous Fish)
- Superorder Selachimorpha (Sharks)
  - Genus *Otodus*
  - Genus (formerly Carcharodon)
    - Species *C. megalodon*
- Superclass Osteichthyes (Bony Fish)
- Class Actinopterygii (ray-finned)
  - Genus *Knightia*
- Class Sarcopterygii (lobe-finned)
  - Genus *Eusthenopteron*
  - Genus *Latimeria* (Coelacanth)
  - Genus *Tiktaalik*
- Class Amphibia (Amphibians)
  - Genus *Acanthostega*
  - Genus *Eryops*
  - Genus *Diplocaulus*
- Class Reptilia (Reptiles)
  - Order Ichthyosauria (Ichthyosaurs)
  - Order Squamata
    - Family Mosasauridae (Mosasaurs)
  - Order Plesiosauria (Plesiosaurs & Pliosaurs)

Order Pterosauria (Pterosaurs)
Clade Dinosauria (Dinosaurs)
Order Saurischia (lizard-hipped)
Suborder Theropoda
Genus *Allosaurus*
Genus *Coelophysis*
Genus *Dilophosaurus*
Genus *Tyrannosaurus*
Genus *Velociraptor*
Suborder Sauropodomorpha
Genus *Brachiosaurus*
Genus *Diplodocus*
Genus *Plateosaurus*
Order Ornithischia (bird-hipped)
Infraorder Ankylosauria
Genus *Ankylosaurus*
Infraorder Ceratopsia
Genus *Triceratops*
Infraorder Ornithopoda
Genus *Iguanodon*
Genus *Parasaurolophus*
Genus *Maiasaura*
Infraorder Pachycephalosauria
Genus *Pachycephalosaurus**
Infraorder Stegosauria
Genus *Stegosaurus*
Class Aves (Birds)
Genus *Archaeopteryx*
Genus *Titanis* (Terror Bird)
Clade Synapsida
Stem Mammals/Proto-Mammals
Genus *Dimetrodon* (pelycosaurs)
Genus *Lystrosaurus* (therapsids)
Class Mammalia (Mammals)
Genus *Basilosaurus* (prehistoric whale)
Genus *Equus* (modern horse)
Genus *Mesohippus* (three-toed horse)
Genus *Homo* (hominin)
Species *H. neanderthalensis*
Species *H. sapiens*
Genus *Mammut* (Mastodon)
Genus *Mammuthus* (Mammoth)
Species *M. primigenius*
Genus *Megacerops* (brontothere)
Genus *Smilodon* (saber-toothed cat)

KINGDOM PLANTAE

FLOWERING PLANTS (Division Anthophyta)
Genus Acer (Maple)
Genus Populus (Aspen & Poplar)
Genus Platanus (Sycamore)

GINKGOS (Division Ginkgophyta)
Genus Ginkgo

CLUB MOSSES (Division Lycophyta)
Genus Lepidodendron (scale tree)

CONIFERS (Division Pinophyta)
Genus *Metasequoia*

HORSETAILS (Division Sphenophyta)
Genus *Calamites* (form leaf genus: Annularia)

SEED FERNS (Division Pteridospermatophyta)
Genus *Glossopteris*

TRUE FERNS (Division Polypodiophyta)
Genus *Psaronius* (form leaf genus: Pecopteris)

ADDITIONAL EARTH MATERIALS

Trace Fossils **limited** to:
Trails, Tracks, Trackways, Borings, Burrows, Tubes, Predation marks, Coprolites
Stromatolites
Amber/copal
Petrified wood
Sedimentary Rocks **limited to**:
Coquina
Chalk
Fossil limestone
Sandstone
Shale
Chert

The Paleontological Research Institution: Past, Present and Future

By Daniel Krisher

[*Note from Editor: PRI is in severe financial difficulty. This article was also published in the March 2025 issue of the Rochester Academy of Science. We publish it here also to ensure as many members and friends as possible see it*.]

In 1932, Cornell geology professor Gilbert Harris was nearing the end of his 40-year career as a professor at the University. Over the years he had established a reputation as a petroleum geologist and mollusk researcher, amassed a significant paleontological collection and had overseen the publication of a personally funded scientific journal.

As he approached retirement, he became increasingly concerned about the future of his

research and collections. Professor Harris first approached the University about providing space and resources for the care of his life's work but was unable to secure backing from the University.

At this point Professor Harris made the decision to create an independent institution which would provide a home for his life's work as well as serve as a facility where researchers without any other institutional home could come and conduct research. On June 28, 1932, Professor Harris and a small group of friends and supporters founded what he called the Paleontological Research Institute.

Figure 1: PRI Outside View [PRI]

Professor Harris served as Director of the institution he founded for many years and, while funding was always an issue, the Institute continued to grow in both size and reputation. In 1968, under the leadership of its second Director, Katherine Palmer, the institute moved to its present location on the west side of the lake just north of Ithaca. In 2003 the institute opened the Museum of the Earth and the Cayuga Nature Center became part of PRI in 2013. The institution has continued to expand its role in the areas of paleontological and earth science research and public outreach. It's 7 million plus specimens comprise a world-renowned collection of Cenozoic mollusks as well as a rapidly expanding collection of the Devonian fauna of New York.

Like most nonprofits, PRI's business model has derived its funding from a mix of admissions, sales, grants and philanthropy. Since admissions and sales need to be kept affordable to ensure public accessibility and grants are always volatile, philanthropy is critical to the functioning of PRI.

Over the past couple of years, several long-term supporters of PRI have found themselves unable to continue their support at past levels. In the face of the funding shortfall PRI has undertaken numerous actions to rebalance the budget including staff reductions, reduced operating hours in the Museum of the Earth and the Cayuga Nature Center and a pause or cessation in some of its past activities. These actions have reduced the funding issues but further reductions in PRI's activities would threaten its ability to fulfill its primary mission.

As the possibilities of decreased funding outflow have been largely maxed out the need for an increase in funding inflow in the form of philanthropy is critical. If you have thought of becoming a member of PRI in the past but just never got around to it the income generated by your membership, while small, is still critical to PRI's future. If you are already a member, consider the possibility of a donation as donations of any size are tremendously helpful.

Figure 2: PRI Lobby with 44-foot long Right Whale #2030 skeleton [PRI]

The Paleontological Research Institution is a unique resource and its loss or further reduction in its function would represent an irreplaceable loss to both western New York and the scientific communities at large.

If you would like further information or would like to lend your support to PRI, please visit https://www.priweb.org/.

Fossil News

Cretaceous fossil from Antarctica reveals earliest modern bird

Ohio University press release issued February 5, 2025.

https://www.ohio.edu/news/2025/02/cretaceous-fossil-antarctica-reveals-earliest-modern-bird

Vegavis iaai. *Image credit: Mark Witton.* https://www.markwitton.co.uk/palaeoart

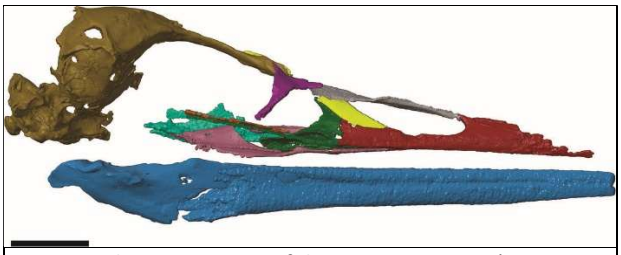
Sixty-six million years ago, at the end of the Cretaceous Period, an asteroid impact near the Yucatán Peninsula of Mexico triggered the extinction of all known non-bird dinosaurs. But for the early ancestors of today's waterfowl, surviving that mass extinction event was like … water off a duck's back. Location matters, as Antarctica may have served as a refuge, protected by its distance from the turmoil taking place elsewhere on the planet. Fossil evidence suggests a temperate climate with lush vegetation, possibly serving as an incubator for the earliest members of the group that now includes ducks and geese.

The paper (published February 5 in N*ature*) describes an important new fossil of the oldest known modern bird, an early relative of ducks and geese that lived in Antarctica at around the same time *Tyrannosaurus rex* dominated North America. The fossil, a nearly complete, 69-million-year-old skull, belongs to an extinct bird named *Vegavis iaai* and was collected during a 2011 expedition. The new skull exhibits a long, pointed beak and a brain shape unique among all known birds previously discovered from the Mesozoic Era, when non-avian dinosaurs and a bizarre collection of early birds ruled the globe. These features place *Vegavis* in the group that includes all modern birds, representing the earliest evidence of a now widespread and successful evolutionary radiation across the planet.

"Few birds are as likely to start as many arguments among paleontologists as *Vegavis*," said lead author Christopher Torres. "This new fossil is going to help resolve a lot of those arguments. Chief among them: where is *Vegavis* perched in the bird tree of life?"

Vegavis was first reported 20 years ago by study co-author Julia Clarke of the University of Texas at Austin and several colleagues. At that time, it was proposed as an early member of modern (also known as crown) birds that was evolutionarily nested within waterfowl. But modern birds are exceptionally rare before the end-Cretaceous extinction, and more recent studies have cast doubt on the evolutionary position of *Vegavis*. The new specimen described in this study has something that all previous fossils of this bird have lacked: a nearly complete skull. This new skull helps lay that skepticism to rest, preserving several traits like the shape of the brain and beak bones that are consistent with modern birds, specifically waterfowl. Unlike most waterfowl today, the skull preserves traces of powerful jaw muscles useful for overcoming water resistance while diving to snap up fish.

These skull features are consistent with clues from elsewhere in the skeleton, suggesting that *Vegavis* used its feet for underwater propulsion during pursuit of fish and other prey—a feeding strategy unlike that of modern waterfowl and more like that of some other birds such as grebes and loons.



Digital reconstruction of the Late Cretaceous (~69 million years old) crown bird Vegavis iaai *that was completed following high-resolution micro-computed tomography of a fossil-bearing concretion discovered on Vega Island, Antarctic Peninsula. Credit: Joseph Groenke and Christopher Torres.*

"This fossil underscores that Antarctica has much to tell us about the earliest stages of modern bird evolution," said Patrick O'Connor, co-author on the study. Birds known from elsewhere on the planet at around the same time are barely recognizable by modern bird standards. Moreover, most of the handful of sites that even preserve delicate bird fossils yield specimens that are so

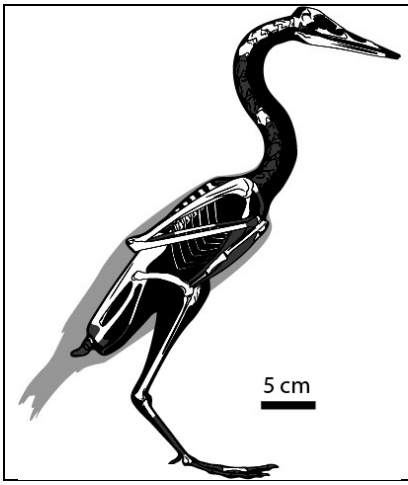
incomplete as to only give hints to their identity, as was the situation with *Vegavis* until now.

A typical day in field camp on Vega Island near the Antarctica Peninsula. Credit: Jin Meng (American Museum of Natural History), 2016.

Helicopter drop off to conduct geological and paleontological survey of Late Cretaceous strata on Vega Island, Antarctic Peninsula. Credit: Patrick O'Connor.

"And those few places with any substantial fossil record of Late Cretaceous birds, like Madagascar and Argentina, reveal an aviary of bizarre, now-extinct species with teeth and long bony tails, only distantly related to modern birds. Something very different seems to have been happening in the far reaches of the Southern Hemisphere, specifically in Antarctica," O'Connor noted.

How the Antarctic landmass helped shape modern ecosystems in deep time is a topic of active research by scientists from around the world. Indeed, according to study co-author Matthew Lamanna of Carnegie Museum of Natural History, "Antarctica is in many ways the final frontier for humanity's understanding of life during the Age of Dinosaurs."



Skeletal reconstruction of the Late Cretaceous (~69 million years old) crown bird Vegavis iaai. Preserved bones of the skull and skeleton depicted in white. Credit: Christopher Torres.

This paper, Torres, C.R., Clarke, J.A., Groenke, J.R., Lamanna, M.C., MacPhee, R.D., Musser, G.M., Roberts, E.M. and O'Connor, P.M., 2025. Cretaceous Antarctic bird skull elucidates early avian ecological diversity. *Nature*, *638*(8049), pp.146-151, may be purchased at https://www.nature.com/articles/s41586-024-08390-0.

Virginia Tech study extends the chart of life by nearly 1.5 billion years

Ancient species may have evolved slower and lasted longer, but the pace of evolution accelerated after the global ice ages, according to a new Virginia Tech analysis. The study, published in the journal Science, maps the rise and fall of ancient life many times older than the dinosaurs.

Three findings are that: 1) The first eukaryotes arose no later than 1.8 billion years ago and gradually evolved to a stable level of diversity from about 1,450 million to 720 million years ago, a period aptly known as the "boring billion," when species turnover rates were remarkably low. 2) Eukaryotic species in the "boring billion" may have evolved slower and lasted longer than those came later. 3) Then cataclysm: Snowball Earth, a spiral of plunging temperatures, sealed the planet in ice at least twice between 720 million and 635 million years ago. When the ice eventually thawed, evolutionary activity picked up, and things weren't so boring anymore.

See the 19 Dec 2024 release from Virginia Tech for the details.

https://news.vt.edu/articles/2024/12/science-extended-chart-of-life.html.

CALENDAR OF EVENTS

March

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

Saturday March 22, FAMILY SCIENCE DAY 2025! 11 AM - 3 PM. University of Rochester, Hirst Lounge, Wilson Commons. Fun, engaging educational hands-on experience with science for families.

April

Tuesday April 1, FOSSIL MEETING 7:00 PM. Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534. Member Gerry Kloc on Trilobites. No fooling! Visitors welcome.

Tuesday April 22, RAS ANNUAL MEETING 7:00 PM. RIT Carlson Center for Imaging Science, Room 1125, 54 Lomb Memorial Drive, Rochester, NY 14623.

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.

Monthly meetings are 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 Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534 unless otherwise listed.

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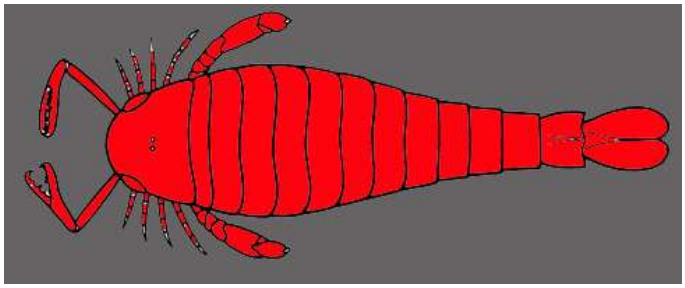
The FossiLetter is published before each meeting month of the year. Please send submissions to mgrenier@frontiernet.net or by U.S. Postal Service mail to 692 Maple Drive, Webster, NY 14580. The deadline for submissions to the Fossiletter is the 15th of the month.

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.



Pterygotus *Eupryterid that fell into a steam vent*