M·A·P·S Digest

Official Publication of
Mid-America Paleontology Society
http://www.midamericapaleo.org

Volume 37, Number 1
Jan. – Mar., 2014

"A LOVE OF FOSSILS BRINGS US TOGETHER"

Calendar

2014

January 11
MAPS meeting at 1:00 pm in Rm 125 Trowbridge Hall, University of Iowa. **See p. 3 for details.**

February 8
MAPS meeting at 1:00 pm in Rm 125 Trowbridge Hall, University of Iowa. **See p. 4 for details.**

March 15 & 16
ESCONI Gem, Mineral, and Fossil Show
DuPage County Fairgrounds; Wheaton, IL
Visit www.esconi.org for more INFO

March 15 & 16
CVRMS Gem, Mineral, and Fossil Show
Hawkeye Downs Expo Center; Cedar Rapids, IA
Visit cedarvalleyrockclub.org for more INFO

April 4-6
MAPS EXPO XXXVI
Location: Sharpless Auctions
Exit 249 I-80
Iowa City, Iowa
Theme: Mississippian (Lower Carboniferous)
Keynote Speaker: Forest Gahn
Topic: TBD

DUES ARE DUE

Please send your 2014 MAPS dues to:

James Preslicka
1439 Plum Street
Iowa City, IA 52240

Contributions to Digest Needed

The Digest editors encourage the members to submit articles for publication in the Digest issues. The Digest is for the members and should reflect their interests. If you have specimens that you collected and would like to share with other members or would like to describe a favorite collecting site, please write an article in Word, Times New Roman size 12 font, single spaced with one inch margins, and send to the editors. Photos and diagrams can be e-mailed separately or incorporated in the article.

John: Fossilnautiloid@aol.com
Chris: CDCozart@aol.com

Call for Papers

The theme for the 2014 EXPO is the Mississippian. Any paper dealing with Mississippian geology, localities, or fossils would be appreciated. The papers should be in Word, Times New Roman, size 12 Font, single spaced with one inch margins, and e-mailed to one of the Digest Editors by the first week of February 2014. Diagrams/Photos can be sent separately or imbedded in text.

John: Fossilnautiloid@aol.com
Chris: CDCozart@aol.com

About the Cover

This month's cover is a photograph of a crinoid holdfast (*Barycrinus*?) collected in rocks of the Mississippian Fort Payne Formation near Livingstone, Tennessee. The specimen was collected and photographed by John Catalani.

A Follow-up Letter from the MAPS Board

The MAPS Board was extremely pleased and gratified with the overwhelmingly positive response from both the vendors and the general public attending the 2013 MAPS EXPO regarding the new venues for both the Floor Show and the Hotel Show. The Board letter accompanying the 2012 December Digest with EXPO registration materials outlined the problems that forced a change in location for both shows. It is not overly dramatic to say that we on the Board were in "panic mode". Probably our only real regret was that there would be some that did not realize that, despite our efforts to inform everyone through various publicity notices, EXPO had moved and ended up in Macomb. Venue-wise, although restrooms were limited, accessibility to the facility, parking, ability to unload/load vendor materials, and FOOD were greatly improved over our previous location (not to mention an area with a larger population to draw patrons and with many hotel/restaurant locations). Obviously, with such a drastic move not every issue can be resolved to everyone's satisfaction. But as time goes by, we are hopeful that, with the cooperation and patience of all involved, EXPO will continue to improve and grow in our new location.

Respectfully, The MAPS Board.

MAPS Club Meeting
Saturday January 11th, 2014
Presentation starts at 1:00pm
In Room #125 Trowbridge Hall
University of Iowa Campus, Iowa City, IA
(The business meeting will follow at approximately 2:00pm.)

As always, ANYONE is welcome to attend the meeting (you do not need to be a member).
ADMISSION IS FREE
So, please bring a friend and enjoy the talk!
Drinks & a snack will be provided by MAPS
UI Campus map

The program will be given by Josh Mathews - Chief Fossil Preparator and a research assistant to Dr. Bill Hammer at Augustana and is titled:

Dinosaurs 'On the Rocks': New Fossil Discoveries and Insights from the Frozen Continent

"For my talk I typically discuss what it's like to do fieldwork in Antarctica and then get into the work we are doing. Although I am a research assistant, my primary duty is prepping the fossils. I do work with the paleo students on their senior research, however most of the research is being done by colleagues from the Field Museum, Howard University, and the University of Washington. I am involved though and discuss the fossils from past expeditions and the new dinosaurs we discovered on our last trip down. It's been a pretty exciting experience to say the least."

Transantarctic Vertebrate Paleontology Project

The Transantarctic Vertebrate Paleontology Project involves the collection and study of Triassic to Jurassic age vertebrates from the southern Transantarctic Mountains near the Beardmore and Shackleton Glaciers, Antarctica. Augustana Geology professor William R. Hammer currently the Principal Investigator on a National Science Foundation grant supporting this research, has led eight vertebrate collecting expeditions to these regions since 1977. Most recently, Dr. Hammer led an Antarctic expedition in December 2010-January 2011. Included among the taxa discovered is the theropod 22-foot long dinosaur *Cryolophosaurus ellioti*--the only one of its kind in the world--on display at Augustana's Fryxell Geology Museum. During the 2010/2011 expedition, the team included Dr. Hammer, Augustana fossil preparator, Josh Matthews and Dr. Nate Smith '02 -- excavation of *Cryolophosaurus* and *Glacialisaurus hammeri* (a sauropodomorph long-neck, long-tail dinosaur related to *Apatosaurus*) was complete and two additional sauropomorph dinosaurs new to science were discovered, one a nearly complete juvenile skeleton. These specimens are currently being described in collaboration with researchers at the Field Museum in Chicago and at Howard University.

MAPS CLUB MEETING, SATURDAY FEBRUARY 8TH, 2014

Presentation starts at 1:00pm
In Room #125 Trowbridge Hall
University of Iowa Campus, Iowa City, IA
(The business meeting will follow at approximately 2:00pm.)

As always, ANYONE is welcome to attend the meeting (you do not need to be a member).
ADMISSION IS FREE

So please, bring a friend and enjoy the talk!
Presentation part of Darwin Days 2013 activities.
Drinks & a snack will be provided by MAPS.
UI Campus map

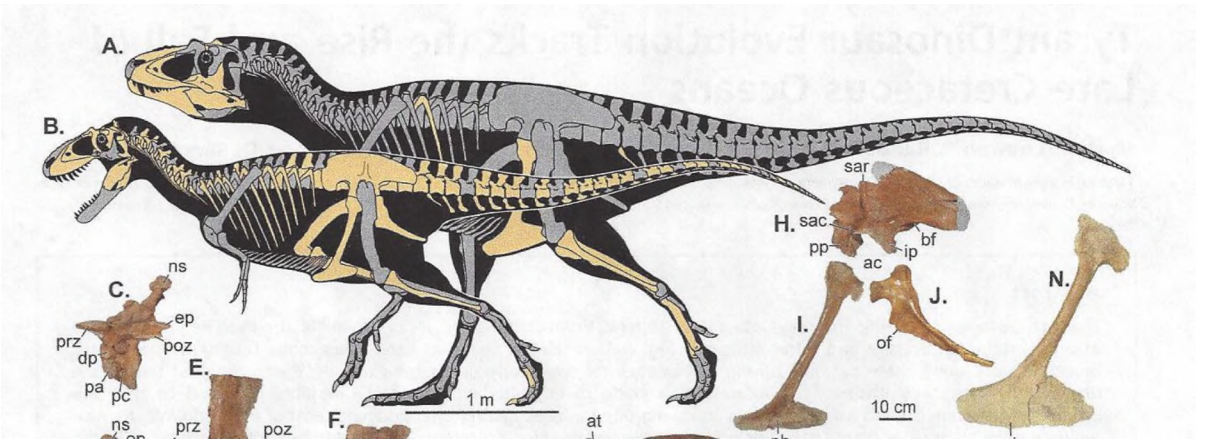
Following the tradition of the past few years, short programs will be given by UI Graduate Students that are in part being supported by MAPS scholarships - these scholarships are funded by our silent & live auctions at the annual Expo gathering in the spring.
Check the MAPS website (http://www.midamericapaleo.org) for talk title(s).

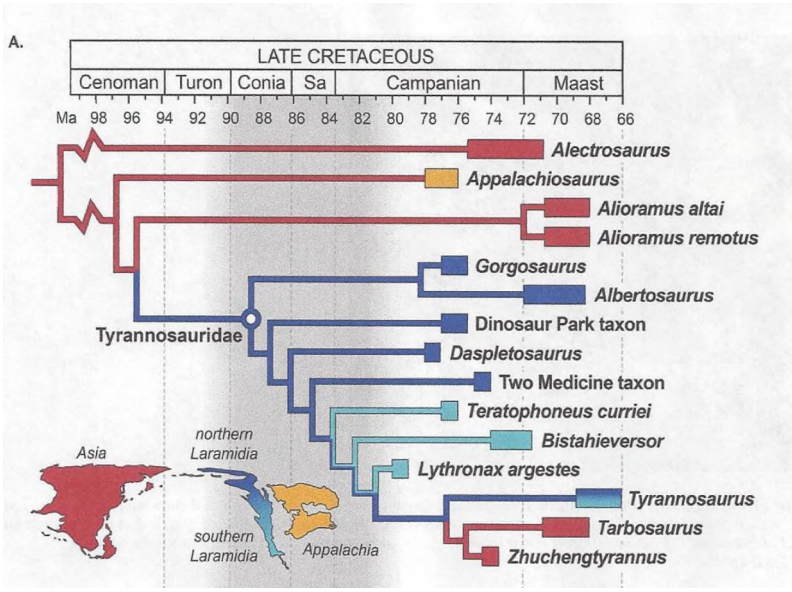
Paleo News Items

Karen Nordquist

New Tyrannosaur from Utah – *Lythromax*

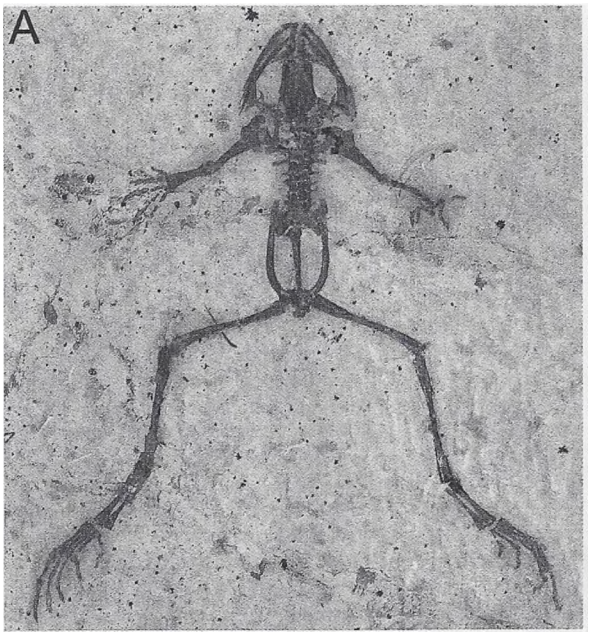
Yet another new dinosaur has been found in the Grand Staircase-Escalante National Monument of southern Utah. This fossil consists of much of the skull and some postcranial material that has been named *Lythronax argestes* from the Greek "lythron" for gore and "anax" for king and "argestes" for the Homeric wind from the southwest referring to its location of discovery. It is aged to the Middle Campanian (the Wahweap Formation about 80 Mya). It adds to the other new tyrannosaur found there in 2011 (PU 505) the short faced *Teratophoneus curriei* from the overlying Kaiparowits Formation (76 Mya). The reconstructions above show *Lythronax* (A) alongside *Teratophoneus* (B) along with a few bones of the later. *Teratophoneus* is diagnosed as a subadult individual with some skull elements and much of the axial column and the pelvic bones. It is identified as a tyrannosaurid theropod that differs from its relatives. Like its relatives, both of these new dinosaurs have short rostrums and broad skulls, but *Teratophoneus* is more similar to the more basal forms like *Albertosaurus* and *Daspletosaur*us. The teeth of *Lythronax* are very heterodont with the first 5 teeth being much smaller than the posterior teeth. Its pubic boot is large and robust like that of Tyrannosaurus. The chart above shows where these new theropods fit and also show their geographic sources with color coding to the continents. The more basal forms including *Albertosaurus*, *Daspletosaurus* and *Gorgosaurus* are from northern Laramidia (dark blue) with their shorter skulls and reduced number of maxillary teeth (<13). The origin of the Tyrannosaurus skull is dated to about 80 Mya with only two species found outside of Laramidia, including *Tarbosaurus* and *Zhuchengtyrannus*. This new data implies that tyrannosauroid Laurasian dispersion occurred by the Late Jurassic through the Middle Cretaceous. The formation of the Western Interior Seaway isolate Laramidia along with the origin of Tyrannosauridae and that separations caused by seaway incursions causing diversification. Later after the Seaway lowered migration to Asia could occur. (Loewen et al in **Plos One** Vol. 8/11, November 2013)



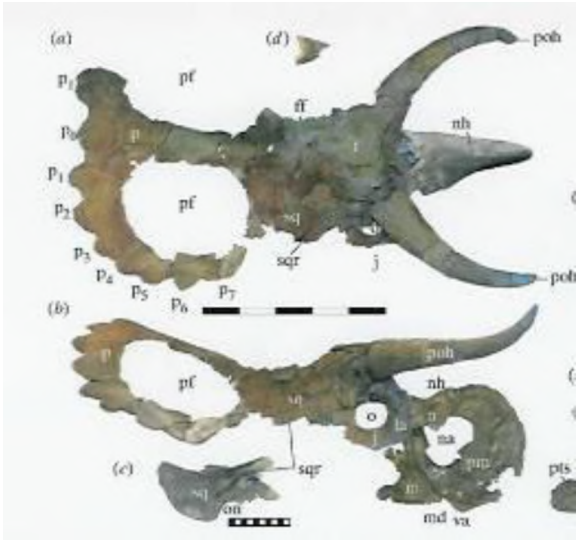


New Frog from Green River – *Aerugoamnis*

Lance Grande et al name a new frog that has been on exhibit at the Field Museum (FMNH PR2384) in Evolving Planet that has now been described. Only two of the five frog specimens known from the Eocene Green River have been described, one a nearly complete skeleton identified as either *Eopelobate*s or a close relative and an indeterminate tadpole. It was from the Thompson Ranch locality of the 52 My site and has been named *Aerugoamnis paulus* from the Latin "aerugo" for green and "amnis" for river and "paulus" for little. It is an amphibian anuran belonging to Anomocoela based on a spiral groove on the iliac shaft, but it differs from others because the nasals are separated by a narrow gap and because the tibiae and fibulae are not fused into a single element. The skeleton is nearly complete on its limestone slab. The counterpart is in a private collection but only has a skull impression and little bone. It measures 19.3 mm (.76 in.) long from snout to vent with hind limbs measuring 23.2 mm (.91 in.) long. The specimen is postmetamorphic indicated by some ossifications although the carpals and tarsals have not fused yet; however, these are the last bones to fuse and it can occur late in life. There are 15 tooth positions along the premaxillae and 10 and 12 small teeth on the left and right premaxillae, respectively. There are about 48 tooth positions along the maxillae with teeth with a narrow basal attachment and presumably bicuspid. There are four digits on the hands and five digits on the feet. Phylogenetically this new frog is placed as a basal member of Pelodytomorpha and is the oldest member of this lineage. Modern forms of this group are only found in Eurasia, but other fossils indicate its presence in North America. (Henrici, Grande et al in **Annals of Carnegie Museum**, Vol. 81/4, September 30, 2013)

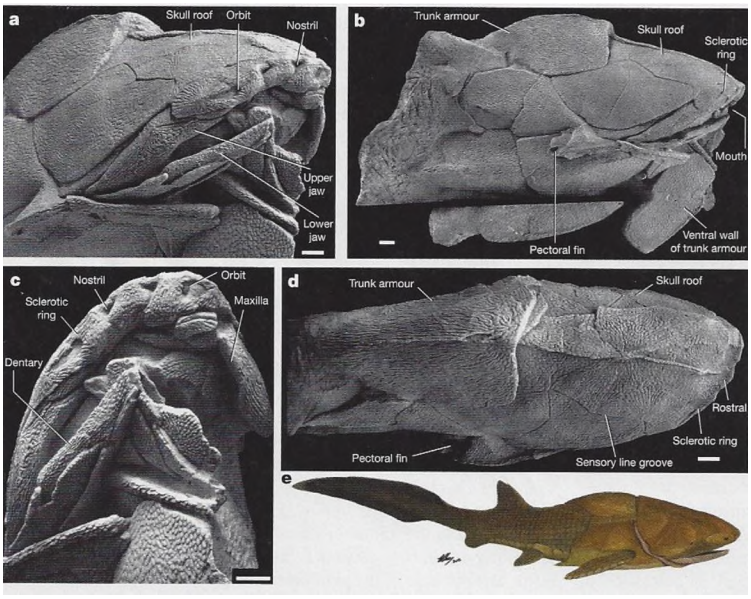


New Short Snouted Dinosaur from Utah – *Nasutoceratops*



For 27 million years *from* 95-68 mya Laramidia experienced a diversity of dinosaurs especially large herbivorous ornithischians with fancy skull ornamentation. The rand Staircase Escalante in southern Utah is now the source of many new species including this new one. It has been named *Nasutoceratops titusi* from the Latin "nasutus" meaning large-nosed and the Greek "ceratops" meaning horn-faced. It also honors Alan Titus for his work. The fossil consists of a fairly complete skull that is 1.8 m (5.9 ft.) long and some postcranial elements of forelimb bones. It is from the Upper Cretaceous Kaiparowits Formation about 75 mya. The skull is shown in dorsal and lateral view at left. It is a centrosaurine ceratopsid with rostrally curved and apically twisted supraorbital horncones, a small narrow elongate nasal horncone, and a parietosqamosal frill with crescent shaped epiparietals. It preserves 22 maxillary teeth and there are 29 alveoli in a referred specimen. These are the largest horncones of any centrosaurine stretching to 40% of skull length. The frill has large oval parietal fenestra on both sides and the length of the frill is equal to that of the skull. The small epiparitals are unusually simple for centrosuarines, which could indicate a juvenile condition. However, based on the fusion of the bones it is probably an adult specimen. It is placed as a sister taxa to *Avaceratops* from the Judith River Formation of Montana (about 2 my earlier) to form a new clade. It appears that centrosaurines originated about 90-80 mya in Laramidia with small nasal horncones, long supraorbital horncones and simpler frills. This new find helps to tell the story of this group of dinosaurs. (Sampson et al in **Proc of Royal Soc. B**, July 2013)

A Silurian Placoderm and the Evolution of the Jaw – *Entelognathus*



Gnathostomes make up the majority of backboned animals (extant groups include the artilaginous Chondrichthyes and the bony fish and tetrapods in Osteichthyes) and it was believed that the precursor resembled a shark. This meant that the bony fish arose later in vertebrate history. Now a new fish dated to 419 mya indicates a different story. This new fish from the Silurian of China combines the dermal skull, braincase and shoulder girdle of the placoderm with the dermal bones of the mandible of the osteichthyans and palate/quadrate characteristics of crown gnathostomes. It has been named *Entelognathus primordialis* from the Greek "enteles" for complete and "gnathos" for jaw and from the Latin "primordalis" for primordial. It consists of the articulated fish and was found in the Xiaoxing Reservoir, Qujing, Yunnan, China. The photos above show the fossil skull in anterolateral (a), lateral (b), anteroventral (c) and dorsal (d) views along with a life restoration (e). The head shield is about 11 cm (4.3 in.) long suggesting a body length of over 20 cm (7.9 in.) long. The features make it difficult to place phylogenetically, but the authors place it outside the modern jawed vertebrate lineage. This makes the sharks an evolutionary novelty rather than ancestral. (Zhu et al in **Nature** Vol. 502, October 10, 2013)

No DNA Found in Amber

Sorry to disappoint all those who saw Jurassic Park and dreamed of creating dinosaurs from the blood of insects in amber. Even though the insects preserved in this way look good, their DNA has deteriorated. Study of insect DNA has been done with museum specimens – "fossils on a pin" in the past but has required destruction of part of the insect to obtain the DNA. Newer non-destructive methods are available now. DNA studies are important in order to help understand some occurrences in evolution; an example is the investigation of extinct endemic island populations to discover their relationships and historical biogeography. This study was done to determine if the fast inclusion of insects within the amber (or copal) indeed was able to preserve the DNA also. They looked at two stingless bees from Colombian copal dated to 10,612 ya. And "post-Bomb")<60 ya). The copal was dissolved and a sample was taken non-destructively before the bees were crushed for a second analysis. The better in amber than in other museum specimens. But it still makes a good story or movie if not an accurate one. (Penney et al in **Plos One** Vol. 8/9, September 013) results showed longer sequences for the younger specimen and more for the destructive method for both. Only one of the sequences of the younger sample matched that of the modern bumble bee, none of the others matched bees. Therefore, insect DNA does not appear to be preserved any better in amber than in other museum specimens. But it still makes a good story or movie, if not an accurate one. (Penney et al in **Plos One** Vol. 8/9, September 2013)

The **M**id-**A**merica **P**aleontology **S**ociety (MAPS) was formed to promote popular interest in the subject of paleontology; to encourage the proper collecting, study, preparation, and display of fossil material; and to assist other individuals, groups, and institutions interested in the various aspects of paleontology. It is a non-profit society incorporated under the laws of the State of Iowa.

Membership in MAPS is open to anyone, anywhere who is sincerely interested in fossils and the aims of the Society.

Membership fee: $20.00 per household covers one year's issues of DIGESTS. All Canadian and Overseas members receive the DIGEST by air letter post. For new members and those who renew more than 3 issues past their due date, the year begins with the first available issue. Institution or Library fee is $25.00.

MAPS meetings are held on the 2nd Saturday of October, November, January, and February and at EXPO in March or April. A picnic is held during the summer. October through February meetings are scheduled for 1 p.m. in Trowbridge Hall, University of Iowa, Iowa City, Iowa. One annual International Fossil Exposition is held in late March/early April.

The MAPS official publication, MAPS DIGEST, is published 5 times per year – Jan-Mar, EXPO EDITION, May-August, Sept-Nov, Dec. (EXPO Materials). View MAPS web page at: http://www.midamericapaleo.org

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