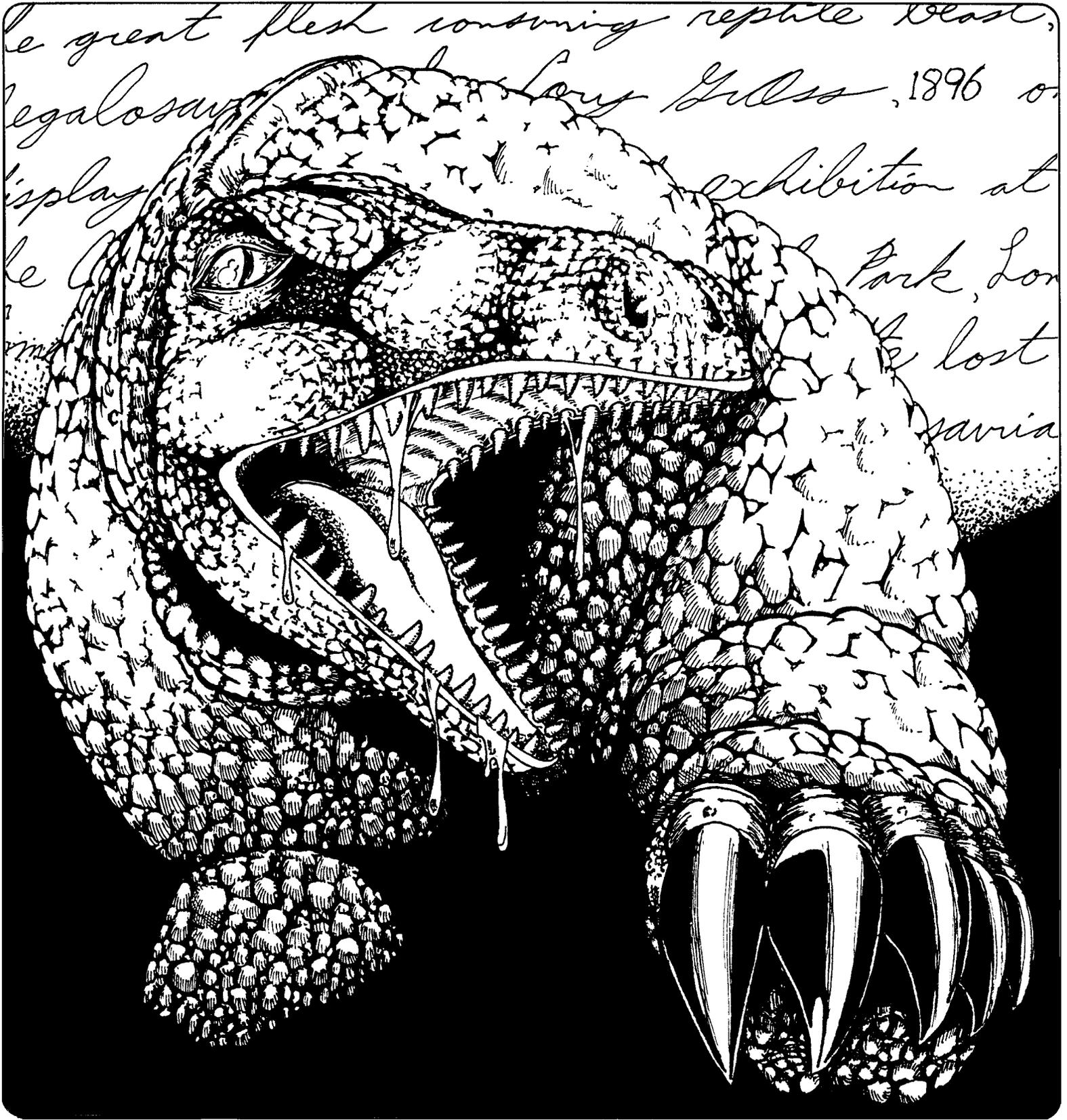


Alberta Palaeontological Society Bulletin

VOLUME 12 • NUMBER 1

MARCH 1997



ALBERTA PALAEOLOGICAL SOCIETY

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Membership	Vaclav Marsovsky	547-0182			

†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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Requests for missing issues of the *Bulletin* should be addressed to the editor.

NOTICE: Readers are advised that opinions expressed in the articles are those of the author and do not necessarily reflect the viewpoint of the Society. Except for articles marked "Copyright ©," reprinting of articles by exchange bulletins is permitted, as long as appropriate credit is given.

UPCOMING APS MEETINGS

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

Friday, March 21—Dr. Anthony Russell: Riddles in the Rock: Ideas about the Meaning of Fossils.

Friday, April 18—Paleoartist Mike Skrepnick, on Mesozoic dinosaur art.

Friday, May 23—Dr. Gerry Morgan: The Evolution of the Vertebrates, part III.

ON THE COVER: A 19th-Century reconstruction of *Megalosaurus*, England. Art by APS member Cory Gross.
©1997. Reproduced by permission.

President's Message

by Wayne Braunberger

Well, spring is almost here. Once again the Society is offering three field trips which, if last year was any indication, should be well attended. **Les Fazekas** puts in a lot of effort to make these trips happen. Being the field trip coordinator is not the easiest job and Les is to be congratulated for his efforts.

We are very pleased to welcome our first Life Member into the Society. **Hope Johnson**, who has been active in palaeontology for a number of years, was elected to Life Membership at our November meeting. A citation appears later in this issue and a commemorative plaque will be presented to her.

Spring is also election time for the Society and candidates are needed for most positions. **Joe LeBlanc**, treasurer, will not be standing for re-election so we definitely need someone to fill this very important position. Joe has been a most capable treasurer and stepped in to fill the position on very short notice. Most of our other board members have served for a number of years and would like to take a break. New people would be very welcome to the Board, as "new blood" is necessary to revitalize the Society. I sometimes think that we get complacent with what we are doing and need new ideas and perspectives. Volunteering for office does not involve a lot of time but some commitment is necessary. Talk to any of the present executive and directors for more details on any of the positions.

Last month something new was tried for a general meeting. Rather than a standard program, four members (**Les Adler**, **Joe LeBlanc**, **Gerry Morgan**, and **Don Sabo**) put on short seminars on a variety of fossil groups. From all accounts this was very successful and we hope to do it again (with different presenters) next year. One of our goals is to make the meetings more fossil orientated with hands-on types of activities that provide opportunities for learning about fossils and how to identify them.

Peter Meyer has taken on the task of revising our by-laws. Several changes have to be made to bring them in line with current regulations. If you have any suggestions for changes to the by-laws please contact Peter. Although a somewhat dry subject, a proper set of by-laws are necessary to keep our society status in Alberta and for this reason some effort needs to be put into revising them.

Our next meetings promise to be very exciting, as **Kris Vasudevan** has some very interesting speakers coming. This, combined with our upcoming field trips makes for a very exciting end to our 1996/1997 year. I hope to see you out at the meetings or on one of the field trips. □

Hope Johnson elected first APS Life Member

by Roslyn Osztian and Howard Allen

At the November 1996 General Meeting a motion was made to nominate Mrs. Hope Johnson, LLD, to Life Membership in the Society. The motion was received with enthusiasm and the subsequent vote was passed by an overwhelming majority of the members in attendance.

Hope Johnson, of Redcliff, Alberta has been a longtime member of the Society. She has contributed both her art work and written material to APS Bulletins and APS Field Trip Guides. In 1989 she led a Society field trip in southeastern Alberta.

Mrs. Johnson co-authored (with Dr. J.E. Storer) and illustrated *A Guide to Alberta Vertebrate Fossils from the Age of Dinosaurs*, a 1974 Provincial Museum of Alberta publication, which has been an invaluable aid to amateur Alberta palaeontologists over the years. In the same year she co-authored a scientific paper on sawfish teeth from southern Alberta. As noted in the foreword to the former publication, Hope Johnson "has been employed as Curator at Dinosaur Provincial Park" and "has cooperated with field parties from the National Museums of Canada, Royal Ontario Museum, University of Alberta and Provincial Museum of Alberta." The Royal Tyrrell Museum has also benefited from her generosity.

In light of her many contributions to Alberta palaeontology, and to the Alberta Palaeontological Society, our membership is privileged to be able to honour Hope Johnson with this much-deserved recognition. □



Some further notes on Dinotour 1995

by Les Adler

In a recent issue of the *APS Bulletin*, **Vaclav and Mona Marsovsky** reported on their 1996 Dinotour experiences in Mongolia. The previous year Dinotour visited Texas institutions and reptilian fossil sites. Thanks to a severe Calgary winter I have had a chance to catch up on several books and notes pertaining to Dinotour 5 (1995).

In addition to the tour guidebook, Dr. Tom Lehman provided notes regarding Triassic localities and vertebrates. Notes were also available on site for the Lubbock Lake Landmark Archeological Site and for the Alamo. Since the trip two books have been published which cover much of the information presented on the tour: Dr. Louis Jacobs' *The Dinosaurs of Texas* and *The Evolution and Extinction of the Dinosaurs* by Fastovsky and Weishampel. Following are some notes from presentations made across Texas:

APS member **Dr. Phil Currie** spoke on several occasions, balancing the remarks of other speakers. Having recently toured South American vertebrate localities and museums, Phil found that the dinosaurs of South America are different to those found in North America because of the physical separation of the continents in the past and also because of the differences in past climates. South American dinosaurs developed in temperate to polar climates, not tropical. Some hadrosaurs did get through to the tropics when the two continents connected, but not the theropods. Track sites in South America are similar to those in North America. Phil described several South American dinosaurs and their characteristics.

He also discussed bird-dinosaur relationships involving *Archaeopteryx*, *Protoavis* and *Tröodon* and the information being released from finds coming in from various regions. There are many problems remaining to be solved due to poor preservation of distinctive fossils; this has led to several interpretations of the fossil evidence.

Dr. Louis Jacobs, currently the president of the Society of Vertebrate Paleontology and a dinosaur researcher at Southern Methodist University in Dallas has authored a book on the dinosaurs of Texas. He introduced the artist who provided the illustrations for his book, and displayed the

original paintings. He also summarized the sequences of the Texas faunas. Louis has spent a great deal of time in Africa excavating dinosaurs, so he is able to compare and correlate dinosaur discoveries across continents. For example, he compares the faunas of Argentina in South America with those of Malawi in Africa and finds a common distribution of dinosaurs 180 million years ago when separation of the continents was about to begin. Dinosaur finds in Cameroon (west Africa) indicate close proximity to the split.

For the Texas faunas, he deals with three areas: (1) the plains, with Triassic Period deposits of about 220 million years ago; (2) the Big Bend area of southwest Texas, 84 to 66 million years old; (3) the Heartland, with Cretaceous Period dinosaurs. There were four marine transgressions in Texas at 220 mya; 150 mya; 100 mya; and 70 mya. Louis discussed the sequences of faunas occurring between these transgressions.



Dawn Adams of Baylor University studies ceratopsian and ankylosaurian dinosaurs, and in particular their stances: how did the legs fit under their bodies? When these animals died their bones scattered and, of course, are not found upright. Did they have a sprawling arrangement or were their legs directly under their bodies? Dawn locates muscle scars on the bones and then fills in the muscles and labels them. It becomes evident that there are mechanical situations in which statics and dynamics have to be examined to see where the external forces acted on a loaded skeleton. Dawn records the properties and strengths of the materials involved such as the magnitudes and directions of the internal stresses in the bones, the

microstructure and the material composition and distribution of the bones, followed by a photo-electric stress analysis. A model of the structure is made, diagrams drawn and then experiments are carried out on weight distribution; joints are examined and rotated; medical implications are established; the pelvis and scapulas are checked. The results from several species are compared and the method of locomotion is checked to see in which direction the forces are transferred. A comparison is also made with modern horses where copious data are available on leg movements. Different people will see different implications in the data due to each person's psychological and social background. Dawn's methods may be applied to other dinosaur families such as sauropods and theropods.

Fred Lewis, an APS member, travels both in Canada and the United States. Fred is a volunteer at the Indiana State Museum at Indianapolis, which oversees 130 volunteers. The museum concentrates on local historic and scientific projects with a very limited budget and purchases mainly local material. Fred is able to visit and work on several local sites including some with fossil elephant remains. There is a speaker's bureau and a children's museum on hand.

Dr. Eva Koppelhus gave a talk on her activities as a trained palynologist. She has studied Jurassic and Late Triassic microspores and megaspores in the Scandinavian region from locations along the Baltic Sea, Norway, Sweden, Denmark and Spitzbergen. She has been involved with studies of sea-level change and has studied Norwegian Jurassic oil and gas deposits and spent considerable time in Iceland and Greenland. She has examined hadrosaurian skin impressions and stomach contents at the Royal Tyrrell Museum and also examines Alberta amber specimens. □

Material for the *Bulletin*

The editor gratefully accepts any contributions to the *Bulletin*, in any form—handwritten, typed or digital (preferred). **News clippings must include the source and date of publication.** Material in digital form may be on 3.5-inch floppy disks, or by email to **75272.1316@compuserve.com**

I can open most DOS/Windows and Macintosh text formats. Please include a printed hardcopy with any floppy disks. For computer graphics formats, please call me (403-274-1858) or email for more information.

1997 Field Trips

Trip 97-1: Saturday, June 21

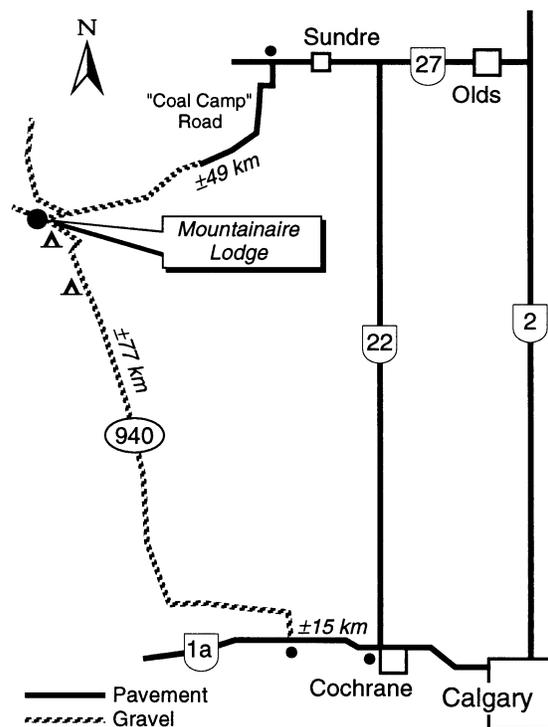
Mountaineer Lodge (Sundre) area

This trip is planned as a one day field trip. If anyone wishes to stay out on Sunday they are more than welcome to do so.

Saturday: sites to be visited are located along the Red Deer River and its tributaries. The actual site(s) we will visit have not been determined as they are dependent on water levels in the spring. A number of Mesozoic (Jurassic and Cretaceous) sections are present in the area with marine molluscs (cephalopods and bivalves) being the common fossils found.

Meeting Place: Mountaineer Lodge at 9:00AM. The lodge is located on the Forestry Trunk Road (Secondary Road 940) on the south side of the Red Deer River. From Calgary travel to Cochrane then take Hwy. 1A west. Turn north onto 940 and travel north to the lodge. Allow at least 2 hours driving time, as road conditions may be poor. Two forestry campgrounds are available in the immediate vicinity. The Mountaineer Lodge may still be open for accommodations, but check first. Please note that some of the sections are along creeks and you should be prepared to wade in knee deep water.

(...Field Trips continued on Page 8)



Fossils in the News

The Globe and Mail, August 13, 1996:

Fossil reveals flight's evolution

NEW YORK—The remarkably preserved remains of a small fossil bird found at Las Hoyas, Spain, show that bird flight evolved much more quickly than previously thought. The fossil, of a finch-sized bird named *Eoalulavis hoyasi*, was found on a slab of 115 million year old limestone. It shows modern-style bones and modern-style feathers.

The specimen includes most of the bird's feathers, and even the apparent remains of its last meal, tiny shrimp-like crustaceans. Flight structures include an "alula," or "bastard wing," the tuft of feathers at the front of a bird's wing that allows it to fly at low speeds without losing lift. In life, the bird "could have flitted between branches or alighted on a lofty perch as effortlessly as a sparrow," according to Dr. Luis Chiappe of the American Museum of Natural History.

New Scientist, October 19, 1996:

Giant flying reptiles dined on shellfish

TEXAS—Workers studying the remains of the giant pterosaur *Quetzalcoatlus* from the Cretaceous of Texas have concluded that this animal, the largest known flying creature—with a wingspan up to 12 metres—probably waded in ponds or shallow lakes, grubbing through the bottom sediments for arthropods.

Quetzalcoatlus was once assumed to have been a scavenger of dinosaur carcasses, but palaeontologists Thomas Lehman and Wann Langston argue that they would have been ill-adapted to such a lifestyle, with their long, thin legs and necks, and narrow beaks. *Quetzalcoatlus* remains, from the Big Bend area of Texas, are always found in rocks deposited in freshwater ponds, where the sediments are strongly burrowed, apparently by arthropods. Lehmann and Langston surmise that the flying reptiles may have lived in flocks, wading like flamingos and sifting through the mud for their food.

The Globe and Mail, November 7, 1996:

Slime holds signs of early life

LONDON—An international team of scientists working on 3.8 billion year old rocks from Greenland report evidence of life, the earliest so far reported. The team found traces of apparently organically-derived carbon in crystals of apatite

that suggest life existed only a few million years after the earth was supposedly bombarded by meteorites that would have sterilized the planet.

Calgary Herald, November 22, 1996:

Meteor not sole dinosaur killer

SEATTLE—Workers at the University of Washington and UCLA have concluded that a major drop in sea level contributed to the mass extinction marking the end of the Cretaceous period. U of W palaeontologist Peter Ward has managed to collect a large number of ammonites from just below the Cretaceous/Tertiary boundary in France and Spain, giving a very precise picture of what changes were happening at the time.

The fossil record shows a maximum sea-level drop occurring about 10,000 years prior to the postulated meteorite impact that is thought to have wiped out a large percentage of Earth's species, including the dinosaurs.

Charles Marshall of UCLA employed new statistical techniques which support their argument that as many as 25% of the K/T extinctions were caused by the drop of sea-level preceding the impact event. Another 25% are attributed to the normal "background extinction" that occurs all the time.

Time, December 2, 1996:

The jaws of destiny

ETHIOPIA—A portion of the upper jaw of a human ancestor discovered in 1994 in the Hadar region of Ethiopia has pushed the age of the genus *Homo* (our own genus) back to 2.33 million years. The specimen, found in association with primitive tools, supports the idea that the invention of tools happened at about the same time as the emergence of the genus *Homo*.

Previous tool finds, dated to as old as 2.5 million years, were found without bone material, leaving open the possibility that members of the earlier genus, *Australopithecus* (which includes the famous fossil "Lucy") may have been tool makers. It now looks like tool use may have begun with *Homo*. Evidence of climate change was recovered with the most recent find, also supporting the idea that tool use and upright stance were adaptations to a new environment.

The Globe and Mail, December 7, 1996:

The death of dinosaurs, blow-by-blow

PROVIDENCE, Rhode Island—Planetary geologist Dr. Peter Schultz, of Brown University and palaeontologist Dr. Steven D'Hondt of the

University of Rhode island have drawn a scenario for the initial destruction caused by the meteorite impact that supposedly caused the extinction of the dinosaurs at the end of the Cretaceous Period.

Studying the geometry of the Mexican Chicxulub crater, identified by Alan Hildebrand of the Geological Survey of Canada, the researchers find that the crater is elongated, suggesting that the asteroid struck the Yucatan area from the south-east at a shallow angle, from 20° to 30° above horizontal, and caused a blast of white-hot debris to be sprayed across western North America.

This idea accounts for the evidence that extinctions, especially of plants, seem to have occurred first and most severely in North America, and that the effects later spread to the rest of the world. Plants related to the Norfolk Island pine and the monkey-puzzle tree, now restricted to the southern hemisphere, were once abundant in North America.

Researchers hope to test this oblique-impact theory, and will look for further evidence which may include varying thicknesses of impact ejecta and asymmetry in the pattern of crustal faulting in the area of the crater.

The Globe and Mail, January 4, 1997:

No buyers for dino eggs

NEW YORK—It appears that there is no longer a sunny side to the dinosaur egg market. Two well-preserved therizinosaur eggs from China received no bids at an auction in New York. Terry Manning of the Dinosaur Embryo Project, a British research group, had put the eggs up for sale to fund his group's research, but failed to interest any buyers.

Calgary Herald, December 21, 1996:

It's been a while Crocodile

DRUMHELLER—This is another in a series of *Herald* feature articles on palaeontology, written by staff of the Royal Tyrrell Museum, this time by collections technician Tim Schowalter.

One of the best finds of the 1996 field season in Dinosaur Provincial Park was the skull of a crocodile, which should shed light on the relationships between various species of crocodylians from North America and Asia.

Dr. Xiao-chun Wu, a postdoctoral fellow working with Dr. Tony Russell of the University of Calgary and Don Brinkman of the Tyrrell Museum is studying the species *Leidyosuchus canadensis* of the Dinosaur Park beds. Using specimens from five other museums, the team is trying to sort out the true diversity of North American fossil crocs.

Problems with the 1907 type descriptions of *L. canadensis* and descriptions of later-found material has led to a confusing and incomplete definition of the species. Seven species of *Leidyosuchus* have been described from North America, two from Dinosaur Park beds and five from younger beds. Wu and colleagues now believe that only one species, *L. canadensis*, occurs in Dinosaur Park.

The Daily Telegraph (London), Jan. 23, 1997:

Fossils unearthed of dinosaur that ruled prehistoric Britain

ISLE OF WIGHT, England—The nearly complete remains of a new species of carnivorous dinosaur have been excavated from 120 million year old (Early Cretaceous) rocks on the Isle of Wight, off England's southwest coast.

The new theropod, dubbed *Neovenator salerii* was an 8 metre-long cousin of the American dinosaur *Allosaurus* that is presumed to have stalked herds of the herbivorous biped *Iguanodon*, bones of which are not uncommon in the area. The skeleton is to be the centrepiece of a new £2 million dinosaur museum currently under construction on the Isle of Wight.

The PEGG, February 1997:

Alberta palaeontologist receives Order of Canada

EDMONTON—Dr. Charles Stelck, whose name is familiar to many in Canada's palaeontological community, has been named an officer of the Order of Canada. Professor Stelck, who teaches geology and palaeontology at the University of Alberta, has been called the "dean of Canadian palaeontology" for his many years of work on invertebrate fossils and microfossils, particularly in northwestern Alberta and northeastern B.C.

The Globe and Mail, February 12, 1997:

Indian farmers unearth dinosaur eggs

PISDURA, India—What villagers thought were merely oval-shaped rocks dug up while plowing their wheat and cotton fields, turned out to be a spectacular treasure-trove of fossil dinosaur eggs. The fossils, measuring 15 cm. by 7.5 cm. had been unearthed over several years near this village 700 km. northeast of Bombay. Dr. Gyani Badam of Deccan College reports that more than 300 eggs were recovered, occurring in clusters of four to ten, as well as bones and coprolites (fossil dung). □

[Thanks to Les Adler, Trudy Martin, Roslyn Osztian and Sam Richter for clippings. -ed.]

A Most Deadly Virus

by Sam Richter

Last June, Sam provided us with safety tips on dealing with ticks, a potential summer field hazard. This spring, he deals with another problem that collectors could encounter in the field. —ed.

A young woman walked into hospital complaining of worsening flu symptoms: fever, chills, vomiting, diarrhoea, and weak, aching muscles. Nine hours later, in spite of intensive care, she was dead from the Hantavirus Pulmonary Syndrome (HPS) virus.

There are at least 19 strains of Hantavirus worldwide. It is a common infection of small rodents: mice, rats, chipmunks and even bats. The strain specific to mice and found in all of North America is called HPS. It is the most deadly of all the Hantaviruses, and is carried by mice. The virus is shed in the saliva, urine and droppings. It survives well even when dried and has been around for centuries.

Inhaling of aerosols or dust containing the virus; touching a contaminated surface and then the eyes or nose; or direct entry through cuts or scrapes can result in infection.

Infection starts with flu-like symptoms and can quickly progress to heart and respiratory failure, with heart rate of 118–130 beats per minute, panting, weak pulse and fever to 103°F.

The cause of respiratory failure is leakage of plasma from the capillaries that transfer oxygen and carbon dioxide in the lungs. Flooding of lungs means less surface area to transfer oxygen and the blood oxygen goes down. Loss of blood volume means less blood to carry what little oxygen there is. The heart is overworked and the lungs are drowning in body fluid.

The main therapy is to get the blood oxygen level back to normal and to maintain adequate blood volume. Success gets heart rate and breathing back to normal and the patient may be out of hospital in 7–10 days.

Death rate is from 50% to 75%; the median is 60%. Death may occur from the same day symptoms appear to 6 weeks later—median is 4 days. Symptoms appear from 1 to 21 days after infection—median is 4 days. A milder strain of Hantavirus carried by rats is suspected of being a cause for some high blood pressure and kidney disease.

A nice lady was looking after her sick cat. It sneezed on her face. The cat survived; she didn't. Most cats and dogs can acquire immunity to HPS.

Hikers on different wilderness trails have come down with the virus. They noticed many mice in some areas but didn't stop or get off the trail at those places. Viruses are very tiny and can be carried on air currents. Many mice could mean many virus carriers. Avoid dusty cabins, floorless tents and mouse hangouts.

Assume every mouse could get you. Get them first! One pair in the fall can become 150 mice by spring. The virus spreads by contact of mother with babies. Humans are a dead-end for the virus. Permanently set traps and poison bait wherever mice can show up.

Products and procedures are available to allow being in a virus contaminated area and yet keep the risk of infection to near zero. Farm and safety-supply houses have the personal items required. The main item for keeping the virus out of lungs is the disposable "High Efficiency Particulate Air" (HEPA) dust mask. These trap a very high percentage of the dust to which viruses can adhere. Also available are disposable paper coveralls with hood, and gloves—latex or polyvinyl. Kitchen gloves are usable and can be disinfected for reuse. Goggles and rubber boots would have you covered.

Lysol is handy for washing down rubber boots, hands and the spot spraying of dead mice, droppings and traps.

Before removing a dead mouse, spot spray with Lysol. Always do what you can to raise as little dust as possible. Dust mask and gloves will do here. Use the "doggy doo" method: place a hand in a suitable plastic bag, pick up the mouse with the bag; use the other hand to pull the bag over the mouse and twist shut. Double bag and place in trash for disposal. Burning in a hot fire works well. Buried virus has been found to be viable after many years in the ground. This could be where the "Curse of the Mummy" comes from.

Use the wet method of cleanup for floors and furniture, if applicable. A house plant sprayer works well to wet the area down. If there is adequate ventilation, a 10% mixture (9 parts water to 1 part bleach) could be used. Bleach is an effective, cheap disinfectant. Chlorine is the active ingredient and is very reactive. Under ideal conditions it will inactivate the weaker viruses in 5 minutes. Tough viruses need 35 minutes. Soak used gloves in a basin with 10% bleach for at least an hour.

Then rinse and hang up to dry. Chlorine is hard on the eyes, skin and lungs. Ventilation is key for minimum damage.

Bleach is good for wiping down dusty tables, etc. If there is poor ventilation, use Lysol: spray then wipe. Sweeping compounds do help keep dust down. Compressed air is a quick way of removing mouse nests from equipment, but raises a lot of dust. This has resulted in HPS infections. Techniques have been developed to allow working safely on contaminated equipment.

Vacuums are available with HEPA final filters. Normal filters are too porous and let dust fines and virus escape through and into the exhaust, spreading the virus. As few as 8 influenza viral particles has been shown to be enough to cause full flu infection.

No virus has ever found a way to get through physical barriers. HPS can result in a lot of misery; all efforts to avoid becoming infected are worthwhile. □

[Makes me feel good, knowing I once trapped 13 deer mice in less than a week, in an oilfield accomodation trailer...the mice were living in the forced-air heating ducts! – ed.]

Sam has provided a number of reprints of articles dealing with Hantavirus, that will be placed in the APS library.

1997 Field Trips

(...continued from page 4)

Trip 97-2: Saturday & Sunday, July 19 & 20

The aim of this trip will be to examine Upper Cretaceous fossil localities (mostly vertebrate) in the Medicine Hat area, southeastern Alberta.

Trip 97-3: Saturday & Sunday, Aug. 16 & 17

This is a return visit to the popular Tertiary (Eocene) fossil plant, insect and fish locality at McAbee, west of Kamloops, B.C.

Further details and directions for the July and August field trips will appear in the June Bulletin.

For more information, or to sign-up for field trips, contact Les Fazekas, (403) 248-7245. □

Program Summary

December 20, 1996: *The DINOTOUR 1996 trip to the Gobi Desert of Mongolia, with APS members Vaclav and Mona Marsovsky.*

Vaclav and Mona, on short notice, were generous enough to provide a fascinating travelogue of their expedition to the Gobi Desert with DINOTOUR.

The two-week trip took place in September of 1996, and the Marsovskys documented their adventure with an abundance of breathtaking slides showing the Mongolian cities, museums, countryside, campsites and (best of all!) the astonishing dinosaur fossils for which the area is famous. Vaclav prefaced his presentation with several overheads showing basic aspects of the Gobi geology and palaeogeography, and the diversity of dinosaur faunas, drawing comparisons with the Alberta faunas of Dinosaur Provincial Park. Be sure to read Vaclav's detailed account of the trip in the December 1996 *Bulletin*.

– Howard Allen

January 17, 1997: *Four “mini-programs” by APS members.*

By all accounts, the January “round-robin” session of mini-programs was a great success. Four members brought specimens relating to a topic of their own interest, and set up small displays in corners of the meeting room. The rest of the members in attendance broke up into four groups, each gathering at one of the stations. Examination of the specimens and informal discussions ensued, which many members—including those presenting the displays—found to be remarkably educational. At fifteen-minute intervals the groups rotated to the next station, so that after an hour all four stations had been visited by all in attendance.

It is hoped that other members will have been encouraged to participate in a future session.

The four members who provided displays were:

Les Adler

Materials relating to the collecting process.

Joe LeBlanc

Fossil shark's teeth.

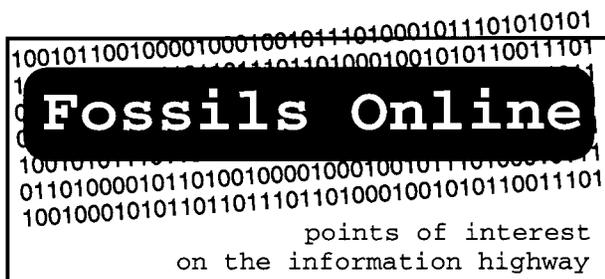
Gerry Morgan

Comparison between modern and fossil bones.

Don Sabo

Ornithomimid dinosaur material.

– Howard Allen □



by Howard Allen

I'm being lazy this month. **Lynne M. Clos**, editor of the Western Interior Paleontological Society's *Trilobite Tales* frequently compiles new websites of interest to fossil fanciers. The following sites are mostly taken from the November and December 1996 issues of *Trilobite Tales*. I have omitted some that have appeared here before.

I've checked few (if any) of these sites, so can't comment on the quality or content. Some may have moved or gone defunct in the interim. Try one of the search engine sites (Yahoo, Altavista) if you have trouble finding any of these pages. *Trilobite Tales* is available in the APS library.

Note! All website URLs are prefixed with **http://**

ucmp1.berkeley.edu

U. of California Berkeley, Museum of Paleontology

www.mei.com/other/mpm/welcome.html

Milwaukee Public Museum

www.nrm.se/

Swedish Museum of Natural History

www.gla.ac.uk/Museum/HuntMus/earth/

Hunterian Museum, University of Glasgow, Scotland

www.cmnh.org

Cleveland Museum of Natural History

www.rom.on.ca

Royal Ontario Museum

www.worldweb.com/aep/parks/Dinosaur

Dinosaur Provincial Park, Alberta

dinogenes.baylor.edu/WWWproviders/Streker_Museum/welcome.html

Streker Museum, Waco TX (mammoth site)

www.lam.mus.ca.us/page/

George Page Museum, La Brea Tarpits, Los Angeles

www.vt.edu:1002/artsci/geology/mclean/Dinosaur_volcano_extinction/index.html

Dewey McLean's extinction debate page.

www.emory.edu/GEOSCIENCE/HTML/Dinotraces.htm

Dinosaur trace fossils.

www.emory.edu/GEOSCIENCE/HTML/TFW3.html

Trace fossils in general, not just dinosaurs.

www.dinosauria.com

Jeff's dinosaur page

denrl.igis.uiuc.edu/igsroot/dinos/dinos_home.html

Dino Russ' Lair

www.ucmp.berkeley.edu/clad/clad1.html

The UC Berkeley cladistics page.

www.lava.net/~granahan/paleodb.html

Cyberspace Museum (info on other museum sites)

www.hcc.hawaii.edu/dinos/dinos.1.html

Dinosaurs in Hawaii (!)

www.aps.edu/htmlpages/dinosinnm.html

New Mexico Museum of Natural History

www.unm.edu/%7Egreywolf/test/nmfp955b.html

New Mexico Friends of Paleontology

www.rof.net/wp/rgreg/rgregfos.html

Dave's Eocene Fossils (Green River, Wyo. fossils)

www.ghgcorp.com/arts/

Calcite Palace (information about microfossils)

www.cs.uwindsor.ca/meta-index/mcat/html-docs/woop.html

Gulf of St. Lawrence microfossils (forams, ostracods)

culter.colorado.edu:1030/~saelias/elias.html

Ice age paleoecology

www.halcyon.com/bonebug/

Fossil News: journal of amateur paleontology.

pole.botany.uq.edu.au/porehistbio.html

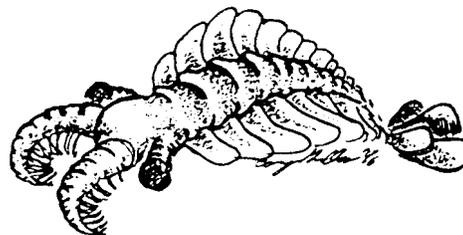
New Zealand prehistory and biogeography

www.emol.org/emol/arizona/petrified.html

Petrified Forest, Arizona

www.nhm.ac.uk/paleonet/

PaleoNet pages (network of paleo. resources)



Besides Lynne Clos' list, here are some other sites you might check out:

www.carleton.ca/~tpatters/Museum/hvpmddoor.html

T. Patterson virtual museum (at Carleton University)

www.carleton.ca/~tpatters/teaching/paleo/paleogate.html

T. Patterson palaeontology course (*Thanks to APS member Pat Brennan, Ottawa, for the two Carleton sites -ed.*)

ourworld.compuserve.com/homepages/naturkundemuseum

Staatliches Museum für Naturkunde, Stuttgart

eteweb.lscf.ucsb.edu/bfv/

Bibliography of fossil vertebrates

pangea.usask.ca/~dfs846/rmac/rmac.html

Rock and mineral associations of Canada: directory of rock clubs across Canada, including APS!

Reviews

[The following review originally appeared on the CompuServe™ Dinosaur Forum. It has been edited and reprinted with permission of the author. ©1997, Roger F. Fry]

Dinosaurs of the East Coast by David B. Weishampel and Luthor Young; Johns Hopkins University Press, Baltimore, 1996. 275 pages (with appendices and index); ISBN 0-8018-5216-1.

This is an interesting read and an absolute “must have” for those dinophiles living on the eastern seaboard. The writers (probably Young, as he is the “writer” of the two) take the reader on a voyage of discovery of east coast dinosaurism. The knowledgeable dinophile will find the early going is a rehash of previous knowledge of the east coast dinosauria with its dinosaur tracks, the initial discovery of the world’s first nearly complete dinosaur skeleton “*Hadrosaurus folkii*” in 1858 and Cope vs. Marsh. However, the rehash is done in such a way as to make it an interesting *deja vu*, with a full explanation of the terminology in layman’s terms in order not to confuse the casual reader. In addition, descriptions are given of the various dinosaurian groupings; cladistics are relied upon to explain much of their inter-relatedness.

The layout of the book takes you from the beginnings of east coast palaeontology (Chapters 1–4) to a description of each “age” of dinosaurs as known in eastern North America (Chapters 5–8). Discussion is done not only on a dinosaur-by-dinosaur basis but on a state-by-state basis. This keeps the reader in touch with what was going on not only “when” but “where” as well. In addition there are copious illustrations, tables and maps to keep a “foreigner” (read non-easterner) aligned with the area and the animal being discussed, whether from Nova Scotia or South Carolina. The ninth chapter is devoted to the modern seekers on the east coast (state-by-state and formation-by-formation with maps) and what and where they are finding things. The tenth chapter is devoted to “dinosaur mysteries” and comes up with the “media-accepted” solution of asteroid impact as the final killer. The final, obligatory Chapter 11 brings you back down to earth by telling you “look, don’t touch!”

As for criticisms—I found the book to make some assertions as though they were fact when really they were based upon speculations or stereotypes. For example, ankylosaurs are described as “slow, sluggish, and low on brainpower—it’s a good thing ankylosaurs were so well armoured!” (page 15). Perhaps, but not proven—some might consider armadillos as slow and low on brain power but I have witnessed their ability to literally leap in the air half a metre when startled. Not a “slow and sluggish” move! The writers also mentioned that “Pachycephalosaurs were the head butters of the Mesozoic with a thickened skull and other skeletal modifications that must have served as shock absorbers for head-on collisions,” (page 15). It is my understanding that this speculation has had some serious opposition following studies of the alignment of the neck vertebrae and their inability to withstand the shock of the collision. [see Bulletin, March 1995 –ed.]

My most serious criticism comes in Chapter 10, entitled “Dinosaur Mysteries.” Did you know “that birds *are* theropod dinosaurs, not just the closest relatives of theropod dinosaurs” (page 205)? I didn’t know that it had been proven beyond a reasonable doubt that birds are theropod dinosaurs. The authors not only “enlighten” me and the rest of palaeontology but state: “never mind clavicles: there are so many similarities between the likes of *Deinonychus* and other maniraptorians that the comings and goings of clavicles really becomes a very small issue” (page 205); and thereby with the wave of a literary magical wand, Weishampel and Young dismiss a problem as slight and of no consequence!

Further into Chapter 10, in discussing endothermy vs. ectothermy, Weishampel and Young state: “Nearly single-handedly, Bakker transformed dinosaurs from slow and sluggish swamp dwellers to lyrically leaping landlubbers.” Well, there you have it... without Bob, John Ostrom’s work would never have been recognized! (Also, I thought that ankylosaurs were slow and sluggish—remember page 15?—apparently they missed the lyrical leap to endothermy!) Further, they give a lot of room to Bakker’s prey/predator biomass theory (a section plus a diagram) but conclude that “Ingenious though the approach is—and it gets to the heart of the cost of endothermy—there have been few advocates of Bakker’s predator/prey biomass ratios.”

I just have to smile at this one... although (as the authors state) there are too many loose ends, the disclaimer of Bakker’s position has to be one of the

most fawning disclaimers that I have seen in a while. (Bob must have been a monetary contributor to the book or has photographs or something!) Finally, for political correctness (being at Johns Hopkins and near D.C.), they give the customary space and head bobbing approval to the “Asteroid Killed Them All” scenario.

Lastly, there is a Chapter 11 which gives all of us amateurs reasons for NOT doing anything that would ruin the province of the specialists. Although I agree with much of what was said in Chapter 11, it was written in a somewhat condescending manner.

Regardless of my “obviously biased” rantings above, the book is well worth the bucks spent on it. (The price was in the mid-twenty to low-thirty dollars US range, for hardback.) I recommend it to anyone interested in dinosaurs and as I said, it is a “must have” for any serious dinophile located on or near the east coast of the US or Canada.

– Roger F. Fry

[Roger Fry is an amateur palaeontologist in Bedford, Texas. The editor thanks Mr. Fry for granting permission to edit and reprint the review.]

Which Came First? by John Horgan. *Scientific American*, February 1997, p. 16, 18, 22.

In the November 1996 issue of *Science*, Alan Feduccia of the University of North Carolina and three colleagues stated that fossil birds of Northern China from about 140 million years ago were too highly developed to have descended from dinosaurs and that their ancestors may have been reptile-like creatures that antedated dinosaurs.

In his book *The Origin and Evolution of Birds* published by Yale University Press, 1996, Feduccia argues that many of the shared features of birds and dinosaurs stem from convergent evolution—coincidences, really—rather than common ancestry. Feduccia cites advanced birds such as *Confuciusornis* and *Liaoningornis* which had beaks rather than teeth about 140 million years ago. He says that *Archaeopteryx* was not the ancestor of modern birds, but was an evolutionary dead-end while the true ancestors of modern birds were archosaurs, lizard-like creatures which gave rise to all the above three.

Mark Norell and Luis Chiappe of the American Museum of Natural History, in a scathing review of Feduccia’s book in *Nature*, Nov. 21, 1996, state that there is not one shred of evidence for his opinions and give their reasons. APS member Dr.

Philip Currie of the Royal Tyrrell Museum has been studying another fossil from the same Chinese site with colleagues from China and says that this fossil shows a turkey-sized, bipedal dinosaur with what appear to be “downy feathers” running down its back, lending support to the notion that feathers originated as a means of insulation for earthbound dinosaurs and only later were adapted for flight. Dr. Currie believes that Feduccia and Martin are so opposed to the standard view of birds’ origins that they will reject any evidence. For most palaeontologists the evidence is overwhelming that dinosaurs did give rise to birds.

The following comments by Les Adler are from an amateur who finds that many palaeontologists’ remarks are confusing:

I have finished reading Fastovsky and Weishampel’s dinosaur text book in which they use cladistics to show that birds are dinosaurs. The above article then does not make any sense. It reminds me of Abbott and Costello’s *Who’s on First?* Having read Stephen Jay Gould’s essay in the February issue of *Natural History* I understand it may be that convergent evolution arises because the same gene displays its properties or characteristics as time and environment allow. If it were possible to identify the genes in the above-mentioned prehistoric creatures then there would be credible evidence to support palaeontologists’ conclusions. It is possible that the palaeontologists’ approach is back-to-front: start with microscopic evidence and work up to large evidence. Qualify your statements as Fastovsky and Weishampel do in their book and state that many of the conclusions will be modified as more evidence is found.

– Les Adler

Why Cladistics? by Eugene S. Gaffney, Lowell Dingus and Miranda K. Smith. *Natural History*, June 1995, p. 33–35.

The American Museum of Natural History in New York is the first institution to present a major exhibition based on cladistics, the best current scientific method for reconstructing evolutionary relationships (according to the authors).

Also called phylogenetic systematics, cladistics is a method of determining the evolutionary relationships of organisms—both living and extinct—and was developed by a German entomologist, Willi Hennig, about 1956, and later used extensively by this museum. This method uses the distribution of features, called derived characters,

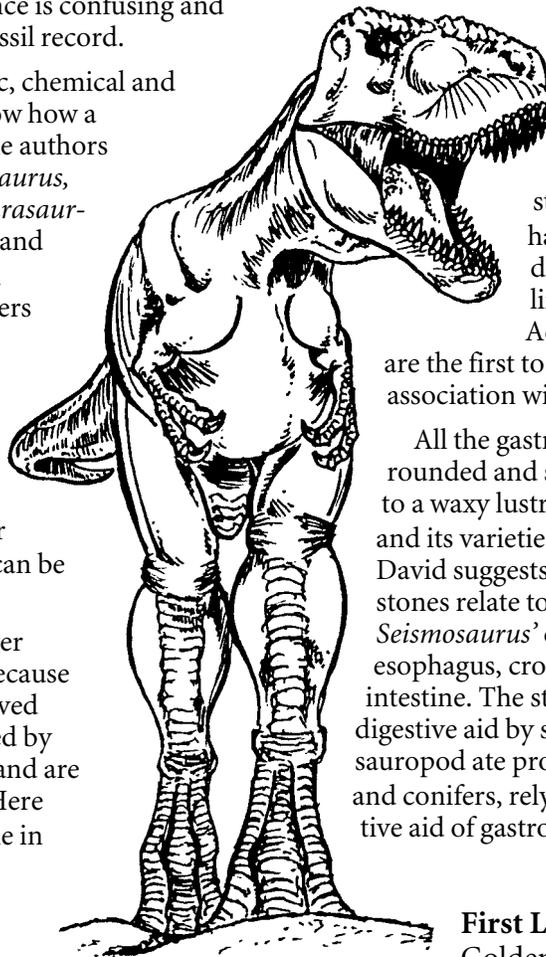
to test relationships. the distribution of characters usually forms a hierarchy of nested groups, with smaller groups contained within larger ones. "Dinosaurs" is contained within the group "vertebrates" because dinosaurs with all other vertebrates have a backbone. The backbone is known as a shared derived character for the group called vertebrates. Each group or clade is defined by a set of such shared derived characters inherited from a common ancestor. According to the above authors, cladistics is more reliable and objective than using the age of fossils or their occurrence in particular layers of rock to determine relationships. At present palaeontologists are improving their knowledge of birds and dinosaurs using cladistics as geological evidence is confusing and confounded by gaps in the fossil record.

This article uses six genetic, chemical and behavioural characters to show how a cladogram is constructed. The authors selected *Archaeopteryx*, *Allosaurus*, *Plateosaurus*, *Stegosaurus*, *Parasaur-olophus*, *Pachycephalosaurus* and *Triceratops* with six nodes. In reality the number of characters selected ranges from around twenty to over one hundred. Computer programs for the method are available.

In the museum, one derived character is used for each group with the character represented by a model that can be touched by the visitor.

Features which define larger groups are called primitive because they are thought to have evolved earlier whereas features shared by smaller groups evolved later and are called derived or advanced. Here Dinosauria is defined by "hole in hip socket," a character that includes birds. Within vertebrates, "hole in hip socket" is unique to Dinosauria, and is derived with respect to other vertebrates. Among dinosaurs this character is termed primitive. Seeing the AMNH collection in a cladistic context emphasizes the real knowledge that can be obtained from fossils. - Les Adler

[At a later date Les will be commenting on *The Evolution and Extinction of Dinosaurs by Fastovsky and Weishampel, 1996, which uses a cladistic approach to the study of dinosaurs* -ed.]



True Grit by David D. Gillette. *Natural History*, June 1995, p. 41-43.

David Gillette was involved over a seven year period in the excavation of a skeleton of *Seismosaurus*, a 46-metre long dinosaur belonging to the family of long-tailed sauropods which includes *Diplodocus*, *Apatosaurus* and *Barosaurus*. One of the ribs was nearly ten feet long and the sacrum was about five feet high. As the team's excavation progressed, 240 stones appeared which considerably slowed down progress. Except for the presumed gastroliths, no sedimentary material larger than sand was evident. The gastroliths lay

directly on sand with some stones in direct contact with the ribs and vertebrae and also had unusual orientations. The stones showed a bell-shaped curve of size distribution whereas stream-carried stones would have shown a different distribution, with more of a linear decrease in size.

According to David these stones are the first to be documented in direct association with the skeleton.

All the gastroliths are exceptionally rounded and some are thoroughly polished to a waxy lustre and are composed of quartz and its varieties such as jasper and quartzite. David suggests that the different types of stones relate to different portions of *Seismosaurus*' digestive system such as esophagus, crop, stomach, gizzard and intestine. The stones probably served as a digestive aid by stirring digestive juices. This sauropod ate prodigious meals of ferns, cycads and conifers, relying on the occasional digestive aid of gastroliths, dinosaur true grit.

- Les Adler

First Lady of Fossils by Frederick Golden with reporting by Joseph Ngala. *Time*, Dec. 23, 1996, p. 39.

Mary Leakey, 1913-1996, was a 20-year old part-time illustrator and amateur archaeologist who met Louis Leakey in 1933, created a social scandal, married him and then moved to Africa. She worked in his shadow and bore three sons. The Leakeys reversed scientific opinion and placed man's origins in Africa. Mary provided discoveries, measured, sketched and catalogued,

and provided fundamental data. She found part of the jaw and skull of *Proconsul africanus*, a skull of *Zinjanthropus* and a set of 3.6 million year old footprints of an upright human ancestor. These footprints are now covered and protected. In the end she was a better scientist than her famous husband. □

Highlights from Exchange Bulletins

The APS exchanges bulletins and newsletters with other societies and clubs. Members are encouraged to examine copies of these, which are saved in the APS library. —ed.

The Earth Science News—Earth Science Club of Northern Illinois, Downers Grove, IL, USA.

October 1996

- *New Dinosaur Center opens in Wyoming*: details of a new fossil centre near Thermopolis.

January 1997

- *Raptor Red review*: Bakker's novel.

February 1997

- *Make a mold from your specimen*: Using silicone compounds for mould-making.
- *Mississippi's own petrified forest*: protected fossil site in the southeastern US.

Trilobite Tales—Western Interior Paleontological Society, Denver, CO, USA.

September 1996

- *List of dinosaur-related magazines*

January 1997

- *Cycads: Living fossils* by Lynne M. Clos: an excellent feature article on this group of plants.

Paleo Newsletter—Austin Paleontological Society, Austin, TX, USA.

August 1996

- *Conularia* by Virginia Feiedman: brief notes.

September 1996

- *Cretaceous killer comes out of the closet after 120 million years* by Robert A. Farrar: details on a skeleton of *Acrocantnosaurus atokensis*, of Oklahoma.
- *More Venezuelan dinosaurs* by John M. Moody: notes on excavation of Jurassic fossils.
- *A little about petrification* by Michael J. Papay
- *Consolidants* by Russ McCarty: tips for using plastic bone preservatives.

October 1996

- *More Venezuelan dinosaurs* by John M. Moody: conclusion.

- *Safety in the field* by Russ McCarty

January 1997

- *"Sue" to be auctioned*: famous *T. rex* up for sale.

MAPS Digest—Middle America Paleontology Society, Cedar Rapids, IO, USA.

July–September 1996

- *Coastal Carolina fossil collecting techniques* by Don Clements.

October 1996

- *Pacific coast tertiary invertebrates and the advantages of amateurism* by Joe Small.

December 1996

- *How to write & decipher fossil descriptions* by Eric S. Kendrew.

- *Canada or bust* by Marc Behrendt: trilobite hunting in Ontario.

January 1997

- *Recycling, 350 million years ago* by Bob Guenther: crinoid/gastropod cooperation. □

Coming Events

Canadian Society of Petroleum Geologists

Lunchtime technical program, **Tuesday March 11**:

Dr. William R. Hammer, Dept. of Geology, Augustana College, Rock Island, Illinois.

Dinosaurs on ice: Jurassic dinosaurs of Antarctica. 11:30AM, Westin Hotel, Calgary. Tickets \$16.50, no later than March 6, from CSPG Office: #505, 206-7th Avenue SW, Calgary. (403) 264-5610.

Calgary Rock and Lapidary Club

March meeting: **Friday, March 14**, 7:30PM, Spruce Cliff Community Centre, 608 Poplar Road, SW. Program: tentatively planned as a "Bring & Brag" session. Visitors welcome.

Calgary Rock and Lapidary Club's

37th Annual Gem, Fossil & Mineral Show

Saturday, May 3, 10AM–7PM

Sunday, May 4, 10AM–5PM

West Hillhurst Arena, 1940-6 Avenue NW

Admission: adults \$3.00, seniors/youth \$2.00.

DINOTOUR 1997

Eleven days in Alberta, Montana, Wyoming, South Dakota, North Dakota and Saskatchewan with Dr. Phil Currie. **May 9 to May 19**. Contact Corliss (403) 271-2350 or Bill (403) 239-6454.

Royal Tyrrell Museum DinoTour 1997

Nine days in Alberta, Saskatchewan & B.C., including Burgess Shale. **June 14–22**. Contact Kim Herman (403) 823-7707 or 1-888-440-4240. □