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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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UPCOMING APS MEETINGS

Meetings take place at 7:30 P.M. in Room B108,
Mount Royal University (formerly College), 4825 Mount Royal Gate SW, Calgary, Alberta.

Friday, December 11, 2009 (Note: second Friday)—Christmas Social.

Friday, January 15, 2010—Dr. Jeremy Fox, University of Calgary:
Darwin's Origin of Species: A guided tour (see Page 3).

Friday, February 19, 2010—Dr. Leslie Eliuk, Dalhousie University:
A Tale of Two Reefs: Coral reefs vs. sponge reef mounds from the western Atlantic Jurassic-Cretaceous shelf margin (see Page 3).

Saturday & Sunday, March 13 & 14, 2010 Paleo 2010: APS 14th Annual Symposium (see Page 17).

ON THE COVER: Gastropods from the Isle of Wight, Headon Hill Formation, late Eocene. (See story, pages 6–8.) 1. *Ptychopotamides vagus* (Solander), 22.4 mm. 2. cf. *Bittium* sp., 9.1 mm. 3. *Exechestoma ventricosum* [= *Batillaria ventricosa*] (J. Sowerby), 10 mm. 4. cf. *Klikia vectiensis* (Edwards), 7.3 mm. Specimens courtesy of Vaclav Marsovsky, photos by Howard Allen, copyright © 2009.

Upcoming Events

Meeting dates for 2010

Year	Month	Board Meeting	General Meeting
2010	Jan	5	15
2010	Feb	9	19
2010	Mar	2	13–14 (Paleo 2010)
2010	Apr	6	16
2010	May	4	14 (second Friday)

January 2010

Dr. Jeremy Fox

Department of Biological Sciences University of Calgary

Darwin's Origin of Species: A Guided Tour

Friday, January 15, 2010, 7:30 P.M.

Mount Royal University, Room B108

Charles Darwin's *On the Origin of Species* was published on or about November 24, 1859. It was an immediate sensation, sparking the first truly public scientific debate in history. Darwin's ideas remain the foundation for evolutionary biology today, and the implications of his ideas continue to be debated. I will present a guided tour of the first edition of Darwin's revolutionary book. Compared to later editions, the first edition is the clearest and most forceful statement of Darwin's ideas, and turned out to be the most correct statement. The tour will include highlights from each chapter and remarks on how Darwin's ideas have stood the test of time.

Biography:

Jeremy Fox earned a B.A. in Biology at Williams College (USA) in 1995, and a Ph.D. in Ecology & Evolution at Rutgers University (USA) in 2000. He spent four years as a postdoctoral researcher at the NERC Centre for Population Biology at Imperial College London, Silwood Park (UK) before joining the University of Calgary Department of Biologi-

cal Sciences in September 2004. He is currently an Associate Professor. In the 2008–2009 year he served as the lead organizer for a year-long series of events marking Charles Darwin's 200th birthday and the 150th anniversary of the publication of *Origin*. □

February

Dr. Leslie Eliuk

Earth Sciences Dept., Dalhousie University, Halifax, Nova Scotia

A Tale of Two Reefs: Coral reefs versus sponge reef mounds from the Western Atlantic Jurassic-Cretaceous shelf margin

Friday, February 19, 2010, 7:30 P.M.

Mount Royal University, Room B108

Program Summary

Kirstin Brink

University of Toronto, Mississauga, Ontario

Cranial crest growth of Hypacrosaurus stebingeri

Friday, November 13, 2009

The lambeosaurine *Hypacrosaurus stebingeri* (Ornithischia: Hadrosauridae) is an intriguing dinosaur known from complete, articulated skulls from embryonic to adult stages. The present study is the first detailed description of the cranial ontogenetic series of this taxon at five growth stages (embryo, nestling, juvenile, sub-adult, and adult), including specimens from Montana and Alberta.

The adult skulls are characterized by distinctive cranial crests, which do not become prominent until the sub-adult growth stage. A comparison of the changes through growth of *H. stebingeri* to changes in *H. altispinus*, *Corythosaurus*, and *Lambeosaurus* reveals that the development of the crest of *H. stebingeri* and *Corythosaurus* is very similar. Sub-adults of



Herbivores or carnivores? Dino enthusiasts at Sam Livingston Elementary School Kindergarten display the effects of too much red meat in the diet. Presenter/photographer "Dino Dan" Quinsey was lucky to escape with his life.

H. stebingeri and *Corythosaurus* both possess a bifurcated nasal bone with branches of similar length that form an interdigitate suture with the premaxilla, and a premaxilla-nasal fontanelle that remains partially open late into ontogeny. Adult skulls of *H. stebingeri* are diagnosed by a unique suite of shared characters: the nasal forms a small portion (49% or less) of the external crest surface, as in *Lambeosaurus*, and the nasal is rostrally bifurcated and dome-shaped, as in *Corythosaurus*.

A re-examination of embryonic skull material from Devil's Coulee has revealed that the diagnostic nasal is not preserved, and so the taxonomic identity of these embryonic skulls is difficult to determine. This study confirms that few characters exist to differentiate species of juvenile lambeosaurines with undeveloped cranial crests, and suggests that most diagnostic characters develop late in ontogeny.

Biography

Kirstin Brink is a Ph.D. candidate at the University of Toronto in Mississauga. She previously earned a M.Sc. degree from the University of Calgary. □

Sam Livingston Kindergarten Presentation

By Dan Quinsey

The APS made two presentations to Sam Livingston Elementary School Kindergarten students on November 16, 2009. There were 120 kids (6 classes) in total.

We split the kids into two presentations, making one in the morning and the other in the afternoon. The students were told what a palaeontologist is and does; what fossils and trace fossils are; and what dinosaurs ate, how they walked and saw the world, why they had big tails, and finally why and how we imagine what colour they were. There were many visual aids and fossils passed around during the discussion.

Activities included: Dinosaur Stance, Carnivore

and Herbivore Masks, and Carnivore and Herbivore identification. We also ventured into the hallway to measure the length of a *Brachiosaurus*.

Everyone had a great time and “Dino Dan” had a good long nap when he arrived back home later that afternoon. Many thanks go out to **Heather White** of Sam Livingston Elementary School for giving us the opportunity to spread the palaeo word. □

Microfossil Sorting Project Winter 2010

By Mona Marsovsky

This winter APS members have the chance to aid **Patricia Ralrick** of the University of Calgary in her research into the fauna of the Scollard Formation. We will be using the microscopes provided by Mount Royal University to search for tiny fossils in the matrix samples provided by Patricia. **Dr. Don Brinkman** of the Royal Tyrrell Museum will also be advising at these sessions, as time, weather and road conditions permit.

Microfossil sorting seminars are scheduled for the following Saturdays:

January 16, 2010

January 30

February 13

February 27

You are welcome to come to as many sessions as you like. All sessions will take place from 1:00 P.M. to 3:30 P.M. in Room B213 at Mount Royal University, on a drop-in basis. If you register in advance with Vaclav or Mona Marsovsky (phone 403-547-0182, monahome@telus.net), we will be able to notify you in case we have to cancel the session unexpectedly. Please bring tweezers or a tiny paint brush and a pen to label your finds. □



Taxonomic changes for an iconic dinosaur

By Vaclav Marsovsky

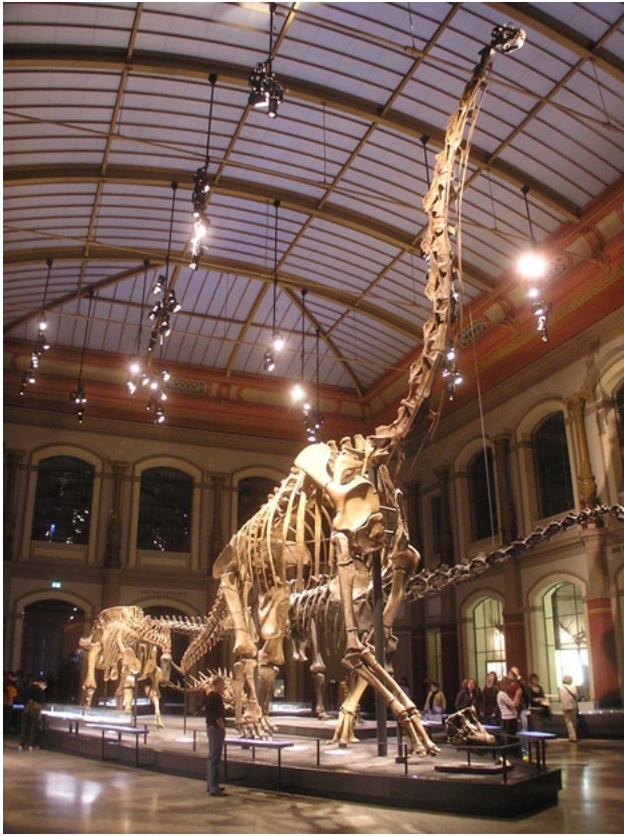
The following information is taken from a recent paper published in the technical *Journal of Vertebrate Paleontology*, Vol 29, No. 3 (September 2009), titled “A re-evaluation of *Brachiosaurus altithorax* Riggs 1903 (Dinosauria, Sauropoda) and its generic separations from *Giraffatitan brancai* (Janensch 1914)”¹

The author of the study is Michael P. Taylor from the University of Portsmouth, UK. Taylor has re-analyzed *Brachiosaurus altithorax* Riggs, 1903, found in the Morrison Formation near Grand Junction, Colorado (the type specimen of *Brachiosaurus*) and *Brachiosaurus brancai* (Janensch, 1914) from the Tendaguru Formation of Tanzania. W. Janensch had named the African genus as *Brachiosaurus* based on published data available at the time. A beautiful composite mount of the skeleton of *Brachiosaurus brancai* can be seen at the Humboldt Museum in Berlin (see figure, page 6).

The type specimen of *B. brancai*, originally based on a single skeleton, was subsequently found to consist of two individuals. Of these two, Taylor proposes the larger to become the lectotype of *B. brancai*. (Lectotype means a single specimen which is designated as the name-bearing type specimen from a series of syntypes, if a holotype specimen was not designated by the original author).

Taylor found differences in 26 osteological characters of the axial and appendicular skeleton between the African and American forms. On this basis he argues that the African genus is different enough from the American genus to warrant its own generic name, *Giraffatitan*. It was R. S. Lull who first noticed that there was a lack of evidence for congenericity. Gregory Paul, in 1998, proposed the subgeneric name *Giraffatitan*, (therefore *Brachiosaurus (Giraffatitan) brancai*), based on observed differences in the

¹ The paper may be downloaded from M. Taylor’s website at <http://www.miketaylor.org.uk/dino/pubs/taylor2009/Taylor2009-brachiosaurus-and-giraffatitan.pdf>



Giraffatitan brancai, formerly *Brachiosaurus*. The famous mount at Berlin's Museum für Naturkunde. Photo by Axel Mauruszat, copyright © 2008, reproduced under terms of license.

vertebral column. Subsequently, G. Olshevsky (1991) raised the name *Giraffatitan* from subgeneric level to generic rank. Taylor goes on to describe and provide revised diagnoses for *Brachiosaurus altithorax* and *Giraffatitan brancai*.

Following the study of all available brachiosaurid material, Taylor questions the identity of *Ultrasaurus macintoshi* (Jensen 1985) from the Dry Mesa quarry, Colorado. He points out that the name *Ultrasaurus* was preoccupied by a Korean sauropod, so the Dry Mesa brachiosaurid was changed to *Ultrasaurus macintoshi*. The type specimen of *U. macintoshi* is based upon a dorsal vertebra. J. Jensen referred other isolated elements (rib, scapulocoracoid, cervical and caudal vertebra) in the quarry to *Ultrasaurus*. Many of those referred specimens have since been reassigned to the Diplodocidae (i.e. *Supersaurus*). Even the type specimen—the dorsal vertebra—was subsequently reassigned as a diplodocid (Curtice et al., 1996). *Ultrasaurus* thus became a junior synonym of *Supersaurus*. From the *Ultrasaurus* material, only a scapulocoracoid is recognized as being brachiosaurid. The coracoid of the Dry Mesa brachiosaurid is smaller and different from that of *Brachiosaurus altithorax*.

So in summary, only the original American form keeps the name *Brachiosaurus* while the African form is now called *Giraffatitan brancai*. □

SVP 2009 in Bristol, U.K.

By Mona Marsovsky

The Society of Vertebrate Paleontology (SVP) held a very successful conference at the University of Bristol, England, on September 23–26, 2009. Although there were concerns that attendance would be low at this first-ever conference held outside of North America, attendance included 1,125 registrations, the second highest total in SVP history (this was the 57th symposium and 69th annual meeting of the SVP). Only fifteen registrations separated this conference from the record for largest ever, held in Austin, Texas in 2007. Three (and sometimes four) sets of simultaneous presentations filled four days. Each presentation was allocated a total of fifteen minutes, including questions. Four sets of posters were presented, one



Bristol University, venue of the 2009 SVP conference. Bristol City Museum and Art Gallery (left) and the Wills Memorial Building tower. Photo by Vaclav Marsovsky.

set per day. There were about 120 posters displayed in each set. Even though two hours per day were dedicated to view posters, it was difficult to see them all. A record number of 899 requests for presentations were received, of which 11% had to be rejected due to lack of room.

Exhibitors displayed books and palaeoart over the first three days of the conference. During that same period, a special preparators' table was available in the exhibition hall for demonstrations of tools and to answer questions on preparation techniques.

The City of Bristol hosted a reception at their science museum, "At-Bristol" on the first evening of the conference.

A special presentation on Thursday evening, September 24, by Sir David Attenborough, entitled *Alfred Russell Wallace and the Birds of Paradise* was sold out and prompted rave reviews.

The annual silent and live auction held on the evening of Friday, September 25, netted £8,139 (approximately US\$13,836), which will be split between the svp Preparator's Fund (for the training of preparators) and the svPCA Jones Family Fund (for funding travel to svPCA conferences). Monty Python's version of King Arthur's Camelot was the theme for the live auction.

The annual awards ceremony on the final evening was worthwhile to attend, if only to see **Dr. Philip Currie** of the University of Alberta wearing a suit. As Vice President of svp, Phil helped the president of svp, Blaire Van Valdenburgh, present the awards.

The svp President announced that in 2010 the svp flagship publication, *Journal of Vertebrate Paleontology* (JVP), will now have six issues per year, up from the previous four issues. A new junior membership category will also be introduced in 2010. svp has started a fund raising program to create an endowment fund by 2014 to support its awards program.

The volunteers and staff who worked on the symposium, the program committee, svp publication, and the auction were all acknowledged with standing ovations from the audience. svp members who had passed away over the last year were acknowledged with a brief description of their work.

Cash grants and awards were presented for the following:

- Institution of a Developing Nation.
- Scientist from a Developing Nation.
- Bryan Patterson Memorial award to sponsor travel required for field work by a student.
- Richard Estes Memorial Grant for a student doing non-mammalian research.

- Predoctoral Fellowship Grant for student research done before working on Ph.D.
- Preparator's Grant to support training for a preparator.
- John J. Lanzendorf Paleoart prizes for the best 2-dimensional art, 3-dimensional art, and scientific illustration.
- Edwin H. and Margaret M. Colbert award for the best poster presented by a student at the conference.
- Alfred Sherwood Romer prize for best talk by a pre-doctoral student at the conference.



Field trip participants examine the fossiliferous Eocene exposure at Headon Hill, Isle of Wight. Photo by Vaclav Marsovsky.

- Morris F. Skinner award for outstanding work in collection and teaching.
- Joseph T. Gregory award for service to the Society.
- Honorary membership for contributions to palaeontology (presented to four svp members).

The A.S. Romer-G.G. Simpson Medal, svp's most prestigious award, honouring excellence in palaeontology research and teaching, was presented

to Farish A. Jenkins, Jr. for his many years of teaching and research at Harvard.

This year's svp was highlighted by an excellent variety of field trips. Before the conference, delegates chose between the following field trips which ranged from one to six days in length:

- *Archaeopteryx* and Friends: Famous Vertebrate Fossil Lagerstätten in Southern Germany.
- Classic Fissure Localities from the Late Triassic / Early Jurassic of the Bristol Channel (Glamorganshire and Gloucestershire).
- Visit to Charles Darwin Heritage Sites in the UK: University of Cambridge, Down House, Kent, Oxford University.
- The Dorset and East Devon Coast (Triassic, Jurassic and Cretaceous on the southern English coast in the area of Lyme Regis).
- National History Museum, Palaeontology Conservation Unit (PCU).
- Watchet Coast, Somerset.

After the conference, two five-day field trips were offered:

- From Glens to Miller: 230 Million Years of Fossil Vertebrates From Scotland's Majestic Highlands and Islands.
- Vertebrate Localities in the Early Cretaceous and Paleogene of the Isle of Wight, Southern England

I really enjoyed the Dorset coast field trip and was impressed by the number and quality of fossils (marine reptiles, ammonites and dinosaurs) collected over the years from that area. I also learned about collecting techniques. March is the best time to collect fossils, because the intense winter storms sweep away the sand and erode the cliffs. The fossils are found on the shore in concretions of a particular shape and colour and sometimes are exposed in the "ammonite pavement". Landslides are also good areas to find fossils. Fossils occur in particular layers which are well known by the local collectors. Fossil collecting by amateurs and professionals is encouraged under the "Responsible Fossil Collection Code," which expects that scientifically important specimens will be loaned or donated to the small museums in the area or to the Bristol City Museum.



Gastropod shells are extremely abundant in some beds of the Eocene Headon Hill Formation at Headon Hill, Isle of Wight. Photo by Vaclav Marsovsky.

The Isle of Wight field trip illustrated the difficulties that researchers have to endure to access remote field sites. The hike to one remote site was called the "Oligocene Death March" by one of the German participants on the tour. Collectors must always be aware of the tides to avoid being caught between the vertical cliffs and the high tide. Most of their finds come from screen washing matrix taken from the nearly vertical cliffs. Recent screen washing of matrix collected has yielded new species of animals (see *APS Bulletin*, March 2009, Fossils in the News, page 10). The nearly vertical orientation of the strata meant that one could travel from the Cretaceous to the Eocene by walking a few metres along the beach. The different texture and colour of each layer allowed detailed analysis of not only the age but the deposition of that layer. I did not expect the rock layers to be so beautifully coloured and for the weather to be so warm (people were swimming in the English Channel at 9:00 in the morning!).

Next year's svp conference is scheduled for October 13–16, 2010 in Pittsburg, Pennsylvania. The 2011 conference will take place on October 19–22, in Las Vegas, Nevada. Berlin in Germany has been suggested as a potential venue in 2014. □

www.albertapaleo.org

Fossils in the News

Edited by Chris Marion

The Australian

Turning turtle on links to north

Elizabeth Smith works in the opal fields of Lightning Ridge, Australia, and has found evidence that meiolaniid turtles may be much older than originally thought. www.theaustralian.news.com.au/story/0,25197,26228069-30417,00.html

Science Daily

Crushed bones reveal literal dino stomping ground

A quarry near Moab, Utah has yielded thousands of dinosaur bones representing—so far—sixty-seven individuals in eight different species and all ages and sizes. Most of the bones have greenstick fractures, leading the researchers to believe sauropods may have trampled carcasses lying near the shores of an ancient lake bed. www.sciencedaily.com/releases/2009/10/091014102028.htm

CBC News

Small, horned *T. rex* relative found in Asia

A 4 m, 370 kg tyrannosaur with a small skull and slender teeth in a long snout adorned with eight horns has been found in the Gobi desert in sediments 65–85 million years old. *Alioramus altai* would have lived at the same time as the *Tarbosaurus* found at the same site, but would likely have fed on smaller prey. www.cbc.ca/technology/story/2009/10/05/tech-biology-dinosaur-small-t-rex.html

Science Daily

Rare evidence of dinosaur cannibalism: meat-eater tooth found in *Gorgosaurus* jawbone

University of Alberta researchers **Phil Bell** and **Phil Currie** report in *Lethaia* on a meat-eating dinosaur

tooth found embedded in a 70-million-year-old *Gorgosaurus* jaw. www.sciencedaily.com/releases/2009/10/091006155909.htm

Science News

King of the ancient seas

A huge, 240-million-year-old ichthyosaur discovered in central Nevada and presented at the SVP meeting in September, had unusual diamond-shaped teeth with serrations at its front and rear edges. www.sciencenews.org/view/generic/id/47658/title/King_of_the_ancient_seas

Science Daily

Tiny tyrannosaur: *T. rex* body plan debuted in *Raptorex*, but 100th the size

Meet *Raptorex kriegsteini*, a 125-million-year-old, 3 m tall, 68 kg tyrannosaur with the large head, tiny arms, lanky feet and enlarged olfactory bulbs of its younger and much larger *T. rex* relative. www.sciencedaily.com/releases/2009/09/090917144115.htm

CBC

Tiny *Raptorex* lived long before *T. rex*

More on Paul Sereno and Stephen Brusatte's north-eastern China find, which was described in the Sept. 17 online edition of *Science*. www.cbc.ca/technology/story/2009/09/17/tech-dinosaur-tiny-t-rex.html

CTV

Early, smaller version of *T. rex* discovered

www.ctv.ca/servlet/ArticleNews/story/CTVNews/20090918/trex_small_090918/20090918?hub=SciTech

National Geographic

Odd new pterosaur: "Darwin's wing" fills evolution gap

A new type of pterosaur found in northeast China has the big head and long, flexible neck of advanced pterosaurs but the very long tail of primitive forms. *Darwinopterus* was about the size of a crow and had long jaws with rows of sharp, pointy teeth which would likely have made it a mid-air predator. At 160 million years old, it falls nicely in between the two

known groups of pterosaurs and helps shed light on the evolution of that group. <http://news.national-geographic.com/news/2009/10/091013-new-flying-reptile-pterosaur-darwin-picture.html>

More on *Darwinopterus*, the new pterosaur which was described in the journal *Proceedings of the Royal Society B* at www.cnn.com/2009/TECH/science/10/14/darwinopterus.dinosaur.fossil/index.html

CBC

New pterosaur named to honour Darwin

www.cbc.ca/technology/story/2009/10/14/tech-pterosaur-new-darwin.html

BBC

Reptiles' walk "evolved faster"

New research based on footprint evidence, published in the *Journal of Paleontology* by Mike Benton of Bristol University, shows that reptiles began walking with their legs tucked underneath their bodies shortly after a mass extinction that happened 250 million years ago. http://news.bbc.co.uk/2/hi/uk_news/england/bristol/somerset/8256270.stm

More Fossils in the News!

Check the internet for these stories:

CBC—*Robots with fins, tails offer new insights into evolution* www.cbc.ca/technology/story/2009/06/01/robots-fins-evolution874.html

Science Daily—*Oldest example of mutualism: Termites and protozoa discovered together in ancient amber* www.sciencedaily.com/releases/2009/05/090514153139.htm

Science Daily—*Competition may have led to new dinosaur species in NW Alberta* www.sciencedaily.com/releases/2009/05/090512134657.htm

Science Daily—*Ancient volcanic eruptions caused global mass extinction* www.sciencedaily.com/releases/2009/05/090528142827.htm

National Geographic—*Giant dinosaurs stuck their necks out, not up?* news.nationalgeographic.com/

news/2009/05/090514-dinosaurs-long-necks.html

Science Daily—*Giant dinosaur posture is all wrong: Sauropods held their heads high, research finds* www.sciencedaily.com/releases/2009/05/090526213918.htm

Science Daily—*Microfossils challenge views of "snowball Earth" glaciations on life* www.sciencedaily.com/releases/2009/05/090526140846.htm

Science Daily—*Link between sociality and brain increase in carnivores questioned by evolutionary biologists* www.sciencedaily.com/releases/2009/05/090525173545.htm

BBC—*Scientists hail stunning fossil* news.bbc.co.uk/2/hi/science/nature/8057465.stm

Science Daily—*Fossil of "giant" shrew nearly one million years old found in Spain* www.sciencedaily.com/releases/2009/05/090518103229.htm

Science Daily—*Insight into evolution of first flowers* www.sciencedaily.com/releases/2009/05/090518172453.htm

National Geographic—*Biggest trilobite sea beasts found... in swarms* news.nationalgeographic.com/news/2009/05/090511-giant-trilobites-swarms-picture.html

Science Daily—*Small brain of dwarf "hobbit" explained by hippo's island life* www.sciencedaily.com/releases/2009/05/090507185535.htm

National Geographic—*"Lost world" of dinosaurs survived mass extinction?* news.nationalgeographic.com/news/2009/05/090501-dinosaur-lost-world.html

Science Daily—*Gaping Gila monsters, buzzing insects, clambering ungulates: new finds from Germany's Messel pit* www.sciencedaily.com/releases/2009/08/090814101831.htm

Thanks to Vaclav's magic, these links and many more, all nicely organized by topic, can now be found on the APS website at www.albertapaleo.org/. Click on Fossils in the News in the sidebar. Thank you to Phil Benham and Mike Dooley for sending links. □

Field Trip Reviews

By Howard Allen

Photos by the author except where noted.

Field Trip 2009-1

June 27–28, 2009

Drumheller area, Alberta

Our 2009 field trip season started off in fine form, with excellent weather for badlands exploration.

Day one commenced with a meeting at the Horseshoe Canyon viewpoint, whence we followed leader **Wayne Braunberger** to the first stop, on the east side of the Horseshoe Canyon badlands. This exposure of the Horseshoe Canyon Formation includes light grey, fluvial sandstones containing an abundance of carbonized plant material. A nice *Ginkgo* leaf was discovered within minutes (Figure 1).

Once everyone had their badlands legs, we headed east into the valley of the Red Deer River, stopping on the side of the highway at East Coulee, south of Drumheller. A steep scramble up the side of the



Figure 1. *Ginkgo* leaf in sandstone matrix, Horseshoe Canyon Formation, Horseshoe Canyon. Lens cap diameter is 70 mm.



Figure 2. Phil and Michele Ashbury scanning the Horseshoe Canyon badlands.

coulee/canyon brought us to a remarkable trace fossil occurrence. The beds here were deposited close to the edge of the Bearpaw Sea; the stratigraphy records several marginal-marine river or delta distributary channels cutting down through pre-existing beds, and filled with brownish, marine shale (“mud-filled channels”). One of these channels had cut down to the top of an old coal seam and while the channel was still open, organisms (presumably clams) had burrowed into the coal (perhaps still wood at the time), much as modern “shipworms” bore into driftwood and wooden pilings on the seashore. A layer of sand was later deposited on the channel bottom, filling in the burrows. Some 70 million years later, the sand-filled burrows are now a trace fossil, called *Teredolites* (Figure 3). While the burrows were still open to the water, shark teeth swept along the channel bottom occasionally fell into the burrows and were trapped there for posterity. One of our party found just such a fragmentary specimen, and attendees of previous field trips to this location reported similar finds.

Our convoy headed back north for our lunch stop, but first we made a short detour up a prairie trail to



Figure 3. Sand-filled *Teredolites* (clam?) borings in the Horseshoe Canyon Formation, East Coulee. Top photo shows an inverted slab of matrix with the bottoms of the burrows exposed; note coal between the burrows. Lower photo shows the borings in growth position, at the interface between the coal seam (below) and the overlying channel sandstone (fine rootlets are recent). Lens cap diameter is 70 mm.

a scenic overlook, providing a fine panorama of the Willow Creek valley, which exposes a thick section of the lower Horseshoe Canyon Formation and its contact with the underlying marine Bearpaw Formation. Of particular note (for fans of clastic sedimentology; my apologies to the non-geologists) is a magnificent example of “inclined heterolithic stratification” (IHS) displayed in the lowermost sandstone beds of the Horseshoe Canyon Formation.¹

Brushing off the crumbs of our bag lunches, eaten at the Willow Creek Hoodoos point of interest where we shared the small parking lot with dozens of tourists, we reassembled the convoy and continued north toward Drumheller. We stopped at the Drumheller water treatment plant, at the southern edge of town, where Wayne pointed out salient features of the stratigraphy visible across the valley. We then made our way through Drumheller, stopping just north of town at the junction of the airport road and Highway 9.

Two fairly spectacular geological features are visible at this locality, both on the east side of Highway 9 (Figure 4). The most obvious feature is a small sandstone channel or crevasse-splay deposit that appears in cross-section as a sharply-delineated white, lens-shaped structure on the brown and grey badland slope above the highway. The structure represents either a small river channel, or a crevasse-splay (a secondary channel that develops from the breach of a river levee during flood stage, resulting in the localized deposition of sandstone on the flood-plain). The channel is down-cut into the muddier, darker flood-plain deposits, and was subsequently filled by coarser, light-coloured sand. The second feature is less immediately obvious until someone points it out to you, at which point you think “how did I miss that?”. If you focus your gaze on a dark, coaly bed at the base of the channel structure, then shift your eyes northward, the coaly bed is seen to come to an abrupt end at a small ravine. This is the “Drumheller Fault”, which has been mapped well into the sub-surface, where it cuts through a Devonian-aged oil reservoir, horizontally displacing the two sides by as much as 1.6 km. Vertical displacement at the Highway 9 exposure has been measured as about 24 m (downward to the south).

Our final stop of the day brought us back to the palaeontological realm, at the spectacular badlands of Horsethief Canyon, north of Drumheller. From the parking area/viewpoint, we scrambled a short distance down into the badlands to examine shell beds containing abundant oysters (*Crassostrea sub-trigonalis*) and clams (*Corbicula occidentalis*; Figure 5) that lived in brackish water of a brief northward expansion of the Bearpaw Sea. The shell beds

¹ Another interesting geological feature noted by the author while driving to the lookout point, but not discussed on the field trip, is a wonderful little anticlinal fold (probably a glacial ice-thrusting feature) exposed in a road cut on the edge of the canyon, where secondary road 573 climbs out of the Red Deer River Valley. It is visible on Google Earth if you key in and zoom down to the coordinates 51.373614, -112.519702.



Figure 4. Two cool geological features in one photo! Exposure of the Horseshoe Canyon Formation along Highway 9 at the intersection with the Drumheller airport road, north of Drumheller, looking east. A well-defined sandstone-filled channel or crevasse splay is obvious as the white, lens-shaped feature above the truck. The Drumheller Fault appears at the left side of the photo. Note how the beds (especially the dark, coaly bed) abruptly end at the small ravine.

are referred to as the Drumheller Marine Tongue.

Day Two saw us reconvening on Sunday morning at the Morrin Bridge campground on the Red Deer River. This second day was designated as a free exploration of the badlands, and participants quickly dispersed into the scenery to spend a blazingly hot day searching for items of palaeontological interest. These turned out to be rather scarce, apart from the ubiquitous pulverized fragments of dinosaur bone and bits of fossil wood so characteristic of the Horseshoe Canyon Formation.

Field Trip 2009-2

July 18–19, 2009

Coronation/Hanna area, east-central Alberta

The palaeontological focus of this two-day trip was the Upper Cretaceous Bearpaw Formation, which comprises the bedrock over a wide area of east-central Alberta.

The upside of this is that the Bearpaw can be very fossiliferous, which is why it's always worth stopping to look at any exposures. The downside is that the Bearpaw is largely a shale formation, soft and easily eroded, seldom forming large exposures, even along streams and road-cuts. Being soft and muddy, it quickly reduces to soil and thus is typically covered by vegetation. One factor in the palaeontologist's

favour, however, is that Bearpaw Formation fossils most commonly occur in hard mudstone concretions that resist weathering, and therefore tend to become exposed and concentrated at the surface, even in areas where no significant outcrop is apparent. Experienced fossil hunters know that Bearpaw fossils can be found in ditches, at the bases of slopes, and the beds of small creeks, and that time spent cracking open plain-looking, rounded concretions will eventually pay dividends.

Such was the case on our second field trip of the year. A fairly large contingent convened Saturday morning at a park in the town of Coronation. After



Figure 5. *Corbicula occidentalis* clams in sandstone of the Drumheller Marine Tongue, Horsethief Canyon, north of Drumheller. Lens cap diameter is 70 mm.



Figure 6. Typical Bearpaw Formation “outcrop” in central Alberta. Field trip participants search for concretions in the overgrowth. Surprisingly, a number of fossils were found.



Figure 7. Potentially fossil-bearing sandy mudstone concretions found at the roadcut in Figure 6.

waiting. . . and waiting for laggards to turn up, we eventually made our way in a long convoy via dusty gravel roads to a roadcut northeast of Coronation. The propensity of the Bearpaw Formation to become overgrown was made apparent right away: the roadcut had become so overgrown since our last visit (in 1993) that it was unrecognizable and we drove right past it! We stopped, and after a few minutes of head-scratching and consulting the map coordinates, we doubled back half a kilometre to a high, grassy bank, where we geared up and started exploring (Figure 6). It didn't take long before the tell-tale mudstone concretions started turning up (Figure 7); as often as not, they were discovered by feeling a hard lump in the grass with one's boot toe, much as a golfer locates an errant ball in the rough. Though many of the concre-

tions were duds, some produced fossils: crayfish remains, *Baculites* ammonites, inoceramid clams, and the large “razor clam” *Gervillia borealis* were among the finds.

Our second stop of the day was a small valley a few kilometres away. Again, the locality—a grassy cow pasture—looked unlikely, with exposures of the Bearpaw shale being scarce to non-existent. Almost immediately, however, fossiliferous concretions were discovered in the grass and a number of good specimens were found: a large segment of *Baculites*, various small to large pelecypods and a number of small scaphitid ammonites, probably including *Rhaeboceras* and

Ponteixites. The author was lucky enough to spot one fist-sized concretion lurking under a tussock that, when examined, revealed a partially-exposed and very well preserved ammonite (probably *Rhaeboceras albertense*; Figure 8).

This was our last “official” stop of the day, and once all our members had straggled back to the vehicles we departed to find accommodations for the night. A few of the keener participants stopped to examine a significant badlands exposure on the highway between Coronation and Hanna. The rocks here belong



Figure 8. Scaphitid ammonite, probably *Rhaeboceras albertense*, in a concretion, Bearpaw Formation.



Figure 9. Some of the crew at Berry Creek Reservoir. Left to right: Jay, Arnold, Keith (seated), Kerri, Becky, Paula, Clair, Valerie, Brenda, Pete (seated) and Cheryl.

to the lower Horseshoe Canyon Formation, but after tramping around in the heat for the better part of an hour we found the area to be thoroughly and depressingly unfossiliferous.

The single venue for day two was Berry Creek reservoir, south of Hanna. It's possible that memories or reports of our 1993 visit (*Bulletin*, September 1993) deterred most members from camping at the reservoir Saturday night, so only the author and trip leader **Wayne Braunberger** risked it. Fortunately we suffered no worse inconvenience than voracious mosquitoes and a ban on open campfires.

Sunday morning dawned on another fine day. Most of the mosquitoes slept-in late, and other field trip participants arrived by the appointed 10:00 meeting time. Following a brief discussion of the local geology (Bearpaw Formation), we split up into small groups and began exploring the shoreline of the reservoir for more fossiliferous concretions. Though no earth-shaking scien-

tific discoveries were made during the day, a number of typical Bearpaw fossils (*Baculites*, *Inoceramus*, etc.) were found in fragmentary condition, and everyone got their share of sunshine, fresh air and exercise.



Figure 10. A pair of young coyotes put in an appearance at Berry Creek Reservoir.

Field Trip 2009-3
August 15-16, 2009
Flathead Valley, southeastern
British Columbia

The author, to his chagrin, was unable to attend the Flathead Valley field trip, and as there was no writeup submitted, readers will have to content themselves with enjoying the excellent photographs taken by member Keith Mychaluk. □



Darrel Nordby (left) and Guy Santucci disagree on which way to go next.



Tertiary (Oligocene) gastropods in a slab of Kishenehn Formation sandstone, Couldrey Creek, in the Flathead Valley.



Whitetail deer high tail it out of the path of the APS convoy.



Darrell examines the Kishenehn Formation outcrop on Couldrey Creek.

ALBERTA PALAEOLOGICAL SOCIETY

Paleo 2010

Presented in conjunction with the CSPG Palaeontological Division
and Mount Royal University Earth Sciences Department.

Mount Royal University
4825 Mount Royal Gate SW, Calgary, Alberta

Lectures and poster displays—Saturday, March 13, 2010, 9:00 AM to 5:00 PM
Workshops—Sunday, March 14, 2010, 9:00 AM to 4:00 PM

Saturday events are free to the public
Sunday workshops require registration and a minor fee.



Saturday, March 13, confirmed speakers

**Titles are tentative. All talks are to be held in Jenkins Theatre,
lower level of Mount Royal University.**

Craig Dylke—*New Zealand's fossils: Remnants of a lost continent.*

Danielle Fraser, Jordan Mallon, Rob Furr and Jessica M. Theodor; University of Calgary—*Using High Dynamic Range imaging in vertebrate palaeontology.*

Scott Persons, University of Alberta—*Changing the face of tyrannosaur rear ends: Tail muscle reconstruction in theropod dinosaurs.*

Darren Tanke, Royal Tyrrell Museum of Palaeontology—*Rebuilding a scow used by early field palaeontologists in Alberta, Canada and a 2010 commemorative expedition.*

Victoria Arbour and Mike Burns, University of Alberta—*My ankylosaur is a big dumb tank! Ankylosaur reconstructions in the scientific literature and popular media.*

Lisa Bohach, FMA Heritage—*The art, culture and science of Iniskims.*

Marianne Collins, ArtoFact—*History, mystery and Baywatch: Illustrating the animals of the Burgess Shale.*

For more information, see Page 18 

Paleo 2010

APS Fourteenth Annual Symposium
Saturday and Sunday, March 13 & 14, 2010

The Symposium

Paleo 2010 is a two day event with lectures, posters and showcase displays on Saturday, March 13 and workshops on Sunday, March 14. Saturday programs are free and open to the general public. We will encourage families to bring fossils to our identification booth on Saturday. For kids, we have videos and an activity table. No registration is required to attend Saturday activities. Sunday workshop participants will be required to register and pay a moderate fee for manuals and materials. The main events will be centred in the lower level hall at Mount Royal College. Lectures will be held in the Jenkins Theatre.

Call for posters and abstracts

The Alberta Palaeontological Society (APS) invites you to present a poster at Paleo 2010. This symposium will feature presentations from a mix of avocational and professional palaeontologists from all over western Canada. We are interested in posters or displays associated with palaeontology. Specific invitations have been sent to staff and students of universities, natural history clubs, the Geological Survey of Canada, museums, members of the petroleum industry and the artists' community. The aim is to showcase palaeontology to the general public and foster closer relations between the APS and the above groups. The event is free to all participants. There is no fee to submit a poster and abstract.

Instructions for posters and displays

A table and stand with a 4x8-foot poster board will be supplied to each presenter. Each presenter should bring stick pins or tape for attaching posters, but we will try to have some on hand for those who forget. Those with special requirements such as electricity to operate a display or a larger display area should identify these requirements upon submission of a request for space. Presenters are requested to provide an abstract as per instructions below. We request that poster presenters be set up by 9:00 A.M. Saturday, March 13. During the day a poster session period will be specified; please be available at least during this time for discussion about your exhibit. The deadline for submission of requests for poster space is February 1, 2010.

Paleo 2010 abstracts volume

As in past years an attractive symposium abstracts volume will be published. It will be sold at a price to cover publication costs. We request that speakers and poster presenters submit abstracts for the publication to the editor (see below). Abstracts may be any length (one page being standard; less than a full page is OK). Requests for longer abstracts will be accepted. Abstract contributors are encouraged to include photos and/or diagrams, but it should be noted that the abstracts volume will be printed in black and white. Documents will not be edited for content but may be reformatted to fit into the volume. Snail mail address (and email address if you wish) of the author should be included. Deadline for submission of abstracts is February 15, 2010. Specific instructions and examples can be downloaded from our website, www.albertapaleo.org or by contacting the Editor.

Workshops

Two workshops are offered in 2010. Both will be held at Mount Royal College, Room B213.

Classic Permian vertebrate fossil localities of Texas, with Dr. Jason Anderson. Sunday, March 14, 2010, 9:00 A.M. to 12:00 P.M. Cost: \$15.00 per person. This workshop will cover the faunas typical for the classic Permian localities of northern Texas. There will be a brief introduction to the history of collecting in the Permian of Texas. This will be followed by a survey of the most common fossils found. Small collections of fossils from a few localities will be provided for workshop participants to examine and identify. Screenwashed sediments may also be available for participants to examine for fossil remains.

"Make-A-Saurus" with sculptor Brian Cooley. Sunday, March 14, 2010, 1:00 P.M. to 4:00 P.M. Cost is \$25.00 per person. Using a variety of simple materials and methods, participants will learn how to make their own dinosaur, which they will be able to take home at the end of the workshop. Brian Cooley has been making sculptures of dinosaurs for over twenty-five years. His sculptures may be seen in museums all over the world.

To register for workshops, contact Mona Marsovsky at (403) 547-0182 or email monahome@telus.net. Registration deadline is February 28, 2010. Cheques should be made payable to Alberta Palaeontological Society. Payment may be handed to Mona or mailed to the Society's mailing address at P.O. Box 35111 Sarcee Postal Outlet, Calgary, AB T3E 7C7.

Contact Information

Paleo 2010 committee chairperson: Philip Benham (403) 691-3343, programs@albertapaleo.org

Posters & displays: Wayne Braunberger (403) 278-5154, events@albertapaleo.org

Lecture program/general information: Philip Benham (403) 691-3343, programs@albertapaleo.org

Abstract submissions: Howard Allen (403) 862-3330, editor@albertapaleo.org

Visit the APS website for confirmation of lecture and workshop times and speakers: www.albertapaleo.org

Helpful Hints for Poster Presenters

Definition

A poster is a visual medium to express results of one's research work on a topic they have chosen to study or to provide an overview of a researched topic.

Who should do a poster?

Anyone who has an interest in sharing the work that they have done and who likes feedback from the audience (symposium attendees) on their work should consider doing a poster.

What should be considered for a poster?

Any topic that ties in with palaeontology can be considered for a poster.

Why posters?

Oral or written presentations are mechanisms to convey past and recent developments in a field of study that is of interest to the investigator. An effective written presentation is a poster presentation.

What is a poster?

A poster is something that you pin up on a board. The dimensions of a poster can vary. It can be anywhere from 2' x 3' to 4' x 8'. It contains text and figures relevant to your work. It follows the same pattern as any scientific article that appears in a journal.

A typical format:

- Title, Author(s), Affiliation
- Summary—sum up the study in one paragraph
- Introduction—reasons behind the work
- General information, location (study area)
- Description and interpretation
- Conclusions
- References

Dedicate a box to each one of the sections listed above. Within the box, include the text and figures relevant to that section. Number the boxes in such a way that the reader can follow from one box to the other in the presenter's intended sequence. The structure of the framework will vary from topic to topic.

How does one make a poster?

Today, with powerful graphics and word processing software, a poster can be made entirely using a computer. The final poster image can be printed on a large-format colour printer. But you don't need a computer to do a poster! Carefully hand-lettered or typewritten text can be combined with drawings, photos or enlarged photocopies to make an effective presentation. These days it should be easy to find someone with a computer who could print out some titles or captions to add to your text.

What about the visual presentation?

Whatever the size of the poster, when one views it from one or two metres away, the type (or font) size must be large enough that the text can be easily read. Also, figures should be reasonably large. Think about when the eye doctor wants you to read off his chart of alphabets and numbers from a distance. Don't be tempted to crowd too much information onto a poster—you can overwhelm your audience. Adding colours makes a difference to the poster, and can lure viewers to your poster or even drive them away!

What's an abstract?

An abstract is just a summary of your work, from introduction to conclusion, boiled down to one or a few paragraphs. We'd like to have an abstract from each of our poster presenters and speakers, to include in the Symposium Abstracts Volume. Illustrations are welcome (they will be converted to black-and-white).

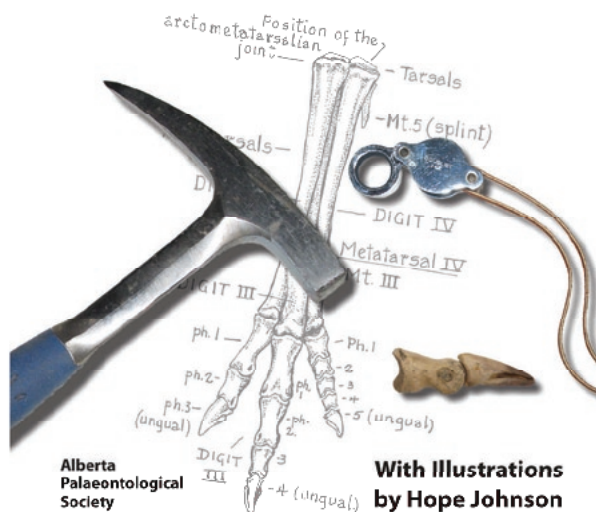
Good luck, and have fun!

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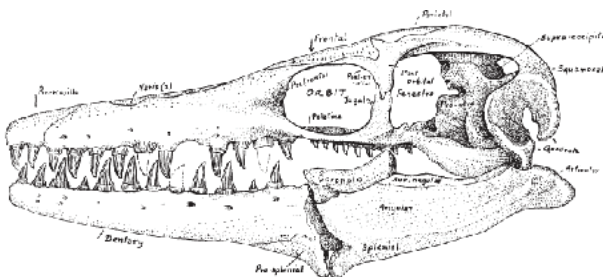
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