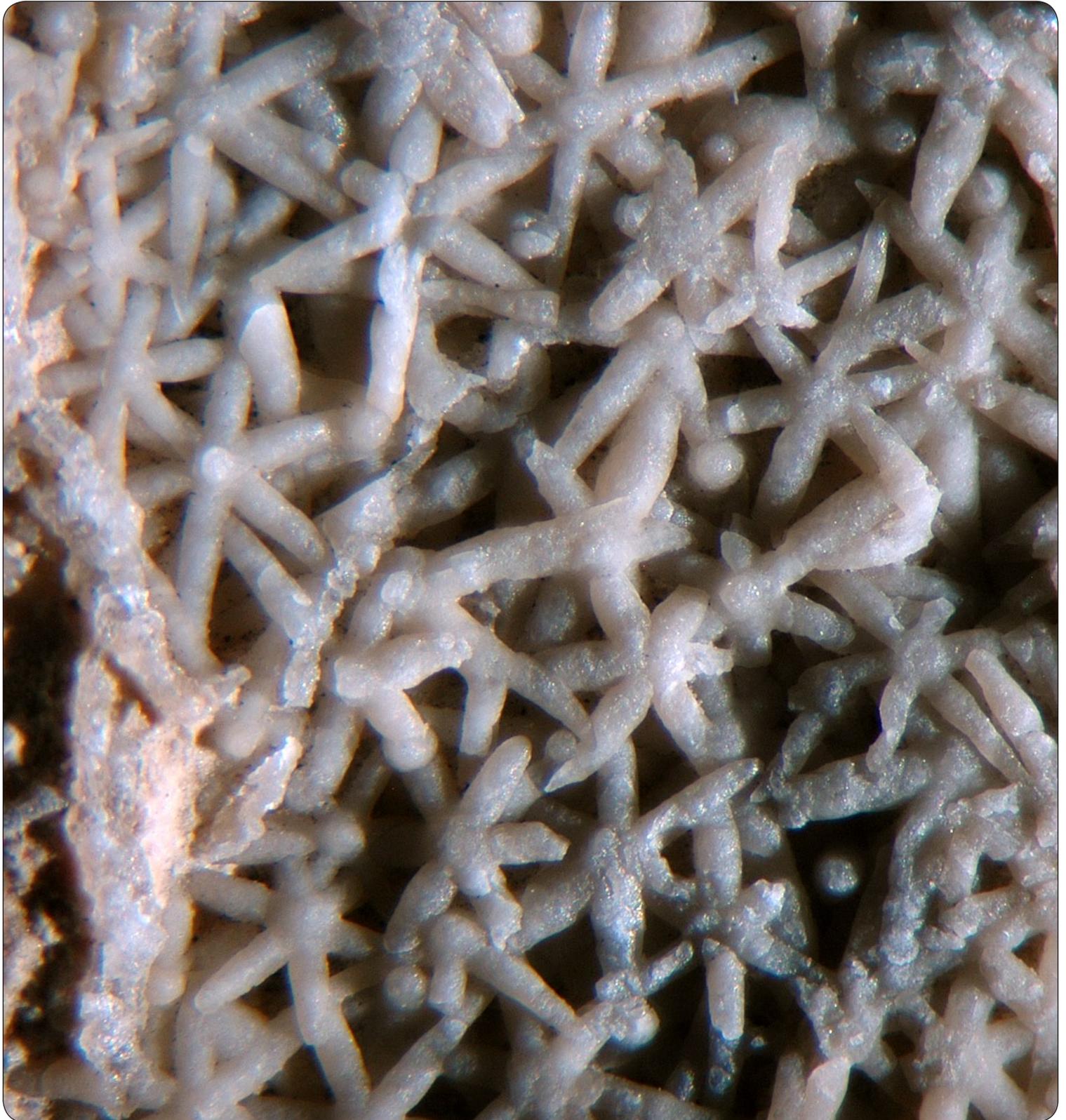


Palaeontological
Alberta *Society*
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ALBERTA PALAEOLOGICAL SOCIETY

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† Alberta Palaeontological Advisory Committee

The Society was incorporated in 1986, as a non-profit organization formed to:

- Promote the science of palaeontology through study and education.
- Make contributions to the science by:
 - Discovery
 - Collection
 - Description
 - Education of the general public
 - Preservation of material for study and the future

- Provide information and expertise to other collectors.
- Work with professionals at museums and universities to add to the palaeontological collections of the province (preserve Alberta's heritage).

MEMBERSHIP: Any person with a sincere interest in palaeontology is eligible to present their application for membership in the Society. (Please enclose membership dues with your request for application.)

Single membership **\$20.00 annually**
Family or Institution **\$25.00 annually**

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Society Mailing Address:

Alberta Palaeontological Society
P.O. Box 35111, Sarcee Postal Outlet
Calgary, Alberta, Canada T3E 7C7
(Web: www.albertapaleo.org)

Material for the Bulletin:

Howard Allen, Editor, APS
7828 Hunterslea Crescent, N.W.
Calgary, Alberta, Canada T2K 4M2
(E-mail: editor@albertapaleo.org)

NOTICE: Readers are advised that opinions expressed in the articles are those of the author and do not necessarily reflect the viewpoint of the Society. Except for articles marked "Copyright ©," reprinting of articles by exchange bulletins is permitted, as long as credit is given.

UPCOMING APS MEETINGS

Meetings take place at 7:30 P.M., in Room **B108**,

Mount Royal College: 4825 Mount Royal Gate SW, Calgary, Alberta.

June, July, August 2008—No meetings. See Field Trip Updates, Page 6.

Friday, September 19, 2008—Annual Open House and Fossil Clinic (See Page 6).

Friday, October 17, 2008—(Tentative) Philip Benham, APS.
Garden of Eden: Africa's Great Rift and its influence on evolution.

Friday, November 21, 2008—Craig Scott, Royal Tyrrell Museum.
Early Tertiary mammals of Alberta.

ON THE COVER: Photomicrograph of a calcisponge, magnified 28x, showing the network of six-pointed, calcareous spicules that make up the animal's skeleton. Upper Devonian, probably Escarpment or Twin Falls Formation, Hay River at Enterprise, NWT. Collected by Dr. Meinrad Hoffmann and donated to the APS fossil collection (catalogue no. APS.2008.54). Photo by Howard Allen.

Annual elections held at AGM

By Vaclav Marsovsky, Past President

The annual election of the Board was held at the May 9, 2008 Annual General Meeting. We are proud to welcome the elected members to their respective positions.

Officers

Dan Quinsey as President. Vice President, vacant. The Board will be working to fill this position. **Mona Marsovsky** as Treasurer. **Garren Dugan** as Secretary. **Vaclav Marsovsky** remains as Past President.

Directors

Wayne Braunberger as Field Trip Coordinator. **Howard Allen** as Editor. **Vaclav Marsovsky** as Membership Director.

The directorship of Program Coordinator will be up for renewal next year. The revised APS Bylaws were also tabled and adopted. The revised Bylaws are included in the Handbook for Members which has been updated and posted on the APS website. The Board also thanks Howard Allen for stepping forward to fill the position as the chairperson of the Fossil Collections Committee (formerly known as the curator of the APS fossil collection) which was vacant. □

Members approve new Bylaws

By Dan Quinsey, President

The proposed Bylaws changes were passed with a majority vote (more than three-quarters of the Members in attendance) at the Annual General Meeting (AGM) held on May 9, 2008, with one change. The proposed amendment to Section 2.1 to add "*The Board is not obligated to detail reasons for declining an application for membership.*" was stricken. All other proposed amendments were accepted.

At the meeting, one of our Members claimed they did not know of, and were not in possession of the

APS Handbook referred to in the Bylaws and that the process was illegal, as the Proposed Bylaws were not issued in their entirety. It was pointed out that in our March 2008 *Bulletin* on Page 4, where the proposed Bylaws changes were announced, it was clearly stated: "*To simplify the process, the proposed changes [listed therein] have been generalized. If you have misplaced your Membership Handbook and require an original set of the APS Bylaws and/or you would like to see the Proposed Bylaws in their entirety, please contact our Editor (see contact information on Page 2).*"

Another Member brought up a number of proposed amendments for discussion. The concerns this Member had were discussed and then put to a vote by a showing of hands, whether to leave them as originally proposed, or to modify them as suggested. All (except for Section 2.1 noted above) were left as originally proposed.

I would like to thank those Members present at the AGM for raising their concerns and to all the Members and guests present for their patience and understanding of the process necessary to discuss this Special Resolution.

I would also like to thank those Members who contacted me ahead of time indicating they would not be able to make the meeting. Although it is not a requirement, the gesture was very much appreciated. □

APS Symposium 2008 wrap-up

By Mona Marsovsky

More than eighty people came to Jenkins Theatre at Mount Royal College on March 15, 2008 to enjoy the eight interesting palaeo talks, numerous fossil displays and more than twenty fascinating posters.

The talk by **Alwynne Beaudoin** from the Royal Alberta Museum showed us the importance of seeds in the analysis of Quaternary sites. **Kevin Aulenback** illustrated the complexity of ferns. **Lisa Buckley** of the Peace Region Palaeontology Research Centre (PRPRC) showed how the detailed study of the variation in the teeth of one species of theropod can help in identifying teeth from other species. **Eric Snively** of the University of Alberta entertained with his bird observations and extrapolation to theropod

feeding behaviour. **Richard McCrea** of PRPRC showed how he goes to great heights to research dinosaur trackways in BC. **Darla Zelenitsky** from the University of Calgary illustrated the similarities and differences in reproductive traits between birds, crocodiles and dinosaurs. **Darren Tanke** and **Don Henderson** of the Royal Tyrrell Museum of Palaeontology used the rate of erosion, size of Dinosaur Provincial Park and average density of dinosaur skeletons to forecast the number of dinosaur skeletons that could be found in Dinosaur Provincial Park from now until the Park was eroded to river level. Keynote speaker, **Karen Chin**, from the University of Colorado at Boulder discussed coprolites and dinosaur biology.



Studying coprolites at the workshop, with Dr. Karen Chin. No scratch and sniff! Photo by Philip Benham.



Lisa Buckley shows some young protégés how to make plaster casts of dinosaur tracks. Photo by Vaclav Marsovsky.

The two workshops held on the next day (Sunday, March 16, 2008) at Mount Royal College were filled to capacity (22 and 21 people respectively). In the morning, Karen Chin's workshop *Sleuthing Ancient "Menu Mysteries"* discussed the various techniques palaeontologists use to theorize what an extinct animal ate. The second half of the workshop allowed participants to test their knowledge and distinguish fake from real coprolites. On the whole, the class scored quite well: we really know our sh... er, stuff!

In the afternoon session, Richard McCrea, Lisa Buckley and **Tyler Shaw** from the PRPRC taught the workshop *Introduction to Fossil Vertebrate Track Identification and Field Techniques*. Richard started off the workshop by talking about how to identify tracks and the important things to note when one finds a tracksite. Participants will find his handy tracksite checklist and identification guide useful in the future. Lisa and Tyler created plaster casts of the theropod track from Wolverine Creek, near Tumbler Ridge, BC (Early Cretaceous: late Cenomanian–early Turonian) for all participants to take home.

Thanks go to **Mount Royal College** for providing the venue and equipment. **Mike Clark** from Mount Royal arranged the venue and equipment and moved the poster boards. The **Canadian Society of Petroleum Geologists** helped publicize the event and with the help of **IHS Inc.** helped cover the speaker expenses. The whole event would not have happened without the efforts of the volunteers who organized the event: **Dan Quinsey, Wayne Braunberger, Phil Benham, Howard Allen, Mona Marsovsky,**



Davis Roman presents results of his collecting efforts at the poster session. Photo by Philip Benham.

Vaclav Marsovsky and Rosyln Osztian. Thanks go to the sales table volunteers who sold a record number of abstract volumes (57): **Keith Mychaluk, Mike O'Toole, Vaclav Marsovsky, Rosyln Osztian, Peter Truch, Doug Shaw, Harvey Negrich, Mona Marsovsky and Georgia Hoffman.** □

Results of the 2008 Microfossil Sorting Project

By Mona Marsovsky

Variety was the theme for this year's microfossil sorting sessions. We searched in matrix from the Santonian (Late Cretaceous) to the Paleocene.

On four Saturday afternoons in January, February and March, APS members searched for fossils in the samples provided by **Dr. Donald Brinkman**, the Acting Assistant Director of Collections, Preserva-

tion and Research, of the Royal Tyrrell Museum of Palaeontology (RTMP). Attendance was excellent with an average of eleven people volunteering each session. One day had a record number fourteen participants.

The Paskapoo Formation (Paleocene) yielded a few mammal teeth. The Dinosaur Park Formation (Lethbridge Coal Zone; late Campanian) from Wolfe Coulee yielded a large number of dinosaur, fish and turtle remains. The Milk River Formation from just outside Writing-on-Stone Provincial Park is about 10 million years older (at the boundary of the Santonian and Campanian Ages in the Late Cretaceous) than the Dinosaur Park Formation and yielded a large number of fossils. The Lethbridge Coal Zone of the Dinosaur Park Formation from Onefour (southeast of Manyberries) produced a large number of aquatic species, including teeth of *Hybodus* sharks, crocodiles and *Myledaphus* (ray); amphibian vertebrae, salamander jaws, fish vertebrae and an especially large concentration of *Paralbula* (fish) teeth. The sample from this region was collected in 1967—making it older than some of our fossil sorters!

For the last two sessions, **Jim Gardner** of the RTMP joined our group and inspired our search for salamander and frog remains.

Thanks go to all of the APS volunteers: **Les Adler, Mona Marsovsky, Vaclav Marsovsky, Roslyn Osztian, Ken Roman, Davis Roman, Al Rasmuson, Paul Dugan, Garren Dugan, Harvey Negrich, Mike O'Toole, Dan Quinsey, Doug Shaw, Tim Shaw, Howard Allen, Phil Ashbury, Georgia Hoffman and Peter Truch.**

We were able to search an amazingly large amount of matrix, thanks to everyone's efforts. The APS would like to thank Don Brinkman for giving us the opportunity to search for fossils during the depths of winter. □

Rock 'n' Fossil Road Show set for October

The next Geological Survey of Canada Rock 'n' Fossil Road Show will be held Saturday, October 18, 11:00 A.M. to 3:00 P.M. at the Crowfoot Public Library, 8665 Nose Hill Drive, NW.

As in other recent Road Shows, the APS will be participating. The Crowfoot Library will be celebrating its 5th Anniversary on October 18, so we will be a part of the festivities. □

2008 Field Trips Update

By Wayne Braunberger

Trip 2008-2, July 19–20, 2008 Flathead Valley, Southeast British Columbia

A two day loop through the Flathead Valley visiting a number of palaeontological sites is planned. Plans are to begin in Fernie and end at Corbin. The overnight stop will be in the Flathead Valley. There are no motel accommodations available at the site. If you wish to stay in a motel you will have to drive back to Fernie. Travel will be on gravel forestry roads. The registration deadline is July 4, 2008.

Trip 2008-3, August 16–17, 2008 Southeast Alberta & Southwest Saskatchewan (Eastend area)

On the first day we will visit the Ravenscrag Butte-Eastend area of Saskatchewan. Preliminary plans include a tour of the Eastend Museum and a visit with “Scotty” the *T. rex*. There will be a modest fee for entrance to the museum. If time permits, Day Two will include stops in southeast Alberta. This trip has not been finalized. Please contact me for more information closer to the deadline. Registration deadline is August 1, 2008.

You should have received a field trip registration form with the March *Bulletin*. Copies are available on the APS website (www.albertapaleo.org/fieldtrips.htm).

If you provide an e-mail address on your signup sheet I will send you the trip information electronically. Alternatively I will send it by regular mail or if time is at a premium I will call you. Included will be information on the trip regarding meeting place and itinerary, waiver and medical forms and any other information that may be pertinent. Please ensure that your addresses are correct and legible when sending in registration forms. When you arrive at the meeting place please have the forms completed so less time will be spent on paperwork prior to the trip.

All participants are required to have fully completed waiver forms in order to attend the trip. Please note that you are not required to provide any medical information unless you want to. This information is kept private and will only be used in the event of a medical emergency. Medical forms are destroyed immediately after the trip.

If anyone did not get a field guide that they should have received, please let me know. If you did not attend a trip I would have mailed it to you. If the trip was cancelled, the fees were either applied to another trip or a refund was given. Please let me know if you think you should have received a refund or are owed a field guide.

If you require further information please contact me at events@albertapaleo.org or during the day at (403) 296-3232 or (403) 278-5154 in the evening.

Field trip participant responsibilities

It is understood that risk is inherent to some degree in outdoor activities. Before registering for a trip please ensure you understand the risks involved and are prepared to accept them.

- As a participant you are responsible for your own safety and equipment at all times.
- Inform the trip leader of any medical conditions they should be aware of in an emergency.
- Ensure that your previous experience, ability and fitness level are adequate for the trip. □

Upcoming Talks

September

Alberta Palaeontological Society Open House and Fossil Clinic

Friday, September 19, 2008, 7:30 P.M.
Mount Royal College, Room B108

The Alberta Palaeontological Society welcomes APS and CSPG members, families and the general public to their Open House and Fossil Clinic. APS members and guests will have specimens on display and resident experts will be on hand to help identify fossils that are brought in to the clinic. Fossils found on the summer's field trips and expeditions will also be presented and discussed. □

Opportunity to Contribute Fossil Photos

Dear APS:

I would ask that you please forward the following message to your membership:

I am actively hunting for images of Canadian fossils for *The Paleontology Portal*, a website that serves as a “portal” to North American paleontological information on the internet. You can see the site at www.paleoportal.org/index.php. If you are not familiar with the *PaleoPortal*, you should definitely visit our “Exploring Time & Space” section at www.paleoportal.org/index.php?globalnav=time_space. The United States is fairly complete, but we are very short on fossil images for both Canadian provinces and Mexican regions (text content is in development).

Any photos of Canadian fossils (sharp, good quality images) that your members could contribute would be most appreciated. Along with each photo, we would need the specimen name (fossils must have reliable identifications), age (time period), formation, and location where found (nothing too specific)—any other information is optional, though welcome. Although anyone can submit fossil photos at any time using the “add links or images” button at the top of most every page, it would probably be much easier for your members to simply e-mail JPEGs (and the additional information requested in the paragraph above) directly to me at htims@berkeley.edu.

Most photos would be used both in slide shows for the province pages, such as the one for Manitoba (currently empty) at www.paleoportal.org/index.php?globalnav=time_space§ionnav=state&state_id=61, as well as in our Fossil Gallery. In the latter, your copyright information would appear directly below the image. For the slide shows, copyright information is provided on a separate “page credits” page—links to these can be found at the bottom of each province/time period page.

Thank you for considering this request.

Dave Smith
University of California Berkeley

David K. Smith
Museum of Paleontology
1101 VLSB # 4780
Berkeley, CA 94720-4780 USA
htims@berkeley.edu
510-643-6378 □

News from the Dino Room

By Howard Allen

As the only member of the APS Executive im-prudent enough to admit to having space in his basement, I have been selected to take custody of the APS fossil collection, as of November, 2007. The collection has been moved to my house, from former Curator **Ron Fortier**'s residence. Thanks to Ron for all the work he has put into the collection over the past several years. (Ron recently informed me that his application for APS custodianship of our Alberta fossils has been approved by the Government.)

Since taking on the collection, I have gone through the specimens and taken an inventory of the contents. A backlog of unprocessed specimens has been high-graded and entered into the collection catalogue. I have entered all specimens into an electronic database and applied numbers to the specimens themselves. As of this writing, all specimens in the collection are numbered and catalogued.

APS members may request a digital copy of the catalogue, which is available in several formats including PDF, FileMaker Pro and tabbed text. As the catalogue currently totals 489 pages(!), requests for printed copies will not be entertained. An abbreviated, 10-page list of all specimens (sorted by age) is available at www3.telus.net/public/howallen/downloads/ Members wishing to donate material are advised to check this list first, to avoid duplication of specimens in the collection.

Work on the collection continues. Among the projects on my “to do” list:

- Attempt to identify unidentified specimens.
- Fix incorrect identifications & information and fill in missing information, where possible.
- Trim bulky specimens of excess matrix.

If you'd like to see the collection, get in touch with me (contact information is on Page 2). □

Discover's Top Palaeontology Stories of 2007

by Mona Marsovsky

Keith Mychaluk noticed the large number of palaeontology articles that made the top 100 science stories of 2007 in the January 2008 edition of *Discover Magazine*. This article summarizes those palaeontology stories.

The discovery of 68 million year old proteins from the leg of *Tyrannosaurus rex* by Mary Schweitzer of North Carolina State University showed that molecular analysis is possible even in material this old. When dissolving samples of a fossilized bone in a weak acid preparation for analysis, some of the material left showed structures that appeared to be blood vessels and bone cells. Further research managed to sequence the proteins found in the material and show that these proteins were most similar to those of birds.

DNA found in a 10,300 year old human tooth, from Prince of Wales Island south of Alaska, contains the oldest genetic sample ever recovered from the Americas. The theory that humans first arrived in the Americas about 15,000 years ago and migrated down the west coast before spreading across the continent is supported by comparisons made by Brian Kemp of Washington State University of this DNA sample with the DNA from 3,500 Native Americans. The surprising part is that the closest matches were from those living near the west coasts of North and South America, even as far south as Tierra del Fuego.

Cynthia Marshall Faux, of the Museum of the Rockies in Bozeman Montana, proposed that the distinctive dinosaur death pose, in which the neck, spine and tail curve backward, resulted from an injury to the cerebellum during the death of the animal. This section of the brain controls fine muscle movements. This type of injury is common in warm-blooded animals, but not in reptiles, supporting the idea that dinosaurs were warm-blooded.

The world's most intact mammoth remains were unearthed near the Russian town of Salekhard in May 2007. The frozen woolly mammoth, estimated to have lived 40–30 thousand years ago, was just a baby, dying at the age of 4 months. A full body CT scan was conducted in Japan before a detailed autopsy was performed in St. Petersburg. Palaeontologists will use the chemical and isotopic composition of the tusks to determine the temperatures, humidity and diet and health of the animal to infer the environment at a time just before the extinction of the mammoths.

Douglas Kennett and his colleagues from the University of Oregon proposed that the sudden disappearance of the Clovis people and extinction of thirty-five genera of animals 13,000 years ago in North America was caused by a huge comet (several kilometres wide) that exploded north of the Great Lakes. They think this event may have caused a 1,000-year cold spell that helped cause the extinctions. Their theory is based on a thin layer of black soil, found at more than fifty North American sites, containing iridium and metallic and carbon spheres. The melted charcoal in the mix is thought to have been the result of extensive forest fires caused by the impact.

Scott Elrick, of the Illinois State Geological Survey, reported on his studies of a 300 million-year-old fossilized forest in an Illinois coal mine. The forest, which covers 10 square km, includes lycopod trees 2 m wide and 30 m long as well as sphagnum moss and tiny ferns. The incredible three-dimensional preservation is credited to the gradual drop of one side of a fault, probably triggered by an earthquake, which resulted in the forest being gradually submerged in layers of mud over a period of four months.

The first fossil leaf insect was found in the oil shale deposits of Messel, Germany. The environment at the time that this well-preserved 47 million-year-old (Eocene) insect lived, was one of the warmest in history. The completeness of the fossil allowed Sonja Wedmann, from the Institute of Paleontology at the University of Bonn, to infer that the insect may have hidden from predators the same way that living insects do today, by hiding its head between its legs. □

www.albertapaleo.org

Fossils in the News

Reuters.com (online)

February 18, 2008

Ancient “devil frog” may have eaten baby dinosaurs

MADAGASCAR—Palaeontologists, including Dr. David Krause of Stony Brook University, New York, have pieced together the remains of a monstrous frog that lived in the Late Cretaceous in northwestern Madagascar. Dubbed *Beelzebufo ampinga* (“Devil toad with shield”), the brute would have weighed in at 4.5 kg, with a length of 40 cm, considerably larger than the west African goliath toad, the living record-holder. *Beelzebufo* lived in a semi-arid environment and may have been an ambush predator like its nearest living relatives in South America, attacking lizards, mammals and perhaps even baby dinosaurs.

Quirks and Quarks

CBC Radio One, April 5, 2008

Did pachycephalosaurs butt heads?

EDMONTON—APS member and Post Doctoral Fellow at the University of Alberta, Dr. Eric Snively was interviewed by radio host Bob McDonald about the science behind head butting behaviour in pachycephalosaurs. Is it fact or fiction? Pachycephalosaurs are medium-sized bipedal herbivorous dinosaurs with thickened skull caps.

Dr. Snively developed a program to model the forces in the head and body if two pachycephalosaurs were to run into each other head-on. He took their mass, expected speed at impact and morphology into consideration. What he found was that the pachycephalosaur head and body design was good at dissipating and diminishing the forces rapidly. The pachycephalosaurs had joints between their vertebrae that acted like shock absorbers. Young pachycephalosaurs had struts that would dissipate the forces making them better suited for head butting than older individuals.

Having completed the computer modeling, his conclusion is that pachycephalosaurs were certainly capable of head butting. Dr. Snively’s next step is to look for evidence of head butting behaviour. He

plans to do this by looking for injuries, pathologies and signs of bone healing at body sites where one may expect to see injuries.

– Reviewed by Vaclav Marsovsky

CNN.com (online)

December 5, 2007

“Mummy” yields rock-solid info on dinosaurs

WASHINGTON—A remarkably complete fossil of a Late Cretaceous hadrosaur, nicknamed “Dakota,” is shedding new light on the anatomy of dinosaurs. Found in 1999 in North Dakota, the fossil includes skin, ligaments, tendons and maybe some internal organs. The specimen is being examined with the help of a giant CT scanner owned by Boeing.

The fossil is completely mineralized, so is not really a “mummy” in the usual sense, but it has been preserved in exquisite three-dimensional detail. The skin shows scales arranged in a pattern of stripes. Dr. Philip Manning of Manchester University, one of the lead researchers, notes that similar patterns in living reptiles often coincide with colour stripes, though there is no direct evidence of colour on the fossil.

The fossil’s vertebrae are also seen to have 1 cm gaps between them, indicating the presence of soft, intervertebral discs. This evidence points to dinosaurs being longer than normally portrayed: museum mounts are always constructed with the vertebrae in contact with one-another, which was not really the case. The presence of preserved ligaments and tendons allows the researchers to better calculate muscle mass, which is showing that these dinosaurs were more muscular than previously thought, suggesting that they may have been more agile and able to outrun large predators like *T. rex*.

Although it is very unlikely that any DNA is preserved in the specimen, another Manchester U. researcher, Roy Wogelius, is confident that they will find some residual organic molecules as work on the specimen proceeds.

Discovery News (online)

May 8, 2008

Flesh-eating insect gnawed on dino bones

PROVO, Utah—Their curiosity aroused by pits, grooves and what appeared to be tiny teeth marks

on the bones of a Jurassic *Camptosaurus* skeleton from Wyoming, Brigham Young University professor Brooks Britt and colleagues found evidence of insect scavenging on the bones.

The tiny “teeth” marks were first compared to teeth and jaws of small, contemporary mammals, but were found to be too small; that narrowed the search to insects. The closest match was found to be marks left by living dermestid beetle larvae, which live on rotting meat. Apparently the larvae resort to gnawing on softer parts of bones for sustenance after the softer tissues have been consumed. The dermestid beetle marks are quite common on dinosaur bone. Britt’s group also found dermestid frass—beetle dung—inside some of the bones. The evidence extends the range of this group of beetles back 48 million years earlier than previously known.

Examination of a wider variety of dinosaur bones has shown that, while dermestid beetles are probably responsible for most Cretaceous-age bone damage, termites—which leave a different mark—were likely the dominant bone-chewers in the Jurassic.

Reuters.com (online)
February 27, 2008

Fossil sea monster big enough to “bite a car”

OSLO, Norway—A team of Norwegian palaeontologists has found the remains of the biggest pliosaur (marine reptile) known to science. Discovered on an island in the Svalbard archipelago, the giant pliosaur—as yet unnamed—was 15 m long, with a lower jaw 3 m long. Lead researcher Joern Hurum, of the Oslo Natural History Museum, says the new pliosaur is smaller than a 23 m long ichthyosaur (found in British Columbia and excavated by the late Dr. Betsy Nicholls of the Royal Tyrrell Museum), but was “probably [more] fierce,” with teeth “the size of cucumbers.” For details and pictures, see www.reuters.com and search for “Norway pliosaur”.

CBC News (online)
January 3, 2008

Insects contributed to dinosaurs’ demise, book says

CORVALLIS, Oregon—In their new book, Oregon State University researchers George and Roberta Poinar contend that dinosaurs suffered a slow demise

toward the end of the Cretaceous Period that was brought about by disease-spreading insects. Experts in amber and amber fossils, the Poinars have found biting insects in Cretaceous amber that contain in their guts microscopic parasites that cause leishmaniasis and malaria, both diseases that can affect living reptiles.

What bugged the dinosaurs? Insects, disease and death in the Cretaceous (Princeton University Press, 2007) is the title of the Poinars’ book, in which they argue that disease-spreading insects would have caused epidemics among the dinosaurs, diminishing their numbers prior to the final extinction event. Another factor they suggest is that insects, through their pollination activity, accelerated the spread of the flowering plants throughout the world, displacing most of the non-flowering plants that had been the primary staple of the herbivorous dinosaurs’ diet.

The Times of India (online)
December 17, 2007

We lost woolly mammoths to forests!

LONDON—Dr. Adrian Lister, of University College, London, has examined hundreds of mammoth fossils and extracted and compared DNA sequences. This research has revealed that the mammoths’ gene pool was very shallow: there was very little genetic difference between individuals, rendering them vulnerable to sudden changes in their environment. He opines that an expansion of forests some 20,000 years ago severely diminished the grasslands upon which the mammoths depended for food: “These animals are mostly governed by vegetation rather than climate and so they were squeezed into very small populations as the forests took over the cold grasslands.” “I don’t think people played a major role in wiping them out,” he adds.

[Editor’s note: while this theory might hold for the European case, I don’t see how it would apply to North America, where mammoths also lived; the prairie grasslands cover hundreds of thousands of square kilometres, and I’ve never seen any suggestion that this region was forested since the last ice age. Surely, if grassland vegetation was the primary factor in mammoth survival, the vast North American plains could have supported at least a few thousand mammoths! Anyone care to discuss?]

[Thanks to Phil Benham, Georgia Hoffman and Keith Mychaluk for providing links. –ed.] □

More Free Stuff on the Internet

By Howard Allen

It's been a year and a half (December 2006) since the last installment of this occasional column alerting APS members to free, fossil-related goodies available online. Just to refresh your memory and for those who missed the first installment, what I consider "Free Stuff" includes scientific publications or software that you would otherwise have to visit a library to view, and/or pay money to obtain. It must be material that you can save and use "offline"; it must be "full text" (not just abstracts or reviews); it must be "mainstream" scientific material: not blogs, amateur efforts or material of a questionable nature; it must be cross-platform (Mac & Windows at least); it must be available for a reasonable length of time; and above all, of course, it must be free!

Here's the latest assortment:

Dr. Philip Currie's dinosaur literature

Dr. Currie has generously made a great number of his scientific papers on dinosaur research available for free download from his University of Alberta web page. Click "Publications" in the Navigation box (next to his mug shot). The papers are in PDF format and are mostly scanned raster images, so the files tend to be large.

www.biology.ualberta.ca/faculty/philip_currie/

Theses Canada Portal

This one is a bit of a long-shot, but if you're trying to find a graduate student thesis—practically impossible unless you happen to live near that student's *alma mater*—it might be worth checking this federal government website. If you're really lucky, the thesis may be available as a full-text PDF. I've managed to find a few palaeontology and geology theses on this site. Do an author or keyword search.

www.collectionscanada.gc.ca/thesescanada/index-e.html

Google Earth

For the web-savvy, this one is already old hat, but it bears repeating. As a palaeontological tool, Google Earth ties for first place with my rock hammer. How else could you visit field localities ahead of time,

from the comfort of your own home? You can scout localities anywhere in the world (outcrops, access roads, cutlines and obstacles are for the most part clearly visible); mark and save locations; get precise directions; check the status of old published sites (is it overgrown? flooded? absorbed into a city? turned into a park? how far will you have to bushwack from the nearest road?). All of this and more is possible in the free version. If you're willing to pay for an upgrade, a \$20 annual subscription gets you the "Plus" version, which allows you to measure precise distances between points or along routes, plot GPS waypoints and tracklogs and overlay maps—yes, even scanned-in geological maps: watching Google Earth shrink-wrap a geological map onto the 3D terrain and rotate it to any angle is guaranteed to make you swoon! The software will give your graphics processor a workout, so it helps to have a computer with decent horsepower (not to mention a DSL or cable internet connection—don't try this with dialup!). Satellite image resolution varies from place to place, but imaging is periodically updated, usually for the better. A must-have tool for 21st-century fossilists.

<http://earth.google.com>

Milk River fossil fauna (Russell, 1935)

This is a one-off PDF scanned copy of the 1935 Transactions of the Royal Society of Canada paper, *Fauna of the Upper Milk River beds, southern Alberta*, by Loris S. Russell (not "Louis B. Russell" as stated on the web-page—sheesh—you'd think these guys would know better!). Compliments of the Southern Alberta Dinosaur Research Group, the file is 2 MB.

www.digitaldreammachine.com/sadrg/sadrg_files.html

Deep Blue: University of Michigan Papers on Paleontology.

The University of Michigan's Museum of Paleontology has been publishing reports since 1924 and has made them available for free download. The files are PDFs, mostly raster image scans, covering an eclectic range of topics including invertebrate and vertebrate palaeontology and palaeobotany. Of special note to enthusiasts of the Arkona/Hungry Hollow (Ontario) fossils is Stumm and Wright's 1958 *Checklist of fossil invertebrates*, which I coveted for years, but could never find in any local libraries—even Harvey Negrich's famous library came up empty—lo and behold, here it is, for free!

<http://deepblue.lib.umich.edu/handle/2027.42/41251>

□

APS Balance Sheet for 2007

Revenues

Memberships	2205.00
US\$ Exchange	0.00
T-shirts	120.00
Pins	9.00
Field Trip Guides	10.00
Abstract Volumes	48.00
CD-ROM	0.00
Postage for Sales	18.65
Misc. Sales	12.00
Refreshments	38.73
Field Trip Fees	355.00
Workshop Fees	840.00
Donations	25.00
Symposium Abstract Sales	424.00
Symposium Donations	500.00
Fund Raising	64.00

Subtotal Revenues 4669.38

Plus Revenue Received in 2006 for 2007

2007 Membership Fees	1510.00
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Subtract Revenue Received in 2007 for 2008

2008 Memberships Fees	1220.00
2008 Symposium Donation	500.00
Savings for T-shirt purchase	1500.00
Fund Raising Proceeds	64.00
2008 Symposium Workshop	60.00
D Tanke Monograph Printing	100.00

Total Revenues 2735.38

Expenses

Bulletin Printing	361.69
Bulletin Postage	320.17
Speaker Expenses	400.25
PO Box Rental	0.00
Membership Printing	0.00
Membership Postage	20.78
Field Trip Expenses	138.74
Workshop Expenses	183.97
Symposium Speaker	523.99
Symposium Abstract Printing	326.99
Postage for Sales	19.72
Website Expenses	550.60
Refreshments	38.01
Bank Charges	99.20
Lawyer and Insurance	0.00
Miscellaneous	93.47
Special Projects	152.57

Subtotal Expenses 3230.15

Plus Expenses paid in 2006 for 2007

PO Box Rental for 2007	125.08
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Minus Expenses paid 2007 for 2008

2008 Symposium Speaker	493.62
Special Projects	152.57

Total Expenses 2709.04

Excess of Revenues over Expenses = \$26.34

For Years 2002 to 2007

Total Fund Raising Proceeds 3,711.50

Total Fund Raising Costs 328.43

Net Fund Raising 3,383.07

Inventory Sale Value \$592.00

Values Current to Date: Dec. 31, 2007

Audited by APS Members;

Feb 3, 2008 Pete Ingh Pete Truch

Mar. 27, 2008 Harold G. Whittaker Harold G. Whittaker