

# The Paleo Times

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The Official Publication of the Eastern Missouri Society For Paleontology

## EMSP SOAPBOX

By David Lukens & Don Howell

If you have any articles, comments, or need to communicate with me I can be reached through the following: [dmslukens@yahoo.com](mailto:dmslukens@yahoo.com) (personal) or contact me at 636-751-8746 (cell).

### Next meeting

Next meeting is **Friday, November 13th** at 7:30 pm in the New Earth and Planetary Sciences building at Washington University (see more details below).

Remember, there will not be a meeting in December since there will be the Christmas Party. If you do not make the November meeting and want details about the Party, call me or e-mail me after the meeting and I will provide details.

## PRESIDENT'S CORNER

Hi folks,

I hope your October was as nice and fast passing as mine. I understand the field trip was a huge success; wish I could've gone! Thank you very much to Dr. Stephanie Kuster for the interesting presentation she gave at the last meeting. I very much enjoyed hearing about her "life's work". Please come to the November meeting as we will be planning for the Christmas party and holding elections for officers. We will also have another great program by one of our members, Mike Fix. You are especially needed at the meeting if you would like to run for one of the offices or want to nominate someone else. I can't wait to see each and every one of you, Don Howell III

## Thanks / Congratulations

To Dr. Stephanie Kuster for her presentation of her dissertation at the meeting and also for all the books that she gave away. The ones that were not picked up will be going to Jordan Montana this summer to be donated to the town library. Thanks to Tom & Keri for setting up the Mark Twain Lake Trip, it was cold but it was great. Thanks to Rick's wife, Kay, who is making table covers for the club's table for the Viking show.

## Treasurer's Report

Club member may hear the treasurer's report at the monthly meeting.

## NEXT MEETING

The speaker for the Nov. meeting will be Mike Fix who will be giving a presentation on the Bollinger County Museum of Natural History in Marble Hill Missouri. He will briefly go over the history of the museum, and then show lots of photos of the major exhibits, with special emphasis on fossil displays including those on the Missouri State Dinosaur, *Hypsibema missouriense*, but also displays of Civil War artifacts, Native American artifacts and culture, crystal radio sets, local history, and more.

Other items to be discussed during the next meeting

- Elections are next month for club officers. If you are interested in being an officer please come to the meeting and get nominated. We are always looking for help.
- **Do you have some fossils that are okay or that you don't want? Bring them to the next (Nov.) meeting. Just before the next meeting we are going to try to set up some**

**grab bags for sale at the Fossil show at the Viking sale in November.**

- Viking show, do we have enough people to cover the tables during the show and to set up and tear down.
- Christmas party – we need to decide on a date and looking for a volunteer to host the party.
- Review of recent field trips, winter is pretty much here so probably no more trips until spring.
- Upcoming Tucson show – who will be going, how much will the club authorize to spend on buying fossils at the show.
- **If you have gone to any of the recent field trips to either the Bruce's site, Mark Twain Lake, or Danville Quarry and you have some good finds, please bring them to the meeting to show off.**

Upcoming Events/ **Field Trips**

**October 31, 2009 – Field Trip** – The Danville Quarry on 10/31/2009 is canceled. Due to unforeseen issues, the quarry could not let us in on 10/31/09. We will likely try to reschedule for sometime next year.

Early November –Field trip to Hannibal Quarry had to be **canceled** due to hunting season.

**November 27-29** - Date has been set for the next Viking show. Location will be the same as last year. Dates will be November 27-29, 2009. The price will be \$75/table. We will be getting 2 or 3 tables. As the date gets closer we will need people to sign up for this show to help man the table. Holiday Inn, 10709 Watson Rd. (I-44 and Lindbergh Blvd.); Fri. 4-8, Sat. 10-7, Sun. 10-5; adults \$2, students \$1, children 12 and under and Scouts in uniform free; dealers. Due to the small number of tables, people will need to sign up on a first come first serve opportunity to man the tables. Sign up list will be available at the Oct and Nov meetings or my contacting myself or Rick Poropat. We will probably be limited to more than 2-3 people at a time.

At the next meeting Bruce Stinchcomb will have his newest book for sale. This one will cover the Mesozoic time.

**December, 2009 – Christmas Party** – We will need to start making plans for a Christmas party for early December. We will also need to see who is willing to host a party this year. Generally the club supplies meat and drinks. Club members bring something to share. Also we look for fossils we can toss into a bag for drawings for the kids attending the party.

**January 16, 2009 – Fossil Board Put Together** - In January we will need to get together to build up our supply of fossil boards that we have for sale for the show. Date is tentative and plan is to have this at David Lukens' house.

Early 2010 – John is checking into the possibility of a trip to Parson's quarry in Tennessee in Spring 2010 to see if it is possible.

Remember that annual dues were due starting in January. If you have not paid, please get your money in. If it is not paid by March 1<sup>st</sup>, your newsletters will stop.

**Notes from the Meeting**

Collections are still ongoing for the Joe's Scholarship Fund. If you want to donate please bring your donations to the next meeting or put them in the mail.

Current membership stands at approximately 47 e-mail + 17 letters. Last meeting the room was completely full with no empty seats. We had 10 new members or guests at the meeting.

We had approximately 10 new members and visitors at the last meeting. As previously discussed we had over 1,200 visitors to our table at Parkapalooza and signed up 2 new members.

For those who have not been to Bruce's Artiola site, the visit from the scientists from the American Museum of Natural History was very successful. The site has been opened up more and clean with a bulldozer to make it a lot more accessible.

Stephanie Kuster gave a great presentation on her dissertation on the analysis of dinosaur bones and fragments and how they can be used to determine what animals they came from.

### **Paleo-shorts**

-Original and summary articles provided by members of EMSP. Where possible, I have tried to add in website where you can read more.

<http://www.sciencecentric.com/news/article.php?q=09100761-u-researcher-has-rare-evidence-dinosaur-cannibalism>

A Gorgosaurus jawbone found in Alberta Canada shows evidence that it was attacked and eaten by another dinosaur. The 70 million year old bone was found in 1996 but was recently examined at the Royal Tyrell museum where part of a tooth, believed to be from another Gorgosaurus, was noted embedded in the jaw. The injury was not healed indicating that the animal died after the attack. Whether the victim was dead when devoured is unknown. The bite inflicted on the 33 foot long animal had the same force as a very large shark. This is only the second proven case of dinosaur cannibalism, the other was from Madagascar.

<http://www.sciencecentric.com/news/article.php?q=09100748-trackway-analysis-shows-how-dinosaurs-coped-with-slippery-slopes>

Study of a large track way with hundreds of dinosaur prints in Lesotho, South Africa is providing new information on dinosaurs' movements. The 200 million year old prints from 4-legged dinosaurs were made when all the continents were combined into Pangea. The tracks were discovered in the 1960's but have recently been reexamined using mapping and a 3D surface scanner that measured down to the millimeter and will be used for future research. The study shows that some of the dinosaurs (tracks are from multiple species) made quick abrupt movements to compensate for the inclined slippery ground they were traveling on. Study of the tracks has revealed that the terrain changed from a wet riverbed, to a sloping bank, to a flat point bar. The advantage is that the tracks show how the animals moved on different ground even though only the base of the foot is shown making species identification impossible though major groups can be identified. Analysis of the tracks showed that ornithischians were bent down in a 4 legged wide spread stance in the riverbed, changed

to a 4 legged narrow stance on the slope, but walked on 2 legs on the flat dry point bar. The theropods maintained the same stance under all conditions though they used their claws to grip on the slippery surfaces. These tracks also give clues to there later development as ornithischians eventually went to using all 4 legs all the time while theropods eventually became birds, possibly because they used their wings to balance on slippery surfaces.

<http://www.sciencecentric.com/news/article.php?q=09100606-bizarre-new-horned-tyrannosaur-from-asia-described>

Remains of another relative of the T-Rex have been found. The new species, *Alioramus altai*, lived at the same time as its larger cousin but was long snouted, thin, and had a horn. It points out the fact that not all tyrannosaurs were big and bad, some were small but probably equally nasty. Tyrannosaurs have been found in both Asia and North America and include the species. *Albertosaurus*, *Gorgosaurus*, *Tyranosaurus*, *Tarbosaurus*, and *Alioramus*. Many have similar structures with large jaws full of sharp teeth. The *Alioramus altai*, was found in 2001 in the Gobi Desert of Mongolia. While remains were found previously, there were scattered and fragmented while this example was well preserved. Parts of a *Tarbosaurus* were also found at the same site. The *Altai* was estimated to weigh about 800 pounds but have an entirely different skull. The teeth are slender and the muscles small and weak and the long snout had 8 horns 5 inches long. CT scans of the skull show it to be related to tyrannosaurs with large air sacs and olfactory bulbs indicating a good sense of smell. The inner ear was small indicating poor hearing. Study of the ear bones showed it to be 9 years old and about 85% of its adult size. The skull structure indicates it went for smaller prey and probably did not crunch bones.

<http://www.sciencecentric.com/news/article.php?q=09093003-did-tyrannosaurus-rex-suffer-from-common-bird-disease>

Did the T-rex and its relatives suffer from bird diseases? That is the suggestion from a number of leading paleontologists. They suggest that they may have suffered from trichomonosis, a disease common in pigeons that passes on to birds of prey when they eat the infected birds. The symptoms include swelling and holes at the back of the lower jaw. It does not spread due to the white blood cells in birds.

A number of T-rex, including the ones in Chicago (Field Museum) and Pittsburg (Carnegie Institute) have similar holes to what is found in modern birds with the same disease. Previously in dinosaurs this was blamed on tooth punctures or on infections. It is possible that it could have been deadly as parasites can get into the infections and lesions can damage the bone making it difficult to swallow or eat. Evidence of the disease has only been found in Tyrannosaurs and may have been spread either by them biting each other or if there cannibalized each other. Around 60% of T-rexs found have evidence of face biting and half have the holes in the jaws. It may have spread similarly to the cancer currently spreading among Tasmanian Devils who spread it through fighting and biting.

<http://www.sciencecentric.com/news/article.php?q=09100240-new-ancient-fungus-finding-suggests-world-forests-were-wiped-out-global-catastrophe>

Fossil records show that the fungus *Reduviasporonites* was prevalent throughout the world 250 million years ago during the Permian-Triassic period when up to 96% of all ocean species and 70% of all land species went extinct. Scientists were able to determine that the fossils were of a fungus and not an algae by looking at the carbon and nitrogen contained in the fossils which showed them to be a type of fungus that lives in dead trees and rots the wood. Their spread across the planet would indicate that much of the world's forest were wiped out in the extinction. At the time of the extinction, large lava flow in what is now Siberia expanded across Pangea. The findings point to the fact that most of the vegetation in the world at the time did not survive. The scientists believe that the large lava flows released poisonous gases that resulted in acid rain and damaged the ozone layer. This resulted in increased radiation. The combination resulted in the destruction of trees and plants on a worldwide scale allowing the fungus to multiple.

[http://news.xinhuanet.com/english/2009-10/09/content\\_12196491.htm](http://news.xinhuanet.com/english/2009-10/09/content_12196491.htm)

A new fossil species of mammal has been discovered in northeastern China. The animal named *Maothierium asiaticus* comes from the Yixian Formation which are 123 million years old. The fossil was well preserved including the ear bones. Paleontologist have been interested in the development of the mammal ear because mammals

ears are more sensitive than other animals. This allowed them to hear a wider range of sounds which permitted them to be more active at night when the world was dominated by dinosaurs. Mammal's excellent hearing is a result of the three bones (hammer, anvil, and stirrup) in the middle ear plus the eardrum. These developed from jaw hinge bones in reptiles. While the ear bones of the *Maothierium* are similar to modern mammals, it also has a connection to the lower jaw which does not exist in mammals now. But it is similar to the primitive middle ear of ancestors or mammals or of embryos of living mammals.

The *Maothierium asiaticus* had teeth that were ideal of eating insects and worms and was a ground dweller. It was about 6 inches long and only weighed about 4 ounces and was likely related to the platypus.

<http://www.sciencedaily.com/releases/2009/10/091001110548.htm>

The first thorough description of the 4.4 million year old fossil *Ardipithecus ramidus*, Has been published. It is believed that this hominid, while not the common link between humans and chimps, shares many of the characteristics of the link. The final common ancestor between the two species is believed to have existed about 6 million years ago. The detailed description consists of 11 detailed reports and other general summaries published in a special issue of *Science*. The *Ardipithecus* fossils found, which were female and nicknamed "Ardi" are a million years older than "Lucy" the famous *Australopithecus afarensis*. The analysis of the bones including the skull, pelvis, hands, and feet show a mix of characteristics: some from its ancestors, some similar to other primates at the time, and some to later descendents. The variety of traits indicates that the apes have evolved significantly since the last common ancestor. But it had also not evolved much in the direction of Lucy. While Ardi at 4' tall and 120 pounds was the most complete skeleton, over 110 *Ardipithecus* specimens have been found. Previously it was thought that the last common ancestor would have many of the same traits as the great apes, but Ardi did not have these traits. These hominids lived in woodlands, walked on two legs and did not use their knuckles for support. The apparently did not spend much time in trees either like chimps.

<http://www.sciencedaily.com/releases/2009/10/091008113341.htm>

Study of the 4.4 million years old *Ardipithecus ramidus* skeleton known as “Ardi” have shown that it lived in woodlands not in open savannahs as many people have thought including Charles Darwin. This was determined by studying the radio isotopes in the soils and teeth associated with the fossils. This can be determined by the ratio of C-12 to C-13 as plants and trees absorb them at different rates and the animals that eat them also absorb them at these rates. The determination was based on looking at 5 teeth from *Ardipithecus* and over 170 teeth from 24 different mammals at the time. All are from the fossil layer in the Afar rift in Ethiopia which covers a 4-5 mile arc. The study showed that the area was woodland at the west and grassland at the east and all the *Ardipithecus* remains were found in the woodland part. Analysis of the animals’ teeth even showed the same pattern with grazing animals in the east (like zebras) but browsers (like giraffes) in the west in the same places as the hominid bones. The teeth of the hominid show some grassland diet but more than a chimps but much less than the australopithecines that survived in the grasslands. This suggests that when it moved to 2 legs and came down from the trees, it still stayed in the woodlands for a while prior to moving to the grasslands.

<http://www.sciencedaily.com/releases/2009/10/091002120412.htm>

Since the discovery that the dinosaurs, and much of the life in Earth, were wiped out by an asteroid impact, 65 million years ago, debate has raged over how long it took for life to rebuild. Many scientists have argued that it took millions of years. But new studies from MIT indicate that photosynthetic organisms (algae and cyanobacteria in the ocean) came back within a century. Previously scientists looked for fossils in the sediments but this type of life does not leave fossils. But they do leave traces of organic molecules known as “chemical fossil” which indicate their presence. The MIT scientists collected sediment samples from Stevns Klint, a cliff in Denmark where the deposits for the extinction period at 10 inches thick where in most areas they are less than 1 inch. Also they had access to one of the world’s most advanced Gas Chromatograph-Mass Spectrometers (GC-MS) located at MIT. Because this machine is much more sensitive, it is able to find traces that many other scientists’ can

miss. The study indicates that immediately after impact large portions of the ocean lacked oxygen and were detrimental to life. But close to the shores, the algae returned within 100 years. In the open ocean though it may have taken between 1-3 million years to return. While shortly after impact the simple food supply returned for some life, the rebuilding of the food chain and ecology took much longer.

<http://www.sciencedaily.com/releases/2008/10/081001093616.htm>

For a long time it was unknown how or where marine organisms survived the mass extinction at the Permian-Triassic boundary 225 million years ago. An extinction which wiped out 95% of all life in the ocean. Now paleontologists have discovered that the shorelines of ancient Canada in Alberta, British Columbia and the Canadian Arctic were one of the hiding spots for life. While this may not be in the only refuge, it is the only one found so far. The cause of the extinction is still unknown though the most accepted theory is massive climate change resulting in increased temperatures, increased CO<sub>2</sub>, and lower O<sub>2</sub> levels. Previous studies of rocks from the extinction have been done in Greenland and China but were from deep ocean water. The rock layers from Canada are from shorelines and include trace fossils and conodonts, a microfossil that undergoes rapid evolutionary changes. The trace fossils indicate that some locations maintained high levels of oxygen and point to its lack as a major reason for the slow recovery from the extinction.

<http://www.sciencedaily.com/releases/2009/09/090902122331.htm>

Again at the Permian-Triassic extinction 252 million years ago, new studies show that ammonites came back 10-30X faster than previously thought. This may change the way that paleontologists think about how species evolve. A study by French & Swiss paleontologists has shown that the cephalopod ammonites may have needed as little as 1 million years to recover from the extinction and reach the same diversity levels as previous to the extinction. The cephalopods almost went extinct with only 2 or 3 species surviving and one species being the source for the diversification. It took the scientists 7 years to gather the specimens from 860 genera from 77 locations in the world spanning 25 different times over 100 million years and to analyze them. This

discovery, combined with other data may require a revision to the thought that it may have taken 5-15 million years for species to recover after extinctions. But it still points out that the recovery takes a long time.

<http://www.sciencedaily.com/releases/2009/10/091020203420.htm>

A new report has documented evidence of the oldest human activities in grasslands. The evidence dates back 2 million years. While it has long been suspected that hominids moved into grasslands and developed stone tools there, the evidence for the grassland ecosystems has been lacking. Now new studies have been done on the 2 million year old Oldowan site in Kenya. Both artifacts and animal remains were found, allowing scientists to reconstruct the environment. The work included chemical analysis of both animal teeth and the fossil soils (see previous articles). The studies show that the area was mainly grasslands between 1.5-2.5 million years ago. The evidence indicates that the hominids were active in the grasslands and that they got meat and bones from many different animals and also carried the stones used for making tools very long distances. Studies of various sites show that the hominids lived in various environments including grassland and woodlands and were able to adapt and use the habitat in both areas.

<http://www.newsdaily.com/stories/tre59k6gt-us-dinosaur-tiny/>

Fossils of *Fruitadens haagarorum*, the smallest dinosaur in North America were recently identified. The fossils, from 4 different individuals, were found in western Colorado and include skulls, vertebrae and limbs show the animal to be about 2 ½ feet long and about the weight of a rabbit (2 pounds) and very fast. The fossils were recently put on display at the Natural History Museum of Los Angeles County. The fossils date to 150 million years ago and the animal would have been living among giants such as *Brachiosaurus*, *Allosaurus* and *Torvosaurus*. The fossils have several unique features including canine teeth at the front of the lower jaw and leaf-shaped teeth in the cheek region. The teeth indicate it ate both animals and plants and that it probably belonged to the group heterodontosaurids which survived for over 100 million years. There is one other dinosaur that may have been smaller from

China but the examinations of the remains are not conclusive. .

<http://www.newsdaily.com/stories/tre5911mv-us-india-dinosaur/>

A group of dinosaur eggs dating to 65 million years ago have been found in Tamil Nadu in southern India. The eggs were found in clusters of 8 and were in sandy nests about 4 feet in diameter. The eggs were between 5-8 inches in diameter. The eggs were buried in volcanic ash, likely from the Deccan eruptions which occurred near the end of the age of dinosaurs. The eggs along with coprolites, and bones were found at the bottom of streams in the local Cauvery River. Police protection for the area has been requested as previous similar finds have resulted in looting the sites.

<http://www.sciencedaily.com/releases/2009/10/091022101702.htm>

250 million year old fossils from Shaanxi Province in China have turned up the remains of some of the first animals with shells known as *Cambrothya*. These tiny animals which were only a 1/10 of an mm long (1/250 of an inch) were shaped like tiny jars. Analysis of the fossils is difficult as the external shells were made of dozens of pieces which fell apart when the animals died. Previously it was thought that the shells from the *Cambrothya* were parts of another animal but studies showed that it was one animal, a couple of inches long covered with hundreds of armored plates shaped like jars. The *Cambrothya* appears to be related to another animal from the Cambrian called the chancelloriids which looked like barrel cactuses. They were also similar to the halkieriids which were armored slugs (must have had some real enemies).

[http://www.sciencenews.org/view/generic/id/48672/title/Ancient\\_giant\\_beavers\\_did\\_not\\_chow\\_on\\_trees](http://www.sciencenews.org/view/generic/id/48672/title/Ancient_giant_beavers_did_not_chow_on_trees)

During the last ice age, giant beavers weighing between 130-220 pounds existed in North America. But *Castoroides ohioensis*, unlike modern beavers is now not believed to have eaten trees, or at least very few. The analysis is based on the C-12 and C-13 ratios extracted from material from 14,500 year old jaw bone in southern Wisconsin. The plant and pollen fossils from the surrounding dirt indicate that the area was cold and marshy and had few trees. The C-12 & C-13 (carbon 12 and 13) ratios were not in the range of an animal which eats tree material but

did fall in the range of one that consumed aquatic plants such as pond weeds. This would make their diets similar to hippos. As time passed the area became warmer and drier and the resulting forests became habitat for modern beavers.

[http://www.sciencenews.org/view/generic/id/48616/title/Fossil\\_find\\_sparks\\_debate\\_on\\_primate\\_origins](http://www.sciencenews.org/view/generic/id/48616/title/Fossil_find_sparks_debate_on_primate_origins)

Remains of a lower jawbone from the new lemur like genus and species have been found in Egypt's Fayum. The 37-million-year-old animal is named *Afradapis longicristatus*.

While its skeleton resembles higher primates such as monkeys, apes, and humans it did not belong to the same group. This animal belongs to the same group as the recently discovered *Darwinius* which are called adapiforms which are an extinct group of primates. This provides the first evidence that they co-existed with other anthropoid primates, most primates at this time were small though *Afradapis* weighed between 5-7 pounds where as *Darwinius* only weighed between 3-6 ounces. It is proposed that both belong on a side branch of the primate family and likely developed similar characteristics since they were competing for similar foods and habitat. The jaw and teeth have similar traits to other anthropoids of the same time period including similar molars and a full fusion of the two halves of the jaw. Its large cheeks allowed it to eat tough leaves and fibers but also fruits. Though fruits were probably not the main part of the diet.

Recent computer analysis of relations between 117 living and extinct primates (using 360 features of the skeleton) indicate that the oldest primates are from Asia not Africa with the oldest known being about 40 million years ago.

[http://www.sciencenews.org/view/generic/id/48389/title/Darwinopterus\\_points\\_to\\_chunky\\_evolution](http://www.sciencenews.org/view/generic/id/48389/title/Darwinopterus_points_to_chunky_evolution)

New fossils from 160 million year old deposits in China indicate that pterodactyl's heads developed before their bodies. In the past, pterodactyl fossil came in two groups: primitive long tailed lizards and giant flying reptiles with short tails. It was assumed that missing links would have medium bodies and tails. But the recently discovered 20 skeletons named *Darwinopterus* which were about the size of a crow have long tails and small rear ends but have heads and necks like later versions with long jaws full of sharp teeth. These traits in addition to the flexible neck indicate they hunted like hawks.

This supports the theory of modular evolution that believes that entire sets of features change rather than just one small thing at a time.

<http://www.palenews.net/>

The asteroid impact off what is now Mexico 65 million years ago may not have been the only impact according to scientists. The impact at the Chicxulub crater off the Yucatán Peninsula was from a 6 mile wide asteroid. But a new theory indicates that the dinosaurs may have been finished off by a second impact in India from a 25 mile wide asteroid a couple of hundreds of thousands of years later. This impact off the west coast of India was about 300,000 years later. This impact, known as the Shiva Crater is 300 miles wide and was first explored in 1996 and may be the largest crater on Earth. The impact would have been large enough to penetrate through the crust to the mantle and would have created the rough rim that is seen. The scientists also believe the impact caused part of India to break off and move toward Africa forming the Seychelles islands.

Additional investigations into the fossil layers around the recently discovered Titanoboa (the world's largest fossil snake) are giving clues to the environment it lived in 60 million years ago. The study looked at over 2000 leaf fossils from the same Columbian coal mine where the snake's bones were found. The leaves were from palm, legume, and other species still common in South American rain forests. If so, this is the first evidence of a modern rain forest that has been found. The study indicates that the forest was a few degrees warmer and had less variety than modern rain forests. This may indicate that they were still recovering from the asteroid impact off Mexico 5 million years before. Previous studies of pollen show that the rain forests changed a lot from before and after the asteroid impact.

<http://www.livescience.com/animals/091008-bird-growth.html>

New analysis of 150 million year old bone fragments from *Archaeopteryx* indicate that it grew slowly like dinosaurs rather than fast like modern birds. Based on the analysis it was estimated it took around 1000 days to go from baby to adult compared to weeks for modern birds. The study also indicates it was larger than previously thought, likely the size of a raven. The metabolism of dinosaurs indicates slow growth

and taking years to reach adult size. *Archaeopteryx* appeared to be a crossover between a dinosaur and bird with feathers and a wishbone but had non-bird features such as a long bony tail, claws, and teeth. Paleontologists also previously thought that fast growth was a requirement for the ability to fly. The scientists looked at small bone fragments taken from the long bones of fossils and also sampled fragments of bones from other early birds along with dinosaur bones *Velociraptor mongoliensis* and *Mahakala omnogova* that is similar in size to *Archaeopteryx*. The bones from the early birds were similar to dinosaur bones though later birds such as the old *Ichthyornis dispar*, from around 100 million year ago indicated rapid growth due to the orientation of the bone fibers and well supplied blood vessels.

<http://www.paleontologynews.com/story.asp?ID=514065&Title=CDOT%20Paleontologist%20Finds%20More%20Fossils%20Along%20I-25>

A new place to look for fossils, road cuts along I25 in Colorado? A paleontologist working for the Colorado DOT recently found fossils (articles does not say what) at the I-25 and Crossroads Boulevard interchange in Loveland. The fossils were first found in 2002 and again recently when additional road work was done, the largest were about 4 inches long and will go to the collection CU Boulder.

#### **FOR SALE**

**Club member Addy has some equipment for sale. If you are interested you can get contact information at a club meeting for more information**

#### **Upcoming Gem & Fossil shows-**

Arizona Mineral & Fossil Show, January 30–  
February 13, 2010, Tucson, AZ

MAPS 2010 – Western ILL University, Macomb IL  
March 26-28, 2010.

#### **Reports**

If you have suggestions for field trip locations, please e-mail them to me and I will begin putting together a list.

#### **NEEDED**

We are always looking for more donations of small fossils (quarter size or smaller) for the fossil boards. We are especially in need of small trilobites (the Utah ones are best) were also looking for horn corals, other corals, gastropods, bryozoans, and other donations. Please bring to the next meeting so we can meet later and work on putting more fossil boards together for the upcoming show.

#### **CONTACTS**

Do you need to find out something about the next meeting or have questions on the next field trip? If so, please talk to or contact one of the EMSP officers.

President – Don Howell

([donhowelliii@sbcglobal.net](mailto:donhowelliii@sbcglobal.net))

Vice-President: Bruce Stinchcomb

Treasurer: Pete Smith

Secretaries: David Lukens

([dmslukens@yahoo.com](mailto:dmslukens@yahoo.com)) and Peggy Cole

#### **DUES ARE DUE**

Our treasurer, Pete Smith will accept dues payment for a full year. **Dues are \$20.00 per household per year-payable in January if receiving the newsletter by e-mail. The dues are \$25 for those receiving the newsletter by regular mail.** See Pete at the next meeting or mail a check (payable to Eastern Missouri Society for Paleontology) to:

#### **EMSP**

**P.O. Box 220273**

**St. Louis, MO. 63122**

## Distribution of the Newsletter by email

Can't find your newsletter, just when you need it for a trip? Then sign up for the e-mail version. This also saves the club money so we can bring in speakers (once we pick some...) E-mail requests to [dmslukens@yahoo.com](mailto:dmslukens@yahoo.com), [motirek@gmail.com](mailto:motirek@gmail.com) or [abfactor@gmail.com](mailto:abfactor@gmail.com)



Meetings are held the 2nd Friday of every month (except July, August, and December) in room 203 of the new Earth & Planetary Sciences Building on the campus of Washington University. The Earth & Planetary Sciences building is on the southwest corner of Hoyt Drive and Forest Park Pkwy. There is a large parking lot just across the street.

# What is EMSP?

The Eastern Missouri Society for Paleontology (EMSP) is a not-for-profit organization Dedicated to promoting the enjoyment of fossil collecting. It is open to all individuals interested in learning about the history of life on earth. The club membership includes professional paleontologists as well as amateur hobbyists. The EMSP provides an open forum for the exchange of information and 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 the Earth and Planetary Sciences Building on the campus of Washington University. Each meeting includes an informal exchange of information and speakers on a variety of fossil-related topics.

Weather permitting, field trips to fossil collection localities around the St. Louis area are held each month. Led by experienced collectors, these trips are a fun way to augment discussions at the monthly meetings. The club participates in joint field trips with other paleo clubs, visiting fossil sites throughout the United States. EMSP is also a proud to be involved in partnerships with the St. Louis Science Center and the Greater St. Louis Association of Earth Science Clubs, Inc.

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