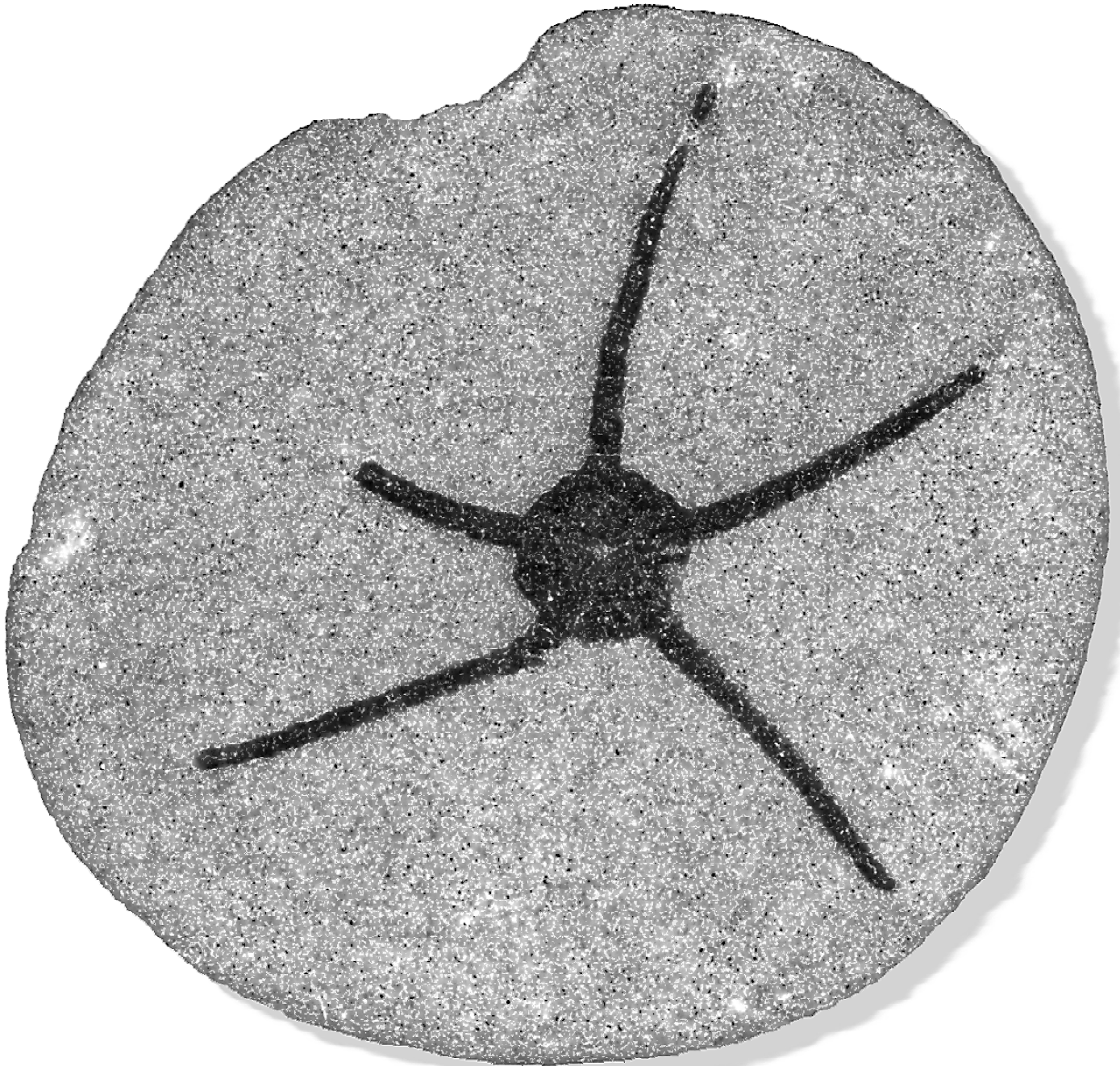


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Alberta *Society*
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ALBERTA PALÆONTOLOGICAL SOCIETY

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* Officers and Directors marked with an asterisk are senior board members for executive meeting quorum purposes.

†APAC is the Alberta Palæontological Advisory Committee

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

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

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

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

THE *BULLETIN* WILL BE PUBLISHED QUARTERLY: March, June, September and December.
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NOTICE: Readers are advised that opinions expressed in the articles are those of the author and do not necessarily reflect the view-point of the Society. Except for articles marked "Copyright ©," reprinting of articles by exchange bulletins is permitted, as long as appropriate credit is given. Requests for missing issues or back 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 Road SW, Calgary, Alberta

June, July, August, 2001—No meetings. See field trip schedule, Page 4.
September 21, 2001—Gilles Danis, Prehistoric Animal Structures, Inc., of East Coulee, AB, will discuss his company's dinosaur reconstructions (tentative).

ON THE COVER: Alberta fossils—an extremely rare brittle star fossil on sandstone, probably Cretaceous, from the surface deposits of east-central Alberta. Enlarged 6x, photo by Howard Allen. See story on Page 9. Have you got a rare, unusual, or spectacular Alberta fossil we can showcase on a future cover? Please contact the Editor!

APAC Annual Meeting

by Vaclav Marsovsky
APS President and your APAC representative

APAC stands for the Alberta Palaeontological Advisory Committee. The annual meeting is a forum for the whole Palaeontological community to come together. APAC is made up of representatives from the academic community (U of Calgary, U of Alberta), the institutional community (Geological Survey of Canada and the Royal Tyrrell Museum of Palaeontology), industry (currently a representative from the oil and gas sector) and us, the amateur community. The 2001 annual meeting took place on April 20.

Under Alberta regulations, only certain individuals with appropriate academic background are permitted to excavate and carry on or supervise field work. These are typically the curators from the RTMP, professors from U of A and U of C and their grad students, and the scientists at the GSC.

A spokesman for each group provides a field-work report for the previous year (2000 in this case). After this, applications to excavate palaeontological resources are reviewed for the upcoming field season. Custodianship applications and export permits are also reviewed. These can be submitted by any individual in Alberta. Such requests have to be backed up by a meaningful purpose and almost always will need to demonstrate that they will serve the public interest, as in education. There are only a few applications submitted each year.

This year, our APS application for custodianship of the Society collection was among the documents, as well as our export permit request to take fossils to the Kamloops, BC symposium. See the item on our custodianship application, following this article.

Lastly, the spokesperson for each institution provides an update on their activities and brings up any new business. On behalf of APS, I update the group on our meetings, (where and when), our field trips, *Bulletin*, and approximately how many members we have.

The above summary does not represent the complete agenda of the meeting but is meant to provide you with the highlights of what goes on.

If anyone has any issues that are related to Palaeontological Resources in Alberta, the APAC is one forum where such issues can be raised, discussed and submitted. Please drop me a note via the APS mail box (see Page 1) or contact me by e-mail: president@albertapaleo.org □

Society Receives Custodianship of Collection

by Vaclav Marsovsky

The APS has received a Certificate of Custody for the fossils in our Society collection, from the Government of Alberta, Department of Community Development. This applies to Alberta fossils only. Custodianship is granted only if it serves the public interest. In our situation, we use the collection for educational purposes. This can be for display purposes, for assisting with identification or for hands-on use.

Having been given this responsibility demonstrates that the collection is a long term commitment by the APS and we hope it will be the impetus for members to donate more often. We would like our collection to grow and become more comprehensive. There are gaps in our collection and some fossil groups are not well represented, if at all. We would be happy to receive any fossils you may wish to donate. As usual, the specimens must be accompanied by location data [see "The APS Fossil Collection," *March 2001*, p. 12, and specimen sheet on the back page of the same issue -ed.]. Talk to our curator or any member of the executive about making a donation. □

Oops!

The person appearing in the photograph on Page 4 (lower left) of the March 2001 *Bulletin* was misidentified as "Vien D. Lam." His name is in fact **Earle Wiebe**. The Editor apologizes to both gentlemen for any embarrassment that may have been caused by the mixup. □

Letters

APS Presentation to Beaver Scouts

Please accept the heartfelt gratitude of our Beaver Colony for the marvellous presentation given by **Dan Quinsey** and his friend **Tyna Capadocia** on April 3, 2001. My initial inquiry to the APS requested someone who could spend 10–15 minutes talking to our Beavers about palaeontology. Dinosaur Dan and Tyrannosaurus Tyna (as we called them) gave us that and much more. All told, we enjoyed about 30 minutes of presentation, Q/A, a game, and hands on time with wonderful fossil samples. As a final touch, Dan gave each and every Beaver (some 35+) their very own bag of fossils to keep. That was a most generous and unexpected treat for all.

I would also like to thank **Philip Benham**, my first point of contact who put me in touch with Dan, initially.

Thanks for helping our little ones experience thrill and wonder of palaeontology first hand.

Jeff Jewitt (“Hawkeye”)
Leader, Queensland 172 Beavers,
Scouts Canada

Hunters and Collectors

*Editor’s note: The article “Hunters and Collectors” by APS member **Mark Farmer** (March, 2001) provoked a very strong reaction from some readers. Though it was anticipated that the article would be controversial, it was seen by your Editor to raise a number of points worthy of consideration (or argument). Members are invited to discuss this article (and any others) by letter. Please note that letters will be subject to editing. Following are two of the more measured responses received to date:*

I was agitated after reading the article “Hunters and Collectors” by Mark Farmer in the March 2001 *Bulletin*. I agree everyone is entitled to their own opinions, however, I believe if you are going to put them into writing, they should be informed opinions.

Our group comprises a small cluster of members, most of whom know each other well. When Mark Farmer mentioned those “hunters” who house their collections into crates, sheds and bungalows, most of us knew exactly whom he was referring to.

Well, Mr. Farmer, I know for a fact the bungalows

of fossils you were referring to are very well catalogued and graded. The custodian of these fossils is a very well respected active member of our Society. Many members consult this “hunter” for his expertise and knowledge in his field. He has studied, prepared and catalogued his specimens with great diligence and is eager to share his hoard with others for the unique purpose of promoting the science through education. Is this not one of the main goals of the Society?

It is none of your business, Mark Farmer, how others pursue their hobby. By the way, “kleptomania” is a compulsive neurotic desire to steal. I believe the word you were looking for was “hoard.” To collect, keep and store away as a hoard.

Yes, you are entitled to your opinion. But next time, think first about what your are saying and put together a well-informed opinion.

That is my opinion.

– Dan Quinsey

By not allowing the cleaning or preparing of “a fossil to remove excess dirt or rock” [Spivak and Neuman, 2001, p. 66] the Historical Resources Act effectively deters amateurs from being able to identify and study the surface fossils legally collected. It also discourages cataloguing, since attempts to apply an identifying number to dried mud or lichen will be futile. All the amateur collector in Alberta can do legally therefore is place surface-collected fossil bone chips from a single location in a box with the location details recorded in or on the box. How Mark Farmer can liken this to kleptomania is incomprehensible. Mark Farmer is clearly unaware of the legal restrictions to the cleaning and preparation of their finds by amateurs, despite his few days working at the RTMP. He is, however, correct that this is not palaeontology.

The real tragedy of all this is that without cleaning each specimen, the amateur is potentially deprived of the opportunity to study and learn from it and may be unable to determine whether or not the specimen could be of any significance. In this way, the intent of the Historical Resources Act of Alberta to ensure “the palaeontological resources of Alberta... may be enjoyed by members of the public and studied (only)* by trained professionals” [*op. cit.*, p. 65] is eminently successful.

But wait, all is not lost. Those otherwise seemingly worthless fossil bone chips can be invaluable when giving talks to children and may even inspire some of them to go on to study palaeontology. A surprising number of APS members have given talks to children over the years.

Mark Farmer is obviously ignorant of the extent of stored, unprepared specimens at the RTMP, many of which, given constraints of space, staff, and financing, will probably never be prepared and studied. This too is not palaeontology. Other museums also have huge quantities of stored, unprepared specimens. In the overall scheme of things a collection of badly weathered, shattered fossil bone fragments, surface collected and not connected or identifiable, is of little significance.

– Roslyn Osztian

** (only) was inserted into the quotation by Ms. Osztian.*

Reference:

Spivak, D.N. and Neuman, A.G. 2001. Amateur fossil collecting in Alberta: a review of the Historical Resources Act. Alberta Palaeontological Society, Fifth Annual Symposium, Abstracts Volume, p. 65–67.

Heather Whitehead—Westward Bound!

I wanted to let you know that I am on my way “Back West”—not to Canada, but to the Denver area, which is a lot closer than New York has been! I have accepted a job offer from the Colorado School of Mines in Golden, CO, as a reference librarian, and begin work there June 4, 2001. I will be leaving here May 26, and pointing my Subaru west for a 5–6 day cross country trek.

In Colorado, my new address is:

12 S. Holman Way
Apt 4E
Golden CO 80401
Email: hw@canada.com

It is really chaotic closing out a job of 7½ years, but it is definitely time to move on. I had applied at CSM back when I was still in Library School, but was not hired then—I was really happy to get a second chance.

Golden is a small town just west of Denver, surrounded by hills with views to the Rockies and the Denver skyline. It’s about 10 minutes to Dinosaur Ridge and Red Rocks Park, and seconds to hiking trails and even kayaking (not that I do anything like that!!)

On a good day, have a look at:

<http://www.mines.edu/tour/webcam/>

This is where I’m going to be!

– Heather Whitehead

[Heather was the previous Editor of the Bulletin]

Robin on the Road Again

It’s been a while since you’ve heard from us. We spent the winter working in Florida and now we are in Texas. We’ve been so busy I haven’t had any time to “hunt” but have met a couple of people I was able to trade with.

The newsletter looks great, hopefully I can write for you again soon. – Robin & Willie Sweeten

[U.S. member Robin has written articles for the Bulletin on her fossil hunting expeditions.]

2001 Field Trips

(See Sign-up Sheet, enclosed with this issue!)

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

June 23 & 24, 2001 (Saturday and Sunday), Cranbrook, BC

Day 1: Saturday, June 23, 9:00 A.M. sharp

Meet at the ABC Restaurant parking lot (1601 Cranbrook Street North) in Cranbrook (north end of town when approaching Cranbrook from the east). **Allow at least 4 hours driving time** from Calgary (via Crowsnest Pass).

Itinerary: Approx. one hour drive to brachiopod/coral locality in the Middle Devonian Harrogate Formation, along the Bull River. After lunch in the field, we will drive another hour to a graptolite locality near Premier Lake. This last stop of the day will be close to Lussier Hot Springs, so bring your swimming suit as a few of us may go for a swim! We will be travelling on gravelled mountain roads for much of the day. Although they *should* be passable with regular vehicles, 4x4s are strongly recommended: plan accordingly. Our gracious guide, **Guy Santucci**, has also offered to host a **BBQ** at his home in Cranbrook on Saturday evening. Guy is planning to offer buns, salads, baked potatoes, pop and condiments—please bring your own hamburgers, steak, wieners and “survival” beverages. **If you wish to attend the BBQ, please inform Keith Mychaluk at least one week prior to the trip** so that proper arrangements can be made with Guy. [continues...]

**Day 2: Sunday, June 24; 8:30 A.M. sharp
(Note! 1/2 hr. earlier than Saturday)**

Same meeting place (ABC Restaurant).

Itinerary: We will drive to a popular trilobite collecting site in the Lower Cambrian Eager Formation. Digging and splitting of rock layers will likely be necessary at this site, which usually yields only fragments rather than complete trilobites. Please bring a variety of heavy chisels, sledge hammers and pry bars, as the layers are very difficult to split. On the way back to Calgary, we will search for Cretaceous-aged flora in the Kootenay Formation near Morrissey, if time permits.

As with all APS trips, accommodations are the responsibility of participants. Cranbrook's Tourist Info number is (250) 489-5261. Guy Santucci has recommended two **motels:** Model "A" Inn (250-489-4600) or Traveller's Motel (250-426-4208).

Campgrounds

Mount Baker—right in town. (1501 - 1st Street S.)
Tel: 1 (877) 501-2288 or (250) 489-0056.
Fax: (250) 489-0067.

Ponderosa Motel & Campground, in town:
500 Van Horne Street, Tel: (250) 426-6114.
Fax: (250) 426-6221.

Fort Steele Resort: 10 Wardner-Ft. Steele Road:
Tel: (250) 426-4268, Fax (250) 489-4233, e-mail:
resort@fortsteele.com website: **www.fortsteele.com**

Fort Steele Original Campgrounds:
335 Kelly Road. Tel: (250) 426-5117.

Jim Smith Provincial Park, Jim Smith Lake Road
Tel: 1 (800) 689-9025 or (250) 422-4200.

There is no attendance limit for this trip. Cost is \$5.00 per membership and is **due before June 15.**

July 14, 2001 (Saturday), Fish Creek Provincial Park, Calgary, Alberta

Meet at 10:00 A.M. on Saturday, July 14, Fish Creek Park Interpretive Centre (just off Bow Bottom Trail, turn right before Lake Sikome).

Recent excavations in Fish Creek Park, led by Dr. Dale Walde of the University of Calgary, have yielded an amazing array of archaeological sites. Buffalo jumps and kill sites, teepee rings and primitive tools attest to man's 10,000 year occupation of the Fish Creek area. We will visit a number of active quarries in the park during our tour, which will last approximately 2 hours.

Attendance is limited to 30 people but there is no cost for this trip. If interest warrants, a second date may be added.

July 21 and 22, 2001 (Saturday and Sunday), Grande Cache, Alberta

Day 1: Saturday, July 21, 9:00 A.M.

Meeting place: Grande Cache Tourism and Interpretive Centre (on Highway 40, south side of Grande Cache—see website below, for details).

Driving time from Calgary is about 7 hours.

Open-pit coal mines near Grande Cache (approximately 145 km. northwest of Hinton, AB) have revealed astounding dinosaur trackway sites in the Lower Cretaceous Gates Formation. Richard McCrea, who is studying these occurrences, is attempting to gain access for the APS. At this time, the coal mines are in receivership, so access is uncertain. If access cannot be secured, Day 2 sites will be visited ahead of schedule.

Day 2: Sunday, July 22, 9:00 A.M.

Meeting place: Same as Day 1 (Grande Cache Tourism and Interpretive Centre).

Other fossil sites along Highway 40, south of Grande Cache, will provide opportunities to examine Palaeozoic invertebrates and Cretaceous and Tertiary-aged plant remains. Stops may include Pierre Grey's Lakes area, Muskeg River, Pinto Creek and Rock Lake. Exploration will be the key word for Day 2; several of these sites have been selected from historical literature and may not have been visited in decades.

For more information on Grande Cache, including **accommodations**, call 1 (888) 827-3790. The town's website, **www.town.grandecache.ab.ca** contains valuable information on accommodations. **Campgrounds** near Grande Cache include Marv Moore Campground, (780) 827-2404, Smoky River Campground (780) 827-2848 and Pierre Grey's Lakes Recreation Area. Campgrounds south of Grande Cache and near Day 2's activities include Rock Lake Provincial Recreation Area and William A. Switzer Provincial Park, (780) 865-5600. Due to the distance from Calgary, participants may wish to add an extra day or two to their travel plans.

There is no attendance limit for this trip. Cost is \$5.00 per membership and is **due before July 1.** Please contact Keith Mychaluk for the latest details on this trip.

August 18 and 19, 2001 (Saturday and Sunday), Cripple Creek, Alberta

Day 1: Saturday, August 18, 8:00 A.M.
(Note the early start!)

Meet at Ram River Falls Campground, Forestry Trunk Road, northwest of Rocky Mountain House. From Rocky Mountain House, take Secondary Road 752 west until it connects with the Forestry Trunk Road (Secondary Road 940). Continue northwest (right) to Ram Falls Campground, north of the bridge. **Allow at least 4 hours driving time** from Calgary.

Used as a study area for petroleum geologists for decades, the Cripple Creek-Hummingbird Reef area is one of the most spectacular Devonian-aged reef complexes exposed in Alberta. Many buried Devonian reefs in north-central Alberta form large oil and gas reservoirs. Outcrops of the Leduc (Cairn-Southesk) and Ireton Formations at Cripple Creek are highly fossiliferous. Typical invertebrate fossils include brachiopods, corals, bryozoans and molluscs. The “roads” into the Cripple Creek site from Ram River Falls are horrible on a good day. **Trucks with 4x4 capability are a MUST.** A 3 to 6 km. hike (each way) may also be necessary, depending on road conditions. Although good fossils should be accessible in the creek, the best geological exposures will require hiking steep vertical sections. Please do not attend this trip if you feel you cannot make the physical commitment. For safety and liability reasons we cannot have people turn back halfway to the site—this is bear country. We must stick together as much as possible—please plan accordingly. We may decide to camp near Cripple Creek on Saturday night; if not, we will return to the Ram River Falls Campground. This will be a rough trip so please come prepared.

Refunds are available for those who have already signed up and paid, but no longer think they can handle the extreme conditions.

Day 2: Sunday, August 19.

Meeting time and place to be announced on Saturday. Back to Cripple Creek unless conditions prohibit.

There is no attendance limit. **Cost is \$5.00 per membership and is due before August 1.**

September 22, 2001 (Saturday) Tour of P.A.S.T. workshop, East Coulee, Alberta

Saturday, September 22, 10:00 A.M.

Meet at P.A.S.T. workshop, 232 - 2nd Avenue, East Coulee, Alberta. (East Coulee is 20 km. south-east of Drumheller, on Highway 10: consult your road map.) **Allow at least 2 hours driving time** from Calgary.

P.A.S.T., or Prehistoric Animal Structures, specializes in mounting skeletons for exhibitions and museum displays. They have constructed skeletons of dinosaurs, other fossils, recent mammals and reptiles for such institutions as the Royal Tyrrell Museum and the Field Museum of Natural History in Chicago. Our tour will showcase P.A.S.T.'s current project—a *Seismosaurus* skeleton from New Mexico. Techniques used in fossil preparation, casting and mounting will be explained.

There is no attendance limit for this trip. **Cost is \$2.50 per person.** (P.A.S.T. must charge this to cover liability insurance—hazardous goods on site.) For more information on P.A.S.T. see their website: www.agt.net/public/past/pastweb.htm □

SVP Meeting Slated for October

by Keith Mychaluk

The Society of Vertebrate Paleontology (SVP) will be hosting their 61st Annual Meeting just south of the border, in Bozeman, Montana from October 3 through 6, 2001. The conference will include a number of technical lectures, workshops and field trips related to vertebrate palaeontology. Last year's meeting was held in Mexico City [see *Bulletin*, December 2000, p. 8; also Dec. 1998, 1997, 1996, etc. -ed.] For more information, including registration and accommodations in Bozeman, visit the SVP website at: www.vertpaleo.org

Several APS members have already expressed an interest in attending the conference. For those who are planning to attend and wish to car pool with other members, please contact APS events coordinator Keith Mychaluk at (403) 228-3211 or events@albertapaleo.org. If interest warrants, rental vehicles from Calgary may be arranged. □

Program Summary

April 20, 2001

Anatomy of an Upper Cretaceous Elasmosaur from Southwestern Saskatchewan. By Tamaki Sato, University of Calgary

Tamaki Sato is a graduate student at the University of Calgary. She is conducting a study on Elasmosaurs as part of her graduate work.

The Cretaceous rocks of western Canada have produced fossils of a number of types of aquatic reptiles—turtles, crocodiles, ichthyosaurs, mosasaurs and plesiosaurs. One group of plesiosaurs, with long necks and small heads, are the elasmosaurs. Elasmosaurs occur in Mesozoic marine rocks throughout the world.

In her research, Tamaki is trying to shed light on a number of questions about this group of animals:

- Functional morphology: how did the elasmosaurs' bodies work?
- Were they oviparous (egg-laying), or viviparous (live-bearing)?
- Why did they become extinct?
- What are their closest living relatives?
- How are the different plesiosaurs related to one another?

A specimen from the Bearpaw Formation (Upper Cretaceous: Campanian–Maastrichtian) of southwestern Saskatchewan was discovered in 1993, near the town of Ponteix [see Bulletin, December 1993, p. 3; December 1995, p. 8]. The specimen is well preserved, including the skull (crushed but fairly complete, with preserved details of the inner ear cavity); 55 vertebrae; both fore and hind limbs; and the pelvic girdle, which is eroded, but retains some anatomical features of value. This specimen is one of the latest plesiosaurs found in North America.

The Ponteix elasmosaur is relatively small (about 7 metres long), and has unique skeletal features, indicating that it belongs to a previously undescribed species. One unusual feature is fused gastralia (“belly ribs”)—a feature never before seen in elasmosaurs. It’s not yet known if this is a normal feature for the species, or a pathology.

Comparison with other elasmosaur specimens is difficult, as skulls are generally found in crushed condition, and older specimens have often been badly prepared, with artificial parts added and

camouflaged to look like original bone.

A preliminary cladogram, prepared by comparing 123 measured characters of the Ponteix specimen with those of 14 other plesiosaur species, has suggested that the closest relationship may be to a Jurassic elasmosaur, *Muraenosaurus*. However, Tamaki emphasizes that these results come with a low level of confidence, and computed cladograms vary with the sets of data used for comparison. More data are required before the specimen’s relationships can be interpreted with confidence.

May 25, 2001

The Geological Setting and Palaeobotany of Joffre Bridge Roadcut, a Late Paleocene Fossil Locality near Red Deer, Alberta. By APS member Georgia Hoffman.

Georgia Hoffman gained her BSc (honours) in geology from the University of Pennsylvania. She has worked in western Canada since 1970, in exploration for coal and oil sand, as well as base and precious metals. Georgia received her MSc in Biology from the University of Alberta in 1995 for her work on the fossil flora that is the subject of this talk. She is currently working on an oil sand project in north-eastern Alberta, and continues to work on palaeobotanical projects in her spare time.

[Biographical notes provided by G. Hoffman]

The locality that was the subject of Georgia’s presentation was discovered just east of Red Deer, by longtime APS member **Betty Speirs**, who was largely responsible for the excavation of some 20,000 specimens of plants, vertebrates (mammal parts and articulated fishes) and insects.

Under the supervision of Dr. Ruth Stockey of the University of Alberta, Georgia undertook a scientific examination of the plant fossils in this huge collection.

The rocks exposed by bridge and highway construction comprised a section of the Paleocene Paskapoo Formation, including the upper part of the Haynes Member (sandstone) and the base of the overlying Lacombe Member (shales, siltstones, coal), which contains the fossils in question.

Dating of the Paskapoo Formation has been accomplished through biostratigraphy (fossil mammals and palynology—pollen and spores) and magnetostratigraphy (determination of magnetic polarity of sediments calibrated against a worldwide time standard). The Joffre Bridge locality has been dated as Late Paleocene (Tiffanian).

The sediments at the roadcut (which was already well overgrown by time Georgia began her

research) represent a floodplain environment, centred on a small lake (“Lake Speirs”) that has been interpreted as an abandoned river meander, or oxbow lake. In the interval of time between the formation of the lake and its eventual burial by another active river channel, countless plants and animals fell into the lake and were preserved in the finely laminated muds that eventually became the shales of the Joffre Bridge roadcut.

The flora represented at Joffre Bridge includes over 20 families of plants. As was evident from her spectacular slide show, the preservation of the Joffre specimens is exquisite. Georgia focussed her presentation on three of the best-represented genera. *Glyptostrobus* is a coniferous tree related to the bald cypress (*Taxodium*) of the Louisiana bayous. Living *Glyptostrobus* are presently restricted to eastern Asia. Material at Joffre includes all growth stages of *Glyptostrobus* leaves, seed and pollen cones, and seeds.

Joffrea is a broad leafed tree closely related to the modern Katsura tree (*Cercidiphyllum*), also living in Asia. *Joffrea* (named for the locality, by Dr. Stockey) is also represented by beautifully preserved heart-shaped leaves, twigs, flowers, fruits and seeds, all of which have been found in the context of other attached parts, leaving no doubt as to the identity of the various structures. This remarkable site has even produced numerous *Joffrea* seedlings, in 2 and 4-leaf stages, in both plan view and side view!

One of Georgia’s important discoveries was the true identity of a common, duckweed-like pond plant, originally assigned to the genus *Spirodela*, a living duckweed. Specimens from Joffre Bridge are preserved in astonishing detail—right down to individual epidermal cells. What started as a routine examination of the Joffre material turned up thick rhizome structures that bore no resemblance to anything on a modern *Spirodela*.

Serendipitously, a Czech palaeobotanist happened to have just described a very similar plant from Europe, which has provided these Joffre specimens with a new genus name: *Limnobiophyllum*.

With the help of Geological Survey of Canada palynologist **Dr. Art Sweet**, Georgia also found tiny blossom structures and pollen associated with *Limnobiophyllum*—and this brought another surprise: the pollen of this “duckweed” proved to be nearly identical to pollen of a tropical plant, *Pandanus* (screw-pine), currently native to tropical southeast Asia and the South Pacific islands. *Pandanus* has been reported in the fossil flora of North America for many years, but—apparently—only

as pollen. (In fact, this sword-leaved, “palm-like” plant is often portrayed in paintings of North American dinosaurs.)

This has significant palaeoclimatic implications, since the presence of *Pandanus* has been cited as evidence of a tropical, frost-free climate in the Paleocene. Could it be that a small, frost-tolerant pond-weed has been pulling a fast one on palaeobotanists for all these years? Stay tuned. In her summation, Georgia asked the audience to keep their eyes peeled for any *Pandanus*-like fossil leaves or fruits...the mystery isn’t over yet. □

Calgary Rock and Lapidary Club Annual Show, May 5 & 6, 2001

by Wayne Braunberger

Members of the APS operated the Identification Booth/APS Resource Centre at the annual Calgary Rock and Lapidary Club Show over the May 5–6 weekend. We had a very successful two days promoting the Society, identifying specimens, and dispensing wit and wisdom. The giveaway box generated a great deal of interest and many stopped by to pick up a specimen or more. Once again, **Harvey Negrich** assisted by providing the display cabinets, lights, and several display specimens. Harvey also brought his microscope down and several copies of older Alberta/Canadian Society of Petroleum Geologists Bulletins that were given to any who wanted them. Over the course of the two days several people stopped by to have specimens identified. Many are repeat customers who stop by every year to have their latest finds identified.

Special thanks to those who volunteered their time over the two days: Harvey Negrich, **Dan Quinsey**, **Wendy Morrison**, **Geoff Barrett**, and **Les Adler**. Also thanks to those who donated specimens for the giveaway box: **Don and Vi Merkle**, **Dick and Marian Walker**, Geoff Barrett and Les Adler. We also received unsold material from the CRLC silent auction. □

Rare Brittle Star Passes the Test of Time

by Keith Mychaluk and Howard Allen

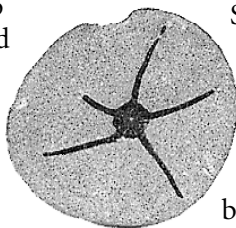
The rarest and most treasured specimen in my collection is this brittle star fossil I found—or I should say, my father found—when I was seven years old. My parents used to take me fossil collecting to the Red Deer River valley north of Drumheller, Alberta every summer when I was a little boy. On one of the first trips I can remember, in 1977, my father and I were exploring a wash only a mile or two upstream from where the Tyrrell Museum now resides. I was walking ahead of my dad when he picked up something I had missed. He called to me and laughed at how some “silly kid” had drawn a starfish on a quarter-sized piece of sandstone he just picked up. He showed it to me and I thoroughly examined it, running my finger across it. Instantly I could feel the raised surface of the fossil and knew it wasn’t a hoax but the real thing! Wow!

The fossil was later identified in 1989 by Dr. Paul Johnston of the Tyrrell Museum of Palaeontology as a brittle star (Class Ophiuroidea), not a starfish. He, however, could not identify the family or genus even with the help of visiting echinoderm specialist Dr. Julian Fell (the surface of the central disk is split away). What is most remarkable about the specimen, is that it did not originate from the Drumheller valley (Horseshoe Canyon Formation). Based on the lithology of the matrix, Dr. Johnston concluded it was brought to the Drumheller valley, probably by glacial transport, from bedrock farther to the west or northwest, perhaps from the Cardium Formation exposed in the foothills. What an incredible journey this little fossil has undertaken.

Although I was hooked on fossils before we found this specimen, I must admit this particular piece sealed the deal. I have never looked back and I am now a professional geologist working in the Canadian oil and gas industry.

As Keith has related, the discovery of this remarkable specimen was a triple whammy of good luck—first, brittle stars are vanishingly rare as fossils in Western Canada; second, this delicate fossil, exposed on the surface of a thin wafer of friable sandstone, survived a journey of who knows how many hundreds of kilometres and thousands of years of weathering. Third was the sheer, right-place-at-the-right-time luck of finding it amid all the exposed rocks of the Drumheller valley. It even beat the 50/50 odds of landing right-side up!

Brittle stars, and indeed, any non-attached echinoderms, are extremely rare in this part of the world. A few records exist of starfishes from the Lower Cretaceous of northern British Columbia and Alberta (McLearn, 1931, 1944; McLearn and Kindle, 1951) and reports from western Alberta (Cardium Formation: W.F. Braunberger, pers. comm.; H. Negrich, pers. comm.¹). A few small echinoids—sea urchins—have been recovered from Upper Cretaceous rocks in central Alberta (Warren, 1926). But the only record of brittle stars I have run across is from the Bearpaw Formation (Upper Cretaceous) of south-central Saskatchewan—and only fragmentary material (Caldwell, 1968).



The specimen, actual size.

The original home of this little specimen is a matter for speculation. In a letter he wrote to Keith, Dr. Johnston opines: “It is probably an erratic, having been brought to the Drumheller area by glaciers. It likely originated from bedrock farther to the west or northwest, perhaps from the Cardium Formation or some other unit within the Upper Cretaceous Alberta Group.”

Studies of glacial drift movements, based on the lithology of embedded rock fragments (erratics) have been undertaken on the ice-age surface deposits of central Alberta (Gravenor and Bayrock, 1955; Morgan, 1969). It appears that much of the glacial drift in east-central Alberta was deposited by Laurentide ice sheets, which flowed southwestward from their ultimate origin in north-central Canada.

For example, Morgan (*op. cit.*) found, in the Calgary area, that the proportion of igneous and metamorphic rock fragments (Laurentide erratics, from the Canadian Shield area, e.g. northeastern Alberta, northern Saskatchewan) versus carbonate rock fragments (Cordilleran erratics, from the Rocky Mountains) in the glacial drift increases

¹ The APS fossil collection actually includes one of these starfish specimens, which has been under the care of the RTMP for a number of years. Its current status is uncertain.

– K.M.



The specimen magnified, under low-angle cross lighting. Vague, five-fold structures are visible on the central disc. (Both photos by Howard Allen.)

abruptly from generally less than 10% Laurentide erratics west of Highway 2, to 50% or more east of Highway 2. This suggests that much of the glacial drift to the east and northeast of this area was transported from that direction; and by extrapolation, it would seem reasonable to suppose that glacial drift in the Drumheller area would comprise at least as high a proportion of Laurentide erratics.

Thus, if Keith's brittle star was indeed deposited by glacial transport, it seems at least as likely that it originated in the northeast as from the west or northwest. There are several Lower Cretaceous marine formations exposed in the Fort McMurray area of northeastern Alberta and adjacent Saskatchewan. As well, much of the region to the north and east of Drumheller is underlain by Upper Cretaceous formations, at least some of which include marine sandstones (Warren, 1926; Hume and Hage, 1941).

It is also possible, however, that the specimen was deposited as fluvial (river-borne) gravel by the Red Deer River, which does originate in the foothills of west-central Alberta, and has cut down through the glacial deposits and underlying Cretaceous rocks since the end of the last ice age. The delicate state of the specimen might at first strain belief that it could have bounced intact for hundreds of kilometres along a river bed with countless other pebbles and cobbles; but the wafer of

matrix on which it now rests might have flaked away from a larger cobble relatively recently.

A petrographic thin-section examination of the matrix sandstone might narrow the possibilities by a process of elimination, but this would certainly risk damaging the specimen. Thus, it is unlikely that we will ever learn this little critter's secrets.

– H.A.

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The Urban Fossil Collector

If you could ask the Urban Fossil Collector any one question about fossils or dinosaurs, what would it be?

Email your questions to **Dan Quinsey:**

quinseyv@cadvision.com

Answers will be published in upcoming *Bulletins*. □

Fossils in the News

Calgary Herald, February 23, 2001

The mother of all extinctions

WASHINGTON (AP)—The majority of ink expended on this article retells the well-known story of the Permian/Triassic extinction event, which is generally acknowledged to have been the most thoroughly destructive to life on Earth, having wiped out, by some accounts, 90% of marine life and 70% of terrestrial organisms.

The news is that a team of scientists, led by geochemist Luann Becker, of the University of Washington, has announced the discovery, in Permian-Triassic boundary deposits, of “buckyballs,” or molecules of buckminsterfullerene, a spherical molecule of carbon atoms forming a hollow, cage-like structure. Trapped inside of these buckyball cages are rare isotopes of helium and argon thought to have an extraterrestrial origin, hence pointing to a major impact as the cause of the great extinction event.

Calgary Herald, February 23, 2001

Allosaurus had a head for hunting

LONDON—Researchers think they have figured out how the Jurassic theropod (meat-eating) dinosaur *Allosaurus* killed its prey. After computer scanning the skull of a Wyoming specimen in three dimensions, the scientists applied engineering analysis used in bridge design to work out the strength of various parts of the skull.

Allosaurus has been something of a puzzle in that its long, slender teeth and relatively delicate jaw bones didn't seem to match the great strength of the skull and upper neck. The team, led by Emily Rayfield of Cambridge University, found that *Allosaurus* had a weak bite compared to other big theropods, like *T. rex*, and probably couldn't have crunched through thick bones.

The conclusion: *Allosaurus* probably employed a “slash and slice” technique, using the powerful neck muscles to slam the skull and upper teeth down onto its prey, tearing off large hunks of meat.

Calgary Herald, February 17, 2001

“Jurassic Park” of fossils unearthed

ARGENTINA—A rich deposit of Jurassic-aged dinosaur fossils has been found in Chubut province, in the Patagonia region of Argentina. Palaeontologists have just begun to explore the new site, first

investigated last November by Dr. Oliver Rauhut of the Egidio Feruglio Museum of Paleontology in Trelew, Argentina. He discovered the bones of a large sauropod dinosaur and two theropods. The site, which could turn out to cover several hundred square kilometres, is also rich in other fossils, including frogs, fishes, turtles, pterosaur bones and at least one jaw of a rodent-sized mammal. A variety of plant fossils rounds out the collection.

Calgary Herald, December 16, 2000

“Living fossil” tree found in Australia

SYDNEY (Reuters)—Move over, Wollemi pine, [Bulletin, *March 1995, June 1999*] there's a new “old” tree in town. Another previously unknown tree has turned up in the wilds of the Australian rain forest, near Byron Bay, 650 km. north of Sydney. Dubbed the “Nightcap oak,” the 40-metre tall tree's fossil record can be traced back 90 million years (Cretaceous), to a time when Australia was part of the supercontinent Gondwanaland, including Antarctica and South America.

National Post, January 25, 2001

Bizarre-toothed dinosaur named after Dire Straits lead singer

MADAGASCAR—A team of U.S. palaeontologists have honoured Dire Straits lead man Mark Knopfler by naming a new dinosaur for him. The Late Cretaceous dinosaur, named *Masiakasaurus knopfleri*, was the size of a large dog, but is remarkable for its front teeth which are “...long and conical with hooked tips. They protrude straight forward, so it might be easier to catch fish, but it might be used to spear insects or some other animal.” This is according to expedition leader Scott Sampson, of the University of Utah. Apparently, the team enjoyed their best success at fossil hunting while listening to Dire Straits.

National Post, February 8, 2001

Restored dinosaur smell too effective

LONDON—After the Natural History Museum contracted out the job of providing dinosaurian odours to accompany its latest *T. rex* exhibit, it had second thoughts about its idea of recreating the smell of the carnivore's breath. The thought of treating its patrons to a bouquet of blood, rotting meat and infected wounds convinced the museum to opt instead for a tamer treat, “Maastrichtian Miasma”—a “boggy, acrid, earthy scent”—the odour of the *T. rex*'s habitat.

Perhaps it's just as well: according to Jack

Horner of the Museum of the Rockies (Bozeman, MT), “*T. rex* would have to be the most putrid, foulest thing that ever lived. A hyena times 10 would not even get you close.”

African dinosaur makes local scene

CALGARY—Earlier this year, APS member **Sam Richter** was on hand with his camera for the appearance of a full-size mounted model of the African sauropod *Jobaria tiguidensis*, the original of which was unearthed by Dr. Paul Sereno in Niger [see *Bulletin*, December 1999]. The skeleton pictured on this page was constructed at the P.A.S.T. Inc. workshop in East Coulee, Alberta (venue for our September field trip—see Page 6) and was on display at Calgary’s Southcentre Mall.

The Calgary Sun, April 26, 2001

Feather flap over fossil

NEW YORK (AP)—Another feathery dinosaur has emerged from the Late Jurassic fossil beds of China, this one the most complete specimen found to date. The dinosaur—a duck-sized dromaeosaur—lies in a slab of shale, fringed with downy, feather-like structures. “There’s strong evidence that these body coverings were originally insulation for warm-blooded dinosaurs and were only later co-opted for flight,” says Mark Norell of the American Museum of Natural History.

The naysayers are, of course, unmoved; Smithsonian Institution ornithologist Storrs Olson scoffs, “To me, it’s the best specimen yet showing that these structures are not feathers.”

The Globe and Mail, May 11, 2001

Dinosaurs lived through one extinction, study says

QUEEN CHARLOTTE ISLANDS, BC—Evidence from a study of microfossils in marine sedimentary rocks from remote exposures in the Queen Charlotte Islands shows that the Triassic/Jurassic boundary extinction event (200 million years ago) was very abrupt. This is the conclusion of a paper published in the May 11 issue of *Science*.

The study shows that more than fifty species of planktonic radiolarians (silica-shelled protists)

vanished abruptly—in less than 10,000 years—reflecting a crisis in ocean productivity. Radiolarians are at the base of the biological food chain. The timing coincides with the disappearance of many larger organisms, including the “mammal-like” reptiles, leaving the stage set for the age of the dinosaurs, says lead author Peter Ward, of the University of Washington.

Co-author James Haggart, of the Geological Survey of Canada says that the evidence is “compatible with an extraterrestrial impact,” though it could also be explained by other factors, such as a buildup of greenhouse gases. The team hope to continue their work on the Queen Charlottes this summer.

Calgary Herald, May 25, 2001

Minuscule mammal may be our ancestor

PITTSBURGH (AP)—Carnegie Museum of Natural History palaeontologist Zhe-Xi Luo has announced the discovery of the tiniest but most advanced mammal (for its age: Early Jurassic, 195 million years ago) known to science. The mouse-like critter, dubbed *Hadrocodium wui*, would have weighed about 2 grams, and been a little bigger than a paper clip. Its skull was found in southwest China. “It was a little smart cookie with an extended brain,” says Luo. *Hadrocodium* probably ate insects or worms.

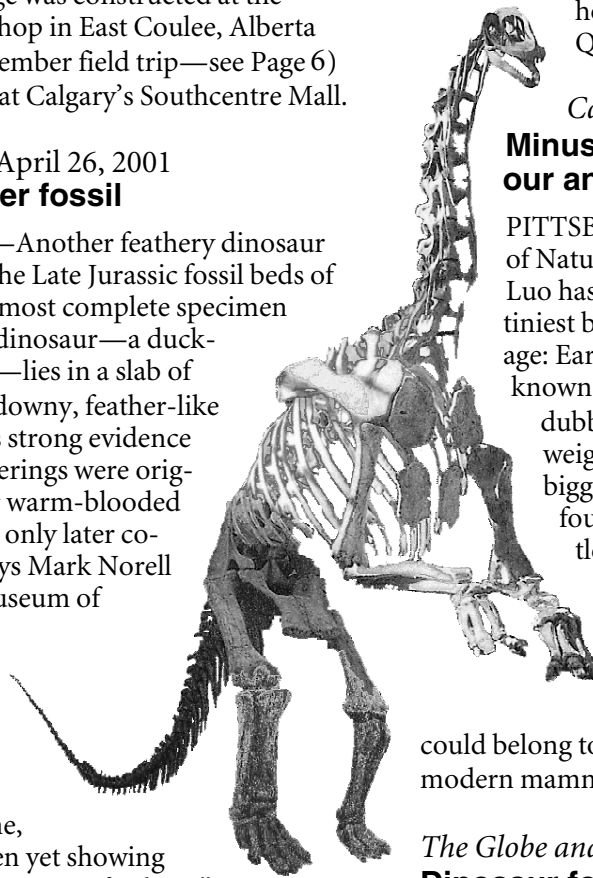
Its skull has features that make its position in the mammalian family tree uncertain, but it could belong to a line that was ancestral to all modern mammals, including humans.

The Globe and Mail, May 10, 2001

Dinosaur fossil extends family lineage of *T. rex*

ISLE OF WIGHT, UK—A new dinosaur fossil from Lower Cretaceous rocks (120 to 125 million years old) has added to our knowledge of the origins of the tyrannosaurids, the theropod lineage that ultimately led to *T. rex*. About 40% of the skeleton of *Eotyrannus lengi* has been excavated by a team from the Museum of Isle of Wight Geology. The 4.5 metre animal had a skull, shoulder and limb structure that shows its relationship to the later tyrannosaurs. □

[Thanks to Les Adler and Sam Richter for handing over clippings –ed.]



Reviews

by Les Adler

Pterosaurs: Lords of the Ancient Skies

by Richard Monastersky, photographs by Jonathan Blair, art by John Sibbick.

National Geographic, May 2001, p. 86–105.

This spectacular article with maps, photos, illustrations and notes is one of a continuing series on “The Rise of Life on Earth.”

A diagram on page 97 shows that pterosaurs, while reptiles, are *not* dinosaurs and that their distinct lineage forms two groups: rhamphorynchoids (long tails, Triassic and Jurassic Periods) and pterodactyloids (short tails, probably Triassic, Jurassic and Cretaceous). The maps on page 89 show the worldwide distribution of fossil occurrences on all continents including Antarctica.

Among the featured palaeontologists are Dr. Kevin Padian, of California, who compares the large types with planes and the small types with birds. Pterosaurs were the first vertebrates to fly, in the Triassic Period, 215 million years ago. The 120 named species range from the smallest no bigger than a sparrow to the largest with a wingspan of 12 metres—comparable to US fighter planes.

From a fossil discovered in Kazakhstan by A.G. Sharov, it appears that pterosaurs had a hair-like covering perhaps akin to fur, and a warm-blooded physiology to maintain the reptile in the air.

Alexander Kellner and Diogenes Campos study pterosaurs from the Araripe Plateau, Brazil, with recent finds of 19 new species. Dr. Peter Wellnhofer studies the pterosaurs from the Bavarian Solnhofen Limestone. Dr. Ruper Wild, a German palaeontologist, discovered fish scales in a pterosaur body. Chris Bennet, University of Kansas, found that he could distinguish between males and females according to their crests and pelvises. Dr. Wann Langston Jr. studies *Quetzalcoatlus* (occurring in Dinosaur Provincial Park, Alberta) at the University of Texas.

After looking at the glorious photographs you can then start to absorb the differences between some of the pterosaurs such as *Dimorphodon*, *Quetzalcoatlus*, *Rhamphorynchus*, *Pterodactylus*, *Dsungaripterus*, *Tupuxuara* and *Pterodaustro*. □

Debut Sue—Chicago’s Field Museum

Unveils the World’s Most Famous *T. rex* by Donovan Webster, photographs by Ira Block. *National Geographic*, June 2000. p. 24–37.

One by bone, scientists and exhibit builders have worked for two years on the world’s biggest *T. rex*. After 67 million years in obscurity, “Sue” again towers above, commanding the attention of all below. In the next year two million people are expected to view Sue, one of Earth’s largest ever land-dwelling carnivores.

The skeleton has been assembled by Phil Fraley Productions using a metal framework so that each piece can be totally secure and also readily available to be removed from the mount for study.

Some observations:

- The olfactory bulbs which receive information from smell receptors in the nose are nearly as large as the rest of the brain.
- Sue is the first *T. rex* to be found with what appears to be a furcula or wishbone.
- Sue is one of only two *T. rex* specimens to be found with forelimbs.
- Abnormal growth in vertebrae and other bones may have been caused by disease.
- A 15 centimetre long middle ear bone is the first found in a *T. rex*.
- One of Sue’s teeth is 30 centimetres long from root to tip, the largest tooth yet described from a meat eating dinosaur.
- Sue’s gastralia are 70% complete.
- Sue’s muscle attachments allow palaeontologists to estimate how far Sue’s legs moved when it walked—3.6 to 4.3 metres per stride.
- It is not known for sure whether this *T. rex* is male or female. The name “Sue” is from the name of the finder in South Dakota.

A scientific report is being readied by Chris Brochu. □

Trilobitophilia by Robert Anderson, *Natural History*, May 2001, p. 86

A couple of websites for trilobite fans:

A Guide to the Orders of Trilobites, maintained by biologist Sam M. Gon III:

www.aloha.net/~smgon/ordersoftrilobites.htm

Another website, by George W. Hart:
www.georgehart.com/trilobites/trilobite.html □

Alberta Palaeontological Society Membership List, June 2001

(...continued from back page)

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