

ALBERTA • PALAEOONTOLOGICAL • SOCIETY

# BULLETIN

VOLUME 7 NUMBER 3

SEPTEMBER 1992



## ALBERTA PALAEOLOGICAL SOCIETY

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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.

Single membership	\$10.00 annually
Family or Institution	\$15.00 annually

**THE BULLETIN WILL BE PUBLISHED QUARTERLY:** March, June, September and December.  
Deadline for submitting material for publication is the 15th of the month prior to publication.

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†APAC is the Alberta Palaeontological Advisory Committee

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## UPCOMING APS MEETINGS

Meetings take place in Room **B108**, Mount Royal College, at **7:30** p.m.

**October 16**—Dr. Dave Mundy: "Testimony of the Rocks"

**November 20**—Dr. Philip Currie: "Small Theropods and the Origin of Birds"

**December 18\***—Christmas meeting, presentation by Les Adler

\*Bulletins will (hopefully) be distributed to members in attendance.

\*\*\*\*\*

**ON THE COVER:** Detail of the second of two montages by APS member Hope Johnson, LLD, of Redcliff, Alberta—Marine life of the Late Cretaceous (Campanian–Maastrichtian) Bearpaw Formation. See page 6 for details (reproduced by permission).

## PRESIDENT'S MESSAGE

by Les Adler

Welcome to the 1992 – 1993 series of programs of the Alberta Palaeontological Society! Meetings will continue to be held in room B108 at Mt. Royal College, mostly on the third Friday of the month starting at approximately 7:30 p.m. (depending on whether or not the door has been unlocked, and whether the AV equipment is at hand).

Several excellent speakers (including myself!) have agreed to visit us, presenting topics with slides and possibly videos, ranging from 'what's in the rocks', through dinosaurs, fossil birds and microfossils, to fossil plants and other fossils occurring in Alberta

Several of our members will be visiting the Ex-Terra Foundation Show in Edmonton in 1993 (see *Bulletin*, June 1992, pg. 12); and the DINOTOUR executive, which includes some of our members, is planning a dinosaur excursion in May or June of 1993.

I hereby express thanks on behalf of myself and the Society, who have benefited immensely from the contributions of our members and their friends. Please excuse me if I have neglected to mention you personally; I hope you will continue to contribute as you have done in the past. Some of the above-mentioned people include Mike Skrepnik, of the DINOTOUR executive. Mike designed the last APS T-shirt and sold half of the issue by himself. I am meeting with Mike to discuss the next sale. Eva and Dr. Meinrad Hoffman, and Steffie and Harvey Negrich have provided large quantities of food for APS Christmas and end-of-season meetings. Wayne Braunberger (APS representative to the Alberta Palaeontological Advisory Committee), Don Sabo (now secretary), and Percy Strong, all past-presidents, have established a Society with a strong record of membership and credible content and direction. Percy has conducted surveys so that the executive is aware of your wishes. Susan Huber of Ganges, B.C. has been very generous with cash donations.

I would also like to thank staff members of the Royal Tyrrell Museum of Palaeontology, the Geological Survey of Canada's Institute of Sedimentary and Petroleum Geology, and the staff of Mount Royal College, who have been generous in providing speakers. Mount Royal College provides us with a venue, the use of audio-visual and other equipment, and parking privileges.

Another group whom I wish to thank is the one that includes Betty Quon, for assembling financial statements and for checking my figures,

Larry Kidner for organizing our financial records and Roger Arthurs, Alex Harich and Dr. Gerry Morgan for auditing the books. Randall Quon has put together a set of videos on dinosaurs, etc., so that we will be in no danger of running out of programs. Harvey Negrich is continuing to curate specimens and put them on display at the Calgary Rock and Lapidary Show in May. Howard Allen has done a tremendous job with our *Bulletin* so that our membership extends from the United Kingdom, the United States, and across Canada from Ontario to British Columbia.

We are in a strong financial situation. I do not see any need to raise our membership fees for some time. Our speakers have been very generous: instead of having to charge members eight dollars per lecture, we make no charge at all. So far we have made no charges for field trips—this may change in the future if expenses become somewhat higher than they are at present.

If you wish to take advantage of the bargains that we offer, including a well-stocked library, visit us at Mount Royal College and you will see that we are meeting our objectives as stated on page 1 of the *Bulletin* (P.S.—don't forget to help the coffee fund!).

## FROM THE EDITOR

by Howard Allen

While the bouquets are flying, I would like to toss a few of my own: thanks to Les Adler, Heather Whitehead and Harvey Negrich for providing articles and news items for the *Bulletin*. Thanks also to my good friends (though palaeontological philistines) Dave and Evelyn Wotherspoon, who continue to scan the papers for items of interest.

In case any members out there have ideas for articles but are having a hard time putting pen to paper, how about putting finger to keyboard? Material for the *Bulletin* can also be submitted in digital form, preferably in Macintosh MacWrite II or Microsoft Word (Mac) formats, but also in Macintosh text (plain, unformatted), or IBM-compatible DOS text (ASCII) file formats. Data must be provided on standard 3.5" floppy disks (single-sided, double sided or high-density). Please include a draft printout of the article with your disk (floppies will be returned on request). If you need more information, or to discuss acceptable formats for submitting computer drawings or art, please contact me at 274-1858.

I hope you all had a good "summer" (such as it was!) and I look forward to hearing about your adventures, both at the upcoming meetings, and in print (!)

## 1992 FIELD TRIP REPORT

by Howard Allen

### Ravenscrag Butte, Saskatchewan, and Manyberries region, Alberta (June 20–21)

The base-camp for this two day field trip was the Eastend, Saskatchewan town campground, which, as luck had it, became the exclusive domain of the APS. Some members arrived the night of the 19th, the rest appeared at intervals the next morning. Twelve people attended.

The day was shaping up to be sunny and hot by time the group was assembled at mid-morning. Trip leader Les Fazekas secured permission from a local rancher to collect in an area on the northwest corner of Ravenscrag Butte. The main outcrop site was occupied by a recently worked kaolin quarry, which exposed several tens of metres of the Whitemud (Upper Cretaceous, from which the kaolin is mined for porcelain manufacture), to Ravenscrag (Paleocene) Formations.

Ravenscrag strata comprised interbedded shales, lignitic coal and thin sandy and silty beds, with abundant fossil root traces. One group discovered a bed of marlstone containing fossil leaves, from which many good specimens were obtained. The author recovered a beautiful specimen consisting of a stem with eight attached, almond-like seeds (probably *Nyssidium arcticum*).

The area also yielded occasional reworked fragments of petrified wood and bone from the overlying Oligocene Cypress Hills Formation gravels. After a few hours at this locality, the group split up—some returning to Eastend, to visit the town museum, the rest proceeding westward along the butte to explore further. This latter group, though not encountering more fossiliferous outcrop, found much evidence of prehistoric aboriginal occupation, including several tepee rings with hearth-stones. One member was lucky enough to find a quartzite pounding-stone nearby.

A bizarre incident occurred later that evening, back at the campsite in Eastend. Steffie Negrich and the Barretts, guests from Calgary, were just setting out on an after-supper walk, when a huge mountain lion loped across the path in front of them, and disappeared into the underbrush! Fortunately the big cat was minding its own business, and no more was seen or heard of it. Inquiries in town the next day confirmed that, yes, mountain lions are occasionally seen in the area, apparently wandering down from the nearby Cypress Hills.

On Sunday, the group left Eastend and headed west, after a final visit to the Eastend museum. The museum houses a fine collection of locally occurring fossils, including Paleocene plant

material, Upper Cretaceous marine invertebrates and dinosaur bones, and Tertiary mammal remains, including a mounted skeleton of a brontothere.

Under a blazing sun and the leadership of Les Adler, the group proceeded to an extensive badlands exposure of the Upper Cretaceous Bearpaw Formation, southeast of the village of Manyberries, Alberta. This was the site of Les Adler's discovery a few years ago of a mosasaur skull, which was subsequently excavated by staff of the Tyrrell Museum.

Within minutes of leaving the vehicles, several group members began making finds. The author picked up a fragment of what appeared to be a small jaw-bone with two rounded teeth and two empty sockets (this was later determined to be a fragment of crayfish claw); a few metres away Les Fazekas' friend Leo picked up a large, serrated shark tooth (*Squalicorax* sp?); seconds later, Les himself found a fragment of a smaller shark tooth (cf. *Hypotodus*). The entire area yielded abundant fragmentary ammonite material (*Placenticerax*, *Baculites*), as well as occasional fragments of large pelecypods (*Arctica ovata*, *Inoceramus* sp.) and scaphopods (*Dentalium* sp.).

### Scabby Butte, Alberta (July 18)

The second field trip of the season was attended by about ten APS members and three guests from the Lethbridge area. The location, an isolated badland exposure of the Upper Cretaceous St. Mary River Formation, is located northwest of Lethbridge, Alberta. Scabby Butte was the site of one of the earliest (1881) dinosaur discoveries in Western Canada. Two *Pachyrhinosaurus* skulls were excavated in 1955, and a mosasaur skeleton has also been recovered.

The group met at Keho Lake campground in mid-morning, under an overcast sky. A blustery north wind kept temperatures in the mid teens. Trip leader Les Fazekas, with permission of the landowners, directed the group to an area overlooking the Scabby Butte badlands, where members dispersed and commenced exploring.

The field trip yielded an abundance of microvertebrate fossils, which, though occurring throughout the area, are often concentrated in small, fossiliferous "bone beds". Teeth of the ray *Myledaphus bipartitus* Cope were locally very abundant—hundreds were collected; other material included the tiny, button-like teeth of *Paralbula casei* Estes (a herring-like, mollusc-eating fish); crocodile teeth (usually lumped into the genus *Leidyosuchus*); ganoid scales of the gar-pike *Lepisosteus*; occasional small fish vertebrae, and various fragments of dinosaur bone.

## DINOTOUR PARTICIPANT MAKES IMPORTANT FIND AT DRY MESA BUTTE

by Heather Whitehead

One of the field sites visited by DINOTOUR 1992 was the Dry Mesa Quarry on the western Colorado Plateau, where the huge sauropods *Supersaurus* and "*Ultrasaurus*" were excavated by Jim Jensen in the 1970s. On June 8, tour member Judith Loebel from London, England picked up a piece of very hard sandstone from the "spoil pile" and turned it over. She saw something out of the ordinary, and asked the tour's scientific leader Dr. Philip Currie "if it was anything interesting."

Phil Currie, Head of Dinosaur Research at the Royal Tyrrell Museum in Drumheller and one of the world's experts on carnivorous dinosaur teeth, quickly realized that Judith had a rare and exciting find—a premaxilla with 3 teeth from a meat-eating dinosaur. Provisionally identified as a probable *Torvosaurus*, the specimen was presented to Brigham Young University representative Ken Stadtman in Provo, Utah on June 12, 1992. Judith's find will be prepared as soon as possible, and the results should be written up for publication in a year or so.

The type specimen of *Torvosaurus* was described in 1979 by Jim Jensen and Peter Galton from a Dry Mesa Quarry find (in fact, the "discovery bone" at Dry Mesa, found by Vivian and Eddie Jones, was a *Torvosaurus* toe bone). *Torvosaurus*, or "savage lizard," was a robust Late Jurassic predator of the Family Megalosauridae, up to 10 m long and up to 5.4 metric tonnes in weight. Its premaxilla—the front of the upper jaw, either right or left side—contained 3 (or possibly 4) teeth, and few specimens had been previously discovered.

A full description of *Torvosaurus* from Dry Mesa Quarry can be seen in:

Britt, Brooks B. 1991. **Theropods of Dry Mesa Quarry (Morrison Formation, Late Jurassic), Colorado, with emphasis on the osteology of *Torvosaurus tanneri***. Brigham Young University Geology Studies, v. 37, p. 1-72. (available at the University of Calgary Gallagher Library).

## ASPECTS OF SEISMOSAURUS

by Heather Whitehead

(From a talk given to DINOTOUR by Dr. David Gillette, Utah State palaeontologist, June 11, 1992)

## Introduction

The sauropod *Seismosaurus* was excavated from the edge of a high mesa in New Mexico, north of Albuquerque, beginning on Father's Day 1985. The original find, 8 caudal (tail) vertebrae, led back into the hill to the sacral (hip) area and beyond to the ribs. Caudal vertebrae near the hip were 1 m deep and 1 m wide, and site palaeontologist David Gillette realized that this specimen was at least the size of *Supersaurus* from Dry Mesa Quarry. *Seismosaurus* has different proportions than other supergiant dinosaurs, which help define it as a separate species. Gillette describes *Seismosaurus* as sort of a dachshund—short-legged and very long-bodied. It may have been up to 150 feet long, with a massive build, and was named for its "earth-shaking footsteps." Cause of death is not known; the skeleton appears to be of a healthy, prime adult specimen.

*Seismosaurus* research includes work on gastroliths (stomach stones) and on application of geophysical remote sensing ("seismic") techniques to field palaeontology. The latter research shows a prophetic choice of name for this dinosaur!

## Gastroliths

The examination of gastroliths associated with *Seismosaurus* is the first detailed study of supposed sauropod gastroliths. So far, 235 of the generally smooth, polished stones have been found associated with the skeleton. Once the field and preparation crews realized the potential significance of the stones, they mapped locations and kept an accurate count; many stones are still jacketed with the bones, and some of these will be left for study by future palaeontologists.

The average size, shape, and weight of the stones was similar to a plum. The largest was grapefruit size, four times the size of the next largest. (David Gillette told a story about an off-hand comment he made about that large stone, at the end of a long interview—which resulted in "Dinosaur Choked to Death" stories in the press!). Some of the stones were found in contact with the ribs; some were flat "skipping stones"; some were found in imbricate associations (i.e. flat stones oriented in parallel alignment), not brought in by stream action—they were held in place, presumably by the *Seismosaurus* carcass, until sand infilled the abdominal cavity.

A graph of frequency of stone occurrence vs. dimension of the intermediate axis of the stones (the intermediate axis is the maximum width swallowed) for 130 specimens showed a bell-shaped curve, with a peak at 30-60 mm. A plot of stone location shows two clusters, one to the rear, in the sacral area, with 26 confirmed stones (estimated 50 total) and the other forward of this,

with 208 confirmed stones (estimated 250 in total).

Gillette thinks the front group came from a pre-digestive crop, and the back group from an intestinal gizzard. He believes that the stones played a part in the digestive process, but their role may have been as “magnetic stirrers,” maintaining turbulence in the digestive tract, rather than acting to grind coarse food. Continued study of these gastroliths may eventually help to develop criteria to differentiate true dinosaur gastroliths from ordinary river stones.

### “High-tech” field palaeontology

*Seismosaurus* was found on a cliff face, in concrete-hard rock. The bones are mainly white, as is the surrounding sandstone; the slight colour difference is very hard to detect. The tops of the vertebrae were 8 feet below the mesa top, the bottoms 10-12 feet below. Over 1 million pounds of rock have been moved at the site so far. The site is also near the Los Alamos National Laboratory in New Mexico, and this connection led to the high-tech work done at the site.

In 1985, David Gillette was employed at the New Mexico Museum of Natural History in Albuquerque. He gave a talk at Los Alamos, and scientists there began working on ideas for “seeing” bones in the ground before digging. Methods discussed and tried include:

- **Ground penetrating radar**—Radio waves are sent into the ground from a moving antenna, generating reflection profiles. A disturbance in the pattern implies a target. Resolution limits the use of the technique to large bones only, and complex subsurface geology can influence the results.

- **Proton free-precession magnetometry**—The technique measures changes in magnetic lines of force that converge or diverge over a target depending on the magnetic properties of the target vs. the surroundings (the *Seismosaurus* bones contain traces of magnetite, so the technique can be used with them). It can detect differences to 2-millionths of one percent. The technique was at first dismissed, but in a training session it picked up tail bone fragments that had been missed.

- **Geophysical diffraction tomography**—The method relies on density contrast between the bone and the surrounding rock. Sound waves travel about 4 times faster in the denser bone. Bottom-sealed PVC pipe was put down boreholes to a level below the fossil horizon. The pipes were filled with water and packed with sand around the exterior. Hydrophones hooked to a computer were sent down to measure shock waves generated with a standard seismic gun. Changes in density/travel time of sound waves are picked up by the hydrophones and analysed by the computer. Rough images and their distance away can be

estimated. The method is still being evaluated but shows some promise for large dinosaur bones in sites where boreholes can be developed, and where the surrounding rock is relatively homogeneous.

- **Examination of solid cores** taken from locations that other methods had predicted would or would not intersect bone. The first hole did not find bone, an expected result; the second hole was also “dry.” Two years later, the second core hole was excavated and it was discovered that it had penetrated *between the sides* of a V-shaped dorsal vertebra (this became known, inevitably, as Murphy’s Hole!).

### Additional Research

Lessem, Don. 1992. **Kings of Creation**. Simon & Schuster, New York, 367 p.

Witten, A., Gillette, D.D., Sypniewski, J. and King, W.C. 1992. **Geophysical diffraction tomography at a dinosaur site**. *Geophysics*, v. 57, p. 187-195.

## DINOTOUR 1993

Set aside 10 days in the spring of 1993 if you are interested in dinosaur palaeontology!

**DINOTOUR** is planning its third annual trip, to take place probably in May. Final dates will be set in consultation with Dr. Phil Currie’s busy calendar. **DINOTOUR** planners are looking at routes in eastern Utah, Colorado, and New Mexico, searching for the right mixture of dinosaur quarries and museums and other sites and activities of interest. Full details of route, timing, and costs will appear in the December APS Bulletin, but interested parties can contact

### DINOTOUR

**12231 Lake Fraser Way S.E., Calgary,  
Alberta, Canada, T2J 3T2**

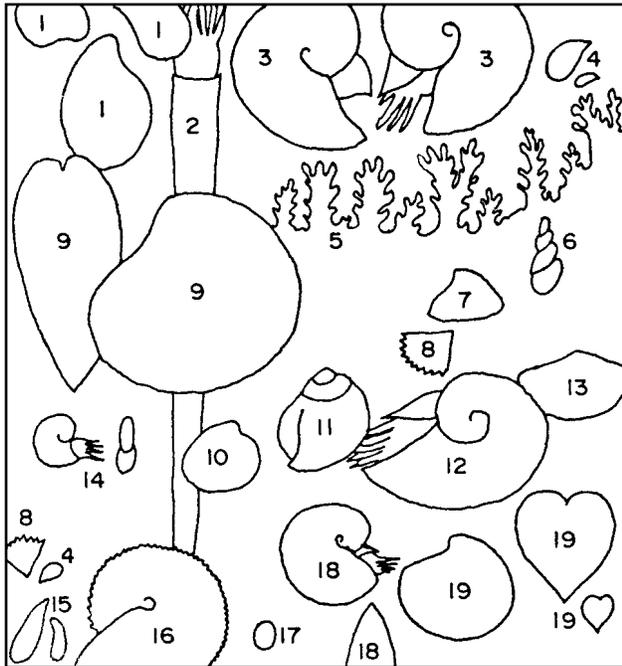
to be put on the mailing list.

The 1992 tour will be hard to beat (see various articles in this and the December issue), but with the expertise of Dr. Phil Currie of the Royal Tyrrell Museum and on-site experts along the chosen route, the 1993 trip will no doubt offer new and exciting experiences.

—submitted by Heather Whitehead, APS member and **DINOTOUR** committee member

## ON THE COVER

art by Hope Johnson, LLD



Key to cover illustration—Bearpaw age sea life

- 1 *Inoceramus* sp.
- 2 *Baculites* sp.
- 3 *Jeletzkytes brevis* (Meek)
- 4 *Phelopteria linguiformis* (Evans and Shumard)
- 5 Suture of *Jeletzkytes brevis* (Meek)
- 6 *Anchura americana* (Evans and Shumard)
- 7 *Anisomyon centrale* Meek—a limpet
- 8 *Chlamys nebrascensis* Meek and Hayden
- 9 *Arctica ovata* var. *alta* Whiteaves
- 10 *Dosiniopsis deweyi* (Meek and Hayden)
- 11 *Cinulia concinna* (Hall and Meek)
- 12 ammonite (unidentified—*Rhaeboceras* sp?)
- 13 unidentified bivalve
- 14 ammonites (unidentified)
- 15 *Volsella attenuata* (Meek and Hayden)
- 16 *Rhaeboceras subglobosus* (Whiteaves)?
- 17 *Haminea occidentalis* (Meek and Hayden)
- 18 *Placenticerus meeki* Boehm
- 19 *Protocardia subquadrata* (Evans and Shumard)

This montage is a pen-and-ink drawing done in 1986. Hope notes that the fenestellid bryozoans appearing in the lower left corner are probably anachronistic in this setting, but pleads artistic licence!

Once again, I extend thanks to Hope Johnson on behalf of the Society, for permission to print this montage and the one appearing on the cover of the March *Bulletin*.

## REVIEWS

from Les Adler

**This View of Life: Abolish the Recent**, by Stephen Jay Gould, *Natural History*, May 1991, pp. 16–21.

In this article, Gould continues to present concepts at variance to those found in many textbooks. The theme in this essay is the invisibility of larger contexts caused by too much focus upon single items—missing the forest for the trees. Because of the fears of global warming, scientists forget that an ice age is prevailing and has done so for the last 3.5 million years. We are currently in an interglacial period, one of many, the last ice sheet beginning its major phase of melting about 11,000 years ago. In reality we are in the Pleistocene Epoch, so the ‘Recent’ subdivision should be discarded.

Glacial periods are tough on faunas. Conflict exists on theories to explain the extinctions of mammals. The study of other types of organisms may shed some light on the problem. Stanley, an expert on fossil pelecypods, studied the fauna of coastal plain deposits in eastern North America. Of 361 early Pliocene species, only 22% survive today. By contrast, the fossil faunas of Japan, in a warmer environment, show 60 to 65% of Pliocene fossil pelecypods surviving today. Stanley concluded that a thermal factor operated in the extinctions of these species. As a consequence of studying interglacial faunas and extinctions, Gould suggests that palaeontologists display a bumper sticker that reads: **ABOLISH THE RECENT**.

**This View of Life: Of Mice and Mosquitoes**, by Stephen Jay Gould, *Natural History*, July 1991, pp. 12–20.

Scientifically, one might wonder if there could be a relationship between the arthropod and vertebrate phyla. In this article, Gould presents the latest findings on gene sequences and animal structures to show that recent breakthroughs point to an anatomical similarity between vertebrate rhombomeres (vertebral segments) and insect metameres (body segments) and to an uncanny likeness in their manufacture by certain genes.

Goethe attempted to explain the varied parts of plants as modifications of an archetypal leaf. Saint-Hilaire, in 1820, tried to carry out a similar feat for arthropods and vertebrates. This led to many arguments, with attempts to also include the structures of molluscs.

The recent gene discoveries seem to validate Saint-Hilaire’s vision of structural unity. Gould muses that as he continues to swat flies and mosquitoes, he might wince at the thought that he is contributing to the killing of genes that helped

to build the brain that coordinates his movements, and even the hand carrying out the action.

**This View of Life: Opus 200**, by Stephen Jay Gould, *Natural History*, Aug. 1991, pp. 12–18.

This is Gould's 200th essay in *Natural History* without missing an issue. In his 100th essay, he indulged his interest in Bahamian land snails. In this essay he indulges in the idea central to his work and formulated with Niles Eldredge—punctuated equilibrium, called “punk eke” or “evolution by jerks” (puns intended). Gould and Eldredge noticed that the vast majority of marine invertebrate species appear fully formed in the fossil record and do not change substantially during a 5 to 10 million-year period; in other words, geologically abrupt appearance followed by subsequent stability of form. Darwin, in *The Origin of Species* (1859), explained the discrepancy between his theories and observations as being due to the gross imperfection of the fossil record.

Eldredge (the ideas) and Gould (the scribing) have turned the basic fact of palaeontology into a subject of active and burgeoning research. Evolutionists today study the puzzle of stasis. Gould believes that punctuated equilibrium does prevail as the primary moulder of pattern in the fossil record. Studies now exist by Cheetham (on bryozoans), Ager (on brachiopods), Stanley and Yang (on clams), Williamson (on snails) and Prothero and Shubin (on horses). The theory does not pertain to all species.

The theory is useful, having been around for twenty years, and has prospects of remaining useful for years to come.

**The Ape that Was**, by Russell L. Ciochon, *Natural History*, November 1991, pp. 54–63.

Ciochon describes the detective work required to find *Gigantopithecus* remains in China. Remains of jaws and about 1,000 teeth were found in caves from southern to central China. A time interval of about 6 million years and more than one species was represented. From a close examination of the fossils scientists are able to conclude that these animals were apes, that they were subject to diseases, that the particles of food found in their teeth were most likely bamboo and durian (the fruit of an Asiatic tree). The animals were slow-moving, and males were larger than females, reaching a height of about three metres and weighing up to 550 kg. Remains of *Homo erectus* have been found along with these remains in more than one location.

The author was unable to find *Gigantopithecus* remains in Vietnam, but did find *Homo* remains. It is believed that *Gigantopithecus*

became extinct about 200,000 years ago, possibly due to a combination of human hunting, competition for food supplies with other animals, disease, and climatic changes. There are stories of large apes in southeast Asia such as Bigfoot and the Abominable Snowman...perhaps *Gigantopithecus* will reappear in the 21st century!

**Sauropod dinosaur issue**, *Natural History*, December 1991, pp. 28–41.

This issue features a set of six articles and a dramatic cover painting to celebrate the opening of a display of giant dinosaur sculptures at the American Museum of Natural History in New York city.

*The Thunder Lizards* is a two-page painting of a herd of *Diplodocus* migrating through a sparsely vegetated landscape of cycads.

*Life Styles of the Huge and Famous*, by Peter Dodson deals with sauropods. About 90 genera have been proposed, of which about 50 may be valid. The most important characteristic of sauropods, the most successful group of dinosaurs, is their sheer size: *Seismosaurus* may turn out to be 42 metres long. Dodson, Bakker, Behrensmeyer and McIntosh have found that sauropods ranged over a variety of environments. Compared to the lush Cretaceous deposits of Alberta, the Jurassic deposits of the USA indicated dry and seasonal climates. The jaws and teeth of these animals raked in huge amounts of plant material, and the sauropods probably swallowed stones to help in digestion. Footprints show that sauropods moved in herds.

On page 31, a time scale shows 16 genera and silhouettes of representatives of each of the six families. Harvey B. Lillywhite, on page 33, provides implications of their huge weight in *Sauropods and Gravity*.

*Barosaurus in Central Park West* by Mark Novell with Lowell Dingus and Eugene Gaffney describes the installation of the *Barosaurus* and *Allosaurus* display in the Theodore Roosevelt Memorial Hall of the American Museum of Natural History. The museum stores boxes of unopened dinosaur bones collected about 100 years ago. The *Barosaurus*, which was 80% complete and distributed over three museums is the only one on display anywhere. The missing parts were modelled in Toronto with some of the bones being replaced by plastic because of the weight of the actual specimens. The Cleveland-Lloyd Quarry in central Utah is an *Allosaurus* graveyard so it was easy to assemble a composite skeleton. The articles are illustrated with many photographs and paintings.

## FOSSILS IN THE NEWS

*The Calgary Herald*, Aug. 8, 1992:

### **Bone booty in badlands**

(by Mark Lowey, Herald writer)

Dinosaur Provincial Park, Alta.—Crews from the Royal Tyrrell Museum of Palaeontology are celebrating several important discoveries, making the 1992 season “the second-best on record”, according to research head Dr. Philip Currie. Finds include North America’s first pterosaur bone-bed (containing remains of the huge *Quetzalcoatlus*); part of a *Troodon* foot; and the remains of three albertosaurs—the completeness of these is yet to be determined.

*The Calgary Herald*, Aug. 8, 1992:

### **A Passion for the Past**

(by Mark Lowey, photos by Tom Walker)

This illustrated two-page spread documents the experiences of several members of the Tyrrell Museum’s volunteer summer field staff. Volunteers are hired from all over the world to work on projects at Alberta fossil sites. According to manager Darren Tanke, 150 people applied for about a dozen positions this year. Volunteers pay their own way to the work sites, live in tents, and work long hours under often difficult conditions, for no pay. In every case, these people are more than thrilled to be chosen for the work: many are science students...all are confirmed dino fanatics.

Research director Dr. Philip Currie (who, we learn, is a rabid collector of rock record albums, plastic dinosaurs and dino T-shirts) worries that, with rising costs and diminishing funds, the Tyrrell Museum’s volunteer program may have to be cut back in future, and/or volunteers may have to be charged a fee to participate.

*Victoria Times-Colonist*, Aug. 16, 1992:

### **Army helicopters lift dinosaur’s skeleton from ground**

Canon City, Colorado (Reuter)—US Army helicopter crews aided in the removal of a 6,350 kg. *Stegosaurus* skeleton and its encasing plaster jacket. The skeleton was discovered by archeologists [*sic*] from the Denver Museum of Natural History, while looking for “prehistoric turtles.”

The specimen “...is fully articulated, and may be the best skeleton ever found. The skull is complete and intact, and the four spikes are still joined to the tail...only the front feet were missing and we found them a short distance away,” says Garden Park Fossil Area project manager Dan Grenard.

An army helicopter flew the dinosaur more than a kilometre, before depositing it on a flatbed truck for final transportation [presumably to the Denver Museum].

*The Calgary Herald*, Sept. 5, 1992

### **Fossilized bee yields DNA code**

San Francisco (Reuter)—Workers at the University of California at Berkeley and California Polytechnic State University have managed to extract “the oldest-known DNA” from a 25-million year-old bee preserved in amber. The bee is one of more than 1000 fossils collected by Berkeley entomologist George Poinar. Scientists hope to use the reconstructed genetic codes in the DNA to work out evolutionary timetables for different species.

[*Calvin and Hobbes* comic strip of 92-08-31 omitted from this digital version due to copyright concerns.]

# FOSSILS UNDER GLASS

by Howard Allen

## DON'T CHUCK THAT SLUDGE!

Many fossil collectors have, at some point, used acetic or hydrochloric acid to free silicified brachiopods or horn corals from their limestone matrix. Siliceous replacement of calcareous shell material is quite common in some paleozoic formations, including Alberta's Rundle Group (Mississippian) and Palliser Formation (Upper Devonian). Once the coveted brachiopods are released from their matrix and fished out of the acid bath, the used acid might be filtered off and saved for the next application, the remaining muddy sludge discarded.

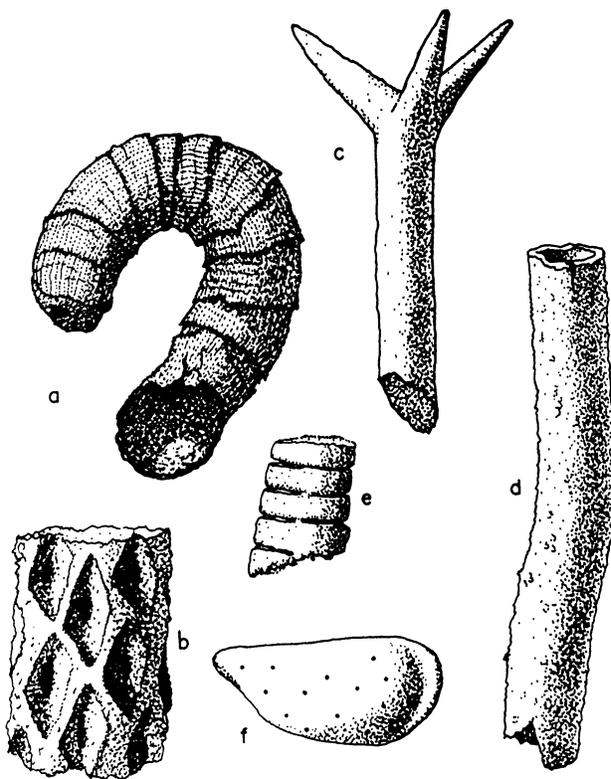
But wait! To the microfossil collector, this is like throwing out the baby with the bathwater. A surprising assortment of specimens may be recovered from acid residues. Many of the microfossil groups are resistant to acids in their original form: conodonts (chitino-phosphate), scolecodonts (chitin, cuticle), sponge spicules, diatoms and radiolaria (silica); charophyte oogonia (cuticle).

Other groups, originally composed of calcite or aragonite, may be rendered acid-resistant by mineral replacement with silica or pyrite. This includes a wide range of organisms including molluscs, brachiopods, tube worms, sponge and echinoderm spicules, ostracodes, forams and just about anything else. Even vertebrate fossils may appear in acid residues: phosphatic fish remains—teeth, scales, bones—are resistant to mild acids... how would you feel about dumping a nice shark tooth down the drain?

The items illustrated in figure 1 all came from the residue of a small fragment of Palliser Formation limestone containing a small rhynchonellid brachiopod. Except for the ostracode (silicified), all were replaced by pyrite. The sample also contained tiny, immature brachiopods, fenestellid bryozoans and crinoid ossicles.

The method for concentrating these residues can be quite simple: after siphoning off the acid solution, I slowly pour water into a small plastic dish containing the sludge,

allowing the clay fraction to float over the rim, while the heavier particles remain in the dish. This is continued until the water becomes clear. At this point the remaining residue is either poured through a paper coffee filter, or left in the dish to dry (after carefully decanting the remaining water). Finally, it's a simple matter of sorting through the dried residue under a microscope. Much of the material will be fragmentary and not worth saving, but can be fascinating to pick through, just to get a feeling for the diversity of organisms that lived and died in the muddy sea bottom.



**Figure 1:** Acid residue, Palliser Formation limestone (Upper Devonian), Kananaskis Valley, Alberta. **a)** a probable serpulid worm tube, pyrite, x25. **b)** fragment of a bryozoan zoarium, pyrite, x40. **c)** a triaene sponge spicule, pyrite, x70. **d)** pyrite coating of a brachiopod spine: the original spine material has dissolved away; x50. **e)** your guess is as good as mine—possibly a spicule—occurs both as pyrite and silica in this residue; x60. **f)** ostracode valve, silica, x50. (all figures by the author)

ALBERTA PALAEOLOGICAL SOCIETY, CALGARY, ALBERTA  
 FINANCIAL STATEMENT FOR EIGHT MONTHS, JANUARY TO AUGUST 1991  
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## BALANCE SHEET

=====				Members' Equity:	
BANK BALANCE, AUG. 31, 1991		\$862.48			
INVENTORY OF PINS AT COST		\$74.31		Previous Years -	\$644.81
INCORPORATION EXPENSE		\$78.00		- adjusted to reflect	
TYPEWRITER	\$379.00			write-off of Library	
less depreciation	\$210.82	\$168.18		Acquisitions	
LIBRARY	\$0.00			Revenue, current	\$538.16
less depreciation	\$0.00	\$0.00			\$538.16
TOTALS		\$1,182.97			\$1,182.97
=====		=====			=====

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OPERATING STATEMENT FOR 8 MONTHS, 1991  
 =====

REVENUE:		EXPENDITURES;	
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Dues	\$570.00	Advertising	\$0.00
Raffle Revenue	\$58.25	Bank Charges	\$34.25
Pin Sales	\$6.00	Postage	\$77.87
U.S. Exchange	\$0.00	Pins, cost of pins sold	\$3.23
Coffee Revenues	\$35.06	Coffee Expense	\$0.00
T Shirt Sales	\$785.00	General Expenses	\$30.00
		Magazine Subscriptions	\$80.31
		Office Expenses	\$4.09
		P.O. Box Rental	\$0.00
		Printing & Copying	\$179.53
		Depreciation Expense -Typewrit	\$25.87
		T Shirt Costs	\$481.00
		Other	\$0.00
SUB-TOTAL	\$1,454.31		\$916.15
EXCESS OF REVENUES OVER EXPENDITURES, FOR 8 MONTHS 1991			\$538.16
GRAND TOTALS	\$1,454.31		\$1,454.31
=====	=====		=====

**APS MEMBERSHIP LIST (September 1992)**

**Names and contact information removed  
to protect members' privacy.**

# Membership Dues for 1993

Dear Member:

This is a first reminder that 1993 membership dues should be paid. Dues are now payable by the January, 1993 general meeting. We appreciate your prompt remittance, so that our programs can be properly funded.

If, as a paid member, you failed to receive any issues of the bulletin during 1992, please indicate the missing issues on the back of this pull-out sheet.

Do you have any comments or suggestions that would help our Society? If so, please include them on the back of this sheet.

Society

Alberta Palaeontological

Howard Allen,  
Membership Director

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## Membership Renewal Form for 1993

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Province/State \_\_\_\_\_

Postal/Zip Code \_\_\_\_\_ Telephone (     ) \_\_\_\_\_

**Cheque or Money Order**                      \$ \_\_\_\_\_ **Single**                      **\$10.00**

**Enclosed**    \$ \_\_\_\_\_ **Family**                      **\$15.00**

(Please do **not** send cash through the mail)                      \$ \_\_\_\_\_ **Institution**                      **\$15.00**

Please make your cheque or money order payable to: **Alberta Palaeontological Society**

**Alberta Palaeontological Society**  
**P.O. Box 35111, Sarcree Postal Outlet**  
**Calgary, Alberta, Canada**  
**T3E 7C7**