

Alberta

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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**

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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UPCOMING APS MEETINGS

Meetings take place at 7:30 p.m., in Room **B108**,
Mount Royal College: 4825 Mount Royal Gate SW, Calgary, Alberta.

Friday, April 21, 2006—Dr. Paul K. Anderson, University of Calgary.
Steller's sea cow: Lesson from a Recent megafaunal extinction?

Friday, May 26, 2006—Annual General Meeting and 20th Anniversary Social.

June, July, August, 2006—No meetings. See field trip schedule, Page 10.

ON THE COVER: A scene from the Upper Cretaceous (Horseshoe Canyon Formation) Willow Creek badlands, near Drumheller, Alberta. Photo by Ron Fortier, © 2003.

From the Desk of the President

By Dan Quinsey

Once again, our Annual General Meeting (May 26, 2006) is creeping up on us. As described in our new bylaws, we need fifteen percent of the members or twenty members, whichever is smaller, to constitute a quorum to transact business. I am sure the members who can attend will do their part to be there to help us meet quorum.

Also during the May meeting, we will be celebrating our 20th Anniversary with some special social events. Please join us and enjoy the festivities. If you have any good pictures from the last 20 years—or stories, for that matter—bring them along for everyone to enjoy.

A second celebration will be held Saturday evening during our Tolman Bridge field trip (June 17–18, 2006). The location will likely be the Tolman Bridge campground. If you are not able to attend the field trip but would like to just camp or at least attend the festivities, contact **Wayne Braunberger** (403) 278-5154, events@albertapaleo.org to indicate your intentions. We need to know numbers to plan for food.

While you are collecting this summer, remember to think about the APS collection and save some specimens for the Society. Also, if you have any fossils you would like to donate to education or the CRLC give-away box, or other palaeontological materials you would like to donate to the silent table auction, please contact me and I will make arrangements to pick them up.

If anyone has any items they would like to donate for a fund-raising garage sale, contact me as soon as possible.

Phone: (403) 247-3022

Email: president@albertapaleo.org □

*This issue marks 20 years
of publication of the
APS Bulletin!*

Notice of Annual General Meeting of Members

To the Members of the Alberta Palaeontological Society:

Take notice that the Annual General Meeting of the Members of the Alberta Palaeontological Society (hereinafter called the “Society”) will be held at Mount Royal College, room B108, on Friday, the 26th day of May, 2006, at the hour of 7:30 P.M. local time to deal with the following business to be brought before the Meeting:

Election of the following Board positions:

1. President
2. Vice President
3. Secretary
4. Treasurer
5. Membership Director
6. Editor
7. Field Trip Coordinator.

- Treasurer’s presentation of the Audited Statement of the financial position of the Society.
- Secretary’s presentation of the Audited Statement of the books of the Society.
- Motion by the Board of Directors to allocate funds toward the publishing of “A Guide to Common Vertebrate Fossils from the Cretaceous of Alberta.”

Dated this 15th day of February, 2006.

By order of the Board of Directors of the Society.

Dan Quinsey, President. □

APS Fossil Collection

The APS has quite a good collection of fossils. Trilobites, a tree trunk, ammonites, brachiopods, and don’t forget about the dinosaur teeth and bones. From the micro-size fossils, to fossils too big to lift, the APS has it all, free and hands-on for Society members. We even have a microscope for those members who want to see the really small fossils.

Contact **Ron Fortier** at rmfortier@shaw.ca or (403) 285-8041, to arrange your personal viewing. □

APS Member Receives The Alberta Centennial Medal

by Dan Quinsey

On behalf of the Alberta Palaeontological Society, I would like to congratulate **Jesse Scott** who recently received The Alberta Centennial Medal, a one-time award created by the Province of Alberta in recognition of outstanding service to the people and province of Alberta. Jesse was recognized for his achievements in writing, in particular “Three Weeks in the Life of *Iberomesornis*” which appeared in the March 2004 APS *Bulletin* (Volume 19, Number 1) and his involvement with the APS and the Royal Tyrrell Museum of Palaeontology.



Dan Quinsey

The Alberta Centennial Medal is conferred upon individuals who have made significant contributions to the community and society through leadership, volunteering and community involvement—basically, Albertans who have gone to great lengths to make their province a better place. The medal is included in the Canadian Order of Precedence of orders, decorations, and medals and may be worn in con-

junction with other official honours. Approximately 8000 medals were awarded to Albertans.

Jesse Scott is 8 years old and has been a member of the APS since 2003. Congratulations Jesse, we are all very proud of you! □

Birthday Wishes to Hope Johnson

APS Life Member, Mrs. Hope Johnson, LLD, celebrates a milestone this March 17, on her 90th birthday. Hope is well known for her contributions to Alberta palaeontology, including her illustrations for the forthcoming APS-published book on Alberta's Late Cretaceous vertebrate fossils. Best wishes and congratulations to Hope. □



Dan Quinsey

PSP Appoints New President

by Dan Quinsey

The Alberta Palaeontological Society would like to congratulate **Katalin Ormay** who has recently been made President of the Palaeontological Society of the Peace (PSP). Katalin replaces **Dr. Desh Mittra** who will remain on the Board of Directors as Past President.

Forming a new society is not an easy task and there are many potholes and road blocks to contend with along the way. Desh and his Board of Directors have done a great job overcoming obstacles and getting the PSP off the ground and they deserve a round of applause as well.

The APS Board is confident the PSP will be triumphant in their ventures and wishes Katalin Ormay success in her new position. □

www.albertapaleo.org

Upcoming Talk

Friday, April 7, 2006, 12:00–1:00 P.M.
Room 1116-1118, Tower 1, Calgary Place,
330 5th Avenue SW, Calgary

Palaeobiological controls on dolomitization and reservoir development in the Mississippian Midale Beds, Weyburn oilfield, southeastern Saskatchewan.

Speaker: **Dr. A.D. Keswani (co-author, Dr. S.G. Pemberton), Ichnology Research Group, Dept. of Earth Sciences, University of Alberta.**

(Admission is free. If you have difficulty accessing the room please contact security at ground level).

Applications of ichnology represent a powerful tool useful for understanding origins of carbonate reservoirs in Mississippian Midale Beds, Weyburn oilfield. Due to a virtual absence of body fossils, discrete trace fossils provide data that is instrumental in palaeoenvironmental reconstructions of reservoir strata; and petrographic analyses of indiscrete bioturbated textures yield insights regarding palaeobiological controls on dolomitization and origins of porosity. An integrated approach, utilizing both these aspects of the ichnologic record is beneficial for genetic modeling of dolomite reservoirs formed within upper Midale Beds. These substrates consist of dolomudstones characterized by a diverse trace fossil suite, including an abundance of *Zoophycos*, *Planolites*, *Chondrites*, some *Helminthopsis*, *Asterosoma*, *Teichichnus*, and *Palaeophycus*, and rare *Siphonichnus* (?). This assemblage is typical of a distal-*Cruziana* ichnofacies, representing fully-marine offshore palaeoenvironments. Such bioturbated muddy substrates developed in response to a major transgression that drowned previous restricted-lagoon deposits, and reworked skeletal deposits in basal lags, and produced bored hardgrounds at the unconformity surface. This flooding event is likely driven by differential subsidence related to ramp evolution.

Prolific hydrocarbon reservoirs are developed within bioturbated dolomudstones, which suggest organism-sediment interactions played a significant role in carbonate diagenesis and origins of porosity.

Since bioturbation is inherently linked to widespread dolomitization of muddy substrates, genetic classification of textural heterogeneities provide a tool useful for understanding development of porosity in reservoir strata. Petrographic studies on such muddy substrates show nearly-complete pelletization of micrite. Arrangements of fecal pellets define burrow-fabrics, consisting of concentric and tangential alignments; and abundance patterns range from clustered-interpenetrating to homogenized textures. Such widespread reorganization of the micrite into fecal pellets, and re-arrangements in allochems highlight an important concept regarding palaeobiological controls on carbonate diagenesis: biogenically-derived textural modifications, and respective changes in distribution patterns of intergranular voids, facilitated percolation of Mg-bearing fluids associated with dolomite formation, within otherwise impermeable muddy substrates.

Fluid flow within pelleted muds resulted in dolomitization and development of intercrystalline porosity at reservoir scale. Furthermore, reservoir quality has been significantly enhanced by development of moldic porosity within such palaeobiologically-influenced dolomites. Distribution patterns in moldic voids suggest percolation of leaching fluids in burrow-fabrics, and dissolution of former skeletal arrangements derived in bioturbation. Such patterns reflect the morphological characteristics of original skeletal alignments, which indicates structural elements such as spreiten has enhanced connectivity of voids within burrow-fabrics. Although such palaeobiological controls influence porosity evolution and enhance permeability in muddy substrates, reservoir potential varies accordingly with destructive effects of compaction and late-stage diagenesis.

Biography:

Arjun recently obtained his PhD from the University of Alberta where he researched the impact of bioturbation on the development of reservoirs under supervision of Dr. George Pemberton.

Information:

This event is jointly presented by the Alberta Palaeontological Society, Mount Royal College and the CSPG Palaeontology Division. For information or to present a talk in the future please contact CSPG Paleo Division Chair Philip Benham at (403) 691-3343 or programs@albertapaleo.org. Visit the APS website for confirmation of event times and upcoming speakers: www.albertapaleo.org

Upcoming Talk

7:30-9:00 P.M. Friday, April 21, 2005. Room B108, Mount Royal College

Steller's sea cow: Lesson from a Recent megafaunal extinction?

Speaker: **Dr. Paul K. Anderson, Emeritus Professor of Zoology, University of Calgary.**

Sirenians appeared in the Paleocene Tethys Sea which extended across the tropics from the Middle East through the Caribbean, and included expanses of warm intertidal and subtidal waters colonized by algae and by sea grasses (angiosperms) belonging to the families Hydrocharitaceae and Potamogetonaceae (Domning, 1981), an attractive resource for mammalian herbivores. One response was the evolution of the Sirenia.

Through the Tertiary Sirenians adapted to harvest macroscopic plants attached to the substratum, aquatic locomotion, and birth of young in the marine environment.

Sirenian evolution took three paths. Manatees (Trichidae), isolated in the fresh waters of the South American rivers and feeding on both aquatic and shoreline vegetation (in particular floating meadows of true grasses in the Amazon Basin) evolved indeterminate tooth replacement to cope with the abrasive diet. Dugongids remained marine. Dugongs (with up to a half dozen coexisting species in the Caribbean) fed primarily, though not exclusively, on sea grasses. Halitherines, isolated on the west coast of Central America by the Isthmus of Panama, responded to cooler waters and declining sea grass communities in late Miocene and early Pliocene by turning to a diet of large marine algae (kelps), opening the way for exploitation of north temperate coastal margins from California to Japan. Adaptation to life in the cooler waters and the kelp zone involved very large size (approaching 10 m in total length), loss of diving ability as foraging became concentrated near the surface on rocky shorelines, a very thick epidermis (protection from barnacles?), loss of phalanges as pectoral appendages took on the role maintaining position in the surge zone, and loss of teeth.

The new diet put sea cows in competition with sea urchins, but in the 30 m below low tide urchins were kept in check by the evolution of a shallow-

water predator, the sea otter. In deeper water, kelps evolved chemical defenses against urchin herbivory. Restriction to the shoreline eventually made sea cows vulnerable to coastal aboriginal peoples, leading to their disappearance from most areas and leaving the relict population around Bering and Copper islands, beyond the reach of prehistoric hunters. (Evidence of such hunting was likely hidden by the post-Pleistocene rise in sea level).

In 1741, arrival of a floating wreck carrying the scurvy-riddled survivors of Vitus Bering's second expedition, including biologist George Steller, exposed the sea cows' last refuge to human hunting. Sea cow meat enabled the survivors to build an escape vessel. Their return to Kamchatka led to an onrush of fur hunters who especially prized sea otter pelts. *Hydrodamalis* was a lingering representative of the Pleistocene megafauna. I have proposed that its extinction should be examined in a community context in which (1) harvest of sea otters resulted in explosion of kelp-eating urchins into the shallows where the sea cows fed; and (2) replacement of chemically unprotected shallow-water kelps by deep-water species with chemical defenses against herbivory sealed the sea cow fate. A recent electronic publication by Turvey and Risley, soon to appear in print, has argued on mathematical grounds that the harvest of sea cows to supply the Russian fur hunters was, by itself, sufficient to account for the final extinction. I still see virtue in a more complex explanation. There are no records of urchin abundance over the period of sea cow extermination. However the local sea otter population was nearly extirpated within 10 years after the Russians arrived (Stejneger, 1887). The urchin population would have quickly exploded into the sea cow foraging zone. The last sea cow was killed 20 years later.

With Martin (2005) I think it important that we understand the full complex of factors leading to late Pleistocene extinctions. Examination of this historical episode in a community context may shed useful light on extinction and be pertinent to our response to the current extinction crisis (<http://massextinction.net>). Palaeontologists have much to contribute to our current and future decisions.

References

- Anderson, P.K. 1995. Competition, predation, and the evolution and extinction of Steller's sea cow, *Hydrodamalis gigas*. *Marine Mammal Science*, no. 11, p. 391-394.
- Domning, D.P. 1978. Sirenian evolution in the North Pacific

Ocean. Univ. Calif. Publ. Geol. Sci., no. 118, p. 1–176.

Martin, P.S. 2005. Twilight of the mammoths. Univ. of California Press, Berkeley, 250 p.

Stejneger, L. 1887. How the great northern sea cow (*Lrytina*) became exterminated. American Naturalist, no. 21, p. 1047–1054.

Steller, G.W. 1751. The beasts of the sea. (Translation by W. Miller and J.E. Miller). In: D.S. Jordan (ed.). 1899. The fur seals and fur seal islands of the North Pacific Ocean, Part 3, p. 180–201. U.S. Govt. Printing Office, Washington.

Turvey, S.T. and Risley, C.L. 2005. Modelling the extinction of Steller's sea cow. Biology Letters, FirstCite Early Online Publishing.

www.massexinction.net. Current extinction. Online at <http://www.well.com/user/davidu/extinction.html>, March 2006. A continuously updated website with hundreds of references to popular and scientific articles on current trends.

Biography

Paul Anderson is Professor of Zoology Emeritus, in the Dept. of Biology at the University of Calgary. His career in biology grew out of boyhood in small New England towns surrounded by forested hills

and a backyard bird feeder. It led to undergraduate specialization in vertebrate biology (Cornell) and graduate degrees from Tulane and (after 18 months of military service in Europe), the University of California (Berkeley) in herpetology. Before settling at the University of Calgary in 1963 he taught at Berkeley and at Columbia University, where his research shifted to population ecology and evolutionary genetics in house mouse populations. A sabbatical leave spent at James Cook University in Australia (1974) led to interest in sirenian biology and conservation and several years of field work on dugong ecology and behaviour in Shark Bay, Western Australia. His thoughts regarding the factors leading to the extinction of Steller's sea cow are based on this dugong experience. He has been a member of the Advisory Board, Acoustic Thermometry and Ocean Climate Marine Mammal Research Program, and has served as chairman of the Marine Mammals Committee of the American Society of Mammalogists. □

Results of the 2006 Microfossil Sorting Project

by Mona Marsovsky

Between nine and fourteen APS members attended each of the three microfossil sorting seminars on the afternoons of Saturday January 14, 21, and 28, 2006 at Mount Royal College.

bones, dinosaur teeth (ceratopsian, plus two kinds of small theropods—including a nice *Richardoestesia* tooth), mammal teeth and numerous unidentified fossils. On the final Saturday, we also worked on a



Vaclav Marsovsky

sample from the only microsite found in the Wapiti Formation, collected at the Kleskun Hills near Grande Prairie. This Late Cretaceous locality is similar in age to the Dinosaur Park Formation, but was deposited further inland.

Using microscopes provided by the College, APS members searched for fossils in matrix collected from the lower Scollard Formation (approximately 66 million years old) of Dry Island Provincial Park. The samples had been gathered by **Dr. Donald Brinkman** of the Royal Tyrrell Museum of Palaeontology (RTMP).

Don Brinkman has now taken all of the vials of fossils to the RTMP

where he will study the changes of vertebrate assemblages in relation to changes in climate. This wraps up the project for another year.

The APS would like to thank Mount Royal College for allowing us to use their facilities and microscopes for this project. We would also like to thank Dr. Brinkman for giving us the opportunity to search for fossils in the middle of winter! □

The Canmore Museum and Geoscience Centre

by Dan Quinsey

(adapted from CMAGS website, www.cmags.org)

The Canmore Museum and Geoscience Centre has a new display in memory of Calgary geologist Gord Tebbutt* which presents fossils and shells from the present and compares them to similar ones from the past. This is a wonderful display and is worth the drive to the Museum located at 9028 7th Avenue, in Canmore. Aside from this display, the museum also has a “high tech” geoscience area which has a computer to run Seismic Micro Technology software for demonstrating geophysical interpretation and a self-run PowerPoint presentation with attached voice commentary which discusses the oil industry. In addition, a large screen television is available to view videos of the geology of the Bow Valley and surrounding area. Two computers are also set up for the kids to run Microsoft’s “Magic School Bus” software. □

* Anonymous. 2004. Memorial—Gordon Edward Tebbutt, 1939–2004. *Reservoir*, v. 31, no. 7, p. 20. Canadian Society of Petroleum Geologists, Calgary.

Dinosaur Research Institute’s 2006 Fund Raising Projects

by Corliss Moore (Dinosaur Research Institute) and Mona Marsovsky (APS)

The Dinosaur Research Institute (DRI) is an independent, non-profit company with the mission to find, manage and direct financial support for dinosaur research. The DRI has supported research by Alberta palaeontologists in a wide variety of areas, including Alberta, Mongolia and Argentina.

In addition to donations from individuals and corporations, DRI has the following two major fund raising projects each year:

1) The DRI Dinner.

This year’s fund-raising dinner at the Earl Grey Golf Club will be held on Saturday November 4, 2006. The theme of the evening will be Mongolia. Dr. Philip Currie of the University of Alberta will describe his research on Mongolian dinosaurs.

See www.dinosaurresearch.com for details.

2) Dinotour.

Discover Alberta’s palaeontological treasures with **Dr. Philip Currie** and **Dr. Eva Koppelhus** of the University of Alberta, July 21–24, 2006. This 4-day family-orientated tour includes a visit to the *Albertosaurus* bonebed quarry in Dry Island Provincial Park, a tour of the Royal Tyrrell Museum and guided hiking in Dinosaur Provincial Park. The tour package includes:

- Guided tour including bus transportation to and from Calgary
- Three nights accommodation (double occupancy) and all meals
- Admission to the Royal Tyrrell Museum and newly renovated Dinosaur Provincial Park Field Station
- Guidebook, T-shirt and goodie bag
- Charitable tax receipt for a portion of the fees

The cost is CAN \$995 for adults and CAN \$795 for children (17 years or younger). Early bird discount of \$100 for registration prior to April 30, 2006. The deadline for registration is June 1, 2006.

To register or for more information contact: corliss.moore@inglewoodgrove.com

Website: www.dinosaurresearch.com □

Library Notes

by Mona Marsovsky, APS Librarian

The following books in the APS library provide background information (biology, geology, collecting) which you may find useful.

Introductions to Collecting Fossils

Zoology by Lawrence G. Mitchell, John A. Mutchmor and Warren D. Dolphin, published by The Benjamin/Cummings Publishing Company Inc., 1988.

This detailed text book discusses the functional systems of animals (e.g. circulation, waste disposal), reproduction, evolution, animal classification and ecology.

The Oldest Traces of Life and the Advancing Organization of the Earth (Part III: Epilogue), Paleo Data Banks, Vol. 21, No. 1, printed by the University of Arizona, 1984.

This book describes plate tectonics and evolution and outlines the history of the Precambrian and early Palaeozoic.

Collecting the Natural World, Legal Requirements and Personal Liability for Collecting Plants, Animals, Rocks, Minerals and Fossils by Donald Wolberg and Patsy Reinard, published by Geoscience Press Inc. Tucson, Arizona, 1997.

This book describes the United States federal and all US State laws governing collecting for archaeology, palaeontology and geology. It also includes contact addresses of the authorities in various states and endangered species lists.

Dinosaur Field Guide by Dr. Thomas R. Holtz Jr and Dr. Michael Brett-Surman, published by Random House, 2001.

This book has illustrations and lists facts on all of the currently known dinosaurs.

Fossils: An Introduction to Prehistoric Life by William H. Matthews III, published by Barnes & Noble Inc., 1962.

How to collect fossils, main divisions of fossils and ages of fossils.

The Elements of Palaeontology by Rhona M. Black, Cambridge University Press, 1972.

Includes pictures of invertebrate, vertebrate and plant fossils

Fossils for Amateurs, A Handbook for Collectors by Russell P. MacFall and Jay C. Wollin, published by Van Nostrand Reinhold Company, 1972.

Includes nature of fossils, where they occur, where to look, practical field tripping, preparing and cleaning fossils, and state maps showing bed-rock ages in the USA.

Fossils, Paleontology and Evolution, 2nd edition by David L. Clark, W.M.C. Brown Company Publishers, Dubuque Iowa, 1976.

Describes the evolution of plants, invertebrates and vertebrates.

Fossil Collecting, An Illustrated Guide by Richard Casanova, published by Faber and Faber, London, 1974.

Includes history of fossil collecting, how fossils are preserved, collected and classified, geological time scale, and where to look in the U.K. for fossils

Fossils of Alberta by Leonard J. La Casse and James Roebuck, published by Hallamshire Publishers, Edmonton Alberta, 1978.

Includes maps of fossil localities in Alberta

An Illustrated Guide to Fossil Collecting, 3rd Revised Edition by Richard Casanova and Ronald P. Ratkevich, Naturegraph Publishers, Inc, 1981.

Includes classification of fossils, history of life, how to collect, catalogue, prepare and display fossils, fossil collecting localities in North America and lists museums with major fossil exhibits.

Fossils of the World: A Comprehensive, Practical Guide to Collecting and Studying Fossils by V. Turek, J. Marek, J. Benes. The Hamlyn Publishing Group Limited, 1988.

Geological Background

Dictionary of Geological Terms, Prepared under the direction of the American Geological Institute, Dolphin Books, New York, 1962.

Geological Highway Map of Alberta by The Canadian Society of Petroleum Geologists, 1975.

Devonian Formations of the Alberta Rocky Mountains Between Bow and Athabasca Rivers by D.J. McLaren, GSC Bulletin 35, 1955.

This book lists the formations and their thicknesses and descriptions.

Moose Mountain and Morley Map-Areas, Alberta by H.H. Beach, GSC Memoir 236, 1943.

This publication describes the geological formations in this area.

The Geology of East-Central Alberta by G.S. Hume and C.O. Hage, GSC Memoir 232, 1941

This book describes the geology of this region.

Geology of Southern Saskatchewan, GSC Map 267A to accompany Memoir 176, 1935.

Rocks and Minerals for the Collector, Cobalt-Belleterre-Timmins; Ontario and Quebec by Ann P. Sabina, GSC Paper 73-13, 1974.

Some Aspects of Petroleum Geology, Compiled by E.F. Lee, Petroleum Department, SAIT, 1978.

North American Stratigraphic Code, The North American Commission on Stratigraphic Nomenclature, reprinted July 1983 from the American Association of Petroleum Geologists Bulletin, Vol. 67, No. 5, May 1983.

Lithologic Symbols and Abbreviations, American/Canadian Stratigraphic, Inc. □

All field trip 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 registration deadlines. This is to allow for more efficient planning of the trips and timely distribution of information.

• **Trip 2006-1**
Saturday, June 3 to Sunday, June 11, 2006
Hay River area, NWT
Registration deadline is May 1, 2006.

• **Trip 2006-2**
Saturday and Sunday, June 17 & 18, 2006
Tolman Bridge, Alberta
Registration deadline is June 1, 2006.

• **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.

• **Trip 2006-4**
Saturday and Sunday, August 19 & 20, 2006
Date is tentative, location to be announced.

At this time a site for the August trip has not been determined. I am anticipating a trip that would focus on plant fossils. Potential locations in both Alberta and British Columbia are being considered. As such the date is tentative and may change depending on where the trip is held. Further information will be available in the June *Bulletin* and on the website.

• **Trip 2006-5**
Fall 2006: Tentative

A field trip may be held in September or October, weather and demand permitting; however, location and dates have yet to be determined. Further information will be available in the June *Bulletin* and on the website.

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** □

2006 Field Trips

by Wayne Braunberger

The field trip registration form for the first three trips is included with this *Bulletin* and on the APS website (www.albertapaleo.org). Information will also be available at the monthly meetings. Trips 2006-3 and 4 have not been confirmed. As further information becomes available it will be posted on the website and in the June *Bulletin*.

Paleo Rangers Field Trip

by Dan Quinsey

The Paleo Rangers Field Trip will take place **Saturday July 15, 2006** and will be in the Drumheller area (specific site will be announced on the day of the field trip). Plans are to seek fossil wood, vertebrate fossils, and invertebrate fossils. All Paleo Rangers (APS members under the age of 18) are encouraged to participate. Just as last year, every Paleo Ranger participant must be accompanied a guardian APS member. There will be a charge of \$5.00 for the field trip guide. Please contact **Dan Quinsey** at (403) 247-3022 evenings and weekends, or by email at president@albertapaleo.org if you are interested in attending or want more information. Deadline to register is June 30, 2006. □

Paleo Rangers Workshops

by Dan Quinsey

A two-part workshop will be held on Friday evening April 7, 2006 at MRC, room B108 from 7:00 to 9:30 P.M. Instructors will be **Dan Quinsey** and **Ron Fortier**.

PRW2006-1. A Simplified Introduction to Geology and Palaeontology.

PRW2006-2. Collecting Fossils from Planning to Curation.

The workshops are open to all Paleo Rangers and Members with little or no experience in fossils. There is no cost to attend these workshops; however, you must pre-register.

To register, please contact **Dan Quinsey** at (403) 247-3022 evenings and weekends, or by email at president@albertapaleo.org if you are interested in attending. Deadline to register is April 2, 2006. □

Reviews

Fossil Shark Teeth of the World: A Collector's Guide, by Joe Cöcke, 2002. Lamna Books, Torrance, CA. ISBN 0971538131, CDN\$19.95.

I recently bought this book. According to the back cover bio, Joe Cöcke has been collecting and studying shark teeth since high school. Joe recently retired after 33 years working at the Natural History Museum of Los Angeles County where he worked in the departments of Vertebrate Paleontology, Education, and Animal Habitats.

Good things do come in small packages! This soft cover book is a little over 15 by 20 cm in size and is 150 pages long but is a wealth of information on shark teeth and their identification.

Most of us are familiar with the book *A Collector's Guide to Fossil Sharks and Rays From the Cretaceous of Texas* by Welton and Farish. Although a valuable addition to your library, it is limited to Cretaceous (and Texas) specimens. *Fossil Shark Teeth of the World: A Collector's Guide* takes things further and provides valuable information on sharks from the Palaeozoic to the Cretaceous.

The book is easy to read and follow. For the novice, the book briefly goes into the geological history of sharks, teeth and jaws, where to find shark teeth, organizing your collection, the name game, the "in-between" teeth (teeth caught in the middle of evolution from one species to another), and hard to identify teeth. The terms used in describing shark teeth are also discussed.

Each page shows a photograph (whenever possible, an "average-looking" tooth is shown to give you a good idea of what the tooth should look like in the field) of the shark tooth being described along with the locality in which the specimen was found. Under each photograph is listed: Other common names; other scientific names; age; average size; occurrence; description; similar teeth; and any additional notes. In all, 86 different species are shown. I was especially interested in the section on *Carcharocles* (mega-tooth sharks) which described 7 different species.

The book concludes with photos of other fossils usually found with shark teeth, evolution of the large sharks, a glossary, index, and suggested reading.

At \$19.95 Canadian, this book is well worth the money.

—Dan Quinsey

How Dinosaurs Grew So Large—And So Small
by John R. Horner, Kevin Padian and Armand de Ricqlès. *Scientific American*, July 2005,
p. 56–63.

Horner is Curator of Paleontology at the Museum of the Rockies and Regents Professor of Paleontology at Montana State University. Padian is Professor of Integrative Biology and Curator of the Museum of Paleontology at the University of California at Berkeley. De Ricqlès is Professor at the Collège de France, Paris, in historical and evolutionary biology; his research team works on the formation of bone and other skeletal tissues.

Sir Richard Owen named the Dinosauria in 1842, putting a label on a very small, poorly known group of very large, unusual terrestrial reptiles. They had five vertebrae (backbones) connected to the hips, not two like living reptiles; and they held their limbs underneath their bodies, not sprawled out to the sides. The image of reptilian physiology (“cold-blooded”) stuck well into the 1960s. It was only in the second half of the twentieth century that scientists began to use growth lines and other structures inside the bones to figure out how these extinct animals actually grew.

In tree trunks, the centre is dead wood. In dinosaur bones cells called osteoclasts hollow out the bone by breaking down the tissue and allowing its nutrients to be recycled. This centre or marrow cavity also produces red blood cells. New tissue is deposited on the outside and long bone growth occurs at the ends of the shafts.

Bone growth at the early stages is often eroded so the early history of the bone has to be reconstructed in various ways. One way is to find juveniles and study these bones. Another way is to examine the distances between growth lines. The Museum of the Rockies at Montana State University has twelve specimens of *Tyrannosaurus rex*; seven of these have well-preserved hind-limb bones that has allowed thin sections to be examined under a microscope. The research team’s estimate is that *T. rex* took 15 to 18 years to attain full size with a hip height of 3 m, a length of 11 m and a weight of 5000 to 8000 kg. It turns out that dinosaurs grew much faster than other living or extinct reptiles.

Gregory M. Erickson of Florida State University and Christopher A. Brochu of the University of Iowa studied the growth of the giant crocodile *Deinosuchus* of about 75 to 80 million years ago. It took nearly 50 years to reach a length of 10 m, three times

as long as it took *T. rex* to reach the same size and faster than an elephant of today to reach the same size. Other determinations are that *Massospondylus* took about 15 years to reach a length of 2 to 3 m, *Psittacosaurus*, a small horned ceratopsian, matured at 13 to 15 years. *Maiasaura* took 7 to 8 years to reach 7 metres long and *Apatosaurus* matured at 8 to 10 years with a weight of 5500 kg.

The tissue in a typical leg bone of a dinosaur is primarily of a type called fibrolamellar: it is highly fibrous or “woven” in texture and it forms around a matrix of poorly organized collagenous fibres well supplied with blood vessels—the same kind of tissue that predominates in the bones of large birds and large mammals. This tissue grows on a scaffold of minerals and collagen fibres that are produced in discrete layers, usually well vascularized, implying rapid deposition and so, rapid growth.

Ted J. Case of the University of California at Los Angeles showed that within any group of vertebrates (fishes, amphibians, *etc.*) larger species grow at higher rates than smaller species do, with larger species reaching adult size in a longer time and this applied to dinosaurs.

The group plotted estimated growth rates on a two-page cladogram or diagram of relationships, built on hundreds of independent characteristics from all parts of each skeleton, adding in rates for pterosaurs, crocodiles, lizards and birds, whether extinct or living. The dinosaur lineage showed growth rates that set them apart from other reptiles with an indication of relatively high basal metabolic rates, more like those of birds and mammals of today: perhaps they were warm blooded.

Dinosaurs were unusual creatures not exactly like any animals of today and were not conventional reptiles. To settle matters considered above, a five-ton living bird will have to be found. –Les Adler

Fossils in the News

Royal Tyrrell Museum press release, Nov. 21, 2005

New horned dinosaur species named for Alberta palaeontologist

DRUMHELLER—A newly described ceratopsian dinosaur from the Late Cretaceous Oldman Formation has been named for RTMP Head of Research, Dr. Donald Brinkman. *Centrosaurus brinkmani* was named and described by Michael J. Ryan of the

Cleveland Museum of Natural History and Anthony P. Russell of the University of Calgary. *C. brinkmani* is distinguished from the previously described spe-



Artist's reconstruction of *Centrosaurus brinkmani*. © 2005, Mark Schultz, courtesy of Dr. Michael Ryan.

cies of *Centrosaurus* mainly by details of the ornamentation of its head shield. *C. brinkmani* has clusters of short spikes surrounding two larger, forward-pointing spikes on the upper frill of the head shield. The new species was described on the basis of fragmentary remains found in bonebeds at Dinosaur Provincial Park and Milk River Ridge.

Rocky Mountain News (Denver, CO), Dec. 2, 2005

Museum draws flak over display

THERMOPOLIS, Wyoming—The appearance of an exceptionally fine specimen of *Archaeopteryx* in a small, privately-run museum, the Wyoming Dinosaur Center, is causing consternation among academics. The museum is owned by fossil enthusiast Burkhard Pohl, who holds a PhD in veterinary medicine. The likes of Mark Goodwin, U. of California, Berkeley and Ken Carpenter of the Denver Museum express concerns over security and the possibility that the specimen, being privately owned, could be resold and made inaccessible to scientists. The specimen, from Bavaria, turned up in the estate sale of a private collector in Sweden, whose widow sold it for an undisclosed sum, speculated to be in excess of US\$1 million. A more in-depth article appears in the *Journal Science* (vol. 310, Dec. 2, 2005).

Science, November 18, 2005

Dinosaurs dined on grass

INDIA—Despite their seemingly ubiquitous presence in the modern world, the grasses have a skimpy fossil record. Until now, the earliest undisputed grass fossils dated from the earliest Eocene, only 56 MYA. A team led by V. Prasad has found phytoliths—microscopic silica structures in grass blades—in Late Cretaceous dinosaur coprolites from central India.

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

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APS PALEO RANGER

A Newsletter Just For Kids

Created by Ron Fortier — Alberta Palaeontological Society

Volume 2006-1

What's New?

You may have heard that the Rangers are planning another field trip in 2006, out to Dino country. We still are, but the date had to be changed to the July 15-16 weekend, if the weather permits. This is a field trip just for kids and their parent or guardian. All other field trips are still open to all members of the APS.

A workshop for Rangers and people new to the game of palaeontology will be held on Friday, April 7 at MRC room B108. This is for people with little to no experience with fossils. Contact Dan Q, dinodan@shaw.ca, (403) 247-3022, or me, Ron at rmfortier@shaw.ca, (403) 285-8041.

What is a good way to store our fossils at home? I don't have to worry about my mummy giving me a hard time about my fossils being all over the place, but I do have a wife who doesn't like messes. My wife Norine lets me show most of my good and interesting fossils out in the open so people can see them. All other fossils have to be put away. But this is where the problem comes in—what to use to store all the other fossils? Let's talk about it at the workshop.

See you there!

Help the dinosaur swallow his food!
Can you find the right path from mouth to tail?

