

Alberta

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

- a. Promote the science of palaeontology through study and education.
- b. Make contributions to the science by:
 - 1) Discovery
 - 2) Collection
 - 3) Description
 - 4) Education of the general public
 - 5) Preservation of material for study and the future

- c. Provide information and expertise to other collectors.
- d. 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**

THE BULLETIN WILL BE PUBLISHED QUARTERLY: March, June, September and December. Deadline for submitting material for publication is the 15th of the month prior to publication.

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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, 2006—No meetings. See field trip Update, Page 5.

Friday, September 15, 2006—Program to be announced.

ON THE COVER: APS 20th Anniversary T-shirt Design Contest, runner-up design by Dan Mislenovich and Wendy Morrison. Additional runner-up T-shirt designs are reproduced on Page 11 and Page 14 (back cover). All designs Copyright © 2005 by the artists.

From the Desk of the President

By Dan Quinsey



By now, our summer break has started and everyone is itching to do some fossil collecting. Please be safe and courteous while collecting this year. Remember to preserve our environment and respect the land. Also, when you are collecting or donating collected pieces for the APS collection, please provide all pertinent information relating to the donated fossil.

Congratulations to all our members on our 20th year. Thank you very much to all of our members who have served in various board and committee positions. Also, thank you to all our volunteers and to those who participated this year by bringing in treats for our social gatherings.

A 20th anniversary celebration will be held Saturday evening during our Tolman Bridge field trip (June 17–18, 2006). The location will be the Tolman Bridge Campsite.

Good luck during the summer and play safe!

Phone: (403) 247-3022

Email: president@albertapaleo.org □

Paleo Ranger Workshops Postponed

Due to scheduling conflicts, we were not able to hold the Paleo Ranger workshops this spring. So for now, we are postponing the workshops until the fall when the Society gets back into session.

This is best for all and will give us more time to make arrangements.

The workshops will probably run in October or November. More information will become available as it is arranged.

Hope to see you all at the Paleo Ranger Field Trip.

– Dan Quinsey □

June 2005 Election of the Board

By Vaclav Marsovsky, Past President

The annual election of the Board was held at the June 2, 2006 meeting. (Due to a lack of quorum at the May 26 General Meeting, business was conducted one week later by those in attendance, as per the Society Bylaws.)

Officer positions are held for a period of one year. Director positions are held for two years. We are proud to welcome the elected members to their respective positions (see list of Officers and Directors, Page 2). The Program Coordinator is a Director mid-way through his term and this position will be up for renewal next year. □

Erratum—

“Dinosaur Provincial Park: A Spectacular Ancient Ecosystem Revealed”

Members who purchased this recent book edited by **Drs. Currie and Koppelhus** should take note of an error in the text. I was studying Chapter 26: *A Vertebrate Assemblage from the Marine Shales of the Lethbridge Coal Zone* (Brinkman, Braman, Neuman, Ralrick & Sato) and discovered an error in the caption of Figure 26.2 on Page 490.

Specimens (I) thru (O) have been incorrectly labelled as follows:

(I) *Ischyrrhiza mira* oral tooth should read:

(I) *Eucrossorhinus microcuspidatus*

(J) *Ischyrrhiza mira* rostral tooth should read:

(J) *Ischyrrhiza mira* oral tooth

(K) *Myledaphus bipartitus* should read:

(K) *Ischyrrhiza mira* rostral tooth

(L) *Protoplatyrhina renae* should read:

(L) *Myledaphus bipartitus*

(M) *Rhinobatos incertus* should read:

(M) *Protoplatyrhina renae*

(N) *Ptychotrygon blainensis* should read:

(N) *Rhinobatos incertus*

(O) Description missing should read:

(O) *Ptychotrygon blainensis*

– Dan Quinsey □

2006 Symposium Another Success!

By Mona Marsovsky

About 100 people attended the 10th annual APS Symposium on March 18, 2006. This year's event celebrated 20 years of the Alberta Palaeontological Society with an excellent lineup of speakers and posters. Everyone enjoyed the plush seating in the Wright Theatre at Mount Royal College. About 20 centimetres of snow stranded one guest speaker, **John Acorn**, in Edmonton; however, **Philip Benham** adeptly filled in with an abbreviated version of his February 2006 talk on evolution in Madagascar. Posters filled the lobby next to the Wright Theatre and extended into the sitting area next to the Courtyard Cafe. Participants viewed the numerous fossil exhibits, including Sternberg's specimen cabinet and a skeleton of an *Oviraptor* from Mongolia.

On the following day, two excellent half day workshops gave participants some "hands-on" education. The workshop presented by **Dr. Donald Henderson** (RTMP) titled "From Sea Urchins to Dinosaurs: How Skeletons Work" challenged the eleven participants in fifteen different workstations to answer questions that explored the form and function of skeletons. Participants studied actual specimens, including a



Garren and Paul Dugan study a tiger skull at the workshop "From Sea Urchins to Dinosaurs: How Skeletons Work". Photo by Vaclav Marsovsky.

cast of Sue's (the *T. rex*) cervical vertebra. An answer key at the end of the workshop allowed everyone to check their responses.

Dr. Paul Johnston from Mount Royal College led the workshop "Evolution on the Half-Shell: Diversity and Palaeoecology of Bivalved Mollusks" which covered the anatomy, diversity, life modes and evolution of bivalves. He divided the class of twelve into five teams that competed in quizzes such as "Will the real clam please stand up?" (identifying which specimens were bivalves), "Can you outwit a clam?" (life modes of bivalves), "Ventral, schmentral—which way is up?" (orientating bivalve shells). To further enhance our appreciation of bivalves, Dr. Johnston and assistant **Kimberley Johnston** treated the class to smoked oysters and Clamato juice.

The Symposium was sponsored by the Alberta Palaeontological Society, the Department of Earth Sciences of Mount Royal College and the Canadian Society of Petroleum Geologists, Paleontological Division. This event could not have taken place without the hard work of many volunteers. **Dan Quinsey** coordinated this event, arranged the venue, advertising, flyers, poster participants and the Paleo Ranger booth. Dan also prepared name tags and certificates for speakers and poster presenters. Dan and **Valerie Quinsey** set up the poster boards. **John**



Instructor Dr. Donald Henderson discusses the finer points of cervical vertebrae with (L-R) Mona Marsovsky, Bert Hunt and Katalin Ormay. Photo by Vaclav Marsovsky.

Cox and Mike Clark from Mount Royal College arranged the venue and the setup. Ron Fortier helped staff the Paleo Ranger booth. Roslyn Osztian organized the fossil display boxes. Philip Benham organized the speakers. Vaclav Marsovsky arranged the workshops. Howard Allen coordinated the creation and printing of the abstracts volume. The following people helped me at the APS sales table: Vaclav Marsovsky, Georgia Hoffman, Roslyn Osztian, David George, Wayne Braunberger and Valerie Adams. Thanks go to all volunteers, speakers and poster presenters who made this event a success. □

If you couldn't attend the symposium, you still have a chance to catch up on the fun by purchasing an Abstract Volume. This year's volume costs only \$7 and includes excellent articles such as Darren Tanke's description of 60 years of pachyrhinosaur discoveries in North America.

Pick up a copy at the next APS Friday night meeting, order from giftshop@albertapaleo.org or phone Mona Marsovsky at (403) 547-0182. Send your cheque to the APS, PO Box 35111, Sarcee Postal Outlet, Calgary AB T3E 7C7. When ordering for delivery by mail, please include \$5 to cover shipping expenses.

The Madagascar Ankizy Fund

By Philip Benham

Hello, APS members. I thought I would provide a brief update on what has happened since my talk to the Society on February 17. The talk, for those who didn't attend, focussed on the tectonic history and palaeontology of Madagascar and the influence of geology on the current distribution of plants and animals on that island nation. I also discussed my experiences on an Earthwatch Project involving a study of lemurs in Manombo Special Reserve in southeastern Madagascar.

My time in Madagascar inspired me to do something about the poverty and other challenges facing the local communities surrounding the reserve. I

committed to donating money to the Madagascar Ankizy Fund (MAF). This charity is run by U.S.-based Canadian palaeontologists who have been exploring for dinosaurs in Madagascar. Their organization builds schools and provides educational and medical support to rural villages in Madagascar. Manombo village is their next project.

In a spontaneous outpouring of good will at my talk many members of the audience donated funds to go towards this cause.

In April I presented a talk on Madagascar to St. Rupert's Elementary school in northeast Calgary. Two hundred wide-eyed children learned about life in Madagascar. They had many good questions and a great enthusiasm for the subject. At the end of the event I donated all the collected donations plus my personal funds on behalf of St Rupert's School to the Madagascar Ankizy Fund. St Rupert's will become a sister school to the one constructed in Madagascar and will receive updates on the community. This first year \$800 Canadian was donated to a very good cause. I thank you all for your generosity.

In addition, an extended version of my original abstract was deemed worthy to be published in *Madagascar Conservation and Development*, sponsored by the Jane Goodall Foundation. I have been in contact with David Krause, MAF founder and palaeontologist at Stony Brook University, New York. In my capacity as technical program director I have invited him to give the APS a talk on one of his regular visits to Calgary. I will keep you updated as things develop. □

2006 Field Trips Update

By Wayne Braunberger

The field trip registration form for Trips 2006-3 and 2006-4 is included with the June *Bulletin*. It can also be downloaded from the APS website (www.albertapaleo.org/signup.doc). Information on Trip 2006-4 will also be available at the September general meeting. As further information becomes available it will be posted on the website.

All fees are due at the time of registration. Non-members and unaccompanied minors will not be allowed to attend field trips. Take note of the regis-

tration deadlines. This is to allow for more efficient planning of the trips and timely distribution of information.

If you would like more information about any of the trips please contact **Wayne Braunberger** at (403) 278-5154 or by email at **events@albertapaleo.org**.

• **Trip 2006-3**

**Saturday and Sunday, July 22 & 23, 2006
Manyberries Area, Alberta.**

Please note that the date has been changed.

Registration deadline is June 30, 2006.

August 2006: Unfortunately, arrangements have not been made for a trip; as such, there will be NO field trip in August this year. Hopefully, access can be secured to the sites and the trip will be held next year.

• **Trip 2006-4**

**Saturday, September 30, 2006
Dinosaur Provincial Park, Alberta.**

Registration deadline is September 1, 2006.

Dr. Don Brinkman of the Royal Tyrrell Museum of Palaeontology will be leading this one-day trip into Dinosaur Park. There will be added costs associated with this trip for transportation into the park and the guidebook. □

Library Notes

By Mona Marsovsky, APS Librarian

Alberta field trip guides in the APS Library

Planning this summer's fossil expeditions? Field trip guides provide valuable information on fossil locations, geology and the fossils themselves. In addition to the field trip guides for all of the APS field trips, our library also includes the following field trip guides for the Alberta area:

Structural Geology Between Savanna Creek and Panther River, SW Alberta, Guidebook including road log. Prepared for the Joint Convention of the CSPG and CSEG, Exploration Update '75, Calgary, May, 1975. Edited by H.J Evers and J.E. Thorpe.

Rock Lake, Alberta, Second Annual Field Trip Guidebook, Edmonton Geological Society, August 1960. Describes field trips in Edmonton, Hinton, Jasper and Athabasca-Smoky County.

Ghost River Area, Route Log 1963, ASPG, Thirteenth Annual Field Conference. Compiled by C.G. Geisler, I.R. Halladay and G.A. Wilson.

Geological Guide to the Central Foothills and Rocky Mountains of Alberta, by P.B. Jones and R.H. Workum, CSPG International Conference, Facts and Principles of World Oil Occurrence, Calgary, Alberta, June 1978.

Macro-Paleo Bearpaw Formation, Southern Alberta, Field Trip Guidebook, Leaders Grant Ward, Rene Vendervelde, and Pierre Pare, CSPG.

Bow Valley, Guidebook of the Sixth Annual Field Conference, ASPG, August 1956.

Sedimentology, Structural Geology and Exploration History of the Mississippian at Moose Mountain, Southwestern Alberta Foothills, Leaders: D.J.C. Mundy, R.G. Widdowson and D.J. Sabo, Trip #9, CSPG, AAPG Annual Convention, June 21-24, 1992.

Peace River, Edmonton Geological Society, 4th Annual Field Trip Guidebook, August 1962.

The Sedimentology of the Blood Reserve Sandstone in Southern Alberta, by Monti Lerand, CSPG Field Trip Guidebook, 1983.

Quaternary Geology of Southern Canadian Cordillera, International Geological Congress, 24th Session, Montreal, Quebec, Canada, 1972, Field Excursion Guidebook A02.

Geology of the Southern Canadian Cordillera, International Geological Congress, 24th Session, Montreal, Quebec, Canada, 1972, Field Excursion Guidebook A03-C03.

Stratigraphy and Structure, Rocky Mountains and Foothills of West Central Alberta and North-eastern British Columbia, International Geological Congress, 24th Session, Montreal, Quebec, Canada, 1972, Field Excursion Guidebook A10.

Vertebrate Paleontology, Cretaceous to Recent, Interior Plains, Canada, International Geological Congress, 24th Session, Montreal, Quebec, Canada, 1972, Field Excursion Guidebook A21.

Coal, Oil, Gas and Industrial Mineral Deposits of the Interior Plains, Foothills and Rocky Mountains of Alberta and British Columbia, International Geological Congress, 24th Session, Montreal, Quebec, Canada, 1972, Field Excursion Guidebook A25-C25.

Devonian Stratigraphy and Facies of the Southern Rocky Mountains of Canada and the Adjacent Plains, International Geological Congress, 24th Session, Montreal, Quebec, Canada, 1972, Field Excursion Guidebook C18.

Articles Donated by Dr. Julia Sankey

Dr. Julia Sankey, Assistant Professor of Geology, Department of Physics and Geology at California State University, Stanislaus, donated several reprints to the APS Library on April 6, 2006.

This set of reprints has something for everyone: dinosaurs, birds, mammals, arthropods, and plants from a variety of ages: Cretaceous, Plio-Pleistocene and Holocene. Long-time APS members may remember Julia presented an interesting talk to the APS several years ago about dinosaurs from Alberta. Julia has done extensive research in Alberta and now focuses her research on the Cretaceous fauna of Big Bend National Park in Texas. The APS would like to thank Julia for her generous donation of the following articles:

Small Theropod and Bird Teeth from the Late Cretaceous (Late Campanian) Judith River Group, Alberta, by Julia T. Sankey, Donald B. Brinkman, Merrilee Guenther, and Philip J. Currie, *Journal of Paleontology*, Vol. 76, No. 4, 2002.

Distribution Patterns of Mammals in the Dinosaur Park Formation and their Paleobiological Significance, by Julia T. Sankey, Donald B. Brinkman, Richard C. Fox, and David A. Eberth, *Dinosaur Park Symposium at the Royal Tyrrell Museum of Palaeontology*, Sept. 24-25, 2005.

Patterns of Distribution of Mammals in the Dinosaur Park Formation and Their Paleobio-

logical Significance, by Julia T. Sankey, Donald B. Brinkman, Richard C. Fox, and David A. Eberth (no source reference provided).

Late Campanian Southern Dinosaurs, Aguja Formation, Big Bend, Texas by Julia T. Sankey, *Journal of Paleontology*, Vol. 75, No. 1, Jan. 2001.

Late Cretaceous Mammals and Magnetostratigraphy, Big Bend, Texas, by Julia T. Sankey and Wulf Gose, *Occasional Papers of the Museum of Natural Science, Louisiana State University, Baton Rouge, Louisiana*, No. 77, Aug. 2001.

Late Cretaceous Vertebrate Paleocology of Big Bend National Park, Texas, by Julia T. Sankey, *Dinosaur Park Symposium at the Royal Tyrrell Museum of Palaeontology*, Sept. 24-25, 2005.

Late Cretaceous Dinosaurs, Eggs, Babies, Fires and Drought in Big Bend National Park, Texas, by Julia T. Sankey, abstract from *Journal of Vertebrate Paleontology* Vol. 25, Supplement to No. 3, 65th Annual Meeting Society of Vertebrate Paleontology Mesa Southwest Museum and Phoenix Marriott Mesa, Oct 19-22, 2005.

Theropod Teeth from the Upper Cretaceous (Campanian–Maastrichtian), Big Bend National Park, Texas, by Julia T. Sankey, Barbara R. Standhardt and Judith A. Schiebout, Chapter 7 of *The Carnivorous Dinosaurs*, edited by Kenneth Carpenter, p. 127.

Vertebrate Paleontology and Magnetostratigraphy of The Glenns Ferry and Bruneau Formations (Plio-Pleistocene), Near Murphy, Southwestern Idaho, by Julia T. Sankey, from *And Whereas... Papers on the Vertebrate Paleontology of Idaho Honoring John A. White*. Vol. 2, Idaho Museum of Natural History Occasional Paper 37, 2002.

Late Holocene Sonoran Desert Arthropod Remains from a Packrat Midden, Catavina, Baja California, Norte Mexico, by William H. Clark and Julia T. Sankey, *The Pan-Pacific Entomologist*, Vol. 75, No. 4, Oct. 1999.

Late Holocene Plants, Catavina, Baja California, by Julia T. Sankey, Thomas R. Van Devender, and William H. Clark, *The Southwestern Naturalist*, Vol. 46, No. 1, March 2001. □

Fossils in the News

National Geographic News, April 3, 2006.

Dino fossils found on remote New Zealand island

CHATHAM ISLAND, New Zealand—Palaeontologists investigating richly fossiliferous beach front outcrops have found remains of theropod dinosaurs on this small island, 800 km east of New Zealand.

According to Dr. Jeffrey Stilwell of Monash University, Australia, the remains include hand, vertebral, foot and leg bones of an unidentified large theropod dinosaur. The fossiliferous sandstone bed is exposed along the shore of the island for more than a kilometre. The rocks have been dated as Late Cretaceous (65–70 million years old). Other fossils of marine and terrestrial organisms are found in the rocks, including birds, marine reptiles, sponges, molluscs, plants and fish teeth.

The dinosaur remains are especially intriguing, as it is believed that the dinosaurs of New Zealand evolved in isolation for some 10–15 million years after New Zealand split away from the supercontinent Gondwana. Stilwell hints that even more remarkable discoveries are to be revealed in the near future. His paper on the fossils is published in the January 30 issue of *Palaeogeography, Palaeoclimatology, Palaeoecology*. See the full story at http://news.nationalgeographic.com/news/2006/04/0403_060403_dinosaur_2.html. An abstract of Stilwell's paper can be seen at <http://www.staff.livjm.ac.uk/spsbpeis/CCNet-23-01-06.htm> (scroll down to abstract 2).

The Globe and Mail, April 6, 2006

Quirks and Quarks interview with Edward Daeschler, CBC Radio, April 8, 2006

The missing link: Fish to tetrapods

The April issue of the Journal *Nature* heralded the discovery of a missing link in the evolution from fish to tetrapods. The 375 million-year-old (Devonian) fossils were found in the summer of 2004 on Ellesmere Island in Nunavut by Neil Shubin (University of Chicago), Edward Daeschler (Academy of Natural Sciences in Philadelphia), Farish Jenkins (Harvard University), a number of Canadian graduate students and a young Inuit man.

The animal, which could have been as long as 3 m from snout to tip of the tail, had a blend of crocodile

and fish traits, including eyes on the top of its flat head, gills, nostrils, scales, fins, a neck and sharp fangs. Its front fins had a wrist structure between that of *Ichthyostega*, an early amphibian (360 million years old), and a lobe-finned fish (e.g. *Panderichthys* (380 million years old)). Although its lower jaw was similar to that of a lobe-finned fish, it had the shortened skull of tetrapods and had lost the rigid connection between the head and shoulders possessed by fish, giving it a “neck”.

The animal was named *Tiktaalik roseae*. The first name is an Inuktitut word for “large freshwater fish” while the last name honours the donor that funded the expedition.

At the time of the Devonian, Ellesmere Island was attached to Greenland and Europe and located much farther south. Temperatures were subtropical, similar to the Mississippi River delta today. It is theorized that the animal lived in shallow (10 cm deep) fresh water and used its front fins to propel itself by “walking” along the bottom, to prop itself up or to venture on the land. During the Devonian, plants were making the transition to land and there would have been plenty of insects and centipedes on land to feed a hungry *Tiktaalik* and plenty of larger predators to avoid in the water.

Once the U.S. researchers finish studying the specimen, it will be stored by the Canadian Museum of Nature in Ottawa until a facility is built in Iqaluit. Although the front of the specimen was well preserved, researchers are hoping to find the rear end of the animal in next summer's expedition.

– Summarized by Mona Marsovsy

CNN.com, May 30, 2006

Mammoth fossils sold as trinkets

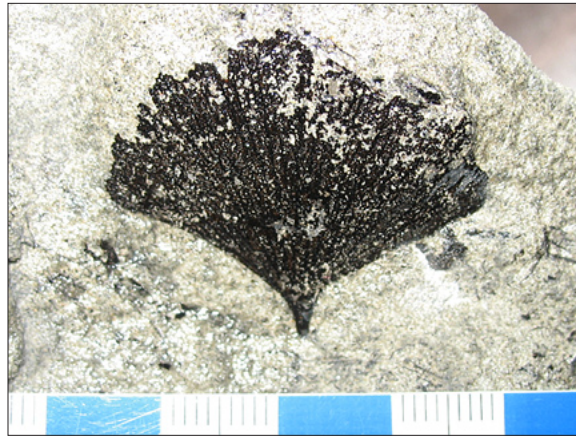
ANCHORAGE, Alaska—Scientists are concerned that large quantities of ice-age fossils are being surreptitiously excavated and sold in the jewellery-souvenir trade. Commercial collectors scour the countryside for mammoth ivory and other material, keeping their localities secret. It is illegal to remove mammoth ivory from federal and state land in Alaska, but the region is so vast and unpopulated that enforcement is nearly impossible. At the same time, mammoth ivory, unlike elephant ivory, is not under any export restrictions, making it easy to distribute and sell to markets worldwide. Scientists like Dale Guthrie of the Institute of Arctic Biology in Fairbanks, Alaska are concerned that the trade in

mammoth fossils could widen to include much rarer fossils, threatening the potential for scientific learning. See the full story at <http://edition.cnn.com/2006/US/05/30/mammoth.trinkets.ap/index.html>

CBC News North online, May 26, 2006

Mystery skull stumps local knowledge

PANGNIRTUNG, Nunavut—Walking with his young daughter along the shore at Pangnirtung, Baffin Island, Andrew Dialla spotted a fist-sized bony object protruding from the ground on a hillside. Supposing that it was the skull of a baby caribou, he dug the object out to show his daughter. However, the skull was nothing like a caribou skull, as it sported two long, curved horns sticking straight up from the skull like prongs of a fork. The rest of the skull superficially resembles that of a young caribou, but caribou calves do not have horns or antlers. Mr. Dialla's find has aroused the interest of a researcher at the Canadian Museum of Nature, but so far no identification of the strange object has been forthcoming. For pictures, see <http://www.cbc.ca/north/story/nor-pang-skull-mystery.html>



Ginkgo leaf in sandstone recently collected from the Horseshoe Canyon Formation (Upper Cretaceous). Scale bar in cm and mm. Photo by Dan Quinsey.

Calgary Herald, May 19, 2006

Hobbits spark giant-sized feud

FLORES, Indonesia—nearly two years after the announcement of the discovery of fossils of a tiny human, dubbed “Flores Man” or the “hobbit” (*Bulletin*, December 2004, p. 16), researchers are no closer to agreeing on what the find represents.

One camp insists the fossils represent nothing more than pathological specimens, victims of the medical condition called microcephaly, in which the skull and brain are abnormally small due to a genetic defect. Opponents call this hogwash, pointing out that modern microcephalic skulls are markedly different in detail from the “hobbit” specimens. They are convinced that the fossils represent a new species of tiny humans. The argument is played out in two papers published in the May 19 issue of *Science*.

Calgary Herald, March 10, 2006

'New' creature turns out to be prehistoric survivor

LAOS—a small nocturnal rodent that looks like a cross between a rat and a squirrel has been recognized as a “living fossil”. The animal, nicknamed the “Laotian rock rat” was discovered last year, living in central Laos. To date, the only specimens studied have been recovered from hunters and village meat markets; scientists have not seen a living speci-

men. Working with bones, however, Dr. Mary Dawson, of the Carnegie Museum in Pittsburgh, immediately recognized the animal, named *Laonastes aenigmamus*, as belonging to a group that has previously been known only from fossils more than 11 million years old.

The area in Laos where the animal was found has been described as “an absolute wonderland” by naturalist George Schaller, as it has produced a number

of exotic species in recent years. It is hoped that the region can receive official protection to preserve its unique wildlife. For a more detailed article and pictures, see <http://www.carnegiemnh.org/news/06-jan-mar/030906laonastes.htm>

Science, March 31, 2006

New sauropod is a stretch

MONGOLIA—Researchers Daniel Ksepka, of Columbia University, and Mark Norell, of the American Museum of Natural History have described the skeleton of a new, very long-necked sauropod dug up in Mongolia in 2002. *Erketu ellisoni* had a neck that was 8 m long, but connected to a “medium-sized” body that apparently stood only about 3 m high at the shoulder. Ksepka and Norell hope that the new dinosaur will help to shed light on the evolution of the Titanosauriformes, to which group this animal belongs. The animal is described in the March 16 edition of *American Museum Novitates*. □

[Thanks to Phil Benham, Georgia Hoffman & Mona Marsofsky—ed.]

Reviews

By Les Adler

Getting a Leg Up on Land by Jennifer A. Clack
Scientific American, December 2005, p. 100–107.

Jennifer is a Reader in vertebrate palaeontology and Doctor of Science at the University of Cambridge in the U.K. where she has been studying tetrad origins for 25 years. She is also a fellow of the Linnean Society and has a wide variety of other interests including choral singing.

The first set of diagrams compares the skulls and skeletons of three vertebrates: *Eusthenopteron*, a lobe-finned fish, *Acanthostega*, an early tetrapod (four feet) and an iguana, a modern lizard. The second diagram compares the evolution of eleven vertebrates from 400 million years ago to 362 million years ago from the Early Devonian to Late Devonian Period, the fossils of which have mostly only been discovered since 1990. A third diagram shows these eleven vertebrates and their distribution across Laurasia and Gondwana.

Jennifer states that evolution has generated some marvellous metamorphoses, one spectacular example being that of terrestrial creatures bearing limbs, fingers and toes which have come from water-bound fish with fins: dinosaurs, birds, lizards, snakes, turtles, frogs, and mammals including humans—all of which had a common ancestor with two limbs in front and two limbs at the back where there had once been fins which flicked instead.

Land is a radically different medium from water, so tetrapods had to evolve novel ways to breathe, hear and contend with gravity. Estimates of the time that these changes took place during the Devonian Period varied from 400 to 350 million years ago.

Only one fish, *Eusthenopteron* and only one Devonian tetrapod, *Ichthyostega*, were available to researchers until recently. Romer thought that fish came out of the water before they evolved legs. The new discoveries have changed the ideas on early tetrapod evolution, diversity, biogeography and palaeoecology.

Acanthostega was found in Eastern Greenland in 1952 by Erik Jarvik of Sweden using two partial skull roofs. A post-cranial skeleton appeared in 1987. It fitted in between fish and tetrapods but quite differently from what was predicted.

Studying *Acanthostega* revealed:

(1) It lacked proper ankles to support the animal's weight on land.

(2) It had lungs but the ribs were too short to prevent the collapse of the chest cavity once out of water.

(3) The bones of the forearm displayed proportions of the pectoral fin of a fish.

(4) The rear of the skeleton showed a deep oar-shaped tail sporting long, bony rays, the scaffolding for a fin.

(5) It had gills in addition to the lungs.

(6) Although a tetrapod it was an aquatic creature but essentially a fish that had never left the water.

(7) These fossils indicate that terrestrial demands may not have been the driving force in early tetrapod evolution.

(8) Each of its limbs terminated in a foot bearing eight well-formed digits rather than the familiar five. Prior to this discovery anatomists thought that the five-digit foot derived directly from the bones constituting the fin of a fish. Later, a Russian tetrapod, *Tulerpeton* was found with a six-digit foot.

(9) In the early twenty-first century it is now known that several genes including the Hox series and Sonic Hedgehog control elements of fin and limb development. Hox d11 and Hox d13 appear to play a role in tetrapods. This leads to a plausible explanation for why the five-digit foot became the default tetrapod pattern to help ankle joints that are stable enough to bear weight and flexible enough to allow the tetrapod walking gait.

(10) *Acanthostega* shows a different dental plan to that of a fish with a shift to feeding out of water.

Several fish and tetrapod fossils are now available for study, showing changes in skulls and jaws, strengthening the snout that allows lifting this part out of the water, to enable changes in breathing. The creatures were shallow water specialists and changes were also taking place with vascular plants during the Devonian Period, with deciduous plants shedding leaves into the water.

Devonian tetrapods have now been found from locations that are now China, Australia, eastern U.S.A. and eastern Greenland. Scientists now have a good explanation for why the front limbs evolved the way that they did but they lack an explanation for the origin of the hind limbs because none of the fossils recovered so far contains any of the needed clues.

A perfect fossil record is lacking and there is no time machine available so many of the remaining gaps in the story so far of how fish gained ground will never be solved.

The Fossils Say Yes by Donald R. Prothero
Natural History, November, 2005, p. 52–56.

Prothero is a professor of geology at Occidental College in Los Angeles and a lecturer in geobiology at Cal Tech. His current research focuses on North American fossil rhinoceroses, camels and pronghorns.

This issue of *Natural History* contains a 40-page section on Darwin and evolution to correspond with an exhibition at the American Museum of Natural History in New York City, November 2005 to May 2006. Whereas creationists state “the fossil record does not support evolution” the following essay suggests the opposite.

When Darwin proposed the idea of evolution by natural selection in 1859, the fossil record offered little support. Darwin was well aware that the geological record was one of the weakest links in his argument. However, two years after his book was published the first specimen of *Archaeopteryx* was discovered and hailed as the missing link between birds and reptiles. Fossils were found demonstrating how thoroughbred horses evolved from a dog-size three-toed creature with low-crowned teeth. Later a much refined version was developed.

Many people still think that the fossil record shows no transitional forms. This misconception is the product of the campaign of disinformation or misinformation spread by the creationist movement.

Less than one percent of all the species that have ever lived are preserved as fossils. The linear arrangement of “*Eohippus*” to *Equus* had to be revised to a bushy pattern with numerous lineages living side by side. Living whales retain vestiges of their hips and thighbones deeply buried in the muscles along their spines. Based on features of the skull and teeth, whales are closely related to hoofed mammals. In 1983, 1994 and 1995 fossil specimens were found leading to more than twelve transitional whale fossil types with confirmation from DNA and ankle bones. Other transitional fossils link manatees, dugongs, seals and sea lions to ancestral land mammal forms.

Mammals and their extinct relatives such as *Dimetrodon* belong to a large group called the Synapsida. During an 80-million-year period synapsids evolved into various wolf-like and bear-like predators as well as peculiar pig-like herbivores acquiring mammalian features:

(1) Additional jaw muscles that enabled complex chewing motions.

(2) A secondary palate covering the old reptilian palate and nasal regions allowing breathing and eating at the same time.

(3) Multicusped molars for chewing rather than gulping food.

(4) Enlarged brains.

(5) Upright rather than sprawling posture.

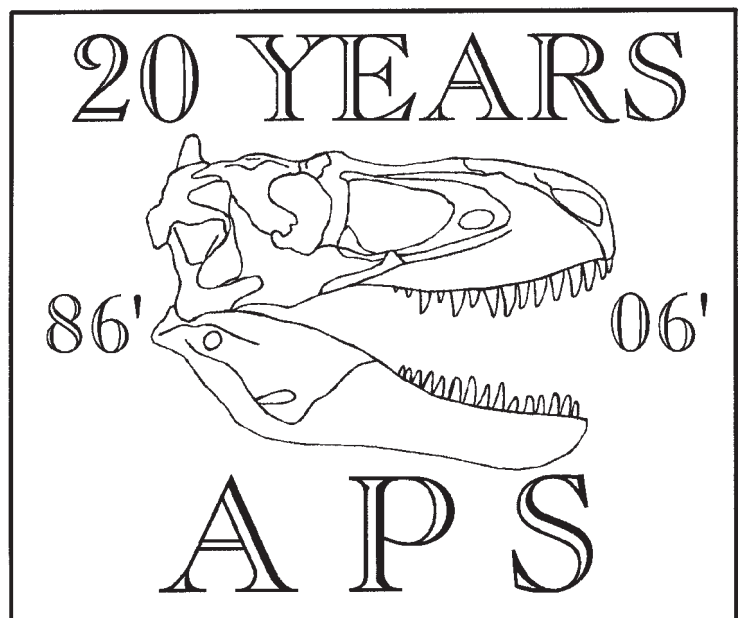
(6) A muscular diaphragm in the rib cage for efficient breathing.

(7) The dentary bone took over the role of hinging the jaw to the skull.

(8) Other reptilian jawbones vanished while two of these shifted to the middle ear to become the anvil and the hammer to provide hearing sensation.

Other so-called “missing links” now include *Sinornis* of China with wings that could fold against its body (Early Cretaceous Period), *Confuciusornis*, which had the first toothless beak, non-avian dinosaurs such as *Microraptor* and *Caudipteryx* with well-developed feathers useful for insulation, later for flight. The human fossil record now includes *Sahelanthropus* between 6 and 7 million years old, from Chad, and *Ardipithecus* and *Australopithecus* between 2 and 5 million years old, from Ethiopia, showing that bipedalism arose before enlarged brains. Fossils are being found in China, from 510 to 500 million years old, that appear to be early vertebrates.

The fossil record is no longer the embarrassment that it was in Darwin’s day. □



Design: Steven Coombs, Barachois, Quebec

ALBERTA PALAEOLOGICAL SOCIETY

Calgary, Alberta

Operating Statement for 2005 (Audited)

January 1, 2005 to December 31, 2005

Revenues		Expenses	
Memberships	3055.00	Bulletin Printing	496.74
US\$ Exchange	9.87	Bulletin Postage	393.30
T-shirts	385.00	Speaker Expenses	158.47
Pins	6.00	PO Box Rental	117.70
Field Trip Guides	18.00	Membership Printing	175.29
Abstract Volumes	0.00	Membership Postage	223.65
CD-ROM	20.00	Field Trip Expenses	22.78
Postage for Sales	0.00	Workshop Expenses	0.00
Misc. Sales	39.02	Symposium Speaker	1812.10
Refreshments	62.62	Symposium Abstract Printing	189.08
Field Trip Fees	230.00	Postage for Sales	0.00
Workshop Fees	650.00	Website Expenses	384.60
Donations	141.35	Refreshments	97.77
Symposium Abstract Sales	525.00	Bank Charges	112.00
Symposium Donations	1800.00	Lawyer and Insurance	0.00
Fund Raising	356.25	Miscellaneous	999.38
		Special Projects	0.00
Subtotal Revenues	7298.11	Subtotal Expenses	5182.86

Plus Revenue Received in 2004 for 2005		Plus Expenses paid in 2004 for 2005	
2005 Membership Fees	1200.00	PO Box Rental for 2005	111.28
Subtract Revenue Received in 2005 for 2006		Minus Expenses paid 2004 for 2006	
2006 Membership Fees	1630.00	PO Box Rental	117.7
Fund Raising Proceeds	356.25	Special Projects	0.00
Total Revenues	6511.86	Total Expenses	5176.44

Excess of Revenues over Expenses = \$1335.42		For Years 2002 + 2003 + 2004 + 2005	
Inventory Sale Value	\$1,798.00	Total Fund Raising Proceeds	3,518.00
Values Current to Date:	Dec. 31, 2005	Total Fund Raising Costs	168.86
		Net Fund Raising	3,349.14

Audited by:

Norine Fortier July 10, 2006 NORINE FORTIER

HOWARD ALLEN APRIL 5, 2006 *Howard Allen*

APS PALEO RANGER

A Newsletter Just For Kids

Created by Ron Fortier Alberta Palaeontological Society

Volume 2006-2

What's New?

Were you disappointed you missed the workshop last month? Don't be! We felt there was not enough time given. So all we have to do now is come up with a date and time that everyone likes. I heard someone say let's have it in the early fall.

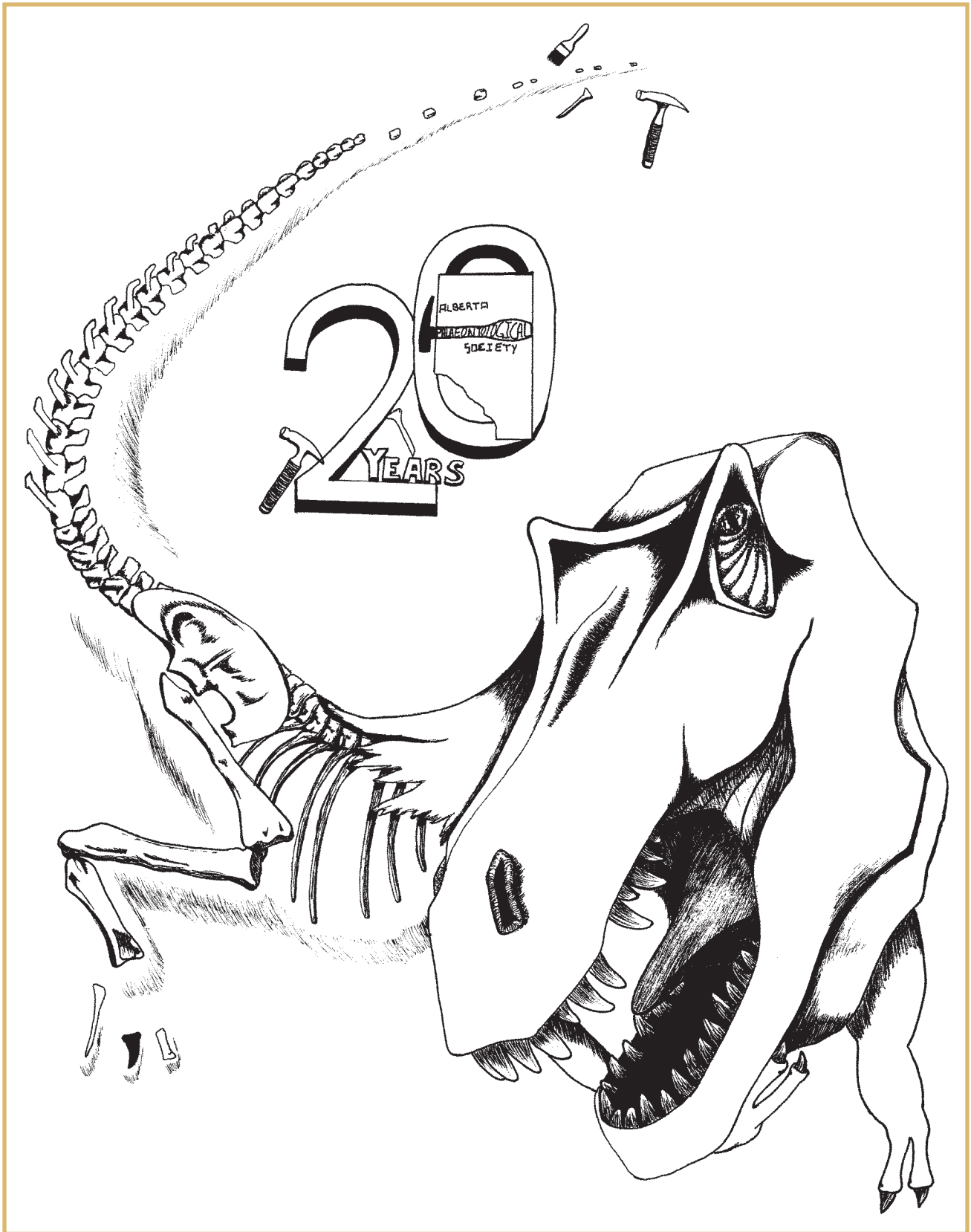
The Paleo Rangers field trip July 15-16 weekend is still a "go", weather permitting. I don't like collecting in the rain. So let Dan Quinsey know if you will be going so we can get everyone information about the trip. Also let him know if you are going to try to camp. This trip is still planned for Dino country, somewhere around Drumheller. Contact Dan Quinsey dinodan@shaw.ca, (403) 247-3022 or me, Ron at rmfortier@shaw.ca, (403) 285-8041.

The Rock and Lapidary Show was great! Tons of kids showed up at the fossil give-away box, along with lots of big people. We even got some new family members signed up. Hope to see you at the summer events!

Word-Unscramble #2

Can you unscramble the following words to answer the questions about Apatosaurus?

1. **CNKE** Apatosaurus had a very long tail and a very long _____.
2. **AHDE** Apatosaurus' nostrils were at the top of its _____.
3. **PEDQUADUR** Apatosaurus was a _____, it walked on four legs.
4. **THAEDCH** Apatosaurus _____ from eggs.
5. **SYERA** Apatosaurus' lifespan may have been over 100 _____.
6. **ONLG** Apatosaurus was almost 100 feet _____.
7. **STAMR** Apatosaurus had a very small brain; it was not a very _____ dinosaur.
8. **PATSNL** Apatosaurus was an herbivore; it ate _____.
9. **SSRAJUIC** Apatosaurus and many other giant plant-eaters lived during the _____ period, about 150 million years ago.
10. **UPSAODRO** Apatosaurus is classified as a _____ dinosaur.



Design: Amanda Donald, Calgary, Alberta