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FOSSIL SECTION

The FOSSILETTER

VOL. 41 Number 5 March 2023

March Meeting

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

At our March meeting we will have the first of our annual Samuel J. Ciurca, Jr. Memorial Lectures. Our distinguished speaker is Dr. Derek Briggs who will be speaking on "*The Remarkable Fossils from Sam Ciurca's Eurypterid Collection*." He sends us the following notes. *"Samuel J. Ciurca Jr., longtime member of the Rochester Academy of Sciences, was an international authority on eurypterids, particularly those of the Silurian Bertie Group of upper New York State and southern Ontario. His collection of these iconic arthropods, now held at the Yale Peabody Museum in New Haven and the Paleontological Research Institute in Ithaca, is unparalleled anywhere in the world. Sam kept meticulous records of his discoveries and developed unique expertise on the rocks that yielded them. I first met him in 2004 and had the privilege of interacting with him and his fossils thereafter. Work on his collections is ongoing and they will continue to be a major resource for researchers in the future. In the meantime, I will present some of his remarkable discoveries and consider the importance of his contributions to paleontology."*

Dr. Briggs is the G. Evelyn Hutchinson Professor of Earth and Planetary Sciences at Yale University and Curator-in-Charge of Invertebrate Fossils at the Yale Peabody Museum. He is a graduate of Trinity College, Dublin, and the University of Cambridge. Before moving to Yale in 2003 he was at the Department of Geology at Goldsmiths, University of London (1977-1985) and the Department of Earth Sciences at the University of Bristol (1985-2002). He served as the Director of the Yale Peabody Museum from 2009 to 2014. His primary research interest is in the preservation and evolutionary significance of exceptionally preserved fossils and he has published more than 400 scientific articles and several books. In 2020, he was presented with the Lapworth Medal, the highest award of the Paleontological Association.

Dr. Derek Briggs at the Parker Quarry

Among Dr. Briggs' publications is the very readable **The Fossils of the Burgess Shale** with co-authors Douglas H. Erwin and Frederick J. Collier. See our June 2017 issue for a complete review of

this book, which can be borrowed at our April in-person meeting.

Samuel J. Ciurca, Jr. Memorial Lecture

Our March meeting features the first Samuel Ciurca, Jr. Memorial Lecture. We plan to hold these in February or March each year and to have an expert in eurypterids or related topics deliver an engaging talk. Sam (1939-2021) was a long-time member of the RAS and such a notable collector and researcher that he was honored with the Harrell L. Strimple Award of the Paleontological Society in 2016. 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. Sam kept thorough field notes and documentation about each specimen and its provenance. Although officially an amateur, he was author or co-author of thirty-three scientific papers, including several published in *The Proceedings of the Rochester Academy of Science*.

Sam had amassed the world's largest collection of these chelicacerate arthropods. Sam believed that his collection outnumbered all other collections combined. Among other museum connections, he was a curatorial affiliate with the Yale Peabody Museum of Natural History. He sent a part of his collection (11,045 specimens from 560 localities) to them in 2019, where it is now known as the *Samuel J. Ciurca Eurypterid Collection at Yale Peabody Museum of Natural History* and is referenced as such in several research papers since then. In his will, he left them the rest of his eurypterid collection and other specimens. YPMNH has one of their website pages dedicated to this collection, https://peabody.yale.edu/explore/collections/invertebrate-paleontology/eurypterids-sea-scorpions.

The two pieces of the part of the giant Acutiramus macrophthalmus *specimen Sam discovered in the Fiddlers Green Formation, NY, juxtaposed following preparation (YPM IP 208195).*

Eurypterids are among the largest known arthropods ever to have lived. Sam collected the largest known complete specimen, *Acutiramus macrophthalmus* in 1965. Reports of larger eurypterids are estimates based on disarticulated segments, likely from moults. For example, YPM IP 208194 is a single *Acutiramus macrophthalmus* body segment. Scaling the whole body up from that single segment leads to an *estimated* length (including extended arms) of at least 2 meters.

YPM IP 218956: Acutiramus cummingsi *featured on the YPMH website.*

President's Report *by Dan Krisher*

The Section's February meeting was held on 2/7 via ZOOM. 56 people attended. The short business portion of the meeting covered the slate of Fossil Board of Director candidates for the 2023-2024 year, the upcoming annual Syracuse University student symposium on April 15 and the annual Penn Dixie "Dig with the Experts" in early

June. A brief discussion on the summer fieldtrips was also held.

The speaker for the evening was Dr. Matt Friedman, Associate Professor in the Dept. of Earth and Environmental Sciences at the University of Michigan and the Director of the UM Museum of Paleontology. Dr. Friedman's talk centered on two timespans important to bony fish evolution. The first of these was in the middle Paleozoic when bony fish experienced their evolutionary appearance and initial expansion. The second was at the Cretaceous-Paleogene boundary with this burst resulting in the beginning of the modern fish faunas we see today. At the end of his talk Dr. Friedman also extended an invitation for members to come to the 12th North American Paleontological Convention which will be taking place in Ann Arbor in June of 2024.

Note: This talk was recorded and is available on our private YouTube channel. Look for the report on our February 7 meeting at https://rasny.org/fossil-section-calendar.

Buffalo Geological Society's 53rd Annual Gem-Mineral-Fossil Show

See last month's issue for more details. This is a reminder that the Buffalo Geological Society's 53rd Annual Gem, Mineral and Fossil Show is on March 18-19, 2023, featuring Fossils of New York, at the Erie County Fairgrounds in Hamburg in the Grange, Market and NYS Police Buildings.

April Meeting Notice

Our April 4 meeting will start at 7PM instead of 7:30PM. Featured is a talk on Silurian trilobites from Illinois and Missouri by member Gerry Kloc. We also have a short presentation by Jonathan Hendricks of the Paleontological Research Institution to discuss their planned Museum of the Earth exhibits and activities in conjunction with this year's very important publication of the *Devonian of New York* treatise by the Devonian Stratigraphic Sub-commission.

Devonian Stratigraphy of NY Meeting

We announced the upcoming *Devonian of New York* treatise special publication in the December 2022 issue together with their 2023 Annual Meeting, IGCP 652 at SUNY Geneseo, NY on 26 July to 07 August 2023. Dr. D. Jeffrey Over has sent invitations for that meeting with a registration deadline of 01 May 2023.

The registration form is on our website at https://rasny.org/fossil-section-calendar.

Spring 2023 Central NY Earth Science Student Symposium

Dr. Linda Ivany of Syracuse University has sent word that the 2023 Central New York Earth Science Student Symposium will be held on **Saturday April 15th, 2023** at Heroy Geology Laboratory.

The abstract and registration deadline is Friday, March 31st, 2023. The event will run approximately from 9 am-5 pm with breakfast and lunch provided. There is a $5 registration fee at the door for individuals not affiliated with Syracuse University.

The Keynote presentation will be made by Dr. Jennifer McIntosh. Dr. McIntosh is a University of

Arizona Distinguished Scholar and Professor of Hydrology and Atmospheric Sciences. Her expertise is in elemental and isotopic chemistry of surface waters, groundwaters, saline fluids, and natural gas.

We will again organize a car pool from Rochester. More details will be provided in the April issue.

Darwin and Fishes

The Paleontological Research Institution's Darwin Days 2023 celebrated the Devonian-age evolution of fish and origin of land vertebrates. We publicized their talks and round-table on the Age of Fishes and I know several of our members attended. If you did not get enough, member John Handley noted that PRI Director Warren Allman has posted an engaging essay on Darwin's study of fishes and their role in his *On the Origin of Species.* https://www.priweb.org/blog-post/darwin-and-fishes

Fossil News

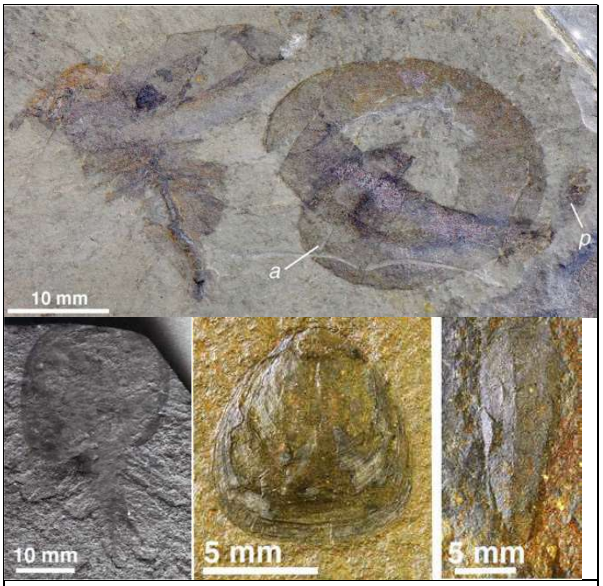

Figure 2. Fossils from the Parker Quarry Lagerstätte. Top: Fig 2G New bivalved arthropod, YPM IP 543321, and priapulid, YPM IP 239053 (a—annulations; p—proboscis). Bottom Left: Fig 2A Protocaris marshi *USNM 15400. Center: Fig 2J Obolid brachiopod, YPM IP 543330. Right: Fig2K Hyolith, YPM IP 543329.*

Lost quarry of first reported Burgess Shale–type fauna rediscovered

(*Following material is mostly taken from the paper with some editing*.) Soft-bodied fossils of Cambrian age, now known as Burgess Shale-type biotas, were first described from the Parker Slate of the northwest Vermont slate belt in the late 19th century, 25 years before the discovery of the Burgess Shale in British Columbia, Canada. The authors report on the rediscovery of fossiliferous horizons at Parker's Cobble, the site of the original quarry, which was thought to have been exhausted by excavation. New discoveries include a radiodont, multiple specimens of a new bivalved arthropod, a priapulid, and other undescribed forms. Pervasive soft-sediment deformation suggests accumulation near the toe of a steep unstable slope, similar to the setting of the Burgess Shale. Although fossils are rare, the exceptional preservation of some soft-bodied taxa suggests that recovered diversity was limited by transport into an inhospitable benthic setting rather than by decay, and this implies a potential for future discoveries of new taxa.

Burgess Shale–type Cambrian fossils are now known from more than 70 localities worldwide. Charles Walcott's Burgess Shale quarry was not the first locality to yield Cambrian soft-bodied fossils—that distinction belongs to excavations in the Lower Cambrian Parker Formation near Saint Albans City in northwestern Vermont.

Noah Parker discovered trilobites while quarrying in the Parker Slate in 1855. James Hall (NYS Paleontologist) described the trilobites in 1859, but the first report of a soft-bodied fossil was Walcott's 1884 description of *Protocaris marshi*. Walcott reported other fossils from the Parker Slate, including the sponge *Leptomitus*, the trunk of an unidentified arthropod, an isolated carapace subsequently referred to *Tuzoia*, and the chordate *Metaspriggina*, although he only assigned the sponge correctly.

To read more, this paper is available from the editor. Pari, Giovanni, Derek EG Briggs, and Robert R. Gaines. "The Parker Quarry Lagerstätte of Vermont—the first reported Burgess Shale–type fauna rediscovered." *Geology* 49, no. 6 (2021): 693-697.

Willner Madge Gallery, Dawn of Life

I looked forward to the opening of this new gallery at the Royal Ontario Museum for a long

time, only to see the Canadian government keep the border closed to us Americans for long after the new gallery opened on December 4, 2021. Although they finally reopened the border with testing requirements in September 2022, I decided to wait until November. By then, the test requirement had been dropped and I joined hundreds of my peers at the annual Society for Vertebrate Paleontology conference held with the ROM November 2-5. I had a great time with all the presentations, poster sessions, and seeing old friends, but for me the highlight of the week was the Wednesday night reception at the ROM, celebrating the new exhibit. I skipped the bar and much of the company to spend the entire evening in the new gallery. It was magnificent!

The new gallery is large and does a good job of telling the epic story of life's origins and development and how ecosystems developed. The gallery features nearly 1,000 fossil specimens, taken from about 4 billion to 200 million years ago— from the earliest Archean through to the Triassic. Over 60% of fossil specimens come from sites across Canada. This new build brings the ROM's total gallery space devoted to paleontology to nearly 25,000 square feet. Most of the specimens selected for this new gallery are accessible to the public for the first time. The gallery is profuse with illustrations, models, videos, and hands-on displays.

The gallery is divided into several thematic sections which proceed through time. So the "Very Long Beginning" Precambrian section is entered first. There, you find one of the oldest rocks on Earth, estimated to be between 3.7 and 4.2 billion years old. Discovered in northern Québec, it contains the oldest evidence of life known to science. The gallery then has many of the oldest known Ediacaran fossils from the Mistaken Point site at the south-eastern tip of Newfoundland, in eastern Canada. As fascinating as these fossils were, I will defer the report on these to next month's issue, as the major attraction for me was their **Burgess Shale** display.

The second section, "The Origin of Animals (Cambrian Explosion)" is filled with fossils from the middle Cambrian Burgess Shale exposed in the Canadian Rockies of British Columbia and was the reason for my being there. Since its discovery in 1909 by Charles Walcott of the Smithsonian Institution, the 506-million-year-old Burgess Shale has become the best evidence of the development of life in the "Cambrian explosion", the rapid radiation of marine animal life that included sponges, soft- bodied and hard-bodied arthropods (including trilobites and the large predator *Anomalocaris*), worms of all kinds, strange spiked creatures such as *Wiwaxia,* and the first chordates—our ancestors. It is famous for being one of the earliest fossil beds in which animals and plants with only soft body parts are spectacularly preserved in exquisite detail as organic films.

An example is the above ROM specimen of *Ovatiovermis*, an entirely soft-bodied legged worm, a lobopodian—with multiple pairs of stump legs called lobopods. Arthropods, tardigrades, and onychophoran worms (velvet worms) may have descended from this group. The preservation on this slab is superb, but typical for the Burgess. This photo also shows one of the exceptional strengths of the exhibit, as many of the fossils are accompanied by very helpful larger-than-life 3-dimensional models showing how the creature may have appeared in life – as best we can tell.

The Cambrian Period was a critical time in Earth's history. During this immense span of time—53.4 million years—nearly every modern group of animals appeared. Cambrian rocks

preserve the record of the first appearance of complex animals with eyes, protective skeletons, antennae, and complex ecologies. Grazing, predation, and multi-tiered ecosystems with animals living in, on, or above the sea floor became common. By the end of the period, the ancestors of sponges, corals, jellyfish, echinoderms, mollusks, brachiopods, worms, arthropods, and vertebrates were all in place.

I counted 150 fossil slabs on display in 12 cases, largely organized by phylum. The signage summarizes the case contents below the case. Every specimen is numbered with an identification key below. This simply lists the scientific names given the specimens, and I believe that more information on each fossil would be helpful. Below I have added detail gleaned from the Wikipedia page, *Paleobiota of the Burgess Shale* for each taxon.

Ovatiovermis is part of the display entitled "Bodybuilding-worms with legs." The introductory sign reads, "These leggy worms, known as lobopodians, fill an important evolutionary gap between the priapulid case to your right and the arthropod case to your left. Paleontologists have unearthed a variety of these forms at the Burgess Shale. Their spiny legs or sharp body spines make them look like extras in a science fiction movie. Today's velvet worms, arthropods, and the microscopic water bear (tardigrades) all evolved from lobopodians. (*ed. note: "may have evolved"*)

The sign at the bottom reads, "Many Burgess Shale lobopodians had long, bristly forelimbs for filter feeding and strong rear claws to anchor themselves. One species, *Collinsovermis monstruosus* (the Collins' monster, top right) was named after former ROM curator Dr. Desmond Collins." This specimen at #1 is heavily armored, it was probably a suspension feeder. It was a tiny worm-like soft bodied animal measuring about 3 cm long. It bears 14 pairs of lobopods, which are closely attached to the main body unlike in other lobopodians. The anterior six pairs are unusual in that they are much longer than the posterior pairs of a typical lobopod.

Just left of this is #2, *Aysheaia* which has ten body segments, each of which has a pair of spiked legs. The animal is segmented, and looks somewhat like a bloated caterpillar with a few spines added on — including six finger-like projections around the mouth and two grasping legs on the "head". Each leg has a row of about six curved claws. No jaw apparatus is evident. A pair of legs marks the posterior end of the body.

In the lower right corner are #3 and #4, indeterminate lobopodians. Note that #4 has been removed for current research.

To the right of these is #5, *Ovatiovermis,* also a likely suspension-feeder with nine pairs of lobopods. The first two pairs were elongate and had approximately 20 pairs of spines on each lobopod, with a bifid claw at each tip. The third to sixth pairs of lobopods were shorter and their paired spines were much smaller. On these four pairs of lobopods the spines were only large near the tip. The last three pairs of lobopods did not have the paired spines, showing that these spines were used for filter-feeding. Note the very large model to the left of the slab.

Far left is *Hallucigenia* on slabs #6 and #7 which was featured in our October 2015 issue and is one of the more iconic taxa from the shale. The generic name reflects the type species' unusual appearance and eccentric history of study; when it was erected as a genus, *H. sparsa* was reconstructed as an enigmatic animal upside

down and back to front, not recognized as a lobopodian until 1991.

Below is the left half of the display case for "Arthropods, part I. Butterflies start here "The top sign reads "Butterflies, blackflies, and spiders are all arthropods – animals with jointed exoskeletons and segmented limbs. For over 500 million years, arthropods have been the world's most diverse animal group. Arthropods evolved from the wormlike creatures to your right. Over time, they developed limbs, exoskeletons, and other specialized body parts. The fossils in this case show some of the first arthropods. Most were vicious predators, with strong claws and ring-shaped mouths lined with teeth."

Most of the specimens in this case are radiodonts—an extinct order of stem-group arthropods that was successful worldwide during the Cambrian period. The first- and best-known is *Anomalocaris canadensis*. This species is in the other half of the case, not shown. The six slabs top right to top center, #22-#27 are *Hurdia*. Two species are identified—*H. victoria* #23, #24, and #27 and *H. triangulata* #22 and #26. *Hurdia* possessed a large frontal head sclerite (hard part covering a segment).

Specimens #17, #18, and #19 at lower right are *Peytoia*, a close relative of *Hurdia* that was originally named as a jellyfish, but was later recognized as the oral cone (mouth) of the creature. This creature is also known from European deposits. To their left are #20 and #21, *Stanleycaris,* a basal *Hurdia*-like (hurdiid) radiodont known from a variety of Cambrian deposits in North America. The sign bottom right says, "Three-eyed *Stanleycaris* is one of the smallest known predators from the Burgess Shale – and also one of the best preserved. Some fossils this animal show traces of nervous tissues, including the brain."

The specimen at top left #28 and the life-sized model is *Titanokorys*, the largest hurdiid from the Burgess Shale, and one of the largest Cambrian animals (up to a foot long). Last in this photo is *Cambroraster falcatus* on the five slabs #29-33 below *Titanokorys*. This radiodont was first described in 2019, and was named after the fictional Millennium Falcon, which its dorsal carapace resembles. The sign at left reads, "Some early predators, like *Camboraster*, had huge shields covering their heads. They used a pair of specialized comb-like claws to scoop prey that lived along the seafloor into their mouths." See our November 2019 issue for more details.

#30 Cambroraster falcatus

The ROM has their animation of *Cambroraster* with an appearance by *Titanokorys at* https://www.youtube.com/watch?v=jI-I0yG_2I4.

Ten more Burgess Shale wall displays cover sponges, cnidarians (e.g., coral and jellyfish), comb

jellies, hemichordates, echinoderms, chordates (phylum includes vertebrates), complex jaws, mollusks, and arthropods II and III.

CALENDAR OF EVENTS

March

Tuesday March 7, FOSSIL MEETING 7:30 PM. Virtual Meeting on Zoom. Speaker is Dr. Derek Briggs of the Yale Peabody Museum of Natural History on "*Remarkable Fossils from Sam Ciurca's Eurypterid Collection*.". Visitors welcome.

April

Tuesday April 4, FOSSIL MEETING 7:00 PM. NOTE EARLIER TIME. NEQALS Community Meeting Room, 1030 Jackson Rd, Webster, 14580. Speakers are member Gerry Kloc of the University of Rochester on *Silurian trilobites collected from Illinois and Missouri* and Jonathan Hendricks on the PRI's planned exhibits and activities in conjunction with publication of the *Devonian of New York*. Visitors welcome.

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 now held as hybrid meetings, live but also broadcast on Zoom. Meetings are held the first Tuesday of each month from October to December and from February to May at 7:30 pm. In person meetings, when they can be held again, are at the Brighton Town Hall, Community Meeting Room, 2300 Elmwood Avenue, Rochester, NY unless otherwise listed.

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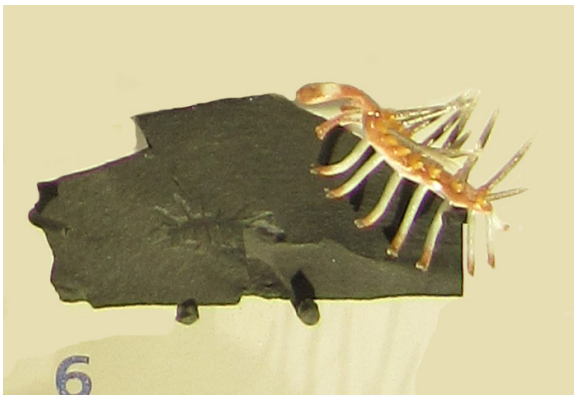
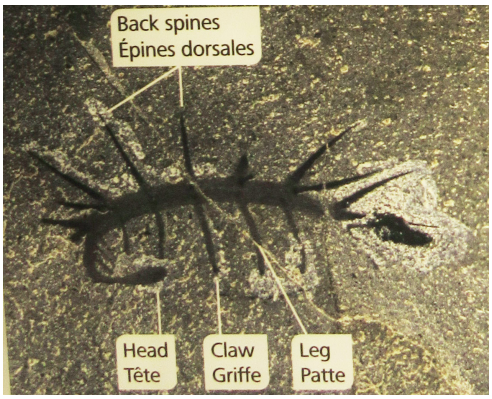
The FossiLetter is published before each meeting month of the year. Please send submissions to mgrenier@frontiernet.net or by U.S. Postal Service mail to 692 Maple Drive, Webster, NY 14580. Deadline for submissions to the Fossiletter is the 15th of the month.

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.





The ever-popular Hallucigenia *at the ROM.*