A publication of the Rochester Academy of Science FOSSIL SECTION

The FOSSILETTER

VOL. 37 Number 7 May 2020

May Meeting

The May section meeting is on Tuesday, May 5, at 7:30PM. This meeting will be conducted as a virtual meeting on Zoom, which requires either a computer with sound (or with a telephone) or a Smart Phone. It is possible to use a telephone only, but you will have only audio and not see the slides for the talk.

We feature our President, Dan Krisher, as our speaker. Dan will present a slide-show talk on "The Year in Geology and Paleontology," a synopsis of many of 2019's exciting finds in these fields. As Dan notes, progress in many fields of study typically proceeds at a relatively slow and incremental pace. If you were to look back over the years in fields such as economics, engineering, the social sciences and mathematics you would see a slow progression where one advancement builds upon another. The "hard" sciences such as physics, astronomy, biology, and geology tend to display a somewhat different pattern. The slow accumulation of knowledge certainly takes place, but these sciences also have an inherent tendency toward rapid and dramatic discoveries which can dramatically change a given field of study. This month's talk will be a PowerPoint presentation via ZOOM which will touch on some of the recent discoveries and concept changes which have occurred in the fields of paleontology and to a lesser degree geology and biology.

Fossil Section Election – Need Volunteers

It is once again time for the Fossil Section to nominate its slate of officers for the 2020-2021 year. Below is the slate of officers as it currently stands. PLEASE consider helping and nominate yourself to be Vice-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. Ballots will be collected by email and at the June 2nd Fossil Section Picnic.

RAS Fossil Section Slate for the 2019-2020 Term
For President: Dan Krisher
For Vice President/Program Chair: *Open*
For Secretary: *Open*
For Treasurer: John Handley
For Director (three-year-term): Michael Grenier
For Director (one-year-term): *Open*

In addition, Fred Haynes was elected to a three-year term as Director in June 2019 and has two years remaining in this position. There are also two appointed positions not up for election. These are Field Trip Coordinator (Dan Krisher) and newsletter editor (Michael Grenier).

President's Report

by Dan Krisher

All Fossil Sections activities scheduled to have occurred since the last board meeting were canceled due to the COVID19 virus. This included the 4/7 Section meeting and the outreach event at the Cobbles School. Other canceled non-RAS events where Section members were planning on participating included the Central New York Earth Science Student Symposium at Syracuse University and the NE Geological Society of America meeting in Reston, Virginia.

The Fossil Board held a Zoom meeting on 4/3 to explore the feasibility of a remote meeting for the May Section meeting. The board decided to proceed with the meeting on 5/5. The board is holding out hope for our annual picnic on 6/2 but

the likelihood this will be postponed till later in the summer is high. All field trips have been canceled until at least 7/1

Mary Anning on Postage Stamps

by Fred Haynes

In last month's Fossiletter, Michael Grenier wrote a wonderful biographic note on Mary Anning touching aspects of her professional accomplishments and her personal life. I enjoyed learning about her fascinating contributions to paleontology. After reading the full article I wondered if Mary Anning had ever been commemorated on a postage stamp. Yes, I collect postage stamps with a thematic specialty of geology on stamps. This includes minerals, fossils, dinosaurs, volcanoes, and yes, famous geologists. I was not aware of any Mary Anning stamps, but I did know where to look for them. And I found a few. The first commemorative stamps I found honoring Mary Anning was a set of seven issued in 2012 by Mozambique (Figures 1 and 2). This set honors the 165th year of her passing. They are very nice looking stamps and include a great deal of detail about Anning, both on the stamps and in the selvages. Six of the stamps are set into a background with a fossil plesiosaur and ichthyosaur (Figure 1). They depict various themes from Anning's paleontological research. Mary herself is depicted on two of the stamps. Personally, I like the 66 MT stamp on the lower right with her standing beside a *Plesiosaurus dolichodeirus*. As is typical of many commemorative stamp sets, the highest value of the set is placed in a separate "souvenir sheet" (Figure 2). For the Mozambique set this sheet includes vivid drawings of both the fossil reptiles Anning studied and also a depiction of them in a Cretaceous Ocean. I will need to obtain these stamps in order to read the full text inscribed onto the selvage.

Another smaller set I found honoring Anning was a three-stamp set issued in 2014 by Mali (Figure 3). The set clearly honors Mary with its high denomination stamp in the center, and the inclusion of Ammonidea, since ammonites were frequently collected and sold by her. However, there is no reason why *Saurolophus* should be associated with Anning's work. It wasn't found and

Figure 1

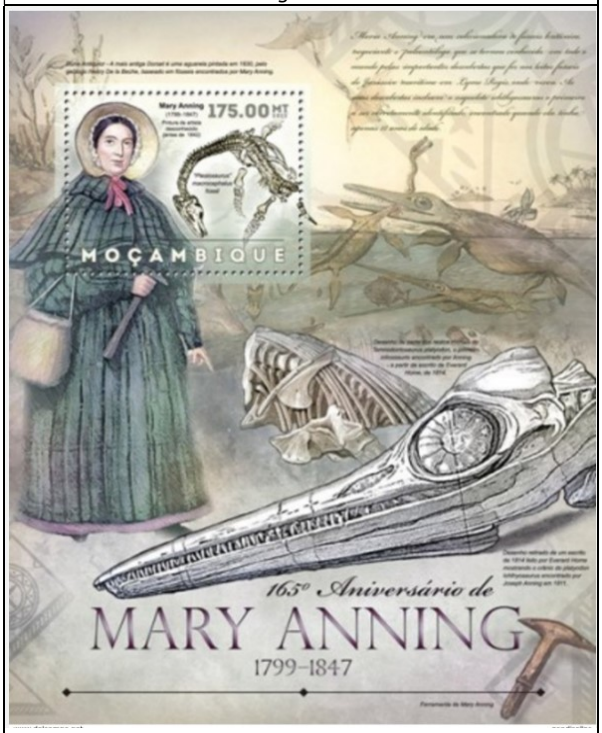


Figure 2

described until 1912, a full 65 years after Mary's death. Further, it was found in Alberta, Canada, and is entirely unknown from England or anywhere in Europe. Sometimes, countries issue stamps without full consideration of their content.

You might wonder why a former Portuguese colony in southern Africa and a land-locked, former French colony in central Africa would honor a British paleontologist whose primary work was done with Cretaceous reptiles found in Great Britain. The answer is pretty obvious: to sell stamps to collectors like me!

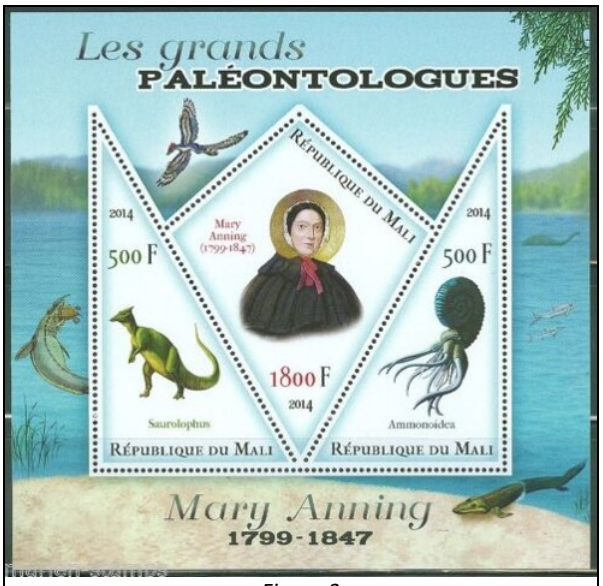


Figure 3

You might also wonder if Great Britain has ever honored Mary Anning in its postal history. After all, Great Britain was the first country to ever issue a stamp back in 1840, seven years before Anning passed away. The answer is "sort of". In 2013, Great Britain issued an attractive set of 10 stamps depicting prehistoric animals. The set was designed to celebrate the long history of paleontology in Britain by featuring the discovery of a multitude of extinct animals in Britain by British paleontologists. Although Mary is not included in the stamps, her work is acknowledged in the descriptions provided by the British postal service. *Ichthyosaurus* and *Plesiosaurus* are both featured in the set. Figure 4 is the Postal Service's Official First Day of Issue Envelope.

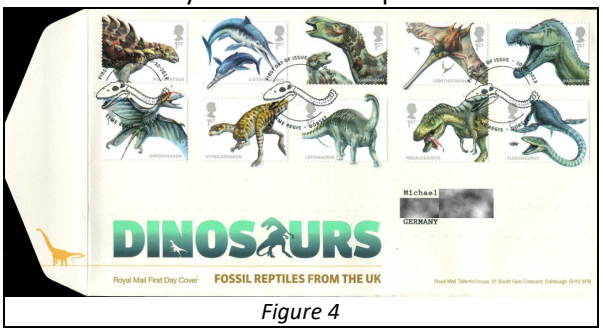
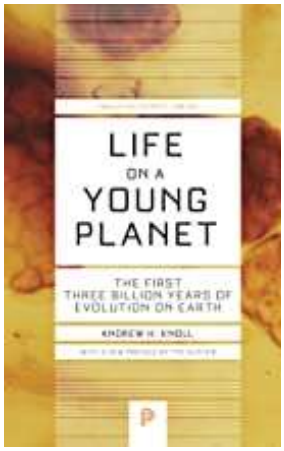


Figure 4

All of this sounds grand until the British Postal Service decided to earmark the self-adhesive set of stamps as "Dinosaurs" and print sheets and envelopes with such labels (Figure 4). Four of the stamps are not dinosaurs, but rather flying and marine animals. Errors such as this are very common among the several thousand dinosaur (or not dinosaur) images that have been printed onto postage stamps.

If you remain curious about collecting dinosaurs (or other fossils for that matter) on postage stamps you might check out this wonderful webpage: www.paleophilatelie.eu/. It is one of the more comprehensive compilations of thematic postal stamps available on any topic.



Book Review

Life on a Young Planet: The First Three Billion Years of Evolution on Earth, by Andrew H. Knoll, Updated Edition. Princeton Univ. Press, 2015, 288 pp.

Harvard professor Dr. Andrew Knoll is likely the foremost Precambrian paleontology and biogeochemistry authority, especially of the single-celled organisms that dominated life for most of the Precambrian. This also qualifies him to help with the search for past life on other planets, and he has served as a member of the science team for NASA's MER rover mission to Mars. We are fortunate that he can write well for the lay reader to make his knowledge explicit to us. On Amazon, this book garners a 4.4 out of 5 with 65 reviews.

In the full history of life, trilobites and other ancient animals form only the half-billion-year tip of a nearly four-billion-year iceberg. Knoll explores the deep history of life from its origins on a young planet to the incredible Cambrian explosion, presenting a compelling new explanation for the emergence of biological novelty.

The very latest discoveries in paleontology--many of them made by the author and his students--are integrated with emerging insights from molecular biology and earth system science to forge a broad understanding of how the biological diversity that surrounds us came to be. Moving from Siberia to Namibia to the Bahamas,

Knoll shows how life and environment have evolved together through Earth's history. Innovations by life forms have helped shape our air and oceans, and, just as surely, environmental change has influenced the course of evolution, repeatedly closing off opportunities for some species while opening avenues for others.

Readers go into the field to confront fossils, enter the lab to discern the inner workings of cells, and alight on Mars to ask how our terrestrial experience can guide exploration for life beyond our planet. Along the way, Knoll discusses some of science's hottest questions, from the oldest fossils and claims of life beyond the Earth to the hypothesis of global glaciation and Knoll's own unifying concept of ''permissive ecology.''

In laying bare Earth's deepest biological roots, "Life on a Young Planet" helps us understand our own place in the universe—and our responsibility as stewards of a world four billion years in the making. (from Publishers Notes)

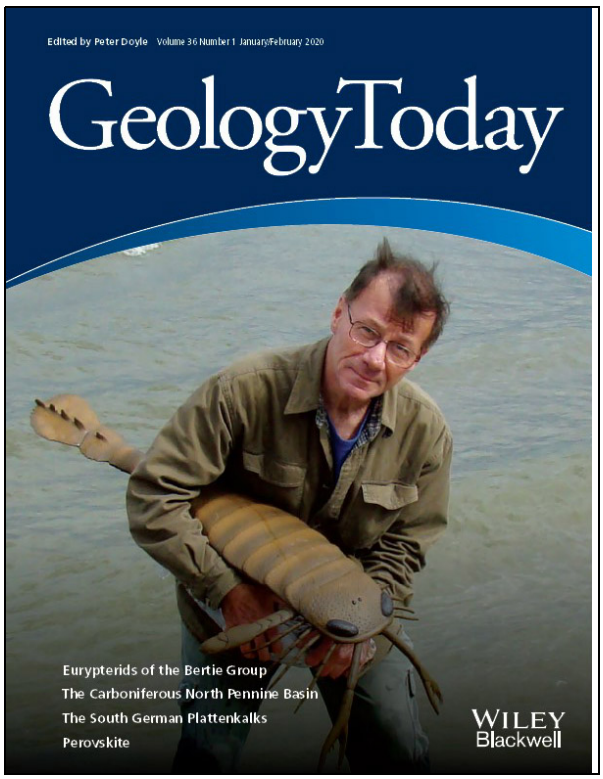
Fossil News

Member Places Specimen in the Royal Ontario Museum

Sam Ciurca reports that he recently delivered a most excellent eurypterid specimen from his collection to the ROM in Toronto. Next time you visit there, look for this one. "This is perhaps the best specimen of *Hughmilleria socialis* I recovered from the Spring House Commons Site." (Pittsford Member, Vernon Formation, Salina Group)

Sam's Hughmilleria socialis *slab now at the ROM*

Sam's other recent coup is to have appeared on the cover of the January/February 2020 issue of *Geology Today*, the publication of the Geologists' Association and The Geological Society of London. This photograph of Sam was taken by Jose Berrios and first appeared on Sam's **eurypterids.net** website as "Eurypterid of the month" for April Fool's Day, 2009. The cover is in conjunction with an article by Derick E.G. Briggs and Brian T. Roach (of the Yale Peabody Museum of Natural History at Yale University) entitled *Excavating eurypterids, giant arthropods of the Palaeozoic*. The article features Sam extensively as the authors draw on the substantial part of the more than 10,000 eurypterid specimen collection that Sam provided to Yale.



Heliophyllum Monograph Published

Your editor was not certain whether to class this a news item or as a **Book Review**. Every member who has rugose corals in their Devonian fossil collection (that's all of you, isn't it?) will want to get a free copy of this 58-page masterpiece, ***Heliophyllum A Study in Survival***, released just this past December. It is published by the Buffalo Geological Society (BGS) and has contributions by both BGS and RAS Fossil Section members (and some who belong to both). BGS Education Committee chairman Walter Drabek coordinated the project and Paul Leuchner, Joseph Sullivan, Joseph Butch, Dan Krisher, Mark Castner, and

Michael Grenier are acknowledged. Many BGS Club members provided specimens.

This work is comprehensive and covers a host of related subjects. There are overviews of the Hamilton Group stratigraphy, the paleo-environment of Devonian New York just south of the equator, and the taxonomy of the *Heliophyllum* genus (with a detailed account of changes made in the taxonomy over the years further on in the paper). There is a lengthy section on morphology (including the unpreserved but presumed soft parts based on modern analogues) and the external features still visible of the fossils. The team thin sectioned several specimens to show detail of internal structure and growth through time of single specimens. Research has suggested that fine growth lines are daily deposits, with coarser being annular, and thus that the length of a Devonian day can be calculated—the authors summarize this nicely.

After short speculative sections on reproduction (with much fossilized evidence) and color, the authors get into their most detailed analysis, that of the myriad shapes in which specimens are found. This originally led to as many as 14 species or sub-species being named, most of which turn out to be morphological variations of *H. halli*. What drove the variation was the instability of the environment to which Heliophyllum was adapted, with frequent toppling events, current changes, turbidity, nutrient availability and others. The effect of each of these (and combinations) are explored with profuse illustrations. The illustrations themselves are a treat, as there are 159 of which 135 are beautifully reproduced detailed photographs. The final sections cover the preserved evidence of predation on some fossils, and the attachment of other animals to the corals hard exterior, which made an attractive anchoring point for bryozoans, phoronids, inarticulate brachiopods, corals, tubiculous worms, and pelmatozoans.

To get this excellent 58-page study, go to https://bgsny.org/, drop down the page until you come to "New Publication: Heliophyllum – A Study in Survival", which is a hot link. Click on it and you will be taken to the FREE download page, from which you can get the pdf document to your own desktop.

Earliest Known Meloidae Beetle Fossil

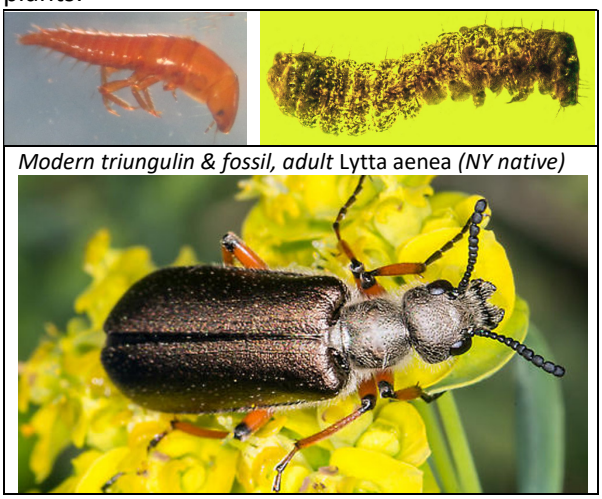
If you saw this reported in February, it was all about the bee in amber fossil. The bee, *Discoscapa apicula*, is not the oldest known bee, but it is the oldest known with proof of flower visit and pollen collection. That makes the bee fossil

Discoscapa apicula *left side*

special, but more on that afterwards. What was not much discussed were the beetle fossils found with it. These are (with that published by same author in 2014) the oldest known Meloidae beetle fossils. These fossils are larvae, in their triungulin stage. They are much disliked by most bee lovers due to the damage they cause in hives. The author is a bee specialist with many papers on fossil bees, other amber imbedded arthropods, and flowers. He does note that he plans to treat these triungulins in a future paper.

Meloidae, commonly called blister beetles, are a family of plant-feeding insects that contain *cantharidin*, a toxic defensive chemical that protects them from predators. Accidentally crushing a beetle against the skin can result in a painful blister, the source of the insect's common name. The female lays between 3,000 and 4,000 eggs. Most of the young starve to death before they find food because of their complicated and hazardous life history. The female deposits masses of eggs near potential food or flowering plants that they can climb. The larvae hatch not as a grub but as tiny active forms (triungulins) with legs and almost all features of adult insects, except

wings. Most species' triungulins try to reach feeding sites on their own and feed on grasshopper or other insect eggs. Many of the Meloinae subfamily (330 known species) and the Nemognathinae subfamily (120 known species), however, are bee specialists. It attaches itself to a bee, and is carried to the bee's nest or hive, where it feeds on the egg in the cell where it lodges, metamorphoses into a grub, and then feeds on the stored honey and pollen, and on bee larvae. When grown it metamorphoses again until the newly emerged adult drops to the ground and feeds on plants.

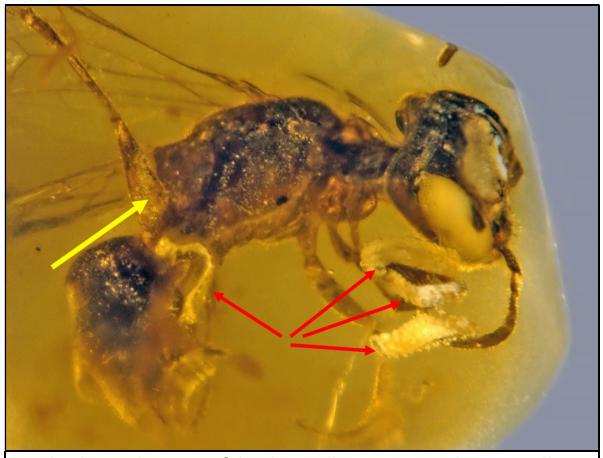


Modern triungulin & fossil, adult Lytta aenea *(NY native)*

Multiple metamorphoses are unusual in arthropods and is termed hypermetamorphosis. A 2-minute BBC film on this life cycle is at youtube.com/watch?v=ZQ8h1YBTSvE.

But as I said, the bee is also interesting. The press release from Oregon State University announcing Dr. George Poinar Jr.'s paper was fairly scant, noting that "The mid-Cretaceous fossil from Myanmar provides the first record of a primitive bee with pollen and also the first record of the beetle parasites, which continue to show up on modern bees today. Numerous pollen grains on *Discoscapa apicula* show the bee had recently been to one or more flowers." It speculatively suggested that the triungulins caused the bee to become stuck in tree resin.
https://today.oregonstate.edu/news/fossilized-insect-100-million-years-ago-oldest-record-primitive-bee-pollen.

The paper itself of course provides more detail and is an easy read. This fossil is from an amber site first found in 1999 in the Hukawng Valley in Myanmar and dated using imbedded pollen to the Upper Albian of the Early Cretaceous (97–110 million years ago). The same deposits have yielded the oldest bee, the oldest angiosperm flowers in amber, and the first fossil evidence of vector borne diseases (all papers by Poinar), other insects, arachnids, birds, lizards, snakes, frogs, and dinosaur parts, making it one of the most significant Cretaceous amber deposits in the world. In this long-ago amber forest, as angiosperms were diversifying, primitive pollen-feeding bees were evolving from carnivorous apoid wasps. This female worker bee falls within the monophyletic group that currently includes all living bees that utilize pollen for development of their brood.



Right lateral view of body. Yellow arrow shows pollen-laden scopae on hind leg femur. Red arrows show four associated beetle triungulins.

Pollen grains in scopae on the femur and tibia of the middle and hind legs and on the claw and tarsus of the middle leg show that *Discoscapa* had recently visited one or more flowers. A list of small flowers described from Burmese amber that this bee could have visited is presented in a table, based on other amber finds in this deposit. The twenty-one triungulins in the same piece of amber is also cited as evidence for flower visits, presuming their behavior was the same then.

The generic name is from the Latin "disco" (different) and the Latin "scapa" (stem, in regards the modified antennal scape of the fossil), and "apicula" is Latin for small bee.

This paper, (Poinar Jr, G. (2020). ***Discoscapidae fam. nov. (Hymenoptera: Apoidea), a new family***

of stem lineage bees with associated beetle triungulins in mid-Cretaceous Burmese amber. *Palaeodiversity*, 13(1), 1-9.) is available from the editor or can be downloaded at https://bioone.org/journals/Palaeodiversity/volume-13/issue-1/pale.v13.a1/Discoscapidae-fam-nov-Hymenoptera--Apoidea-a-new-family-of/10.18476/pale.v13.a1.full

Near Complete Cretaceous "Modern" Bird

Bird fossils from the Cretaceous are in the news a lot, especially fully-feathered specimens out of China over the past few years. What most people do not realize is that these birds are almost all in lineages that did not survive the end-Cretaceous extinction. They are Enantiornithine birds, Hesperornithines, and the like. Only a few "modern" Neornithine birds, also called "Crown birds" are known from the late Cretaceous. The material for these is often so scrappy as to be almost embarrassing. Skulls are all but unknown. I know of only fourteen that have been named, and some of these are in dispute, and others are debatable as to whether they are from the latest Cretaceous or the earliest Paleocene. Dr. Daniel Field and others believe that *Vegavis iaai*, a latest Maastrichtian Age Antarctic specimen most closely related to ducks and geese (Anatidae) is the only well-supported Cretaceous crown bird.

There is no room to cover all this here, but I will provide a review next month. This is just to position how incredibly valuable this new specimen is.

The skull of Asteriornis maastrichtensis

This spectacular fossil, which the newspapers ran as 'Wonderchicken', is the oldest fossil of a modern bird yet found. It dates from 66.8–66.7 million years ago, only about 700,000 years before the bolide impact. (In a 2013 paper, Paul Renne of the Berkeley Geochronology Center dated the impact at 66.043±0.011 million years ago, based on argon–argon dating.) It includes a nearly complete three-dimensional skull, and important skeletal material. This specimen was found in a Belgian limestone quarry by an amateur collector, making it the first modern bird from the age of dinosaurs found in the northern hemisphere.

artist's recreation

Detailed analysis shows that it has features common to modern chicken- and duck-like birds, suggesting that *Asteriornis* is close to the last common ancestor of modern chickens and ducks.

Cambridge University produced a really good 5-minute video at, featuring Dr. Field, viewable at https://www.youtube.com/watch?v=D7BM7-YIyFM.

This paper, (Field, D. J., Benito, J., Chen, A., Jagt, J. W., & Ksepka, D. T. (2020). ***Late Cretaceous neornithine from Europe illuminates the origins of crown birds***. *Nature*, *579*(7799), 397-401.) being a *Nature* publication is not available for free download, but can be had from the editor.

In Memoriam – Barbara F. Stone

We have been told that RAS Life Member Barbara F. Stone has died. She was a long-time member of the Fossil and Mineral sections, and other sections. She passed away at the Friendly Home in Brighton on March 29, 2020 at the age of 99. She is predeceased by her husband of 66 years, Udell B. Stone, who was also a RAS Life Member. Her obituary is at www.anthonychapels.com/obituaries/Barbara-F-Stone?obId=12599258#/celebrationWall

CALENDAR OF EVENTS,

May
Tuesday May 5, FOSSIL MEETING 7:30 PM Virtual Meeting on Zoom 2300 Elmwood Ave. Dan Krisher slide-show talk on "The Year in Geology and Paleontology." Visitors welcome.
June, Tuesday June 2, FOSSIL SECTION ANNUAL PICNIC 6:00 PM Location: Farash Center for Observational Astronomy, Ionia, NY. Meeting subject to change.

Visitors are welcome to all Fossil Section meetings! Refreshments are served. 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 the first Tuesday of each month from October to December and from March to May at 7:30 pm at the Brighton Town Hall, Community Meeting Room, 2300 Elmwood Avenue, Rochester, NY unless otherwise listed.

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Director (one-year-term): Fred Haynes	585-203-1733	fred.patty.haynes@gmail.com
Director (three-year-term): ***Open***		
APPOINTED POSITIONS		
Field Trip Coordinator: Dan Krisher	585-293-9033	DLKFossil@gmail.com
FossiLetter Editor: Michael Grenier	585-671-8738	mgrenier@frontiernet.net

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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.,

An artist's reconstruction of the world's oldest modern bird, Asteriornis maastrichtensis, *in its original environment. Credit: Phillip Krzeminski*