

# The Paleo Times



Volume 19 Number 10

October 2021

The Official Publication of the Eastern Missouri Society for Paleontology

Rick Poropat, Editor

## October Meeting

Our October meeting will be held IN-PERSON on Friday, October 8, 2021 at 7:30 pm in Room 203 on the second floor of the Earth and Planetary Sciences building on the Washington University campus. Our program for the evening will be a discussion of the similarities of dinosaur respiratory systems as compared to modern day birds, presented by Tom Lee. There will also be a business meeting, Affton show sign-up sheet, snacks and possibly some more free fossil giveaways. You can't get these benefits on Zoom! Join us for an interesting and informative evening.

A limited participation, privately led, non-EMSP sponsored field trip to Mississippi might be in the works for October. Details at the meeting?

Due to Washington University COVID policy, all who attend this in-person meeting, regardless of your vaccination status, must wear a mask at all times while in the building. No exceptions! If you don't want to wear a mask, or are unable to do so because of medical or religious beliefs, please do not attend. I am sure that no one wants to jeopardize our standing with Wash. U. and our ability to meet there. This is the University's policy, not EMSP's and it will be enforced.

Masks will be available at the meeting.

The new parking garage across from the Earth & Planetary Sciences building is now open. Parking is free after 5 pm but you must park in the yellow visitor area and only on the first level. Don't forget to take a ticket at the gate when you enter. You will need it to exit the garage.

To access this garage: from Big Bend Blvd., take Forest Park Parkway east to Hoyt Dr., turn right onto Hoyt and enter the garage.

It appears that access to the science building will be through the door on the east side nearest the garage. Warning: the building doors automatically lock at 7:30. Plan accordingly.

## Fossil of the Month



The October "fossil of the month" is the trilobite, *Calymene celebra*, from the Upper Silurian Joliet Formation at Grafton, Illinois. This trilobite in the form of steinkerns, was common at the old Grafton quarry just south of town. The site was visited by many collectors over the years. Unfortunately, the quarry is now the site of Raging Rivers water park and is off limits to collecting, but occasional specimens and trilobite debris can still be found in Mississippi River riprap in the area.

*Calymene celebra* is a member of the order Phacopida and was originally described by P. E. Raymond in 1916, but has been restudied, redescribed and renamed (*Sthenarocalymene* and *Gravicalymene*) several times. The current accepted name refers back to the original Raymond description and the name *Calymene celebra*.

This trilobite is only known from Niagaran dolostone (dolomite) formations associated with Silurian reef structures in Illinois, Wisconsin, Indiana, Ohio and Kentucky. The large, brown, phacopid trilobite steinkerns from Morocco, often seen at rock shows, are incorrectly identified as *Calymene celebra*.

## Rick's Ramblings

Our first in-person meeting in more than a year was sparsely attended but those who were there took home many free fossils & books and enjoyed a great program presented by David Lukens and Paul & Casey Thater. The meeting theme was "what I did on my summer vacation". David showed us images of his trip to the Dakota Dinosaur Museum in Dickinson, North Dakota, a side trip on his way to Jordan, Montana. He also showed the crew at several dinosaur dig sites in Garfield County.

Paul & Casey began their program hunting dinos with the crew in Garfield County and finished with digging for beautiful petrified wood at Eden (Blue Forest) Wyoming. They also brought in some wonderful wood specimens they had cut and polished. Outstanding! That site is on my bucket list. Maybe next year?

If our plans remain in place, our club will participate (in person) this year at the Mineral, Gem & Fossil show & sale in November at the Affton White-Rogers Community Center. We are moving our club booth to a new location with an extra table, taking over a spot held by a dealer that has retired from the show. Our new booth will be located directly in front of the show entrance. Because it is a larger, 3-sided space, we will probably require more volunteers than in the past, however, it will allow us to spread out and provide more space for consignment sales.

Our old space will be converted to display space. The show organizers are determining how many displays the area will contain and will solicit volunteers to set up displays. Stay tuned for more on this as we get closer to the show date.

In addition to volunteers to staff our club booth, we will also require volunteers to take down all the show tables on Sunday. This will involve folding tables as vendors clear them and stacking them in the hallway. We will also collect the electrical power strips and cords. For this work, our club will be refunded 50% of our table rental fee. Volunteers receive free admission to the show. A good deal all around!

For your convenience, I have attached a volunteer sign-up schedule to this email. All club members are encouraged to take some time to look it over and sign up for time slots (minimum of two hour shift) by emailing or calling me. Obviously, everyone cannot work the first night. Be specific in your time slot choices. Please do not email me that you will work any old time on a specific day unless you wish to work the entire day.

Although a few clubs are beginning to have field trips,

we remain on hold for club-sponsored trips. This will probably be the case until next spring at the earliest. Don't let this stop you from collecting on your own. Be safe!

## 2021 Calendar

Oct. 22-24	MAPS Fossil Expo Orr Building, Illinois State Fairgrounds Springfield, Illinois
Nov. 19-21	Mineral & Gem Club Show Affton-Rogers Recreation Center
Dec. 11	EMSP Holiday Party Kirkwood Community Center

## Did You Know?

The type section for the Joliet Formation is in the National Stone Company quarry on the south side of Joliet, Illinois, where the formation is 68 feet thick. It comprises the basal formation of the Silurian, Niagaran Series.

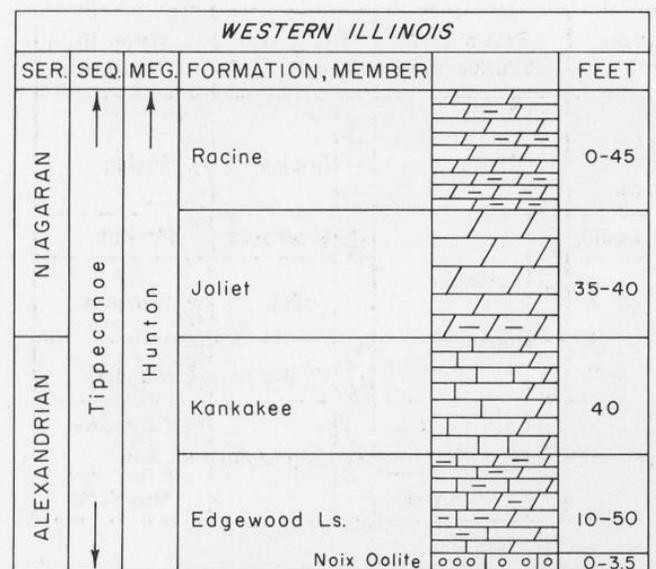


Fig. S-5—Columnar section of the Silurian System in western Illinois.

Joliet Formation covers an area extending from Chicago to Calhoun Co in western IL. Thicknesses ranges from 70-80 ft along Des Plains River valley, 40 ft along Kankakee River, 35-40 ft along Mississippi River at Grafton in Jersey Co. Farther west, truncated by Middle Devonian strata; in southern Calhoun Co., formation is entirely eroded. In exposures in northeastern IL, along Des Plains, Kankakee, Du Page, and Rock Rivers, Joliet is divided into Brandon Bridge, Markgraf, and Romeo Members. Romeo Member is prominent in electric logs and has been traced widely in subsurface. Basal shaly zone of Joliet is characterized by abundance of arenaceous Foraminifera, among which *Ammodiscidae* are prominent. This zone is also present at base of the Joliet

in Jersey Co. and at base of St. Clair Limestone in southern IL. It has not been found in northwestern IL or in WI north of Milwaukee, but eastward it is well represented in Osgood Formation of IN. Outside the area where Joliet is subdivided, its top is not well established, but in northwestern IL, Marcus Formation may be in part equivalent to Joliet, and in southern IL, top of Joliet correlates to a horizon within St. Clair Limestone.

Although extensively studied in Northwestern Illinois, the Joliet exposures in the Grafton area have not been correlated with the rest of the formation.

Invertebrate fossils can be very diverse and numerous within certain sections of the Joliet, but nonexistent in others. In addition to the common *Calymene celebra*, as many as twenty additional trilobites have been identified, including *Dalmanites*, *Bumastus*, *Cheirurus*, *Sphaerexochus*, *Eophacops*, and *Ommokris* a stalk-eyed bug. Most are exceedingly rare, however, and may only be found as isolated heads & tails. Other macrofossils in the formation include brachiopods, corals, gastropods, graptolites, crinoids, pelmatozoans and orthoconic cephalopods.

## Mass Extinction 252 Mya was caused by a 'toxic Soup'

Earth experienced its worst mass extinction about 252 million years ago that was caused by a 'toxic soup' - and scientists warn humans today are 'following this same recipe.'

The deadly concoction was a mix of accelerated greenhouse gas emissions, high temperatures and abundant nutrients, but the new study now identifies toxic microbial blooms as a fourth culprit.

A team at the University of Connecticut found the three 'ingredients' led to a rise in microscopic algae and cyanobacteria that inhibited the recovery of freshwater ecosystems 'for perhaps millions of years.'

This is because blooms deplete free oxygen and release toxins into the water that would typically feed vegetation, soil and wildlife.

Researchers say there is 'a lot of parallels to today' with the increase in temperature at the end of the Permian coincided with massive increases in forest fires, which is currently happening in California.

Tracy Frank, head of the department of geosciences, said in a statement: 'We're seeing more and more toxic algae blooms in lakes and in shallow marine environments that's related to increases in temperature and changes in plant communities which are leading to increases in nutrient contributions to freshwater

environments.'

The end of the Permian mass extinction, or the 'Great Dying,' killed nine out of every 10 species on the planet.

The study, published in *Nature Communications*, notes that when volcanic eruptions caused an acceleration in greenhouse gases and a dramatic spike in temperatures.

This led to deforestation that caused soil to bleed nutrients into bodies of water and feed microbes that formed the giant toxic blooms.

The team determined this by studying fossils, sediment and chemical records of rocks near Sydney, Australia. And when the team compared the fossil records of different warming-related mass extinctions, they found extremely similar fossil records.

'This implicates deadly microbial blooms as repeat offenders of freshwater extinctions during extreme warming events,' the team shared in the press release. Tracy Frank said: 'We're seeing more and more toxic algae blooms in lakes and in shallow marine environments thought to be related to increases in temperature and changes in plant communities which are leading to increases in nutrient contributions to freshwater environments.'

'The volcanism was a source of CO2 in the past but we know that the rate of CO2 input that was seen back then was similar to the rate of CO2 increases we're seeing today because of anthropogenic effects.'

According to this year's report by the Intergovernmental Panel on Climate Change (IPCC), the influence of humans on the changing climate is 'unequivocal,' creating conditions that favor the spread of these warmth-loving microbes. In combination with an influx of nutrients from water pollution, mostly from agriculture and deforestation, this has led to a sharp increase in toxic blooms.

The results: mass fish die-offs, severe human and livestock health effects, and an annual cost measurable in billions of dollars.

Professor Chris Fielding, co-author of the study, said in a statement: 'The end-Permian is one of the best places to look for parallels with what's happening now.'

'The other big parallel is that the increase in temperature at the end of the Permian coincided with massive increases in forest fires.'

'One of the things that that destroyed whole ecosystems was fire, and we're seeing that right now in places like California. One wonders what the longer-term consequences of events like that as they are becoming more and more widespread.'

Source: Stacy Liberatore For Dailymail.com, 09/17/2021.

## Its MAPS Month!

After two long years, it looks like MAPS Fossil Expo is finally going to happen again. All roads lead to Springfield, Illinois, the site of the largest fossils-only show in the world. The new location, only 1.5 hours from St. Louis, brings a world of fossils two hours closer than previous shows.

MAPS is the Mid-America Society for Paleontology, a non-profit organization with members from around the world. They publish a quarterly newsletter and co-sponsor field trips with other organizations, but their main focus is the annual Fossil Expo.

Although it is a 3-day event, if you aren't attending the whole weekend, the best day to attend is on Saturday when all of the seller tables will be filled.

Why attend all three days? On Friday you have the benefit of seeing everything the sellers have to offer before it disappears into new collections. The hourly silent auctions also begin. That night is the keynote address, given by a professional paleontologist. On Saturday, all the sellers have arrived, the silent auctions continue, plus there are fossil seminars on a variety of topics. That night is the live auction. On Sunday, take advantage of the last day to get great bargains as the show winds down. Some sellers have already gone home, but those that are left are ready to deal. A great opportunity to make bulk purchases! Sunday is NOT, however, recommended for a one-day visit!

Expo is a great place to purchase specimens for your collection from places that you will never visit. Other than collecting them yourself, it is the best place I know for obtaining fossils from the Midwest. Tucson or Denver do not compare for the variety of reasonably priced American-made fossils.

Expo is a great place to meet old friends, make new ones and make new contacts in the fossil world. Experts abound, so bring along those specimens you can't quite figure out.

Expo is the place to be to obtain new and used books and other publications about our hobby. Many of the latest releases will be available here.

Expo is simply the place to be October 22-24, 2021. See you there!

Expo information was included as an attachment to the June newsletter. Another is attached to this mailing for those who missed the first one.

Was it mentioned that there is also a satellite show at a nearby hotel? While not affiliated with MAPS, many of the sellers will be at both locations. This show is not limited to just fossils, so minerals, artifacts, sea shells and other science-related items may be found there.

## Four dinosaurs discovered in Montana

A team of paleontologists from the University of Washington and its Burke Museum of Natural History and Culture excavated four dinosaurs in northeastern Montana this summer. All fossils will be brought back to the Burke Museum where the public can watch paleontologists remove the surrounding rock in the fossil preparation laboratory.

The four dinosaur fossils are: the ilium -- or hip bones -- of an ostrich-sized theropod, the group of meat-eating, two-legged dinosaurs that includes *Tyrannosaurus rex* and raptors; the hips and legs of a duck-billed dinosaur; a pelvis, toe claw and limbs from another theropod that could be a rare ostrich-mimic *Anzu*, or possibly a new species; and a *Triceratops* specimen consisting of its skull and other fossilized bones. Three of the four dinosaurs were all found in close proximity on Bureau of Land Management land that is currently leased to a rancher.

In July 2021, a team of volunteers, paleontology staff, K-12 educators who were part of the DIG Field School program and students from UW and other universities worked together to excavate these dinosaurs. The fossils were found in the Hell Creek Formation, a geologic formation that dates from the latest portion of Cretaceous Period, 66 to 68 million years ago. Typical paleontological digs involve excavating one known fossil. However, the Hell Creek Project is an ongoing research collaboration of paleontologists from around the world studying life right before, during and after the K-Pg mass extinction event that killed off all dinosaurs except birds. The Hell Creek Project is unique in that it is sampling all plant and animal life found throughout the rock formation in an unbiased manner.

"Each fossil that we collect helps us sharpen our views of the last dinosaur-dominated ecosystems and the first mammal-dominated ecosystems," said Gregory Wilson Mantilla, a UW professor of biology and curator of vertebrate paleontology at the Burke Museum. "With these, we can better understand the processes involved in the loss and origination of biodiversity and the fragility, collapse and assembly of ecosystems."

All of the dinosaurs except the *Triceratops* will be prepared in the Burke Museum's fossil preparation laboratory this fall and winter. The *Triceratops* fossil remains on the site because the dig team continued to find more and more bones while excavating and needs an additional field season to excavate any further bones that may be connected to the surrounding rock.

The team plans to finish excavation in the summer of 2022.

Called the "Flyby Trike" in honor of the rancher who first identified the dinosaur while he was flying his airplane over his ranch, the team has uncovered this dinosaur's frill, horn bones, individual rib bones, lower jaw, teeth and the occipital condyle bone -- nicknamed the "trailer hitch," which is the ball on the back of the skull that connects to the neck vertebrae. The team estimates approximately 30% of this individual's skull bones have been found to date, with more potential bones to be excavated next year.

The Flyby Trike was found in hardened mud, with the bones scattered on top of each other in ways that are different from the way the bones would be laid out in a living animal. These clues indicate the dinosaur likely died on a flood plain and then got mixed together after its death by being moved around by a flood or river system, or possibly moved around by a scavenger like a *T. rex*, before fossilizing. In addition, the Flyby Trike is one of the last *Triceratops* living before the K-Pg mass extinction. Burke paleontologists estimate it lived less than 300,000 years before the event.

"Previous to this year's excavations, a portion of the Flyby Trike frill and a brow horn were collected and subsequently prepared by volunteer preparators in the fossil preparation lab. The frill was collected in many pieces and puzzled together fantastically by volunteers. Upon puzzling the frill portion together, it was discovered that the specimen is likely an older 'grandparent' *Triceratops*," said Kelsie Abrams, the Burke Museum's paleontology preparation laboratory manager who also participated in this summer's field work. "The triangular bones along the frill, called 'epi occipitals,' are completely fused and almost unrecognizable on the specimen, as compared to the sharp, noticeable triangular shape seen in younger individuals. In addition, the brow horn curves downwards as opposed to upwards, and this feature has been reported to be seen in older animals as well."

Amber and seed pods were also found with the Flyby Trike. These finds allow paleobotanists to determine what plants were living alongside *Triceratops*, what the dinosaurs may have eaten, and what the overall ecosystem was like in Hell Creek leading up to the mass extinction event.

"Plant fossil remains from this time period are crucial for our understanding of the wider ecosystem. Not only can plant material tell us what these dinosaurs were perhaps eating, but plants can more broadly tell us what their environment looked like," said Paige Wilson, a UW graduate student in Earth and space sciences. "Plants are

at the base of the food chain and a crucial part of the fossil record. It's exciting to see this new material found so close to vertebrate fossils!"

Museum visitors can now see paleontologists remove rock from the first of the four dinosaurs -- the theropod hips -- in the Burke's paleontology preparation laboratory. Additional fossils will be prepared in the upcoming weeks. All four dinosaurs will be held in trust for the public on behalf of the Bureau of Land Management and become a part of the Burke Museum's collections.

Source: University of Washington. "Four Dinosaurs Discovered in Montana, including a possible rare ostrich-mimic Anzu: Fieldwork pieces together life at the end of 'Dinosaur Era'." ScienceDaily 21 September 2021.

<[www.sciencedaily.com/releases/2021/09/210921172653.htm](http://www.sciencedaily.com/releases/2021/09/210921172653.htm)>.

## Dinosaur Evolution in Eastern North America

A new study by Yale undergraduate Chase Doran Brownstein describes two dinosaurs that inhabited Appalachia -- a once isolated land mass that today composes much of the eastern United States -- about 85 million years ago: an herbivorous duck-billed hadrosaur and a carnivorous tyrannosaur. The findings were published Aug. 25 in the journal *Royal Society Open Science*.

The two dinosaurs, which Brownstein described from specimens housed at Yale's Peabody Museum of Natural History, help fill a major gap in the North American fossil record from the Late Cretaceous and provide evidence that dinosaurs in the eastern portion of the continent evolved distinctly from their counterparts in western North America and Asia, Brownstein said.

"These specimens illuminate certain mysteries in the fossil record of eastern North America and help us better understand how geographic isolation -- large water bodies separated Appalachia from other landmasses -- affected the evolution of dinosaurs," said Brownstein, who is entering his junior year at Yale College. "They're also a good reminder that while the western United States has long been the source of exciting fossil discoveries, the eastern part of the country continues to provide its share of fossil treasures."

For the complete story, see the following source:

Yale University. "Fossils illuminate dinosaur evolution in eastern North America." ScienceDaily, 25 August 2021. <[www.sciencedaily.com/releases/2021/08/210825143032.htm](http://www.sciencedaily.com/releases/2021/08/210825143032.htm)>.

(EMSP) is a registered Missouri not-for-profit organization dedicated to promoting the enjoyment and scientific pursuit of fossil collecting. It is open to all individuals interested in learning about the history of ancient life on earth. The club membership includes professional paleontologists as well as amateur hobbyists providing an open forum for the exchange of information as well as access to expertise on collecting, identifying, preparing and displaying fossils.

EMSP meetings are held on the second Friday of every month (except July, August and December) at 7:30pm in Room 203, on the second floor of the Earth and Planetary Sciences Building on the campus of Washington University. The building is located at the SW corner of the intersection of Forest Park Parkway and Hoyt Drive. Each meeting includes an informal exchange of information and speakers on a variety of fossil-related topics. Note: the building doors automatically lock at 7:30pm.

Club activities include occasional field trips led by experienced collectors, a great way to augment discussions at the monthly meetings. The club also participates in joint field trips with other paleo clubs, visiting fossil sites throughout the United States. EMSP is also proud to be involved in a partnership with the St. Louis Science Center as well as STEM outreach to classrooms, community events and science fairs.

**Eastern Missouri Society for Paleontology (EMSP)**  
**P.O. Box 220273**  
**St. Louis, MO. 63122**



First Class Mail