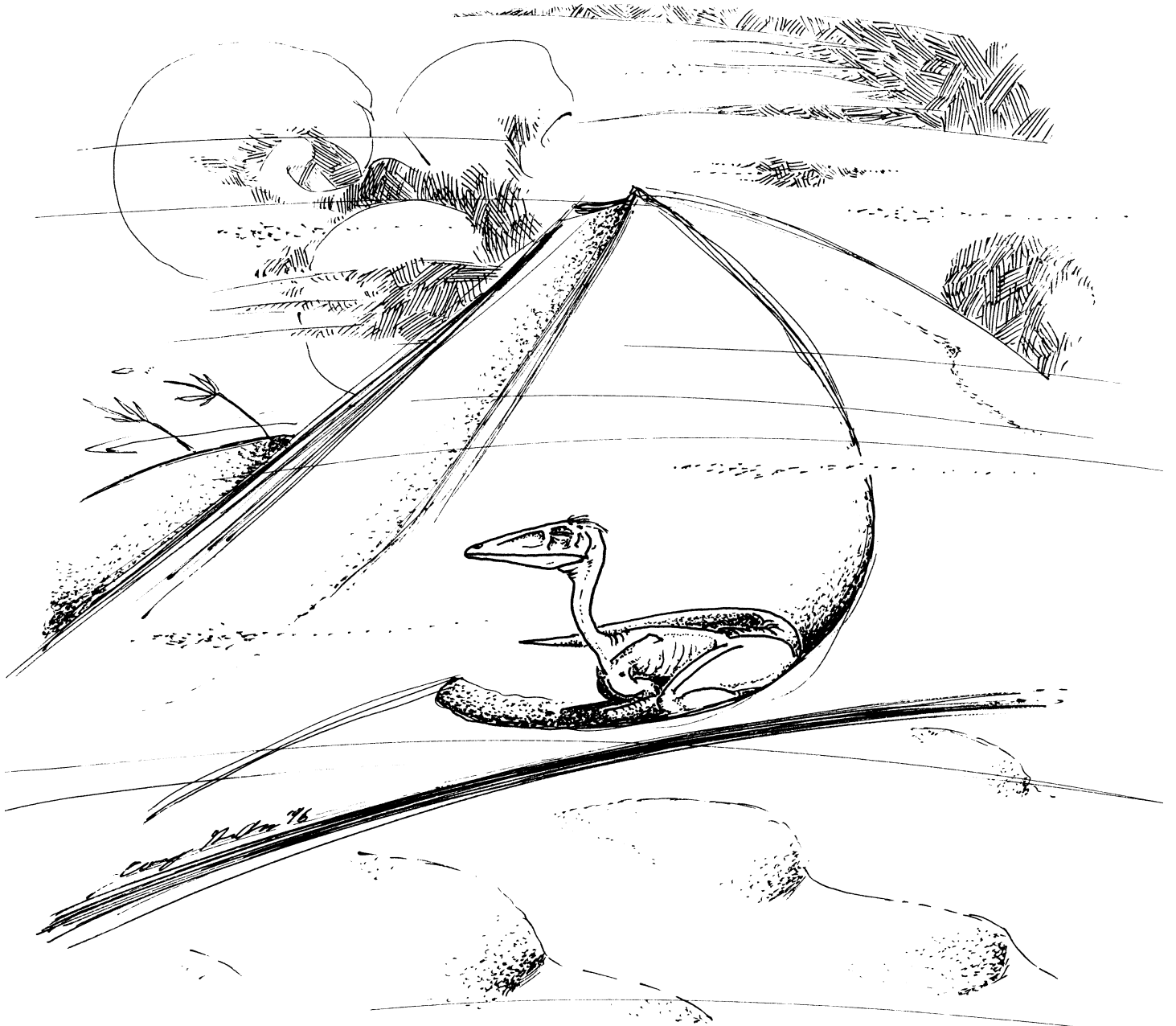


Alberta *Palaeontological Society* Bulletin

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DECEMBER 1998



ALBERTA PALÆONTOLOGICAL SOCIETY

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†APAC is the Alberta Palaeontological Advisory Committee

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

- a. Promote the science of palaeontology through study and education.
- b. Make contributions to the science by:
 - 1) discovery
 - 2) collection
 - 3) description
 - 4) education of the general public
 - 5) preservation of material for study and the future
- c. Provide information and expertise to other collectors.
- d. Work with professionals at museums and universities to add to the palaeontological collections of the province (preserve Alberta's heritage).

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

Single membership	\$15.00 annually
Family or Institution	\$20.00 annually

THE *BULLETIN* WILL BE PUBLISHED QUARTERLY: March, June, September and December.
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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

December 18, 1998—Eric Snively, University of Calgary:

Jaws of Death, Arms of Barney: Tyrannosaurids in Action

January 15, 1999—Third annual "mini-talk/poster session" by APS members

February 19, 1999—TBA

March 19, 1999—Dr. Russell Hall, University of Calgary: *Jurassic Ammonites*

ON THE COVER: *Sinornithoides youngi* (Cretaceous, Asia) hunkers down in a Gobi sandstorm. Art by APS Member Cory Gross © 1998.

President's Message

by Wayne Braunberger

For the first time photography will appear in an issue of the *Bulletin*. The diligent effort and some expenditures by our editor (yes, he upgraded his computer!) enable this to be done. This addition will make for a more interesting *Bulletin*, so be careful—you never know where your photograph may appear.

Over the past few months initial preparations have been made for next year's field trips. Requests have been made to get this information out as early in the year as possible. Hopefully this will enable those of you who live outside of Calgary to make your summer plans and join us on one or more of the trips. **Keith Mychaluk** has done an excellent job of pulling things together for the 1999 season. In order to maintain this momentum Keith circulated a survey at the general meetings and there is one enclosed with this issue of the *Bulletin*. In order to plan ahead for the coming years we need to have a number of trip ideas on the shelf. The more ideas that we have make the planning much easier. More information on field trips appears in this *Bulletin*.

Currently in development is a code of ethics and responsibilities for field trip participants and the membership at large. Some concerns have been expressed about certain activities on field trips and development of an ethics code will help to spell out the behaviour expected of members.

Unfortunately the activities of one individual can cast a bad light on the membership as a whole. When the Society was smaller this was not a problem, as we all knew each other; but as the Society has grown, many new members may be unfamiliar with the unwritten rules of the game. One of the unfortunate by-products of becoming a larger Society is that these types of problems occur and this seems to be a reasonable way of addressing them. Any comments you have on this topic would be greatly appreciated.

Seminars

Included in this *Bulletin* is a survey on seminars. I would ask that you fill this out and return it as soon as possible. At the bottom of the survey is a listing of previously held seminars, which can be held again if enough interest is shown. One of the Society's objectives is to "educate" both the membership and public. If you have any thoughts, ideas, or comments on how we could improve please let me know.

Once again another exciting year has gone by and next year promises to be jam-packed with activities and events. I wish everyone the very best for a Merry Christmas and a happy and prosperous New Year. □

1999 Field Trips

NOTE: Non-members and unaccompanied minors will NOT be allowed to attend field trips. For further information on all trips, contact Keith Mychaluk (403) 228-3211.

Field Trip 99-1: Saturday & Sunday, June 19 & 20, Wolf Coulee, Alberta

This locality is near Dinosaur Provincial Park, in southeastern Alberta. Vertebrate fossils of the Judith River Group occur in the area. Sites near Patricia, AB will be visited on the second day.

Field Trip 99-2: Saturday & Sunday, July 17 & 18, Korite Ltd. ammonite quarry, southern Alberta

On Saturday, an educational tour of the Korite ammonite quarrying operation (Cretaceous, Bearpaw Fm.), south of Lethbridge, will be conducted. Some collecting *might* be allowed, but all material will be inspected by the quarry operator. One or more nearby collecting localities will be visited on Sunday.

Field Trip 99-3: Saturday or Sunday, August 21 or 22, Burgess Shale/Mt. Stephen Trilobite Beds, Yoho, B.C.

Guided tours of the Cambrian Burgess Shale (Walcott Quarry) and/or the Mount Stephen Trilobite Beds are being arranged with Parks Canada. **Fees of \$45 (Burgess Shale) or \$25 (Mt. Stephen) per person are charged for these tours, both of which involve very strenuous hikes of several hours one-way. Only physically fit persons with appropriate footwear should consider attending. Collecting is strictly prohibited!** Attendance (minimum/maximum) in each tour is limited by Parks Canada, so the number of members planning to attend will dictate which tours will be held. **Please contact Keith Mychaluk (403) 228-3211 as soon as possible if you are interested in participating.**

Sign-up sheets will be made available at all general meetings. Out-of-town members please call Keith to sign up. □

Life Member Hope Johnson presented with APS plaque

by Mona Marsovsky

On August 22, 1998, Vaclav Marsovsky, Vice President of the APS, presented Hope Johnson with an Alberta-shaped engraved wooden plaque, in honour of her contributions to Alberta palaeontology (*Bulletin*, March 1997). One of her most notable contributions to the field is her illustrated book, *A guide to Alberta vertebrate fossils from the age of dinosaurs*, published in 1974. This book is a valuable reference for Alberta fossil identification. Unfortunately the book is now out of print and virtually unavailable.



Life Member Hope Johnson, LLD, of Redcliff, Alberta, receiving her Society plaque from Vice President Vaclav Marsovsky. Photo by Mona Marsovsky.

The good news is that Hope Johnson is currently working on her next book, which will continue on the same theme as her first palaeontological book. This new book promises to be a “must have” for all APS members. Hope has promised to let us know when and where to obtain her new book. Hope also wrote and illustrated *Prairie Plants of Southeast Alberta*.

A showcase of her art, including watercolour and oil paintings, drawings, technical renderings and some of the corresponding fossils (for comparison) will be touring twelve venues in southern Alberta this winter, including Hanna, Drumheller, Red Deer and Fort Macleod. Unfortunately, Calgary will not be one of the stops. □

Tyrrell Museum tour set for February

10:00 AM, Saturday, February 27, 1999, Royal Tyrrell Museum of Palaeontology, Drumheller. Meet in the Museum front entrance lobby. The regular (\$7.00) entrance fee will apply.

APS Events Coordinator **Keith Mychaluk** has arranged with Dr. Dave Eberth of the Royal Tyrrell Museum for members of the Society to tour some of the “back rooms” of the museum. Members will be able to see preparation and curation facilities, and some parts of the museum collections not normally available for public viewing. The back room tour will take place in the morning. Members can spend the rest of the day in the public galleries. Contact Keith Mychaluk (403) 228-3211. □

RTMP Volunteer Opportunities

by Mona Marsovsky

Mike Getty runs the volunteer program at the Tyrrell Museum’s Field Station in Dinosaur Provincial Park. He is looking for volunteers to prepare fossils over the winter season (from November to April) at the Field Station. Mike is very flexible in terms of hours (days, evenings, weekends). Call Mike at (403) 378-4342 for more information or to arrange a time to volunteer.



Don Brinkman of the Royal Tyrrell Museum is looking for fossil sites in the Belly River Formation west of Calgary (e.g. Bragg Creek, Ghost Dam, Sundre, etc.). Don is trying to study the differences in animals and plants between the Dinosaur Park Formation and the Belly River Formation, which is at a higher elevation. Both areas are of the same age. If you know of any fossil localities in the Belly River Formation west of Calgary, no matter how poor, please let Don know. Call toll-free 310-0000, then key in 823-7707. □

Program Summary

by Howard Allen

October 16, 1998

Triassic Marine Reptiles of Northeastern British Columbia, with Dr. Elizabeth (Betsy) Nicholls of the Royal Tyrrell Museum of Palaeontology.

Dr. Nicholls' presentation was similar to a lecture she delivered at the Royal Tyrrell Museum, reported by **Mona Marsovsky** in the June, 1998 *Bulletin*. In her more recent presentation to the APS, Dr. Nicholls expanded upon a number of points, and discussed some astonishing developments in the field of Triassic marine reptiles:

- Northeastern B.C. is becoming known as one of the richest areas on Earth for Triassic marine reptiles. Both the Tyrrell Museum and the Royal Ontario Museum (ROM) have ongoing excavation programs.
- A nearly complete Triassic succession is present in the northern B.C. Rockies, with extremely rich fossil resources occurring in two main formations: the Sulphur Mountain Formation (Lower to Middle Triassic) and the Pardonet Formation (Upper Triassic). Fossils in the Sulphur Mountain occur as flattened skeletons in siltstones and shales. Pardonet skeletons are found in limestone, allowing the bones to be removed in good condition (three dimensions), using acids.
- The Sulphur Mountain Formation has produced, in the Wapiti Lake area, numerous ichthyosaurs and thalattosaurs. Nothosaurs and Plesiosaurs are rare in this formation, represented by a few scattered remains. Dr. Nicholls notes that ichthyosaurs and thalattosaurs are so common here that only the best specimens are now removed, due to logistical problems (all sites are accessed by helicopter).
- The Upper Triassic Pardonet Formation is even richer in vertebrate remains than the Sulphur Mountain. The ROM team works from jet boats along Williston Lake, B.C., while the Tyrrell team has been doing work in the Pink Mountain area, using helicopters. Ichthyosaurs are very abundant, and archosaurs are also being found.
- One titanic ichthyosaur has been found in the Pink Mountain area by the Tyrrell team. The skeleton, apparently complete, is lying embedded in limestone on a bedding surface. Vertebral centra are 30 cm. in diameter. Approximately half the

skull has been uncovered to date, exposing two metres of its length. Another two metres is estimated to be buried (the teeth have not yet been exposed). So far, eighteen metres of this brute have been uncovered. The total estimated length is twenty-two metres—the size of a blue whale! It will take approximately another two field seasons to uncover and remove the specimen, and probably ten years to prepare. The specimen's ribs are encrusted with bivalves, showing that the carcass lay on the sea floor for some time, where it was colonized by the molluscs.

- At least one new archosaur species, a large rauisuchian (early crocodile-like reptile) has been found in the same area, in marine deposits. This is apparently unusual, and was originally attributed to a carcass floating out to sea. But other material has since been found, also in marine rocks, leading the Tyrrell staff to speculate that it may have been similar to the modern salt-water crocodiles of Australia. The teeth of this animal—named *Sikannisuchus*—are large, serrated blades, similar in outward appearance to those of large theropod dinosaurs and some sharks. This animal will be formally described by Dr. Nicholls in a paper in the *Canadian Journal of Earth Sciences*, due out in the next few months.

A lively question-and-answer period followed the presentation, demonstrating the depth of interest in this exciting research. □

November 20, 1998

Time-Lapse View of Life and Death in an Eocene Lake, with Dr. Mark V.H. Wilson, University of Alberta

Dr. Mark Wilson began working on the fossil deposit at Horsefly, BC, in 1969, when he began his graduate work at the University of Toronto. He completed his Ph.D. on the Eocene fossil fishes of British Columbia in 1974, spent a year as Assistant Professor of Biology at Queen's University in Kingston, Ontario, and has held his present position, now as Professor of Biological Sciences at the University of Alberta, since 1975.

His research interests have included Mesozoic and Tertiary fossil fishes, palaeoecology, taphonomy (death and burial of fossils), and fossil insects.

In recent years Dr. Wilson has added studies of early vertebrates, including jawless and early jawed vertebrates from the Silurian and Devonian periods. He maintains websites and a newsletter for world specialists on fossil fishes, and is currently leader of UNESCO's IGCP Project 406, an interna-

tional scientific group studying Palaeozoic fossils of the far north. Dr. Wilson is the current chair of the Alberta Palaeontological Advisory Committee (APAC).*

Dr. Wilson's presentation focussed on the fossils of the Eocene age (50-million years old) lake bed deposit at Horsefly, BC. The Horsefly deposit is remarkable in that it allows us to see a continuous, annual record of ancient life that can be dated to 1-year precision, relative to any other point in the sequence—an extremely rare level of precision, comparable only to tree-ring dating. Lakebed sequences of up to 10,000 consecutive years have been studied at Horsefly.

In Eocene time the lake at Horsefly, currently in central British Columbia, was at an approximate latitude of 60° north. The climate was temperate, as indicated by the presence of various flowering plants and gymnosperms such as *Ginkgo* sp.

Thin sediment layers (varves) were deposited on the lake bottom in annual pairs, comprising a light layer (siliceous, diatom-rich, deposited in spring, summer and fall) and a dark layer (clay-rich: winter).

Dr. Wilson used a “photography” analogy in explaining the ways that fossils can shed light on ancient environments and evolution. In the “snapshot” scenario, single fossils are useful in determining the anatomy or setting of a species at a particular point in time. The “panorama” view takes into account the fossil suite of all the organisms that lived in a particular geographical area, how they interacted with one another, and were in turn influenced by factors in their environment. Ultimately, the “time-lapse” concept carries the “panorama” view into the dimension of time, showing how ecological relationships, and evolutionary trends varied over a period of time. This “time-lapse” view is what is so uniquely and exquisitely preserved in the Horsefly lake deposit.

By studying the Horsefly fossils, a wide range of environmental, ecological and evolutionary relationships were uncovered. For instance, the types of fossils found painted a picture of the lake ecology: The presence of numerous tree leaves, as noted above, indicates that the lake was surrounded by forests. Invertebrates such as spiders, water striders and march flies were abundant. Five genera of fishes lived in the lake. Coprolites containing fish bones have been attributed to fish-eating birds. (To date, the only direct evidence of birds has been a few poorly preserved feathers.)

The distribution of fossils in the sediment, when compared to modern lakes, gives an indication of the relative location of sediments with respect to

the lakeshore. Nearshore deposits contain an abundance of coniferous needles, cones, beetles, etc.—objects that tend to sink quickly. Offshore beds have more remains of floating material, such as wood and deciduous leaves. The Horsefly rocks are interpreted to be an offshore deposit.

Examination of the varve pairs shows seasonal variations in fossil types: the light, summer varves contain leaves, coprolites and insects. Winter varves are where the best fish fossils are found—presumably there were fewer predators and/or scavengers in winter, when fishes died and were preserved in cool, anoxic bottom waters.



Mooneye (Eohiodon sp.), x1; Middle Eocene, McAbee, B.C. Showing distinctive male anal fin. Photo by Howard Allen.

In the time dimension, evolutionary trends can be discerned. Most of the insects are remarkably similar to modern examples, showing that very little evolution (at least with respect to visible features) has taken place over the past 50 million years. The fishes show more variation. Compared to modern individuals, the Eocene mooneyes (*Eohiodon*) tended to be considerably smaller in adult size. Careful examination of the *Eosalmo* “missing link” fish shows that the animal's skull is similar to that of the modern grayling, whereas the bones of the body bear a stronger resemblance to modern trouts and salmon.

The availability of a 10,000-year continuous fossil record also allows the use of statistical analysis to spot more subtle evolutionary trends. Environmental trends (climate, population, scavenging) were elucidated, but correlation with evolutionary changes was somewhat tenuous. The statistical analyses showed that some evolutionary changes in fishes could be correlated roughly with major environmental events, but the evolutionary changes tended to occur relatively quickly, followed by long periods of stasis—there doesn't

seem to be a lock-stepped correlation with environmental factors.

Dr. Wilson brought a fine collection of fossils from the Horsefly site for the membership to examine. One remarkable object was a complete stratigraphic section of one Horsefly locality, consisting of approximately 40 centimetres of rock—slabbed, polished and embedded in plastic, providing a hand-size record of 700 years of varved stratigraphic history—in essence, a “type-section” with portability and time resolution to make any stratigrapher green with envy. □

* Biographical notes provided by M.V.H. Wilson.

Dr. Currie speaks on the origin of birds

by Mona Marsovsky

Dr. Philip Currie of the Royal Tyrrell Museum started off the University of Calgary Distinguished Lecture series on October 6, 1998, with a fascinating talk on the evolution of birds from dinosaurs, highlighting new supporting evidence from China.

In 1862, the first fossil bird, *Archaeopteryx* was found with a theropod dinosaur, *Compsognathus*, in Germany. So close was the resemblance between *Archaeopteryx* and *Compsognathus* that some *Archaeopteryx* specimens lacking feathers were misidentified as *Compsognathus*. Since the then-known specimens of meat eating dinosaurs lacked some characteristics that birds had—for instance, wishbones—it was assumed that birds and dinosaurs were cousins, and that a primitive crocodile, which was small, bipedal and potentially climbed trees, was the ancestor of birds. However, newly discovered theropod dinosaur specimens do have wishbones. There are 125 to 200 characteristics that are shared only by birds and theropods.

Skeptics of the theropod dinosaur origin of birds have demanded to see a feathered dinosaur. New discoveries in China have delivered exactly that. Since 1994 more than 1000 specimens of *Confuciusornis*, a primitive bird more advanced than *Archaeopteryx*, have been found in northeast China. The age of the Chinese quarry is still in dispute. One study dates the quarry to late Jurassic (a little younger than the German quarry where *Archaeopteryx* was found), while another study

produced an early Cretaceous age (120 MY).

In 1996, Phil was one of the first westerners to see *Sinosauropteryx prima*, a dinosaur with feather or protofeather impressions along its back, which was found in the same quarry as *Confuciusornis*.

Another specimen was found one year earlier with what were later identified as feather-like impressions on its back and arms. This specimen had just finished dining on a lizard. It appeared as if two eggs were inside its gut cavity. A third specimen of *Sinosauropteryx prima* also had feather impressions, plus a mammal inside its gut. On this specimen the “feathers” show the effect of layering and are thicker on the bottom, with a branching structure. The “feathers” are not restricted to the dorsal midline, but are found on the back of the legs, hips and on the side. The “feathers” are soft and pliable, not uniform in thickness and are not encased in skin. The base of the “feathers” is hollow. Simple branching structures are evident. In these specimens the “feathers” form a corona around the fossil. Phil suggested that in the lake bottom sediments, the “feathers” could have been covered in mud and thus were preserved in a corona, unlike the feathers touching the skin, which would have rotted away. These “feathers” were not flight feathers. Phil proposed they were used to keep warm and/or to protect a clutch of eggs.

True feathers, with shaft and barbs appear on *Protoarchaeopteryx*. This dinosaur was discovered in April, 1997 from the same site as the other Chinese dinosaurs. Now three specimens have been found of this theropod dinosaur. It is covered with feathers and has rudimentary wings, a bird-like head and a short tail. The feathers are symmetrical, unlike those of modern birds which are asymmetrical to assist in flight. Their *Oviraptor*-like front jawbone has serrated teeth, but only in the front of the upper jaws. Their wrist, ankle, vertebrae, ischium and astragalus look like those from dromaeosaurs; whereas their skull and ilium are intermediate between those of birds and dinosaurs.

Phil Currie showed, using cladistics, where the new theropod dinosaurs could fit into the evolutionary tree. The best fit results from putting these new “feathered” specimens with the dinosaurs like *Velociraptor*, rather than with birds. This adds more support for the theory that theropod dinosaurs developed feathers and evolved into birds. The Royal Tyrrell Museum will be displaying the original specimens of these “feathered” dinosaurs of China from late May to August, 1999 (next year!) This may be a once-in-a-lifetime chance to take a close look and see for yourself if these “feathered dinosaurs” really had feathers. □

Fossils in the News

DinoWIRE, Trilobite Tales, September 1998
[Tyrrell Museum's in-house newsletter]

1998 field season at Dinosaur Provincial Park

DRUMHELLER—Specimens collected by Tyrrell Museum staff at Dinosaur Provincial Park this past summer include: five ankylosaur skulls; a hadrosaur skull; a juvenile hadrosaur (*sans* skull); one skeleton of the freshwater ray, *Myledaphus*; “about a dozen” turtle shells and two skulls; “and lots of smaller things.” Ceratopsian frill fragments that were needed to confirm (or discount) the presence of a new type of ceratopsian dinosaur were also found, in the last few weeks of bonebed excavation. [APS member **Roslyn Osztian** participated in the excavation of the ceratopsian bonebed – ed.]

Globe and Mail, October 10, 1998

Northern dinosaurs

ALASKA—In this badly written filler item, a team from the University of Alaska reports the discovery of tracks of five types of dinosaurs at the confluence of the Awuna and Colville rivers, in the Brooks Range foothills of northern Alaska. The tracks are about 100 million years old (Cretaceous) making them “at least 25 million years older than any other fossil beds farther north” [*whatever that means* –ed.]. This is cited as strong evidence of dinosaur migration from Asia. We are also treated to the ambiguous assertion that the dino track discovery reveals “fossils that extend for about 200 kilometres.”

Alberta Report, October 5, 1998

An ancient snail shell is judged to be a mineral

LETHBRIDGE—Two friends of the APS, **Wayne Haglund** (Mount Royal College) and **Dr. Charles Henderson** (University of Calgary) recently found themselves in the role of “expert witness,” on opposite sides of a Lethbridge courtroom.

Farmers Kenneth and Margaret Robinson, of Del Bonita (50 km. south of Lethbridge), refused to allow the Kemp-Asplund Group—a Lethbridge ammonite-prospecting company—access to their property, an action that landed the parties in court. The Robinsons opined that fossils are not a “mineral,” thus Kemp-Asplund had no business performing “mineral exploration” on the Robinson property. The complainants begged to differ.

Wayne Haglund, appearing for the Robinsons, considered that fossils, having formed by an organic process, are not strictly “minerals.” The Judge, however, eventually sided with witness Charles Henderson who pointed out that aragonite, a mineral component of ammonite shell, is all that is left when the organic shell component is lost during fossilization. Justice W. Vaughan Hembroff further ruled that “It seems...clear to me the intention of the Legislature was to include all substances found below the ground in the category of minerals unless excepted in the legislation.”

Calgary Herald, October 2, 1998

Evidence of ancient worms found in rock, say researchers

WASHINGTON (AP)—The discovery in India of trace fossils in rocks more than one billion years old may push back estimates of the time that multicellular organisms first appeared on Earth. The alleged trace fossils, consisting of apparent feeding tunnels of a worm-like organism, appear as meandering grooves in sandstone from northern India. Trace fossil expert Adolf Seilacher, of Tübingen and Yale Universities, says that if they are real, the presence of worm tunnels “means that the birth of multicellular animals was at least twice as long ago as we thought.”

There are skeptics, however. Bruce Runnegar of UCLA is unconvinced that the traces are organic. “If this were true, it would be very important. But I don’t think this discovery represents the final, unequivocal proof.”

Calgary Herald, September 3, 1998

Youngster finds 55M-year-old leaf imprint

CALGARY—As news reports go, this is a “dog bites man” story. Though the discovery of a fossil deciduous tree leaf in Calgary is about as remarkable as finding a dinosaur bone in Dinosaur Provincial Park, it was no doubt an exciting find for six-year old Jonathan Kawchuk, exploring sandstone boulders at Lake Bonavista, in southeast Calgary. This article becomes interesting when it reveals, through an interview with the Geological Survey of Canada’s Godfrey Nowlan, the discovery last year (by another Calgary youngster) of a palm frond, which is extremely rare in the Paleocene rocks of Alberta. Says Dr. Nowlan: “They are virtually unknown in that age of rocks from this part of the world.” The presence of palm trees is, of course, a good indicator of a frost-free climate.

Calgary Herald, September 30, 1998
Dinosaur theorist's job extinct

OTTAWA—This bad news/good news story reports that Alan Hildebrand, the Geological Survey of Canada scientist who was a key player in the discovery and study of the Chicxulub crater in Mexico (linked to the K/T extinction event) has received his pink-slip from the GSC. This is yet another in the seemingly endless series of government cost-cutting efforts that has seen publicly-funded science jobs decimated.

The good news: Dr. Hildebrand is joining the University of Calgary, where he will continue his work, and contribute to the development of a planetary science program at the university.

Calgary Herald, August 13, 1998
Soft-footed truck moves baby dino

DINOSAUR PROVINCIAL PARK—An oilfield trucking company has contributed the latest hi-tech gadget in the field of dinosaur science. Jo-Ann Trucking of Brooks, Alberta, together with Amoco Canada, donated the use of an enormous, fat-tired truck in moving the skeleton of a juvenile hadrosaur out of the park. The fossil, which was too big to be lifted by helicopter, was loaded onto the giant “Foremost Commander,” a vehicle normally used for moving drilling rigs over boggy ground. The giant tires distribute weight over a large area, preventing damage to the delicate vegetation and badlands terrain.

National Post, November 13, 1998
100-million-year-old fish-eating dinosaur found in Sahara Desert
Calgary Herald November 13, 1998
New dinosaur species unearthed

WASHINGTON—Take a champsosaur's skull, put it on a *T. rex*'s body, and pump it up with steroids: now you've got a rough picture of *Suchomimus tenerensis*, the latest monster to make an appearance from the Cretaceous of Africa, thanks to a team led by University of Chicago palaeontologist Paul Sereno. The new dinosaur, a member of the spinosaurid group, was built for fishing. The jaws are long and extremely narrow—like the modern gavial, of India. The teeth are also crocodile-like. From the neck down, the animal was built more like a typical large theropod dinosaur, with powerful hind legs and tail. But unlike *T. rex*, *Suchomimus*' arms were large and powerfully built, with huge sickle-shaped thumb claws, and smaller claws on the other two fingers. “With

its forearms and its jaws, it would have been able to take down just about anything.” Sereno adds: “This animal was easily the size of *Tyrannosaurus rex*. And it was not fully grown.” Its closest known relative was probably the European *Baryonyx*.

The fossils, representing 70% of the animal's skeleton, were found in Niger, in 1997. Associated with the dinosaur bones were remains of fishes, pterosaurs and crocodiles, including one with a two-metre long skull, which would have made the animal up to 15 metres in length—certainly the dominant competition for *Suchomimus*.

The *Herald* article (and the December '98 issue of *National Geographic*) includes a painting of *Suchomimus* by APS member **Mike Skrepnick**.

Calgary Herald, October 10, 1998
Petrified forest being trampled

TANQUARY FIORD, ELLESMERE ISLAND—Uncontrolled tourist traffic at one of the least likely locations—Axel Heiberg Island, in Canada's remote arctic islands—is threatening a remarkable palaeobotanical resource. The Eocene fossil forest on Axel Heiberg (*Bulletin*, June & December 1991) is being trampled by cruise ship tourists and workers from a nearby military station at Eureka. Says University of Saskatchewan palaeobotanist Jim Basinger, “I don't think that people are malicious; they want to see it, but they don't know how.”

The fossil forest is remarkable in preserving essentially unaltered wood, leaves, cones and other plant parts, from such warm-temperate trees as swamp cypress, *Metasequoia*, hickory and spruce. The site has also produced vertebrate fossils, in the form of sea turtles and sharks; and, in a surprising note, “this summer, on nearby Melville Island, palaeontologists... found fossils of huge marine reptiles.” [*Caution: though the context of the article implies that these marine reptiles are also Eocene, their age is not explicitly stated.* – ed.]

The fossil forest lies just outside of the new Ellesmere National Park, but Parks Canada has apparently judged the idea of expanding the park boundary “not practical.” The site is also within a Nunavut Inuit land claim, and residents are said to be “interested in the site's unique character.”

National Post, November 18, 1998
Egg find changes experts' beliefs about dinosaur

NEW YORK—Palaeontologists with the American Museum of Natural History have announced the discovery of confirmed sauropod eggs in Patagonia, Argentina. Large numbers of the 15 cm.

diameter eggs were found at the discovery site, some containing excellently preserved sauropod embryos, even including embryo skin impressions. According to expedition member Lowell Dingus, the discovery (in Upper Cretaceous rocks) represents three “firsts”: “The first embryonic remains of sauropods; the first remains of embryonic skin for any kind of dinosaur; and the first dinosaur embryos ever found in the southern hemisphere.”

The discovery settles a long-standing debate in dinosaur circles: in the absence of any evidence, some experts argued that sauropods could not have laid eggs, as it seemed too unlikely that such enormous animals could have developed so rapidly from tiny egg embryos.

Calgary Herald, October 4, 1998

Smallest mammal’s fossil found in tree

SNOWBIRD, UTAH—Attendees of the recent SVP conference (see reports, this *Bulletin*) learned of the discovery, in Wyoming, of the remains of the smallest mammal known to science. A tiny jaw was recovered from an acid-bath residue when researchers at the University of Michigan were removing a petrified tree stump from limestone matrix. The animal, named *Batodonoides*, lived in the early Paleocene, just after the end-of-Cretaceous extinction event. It is estimated to have weighed as little as 1.3 grams (little more than a paper clip). Says researcher Jonathan Bloch: “At first I thought I was looking at a fish jaw. Under the microscope, I realized I was looking at the smallest mammal teeth I had ever seen. It’s very primitive.”

Calgary Herald, October 3, 1998

Toothy, yes, but no lips

SNOWBIRD, UTAH—In this ground-shaking news item—also from the fall SVP conference— anatomy professor Dr. Lawrence Witmer of Ohio University announces that he “...can find no scientifically justifiable reason to put lips on [*Tyrannosaurus rex*].” Dr. Witmer compared dinosaur fossils with the bones of modern reptiles and birds, finding none of the structural features on the dino bones that would “make lips work.” He would also remove the muscular cheeks from restorations of such ceratopsians as *Triceratops* and *Leptoceratops*, replacing them with a large, horny beak, like those of turtles.

In a refreshingly frank reflection, Wendy Sloboda of the Tyrrell Museum is said to wonder “why such a serious conference is spending time on such a silly argument.”

Society of Vertebrate Paleontology News Bulletin, October, 1998

Loris Shano Russell dies at 94

TORONTO—One of Canada’s most distinguished palaeontologists, Dr. Russell passed away in Toronto on July 6 of this year.

The byline “L.S. Russell” is one of the most familiar names to students of Canadian palaeontology, and has been for much of this century. We in Alberta are familiar with such milestones as *Mollusca from the Upper Cretaceous and Lower Tertiary of Alberta* (1931); *Fossil turtles from Saskatchewan and Alberta* (1934); *Geology of the southern Alberta plains* (with R.W. Landes, 1940); *Dinosaur hunting in western Canada* (1966) and many others. This brief list of titles hints at his wide scope of expertise, ranging through freshwater molluscs, Devonian fishes of Quebec, reptiles and dinosaurs, mammals, and stratigraphy. His last work was published in 1993.

Over a long career (he earned his first degree at the University of Alberta, in 1927), Dr. Russell worked with the GSC, Royal Ontario Museum, National Museum of Canada and the University of Toronto. His students have included the likes of J.E. Storer, M.V.H. Wilson and P. Ramaekers. He earned many awards and honours, including fellowship in the Royal Society of Canada. □

[Thanks to: Les Adler, Vaclav Marsofsky, Trudy Martin (*Calgary Rock and Lapidary Club*), Roslyn Osztian, Sam Richter]

New microvertebrate reference collection for APS library

Society member **Roslyn Osztian** has generously donated a reference set of Cretaceous microvertebrate fossils, housed in coin protector pages in a loose-leaf binder. Roslyn has contributed thirty-two fossil specimens in what she hopes will be the “seed” for a more comprehensive collection of specimens to help collectors identify microvertebrate fossils. Other members are invited to contribute specimens to the reference set, which will become a valuable resource for the Society library. The reference set will be made available for examination at general meetings. □

– Howard Allen, with notes from Roslyn Osztian

APS members attend 1998 SVP conference in Snowbird, Utah

At least three APS members attended this fall's conference of the Society of Vertebrate Paleontology at the Snowbird ski resort, in Utah, USA. Following are reports from two perspectives...

Vaclav Marsovsky—

The SVP conference is one of many annual conferences dealing with palaeontology where professionals and amateurs with a common interest can exchange ideas. There are other conferences that focus more specifically on dinosaurs but this one includes all the vertebrate groups from the Cambrian to the Pleistocene.

Although the SVP has members around the world, the conference is usually held in the US. The conference is dominated by palaeontologists associated with US universities, institutions and museums. There is research presented from around the world but it is disproportionately small. Little is heard about research being carried out in Russia, Mongolia, or China by their own scientists. The only research presented is that coming out of joint ventures in which a US institution is involved. More is starting to come out of Argentina and South America, but you don't see the Barsbolds and Bonapartes at this conference. Perhaps the cost of coming to a conference halfway around the world, and/or language is the barrier.

This year, the conference was held at the beautiful Snowbird resort in the heart of the Utah ski country. It is a spectacular mountain setting with views of multicoloured cliffs of the igneous mountain core and the deciduous trees in full fall colour.

Attending the conference

With this article, I hope to be able to give you some idea of what to expect from attending such a conference, should you wish to attend in future years.

First—can anybody go? Yes. Professionals and amateurs alike take in the four-day conference. SVP members receive a discount, of course. The current format is for one day of symposia, one afternoon of poster sessions and two half-days of oral presentations.

The symposia comprise a series of oral presentations with a common theme. This year I took in the “armoured dinosaurs” symposium and the “Gondwana dinosaurs” symposium. The poster session is usually conducted in a large hall. “Posters” is perhaps a poor term; these are not posters as we might think, but rather summaries of the research completed or still under way. Participants are given a little more than a square metre of tack board surface to pin up photographs, written summaries, maps of their study area and statistical graphs summarizing results. Feedback on the posters is freely solicited. There is often a difference of opinion when it comes to interpretation of the same data among different scientists. Many oral presenters have a matching poster to go with their presentations. Others just have posters and are not giving an oral presentation. During the afternoon allocated to the poster session, one is able to interact with and exchange ideas on the posters with their authors. Viewing posters can be done at your own pace.

The oral presentations are restricted to fifteen minutes each. Slides or overheads are always used. There are two or sometimes three streams of presentations going simultaneously. There is the dinosaur group, the mammal group and the “other” group (includes the fishes, turtles, mammal-like reptiles and amphibians). It is not common for the participants to jump between streams—the fields are so specialized these days that most concentrate on their own areas of expertise. The group is distinctly split between the “dinosaur guys” and the “mammal guys.”

The presentations can be categorized roughly into four groups:

1—Institutions with significant financial backing go to remote corners of the earth to find new vertebrates. This is usually a joint venture with an institution of the host country. After the research is done the fossils go back to their country of origin. These are areas that have not been well studied because they are so remote or the local palaeontological community benefits from outside expertise. They present new findings about what they discovered. Sometimes new taxa are found. Similarities and differences to known animals are then presented.

2—Some researchers go through existing collections to re-analyze a particular animal. Perhaps they study it in more detail, or from a new perspective.

3—Some study a large sample of one thing from various collections. For example, comparing the lengths of phalanges from a group of animals to

learn about trends. These results are often presented statistically or on graphs.

4—Others study a particular bone bed or geological section to interpret the environment at the time of death and speculate on the causes of death of the animals.

Some workers presented preliminary information and told what they will investigate over the coming year, while others presented facts, findings and conclusions, behavioural interpretations, and what things mean in the bigger picture. Of the hundreds of oral presentations there are two that I will mention: The first dealt with the evaluation of biodiversity below the K/T boundary in the Hell Creek Formation. This research used something like 15,000 volunteer-hours to scour the slopes in search of fossils. Dozens of volunteers were dispatched to walk along the contours of badlands on slopes below the K/T boundary to collect specimens and arrive at a statistical sample to see if there is evidence that there are fewer species closer to the K/T boundary—possibly an indicator of some kind of an environmental stress. Great use of volunteers, I thought!

The second presentation was one where the author suggested that bacteria may be linked to permineralization of bone. Ions are produced as a byproduct of bacterial breakdown of organic material. The ions bond with minerals dissolved in groundwater. These minerals then precipitate out of solution and are deposited to become fossilized bone. The author went on to say that experimental studies should get underway to prove or disprove this hypothesis.

The SVP conference is a great place to just sit and listen, or to network. With professional postings being so few, the networking aspect is becoming ever more important. Some people we talked to have clearly redirected their studies to follow opportunities. The so-called “paleo celebrities” like Currie, Sereno, Horner and Bakker (just to mention a few) are usually friendly and approachable at the social functions.

This year, because the conference was set in Utah, there were field trips associated with the conference. This is not always the case if the conference is set in the eastern US. Some say the field trips are the best part of these conferences. There were basically four trips this year, each lasting three days. The Jurassic group visited well-known quarry sites in Utah and Colorado [see Heather’s report, below -ed.]. The Cretaceous group visited other sites throughout Utah, such as Dalton Well. The Tertiary group visited the Bridger and Uinta

basins and the Quaternary group went to examine horse fossils at the Hagerman fossil beds in nearby Idaho and some local museums.

Heather Whitehead—

The setting of the SVP conference (Snowbird) and “*Field Trip #3: Classic Upper Jurassic Dinosaur Sites*” were what drew me to the 1998 SVP meeting. Many of the field trip sites were familiar from DINOTOUR trips, but it was the magic words “Dry Mesa Quarry” that got my cheque-book out!

Jurassic Field Trip

The field trip was a three-day excursion by charter bus through some gorgeous high desert plateau country in Utah and Colorado, with escorted trips to quarries, field sites and museums. Our leaders, Ken Stadtman from Brigham Young University Geology Museum and Brooks Britt from the Museum of Western Colorado, kept things on time (or as much on time as is possible with forty-two enthusiastic paleontologists on board!) and went above and beyond the call of duty to make sure all were having a good trip. Box lunches were catered throughout the trip and dinners were catered by the hotel in Grand Junction, Colorado—everyone was served at once, and able to continue chatting and getting to know one another.

“Day 1” started at 6:00 a.m. It was still dark and the mountain air at 2440 m was wonderful! The list of fellow bus passengers showed we had a real international assembly—people from Brazil, Japan, South Africa, Italy, Australia, Argentina, the UK, Germany, as well as Alaska and other US states. There were some famous names too—it was fun to match up the names with the faces.

Day 1 stops were the museum in Vernal, Dinosaur National Monument, and photo opportunities in the town of Dinosaur, Colorado (“Dinosaur Cemetery” was a big hit!). The weather was wonderful—sunny, dry, upper 80s (30°C). An evening excursion to the local Walmart was arranged, courtesy of Brooks Britt and his family van; with replenished film and camera batteries and at least one pair of fuzzy animal slippers bound for a new Brazilian home, the crew retired for the night.

On “Day 2” we piled into smaller vans and headed south to Delta and the Dry Mesa Quarry. DINOTOUR was there in 1993 and it has always

been my favourite quarry. Dry Mesa sits high on a valley wall, looking down a second valley; it is difficult to get to, so all the more worthwhile; the discovery story with Vivian and Eddie Jones and “Dinosaur” Jim Jensen has always fired my imagination. The quarry has changed a bit over the years, mostly for the better—there are signs explaining things, a walking trail and an outhouse. The road in is still pretty bad (though not muddy this time!), the view is still spectacular and I was very happy to just sit and listen to Brooks and Ken tell stories of working this quarry. Lunch was enjoyed in the sun among the piñon pines at the top of the quarry hill.

In the afternoon we headed west, picked up Jim Kirkland from Dinamation and went to the Fruita Paleo Area, famous for small dinosaurs and other fauna including small mammals. Several participants discovered first-hand the perils of walking on caliche nodules, but there were no serious falls. We learned a lot about the palaeoenvironments in the area and the different fauna each produced.

That evening we visited the Museum of Western Colorado in Grand Junction, which has had many changes since my last visit. I loved the tanks with real garfish swimming around, near displays of their fossil relatives! We were able to visit the collections and see many of the finds from the Grand Junction area.

On “Day 3” we began the trek back to Salt Lake City, but with many detours. We headed for Moab, Utah just as the sun lit up the Book Cliffs north of Grand Junction—a reward for being up so early! The road through Cisco into Moab is one of the most spectacular I have ever travelled, through the canyons and buttes of red-rock country. One of the Brazilians said: “I’ve seen this in the movies!”—and she was probably right. We visited the Dalton Wells Quarry near Moab, in the basalmost Cretaceous Cedar Mountain Formation and were treated to a fast-moving rain shower and thunderstorm at the cliff top. Finds here include juvenile titanosaurs, rare in North America.

Other stops were the Cleveland-Lloyd Quarry; the College of Eastern Utah Prehistoric Museum in Price, Utah; and the Geology Museum of Brigham Young University in Provo. Unfortunately, the Dry Mesa collections under the BYU football stadium were not accessible, though we tried!

A bit after 8:00 p.m., the bus pulled in to Snowbird. The Jurassic trekkers all bid fond good-byes and headed to our various lodges to get ready for the academic side of the conference.

The Conference

My accommodation at Snowbird was at the low end of the scale, but still pretty amazing. I had a studio condo, fully-equipped (including fireplace,) with a balcony overlooking the ski lift, the outdoor swimming pool and the magnificent fall colours on the mountainside. I spent a lot of time sitting outside and enjoying it all (after all, this was a vacation for me, so it was allowed!).

I attended talks that caught my interest, mostly dinosaur talks, though I sat in on a few turtle, fish and bird talks also. There were two or three sessions running simultaneously and though the venues were close, the trek from one to another was rough (mostly uphill, and I was a bit under the weather from the 2440 m elevation).

Some highlights that I remember:

- The scientist who found dinosaurs in the Antarctic talked about field conditions where the best day was -25° Celsius...

- Ralph Molnar spoke about Australia, where dinosaur remains are rarer than in Antarctica; some time periods are represented by a single dinosaur bone, or a fragment of one. As Ralph said, it can allow for a lot of speculation and result in “one weird animal.”

- The value of field notes is emphasized by the work of the Garden Park Paleo Society, who are mapping and relocating quarries based on the field notes of E.D. Cope and finding new specimens. They are also documenting current locations for specimens removed from the area since Cope’s expeditions and cataloguing them.

- Ken Carpenter gave a fascinating talk about the role of bacteria in the process of fossilization, though his slides of carcasses at various stages were not recommended for lunchtime viewing...

The Annual Business Meeting yielded some interesting information, too:

- The Dinosaur Society contribution to page charges for the *Journal of Vertebrate Paleontology* (JVP) has ceased.

- The SVP has a new permanent web page address at: www.museum.state.il.us/svp

- Twenty-two journalists were registered for the conference, including people from *Scientific American* and *Science* (whose representative was one of the Jurassic field trip trekkers). Presence of an Associated Press wire reporter meant conference reports would be sent to smaller as well as larger newspapers.

Final thoughts

- I sat next to Russ Jacobson at the Awards Banquet. For those of you who visit dinosaur sites

on the web, he is “Dino Russ,” and it was great to get a chance to thank him in person for his web site at: denr1.igis.uiuc.edu/isgsroot/dinos/vert-paleo.html#sites

- SVP 1999 will be in Denver, October 20–23.
- SVP 2000 will be in Mexico City.
- The SVP may be unique in its acceptance of “non-professionals” at its conference. There were paleoartists, paleowriters, students, retired folks and many other interested amateurs: we were all made welcome. The conference, field trips and exhibits were well-organized, the leaders and speakers were enthusiastic and helpful and the experience was well worth it.
- Snowbird lived up to its name on the final day—there was about a foot of snow on the ground when I left. Someone made a fabulous snow dinosaur outside the main lodge! □

[*Vaclav and Mona Marsovsky chase dinosaurs around the world from their home base in Calgary. While in Snowbird, they met longtime APS member Heather Whitehead, our faithful reporter in Troy, New York. –ed.*]

Reviews

by Les Adler

Wings Over Spain by Luis M. Chiappe. *Natural History*, September 1998, pp. 30–32.

Luis M. Chiappe is a vertebrate palaeontologist, research fellow and associate in the Department of Ornithology at the American Museum of Natural History in New York City.

In 1969, *The Valley of Gwangi*, a Spanish “lost world” movie featuring Mexican cowboys battling dinosaurs and pterosaurs was largely filmed in and around Cuenca in central Spain. In an unrelated situation in the 1980s fossils were found at Los Hoyas in a small pocket of limestone at a site near Cuenca. Over a ten year period José L. Sanz and his associates from the Autonomous University at Madrid have excavated an entire Mesozoic ecosystem, including insects, crustaceans, fishes, amphibians and dinosaurs which lived in and near a freshwater lake some 115 million years ago. The detailed fossils of primitive birds reveal not only the small delicate bones, but also their feathers and in one case the remains of seafood in its stomach.

This bird showed a small tuft of feathers attached to the “thumb.” This feature, an alula, is a

characteristic of many modern birds but had never before been encountered in a fossil bird from the Mesozoic. This bird was christened *Eoalulavis*—“early bird with alula.” This shows that 115 million years ago, this finch-sized bird was able to fly and manoeuvre almost as well as its modern counterparts. Luis describes the wing properties relating to airflow and flight.

In the lithographic limestones of the Montsec Range of Catalonia the remains of a 135 million-year-old bird hatchling have been found with a large head, enormous eye orbits, teeth, braincase and jaw muscles. It probably flew.

Unprecedented numbers of Mesozoic birds discovered worldwide over the past twenty years have contributed to a revolution in evolutionary thought amongst palaeontologists, showing birds to be the direct heirs of bipedal dinosaurs.

The early birds from Spain take their place in this growing roster and show that the airspace above the large land dinosaurs was full of flapping wings.

First Life by John J. Lee. *Natural History*, September 1998, p. 88.

John is a distinguished professor of biology at City College of New York and was assigned to collect samples of Earth’s first microorganisms for the new Hall of Biodiversity at the American Museum of Natural History.

These early fossils are stromatolites, microbial communities that carpeted the shallow sea floor 3.5 billion years ago, generating enough oxygen over the next two billion years to create the atmosphere. Composed of layers of different types of bacteria, stromatolites are still forming in a few sites. John collected his cores and packed them in a thirty-gallon cask on rollers from Solar Lake, on the Sinai Peninsula, at the head of the Gulf of Aqaba, Egypt. Solar Lake is formed by seepage from the Red Sea—only 30 metres away. The upper layer of the lake accumulates during the winter rainy season. It acts like a lens, focusing the sun’s energy into the deeper layers and making it so hot that no “higher” form of life can survive there.

Near the shore the stromatolites lie matted on the lake floor, but toward the middle of the lake, the thick mat floats some two feet below the water’s surface. Photographs taken of core samples show diatoms closest to the surface in a stromatolite’s living layer, followed by cyanobacteria, then by purple sulphur bacteria. □