A publication of the Rochester Academy of Science™
FOSSIL SECTION

The FOSSILETTER

VOL. 43 Number 1 October 2025

October Meeting

The October section meeting is on Tuesday, October 7, 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. This hybrid meeting will also be broadcast on Zoom. Details on how to log in are in the accompanying email. Refreshments will be served. Welcome back!

Our speaker will be section member Michael Grenier, who is also your editor for this newsletter. He will speak on *The Worst Day Ever: The End-Cretaceous Extinction Event*. Michael will cover what we know about what happened during and after the asteroid impact 66 million years ago and how we know it, based on worldwide research. The Chicxulub asteroid impact causing the end-Cretaceous mass extinction event is now overwhelmingly accepted within the scientific community, though it was contentious for a long time.

Michael working in the Cretaceous Cloverly Formation in central Montana

Michael is a Cretaceous specialist with many summers' experience in the field and is a long-time member of the Society of Vertebrate Paleontology.

President's Report by Dan Krisher

Welcome everyone to the 2024-2025 season of the Rochester Academy of Science Fossil Section. For those keeping track, this marks the 50th year of our existence. The Genesee Valley Fossil Club formed in 1975 as an independent group and in 1981, at the Rochester Academy of Sciences' 100th anniversary dinner, the academy formally accepted the club.

The past year has been quite busy for the Section. The monthly meetings have always been the core of the Section, and the past year was no exception. The meetings covered a wide range of subjects including dinosaurs, eurypterids, weird arthropods, and ichthyosaurs and our February meeting served as a training session for local Science Olympiad teams.

Our summer field trips were equally wide-ranging. Among the sites visited were Split Rock Quarry (Devonian, Onondaga Limestone), Lockport Gulf (Silurian, Rochester Shale), Little Bear's Creek (Devonian, Hamilton Group), and Jaycox Run (Devonian, Hamilton Group). We had two other sites scheduled but unfortunately weather intervened.

The Section also continued its commitment to public outreach with events at the University of Rochester, ADK Mendon Ponds, and the Rochester Museum and Science Center.

This year promises to be as busy as the last so welcome back.

Volunteers Needed for Outreach at RMSC

The Fossil Section will be setting up our outreach tables at two Rochester Museum and Science Center (RMSC) upcoming events. We need Rochester-area members to help. No experience is needed—it doesn't take much to give away candy,

help kids pick out a free fossil, or talk to people about joining. One or two hours from you is all that is needed. It is a lot of fun, and you can take some time to explore the museum yourself. Call Dan Krisher to discuss it at (585) 698-3147.

The first is on Sunday, October 26 from 11 a.m. to 3 p.m. for their "Family Fun: Tricks & Treats" program. They'll provide the candy to pass out.

The second is their December Break Program "Snowed In!" We will be set up on Saturday and Sunday December 27th and 28th 11 a.m. to 3 p.m.

In between these, we will also set up our fossil display at the RAS Scientific Paper Session on November 1st at SUNY Geneseo. Come for the annual Lawrence J. King Memorial Lecture (see below) and help us with the outreach.

Fossil Section at 25th ADK Outdoor Expo

Helping at this program were (l. to r.) Matthew Bouffard John Handley, and Dan Krisher. (Not pictured was Michael Grenier)

We entertained well over 100 kids and families on a very pleasant day on June 14. We showed off our revamped display with many recently acquired display fossils. Always popular is the box from which kids can pick out a fossil they like, have it identified, and then make a collection tag to go with it.

November Meeting Notice

For our November 4th meeting, we are pleased to have Dr. Linda Ivany of Syracuse University as our speaker. She will discuss a spectacular heteromorph ammonite specimen from Antarctica collected by her team and the various lines of research being conducted with it.

December will be our annual show and tell event and holiday party. We have a fascinating set of speakers lined up for our winter Zoom sessions and for our live meetings beginning again in April.

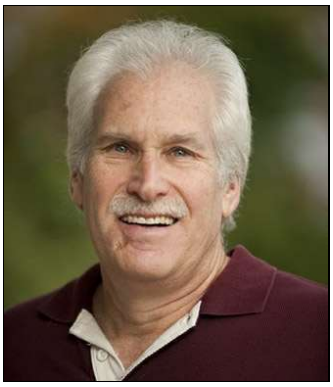
Election Results of June 2025

At the June picnic meeting, the election results were tallied with the slate of nominated candidates winning unanimously.
President: *Daniel Krisher*
Vice President: *Michael Grenier*
Secretary: *Daniel Krisher*
Treasurer: *John Handley*
Director 2-year term: *John Bouffard*
Director 3-year term: *Sonia Lopez Alarcon*
Positions begin immediately.
Director whose term has not expired is Fred Haynes (2026).

Fall Paper Session (From RAS Bulletin)

This Fall, on Saturday, November 1st, we will host the **51st Annual RAS Fall Scientific Paper Session** at SUNY Geneseo.

This event provides an opportunity for local colleges and university science students and faculty to gather and share their research interests and results. For more information and to register go to rasny.org/paper-session. We do need members as volunteers to help organize the Paper Session and to help run it on the day.



We are pleased that Dr. Marc David Abrams will be our keynote speaker for our annual Lawrence J. King Memorial Lecture.

He is Professor Emeritus of Forest Ecology and Physiology at Pennsylvania State University as the Nancy & John Steimer Professor of Agricultural Sciences. His talk is titled *Native Americans, Smokey the Bear, and the rise and fall of eastern oak forests*. It is based on his career-long research

on oak forests and cultural burning. Dr. Abrams is one of our most highly cited and influential forest ecologists.

National Fossil Day

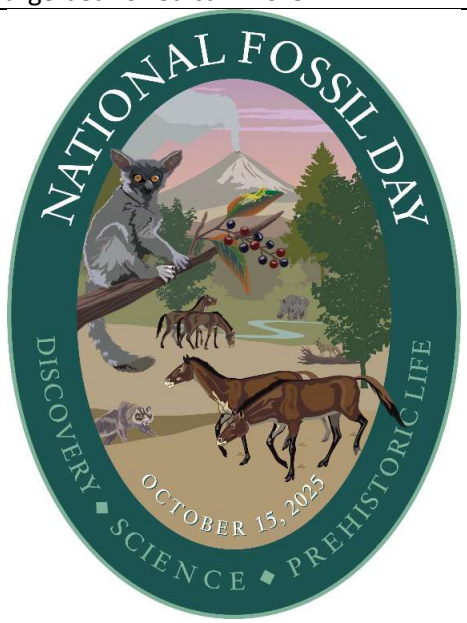
We celebrate the sixteenth annual National Fossil Day™ on Wednesday October 15, 2025.

The following material from the National Park Service site is only a small part of the information on the website. You can learn more at: www.nps.gov/subjects/fossilday/index.htm.

The 2025 National Fossil Day Logo is inspired by the John Day Fossil Beds National Monument of central Oregon and their 45 million years of mammalian ecosystems.

There is an unparalleled record at John Day telling the stories of how life in their environments has changed during the Cenozoic Era, from the Eocene Epoch to the late Miocene Epoch in northwestern United States. Paleontologists from many institutions have been delving into the rocks and fossils of the John Day Basin for more than 160 years to understand this history of life. In recognition of these fossil resources, John Day Fossil Beds National Monument (JODA) was established October 8, 1975, and is administered by the National Park Service. Today it encompasses 13,944 acres, divided among three units: Sheep Rock, Painted Hills, and Clarno. The monument only preserves a fraction of the overall John Day fossil beds, requiring the NPS to partner with other federal, state, and tribal partners, and private landowners. An average of 210,000 people annually visit the lands of the monument for outdoor recreation and to learn about the fossil heritage preserved within the region. New discoveries are still being made here by National Park Service paleontologists and their colleagues.

Neither the K-Pg boundary nor the Paleocene are found in the John Day deposits despite the presence of the Late Cretaceous Gable Creek Formation. The Eocene Epoch of John Day Fossil Beds National Monument records a time when western North America was experiencing widespread volcanic activities. The rocks preserve a semitropical forest known from fossil evidence of at least 77 species of plants represented by fossilized seeds, nuts, fruits and wood. Animals from the Clarno Formation included some of the first large mammals, such as rhino-like brontotheres, small early multi-toed horses, and an early large bear-sized carnivore.



For the 2025 National Fossil Day Logo, we feature the 29-million-year-old Oligocene assemblage of the Turtle Cove Member of the John Day Formation, inspired by new and old discoveries made at John Day Fossil Beds National Monument.

The Oligocene Epoch at the monument is represented by the John Day Formation, which is one of the more fossiliferous geologic horizons within the monument. These rocks record life between 39 and 18 million years ago. All of the formation members have preserved extensive mammal fossils.

The colorful badlands of John Day Fossil Bed National Monument, Oregon. NPS photo.

Lastly, the Miocene Epoch at the monument is represented by several geologic units, beginning with the 16-million-year-old Picture Gorge Basalts. The basalts come from a major volcanic event,

made up of 61 lava flows that erupted on an average interval of 15 thousand years over the course of a million years. Above this is the Mascall Formation, deposited between about 16 and 14 million years ago with forms such as long-jawed gomphotheres (elephant relatives), early dogs, bear-dogs, weasels, cats, pronghorns, camels, rhinos, and horses. At the top of the monument's bedrock is the Rattlesnake Formation, formed around 8 to 5 million years ago by another series of volcanic ash and debris flow events. Just prior to the volcanism, large mammals such as ground sloths, one-toed horses, sabretooth cats, peccaries, North America's last rhinos, and single-toed horses roamed the region.

During the Paleocene, Eocene and Oligocene Epochs (66–25 million years ago), lemur-like primates known as adapiformes roamed throughout North America. However, most of these early primates went extinct by the end of the Eocene. A few species survived as late as the early Miocene in North America. One such species, *Ekgmowechashala zancanellai*, was unique to the Oligocene Turtle Cove Member of John Day Fossil Beds National Monument. Fossils of *Ekgmowechashala* ("little cat man" in Sioux) have also been found in South Dakota, Nebraska, and Texas. It was a small lemur-like primate with teeth specialized for eating soft fruits and insects. This primate is depicted in the 2025 logo within a fruiting hackberry tree near a grasshopper. Both the tree and the insect have fossil representation at the monument: leaves and seeds from the hackberry, and the first ever fossilized egg clutch from the grasshopper. The presence of the primate *Ekgmowechashala* provides evidence that forests were still a dominant feature in the Pacific Northwest during the Oligocene. Below are two *Miohippus* from the Turtle Cove Member of the John Day Formation being stalked by the false sabertoothed cat *Nimravus brachyop.* Two more *Miohippus* in the background are stalked by the little "bone crushing" dog *Cynarctoides lemur*. Further off is a brontothere.

China Dino Exhibit Video

Utah State Paleontologist Jim Kirkland forwarded this promotional piece for a new exhibit at the Shanghai Natural History Museum. You're unlikely to get there, but the video is well worth watching. https://www.facebook.com/share/v/1YfymJxZsd/

The exhibit includes a section on the evolution of flight, from dinosaurs to birds. In this 2-minute very realistic animation one fossil after another in evolutionary sequence comes to life. The naked-eye 3D dinosaur installation feels unbelievably real! You will certainly enjoy watching it.

This exhibition, *China's Dinosaur World*, showcases 118 dinosaur specimens and models from across China, including more than a dozen rare fossils on public display for the first time.

Fossil News **by Michael Grenier**

In our February issue this year, we covered the finding of a mastodon lower jaw with 4 teeth and some associated fragments of rib and toe bone near Scotchtown in Orange County, NY. Hoping to find more, a dig was organized for this summer. It was successful.

Mastodon Dig is Once-in-a-Lifetime Event

SUNY Orange County Community College press release issued July 8, 2025.
https://sunyorange.edu/news/pr2025-043-mastodon-dig-is-once-in-a-lifetime-event.html

Quite literally in their own backyard in Orange County this Summer, 12 SUNY Orange students and

two professors just recently completed a field experience course in which they unearthed the partial remains of a mastodon estimated to be between 10,000 and 13,000 years old.

For six weeks, with Dr. Cory Harris and Anthony Soricelli, the students excavated several one-meter-by-one-meter test units in the hopes of finding additional remains on the heels of the September 2024 mastodon discovery. The SUNY Orange team uncovered multiple vertebrae (including the atlas vertebra), additional jaw fragments, and ribs, all of which are believed to belong to the same Ice Age mastodon. The atlas bone serves as a base for the skull by bearing its weight and maintaining its upright position. Those items have been shipped to the New York State Museum for examination and curation. The group also located a series of smaller pieces of unidentified bones and skeletal fragments, many of which are currently stored at the College's Middletown campus.

Throughout the process, the SUNY Orange team has collaborated with Dr. Robert Feranec and his team at the New York State Museum. Dr. Feranec is Director of research and collections. He provided guidance and support for the students as they tackled a project that truly records local history.

Harris believes there is more of this giant just beneath the surface, more than the excavation team could expose in just six weeks. But for now, in accordance with archeological best practices, the site has been returned to its original state. The students' detailed charts, graphs and notes remain as a map for future crews to possibly pick up where this 2025 team left off.

Mazon Creek Fossils

The Mazon Creek fossil beds are a fascinating conservation lagerstätte found near Morris, Illinois. The enigmatic, likely vertebrate, strange "Tully Monster" (*Tullimonstrum gregarium*) has been covered several times in this journal as paleontologists have tried to sort out exactly what it is. It is only one of hundreds of unique fossils from approximately 309 million years ago in the mid-Pennsylvanian epoch of the Carboniferous period. Over 400 species of plants from at least 130 genera and over 320 species of animals have been identified with both hard and soft tissues preserved, and many soft-bodied organisms that do not normally fossilize. The fossils are preserved in siderite (carbonate ironstone) concretions. Hundreds of scientific papers have discussed the deposits or their fossils.

The remains of plants and animals were rapidly buried by the sediment deposited in the deltaic system. Bacterial decomposition of the remains produced carbon dioxide that combined with dissolved iron from the groundwater. This process formed siderite in the sediments surrounding the remains, forming detailed casts of their structure.

The Illinois State Museum is the principal repository for these fossils. For more information, see their website at https://www.museum.state.il.us/exhibits/mazon_creek/about_mazon_creek.html or watch their YouTube video *"Exploring Fossils of Mazon Creek"* at https://www.youtube.com/watch?v=ZvO9-vNaCiM

Dr. Gordon Baird amassed a colossal collection of geological specimens. He is now Emeritus Professor of Geology and Environmental Sciences at SUNY Fredonia and has been a frequent speaker with us. Most of the rock specimens tied to the strata described in the recent revision of the Devonian are now in the Paleontological Research Institute in the Carl Brett and Gordon Baird collection of about 4,000 stratigraphic Devonian samples (about 30% of the entire PRI stratigraphic collection) from the northeastern United States, particularly New York.

It seems that another part of his collection was 283,821 concretions from around 350 different Mazon Creek localities. (Not a typo! Yes, nearly 300,000 specimens.)

Recreating Mazon Creek's 300-million-year-old ecosystem University of Missouri-Columbia press release issued July 21, 2025.

https://showme.missouri.edu/2025/recreating-mazon-creeks-300-million-year-old-ecosystem/

Researchers at the University of Missouri are collaborating with geologist Gordon Baird to reanalyze his massive fossil collection from Mazon Creek. It is currently housed at the Field Museum in Chicago.

Opened Concretions from Mazon Creek recently offered by www.fossilera.com

Thanks to decades of research at Mazon Creek, including foundational fieldwork by Baird and colleagues in the late 1970s, we now have an extraordinary view of life along that ancient coast.

Baird's original work at the Mazon Creek fossil site helped distinguish two major faunal assemblages, or groups of animal remains. These assemblages helped scientists understand the ancient environments where the fossils originated. They were a marine assemblage comprised of life in offshore coastal waters, and a mixed assemblage from a river delta along the shoreline, where freshwater organisms and washed-in terrestrial plants and animals were preserved together.

Now, a new team has confirmed a slightly more nuanced view of Baird's original findings, using modern data analysis techniques coupled with advanced imaging at the University of Missouri-Columbia's X-ray Microanalysis Core.

"We found three readily identifiable paleo-environments, including the unique characteristics of a benthic marine assemblage representing a transitional habitat between the nearshore and offshore zones," said lead author Jim Schiffbauer, Professor of Geological Sciences. "These ancient environments were each dominated by specific groups of animals, for example freshwater animals nearest to shore, jellyfish and sea anemones further offshore, and marine clams and worms in the transitional zone."

The fossils formed during a phase of sea-level rise and flooding of what used to be large coal swamps.

"The different environments affected how quickly and deeply organisms were buried, and in what specific geochemical conditions fossilization may have started," Schiffbauer said. "That, in turn, shaped where certain microbes lived and helped form the minerals that make up the concretions surrounding these fossils today."

In current and future research, Schiffbauer and Baird are using this information to create a sedimentological model to show how the Mazon Creek ecosystem connects to the Colchester coal layers below—where coal mining led to the fossil site's original discovery.

The new collaborative analysis of the University of Missouri team with Baird, and colleagues from the private sector and the University of Toronto is the most comprehensive and data-driven picture of what Mazon Creek's ancient ecosystem looked like long ago. This knowledge contributes significantly to our understanding of the Carboniferous Period's biodiversity and paleoecology.

"It offers a real snapshot of the incredible diversity present in the late Carboniferous Period and allows for inferences about the complexity of food chains and how this ecosystem functioned," Schiffbauer said. "Now, we have an unparalleled and statistically supported look at the interconnected terrestrial, estuarine and marine life of the Carboniferous Period."

This paper (Schiffbauer, J., Baird, G. C., Huntley, J. W., Selly, T., Shabica, C. W., Laflamme, M., & Muscente, A. D. (2025). 283,821 concretions, how do you measure the Mazon Creek? Assessing the paleoenvironmental and taphonomic nature of the Braidwood and Essex assemblages. *Paleobiology*, 1-19.) is available for free download from https://www.cambridge.org/core/journals/paleobiology/article/283821-concretions-how-do-you-measure-the-mazon-creek-assessing-the-paleoenvironmental-and-taphonomic-nature-of-the-braidwood-and-essex-assemblages/6E839A20DE65DBC5C5E6B0A4954642EB, or email the editor.

Long Shot Science Leads to Revised Age for Land-Animal Ancestor

University of Texas at Austin press release issued May 29, 2025.
https://www.jsg.utexas.edu/news/2025/05/longshot-science-leads-to-revised-age-for-land-animal-ancestor/

The fossil of the Westlothiana lizziae*, which was found in the East Kirkton Quarry in West Lothian, Scotland. Photo: National Museums Scotland.*

In 1984, an amateur paleontologist in Scotland found a remarkable specimen: a nearly complete fossil of what looked to be a lizard or salamander. Rather small at 20 centimeters, it would turn out to be a crucial piece in the puzzle of animal evolution. This creature, called *Westlothiana lizziae*, is one of the earliest examples of a 4-legged animal that had evolved from living underwater to dwelling on earth. It, and other stem tetrapods like it, are common ancestors of the amphibians, birds, reptiles and mammals that exist today.

Despite its significance, researchers had never determined an accurate age of the fossil. But thanks to new research out of The University of Texas at Austin, scientists now know that the *Westlothiana lizziae* is potentially 14 million years older than previously thought. The new age — dating back to 346 million years ago — adds to the significance of the find because it places the specimens in a mysterious hole in the fossil record called Romer's Gap.

While geoscientists can use zircon crystals to determine how long ago a rock was formed, not all rock types are amenable to this type of analysis. The site in Scotland where the fossils were discovered was near ancient volcanoes whose lava flows had long hardened into basalt rock, where zircons do not typically form. Fellow scientists warned Garza that chemically dating the rocks might be fruitless. But he got lucky. As mud cascaded down from the volcanoes, the flowing lava and debris eroded sediment that contained zircons, which got swept into a lake where limestone was forming, entombing these early tetrapod creatures.

Garza was able to extract zircons from the rock surrounding six of the fossils and conducted uranium-lead laser dating on the zircons to determine their oldest possible age. Before Garza's gamble, scientists had figured the fossils were as old as similar fossils from around the world — about 331 million years old.

The more accurate, older maximum age of 346 million years is significant because it places the specimens in Romer's Gap. This is a time period from 360 to 345 million years ago where, for reasons scientists are not exactly sure of, very few fossils have been discovered. It is during this crucial point in history that water-dwelling fish took an evolutionary leap, growing lungs and four legs to become land animals. This is one of the most pivotal milestones in the history of animal evolution.

An environmental reconstruction of the East Kirkton area some 346 million years ago depicts the Westlothiana lizziae *resting on a rock. Illustration: Hector Garza*

This paper (Garza, H. K., Catlos, E. J., Lapen, T. J., Clarke, J. A., & Brookfield, M. E. (2025). New U-Pb constraints and geochemistry of the East Kirkton Quarry, Scotland: Implications for early tetrapod evolution in the Carboniferous. *PloS one*, *20*(4), e0321714.) is available for free download from https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0321714.

CALENDAR OF EVENTS

October

Tuesday October 7, FOSSIL MEETING 7:00 PM. LOCATION: Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534. Speaker is Michael Grenier on "The Worst Day Ever: The End-Cretaceous Extinction Event." Visitors are welcome.

Sunday, October 26, OUTREACH EVENT 11:00 AM to 3:00 PM. LOCATION: Rochester Museum and Science Center, 657 East Avenue, Rochester, NY 14607 "Family Fun: Tricks & Treats"

November

Saturday November 1, RAS 51ST ANNUAL FALL SCIENTIFIC PAPER SESSION & ANNUAL LARRY KING MEMORIAL LECTURE 9 AM to 3 PM. LOCATION: SUNY Geneseo Baily Hall and other sites. Keynote speaker is Dr. Marc David Abrams on "Native Americans, Smokey the Bear and the rise and fall of eastern oak forests." Paper Session and lecture are open to the public.

Tuesday November 4, FOSSIL MEETING 7:00 PM. LOCATION: Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534. Speaker is Dr. Linda Ivany on "Lifespan, Growth Rate, and Ecology of a Giant Heteromorph Ammonite from Antarctica."

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 held as hybrid meetings, live but also broadcast on Zoom. 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 7:00 pm. In person meetings are 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. 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.

Even more baffling than Tullimonstrum is this extraordinary creature found on one of Gordon Baird's recently split concretions. It may, possibly, be some kind of worm.