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FOSSIL SECTION

The FOSSILETTER

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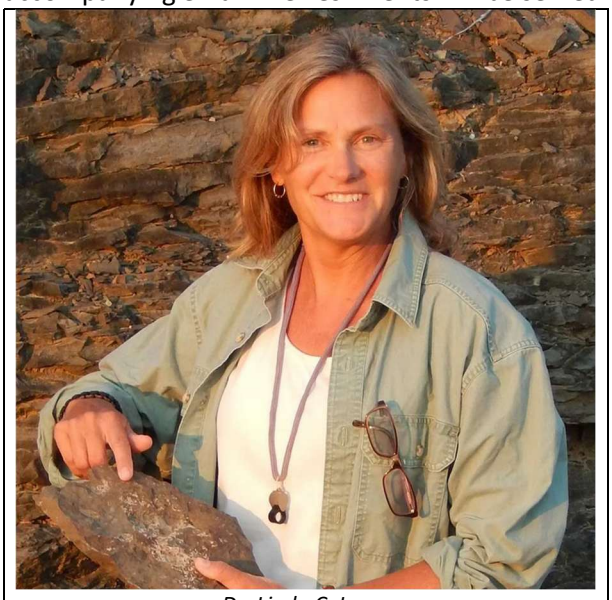
November Meeting

The November Rochester Academy of Science Fossil Section meeting is on Tuesday, November 4, at 7:00 PM. This meeting will be at Pittsford Community Center, 35 Lincoln Ave, Pittsford, NY 14534. The meeting is in Room 018, 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.



Dr. Linda C. Ivany

Syracuse University Professor Emerita Dr. Linda C. Ivany will speak on ***"Lifespan, Growth Rate, and Ecology of a Giant Heteromorph Ammonite from Antarctica."*** Dr. Ivany earned her Ph.D. at Harvard University and was at the University of Michigan before coming to Syracuse University in 2000 where she is Professor and Director of Undergraduate Studies in Earth and Environmental Sciences. Dr. Ivany is a paleoecologist who, with her students, studies the chemistry of fossil shells. The isotopes found enables her to tease out information on the environments in which these animals lived ever so long ago.

Dr. Ivany provided the following material, which has been edited.

"Shells of heteromorph ammonites (Suborder Ancyloceratina) encompass a surprising array of bizarre forms that defy even the simplest of ecological inference. The large (approximately 1.5 meter or 5 feet), paper-clip shape of the heteromorph *Diplomoceras maximum* from the late Cretaceous Lopez de Bertodano Formation of Antarctica is no exception. It raises numerous questions. Was this animal benthic or nektonic or planktonic? Was it a predator or herbivore or planktivore or scavenger? What was the orientation of the shell in life? Was it long-lived and slow growing or short-lived and fast growing? All these questions are fraught with significant uncertainty."

The shell she has studied is at the PRI's Museum of the Earth. Her team has used stable oxygen and carbon isotope analysis of serial samples collected along a half meter section of this shell later in its ontogeny in an attempt to shed light on how this enigmatic animal might have lived. They measured both the $\delta^{18}O$ and the $\delta^{13}C$. The former is based on the ratio of stable isotopes oxygen-18 (^{18}O) and oxygen-16 (^{16}O) and the latter on the ratio of the two stable isotopes of carbon—^{13}C and ^{12}C.

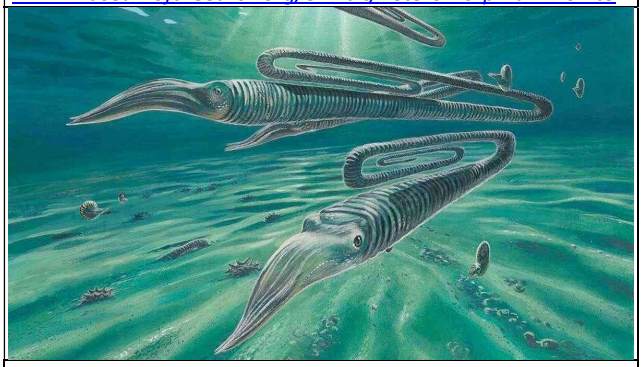
The data reveal that $\delta^{18}O$ and $\delta^{13}C$ covary. They also found that both are consistently depleted in shell material between the pronounced sculptural ribs on the shell surface. The $\delta^{18}O$ values are unremarkable and consistent with other well-preserved skeletal benthos from the formation. Also, the $\delta^{13}C$ values are exceptionally negative.

If this data reflects the annual temperature cycle when the ammonite was alive, then growth was very fast, episodic, and consistent with disequilibrium between the ribs. This implies a lifespan of around 9 years for this ammonite.

If this data is simply coincidental and the intra-rib variation itself reflects the annual cycle, then

methane-derived dissolved inorganic carbon (DIC) was regularly incorporated into shell material. This demands a lifespan in the neighborhood of 200 years. Either would be remarkable and both could be considered consistent with living cephalopod analogs.

Cretaceous Period Diplomoceras maximum *from Seymour Island, Antarctica. This large specimen is on public display at the Museum of the Earth (PRI 13889). It is 1.5 meters long, but if uncoiled the shell would be over four meters long. Image by Jonathan R. Hendricks courtesy of the Paleontological Research Institution, www.museumoftheearth.org/exhibit/heteromorph-ammonite .*



Artist's impression of Diplomoceras maximum by *James McKay. www.cnet.com*

Recently published data from co-occurring bivalves exhibit very low $\delta^{13}C$ values in association with clear annual growth bands, thereby requiring that intra-rib depletions are annual and favoring an age at death of about 200 years. Ammonite paleobiologists must therefore find ways to accept the reality of extreme longevity in this enigmatic animal.

Membership Renewal Time

Unless you are a life member, note that your membership will expire on December 31st, 2025. 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**.

President's Report by Dan Krisher

The Section held its first meeting of the 2024-2025 season on Tuesday October 1 at the Pittsford Community Center. Due to a last-minute change of plans the meeting was led by Section Vice-president Michael Grenier. The short business portion of the meeting featured a brief overview of upcoming events for both the Section and RAS for the next few months.

The evening's speaker was Michael Grenier, long time member and current Vice-president of the Section. Michael's talk was titled "The Worst Day Ever: The End-Cretaceous Extinction Event".

On Sunday 10/26 the Section participated in a Halloween event at the Rochester Museum and Science Center. The Museum hosted over 500 people as families brought their costumed children for this fun event. The Section will also staff a Fossil Outreach table at the RAS Scientific Paper Session on Saturday 11/1.

The November Section meeting will be held on November 4 and the speaker for the meeting will be Dr. Linda Ivany: Professor and Associate Chair Department of Earth and Environmental Sciences, Syracuse University. Dr. Ivany's talk will be on heteromorph ammonites from Antarctica.

December Meeting

To give everyone time to prepare and to ensure it is on everyone's schedule, we remind you that our December meeting is our annual holiday pizza party and Show-and-Tell, with pizza and drinks being provided by the section. The meeting is Tuesday, December 9th at the Pittsford Community Center, 35 Lincoln Ave, Pittsford, NY 14534 at 7:00 PM.

Members are asked to bring their interesting finds and any specimens in need of identification. This is a great opportunity to show off your finds from the past year. Visitors are welcome. Don't worry if what you have is not flashy, fossils rarely

are. Many specimens which appear at first glance to be bland may turn out to be something rare or unusual. If you have specimens which are defying identification, bring them along. Between us we usually have enough knowledge to put a name to something.

Bring children. We will have a table set up where they can pick fossils. We will also have a kid's raffle for those 17 and younger in which every one of them will win a prize. These are donated toys, games, and books.

2025 *BMC Ecology and Evolution* and BMC Zoology image competition—one with fossil art

(from Harman, J., Fenton, B., Ferrier, D., Hipsley, C.A., Liberles, D.A., McDougall, C. and Narayan, E., 2025. 2025 joint BMC ecology and evolution and BMC zoology image competition: the winning images. *BMC Ecology and Evolution*, *25*(1), p.80.)

BMC Fig. 4. Pterosaurs in flight over the Jurassic Hebridean Basin. Attribution: Natalia Jagielska

In 2025, researchers from around the world entered the joint *BMC Ecology and Evolution* and *BMC Zoology* image competition. Their images capture the beauty, struggles, and remarkable strategies life on Earth uses in the fight to survive and thrive.

Their second category, titled "Life in motion," welcomed images that capture movement in nature, as well as fossil evidence revealing how long-extinct species moved. Natalia Jagielska, a digital artist and Postdoctoral Fellow at the Chinese University of Hong Kong won best in category for her image of Pterosaurs in flight over the Jurassic Hebridean Basin. Natalia explains, "The Jurassic Hebridean Basin once covered what is now Scotland. This water body formed a pathway to the Boreal Sea, an area currently known as the North Pole. The sea was teeming with life, and recent discoveries of margin-marine deposits have yielded two pterosaur skeletons: a 2.5-meter wingspan pterosaur known as *Dearc*, and a smaller, crested pterosaur called *Ceoptera*. Despite their differing cranial anatomies, teeth morphology, and wing shapes, these pterosaurs could interact and compete for food during periods of environmental stress.

"Set 170 million years ago in the Middle Jurassic, this image portrays these flying reptiles as they hunt along the shoreline. Pterosaurs were the first vertebrates to evolve active flight, but the limited number of well-preserved pterosaur fossils hampers our understanding of their functional anatomy and behavior, particularly in the Middle Jurassic. By the Cretaceous period (145.5–66 million years ago), some pterosaurs had developed enormous wingspans exceeding 10 meters (33 feet). Utilizing photography and high-resolution X-ray microtomography, I was part of a team that described *Dearc sgiathanach*. Our observations revealed evidence of scarring from muscle attachments on the surface of the deltopectoral crest, suggesting that *D. sgiathanach* possessed large pectoral muscles for both flying and hunting.

"When compared to other recently discovered pterosaurs from the area, *Dearc* serves as an important 'stepping stone' in the evolution of pterosaurs, illustrating a gradual transition towards larger, more land-capable, and diverse morphologies."

To see winners in the other categories, visit the website, which is well worth seeing.
https://bmcecolevol.biomedcentral.com/articles/10.1186/s12862-025-02423-6

Fossil News

Scientists unearth a 112-million-year-old time capsule filled with ancient insects
https://www.sciencedaily.com/releases/2025/10/251011105524.htm

Scientists have uncovered the first South American amber deposits containing preserved insects in a quarry in Ecuador. The discovery captures a vivid picture of a forest that once thrived on the ancient supercontinent Gondwana and

opens new doors for exploring a long-overlooked prehistoric ecosystem.

Amber (fossilized tree resin) has been found in samples dating back as far as 320 million years, but it became far more common between 120 million and 70 million years ago, during the Cretaceous era (143.1 million to 66 million years ago). These ancient resins sometimes contain "bio-inclusions"–trapped remains of plants or animals—that offer rare, detailed glimpses of life forms such as insects and flowers that are not usually preserved as fossils. Until now, nearly all known major amber deposits were located in the Northern Hemisphere, leaving scientists with limited insight into what Southern Hemisphere ecosystems looked like during the time when the continents were beginning to separate from Gondwana.

This 112-million-year-old midge was one of the many insects discovered in the amber. Credit: © Mónica Solórzano-Kraemer

Coleoptera: Tetratomidae

To investigate, Xavier Delclòs and his research team examined amber and surrounding rock samples collected from the Genoveva quarry in Ecuador. The amber, dated to roughly 112 million years ago, belongs to the Hollín Formation, a sedimentary layer that stretches across Ecuador's Oriente Basin. The team identified two distinct kinds of amber: one formed underground near the roots of resin-producing plants, and another that developed in the open air. Among 60 samples of the latter, the researchers found 21 bio-inclusions representing five insect orders, including Diptera (flies), Coleoptera (beetles), and Hymenoptera (a group that includes ants and wasps), as well as a fragment of spider web. In addition, the rock surrounding the amber contained numerous plant fossils such as spores, pollen, and other botanical traces.

According to the researchers, characteristics of the fossils indicate that the amber originated in a warm, humid forest filled with dense vegetation and resin-producing trees in southern Gondwana. They emphasize that this rare find provides a crucial new resource for understanding life and biodiversity during this key period in Earth's history.

This paper, Delclòs, X., Peñalver, E., Jaramillo, C. *et al.* **Cretaceous amber of Ecuador unveils new insights into South America's Gondwanan forests**. *Commun Earth Environ* **6**, 745 (2025) is available at https://www.nature.com/articles/s43247-025-02625-2

An unexpectedly large late Pleistocene-early Holocene vulture from Uruguay

(Material from authors' abstract and from *Discover* magazine https://www.discovermagazine.com/an-unexpectedly-large-vulture-soared-over-south-america-13-000-years-ago-48187)

This reported find will be of interest to members, especially those that participated in the Buffalo Museum of Science's Byron Dig, because of the three ice age California Condor (*Gymnogyps californianus*) bones found at that site. These were a partial humerus, a coracoid shoulder-joint bone, and an ungual, the foot bone that supports a claw. (See Dr. Richard Laub's book *Two Acres of Time* for more details.) These fossils together with a few specimens from the Gulf Coast show that this condor was once found throughout North America, far beyond the remnant population found now only in California.

New World vultures form a widespread group of soaring scavengers in the Americas. This clade currently comprises seven living species in five genera. These are divided into two groups: large condors (*Gymnogyps*, *Vultur*) and smaller vultures (*Coragyps*, *Cathartes*, *Sarcoramphus*) in the family

Cathartidae, which is unique to the Americas. (Old World vultures—native to Africa and Asia—are not closely related and belong to the *Accipitridae* family, along with eagles and harriers.)

The Pleistocene records of these birds are diverse and widely distributed. In this paper, paleontologists Washington Jones and Andrés Rinderknecht of the National Museum of Natural History describe a fossil found in the late Pleistocene-early Holocene sediments of the Canelón Chico locality (Canelones Department, Uruguay). The fossil (MNHN 3948) consists of a distal, well-preserved fragment of a right tarsometatarsus. The *tarsometatarsus* is a bone found in birds, in which several ankle and foot bones have been fused into a single elongated bone, forming what would be the "lower part" of the leg, just above the toes.

Fossil tarsometatarsus fragment (right, top & bottom) with several modern vulture tarsometatarsi for comparison. Note robustness of fossil (Image from Taylor & Francis online)

This bone is the size of those found in the largest condors such as the modern California condor (*Gymnogyps californianus*) but compared to those it has a very flattened shape, indicating that it was more similar to local vultures, especially the much smaller red-headed vulture.

The notoriously flattened shaft may indicate locomotory adaptations not observed in the large condors but characteristic of the smaller *Cathartes* species. Despite their belief that this is a species new to science, the authors declined to name it due to the fragmentary nature of the remains. This study also provides new insights into the trophic roles of scavenger birds during the Late Pleistocene of South America.

This giant vulture likely fed on the bodies of mastodons, giant sloths, glyptodonts, toxodonts, and other mega-fauna. Like the Andean Condor, it would have been a strong glider for long distances as it searched for large carrion. Its disappearance may have been linked to the extinction of megafauna at the end of the Pleistocene.

*Today's Andean Condor (*Vultur gryphus*), the largest bird of prey in the world, with a maximum wingspan of 3.3 m (10 ft 10 in) and weight of 15 kg (33 lbs.). The vulture fossil came from a larger bird. (Image Credit: Adobe Stock)*

This paper, Jones, Gordon W. "A note on the turkey vulture." *The Auk* 52, no. 4 (1935): 22, can be purchased at https://www.tandfonline.com/doi/abs/10.1080/08912963.202

CALENDAR OF EVENTS

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 018, 35 Lincoln Ave, Pittsford, NY 14534. Speaker is Syracuse University Professor Emerita Dr. Linda C. Ivany speaking on "Lifespan, Growth Rate, and Ecology of a Giant Heteromorph Ammonite from Antarctica." Visitors are welcome.

December

Tuesday December 9, FOSSIL MEETING 7:00 PM. Pittsford Community Center, Room 019, 35 Lincoln Ave, Pittsford, NY 14534. Our traditional Show-and-Tell with pizza and drinks provided by the section. This is a great opportunity to show off your finds from the past year. Visitors welcome.

Saturday & Sunday, December 27-28, OUTREACH EVENT 11:00 AM to 3:00 PM. LOCATION: Rochester Museum and Science Center, 657 East Avenue, Rochester, NY 14607 December Break "Mysteries at the Museum"

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 7:00 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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The FossiLetter is published before each meeting month of the year. Please send submissions to paleo@frontier.com 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.

The average wooly mammoth stood about 10'1" at the shoulder. This cartoon shows a large Andean condor to scale on the body of an average size adult male mammoth. The new condor is even larger.