

The Paleo Times

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EMSP SOAPBOX

By Abby Lee

Well the weather threw us all for a loop lately. Hopefully we can all get out to do some collecting. My family and I went to the MAPS fossil expo where cold rain dampened collecting ideas on the way up. I did, however, manage to run into fellow fossil guys at a road cut where I found some interesting trilobites (not great but I'll bring them to the meeting). MAPS was worth the trip again this year. A well-known paleontologist took an interest in the *T. rex* material that Carl Campbell and his associates have discovered in Montana. Something new fossil-wise always comes up as well. I think the Precambrian (Edicarians?) fossils from Australia peaked the interests of several. The environment is fairly kid friendly. Take the whole family next year! I'll have some pictures at the next meeting.

April Meeting Minutes

Old Business:

Rick Poropat reported a date for the summer club picnic (July 28th, Lions Club Pavillion at Kirkwood City Park.

Rick also reported that we will have 2 tables at the Stratford Inn show reserved via club member Melissa Perucca. Rick also said that there would be no St. Charles/Queeney Park Show this year due to financial losses at the show last summer (see update about this on the next page). Cards for the MAPS fossil exposition were available to club members at the meeting.

New Business:

Bruce Stinchcomb agreed to lead a field trip Cedar Creek on Sunday, March 18th (decided to meet at Burger King on the South side of 70, east of the 64/70 merge at 10:00 a.m.).

Some one brought up the fossil hunts being sponsored by the County Parks Dept. on March 17th and 24th at Greensfelder Park by Six Flags.

John Stade is pursuing a Danville Quarry Trip, but looks iffy right now.

No Lee Creek trip for the club this year. We did not make the lottery.

Abby Lee agreed to do a Fossil Table at Old Bonhomme Elementary on April 1st, 1-3 p.m.

Report on club participation at Old Bonhomme elementary school science day:

The club was approached by a Wash U professor that helped coordinate a science day on April 1st. He wanted a display/demonstration about fossils. Carl Campbell and I (Abby) brought the club's posters with some field trip pictures, some dino bones, examples of Missouri fossils, and free Moroccan sharks teeth (if the kids asked a fossil question). We were popular with the 4th grade crowd. A dino know-it-all was quickly helping me with my spiel- which was welcomed because my throat was getting dry. I think we may see a few people from the school at this month's meeting.

Speakers at the March Meeting

The guest speaker was Washington University Assistant Professor Dr. Carrine Blank. She gave a high level technical talk about the evolution of early microbial life on Earth. She presented recent scientific data that suggests that the 3.7 BYA date for fossilized microbial life was probably misinterpreted. She argues that the clear signature for microbial life may date back only 2.2 BYA or so. She also described her efforts to use molecular phylogenetic techniques to resolve ancient evolutionary relationships in the tree of microbial life. Many thanks go to Dr. Blank for a fine talk.

Upcoming Events

April Meeting: The meeting will be **Friday, April 13th** at the **St. Louis Science Center** at 7:30 p.m. in the lower level. The speaker will be club member and lecturer of geology at UMSL, Mike Fix. He will give a talk open to the public about the Chronister dinosaur site located near Marble Hill, MO. This site is the only known dinosaur locality in Missouri. This site has provided several bones of a very large hadrosaurine dinosaur named *Hysibema missouriense*. This is a rare opportunity to hear about Cretaceous dinosaurs from the Eastern half of the great interior seaway. Fossils recovered from this site may ultimately provide extremely valuable information about Cretaceous fauna from the Eastern half of North America.

International Gem and Jewelry Show. April 20-22 Gateway Convention Center in Collinsville, IL: For those also with an interest in gem stones there is a show that is well worth the short trip across the river. Gem dealers from across the globe meet here with some really neat items and artistry. Some fossil jewelry can be found- mainly ammonites and awesome displays of amber. FYI- this is a great place get rings resized on the spot for quite reasonable fees. The international dealers are interesting to meet too- they love to haggle. The show could easily take all day to see. Entrance fee \$7- but look for coupons in the Post-Dispatch.

May Meeting: The May meeting will also be at the Science Center and open to the public. The speaker this month is Janis Treworgy-Professor and

Program Chair of Geology at Principia College (Elsah, Illinois). She will talk about the excavation of a woolly mammoth found on campus in 1999 and provide us with any updates of new findings.

Summer picnic. Rich Poropat has reserved the Kirkwood park pavilion for July 29th for our annual summer picnic. The club buys the drinks and grills the meet. Members bring side dishes and dessert. Fossils show and tell, swapping, and a bit of selling usually occurs as well.

Gem, mineral, and fossil show Aug. 17-19: The St. Louis Gem and Mineral Society Show will be held in minimal capacity this year. The show formally at Queeny Park moved to the St. Charles Convention Center last year and unfortunately lost money. This was my favorite show in town and I hope the show can expand next year. This year ~14 vendors and ~4 demonstrators will hold the show at the Machinists Hall in Bridgton. There will be no swap area this year. I do not know yet if the club will have a booth.

DUES ARE DUE

Our treasurer, Pete Smith will accept dues payment for a full year. Dues are \$15.00 per household per year and are payable on the anniversary date printed on your newsletter address label. 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**

Raffle

A new raffle item was donated by Dave Lukens. It is a Venus Clam from Rock Pit, FL thought to be 1 million years old. The clams are fossilized with naper intact and beautiful crystals inside. The clams hit the market only recently. The sell for over \$100.00 on line and at shows. More about this at up-coming meetings.

Field Trips

It will be warm again soon. Let's plan some field trips. Suggestion- kids like trips and we have not pulled one off in a while. We could revisit the old spot on the Meramec River under the old bridge in South County. Just a though- I'm open to others.

Kansas River – I ran into club member Bruce Wake from Kansas City at the MAPS fossil show. We have been discussing a canoe trip down the Kansas River. The trip was tentatively set for April' however, the water is quite high. We may have to wait until summer. Bruce has graciously offered his home- sleeping up to 8, for arriving Friday night, canoeing on Sat, and leaving on Sunday. This trip offers the opportunity to collect Pleistocene-age bones, as well as, things of all ages that said "moo".

Distribution of the Newsletter by email

We keep adding to the list of club members who have elected to receive the newsletter by email. Many will go out by email this month. This is a cost savings measure for the club. Each newsletter currently costs 39 cents to mail. This is over \$4.00 per person each year for postage alone. A sign-up list will be available at meetings, or email Tom Lee (motirek@gmail.com) to begin to receive the newsletter electronically.

Paleo-short

On ScienceDaily.com week of 4/2/07

According to "No Sex for 40 million years" in a news release from the Imperial College London a group of microscopic aquatic animals called *bdelloid rotifers* have reproduced solely asexually for 40 mya. Fossil records and molecular data were used to confirm that organisms can survive and evolve into new species solely by selectional pressures. The common conception in the scientific community holds that genetic diversity from sexual reproduction is necessary for a species long term survival. These animals are all female and produce eggs which are clones of themselves. The study will be published in PLOS Biology.

PLEISTOCENE PREDATORS' DEMISE ON PARALLEL PATHS? (By Clarence Zacher)

In an earlier *Paleo Times* article about the Ice Age's fossil great birds (Feb. 2007 issue) it was

suggested that a good deal of our understanding about Teratorn family habits were derived from observations of its closest (and now endangered) condor relatives, and from their habits and behavior.

Each of them too, shared lives in somewhat overlapping or identical ranges in the generally arid climate of the Western parts of the North American continent. Each had evolutionary adaptations in common, specific to the ending Pleistocene era with its ecological conditions. Yet, from recovered anomalous fossil bones found far out of their expected regular distribution, surprising distant forays eastward did rarely occur. This suggests the possibility of far ranging mobility with the movement of weather patterns, cyclonic lows and developing frontal systems-in the case of both bird species. They *were* after all the 'thunderbirds'.

Evolution apparently granted to each the marvelous adaptive flight structure evident in the effortless gliding aerial movements high overhead that Charles Darwin so admired in South American condors flying over the Andes. Such birds were found written up in his journals.

Adaptations were refined right down to the webbing between a condor's feet used as resistance in steering and landing. Steering is accomplished with almost imperceptible movements of the flight feathers (primaries) on the outer wing and tail, and very subtly by the alula, a small, strong, dexterous feather on the bird's wrist, where the major wing bones meet. All designed to be much less energetically expensive as far as the bird is concerned.

Although Darwin observed a flight of as many as 20-30 birds heavily taking off from their resting place, then wheel away in majestic circles, it is unlikely such numbers will ever be seen again-in view of their especially slow (and very low) reproductive rates, a trait of all the condor family kin. They are anything-but fast or prolific breeders.

Darwin learned from Chilean local countrymen that instead of being obligate (compulsory) scavengers, condors frequently attack young lambs, goats, and even very small calves. The fact of both North and South American Condor attacks smaller animals- well known to naturalists of today, also accounts for early condor poisoning among stockmen and ranchers in the mountains of California, and this, along with the low birth rate, largely contributed to their scarcity and slow decline.

So Teratorns, with claws and talons basically unsuited to the capture, holding and making off with any larger prey, probably did opportunistically chase available small to mid-size fauna at ground level, catching, gobbling up and eating them whole with a peculiarly eagle-like hooked bill, unlike the vultures' beak.

But more significant perhaps for the Teratorns were the megafauna as a major food source, and its inevitable decline and demise. What follows may comprise the 'rest of the story' why dietary deficiencies might contend as an important influence in killing off the Teratorns as well as some other predators of the Pleistocene.

Consider closely the feeding habits of the Condors today- here's how it's been observed to proceed:

Among the birds of prey present at the banquet, it is the condors that begin the feeding, opening the animal for the smaller birds. And it is the condors that stay until the task of cleaning the skeleton is complete, for in spite of their size and the strength and thickness of their mandible, the condor's possess bills that resolve into tiny, tweezing forceps, delicate enough to clean bits of muscle and tendon from between the tight skeletal articulations. What begins in a rather bloody, tearing fury, attracting a hoard of scavenging birds, ends with the condors alone, calm and meticulously nibbling, almost artful in their effort to leave nothing at all but a bare, new skeleton. (Darwin watched the process from start to finish).

The condors in other words, are adapted to consume the carcasses more thoroughly than the others. And to get the marrow, brains and spinal cord tissue would provide them and incredibly rich food source- rich in nutritional value, rich in fat and protein as opposed to mere pickings over muscle mass tissues.

Some compelling collateral evidence for a dietary deficiency hypothesis as a significant contributing factor to Teratorn extinction comes from DNA analysis of fossil bones and from the bone structures of another variety of hungry Pleistocene predator. A form of wolf subspecies, too, may have enjoyed the boon times during the presence of an existing healthy population of diverse megafauna, yet sadly declined with their absence.

Finally each was equipped with a particularly robust suite of physical attributes with features to employ in their eating habits, with its more nutritional diet menu. The compelling analogy is presented in the article below:

DNA analysis reveals extinct type of wolf

Many species of large mammals went extinct when the last ice age ended about 12,000 years ago, but *Canis lupus*, the gray wolf, survived that wrenching period unscathed-or so scientists thought. New genetic analyses of the remains of gray wolves found in Alaska indicate, however, that a distinct subspecies of *C. lupus* disappeared at the time, possibly because of its dietary habits.

Blaire Van Valkenburgh of the University of California, Los Angeles and her colleagues conducted a genetic study on living gray wolves and also samples of mitochondrial DNA recovered from wolf bones found in Alaskan permafrost. The remains of those 21 animals ranged in age from 12,600 years to 47,000 years.

The team's analyses revealed 15 combinations of genetic variations in the Alaskan wolves that didn't match any of those in 126 modern gray wolves. "This was surprising, so then we looked at the bones," says Van Valkenburgh. They found that the ancient gray wolves had broader snouts, larger teeth, and deeper jaws than their living cousins.

Overall, the findings suggest that the ancient gray wolves belonged to a subspecies adapted to consume bones and carcasses more thoroughly than living wolves do.

The gray wolf subspecies might not have survived the end of the ice age because it depended on a steady supply of large carcasses, says Van Valkenburgh. As the populations of mammoths, mastodons, and other large mammals dwindled, the wolves' good supply would have disappeared, she notes.-S.P

Science News, Nov. 11, 2006. Vol. 170. p.318.

Amber vs. Copal

By Ryan Fairbanks

At the last "rock" show I attended an attractive piece of amber caught my eye. This particular specimen had a multitude of insect

inclusions, and insects being one of my fancies, I just had to have it. So I stood and listened to the dealer's spiel about how great of a deal I was getting on this copal amber. "Copal amber, huh", I thought, "This just must be some other kind of amber, like Dominican." I really had no idea what he was talking about and had never really learned anything about amber other than it was fossilized resin. So I happily paid the man and went home to ogle at my find under a microscope with a considerably thinner wallet.

Later, I found a little insert in my bag explaining that copal amber was anywhere from two hundred to one million years old. This made me a little more curious about this copal amber, and I decided to research it a bit. And, of course, I found out that my piece was more than likely full of modern day bugs; ignorance was bliss.

Copal and amber are very similar in many ways. They are both resins, just at different points of fossilization; copal being the middle and amber the end of that process. Resin starts as a sticky viscous liquid full of free organic compounds. Under the right conditions of time, heat, pressure and environment those compounds will start to form bonds, or polymerize. As this happens, the resin becomes more solid and is essentially now copal. The longer this process goes on, the bonds grow stronger, and begin to push out the volatile oils or terpenes. When the majority of these terpenes have been forced out of the copal, then it can be classified as amber.

The timeframe for this process can vary significantly depending on the environment it was deposited in. Some South American copals are merely a thousand years old, and yet in New Zealand, the kuari gum is ten times that old and still not even considered copal. So just being really old does not necessarily mean amber. Heat and pressure play a major role, but staying in an anaerobic environment determines if that particular deposit will survive the millennia. Oxygen will attack and oxidize the surface of fossilizing resin, slowly breaking it down into smaller and smaller pieces.

So finding a nice piece of amber can be hard and one with a good inclusion even harder still. The most common deposits of amber are the Baltic and Dominican, but there are many other places in the world it's found. Sicily has amber that comes in a blue and green variety. Canada actually has amber from the Cretaceous which is rare. Cedar Lake in Manitoba is famous for small pieces washed ashore. This amber is highly included with flora and fauna.

At MAPS, Ryan and I learned that copal can actually flake to bits in a matter of years. The pieces can be interesting but one should not pay anywhere close to the price of Baltic or Dominican amber for it. I obtained some more sources on amber there and I hope to write additional details about collecting amber soon -Abby

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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