Palæontological
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Society
Bulletin

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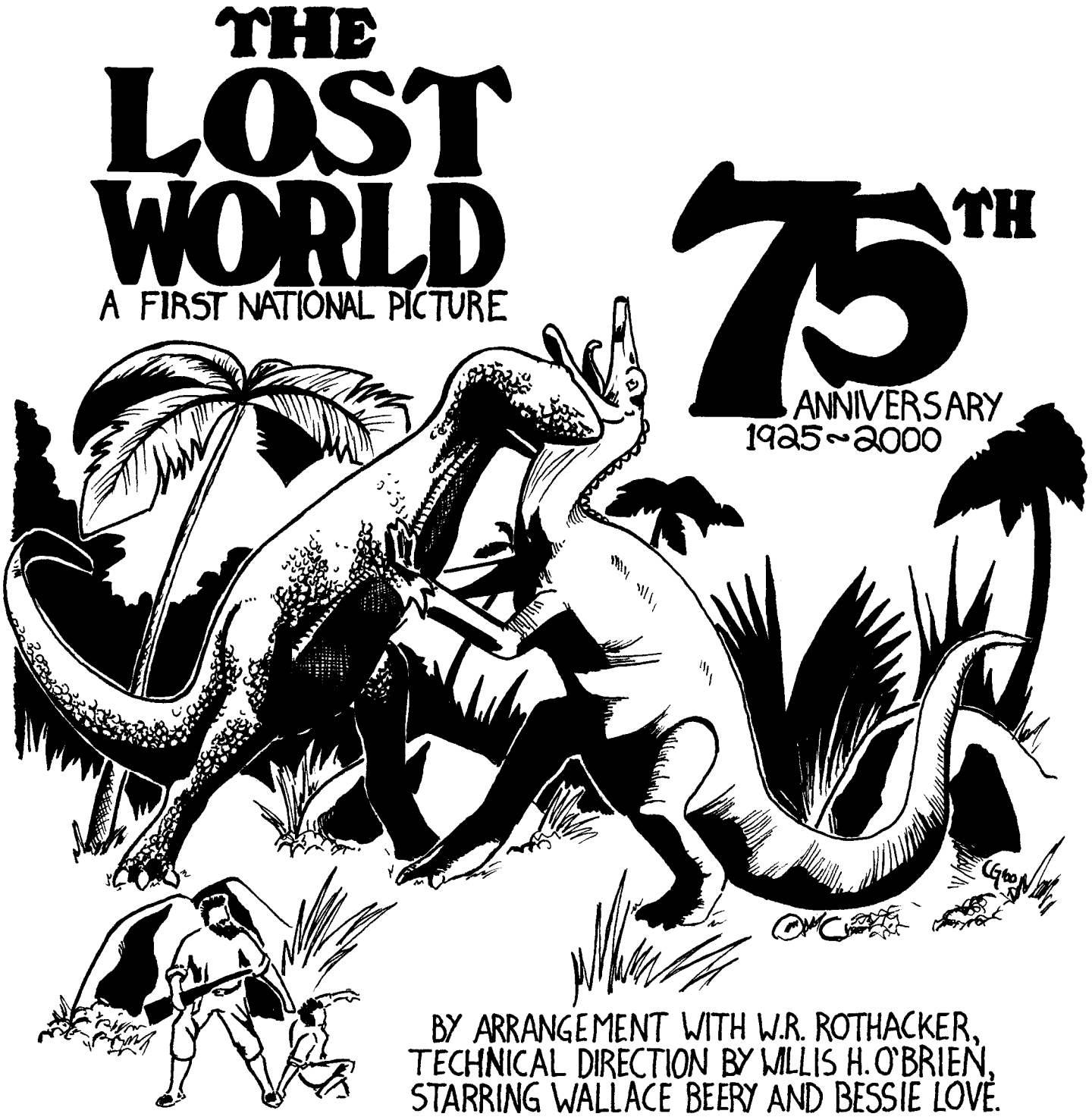

ALBERTA PALÆONTOLOGICAL SOCIETY

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

a. Promote the science of palæontology 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 palæontological collections of the province (preserve Alberta's heritage).

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

Single membership	$15.00 annually
Family or Institution	$20.00 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 Richard Road SW, Calgary, Alberta

June, July, August, 2000—No meetings. See field trip updates, Page 2.
September 15, 2000—Topic to be announced. Bring your finds and photos from your summer adventures!
Dates for upcoming meetings—2000: September 15, October 20, November 17, December 15.
2001: January 19, February 23, March 16, April 20, May 25.

ON THE COVER: *Commemorating the 75th Anniversary of the first dinosaur action film,* The Lost World. See story on Page 11. Art by APS Member Cory Gross © 2000.

2000 Field Trip Updates

by Keith Mychaluk

June 21–25, 2000 (Wednesday thru Sunday) Hell Creek and Glendive, Montana

Due to the delay in publishing the *Bulletin*, this trip will already have commenced by time you read this. Hope you enjoyed the trip!

July 15 and 16, 2000 (Saturday and Sunday) Onefour, Alberta

Meet in front of the Manyberries hotel, in Manyberries, Alberta, at 10:00 A.M., July 15. We will caravan out of Manyberries at 10:15 A.M. sharp. Different sites will be visited on Saturday and Sunday.

To aid in carpool arrangements, the following people are registered for the trip: **Peter Meyer, Sam Richter, Phil Benham, Mark Farmer, George Madge, Cameron Laurion, Evans family, Coutts family, Les Adler, Roslyn Osztian, Ron Fortier, Wendy Morrison, Vaclav & Mona Marsovsky, Geoff Barrett, Harry Cornwell, Ron Manz, Herb Treslove, Wayne Braunberger, Darrell Nordby, Marilyn Francis.**

August 19, 2000 (Saturday) Jura Creek, near Canmore, Alberta

Meeting time is 10:00 A.M., at the parking lot beside Seebe Dam. Travelling west on the Trans-Canada Highway, turn north (right) at the Seebe/Bow Valley Provincial Park/Rafter Six/Yamnuska Centre exit (Highway 1X interchange, between K-Country and Canmore). The dam is on the right (east) side of Highway 1X, on the Bow River. If you reach Highway 1A, you've gone too far. We will carpool from the dam parking lot to Jura Creek, where we will have to park on the side of Highway 1A, near the hamlet of Exshaw.

To aid in carpool arrangements, the following people are registered for the trip: **Peter Meyer, Sam Richter, Mark Farmer, Evans family, Coutts family, Les Adler, Roslyn Osztian, Ron Fortier, Wendy Morrison, Vaclav & Mona Marsovsky, Dan Quinsey, Paul Piovoso, Kathy Higgins, Herb Treslove, Wayne Braunberger, Darrell Nordby.**

August 20, 2000 (Sunday) Mount Stephen Trilobite Beds

We will **depart** from the Yoho Brothers Trading Post, in Field, BC at 10:00 A.M. MST. **Please arrive early.** The Trading Post is at the corner of the Trans-Canada Highway and the main entrance to Field. Estimated return time is 4:30 P.M. **Do not attend this trip if you are not in good physical shape.** The elevation gain during this hike is 520 m (1700 feet), with a round trip distance of 6 km (3.6 miles). Although shorter in length than last year's Burgess Shale hike, the hike up Mt. Stephen is extremely steep. **For more information check out www.burgess-shale.bc.ca on the internet.**

To aid in carpool arrangements, the following people are registered for the trip: **Peter Meyer, Mark Farmer, Marilyn Francis, George Madge, Wayne Braunberger.**

September 16 and 17, 2000 (Saturday and Sunday) Ghost River, Alberta

This is an exploration field trip to the Ghost River area, downstream from Lake Minnewanka, west of Cochrane, Alberta. Broken fragments of Cambrian-aged trilobites have been reported from this area in old literature (written by Charles Walcott himself!). As well, isolated exposures of the Yahatinda Formation (Devonian) have yielded very rare plant and vertebrate remains. There are no guarantees of finding any material on this trip.

Also, **please note that steep climbs** may be required to reach some of the outcrops. As such, **this trip is recommended only for those who are in good physical shape and may not be appropriate for children**. Cost: $5.00 per membership. No group size limit, but **please register with Keith!** Meeting time is 9:00 A.M., at the Cochrane Ranche historical site, on the northwest side of Cochrane, off Highway 1A. We will carpool from Cochrane to the Ghost River site, approximately 20–30 minutes, on mainly gravel roads. Meeting time and place for Sunday will be announced on Saturday. Details are tentative, so keep in touch with Keith.

To aid in carpool arrangements, the following people are registered for the trip: **Phil Benham, Wendy Morrison, Roslyn Osztian, Marilyn Francis, George Madge, Mark Farmer, Vaclav & Mona Marsovsky, Ron Fortier, Wayne Braunberger, Paul Piovoso, Kris Vasudevan, Darrell Nordby**.

Contact Keith Mychaluk (403) 228-3211 for more information on all trips. ❑

Archaeology club planning "Rock Art" field trip

The Archeology Society of Alberta will be running a field trip on August 26 (alternate date, Sept. 9) from 9:00 A.M. to 4:00 P.M. to the Okotoks area, entitled "Rock Art." The trip will be led by Dr. Brian Vivian of the University of Calgary. For more information contact P. Diane van Iderstine, Box 20, Site 5, RR1, Cochrane, AB, T0L 0W0 (email: 41451805@3web.net). ❑

B.C. Societies' 2000 Field Trips

Our Events Coordinator, Keith Mychaluk, has been in touch with a member of the British Columbia Paleontological Alliance, and has received a list of summer field trips scheduled by the various member societies in B.C. **Please be aware that membership in the respective society will be required prior to attending field trips!**

July 2 (tentative): VicPS*, Gabriola Island.
July 7–9: VIPS, Port Hardy (Vancouver Island).
July 21–26: VanPS, Oregon & Washington, USA
July 29–30: VicPS, Puntledge River (Van. Is.)
Aug. 30–Sept. 4: VanPS, Cranbrook, B.C.
Oct. 21–22: VanPS, Princeton, B.C.

*Society addresses:

VanPS: Vancouver Paleontological Society
Centrepoint Post Office, Box 19653
Vancouver, BC, V8T 4E7
www3.bc.sympatico.ca/VanPS/

VIPS: Vancouver Island Paleontological Society
P.O. Box 3142
Courtenay, BC, V9N 1E9

VicPS: Victoria Paleontological Society
318 Niagara Street
Victoria, BC, V8V 1G6 ❑

Program Summary

March 17, 2000
Fossil eggs: what can they tell us?
With APS member Darla Zelenitsky, University of Calgary.

by Mona Marsovsky

Biographical Notes

Darla Zelenitsky earned her Bachelor's Degree in Geology at the University of Manitoba and her Master's degree at the University of Calgary. Darla is currently a PhD student at the University of Calgary under the supervision of Dr. Philip Currie. In 1993, during the course of her master's research, Darla met Dr. Karl F. Hirsch, a world authority on dinosaur eggs. They began working closely together on her M.Sc. research and on additional projects related to fossil eggs. They were able to co-author three papers in popular books and scientific journals. During the course of her PhD., Darla has been working on fossil eggs and embryos from Mongolia, China, South Korea, South Africa, Tanzania, Alberta, Montana, Utah and Colorado. Her research interests include egg taxonomy and cladistics, egg biomechanics, nesting behavior and dinosaur ontogeny. [*Notes provided by Dr. Kris Vasudevan*]

The first dinosaur eggs were found in the 1880s in southern France. These were later identified as being eggs from sauropods. There have been over 200 egg localities found around the world, most of them discovered in the last fifteen years. Ms. Zelenitsky showed slides of the following egg sites and their prepared clutches:

- Northern Montana, Upper Cretaceous, Two Medicine Formation.
- Devil's Coulee in southern Alberta in the Upper Cretaceous Oldman Formation (75 million years old).
- Utah, Lower Cretaceous Cedar Mountain Formation (110 million years old)—theropod egg shells.
- Colorado, Upper Jurassic Morrison Formation—the oldest dinosaur eggs found so far (150 million years old).
- Northern Spain, Late Cretaceous (Maastrichtian).
- South Korea, Lower Cretaceous—nine sites, all found last year.

Dinosaurs, like birds, have hard egg shells, consisting of an inner organic layer and an outer hard layer. The outer layer units interlock. Each unit is

separated by a pore canal that allows the exchange of oxygen and carbon dioxide. Seven different structures of eggs have been identified; however, which egg belongs to which type of dinosaur is a mystery unless embryos are found in the egg or an adult has been found in close association with the eggs. Ms. Zelenitsky presented slides showing the magnified radial cross section of each type. Now many of the egg-layers (i.e. the dinosaur family) can be identified by the egg shell type.

Lambeosaur (crested hadrosaur) eggs have been found in Alberta and Montana. These large eggs (18 centimetres in diameter and 4.5 litres in volume) have a thin (1 mm) eggshell. The eggs are laid one layer deep. Unfortunately these eggs have been altered during fossilization.

Hadrosaur eggs have been found in China, Mongolia, Alberta and Montana (with embryos). These spherical eggs are about half of the diameter and one eighth of the volume of the lambeosaur eggs. Hadrosaur eggs are porous, suggesting that they were laid in mounds, covered by vegetation or soil. The large food supply required by adult hadrosaurs probably meant that constant tending of the nest would be impractical.

Sauropod eggs have been discovered in Argentina (including embryos), France, India and Spain. These eggs are spherical with very porous shell material. In the nest, eggs are stacked on top of each other and were probably covered by vegetation or sediment.

Allosaurid egg sites are known in Colorado and Portugal (supposedly including embryos, although this may be suspect). These eggs are elongate, without external ornamentation and laid in a circle. The circular site has a centre opening where perhaps the animal stood to lay its eggs as it pivoted around.

Therizinosaur eggs have been found in China (including embryos), Mongolia and South Korea. These porous, spherical eggs were laid in stacked nests.

Oviraptorosaur eggs have been discovered in China (including embryos), Mongolia (including embryos), South Korea and Utah. The Oviraptorosaur eggs are very long, highly ornamented, but not very porous. The ornamentation on the outside of the egg could have served to prevent dirt from plugging the pores. Non-porous eggs indicate that the egg was incubated in air. The finding of an adult oviraptor lying over her eggs indicates that perhaps these dinosaurs brooded their eggs, like birds do. Hunan province in China has yielded hundreds of thousands of these eggs. Some are 40 to 45 centimetres long, located in a nest that is two metres in diameter.

Tröodontid eggs have been found in China, Mongolia (with embryos) and Alberta. These elongated eggs resemble those of oviraptorosaurs. Eggs stood on end in a circular nest. There is not much ornamentation on the shell.

Darla noted that eggs can be used to show relationships between families of dinosaurs. She showed that eggs have still not been identified for several families. If the current rate of discovery over the last ten years continues, the missing pieces will soon be put into place.

April 14, 2000
Breaking symmetry: phylogenetic patterns of asymmetry variation in animals and their evolutionary significance.
With Dr. Rich Palmer, University of Alberta.

by Mona Marsovsky

Biographical Notes

Dr. Palmer earned his PhD in Zoology in 1980 at the University of Washington in Seattle. He was the 76th President of the Western Society of Naturalists (1995). Dr. Palmer was also an invited participant at the US National Academy of Sciences Colloquium. He is currently on the editorial board of the American Malacological Bulletin (1990 to present) and was the Associate Editor of Evolution *(1992 – 1997). He is the Canadian Representative on the International Biotest Committee (1989 to present).* [*Notes provided by Dr. Rich Palmer.*]

At the April 14, 2000 APS meeting, members got a chance to learn about the origins of asymmetry from Professor Rich Palmer of the Department of Biological Sciences of the University of Alberta.

Dr. Palmer said that there are two views on evolution:

1) Random genetic mutations allow some individuals to be more successful than the rest, allowing them to pass these genetic mutations to their offspring; commonly called Darwinian evolution
2) Some novel forms arise due to the way that organisms respond to their environment; called "Genetic Assimilation" (Waddington, 1942).

Dr. Palmer showed that asymmetry seems to be influenced by the environment. The "breaking" of symmetry appears to happen in some instances in

the egg cytoplasm while in other cases the "breaking" occurs later in development, due to the effects of the external environment. He showed how the claws of crabs through several generations could be affected by the food given to them. Hard food resulted in a large crusher claw. Similarly, the scent of crabs—predators—could increase the thickness of snail shells compared to those snails in an environment that lacked crabs.

In fruit flies (*Drosophila*), a species known for the ease at which traits can be genetically altered by breeding, researchers have been unsuccessful at forcing asymmetry.

Dr. Palmer showed numerous examples of plant and animal species that were either:

a) Symmetric

b) Asymmetric, but half of the species has the asymmetry on one side, while the other half has the asymmetry on its other half (e.g. a narwhal's one tooth elongates to form its tusk, while the other tooth remains a normal size).

c) Asymmetric only on one side.

Dr. Palmer concluded with the assertion that the environment has an important role in influencing asymmetry.

May 19, 2000
A Review of the Evolutionary History and Diversity of the Vertebrates, Part 4: Class Osteichthyes (the Bony Fishes).
With APS member Dr. Gerry Morgan.

by Mona Marsovsky

Biographical Notes

A long-time APS member, Dr. Gerry Morgan completed three years of study in zoology at the Kings College of London University, before being called up for service with the Royal Air Force. After serving the required two years, Gerry became a technical author on computer hardware. He then completed a degree in Geology and a Ph.D. in Geophysics (the latter from the Imperial College of London University). He earned a postdoctoral scholarship in geophysics at Leeds University, before he joined Gulf Canada as a geophysicist, in Calgary. After seventeen years with Gulf Canada, Gerry moved to Petro Canada, where he has been working for the past three years.[*Notes provided by Dr. Gerry Morgan.*]

Gerry reviewed the evolution of fishes in general, starting from the earliest, the Agnatha (jawless fishes), that became mostly extinct at the end of the Devonian; the Placoderms (armored fishes) were dominant in the Devonian; the Acanthodii (spiny sharks) existed from the Silurian until the mid Permian; the Chondrichthyes (cartilaginous fishes) appeared at the end of the Devonian and are still with us today. Three thousand species (including rays and sharks) represent this class, which is characterized by its lack of bone and lack of both lungs and a swim bladder.

The Osteichthyes first appeared in the Middle Devonian and increased in diversity to their present level of 23,000 to 24,000 species. The major breakthrough for the Osteichthyes occurred at the end of the Cretaceous at which time—within 20 million years—they spread into every habitat, both marine and fresh water. The class Osteichthyes is the largest and most diverse of all fish groups and contains more species than the rest of the vertebrates combined. This class is characterized by a partly bony skeleton, either lungs or swim bladder and lighter and different scales than other fishes.

There are two subclasses in the bony fish class, namely the Actinopterygii (ray finned fishes, which make up more than 99% of all fishes) and Sarcopterygii (lobe or fleshy finned fishes). The Actinopterygii have fins that lack muscles. These fish lack internal nostrils. The Sarcopterygii have internal nostrils that connect the back of the mouth with nasal sacs, so that these fish can breathe through their nose or mouth. In their fins, the lobe finned fishes have a central axis of bones, complete with muscles. It was the lobe finned fishes that gave rise to land vertebrates during the Devonian.

In the interests of time, Dr. Morgan limited his discussion to the most numerous fishes, the Actinopterygii (ray finned fishes), promising to describe the Sarcopterygii to APS members at a later time.

Ray finned fishes are differentiated by their scales and their tail fins. Scales consists of three layers: a bottom bone layer, a middle cosmoid layer and an overlying ganoid layer (shiny enamel). Scales have evolved from having a thick ganoid layer to becoming thinner and thinner, until the cosmoid layer and finally the ganoid layer have been all but lost. Vertebrae extended right to the tip of the tail in the earliest fishes, making the tail asymmetrical. This tended to add lift to the fish, possibly to counteract the weight of their heavy scales. Later, the vertebrae retreated from the tail, producing a more symmetrical tail.

The three main groups of this subclass are as follows:

1. Chondrostei—the most primitive, arose in the mid Devonian and peaked in the Permian and

Triassic. Most became extinct at the start of the Cretaceous.

2. Holostei—intermediate, arose in the Permian to decline at the start of the Late Cretaceous.

3. Teleostei—advanced, arose in the Triassic and increased drastically in the Late Cretaceous.

The current thought is that the Holostei evolved into the Teleostei, and so these two groups are lumped into one group, the Neopterygii.

The Chondrostei have long mouths in which the jaw articulates well behind the eye. They have a single dorsal fin, thick shiny ganoine scales and a very asymmetrical tail. Three species still exist: the paddlefish (*Polyodon*), which has an air bladder but no lungs and most of the skeleton is bone; the birchir (*Polypterus*), a tropical lake fish which has to breathe air from the surface using its ventral lungs; and the sturgeon (*Acipenser*), which has an air bladder and a mainly bony skeleton.

The Holostei have a more symmetrical tail fin than the Chondrostei and their jaw articulates in front of the eyes. Their scales are thinner, but a ganoid layer still exists. Only two species live today. The garpike (*Lepisosteus*) has lived in North American rivers since the Late Cretaceous. Its tail is almost symmetrical and it has thick ganoid scales. The bowfin (*Amia*), also found in North American rivers and lakes, has thinner scales and a symmetrical tail. Its family arose in the Jurassic.

The Teleostei underwent an explosive radiation during the first 20 million years of the Tertiary. By the end of the Eocene, most of the teleost groups had appeared and most of these fishes already had their modern appearance. The Teleostei tail fin looks symmetrical. They have shorter jaws and thinner scales, in which the ganoid and cosmoid layers have been lost. Their skeleton contains more bone than other fishes. The Teleostei have evolved into 25,000 species in 500 families. Of these, 400 families live today. They have been classified into nine superorders and thirty orders. A few of the more important superorders are listed here:

Leptolepomorphia are the most primitive, possibly the root of the Teleostei, still with a trace of ganoid in their scales and a part of the vertebrae in the tail fin. Elopomorphia led to the eels, which have a long body with one large fin (where several fins fused together). Ganoine is missing from their scales, and they have a very specialized mouth. Clupeomorphia and Salmoniformes, include salmon, herring and trout. The Ostariophysi have 6000 species, all live in fresh water and include minnows, carp and catfish. These have the best hearing of the fishes due to their weberian ossicles (vertebrae bones have connected the air bladder to the inner ear). Acanthopterygii, the spiny finned fishes, are considered to be the most advanced with representation from over 15,000 species. Their fins (especially the dorsal fin) are supported by hard spines. Their pelvic fins are far forward, even in front of their pectoral fins. The pectoral fins are higher on the body. This group did not appear until the Late Cretaceous. Included in this group are perch (*Perca*), sea horses, globefish, flying fish, flounder and the huge ocean sunfish (2.5 metres across and weighing 900 kilograms).

Gerry concluded by summarizing the evolution of ray finned fishes (Actinopterygii). Heavy scales became thinner, the tail became more symmetrical, the pelvic fin moved forward, the mouth became smaller and lungs became an air bladder that gave the fish neutral buoyancy. Some of these traits evolved separately in different groups of fish, showing parallel, convergent evolution in action. ❑

2000 Field Trip Report

by Keith Mychaluk

Korite Minerals and Canada Fossils workshops, Calgary (May 11)

On the evening of May 11, about 30 APS members enjoyed a behind-the-scenes tour of the Korite Minerals and Canada Fossils work shops in Calgary. **Pierre Pare**, now the president of both firms, was our host. (Pierre provided a selection of wine while our group was assembling: nice touch!)

Pierre first explained Canada Fossils' business as the exploration, excavation and restoration of fossils for sale to museums and private collectors. Among other things, Canada Fossils is currently focusing on dinosaur skeletons, mammoth tusks and ammonites. Pierre showed several photographs of dinosaur skeletons, excavated in Montana, that Canada Fossils had reconstructed and later sold (twenty one to date!). Unfortunately, they did not have a complete skeleton on hand. Pierre also described the steps required to restore several beautiful mammoth tusks (approximately 10,000 years old) that were on display. The fossil ivory tusks, some over 2 metres long, originated from Siberia, Alaska and the Yukon. Later Pierre proudly displayed some of the most vividly col-

ored ammonites (*Placenticeras*) I have ever seen from the Bearpaw Formation in southern Alberta.

Our group then moved to the adjacent building where Korite Minerals is located. Korite Minerals is the largest producer of ammolite jewellery in the world (ammolite being the brightly-coloured gem-quality portion of ammonite shells from southern Alberta). Pierre explained the tedious steps required to transform pieces of rough ammolite into a variety of jewellery pieces. The tour finished up in a room displaying some superb examples of ammolite jewellery as well as a variety of fossils and ammonites. ❑

Shell Fuels Discovery at the Royal Tyrrell Museum

[*RTMP press release, March 16, 2000*]

DRUMHELLER—The Royal Tyrrell Museum is pleased to announce the expansion and enhancement of two existing educational hands-on learning areas; the Shell Discovery Centre, located at the museum in Drumheller, and the Shell Discovery Van, an educational outreach vehicle.

This initiative has been made possible because of the generous financial support of Shell Canada Limited, who contributed $250,000 to fund the two areas.

"This partnership between Shell and the Royal Tyrrell Museum comes from a shared vision for the importance of developing science education that's more accessible," said Stan Woloshyn, Minister of Community Development. "We have the researchers and the educators. Now, thanks to Shell, we have the means to improve the delivery of our message both in the museum and to school communities around the province."

The Discovery Centre is a complete refit of the museum's former Discovery Room. Along with a new look, it will offer engaging, child-friendly activities and computer technology. The Discovery Van will be a mini-museum on wheels, equipped to move hands-on specimens, props and educators to classrooms across the province. The centre and the van will be operational April 29. The museum expects more than 315,000 people will be introduced to the new programs and activities in the coming year.

Shell Canada President and CEO Tim Faithfull is pleased that Shell is partnering with the museum to promote science education. "The Shell Discovery Centre will be a place where children and adults can come together to learn the key concepts palaeontologists use to unlock the mysteries of the past. It will feature some of the museum's world-renowned research and discoveries in a format that is both fun and educational." ❑

Palaeo Internet Sites Part 2

by Philip Benham and Mark Farmer

[*For this issue, we have a tag-team review of internet sites by two of our more enthusiastic surfers. Phil and Mark have rated the sites on a scale of 1 to 4 "dinos." –ed.*]

Phil writes…

In this instalment I cover the proliferating websites for clubs under the umbrella of the BC Paleontological Alliance, some Canadian fossil sites and a new website for "Willo, the dinosaur with a heart". Internet sites vary widely in quality and addresses come and go. I have tried to provide a selection of the best sites that are likely to last and some that I hope will last. If the address changes, try a keyword search. If you have suggestions for some interesting websites you can email me at **benhamp@cadvision.com**

Mark writes…

The internet runneth over with palaeo info, some of it useful, some dubious and some just plain weird. Here's a brief guide to some of my favourite links. Feel free to e-mail me your favourites at **mfarmer@calcna.ab.ca.** Enjoy!

http://www.dinodata.net/
Dino Data

When it's working, this site's an excellent reference for just about any dinosaur species you can think of. From the main screen, click on *DinoData*, then *Dinosaurs* to get info on the species of your choice. The data are cross-referenced, so you can find out which species appear in any given formation, country, epoch, class, etc. The site also features dino news, pictures and more.

The problem is reliability—it's spotty. But keep trying, because it's worth seeing the wealth of information this site has to offer.

Rating:  *(MF)*

http://www.cariboo.bc.ca/schs/chem/GEOL/BCPA.HTM

B.C. Paleontological Alliance Homepage

Like the APS, a series of clubs in British Columbia have brought together a mix of professional and amateur paleontologists. The BCPA promotes educational of the public and a responsible collection of fossils.

The regional Societies websites and addresses for membership applications are:

http://www.cariboo.bc.ca/schs/geol/tnps.htm
Thompson Nicola Paleontological Society (TNPS)
Chair: Ken Klein, Kamloops.
University College of the Cariboo,
P.O. Box 3010, Kamloops, V2C 5N3

Vancouver Island Paleontological Society (VIPS)
Chair: Dirk Meckert, Courtenay.
Membership Secretary:
P.O. Box 3142, Courtenay, V9N 1E9

http://www3.bc.sympatico.ca/VanPS/
Vancouver Paleontological Society (VanPS)
Chair: Karen Lund, Vancouver.
Membership Secretary:
Centerpoint P.O., Box 19653, Vancouver, V8T 4E7

Vancouver Island Paleontological Museum Society (VIPMS)
Chair: Graham Beard, Qualicum Beach.
Membership Secretary:
151 West Sunningdale, Qualicum Beach, V9K 1K7

Victoria Paleontological Society (VicPS)
Chair: Tom Cockburn, Saanichton
Membership Secretary:
318 Niagara Street, Victoria, V8V 1G6

http://www.highway16.com/paleo/
Northern BC Paleontological Society
President: Bob Campbell

Rating: *(PB)*

http://www.dinosaur.org/frontpage.html

The Dinosaur Interplanetary Gazette

Sort of the *Calgary Sun* of dinosaur news. Flashy, entertaining, if short on hard data up front. Check out the Dinosaur News section for the latest dirt. Also features lighter fare: cartoons, jokes and "DNN: the Dinosaur News Network." Meatier sections include dinosaurs in the news, regular columns, message boards, classified ads, and book and movie reviews.

The one strike against this site is page length: instead of putting information on a number of pages, it's concentrated on a few very long pages. This can make loading and navigating the pages a little tiresome.

Rating: *(MF)*

http://www.island.net/~rolfl/

DIRT (Denman Institute for Research on Trilobites)

This organization is run by Rolf Ludvigsen, editor of Life in Stone and co-writer of West Coast Fossils, two excellent BC palaeontological publications.

Rating: *(PB)*

http://www.boscarelli.com/

Bosco's Rockpile

An interesting catch-all site. Check out the exhaustive extinction theories section. Considering it was put together by a private individual, it's quite impressive. The links sections (*Paleontology*, *Pebble Pile*, *Favorite Links*, *Dinosaur Links*) are huge. For that reason alone, this site should be your first stop if you're looking to link to other palaeo sites.

Rating: *(MF)*

http://www.best.com/~atta/taxonomy.html

Curiosities of Biological Nomenclature

Ever wonder what some of the unpronounceable Latin names mean? This site discusses proper usage of terminology. Perhaps most entertaining is a comprehensive list of official but unusual names that are scientifically valid. Examples include *Godzillius* (a large crustacean), *Disaster* (an echinoid) and *Ba humbugi* (Fijiian snail from the island of Mba).

Rating: *1/2* *(PB)*

http://www.dinosauricon.com/main/index.html

The Dinosauricon

Another catch-all site. The impressive art gallery, featuring over 600 images, is reason alone to visit. The site also boasts a large index of dinosaurs classified by genus, a breakdown of all dinosaurs classes showing their relationships, and a monster cladogram of all dinosaurs (or at least a whack of them). Check out the great graphic depicting the periods, epochs and ages of the Mesozoic (click on *Ages of the Mesozoic* at the top of the page).

Rating: *(MF)*

http://www.avalonworlds.com/rlcst/index2.html
Lake Temiscamingue Fossil Centre

Notre Dame du Nord, Quebec: focuses on flora and fauna from the Ordovician and Silurian as well as other activities available when visiting the area.

Rating: *(PB)*

http://www.EnchantedLearning.com/subjects/dinosaurs/index.html
Enchanted Learning Software's Zoom Dinosaurs

Information for all ages, but principally for 6 to 15 year-olds. That said, my 29-year-old self keeps going back for the entertaining, easily digestible information. The site has enough info to keep older kids interested, but features colourful pictures, simple language and an easy-to-use interface for younger kids. Click on *Dino Info Sheets* on the left-hand side to get information on specific species, including anatomy, diet, behaviour and an interesting diagram showing relative "intelligence."

Rating: *(MF)*

http://www.ednet.ns.ca/educ/museum/fossils/
Fossils of Nova Scotia.

This Nova Scotia Museum site covers some of the palaeontological highlights of the province, such as early dinosaurs at Parrsboro and amazing Carboniferous trees at Joggins. It also discusses provincial collection laws and important historical figures in palaeontology and gives you a virtual tour of the major paleo sites. Excellent photos of Nova Scotia fossils.

Rating: *1/2* *(PB)*

http://www.ucmp.berkeley.edu/
The Museum of Paleontology at the University of California, Berkeley

Excellent site for invertebrates: morphology, fossil record, ecology, systematics, etc. Click *Phylogeny* under *On-Line Exhibits*, then click the *Any Taxon* button at the bottom of the page. From here you can explore any kingdom of life on earth.

Rating: *(MF)*

http://www.pacificcoast.net/~beg/sw/sw4.html
Michael Skrepnick's dinosaur art homepage

A glimpse at the work of a local professional artist and APS member.

Rating: *1/2* *(PB)*

http://www.fossilhut.com/
Missing Link Fossil Enterprises/Bill's Fossil Hut

Based in Qualicum Beach on Vancouver Island, Bill Hessin provides a good set of pictures of Canadian fossils and offers fossil cleaning and preparation services. He has for sale a variety of carefully prepared specimens, replicas, books and art. If you are visiting Vancouver Island, I highly recommend a visit but at the very least stop by for an electronic visit. Bill also does museum quality fossil preparation for those of you without the time, skill or inclination.

Rating: *(PB)*

sci.bio.paleontology

Not a website—a usegroup. Here folks engage in on-line discussions about all aspects of ancient life by e-mailing messages to a central server, with dozens of discussions happening at any given time. The quality of discussion varies widely from topic to topic. Some are scholarly, some not-so-scholarly. Some people are easy-going, some cranky and some just plain weird. That said, this is a highly addictive resource; discussions can get very heated, interesting and in-depth.

The best advice is to "lurk" (read postings without posting yourself) for a while to get a sense of what discussions are like, what kind of responses you can expect, how to formulate your postings, etc.

Rating: *(MF)*

alt.dinosaur

Another usegroup. I avoid this one, because it isn't nearly as scholarly as sci.bio.paleontology. Discussions tend to be about "Jurassic Park" as often as palaeontology, and can be trivial and rather weird. Approach with caution.

Rating: *(MF)*

sci.bio.evolution

This usegroup is interesting for the breadth of discussion. Anything to do with evolutionary biology, including theories, controversies, etc. Virtually no creationism noise to interfere with the discussion.

Rating: *(MF)*

http://www.dinoheart.org/
North Carolina Museum of Sciences

Website on the recent discovery of "Willo," a

66 million year old dinosaur that was found preserved with a heart, cartilage and tendons. This *Thescelosaurus* specimen was recovered from South Dakota. Its advanced four chambered heart is strong supporting evidence for the warm blooded nature of dinosaurs. Check out the great photographs and the details on the find of the year. Remains of the plant eating *Thescelosaurus* have been reported from Alberta and palaeontologist Dale Russell provides a further Canadian connection to this story.

Rating: *(PB)*

http://gallery.in-tch.com/~earthhistory/
Earth History Illustrations

National Geographic artist Douglas Henderson has created an online book of his paintings of the history of life. Incredible paleo paintings.

Rating: *(PB)*

http://www.mammothsite.com/
Hot Springs South Dakota Mammoth Site

Around 26,000 years ago a local sinkhole was the doom of a number of mammoths. Details on the excavation and lists of the variety of vertebrates uncovered. Virtual tour provided.

Rating: *1/2* *(PB)*

http://sciencematters.com/prehistoric/
Science Matters

Science news site with a section focussing on the palaeontological.

Rating: *1/2* *(PB)*

http://www.coloradomtn.edu/campus_rfl/staff_rfl/kohls/eocene.html
Dave's Eocene Fossils

Picture gallery of plants and insects from the 48 million year old Eocene Green River Shales in north-west Colorado and Wyoming. Compare with flora and fauna of similar age in the BC Interior.

Rating: *(PB)* ❑

Bookmark our new website!
www.albertapaleo.org

Review

by Les Adler

The Rise of Life on Earth: Messel—Window on an Ancient World by Hillel J. Hoffman, photographs by Jonathan Blair, art by Christopher A. Klein and Mark Hallett. *National Geographic*, February 2000, p. 34–51.

This fossil site is an abandoned mine pit in the German town of Messel, a half-hour journey from downtown Frankfurt. The oil shale is 40% water and 15% decayed aquatic algae. Workers look for fossils by breaking open the layers like pages in a book. Most pieces are blank with the empty slabs being thrown onto piles. Fossils are stored in water and then transferred to epoxy resin.

Many fossils are found whole in repose with soft tissues being preserved in dark outline. Researchers feel as if they are working with living animals. Millions of cubic metres of oil shale remains to be excavated. In 1995 this site was declared a World Heritage Site by UNESCO, capturing a moment in time in the Eocene Epoch, 49 million years ago.

Here is a selection of some of the remarkably detailed photographs (you automatically become a privileged person if you see these): a bird's banded feathers; a frog's eyeballs; the internal organs of a mammal; a pair of turtles; a bowfin fish; a complete crocodile; a complete bat; representative berries, pollen grains and a legume leaf selected from fossils of some 60 families of plants; the carapace of a stag beetle, with the metallic greens and blues preserved.

Detailed comments on the horses and bats are provided and a composite ecosystem has been painted with numerous birds, mammals, insects, snakes, plants and seeds. ❑

Welcome new members!

Lyle Hartwig, Calgary, AB
Dane McArthur, Calgary, AB
Pierre Pare, Calgary, AB
Dr. Richard Palmer, Edmonton, AB
Jill Simpson & Michael Knisley, Calgary, AB
Gerald Vogels, Calgary, AB
Yoho Burgess Shale Foundation, Field, BC ❑

The Lost World Celebrates 75 Years

By Cory Gross

Celebrating its 75th anniversary this year is *The Lost World*, the 1925 black-and-white silent classic and seminal dinosaur film. Based on the Sir Arthur Conan Doyle novel of the same name, it was produced by William R. Rothacker and featured special effects by Willis O'Brien, of *King Kong* fame.

The movie opens with reporter Edward Malone coming into the company of Professor George Edward Challenger (though not before taking a few bruises), who has been making some astounding claims. Based on the testimony of one Paula White, Challenger has been asserting the existence of a hidden plateau in South America where the laws of natural selection have been suspended and dinosaurs still reign. Coaxed by the incredulity of Professor Summerlee, Challenger has prepared an expedition into the Amazon in search of this plateau. Challenger's expedition includes himself, Summerlee, explorer and friend Lord John Roxton, Malone, and Paula White. This mission is even more personal for Miss White: it was her father, Maple White, who discovered and was subsequently lost on the plateau.

Upon reaching the plateau, the company of explorers (and the viewer) are treated to a visual feast of prehistoric life. Unfortunately, it does not come until after they are stranded on the tableland by a feisty brontosaur. But during their tenure, they witness many a marauding allosaur, a villainous ape man, and a cataclysmic volcanic eruption. Fortunately, they are able to make it off the plateau and bring a not-so-little something back with them.

At one million dollars, *The Lost World* was one of the most expensive movies made at that time, and wowed the audiences with its realism, which audiences of today scoff at as "cheesy." It had attacking pterodactyls, nature red-in-tooth-and-claw, lots of guns, a dinosaur stampede, a new lady-love character invented by the producer, and a dinosaur running amok in civilization… everything one could want in a dinosaur movie! Conan Doyle himself loved it, even though it wasn't quite what he had written.

Without a doubt, the full weight of this achievement in prehistoric cinema belongs to special effects artist Willis O'Brien. Taking note of O'Brien's stop motion technique used in humorous shorts for Thomas Edison's film company and the short film *The Ghost of Slumber Mountain*, Watterson Rothacker called the young man in to apply his technique to Conan Doyle's tale. Teaming up with sculptor Marcel Delgado, they built and animated over 50 dinosaur models. The magnificent dinosaur stampede in the film required a miniature set that was 150 feet long. The dinosaurs O'Brien and Delgado created were so realistic that Conan Doyle brought a reel of the film to show the Society of American Magicians, and it indeed fooled them all into believing dinosaurs did still walk the Earth.

Unfortunately, time was good to neither O'Brien's models or the movie they starred in. Some of the stop-motion models from 1925 still survive—albeit in a somewhat dessicated form thanks to the quality of rubber used—in the mansion/sci-fi museum of Mr. Science-Fiction, Forrest J. Ackerman. The movie itself suffered a worse fate that has thankfully been turned around in recent years. Over the years, much of the original film was lost as it changed owners who sought to use the film for different ends. Much of the original material was cut out, either for the sake of time or interest (much of the film was lost when the human live action sequences were disposed of in favour of dinosaur shots). For some time it looked as though the film's full original length of over an hour and a half was lost entirely. However, a new set of negatives was found in Czechoslovakia (of all places) and was bought by the George Eastman House. They then proceeded to restore the film to the best of their ability.

Much of the original film was lost… however, a new set of negatives was found in Czechoslovakia (of all places)

The original 1925 version of *The Lost World* was the first major "live" dinosaur film. Many films that came after are directly influenced by it (*The Land Unknown*, *The Lost World: Jurassic Park*), and ALL dinosaur films owe a debt to this classic.

Besides that, *The Lost World* also holds another historical record. It became the world's first "in-flight" movie when the German Air Service Company premiered it on Feb. 4th, 1926 during a flight over Berlin. ❑

Amazing Fossils

Indiana discovery reveals life from 3 to 6 million years ago

By Steve Kash

[*APS member* **Fred Lewis**, *of Carmel, Indiana, who sent in this article, writes that he participated in the excavation of this remarkable find, and wishes to share the results with our membership.–ed.*]

During the first 14 days of June 1998, paleobiologist Ron Richards and a crew of Indiana State Museum staff and volunteers worked diligently in chilly, rain-soaked weather to recover bones and plant material from piles of sediment that had been isolated by workers in a Grant County quarry.

The partial jaw of an ancestral bear, tooth fragments of rhinoceros, shell fragments of giant tortoise and the abundant remains of turtles, frogs, snakes and small mammals saw light for the first time in millions of years.

The discovery of ancient bones of creatures that inhabited Indiana millions of years ago changed the geologic time scale that had been used for more than 130 years.

When Jason Greer and Dick Huffman set off for their job site with a dump truck and a backhoe on June 21, 1996 they thought they were headed for just another day of work at Irving Materials Inc.'s Pipe Creek Junior Quarry near Swayzee.

Their assignment was to prepare bedrock for eventual drilling and blasting by cleaning dirt-like sediment out of an unexpected 200-foot wide, 30-foot deep sinkhole that had been found in the bedrock 15 feet below the ground's surface.

Little did the two quarrymen realize that before the day was done their dump truck would be filled with perhaps the most priceless sediment ever scooped up from Indiana's landscape.

As excavation neared completion in the late afternoon, while backhoe operator Huffman was talking with his supervisor Ray Rich, he spotted something that caught his eye in the pile of loose debris he had been removing. Immediately he shouted on his radio to co-worker Greer, whom he knew to be an amateur fossil and artifact hunter.

"Jason, I'm finding bones. Come down here and look."

"As soon as I heard Dick on the radio, I knew the bones would be old because they were so deep," Greer recalls. "I just didn't realize how old. I thought they might be 15,000 years old or so from back in the glacial ages."

Greer promptly told plant superintendent Ron Lewis about their find. After Lewis came down to the sink-hole site and saw the bones, Greer requested that they dump the bone-bearing debris on an isolated area so it could be properly studied.

Lewis agreed, and by doing so set in motion a series of events that gained the attention of geologists throughout the United States. The special sediment was to open a time window far into the past.

Within a few days Irving Materials' geologist Jon Havens and Dr. Jack Sunderman, a retired geology professor at Indiana-Purdue University in Fort Wayne, were on the scene doing a preliminary analysis of fossil materials that would come to include large and small animals as well as plant fossils.

Initially their findings included numerous frog, turtle and rodent bones, and a few tantalizing bones of bigger animals.

The remains of the larger animals turned out to be the toe of an 8-foot-tall camel, the foot bone of a pig-like animal called a peccary, and parts of a land tortoise similar to the kind found on the Galapagos Islands in the Pacific Ocean near the equator.

Preliminary investigation convinced the scientists that the ancient fossils were older than Ice Age deposits.

Sunderman quickly became intrigued by sinkhole sediments that were not part of the glacial drift swept down into Indiana from Canada. Striking masses of bright red clays suggested long weathering and warmer climate, but what most aroused Sunderman's curiosity was the presence throughout the sinkhole of numerous rounded and smoothed quartzite pebbles.

The quartzite would be a key clue to determining the relative age of the finds in the sinkhole. Sunderman knew there was no possible Indiana source for this quartzite. He reasoned that the distinctive pebbles had been transported to Indiana before the first Ice Age more than two million years ago during the late Tertiary period of geologic time. Sunderman believed the most likely source of the pebbles was along the western flank of the Blue Ridge Mountains.

A preglacial Tertiary Period river called the Teays that was at least the size of the modern-day Ohio could have transported the quartzite pebbles. The Teays crossed West Virginia, Ohio, Indiana

and eastern Illinois before draining into a primitive Mississippi River. In some places the Teays eventually cut a 400-foot deep channel into the bedrock of northern Indiana.

To investigate his beliefs, Sunderman took a trip with geology student John Koryl to one of the few visible remains of the ancient Teays, a valley west of Huntington, West Virginia. There they managed to find the same type of distinctive quartzite pebbles found in the Pipe Creek sinkhole.

By late February, 1997 the scientific inquiry into the fossil discoveries at the Pipe Creek sinkhole was underway. Dr. James Farlow, a paleontologist from Indiana-Purdue University in Fort Wayne, came to head the investigation. Soon more unusual bones were found, including one bone that turned out to be a rhinoceros tooth (the Pipe Creek sinkhole is the first place in the northeastern United States that the remains of either a camel or a rhinoceros have been found).

Eventually, scientists would identify other animal fossils, including remains of a small, extinct bear species, as well as fossil material from a bone-crushing, dog-like carnivore. Another fossil was identified as the remains of a songbird.

Farlow's investigation led to bones being analyzed by scientists from around the world. By comparing the bones at the sinkhole with other bones of the same species at sites where positive dating is possible, Farlow has concluded that the sediment in the sink-hole was deposited sometime between three million and six million years ago.

Prior to discovery of the sinkhole, there was an enormous evidence gap in Indiana's fossil history. Although there were glacial era findings dating back more than 100,000 years, the next findings had come from coal deposits 300,000,000 years ago—which was before the time of dinosaurs.

Sunderman believes the sinkhole began as a small cave in the surrounding bedrock. As the cave grew larger, the ceiling became thinner and eventually collapsed to form a sinkhole which became habitat for amphibians and reptiles such as frogs, turtles, tortoises and snakes, and a drinking hole for larger mammals.

Sunderman reasons that the distinctive quartzite pebbles and possibly some of the larger mammal fossils were washed into the sinkhole by local streams after the Teays River began to cut its deep bedrock valley across northern Indiana.

Dating of the sinkhole has been a perplexing scientific puzzle. "We're finding animal remains at the sinkhole not normally located in the same time frame at the same site," Farlow says. "The small rodent remains are characteristic of the Early Blancan Age of three to four million years ago, and the large animal remains are normally associated with the late Hempillian Age which took place five to six million years ago."

Farlow's challenges to dating are compounded because the sediment taken from the sinkhole appears to have formed during a relatively short period of years. He says that scientists don't know the exact time limits for these extinct species. He believes it is possible that the older species could have persisted longer in Indiana than in other places where they've been found, or that the younger species may have lived here earlier than they did elsewhere.

Curiously, the paleontologists have found few fish bones in the sinkhole debris, but they have found an abundance of pond turtles which suggest standing water was in the sinkhole most of the time. Farlow believes that fish bones being absent is a possible indication that on rare occasions the sinkhole dried up and could not support fish life.

According to Farlow, Indiana's climate was much warmer during the time the sinkhole was in existence than it is now. Many of the life forms inhabiting Indiana such as the giant tortoise and rhinoceros could not have withstood prolonged cold. The area around the sinkhole was similar to savanna parkland with temperatures in the range of those in Florida today, but the weather would have been much drier than Florida's modern climate.

During the life of the sinkhole, the Rocky Mountains and Appalachians had formed, and the Florida Peninsula was jutting out into the sea, but because the world was so warm, ocean levels were higher and North and South America were not yet connected. Meanwhile, in East Africa, the branch of primate which was to be the ancestor of modern humans was evolving into creatures ever more similar to ourselves.

When the earth's climate chilled during the Ice Ages the action of the resulting glaciers that blanketed northern Indiana acted as a sealant over the sinkhole, protecting the Tertiary Period sediment deposits from the erosion that would normally have destroyed them years before the IMI quarrymen made their discovery.

IMI designated that the Indiana State Museum will be the ultimate repository for Pipe Creek Junior's ancient remains. In the past two decades, the state museum has grown into the largest and most comprehensive repository of ancient bones in Indiana. ❑

Steve Kash is a freelance writer from Terre Haute, Indiana.

Alberta Palaeontological Society Membership List, June 2000

(…continued from back page)

Names and contact information removed to protect members' privacy.

Is your address correct? If not, please call or write the Membership Director (see Page 1)

Alberta Palaeontological Society—Exchange Bulletins

as of June 21, 2000

Alberta Federation of Rock Clubs	*Fossil Trails*	Sherwood Park	AB	Canada
Austin Paleontological Society	*Paleo Newsletter*	Temple	TX	USA
British Columbia Paleontological Alliance	*BCPA Newsletter*	Courtenay	BC	Canada
Calgary Rock and Lapidary Club	*Calgary Lapidary Journal*	Calgary	AB	Canada
Earth Science Club of Northern Illinois	*The Earth Science News*	River Grove	IL	USA
Royal Tyrrell Museum of Palaeontology*		Drumheller	AB	Canada
The Roamin Club	*The Pterodactyl*	Lake Orion	MI	USA
Western Interior Paleontological Society	*Trilobite Tales*	Boulder	CO	USA

*Complimentary copy mailed (no material received in exchange)

Exchange bulletins are kept in the Society Library.

Alberta Palaeontological Society—member email Addresses

Note! Many of these addresses are work addresses: please use respect—no spamming!

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Is your email address correct? Want it listed? Want it removed? Contact HowieAllen@compuserve.com

Alberta Palaeontological Society Membership List, June 2000

108 Active and Institutional Members—dues paid as of June 21, 2000

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Membership List continued on page 14…☛