

# The FOSSILETTER

VOL. 39

Number 2

November 2021

## November Meeting

The November section meeting is on Tuesday, November 9, at 7:30 PM. This meeting will be conducted as a virtual meeting on Zoom. Details on how to login are in the accompanying email.

We have as our guest for our November meeting Carl Fechko, past president of the North Coast Fossil Club in Cleveland, Ohio and well-known collector. Carl has collected fossils in the Eocene Green River Formation of Wyoming in each of the past five years. This formation is well-known for its myriad of superbly preserved fossil fish, which are ubiquitous at fossil shops and gem & mineral shows. Many other life forms are also preserved there. Carl will speak to us on "The geology, history, and fossils of the Fossil Lake Sediments of the Green River Formation".



Carl Fechko with a specimen of *Diplomystus dentatus* found during one of his excavations. Credit: C. Fechko

Those who attended our meeting this past February will remember Carl as the presenter in a short talk about the find of the superb Late Silurian Acanthodian fish ("spiny shark") *Nerepisacanthus denisoni*, soon to be on permanent display in the

new Royal Ontario Museum Willner Madge Gallery's Dawn of Life exhibit, set to open in November 2021. This specimen and find was featured in an article in our March 2021 newsletter. This is the oldest/most complete jawed vertebrate in the fossil record at 420 million years old.

A science teacher for 35 years, Carl is an experienced speaker and has given talks on this subject to several other fossil clubs.

## President's Report by Dan Krisher

The Section held a meeting via ZOOM on October 5th. Among the items discussed in the business portion of the meeting were the need to conduct our meetings via ZOOM for the remainder of the 2021-2021 season. There was a brief discussion on the possibility of holding a December meeting at the Brainery so we can have our annual show-n-tell and pizza gathering. This is being followed up on.

The Fossil Board met on 9/22 at the home of Michael Grenier to sort the large fossil collection it acquired many months ago via a gift from an estate. A small amount of material was discarded with the major portion being set aside for outreach events. A smaller quantity was set aside for auctions. A portion of the material was of sufficient quality to form the basis of a display collection for outreach events.

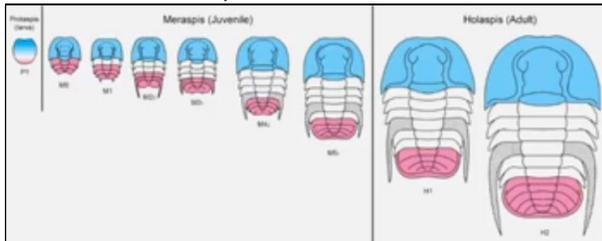
The speaker for the meeting was Dr. Melanie Hopkins, Chair of the Division of Paleontology and Curator in Charge of Fossil Invertebrates at the American Museum of Natural History. Her talk was entitled "How to Grow a Trilobite: Learning about trilobite growth and development through empirical and modeling studies.

## "How to Grow a Trilobite" Talk

Dr. Melanie Hopkins' talk (47 minutes long) was recorded and is at: <https://youtu.be/RgGH4E2xENS>

Dr. Hopkins noted that we have complete growth series for a number of trilobite species, and studies of these have enabled her team to develop models for the growth. She noted that as trilobites grew, they added body segments with every molt that they went through. Most trilobite fossils are the remains of their molts, as they may have molted many times before leaving a body at the end. As they grew, new segments were added from the back of the pygidium, so what wound up in the middle started out at the tail end. So in the illustration below, the spined thoracic segment on *Shumardia salopiensis* at full maturity can be found on the pygidium when it first formed. After full maturity (final number of segments reached), the trilobite continued to grow.

While the growth of the cephalon is linear, the growth of the post-cephalon body follows a curve, which can be described with an equation with only three factors. This means that the growth rate can be represented mathematically and allowed a computer model to be created to predict growth rates in different species.



With enough specimens, it is possible to reconstruct trilobite development from larvae to adults. This is the growth sequence for *Shumardia salopiensis*.



This is a slab collected by Dr. Hopkins in the House Range of western Utah, with specimens of *Elrathia kingii* for juvenile to adult. The contrast between specimens and matrix is natural.

We strongly recommend viewing the video for a fascinating discussion about trilobites and about the development of her model and where it is likely to lead.

### Scientific Paper Session

The 47th Rochester Academy of Science Fall Scientific Paper Session will be held at the Nazareth College Shults Center and Peckham Hall this coming Saturday November 6th. Sixty-two research studies will be reported as posters or oral presentations across a wide range of disciplines including one in paleontology--VERTEBRAL FOSSILS OF THE SQUAMATES AND ANURANS OF CATHEDRAL CAVE, NEVADA, by Jack Gembala, Maria Belen Salinas, and Jennifer C. Olori. Department of Biological Sciences, SUNY Oswego.

If you plan to come, please register (free!) at <https://rochesteracademyofscience.godaddysites.com/paper-session>.

At 1PM, our annual Larry King Memorial Speaker this year will be Dr. Howard Lasker of SUNY Buffalo speaking on *The Ecology of Coral Reef Organisms*.

### Samuel J. Cieurca, Jr., 1939-2021

We noted Sam's passing last month with a brief notice. Since he deserves much more, we are pleased to dedicate this edition of *The FossilLetter* to him. *Warning: eurypterids ahead!*

Sam had been interested in paleontology since a teenager, and quickly developed a fascination with eurypterids. A voracious collector, Sam amassed the world's largest collection of these chelicerate arthropods. (Their closest living relatives are scorpions and spiders all of which are land-dwelling.) In fact, it is asserted that Sam's collection outnumbered all other collections combined.

Eurypterids are among the largest known arthropods ever to have lived. The largest known is ~2.5 meters (8.2 feet) in length (a specimen of *Jaekelopterus rhenaniae* found in Germany). Other species could get nearly as large, though most are much smaller. *Eurypterus remipes* was officially named the State Fossil of New York in 1983.

Sam was a curatorial affiliate at the Yale Peabody Museum of Natural History. He sent a

part of his collection (11,045 specimens from 560 localities) to the Yale Peabody Museum in 2019, where it is now known as the *Samuel J. Cieurca Eurypterid Collection at Yale Peabody Museum of Natural History* and is referenced as such in several research papers since then. Sam has left the rest of his eurypterid specimens to Yale Peabody also.



Now on display at the New Mexico Museum of Natural History, a specimen from the Williamsville 'A' Waterlime, Ridgemount Quarry South, Niagara Peninsula (Fort Erie, Ontario, Canada).

Sam was generous with his collections. Many museums have a display specimen that came from Sam. One example is the New Mexico Museum of Natural History in Albuquerque. In early 2019, he noted that they had very little, just one specimen

of the rare Permian *Adelophthalmus*. He donated to them one of the better *Eurypterus dekayi* specimens from his collections. The Paleontological Research Institute also has a substantial collection from Sam and is destined to get his remaining non-eurypterid collection.

Sam was not “just a collector.” He kept thorough field notes and documentation about each specimen and each area and strata in which he collected. He studied the morphology, taxonomy, stratigraphy, geologic history, and paleoecology of his specimens and became a world renown authority on these creatures. He authored or co-authored scores of scientific papers, articles, posters, GSA field trip guides, and a short book on eurypterids. For all this, in 2016, he was honored with the Harrell L. Strimple Award of the Paleontological Society. This is their highest honor for amateur paleontologists, those who make exemplary contributions to this field but who do not make a living full-time from paleontology. He also published papers and patents as a professional chemist at Kodak.



Samuel J. Cieurca Jr. (at podium) at 2016 GSA Meeting, receiving Strimple Award (Photo by John Hammond)

Sam was a fixture at our outreach programs, where his full-scale model of an *Acutiramus macrophthalmus* attracted kids and adults alike to our fossil table.

Sam also maintained an extensive eurypterid research website at

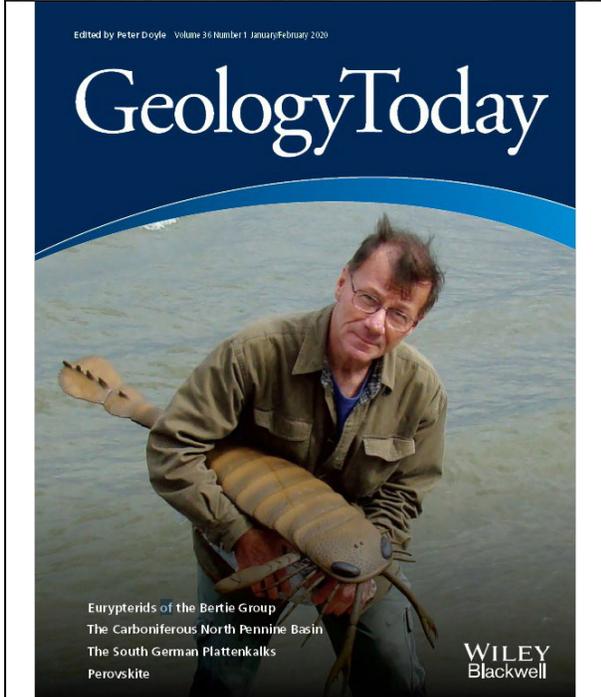
<http://eurypterids.net/EurypteridLinkIndex.html>

and published a “Eurypterid of the Month” collection at

<http://eurypterids.net/EurypteridMonth.html>

On the latter site, on April 1st, 2009, Sam reported the capture of a live, surviving, relic *A. macrophthalmus*, in Lake Ontario, including this photo, which was used as the January/February 2020 cover for *Geology Today*, the journal

published on behalf of The Geologists' Association and The Geological Society of London. This issue featured a paper on Sam's 1.25 meter specimen (4.1 feet) on which he based his model. (see Fossil News, below)



**Partial bibliography, publications by Samuel J. Ciorca, Jr. since 2002.**

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2. Ciorca, S.J., 2019. Early Devonian Manlius Group: Eurypterids, Crinoids, Olney Limestone and a Drone. *The Proceedings of the Rochester Academy of Science*, Vol. 21, No. 5, p.423-424.
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4. Ciorca, S.J., 2018. *Buffalopecterus* Within the Late Silurian Bertie Group of New York and Ontario, Canada. *The Proceedings of the Rochester Academy of Science*, Vol. 21, No. 5, p.375.

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6. Vrazo, M.B., Brett, C.E. and Ciorca, S.J., 2017. Paleocological and stratigraphic controls on eurypterid Lagerstätten: a model for preservation in the mid-Paleozoic. *Paleobiology*, 43(3), pp.383-406.
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8. Ciorca, S.J., 2017. Salvage Paleontology — Silurian Rocks of Upstate New York. *The Proceedings of the Rochester Academy of Science*, Vol. 21, No. 5, p.312-313.
9. Vrazo, M.B., Brett, C.E. and Ciorca Jr, S.J., 2016. Buried or brined? Eurypterids and evaporites in the Silurian Appalachian basin. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 444, pp.48-59.
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13. Ciorca, S.J., 2013. *Eurypterus pittsfordensis* Fauna: New Localities for the Barge Canal Member, Lower Vernon Formation, Salina Group (Erie Canal at Fairport and Pittsford, New York). *The Proceedings of the Rochester Academy of Science*, Vol. 21, No. 5, pp.91-92.
14. Ciorca, S.J., 2012. Eurypterids of the Devonian Olney Limestone (Manlius Group) of Central New York. *The Proceedings of the Rochester Academy of Science*, Vol. 21, No. 5, p.46.
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- Canada. *The Proceedings of the Rochester Academy of Science*, Vol. 20, No. 3, pp.171-172.
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  29. Cieurca Jr, S.J., 2005. Eurypterids and facies changes within the Silurian/Devonian "Eurypterid Beds" of New York State. In *New York State Geological Association 77th Annual Meeting. Oswego, NY* (pp. 113-121).
  30. Cieurca, S.J., 2005. Analysis of the Completeness of Eurypterid Remains. *The Proceedings of the Rochester Academy of Science*, Vol. 20, No. 3, p.98.
  31. Cieurca, S.J., 2004. A New Eurypterid (Carcinosomatidae) from the Silurian Clinton Group of Western New York State. *The Proceedings of the Rochester Academy of Science*, Vol. 20, No. 3, pp.57-58.
  32. Cieurca, S.J., 2003. Eurypterids, The 'Martisco Reef Complex' and Visiting European Geologists 2003. *The Proceedings of the Rochester Academy of Science*, Vol. 20, No. 3, p.42.
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### Fossil News by Michael Grenier

Eurypterids range in age from the Ordovician (467.3MYA) to the Permian, becoming extinct during the Permian–Triassic extinction event 251.9 MYA. They are found on all continents, except they have not been found yet in Antarctica. There are about 250 species identified so far and these were mostly predators in marine or brackish environments. These became extinct in the end-Devonian mass extinction, leaving only freshwater bottom feeders in the Carboniferous and Permian. Some species of eurypterids are unusual for arthropods in reaching very large sizes.

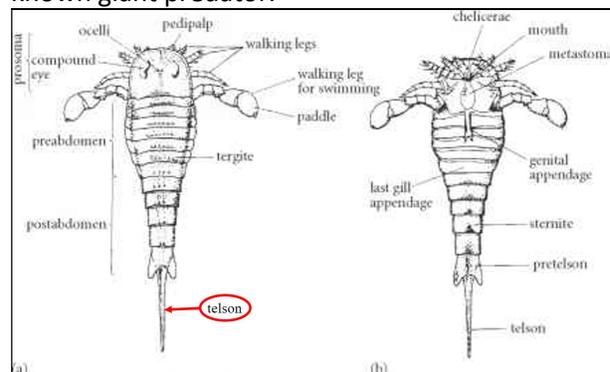
The following paper is the last of Sam's to be published before he died.

### Giant Eurypterus Found

Material for this report is taken from Ruebenstahl, A., Cieurca Jr, S.J. and Briggs, D.E.,

2021. A Giant Eurypterus from the Silurian (Pridoli) Bertie Group of North America. *Bulletin of the Peabody Museum of Natural History*, 62(1), pp.3-13).

Specimens of *Eurypterus* are the most common eurypterid fossils worldwide and are abundant in the Bertie Group (Silurian) of western New York and contiguous southern Ontario Province, Canada. Most *Eurypterus* specimens are relatively small compared with *Acutiramus*, *Eusarcana*, and *Dolichopterus*. In this paper, the authors discuss the discovery of an isolated *Eurypterus lacustris* telson (tail spine) nearly 15 cm long which must have come from an individual more than half a meter in length. This makes *Eurypterus* another known giant predator.



Eurypteris morphology displaying features of (a) dorsal and (b) ventral surfaces. (from [www.fossilhunters.xyz](http://www.fossilhunters.xyz), telson emphasis added)



FIGURE 2B. The largest complete *Eurypterus lacustris* specimen in the Yale Peabody collection, from Fort Erie, Ontario, Canada. YPM IP 213539, counterpart. Scale bar equals 20 mm. Total length 26cm (10 ¼ in), telson (tail spine) length 6.8cm (2 2/3 in).

The first eurypterid to be described was *Eurypterus remipes* from New York in the Bertie Group in 1825. The second eurypterid was *E. lacustris* from the Bertie in Ontario. These two species are variously estimated to be about 80-90% of all eurypterid specimens worldwide. Complete

specimens of *Eurypterus* average at about 13 to 23 cm (5 to 9 in) in length with a telson of 3 to 6.5 cm (1 to 2 ½ in).

This largest known telson of *Eurypterus* was collected in Member A of the Williamsville Formation in the Bertie Group of the Ridgemoor Quarry, Fort Erie, Ontario, Canada, by Samuel J. Ciarca, Jr., who donated it to the Yale Peabody Museum of Natural History (specimen number YPM IP 548836, part and counterpart). Discovery of a *Eurypterus* telson nearly 15 cm long greatly increases the maximum size estimates for this most common and historically significant eurypterid.

The outline of the telson tapers gradually along its length to a blunt slightly rounded termination. The maximum preserved width is 30 mm at the proximal end, and the telson is 148 mm in length. The cuticle is present in the posteriormost 30% of the telson length on the figured counterpart and in the anterior 40% of the part. Where the lateral margins of the telson are preserved serrations are clearly evident along the right margin of the counterpart (Figure 1D) and toward the distal extremity of the left margin (Figure 1C). This morphology is consistent with that of the telson of *E. lacustris* rather than *E. remipes*; the other two species of *Eurypterus* from the Bertie Group, *E. dekayi* and *E. laculatus*, lack serrations.

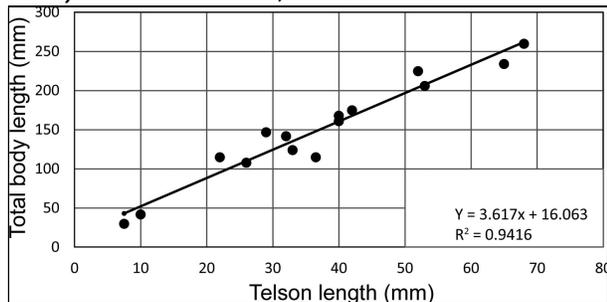


FIGURE 3. Telson length against total body length, in millimeters, from full body specimens of *Eurypterus lacustris*, Fort Erie, Ontario, Canada, held in the collections of the Division of Invertebrate Paleontology, Yale Peabody Museum of Natural History (n=15).

All full body specimens including the telson of *E. lacustris* from Fort Erie, Ontario, presently in the Yale Peabody collections, (n=15) were measured: these two dimensions show a strong correlation, indicating that body and telson grew at the same rate. According to their plot (Figure 3), the giant isolated telson (Figure 1A) belonged to an individual 55.4 cm in total length. As the isolated

telson presumably represents a molt the final size of the individual would have been even larger.

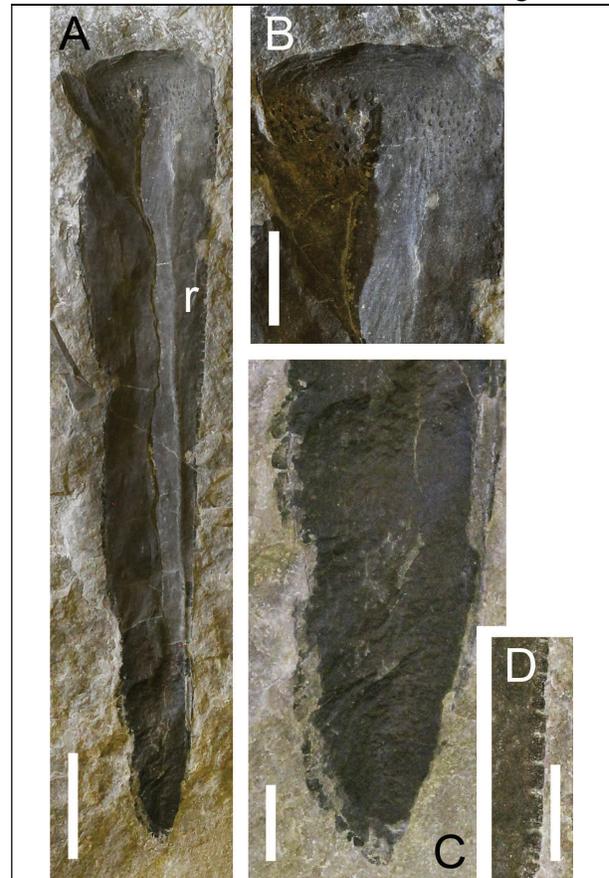


FIGURE 1. *Eurypterus* telsons. *E. lacustris*, Ridgemoor Quarry, Fort Erie, Ontario, Canada (A–D). A. YPM IP 548836, giant telson, counterpart, illuminated from the left (r indicates the impression of the ventral ridge). B. Proximal end. C. Distal end showing serrations on right side and around tip. D. Right side showing serrations. Scale bars equal 20 mm in A; 10 mm in B; 5 mm in C–D.

Most eurypterid fossils of the Bertie Group are molts in various states of completeness. Evidence for an individual of *Eurypterus lacustris* more than 50 cm in length prompts a consideration of the number of molts required to reach this size. Analysis of molt populations by the authors suggests that this giant specimen of *E. lacustris* probably molted about 15 times.

This paper is available from the editor.

### ***Largest Eurypterid Specimen Goes on Display***

Material for this report is taken from Briggs, D.E. and Roach, B.T., 2020. Excavating eurypterids, giant arthropods of the Palaeozoic. *Geology Today*, 36(1), pp.16-21.

One of Sam Ciarca's extraordinary discoveries is the giant complete specimen of *Acutiramus macrophthalmus* which he collected from the Phelps Member of the Fiddlers Green Formation at Passage Gulf in 1965. Sam managed to extract the 500-pound counterpart complete. The part had to be recovered in two pieces and is now in the Yale Peabody Museum (YPM IP 208195).

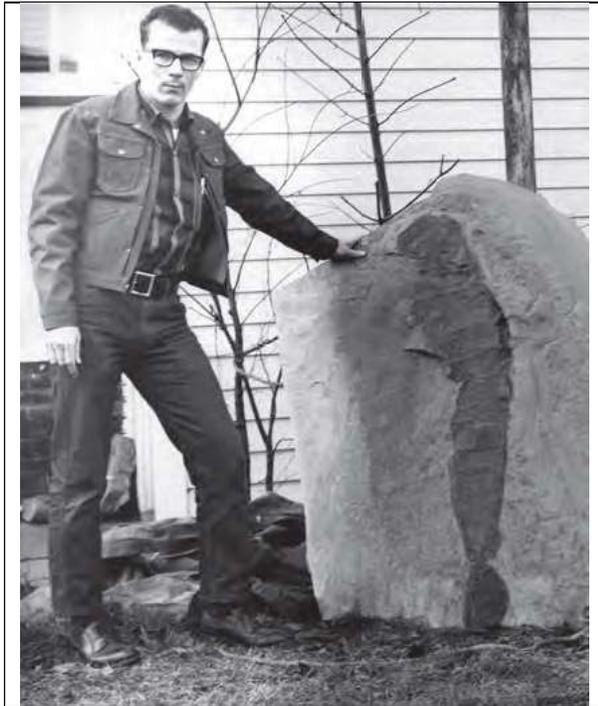


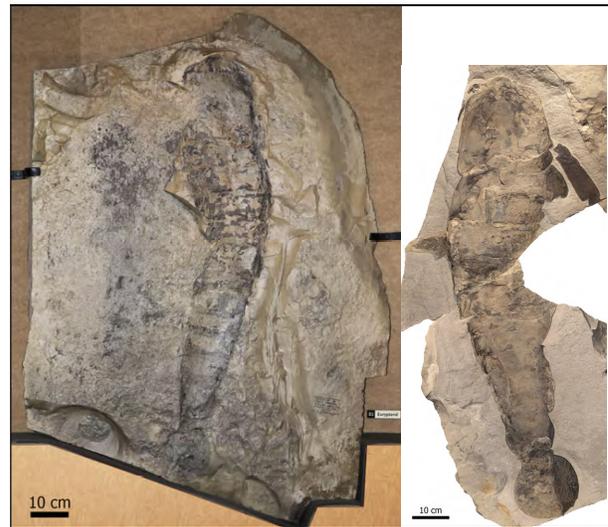
Fig. 8. Sam Ciarca in 1965 displaying the counterpart slab of his newly discovered giant specimen of *Acutiramus macrophthalmus* from the Fiddlers Green Formation, NY, which has been on display in the Paleontological Research Institute Museum of the Earth in Ithaca since 2003. (PRI 42897: photograph courtesy of Sam Ciarca.)

Nearly a third of all eurypterid genera include species that reached lengths of more than 80 cm. These estimates are not based on complete specimens but on extrapolation from large isolated elements. The specimens are often disarticulated during and following moulting and before burial. Small complete specimens are found, however, which allow the size of larger individuals to be inferred from isolated elements. For example, a 46 cm long chelicera (claw) of *Jaekelopterus rhenaniae* from the Eifel region of Germany indicates a body length of about 2.5 m! An isolated tergite 45 cm wide (YPM IP 208194) of *A. macrophthalmus* must

have belonged to an individual at least 2 m long. A spectacular composite of *Acutiramus* about 1.5 m long on display in the Royal Ontario Museum was assembled from pieces of four individuals from Passage Gulf in Herkimer County, NY.

For complete eurypterid specimens, Sam's specimen is apparently rivaled only by a slightly smaller complete *Pterygotus anglicus* held by the National Museum of Scotland, Edinburgh. The largest individuals of *A. macrophthalmus* were undoubtedly much longer than this one.

The Yale Peabody Museum is preparing a major renovation of exhibits. This specimen required major work to meet their display standards. The outline was poorly defined and not readily visible to a museum visitor. It lacked the dark coloration that makes Bertie Group specimens stand out against the lighter background matrix because much of the cuticle is on the counterpart. The preparators used a pneumatic air scribe to enhance the margins and add relief between the specimen and adjacent matrix and coated it with a very dilute consolidant to enhance the fossil by giving it a more uniform coloration and lustre.



(left) Fig. 9. Counterpart slab of the giant specimen of *A. macrophthalmus* on display in the PRI Museum of the Earth. (right) Fig. 11. The two pieces of the part juxtaposed following preparation (YPM IP 208195).

This paper is available from the editor.

## CALENDAR OF EVENTS

### November

**Tuesday November 9, FOSSIL MEETING 7:30 PM. Virtual Meeting on Zoom.** Speaker is Carl Fechko on collecting in the Eocene Period Green River Formation near Kemmerer, WY.

### December

**Tuesday December 7, FOSSIL MEETING 7:30 PM LOCATION To Be Determined.** 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.

Visitors are welcome to all Fossil Section meetings! For more information and the latest updates check the RAS Website ([www.RASNY.org](http://www.RASNY.org)). You can also contact Dan Krisher at [DLKFossil@gmail.com](mailto:DLKFossil@gmail.com) or John Handley at [jhandley@rochester.rr.com](mailto:jhandley@rochester.rr.com) for further information.

### ROCHESTER ACADEMY OF SCIENCE FOSSIL SECTION

Monthly meetings will be held on Zoom until at least December 2021. 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, when they can be held again, are at the Brighton Town Hall, Community Meeting Room, 2300 Elmwood Avenue, Rochester, NY unless otherwise listed.

#### OFFICERS

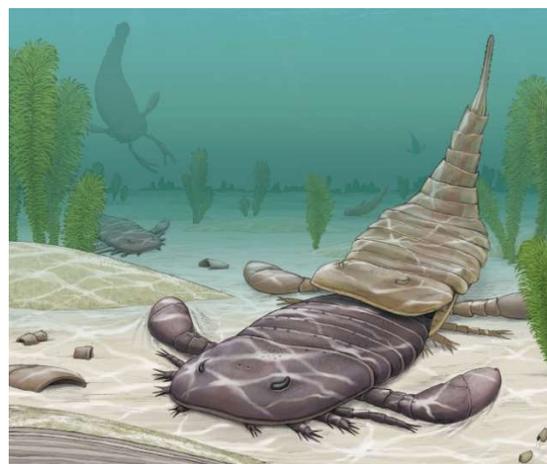
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Director (three year term): <i>Open</i>		

#### APPOINTED POSITIONS

Field Trip Coordinator: Dan Krisher	585 293 9033	DLKFossil@gmail.com
FossilLetter Editor: Michael Grenier	585 671 8738	mgrenier@paleo.com

The FossilLetter is published before each meeting month of the year. Please send submissions to [mgrenier@frontiernet.net](mailto:mgrenier@frontiernet.net) or by U.S. Postal Service mail to 692 Maple Drive, Webster, NY 14580. Deadline for submissions to the FossilLetter is the 15<sup>th</sup> of the month.

For scheduling changes and the latest updates please check the RAS Website ([www.rasny.org](http://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.



*A molting Eurypterid in the late Silurian (illustration by Emily Damstra, emilydamstra.com)*