Alberta Palæontological Society Bulletin

VOLUME 12 • NUMBER 2 JUNE 1997

ALBERTA PALAEONTOLOGICAL SOCIETY

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.
Deadline for submitting material for publication is the 15th of the month prior to publication.

Society Mailing Address:
Alberta Palaeontological Society
P.O. Box 35111, Sarcee Postal Outlet
Calgary, Alberta, Canada T3E 7C7

Material for *Bulletin:*
Howard Allen, Editor, APS
7828 Hunterslea Crescent, N.W.
Calgary, Alberta, Canada T2K 4M2
(E-mail 75272.1316@compuserve.com)

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

UPCOMING APS MEETINGS

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

June, July and August—No meetings—see the Field Trip schedule, page 13 of this issue.
Friday, September 19—Our annual Show-and-Tell meeting: bring your fossil finds, slides and snapshots from the summer collecting season.

ON THE COVER: *Phorusrhacos* sp., a giant flightless bird from the Miocene of Patagonia. Art by APS member Cory Gross. ©1997. Reproduced by permission.

President's Message

by Wayne Braunberger

Field trip plans are essentially complete, with three trips offered this year: details are included in this issue of the *Bulletin*. Attending a field trip is a worthwhile experience, as you will be able to visit areas not normally accessible to the individual. A great deal of effort is put into organizing these trips by both the field trip coordinator (**Les Fazekas**) and the trip leaders; so let them know that you appreciate their efforts.

Safety in the field is very important, not only for your own well-being but for everyone else on the trip as well. There are risks inherent to field trips but if we all work together to be safe we will enjoy our trips a lot more.

At the April meeting **Harvey Negrich** brought in a number of coin bags for use as collecting bags. The bags were donated by **Emmette and Jean Wallace** of Temple, Texas and Harvey brought them back when he returned from his holiday.

By the time you read this our elections for Society officers and directors will have taken place. Hopefully we will have some new faces on the board for the coming year. Next September the new by-laws should be ready for review by the members, as **Peter Meyer** has made significant progress on the revision.

The first weekend in May is when the Calgary Rock and Lapidary Club holds its annual show. Several members of the Society were active in the show. **Les Adler**, **John Birrell**, **Les Fazekas**, **Don Sabo**, and the Society all had fossils on display. Harvey Negrich ran the resource centre and as usual brought along a number of interesting specimens. **Holger Hartmaier** had a fine collection of mineral specimens for sale at his booth and Peter Meyer helped at the silent auction.

If the weather in the early part of May is any indication, we should have a good summer. Please enjoy your summer, and take care. I hope to see many of you out on the field trips. ❑

Welcome New Members!

Philip and Celeste Benham, Calgary, AB
Roy and Lenda Cook, Fernandina Beach, FL, USA
Myrna and Gordon Coutts, Calgary, AB
Jennifer Evans, Calgary, AB
Terrill Gordon, Calgary, AB
Shane Leuck, Medicine Hat, AB
Joe Small, Dash Point, WA, USA ❑

Program Summary

February 21, 1997: ***Fossils in the Diamondiferous Kimberlite Pipes of the Northwest Territories, with APS member Holger Hartmaier.***

For this reviewer's money, one of our most exciting presentations, for its geological implications, was Holger's February discussion of the diamond-pipe fossils of the N.W.T.

Holger is a geological engineer who works on mining, dam and other industrial projects throughout Canada. One of his recent assignments took him to the Lac de Gras area of the west-central N.W.T., where a major diamond exploration and development effort is currently underway. Holger's interest in fossils drew his attention to an article in the *Northern Miner* newspaper, which mentioned that fossils had been found in some of the diamond-bearing rocks of the region.

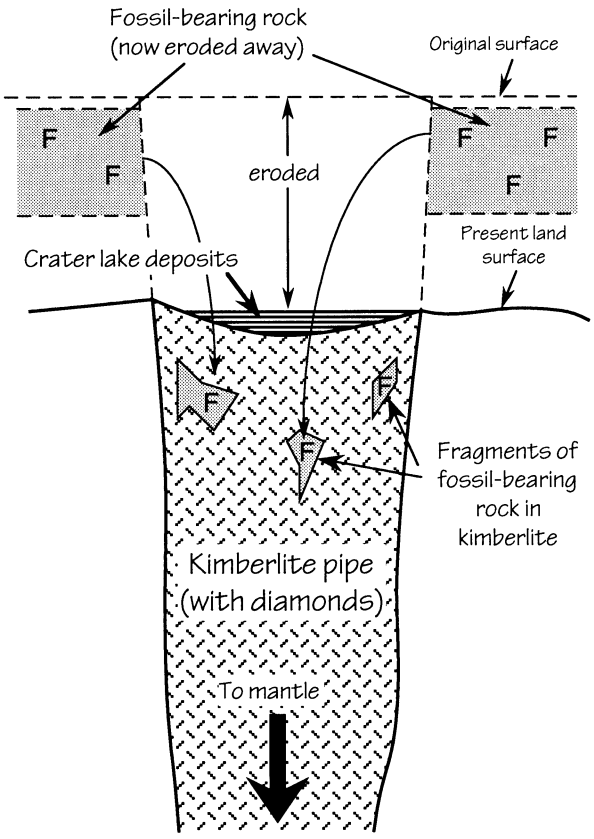
To anyone with a basic understanding of fossils and geology, the first reaction to hearing of fossils being found in kimberlite diamond pipes is naturally: "say, *what*!?" …and with good reason; fossils are almost exclusively found in sedimentary rocks, deposited under the influence of surface media: water, ice, wind. Kimberlite is an igneous rock, composed mostly of olivine (=peridot), an iron-magnesium silicate mineral, originating deep in the Earth's interior (the semi-molten upper mantle)—how could it contain fossils?

Holger explained that a number of diamond pipes around the world have been found to contain fossil fragments, which were originally derived from one of two sources: they were either blasted out of the overlying sedimentary rocks when a kimberlite pipe erupted through the Earth's crust, and embedded in the kimberlite material; or they were deposited by sedimentary processes in lakes or ponds that formed on the surface, after the pipe had been erupted, in material that was eroded from the top of the kimberlite pipe.

Kimberlite pipes are nearly vertical-sided, carrot-shaped tubes of kimberlite rock, usually only a few hundred metres in diameter, but many miles deep, that were literally blasted through the Earth's crust—it is thought that these pipes were punched through in as little as a few hours…a day or two at the most. Kimberlite rock fills the pipes, and often carried with it diamonds that formed in the mantle, and which are, of course, the object of much commercial interest.

The kimberlite rock is very unstable, and erodes easily at the surface; hence diamond pipes are usually found under ponds or lakes, which filled in the eroded tops of the pipes. Fish and other freshwater animals, as well as plants and wood fragments (all typical of lakes and ponds) become buried in the sediments of these overlying lakes. This is one source of the fossils.

The other, more interesting source is those that were incorporated into the kimberlite rock after having been ripped off the sides of the pipe. Two interesting facts are revealed by these fossils: first, temperature analysis of fossil wood and pollen has shown that the kimberlite material could not have been very hot when it was shot through the rock—no more than about 100°C. This suggests that the kimberlite cooled on its trip to the surface, and was already solid—maybe the consistency of gravel or coarse sand—when it blasted through the surrounding rock. Second, the fossils and their associated rock fragments are often the only remnants of sedimentary beds that have long since eroded away—proving that areas now barren of sedimentary rock cover for hundreds of kilometres in any direction were once overlain by considerable thicknesses of fossiliferous rock.



The Lac de Gras pipes contain fossils that have been dated to Paleocene, Cretaceous and even Devonian age. This is forcing geologists to radically alter their ideas about the locations of ancient shorelines in western Canada. The Lac de Gras area today is entirely situated within the Canadian Shield, that huge body of very ancient (early Precambrian) granites and metamorphic rocks that forms the core of the North American continent. Palaeogeographic maps of ancient North America had always shown the edges of the Cretaceous and earlier interior seaways as being far to the west of the present Lac de Gras region; there was never any evidence to suggest otherwise —until now. It had been assumed that the interior Canadian Shield area had been more-or-less exposed throughout much of geologic history, and that no sedimentary cover had accumulated. Now the diamond-pipe fossils are showing that seas probably covered most if not all of the continent at one time or another.

Holger brought along chunks of kimberlite rock for the audience to examine, and showed slides of his project area in the N.W.T. A lively question-and-answer period followed the presentation.

– Howard Allen

March 21, 1997: ***Riddles in the Rocks: Ideas about the Meaning of Fossils, with Dr. Anthony Russell, University of Calgary.***

The Society was extremely fortunate to have Professor Anthony Russell, Head of the Department of Biological Sciences at the University of Calgary, as our speaker at the March meeting. He presented an invigorating talk on the history of western society's interpretation of fossils. His emphasis on the historical perspective of the meaning of fossils was a welcome insight on the process all amateur and professional palaeontologists go through in their understanding of fossils.

Professor Russell obtained his BSc. in zoology and botany from the University of Exeter, and his PhD. in vertebrate anatomy from the University of London (UK). His main interests lie in the functional morphology of amniote vertebrates, with a focus on locomotion in reptiles and feeding in mammals. A major focus for his work has been the Gekkonidae (geckos). He has interests in systematics and in the ecology and basic biology of the amphibians and reptiles of Alberta; his palaeontological interests focus on archosaurs. Dr. Russell's teaching lies in the areas of vertebrate anatomy, vertebrate systematics, palaeontology and organismic biology. He has also taught the history

of biology, and general introductory courses.

Dr. Russell showed how the interpretation of fossils has changed over time; deductions are necessarily based upon peoples' experience with the modern world. Thus, even though some of the ideas about fossils put forward by early workers may seem ridiculous to us (in the light of our modern knowledge), in retrospect those same ideas can be seen to have been entirely reasonable considering the knowledge available to those early workers.

Xenophanes, a Greek, was the first worker to interpret fossils as the remains of formerly living creatures. However, his countryman Aristotle, who came later, took a different view. He postulated that there was a celestial influence that caused the mineralization of rocks; fossils were simply a part of this process—they formed spontaneously in the rocks, as a side-effect of the celestial mineralization process. Aristotle's reputation caused this idea to persist until the 16th Century.

In the mid-1500s Conrad Gesner published his treatise *On Fossil Objects*, which included all buried objects—he made no distinction between organic and inorganic items. Gesner accepted Aristotle's idea that fossils were probably preformed in the rock, but his studies focused on the question: "why do fossils *look like* modern organisms?" Gesner made three important contributions to the science of palaeontology: he produced accurate illustrations of fossil specimens; he kept catalogued collections of specimens; and he initiated correspondence networks with other scholars, to discuss these topics.

Leonardo da Vinci advocated a "modern view" of fossils as the remains of living organisms, but he wasn't a mainstream influence in his time, and his ideas didn't attract much attention.

The first popular concept of fossils as once-living beings came from biblical interpretation —not from scientific observations. Thus, the presence of sea shells on mountain tops could be explained by invoking the Noachian flood.

Our modern view of the meaning of fossils eventually developed as a result of the coming-together of several concepts derived from scientific observation: 1) British geologist Charles Lyell's concept of uniformity ("the present is the key to the past") began to push out the idea of catastrophism; 2) the great age of the Earth was established; 3) the processes of sedimentation and stratification became understood; and 4) the Darwinian concept of evolution was put forward.

– Kris Vasudevan and Howard Allen

May 23, 1997: ***The Evolution of Palaeozoic Reefs, with Dr. Dave Mundy.***

"MICROBE"
"MICROBIALITE"
"THROMBOLITE"

Drop any of the above terms at a carbonate sedimentologists' cocktail party and, our speaker assured us, you will instantly become the centre of attention—an object of fawning admiration.

As this singular piece of advice suggests, the study of ancient reefs is a field of active palaeontological research—and even controversy.

Our speaker, the always entertaining Dave Mundy, is a carbonate sedimentologist (a specialist in the genesis of limestone and dolomite rocks) and palaeontologist with Talisman Energy, as well as the Society's "Director-at-Large." He presented a talk illustrated with slides of outcrop sections of fossil reefs in North America and England.

Dave's presentation outlined the history of reefs and reef-like structures from Precambrian through Permian time and the organisms that built them.

One of the areas of controversy in reef-study involves the basic question, "what is a reef?" Many long-recognized limestone buildups were ignored or discounted by reef experts, because no original reef-building organisms could be discerned in the rocks. Lately, it has been recognized that many of these buildups were created by sediment-binding cyanobacteria ("microbes,") whose organic remains are almost never preserved in the fossil record, but which nonetheless were important builders of these organic limestone structures that are more-and-more becoming accepted as "reefs." A "reef," then, can be defined generally as any significant limestone structure built by colonial marine organisms—be they microbes, sponges, corals, brachiopods (yes) or any of numerous other weird and wonderful critters. The controversy continues, of course, in the definition of "significant limestone structure"; Dave showed us a slide of a trash-can sized structure in an outcrop, which despite its diminutive size, fit all the criteria of being a structure created by colonial, calcareous marine organisms.

In sketching out the history of reefs, Dave introduced us to the concept of "guilds," which are the basic rôles or niches filled by different organisms that play a part in the life of a reef. There are five guilds recognized by reef scientists:

Constructors are organisms, such as corals, that actively build the framework of the reef.

Binders glue together and infill the framework

structure—microbialite (cyanobacterial "microbe-rock") and encrusting bryozoans are examples.

Bafflers are organisms that protrude from the surface of the reef structure and act as baffles, trapping sediment and forming shelters for other organisms—examples include crinoids and fan-like bryozoans or corals.

Dwellers do not attach themselves physically to the reef, but live in its nooks and crannies—fishes, trilobites, ostracodes—their remains eventually contribute to the overall bulk of the reef, and become incorporated by the binders.

Destroyers are organisms that break down the reef framework, by boring into it (clams, worms, sponges) or by breaking it down into particles that fill in the voids.

Even though many changes in the types of reef-building organisms have occurred over geological time, these "guilds" are a common thread in the life of all reefs.

Dave showed how extinction events radically changed the makeup of reef organisms through history; there were periods of "explosive" reef development, with intervening times of relatively little reef presence in the rock record.

One constant throughout the Precambrian and Palaeozoic was the existence of the "microbe" reefs, which managed to hang on through many extinction events, and always bridged the gaps between the shorter periods of major reef growth by other, flashier organisms, like archaeocyathids (Cambrian), tabulate corals (Silurian), stromatoporoids (Devonian) and the productid brachiopods and sponges (Permian). The microbes continued to build their modest mounds and reefs: stromatolite (layered/banded microbialite) reefs (Precambrian), thrombolite (clot-like microbialite) reefs (Ordovician), "Waulsortian" mounds (Mississippian), and once again thrombolite reefs in the Pennsylvanian.

One of Dave's own subjects of study has been the Carboniferous microbialite reefs of Derbyshire and Yorkshire, England. Readers who are interested in learning more about these fascinating fossil communities should read Dave's paper, available in the APS library:

Mundy, D.J.C. 1994. Microbialite-sponge-bryozoan-coral framestones in Lower Carboniferous (Late Visean) buildups of northern England (UK). *In:* Pangea: Global Environments and Resources. Canadian Society of Petroleum Geologists, Mem. 17, p. 713–729.

– Howard Allen ❑

An Unusual Tyrannosaurid Ungual from Southern Alberta

by Hope Johnson, LLD

For this issue, APS Life Member Hope Johnson has submitted one of her wonderful, illustrated commentaries on Alberta fossils. Her remarks refer to the specimens figured on the opposite page. She writes:

To members of the Alberta Palaeontological Society:

Herewith, a drawing of two different unguals from tyrannosaurids, labelled "A" and "B".

"B" is the generally known type—*Tyrannosaurus, Albertosaurus* and *Daspletosaurus* (family Tyrannosauridae).

Now, "A" (1, 2, 3, 4 and 5) is "certainly tyrannosaurid…" (Pers. comm., Dr. Philip Currie) and he adds: "…*What*?"

He looked at this drawing, had it photocopied, and examined the specimen, and said, "I have been at the Alberta Provincial Museum and subsequently here at the Tyrrell Museum, and in these 20 years I have never seen an item such as this. Now, in the past three months, I have seen *two*."

I remarked that this is an exceptionally business-like "claw" (bone) and it would probably call for longer arms and a more upright stance. Dr. Currie described it as "a raking claw."

The other specimen of type "A" came "from south of Suffield." This is somewhat vague. It could mean nearly due south, some 12 miles, in a badland area there. Or, it might have come from the G. & Stan Lapp property, south of the tall microwave tower, referred to locally as "Petrified Coulee."

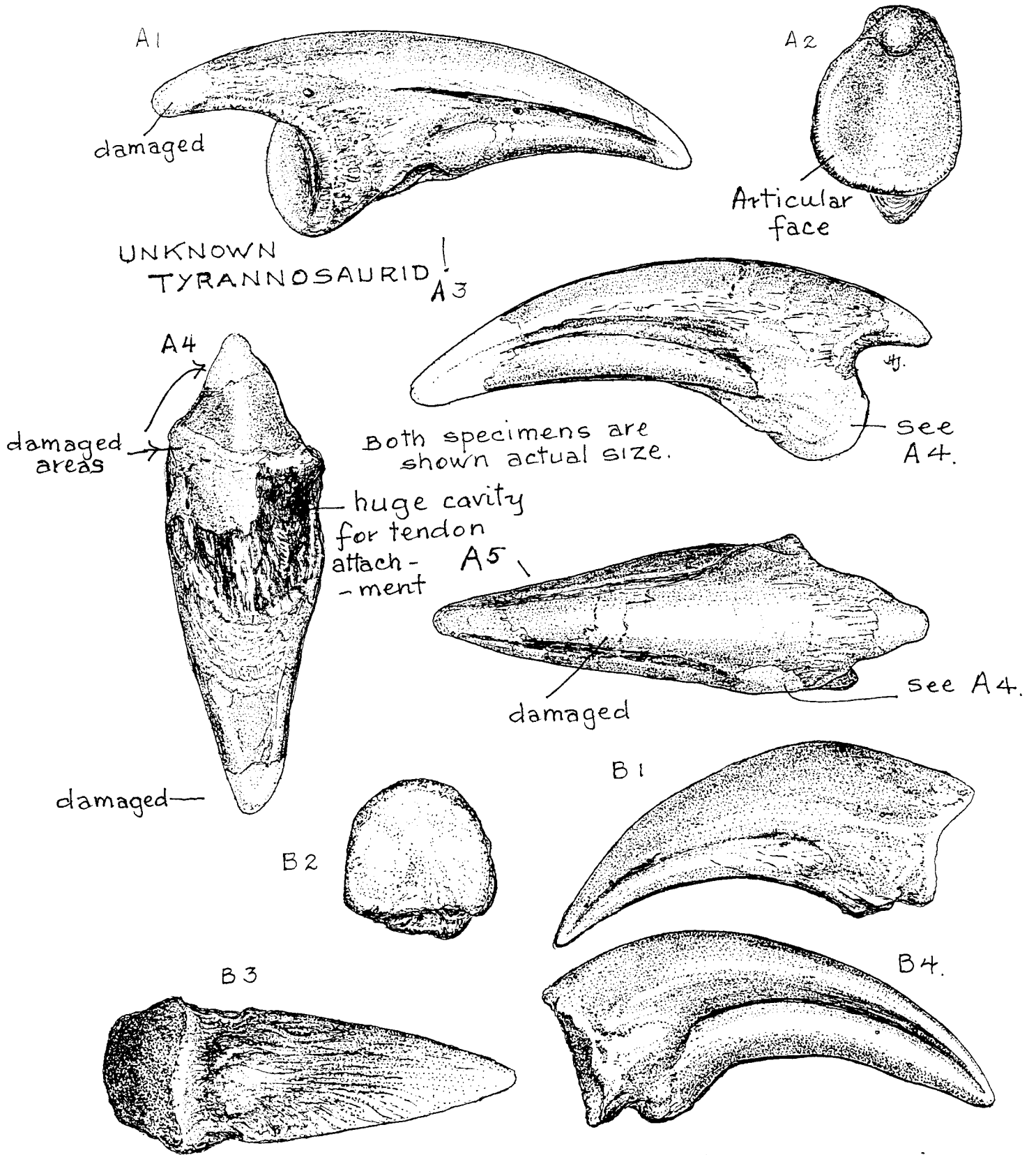
Type "A" is certainly from the **manus** [hand]. Type "B" could be from either a manus or **pes** [foot]; if from the pes, the owner would have been *very* small. This is not a bone which indicates much action. The articulation is close to flat (see "B4"), and the tendon attachment just a rather low node.

Type "A" calls for longer arms, probably a much smaller head, probably a more powerful humerus and scapula.

Watch for this "tyrant"!

– Hope Johnson, LLD, Redcliff, Alberta ❑

LARGE THEROPOD - UNGUALS.



B1, 2, 3 & 4 - usual tyrannosaurid ungual form.

Chasing dinosaurs …in Argentina!

by Vaclav Marsovsky

[*APS members Vaclav and Mona Marsovsky visited Argentina this spring. Following is the first of a two-(or three?)-part travelogue of their adventures.*]

Argentina is not tourism-friendly, but its palaeontological riches are unique. Doing the country in a rent-a-car is perhaps not the best approach, as the distances are comparable to those in Canada and there are hassles associated with the numerous daily police checkpoints…have your documents in order!

In Buenos Aires the natural history museum, Museo Argentino De Ciencias Naturales, is a showplace for Argentina's fossils. Argentina has adopted the practice of leaving fossils in the provinces in which they are found. Therefore many of the dinosaur skeletons in the Museo Argentino are casts, and the only real fossils are loaners.

The most unusual dinosaur on display—and specific to Gondwanaland—is the *Carnotaurus sastrei* from the Cretaceous. This is the bulldog-faced theropod with short horns from Chubut province (about 1500 km. southwest of Buenos Aires). The metatarsals follow the *Allosaurus* model, where all three reach the ankle rather than the centre one being pinched off. The fourth digit of the foot is a short stub, which does not reach the ground. The hands are most unusual as each hand has four fingers: three clawed and one vestigial with no claw. Another unusual animal is the *Amargasaurus cazaui*, a 115 million year-old sauropod with a sail on its neck, from Nequen province, 1200 km. to the southwest. The neural spines on the cervical vertebrae have been extended to produce a two-foot high sail on the neck. These two dinosaurs were collected only recently: the *Carnotaurus* in 1984 and the *Amargasaurus* in 1986. I am sure there are more unusual discoveries yet to be made.

The drive from the capital to Nequen is like driving from Winnipeg to Calgary. Nequen, the most northerly province of Patagonia, lies 1200 km. southwest of the capital, up against the Andes. The badlands are very localized; basically they occupy the north and south escarpments of a broad valley, several kilometres wide—the remnant of a large ice-age river. The badlands are very scenic, horizontally banded in alternating bright red and cream colour.

Some 100 km. west of the city of Nequen is a small local museum, Museo de Plaza Huincul. We came here to see the large carnivore, *Giganotosaurus carolinii*. The skull is being studied and described here by Radolfo Coria, the first Argentine we met who spoke English! Dr. Currie of the Royal Tyrrell Museum has visited here several times, most recently earlier this year. The *G. carolinii* skull parts were sitting on the floor in Radolfo's office, in three boxes. The skull was found disarticulated in the ground. A cast copy has been made ready for display in an eastern US museum in June of 1997. Except for a few missing pieces like the jugal (cheek bone), most of the skull pieces were found. Using the assumption of symmetry between the left and right sides, the entire skull was reconstructed. Radolfo pointed out the similarities in the skull parts between *G. carolinii* and that of *Allosaurus fragilis,* a poster of which he pointed to on the wall. *G. carolinii* has the more primitive features of *A. fragilis* and the size of *T. rex*—in fact the skull is a foot longer than *T. rex*'s—bigger skull, but smaller teeth. The teeth were a couple of inches shorter than *T. rex*'s and followed an "S" curve looking edge-on.

It's not often that a person gets to hold the real jaw of a theropod dinosaur—let alone the only one of that species ever found—what if we had dropped it?

On display in the Plaza Huincul museum were several large dorsal vertebrae of *Argentinosaurus huinculensis*, a large Cretaceous titanosaur sauropod (90 million years old) found at Plaza Huincul in 1993, in the Rio Limay Formation. The vertebrae were larger than that of the *Ultrasaurus* I saw at Brigham Young University last year, and as large as any whale vertebrae I have seen. From the bottom of the centrum to the top of the process is 165 cm. While clearing a town canal to manage water from flash floods, a huge femur was discovered. It is possible that the femur came from the same animal; it was found at the same level and is

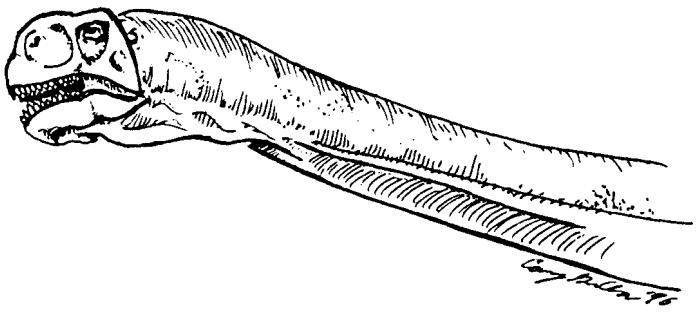
on display next to the vertebrae. The museum also has a small primitive ornithomimid, about the size of a chicken, called *Gasparinisaura cincosaltensis,* with an ossified sheath over the length of the tail—like a long, narrow ice cream cone.

As we drove to the town of El Chocon, 85 km. away, to view *G. carolinii*'s body, the realization sunk in…it is not often that a person gets to hold the real jaw of a theropod dinosaur—let alone the only one of that species ever found—what if we had accidentally dropped it? I could imagine the headlines: "CANADIAN TOURIST DROPS DINOSAUR!"

As you descend into El Chocon, which lies in a valley, two theropods greet you on a large billboard: "Welcome to the Dinosaur Valley"(in Spanish, of course). The area looks very much like Arizona's Lake Powell country—a large reservoir several hundred kilometres long surrounded by red sandstone cliffs. The museum is not so easy to find. It is so new that there are no exterior signs and no admission is charged…I don't think the paint was dry.

Giganotosaurus carolinii is on display, lying on his left side—all fourteen metres of him. The real bones are lying in the dirt. A poor copy of the skull was added, but the rest of the missing pieces have not been replaced by "guesses": no hands or feet were found, so there are no hands or feet on display. Apparently, *G. carolinii* was found eighty percent complete, but disarticulated. To complicate things further, another smaller theropod was found, mixed in with the remains of *G. carolinii.* The smaller theropod is thought not to be another *G. carolinii*, but something else. *G. carolinii* was discovered in 1993, 18 km. from El Chocon, near the shore of the large lake. The dinosaur was named for Señor Ruben Carolini, a "paleontologo aficionado." On the museum wall is a satellite photograph marking the spot where the skeleton was found. ❑

[*In Part II, I will cover the "Valley of the Moon," world of the mammal-like reptiles…to be continued in the September* Bulletin*. –V.M.*]



Rattlesnake Bites

by Sam Richter

Rattlesnakes are found where there is food and where temperature conditions allow. They are most active when their *body* temperature is 27° to 32° C. They can't sweat, so will die if their body temperature exceeds 43° C. At the other end of the scale, they become lethargic at 4°C.

Fangs are less than 2 cm. long and fold up into the upper jaw. Venom flows down the hollow inside of the fangs and exits to the front, just above the tips. Fangs are curved rearward and this smears venom through the prey's tissue.

Rattlesnake venom has thirty or more components. Lunch can't be allowed to run away, so immobilization and death have to occur almost instantly. The main factors in venom are: neurotoxic, spreading, digestive, and hemorrhagic. Humans are most affected by the digestive factor. Local reaction is caused by the digestion of muscle tissue, resulting in pain and swelling. Other reactions are variable. Within ten minutes muscle twitching, tingling feeling, painful cramps and major hemorrhage under the skin can occur. Swelling is the result of fluid leakage and can cause low blood pressure.

Rattlesnake bites are not considered an extreme emergency. Mortality is low. It can take two days or more for death to occur. In Alberta, only one person has been reported dying from rattlesnake bite. Ninety-eight percent of bites are on extremities and 85% have little or no venom.

Results of snake bite kit suction devices on venom is variable. The venom diffuses into tissue rapidly and little may be removed. Immediate high, steady vacuum is needed for more than trivial amounts of venom removal. "Chinese cupping" could be tried on an applicable surface: a small, baby-food sized jar has a flame passed quickly in and out of it, heating the air only. The mouth of the jar is placed against the skin and held there till the air cools. Impressive vacuum results.

No cuts! Nerves and tendons are easily injured, causing permanent crippling.

Tourniquets have little value. Restricting circulation can end in gangrene. Loosening of a tourniquet that has been on for a while can dump products into the system that can kill.

Ice treatment doesn't affect venom reactions and can result in frostbite in July.

Over 200 bite treatments have been tried and

(continued, page 10)

Speculations in Natural History:

The Citizens for a Dinosaur-Free Media Manifesto

by Cory Gross

[The following bit of silliness was inspired by the recent announcement of a dinosaur cereal sold to coincide with the release of the sequel to Jurassic Park, not to mention the author's own hidden panache for villainy.]

DINOSAUR FUN?!? By Lucifer's beard what kind of madness is this?!? Of all the arse-narfing, hanky-panky, higgly-piggly, jiggery-pokery, tom-foolery we have ever seen...! WE WILL REMAIN SILENT NO LONGER! Dinosaurs are not fun! They are old dead animals! Not "funny-stuff"! The world is cold, dark and hard! Scientists are colder, darker, and harder! Now you have gone too far! We are the CITIZENS FOR A DINOSAUR-FREE MEDIA, and this is our 10-point manifesto:

1) Under no circumstances are the terms "dinosaur" and "fun" to be used in conjunction. Violators shall be prosecuted to the fullest extent permissible by the ICZN.

2) Anyone caught using the word "raptor" shall be personally wedgied by our Liberation Squad.

3) There shall be a new zero-tolerance policy on active poses and feathers in all dinosaur art. As well, only shades of dark brown, dark green, and grey are to be used. Those who do not comply will have their artist's licenses revoked.

4) Those found worshipping Jurassic Park and/or Steven Speilberg shall be stripped, redressed in a lab coat or three-piece suit (wedgie squad director's discretion) and be forced to convert into a lab-monkey.

5) No palaeontologists are to enjoy their work under any circumstances or they shall be forced to undergo an extensive lecture by a litany of grade 5 science teachers until they realize just how boring science really is.

6) Children will only be allowed to read wedgie squad approved textbooks from the 1940s, with all pictures and references to behaviour blotted out with a big ol' black Jiffy Marker.

7) Science and dinosaurs are to be made in no way attractive or interesting to the public by any means. Legal action against Bill Nye The Science Guy and Bob Bakker is pending.

8) Dinosaur toy shipments will be cheese bombed and all Toys R Us outlets razed to the ground. (Besides, they can put out kids' eyes).

9) All books on dinosaurs are to be recalled and properly edited until they have reached our carefully determined quotas of "dry" and "tasteless." And finally:

10) THERE WILL BE DINOSAUR CEREAL OVER OUR DEAD BODIES!!

You have been warned. That is all.

This message brought to you by the
CITIZENS FOR A DINOSAUR-FREE MEDIA

(Rattlesnake Bites…from Page 8)

found ineffective. They appear to be more valuable to the treater than to the victim.

Nausea, dizziness and weakness are most likely signs of low blood pressure due to low blood volume. Drink some water, gatorade, etc.; alcohol amplifies some venom effects.

The latest attempt to slow leakage of venom into the affected area is an elastic bandage wrapped over most of the affected appendage—snug only! A finger must be able to be placed easily between bandage and skin. Check often to ensure that circulation isn't being cut off.

Proceed at a reasonable pace to your vehicle. Takes lots of breathers and drink water often. Don't overtax the patient. Keeping the blood volume up and reducing pain are the main goals.

Hospitals in southern Alberta have antivenom horse serum. This works best in assisting the body's struggle if it can be used within four hours. Its use is tricky and requires careful monitoring.

Pay some attention to where you're stepping. Walk heavily: let the snakes know you're coming. Hard leather boots and baggy pants over the tops of boots work to limit penetration. Be careful when stepping over logs and off of rocks. Snakes get upset when stepped-upon! Heavy leather gauntlets are useful when moving wood piles or rocks.

If bitten on the hand, immediately remove rings, bracelets, and wristwatch, to ensure there is no constriction if swelling occurs.

Snakes are hard to spot. When in grass or bushes, use a walking-stick like a blind person would, poking ahead and to the sides. This may get them to move and be seen.

One last bit of advice: no picking of deadwood by moonlight! ❑

Reviews

The Lost World by Michael Crichton. Ballantine Books, 1995. 430 p.

This sequel to *Jurassic Park* is a fast-paced, action-packed dinosaur thriller. Definitely not for the squeamish, or for a relaxing read. The animals are menacing and real. Those who can stand terror, grisliness and suspense will like it. Be prepared to read the last 150 pages at one sitting.

Crichton has a nice way of introducing the latest thinking on controversial issues: why do complex animals die out when there doesn't seem to be a reason for it? How did dinosaurs act when in social groups? Why do complex systems flourish when on the "Edge of Chaos," but not when in "Harmony with Nature"? Does behaviour have more to do with extinction than environment? Are humans on the edge of extinction?

Dinosaurs have moved from being seen as weak, slow and stupid to strong, fast, agile and smart. Killer *T. rex* is now ten tons of "Tough-But-Ever-So-Gentle," big, lovable sweetie—very marketable!

Richard Levine is obsessed with finding live dinosaurs. His search leads to an extinct volcanic island off the coast of Costa Rica. Diego, a local fisherman, gets Levine onto the island. They look at strange tracks in the mud at a creek crossing. Suddenly, an attack from the rear—Diego is screaming as his body is hauled into the bushes. Levine runs, but something heavy slashes his backpack, forcing him to his knees in the mud.

Levine spends a sleepless night up in a tree, surrounded by hungry 'raptors. His garbled satellite phone message gets the rescue team moving. They and their equipment are on the island early next morning.

Team members find a large building complex. It produced the dinosaurs for "Jurassic Park." Records found show that dinosaurs were routinely tagged and turned loose. Six years earlier, when Jurassic Park was destroyed, this island was quietly abandoned. Later, team observations show that the island is a high-stress environment with far too many underfed predators.

Lewis "Undertaker" Dodgson, the ruthless bio-geneticist, and two accomplices, Baselton and King, follow the team to the island. They are after live dino eggs. Finding the *T. rex* nest, King steps on a baby and breaks its leg. Baselton becomes a *T. rex* snack. Dodgson and King run. The *T. rex*

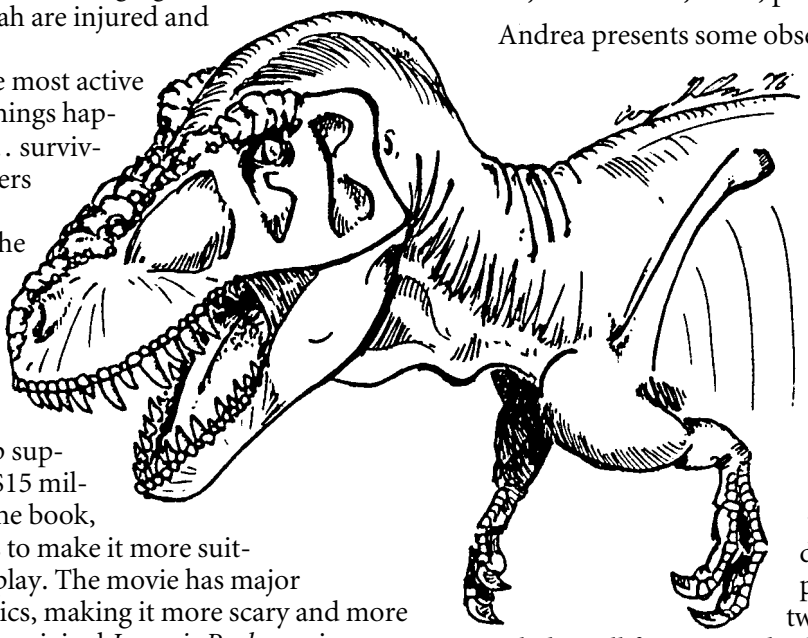
parents follow…

Team members inspect the *T. rex* nest. Eddie does a soft-hearted but bad thing: he brings the broken-legged baby to their base camp— a long, articulated R.V. Ian Malcolm, of Jurassic Park fame, and Sarah Harding make a fibreglass cast for the baby's leg.

The resin is still hardening when the *T. rex* parents show up searching for their baby. Mother sees Junior; smashing the window with her head, she reaches in and picks up baby in her jaws. The baby is parked in a tree.

Now, two enraged parents intend to kick this thieving R.V. out of their territory. They knock the front half onto its side, then onto its roof. Kicking and banging, they push it over the edge of a 500-foot sheer rock cliff.

The articulation between R.V. halves is slowly giving way. Soon the swinging half will free-fall. Ian and Sarah are injured and trapped inside.



Predators are most active at night…bad things happen in clusters… surviving team members can't get to the pick-up site in the morning… the choppers leave—empty. Score: Dinos 5, Humans 1.

David Koepp supposedly got US$15 million to rewrite the book, changing things to make it more suitable as a screenplay. The movie has major animated graphics, making it more scary and more realistic than the original *Jurassic Park* movie… ever see live dinos in California?

Crichton is writing another dinosaur story, "Jurassic Park 3," to be released in 1999.

– Sam Richter

Pterodaustro's Smile by Luis M. Chiappe and David Rivarola. *Natural History*, November 1996, p. 34, 35.

Luis and David of the American Museum of Natural History, with a staff of 20, quarried about 20 tonnes of rock at San Luis, Argentina in 1994, uncovering several skulls and jaws of *Pterodaustro* fossils (a specialized pterosaur—a close relative of dinosaurs). Other fossils included fish, shrimps, tracks and plants. The pterosaur bones were distributed over an area of less than 37 square metres, showing that the pterosaurs were gregarious, and flocked to feed in the shallow waters of a lake.

A smiling *Pterodaustro* reveals a row of hundreds of tiny wire-like structures on each side of its lower jaw, forming a kind of filtering basket. The upper jaw was lined with hundreds of minuscule teeth that helped the lower jaw's filtering system. Anusuya Chapman of Cape Town, South Africa studies the microstructure of the bones of dinosaurs. She found that *Pterodaustro*'s structures were real teeth with an internal core of dentin surrounding a cavity and a peripheral band of enamel. No other vertebrate is known to have had such a sophisticated filter-feeding apparatus.

– Les Adler

The Age of Pterosaurs by Andrea Dorfman. *Time*, October 28, 1996, p. 68, 69.

Andrea presents some observations made while attending the pterosaur symposium at the 1996 annual meeting of the Society of Vertebrate Palaeontology in New York City. Apart from the fact that these ancient winged creatures flew there isn't a thing that all the experts agree on. At the meeting scientists debated whether pterosaurs walked on two legs like birds or crawled on all fours. Hundreds of footprints discovered in the United States and Europe over the past few years, argues Martin Lockley of the University of Colorado at Denver, strongly support the latter conclusion.

Some scientists think that these animals launched themselves from a running start, while others believe that they were so clumsy on the ground that they would have had to drop from cliffs or trees to attain a flight-like glide.

Palaeontologists believe many pterosaurs had tastes similar to modern sea- and shore birds and that they may have nested in colonies.

As Dr. Peter Wellnhofer of Munich says, "In the living world, there's nothing really comparable to a pterosaur."

– Les Adler

This View of Life: As the Worm Turns by Stephen Jay Gould. *Natural History*, February 1997, pages 24–27.

Perhaps you have read of the cloning of a sheep and a rhesus monkey? Stephen has been reading a large number of reports of the latest biological findings. He takes a long time to develop some topics. For the first several pages, I couldn't see where he was heading but later I saw the point, which is useful to palaeontologists' studies of body relationships.

Walter H. Gaskell (1847–1914) chose an improbable link of arthropod to vertebrate as being a mode of linear biological progress. This is difficult to show due to the huge differences in the geometry of the internal organs of these animals; Gaskell claimed that arthropod stomachs turned into vertebrate brains!

Another scientist, Etienne Geoffroy Saint-Hilaire in the 1820s proposed a theory to unite the architecture of complex animals by comparing vertebrates with segmented worms and turned-over arthropods.

According to Stephen, the worm has turned over twice during the last year in both actual and symbolic styles. Geoffroy may be correct after all—not in every detail, but in basic vision and theoretical meaning.

Scientists have now made the astounding discovery that all complex animal phyla, arthropods and vertebrates in particular, have retained, despite their half-billion years of evolutionary independence, an extensive set of common genetic blueprints for the building of bodies.

Many similarities of basic design among animal phyla, once so confidently attributed to convergence and viewed as a testimony to natural selection's power to craft exquisite adaptation, demand the opposite interpretation: that the similar features are homologies, or products of the same genes inherited from a common ancestor and never altered enough by subsequent evolution to erase their comparable structure and function. The similarities record the constraining power of history, not the building skills of natural selection, independently pursuing an optimal design in separate lineages. Vertebrates are, in a sense, true brothers (or homologs) and not mere analogs, of worms and insects.

Edward Lewis, Christiane Nusslein-Volhard and Eric Wieschaus found that the homeotic genes of insects, responsible for specifying the separate identities of segments along the main body axis (by orchestrating the growth of antennae, mouth parts, legs, and so on in their proper places) were also discovered, in minimally altered form, in vertebrates.

The paired eyes of three great phyla— vertebrates, arthropods and molluscs—share an inherited embryological pathway largely orchestrated by a gene, (called Pax-6 in its vertebrate form), retained in all these phyla from a common ancestor and remaining similar enough to work interchangeably).

Work done in the laboratory of Eddy M. DeRoberts at UCLA has affirmed all essentials of Geoffroy's theory in contemporary terms (*Nature*, vol. 376, 1995 and *Nature*, vol. 380, 1996).

Two phyla share a common architecture but in reversed arrangement. Instead of the fly in the original movie version of *The Fly* shouting, "Please help me," in the next remake he will say, "Turn over and be a man." *– Les Adler*

Leonardo's Fossils by Martin Kemp. *Natural History*, November 1996, p. 14, 16.

Leonardo da Vinci recorded his ideas and observations on physical causes and effects in nature in the Codex Leicester, eighteen loose, double-sided sheets with 360 pen-and-ink sketches. The Codex is now owned by Microsoft founder, Bill Gates.

The pages devoted to the origins of fossil shells show Leonardo at his best—urgent, involved, incisive, alert to analogies and received wisdom and willing to modify his theories, and inventive in explanation. Geologists had no knowledge that Leonardo had preceded them intellectually in the late 1400s.

A large sack of fossil shells from high up in the mountains was brought to his workshop by some peasants. Leonardo rejected explanations that the strata had originated with the Flood of Genesis or to an astrological or alchemical process. Leonardo rejected the usual explanations by stating that since "things heavier than water cannot float on the surface, but remain at the bottom except by wave pressure and if the specimens had come a long way they would all be mixed up and heaped together". Instead all the various types such as oysters and gastropods are found at a distance from each other just as they are seen every day on the seashores.

No one before Leonardo had developed a dynamic vision of the realignments of water and earth revealing that sedimentary rocks and shells had previously been under the seas.

– Les Adler ❑

1997 Field Trips

Three field trips have been planned for the summer of 1997. Details on the first trip, to the Mountainaire Lodge area, June 21, were published on page 4 of the **March** *Bulletin.* If you didn't get the March issue, or otherwise need more information, contact the Field Trip coordinator, **Les Fazekas, at (403) 248-7245**.

READ THIS: non-members and unaccompanied minors will not be allowed to attend field trips (one child per adult guardian). Participants will be required to read and sign a liability release form.

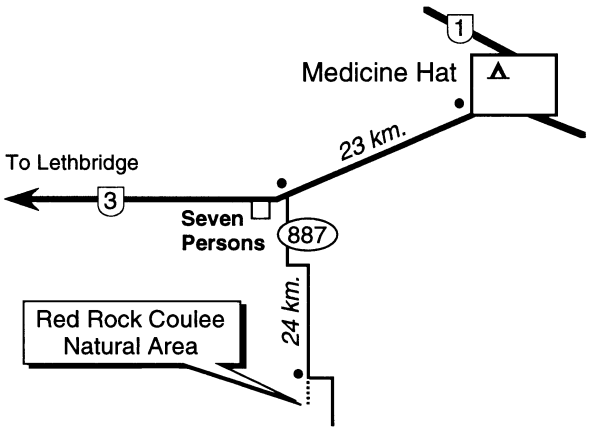
Trip 97-2: Saturday & Sunday, July 19 & 20 Medicine Hat area, southeastern Alberta

The Red Rock Coulee area, and possibly one or two other localities in southeastern Alberta will be investigated. Cretaceous non-marine (mainly vertebrate) and marine fossils occur in the region.

Meeting Place: Red Rock Coulee Natural Area, at 10:00 AM, Saturday, July 19. From Medicine Hat, drive 23 km. SW on Highway 3 to the junction with secondary road 887, just east of the hamlet of Seven Persons. Drive south on 887 for 24 km., then turn right at the sign to Red Rock Coulee. **Allow 4 – 4.5 hours driving time from Calgary**, or 1 hour from Medicine Hat.

Potential Hazards: Rattlesnakes (read the related article in this issue, page 8).

Clothing and Equipment: sunblock, hats, rainwear, mosquito repellent, water, sturdy hiking shoes or boots, food.



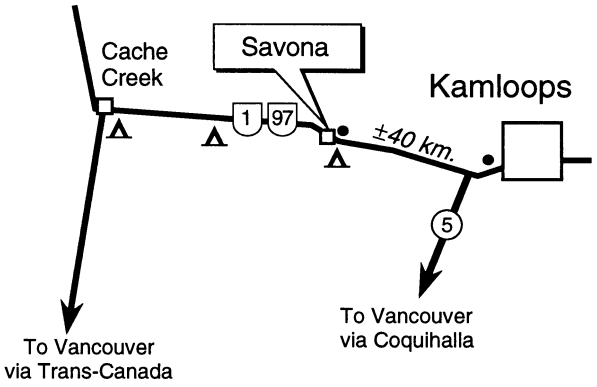
Trip 97-3: Saturday & Sunday, August 16 & 17; McAbee, south-central British Columbia

The McAbee locality is known for its well-preserved fossil plants, insects and fishes of Tertiary (Middle Eocene) age.

Meeting Place: Savona, B.C. at 10:00 AM local time (11:00 AM Alberta time), Saturday, August 16. From Kamloops, drive west on the Trans-Canada Highway (Highway 1 & 97) approximately 40 km. to the village of Savona. Meet at the Savona campground. There are also camping facilities in Cache Creek and on the Thompson River, about midway between Savona and Cache Creek. **Driving time from Calgary is AT LEAST 7 HOURS**. You would be well-advised to drive part way on Friday.

Potential Hazards: Steep slopes, falling rocks, rattlesnakes.

Clothing and Equipment: sunblock, hats, rainwear, mosquito repellent, water, sturdy hiking shoes or boots, food, paper for wrapping fossils.



Trip Participant Responsibilities: It is understood that risk is inherent to some degree in all outdoor activities. Please ensure you understand the risks involved and are prepared to accept them.

- As a participant, you are responsible for your own safety and equipment at all times.
- Trip coordinators are not professional guides. They are simply club members who have volunteered their time for your enjoyment.
- Inform the trip leader of any medical conditions they should be aware of in an emergency, for example: diabetes, bee-sting reaction, asthma.
- Ensure that your previous experience, ability and fitness level are adequate for the trip.
- Stay with the group. Wait for other group members frequently and at all route junctions.
- Tell the trip coordinator if you must turn back.
- Contribute to car pool expenses.
- Enjoy!