

# Alberta

*Palaeontological  
Society  
Bulletin*

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JUNE 2002



# ALBERTA PALAEOLOGICAL SOCIETY

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Membership	Howard Allen	274-1858
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† APAC is the Alberta Palaeontological Advisory Committee

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

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

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

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

\* A dues increase was approved at the May 2002 annual meeting. Effective January 1, 2003, dues will be \$20.00 and \$25.00 respectively. (This also applies to dues collected prior to January 1, 2003 but applied to the year 2003.)

## THE BULLETIN WILL BE PUBLISHED QUARTERLY:

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Society Mailing Address:

**Alberta Palaeontological Society  
P.O. Box 35111, Sarcee Postal Outlet  
Calgary, Alberta, Canada T3E 7C7  
(Web: [www.albertapaleo.org](http://www.albertapaleo.org))**

Material for the Bulletin:

**Howard Allen, Editor, APS  
7828 Hunterslea Crescent, N.W.  
Calgary, Alberta, Canada T2K 4M2  
(E-mail: [editor@albertapaleo.org](mailto:editor@albertapaleo.org))**

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## UPCOMING APS MEETINGS

Meetings take place at 7:30 p.m., in Room **B108** (or **B101**, across the hall)  
**Mount Royal College:** 4825 Richard Road SW, Calgary, Alberta

**June, July, August, 2002**—No meetings. See Field Trip schedule, Page 13.

**September 20, 2002**—Annual "Show-and-Tell." Bring in your finds from the summer for discussion and identification, as well as any other specimens, photos, new books, etc.

**ON THE COVER:** Argentine fossils!—Longitudinal section of a petrified *Araucaria* sp. seed cone (Jurassic) from Santa Cruz Province, southern Argentina. Magnified approximately 2.5 times. Specimen courtesy of Vaclav and Mona Marsovsky, photo by Howard Allen. Have you got a rare, unusual, or spectacular *Alberta* fossil we can showcase on a future cover? Please contact the Editor!

# Summary of Annual Meeting and Elections

by Dan Quinsey

Our Annual Meeting was held on May 24, 2002. A total of 36 members in good standing were in attendance representing 24% of the membership (only 15% was required for quorum). The meeting lasted an hour and a half.

Tanya Samman, a Ph.D. student in the Department of Geology and Geophysics of the University of Calgary, gave a presentation on the "Tooth Placement in *T. rex*." Her presentation was concise and well presented. She familiarized the audience with the terminology used in describing dinosaur teeth then proceeded to show how she gathered data on these teeth. The data collected were then statistically analyzed and presented. Her conclusions demonstrated it was very difficult to quantifiably differentiate the teeth of tyrannosaurids; however, once more specimens are found or made available, (only 35 decent specimens were available for the study), her analysis methods could possibly present statistics that would further the identification of tyrannosaurid teeth.

Programs for the upcoming year are being planned. The September meeting will be a show-and-tell meeting where members are encouraged to bring their fossil finds from the summer for display and identification assistance if needed.

Our annual elections were held after the presentation. The members listed at the top of Page 1 were elected by acclamation or are continuing in their positions.

Recommendations in the form of a brief report and a 15-page handout were presented to the membership by the Board regarding the motion to consider membership in the AFRC and GMFC made by Peter Meyer on March 15, 2002. The recommendation read: "After thorough investigation into this matter, the APS Board of Directors strongly recommends against seeking membership in the AFRC and GMFC at this time. The Board will continue to investigate our options regarding third-party liability insurance."

Overheads demonstrating the need to raise membership dues were presented to the membership. Operating statements and an expenses per membership comparison for the years ending December 31, 2000 and 2001 were presented, establishing an increase in expense per membership from 2000 to 2001 of \$5.07. Several facts demonstrating the need for a dues increase were then presented to the membership.

Due to concerns expressed by members during the last few months, the original motion:

*To increase membership dues for the Alberta Palaeontological Society to \$20.00 for a Single, Family or Institutional membership commencing with the 2003 calendar year.*

Was amended by the Board to read:

*To increase membership dues for Single, Family, and Institutional Membership into the Alberta Palaeontological Society by \$5.00 each commencing with the 2003 Calendar year.*

A call for the questions was carried 25-0 and the vote on the amended motion was also carried 24-0.

The Board of Directors would like to thank all those members who were able to attend the meeting and wishes all a safe and prosperous summer. See you in September! □

## Membership Survey Comments

Feedback helps us to focus our efforts in the right direction. Although we cannot accommodate all of our members' wishes, the Board of Directors will take into consideration comments made in the recent APS survey during the decision making process.

In regards to the general meetings, we agree the air conditioning in room B108 is a distraction and acoustics are mediocre at best. We are in the process of raising funds through projects to purchase a public address system.

We encourage the general public to take in our

general meetings in order to promote the science of palaeontology through study and education. Because of this, we are trying to keep the business portion of general meetings to a minimum. Many of our members pointed out they are happy with the general meeting format and would change nothing. One last point, our meetings are held Friday nights as this is the only night public activities are not scheduled at Mount Royal College, thus we have been granted the venue at no charge. Moving the meeting to another day would add an additional cost to the Society.

The *Bulletin* is our best pleaser. Members want the content expanded, letters to the editor, more pictures, stories, and short commentaries. Some members want forms of entertainment while others feel the content should be scientific. We have many compliments from members, the general public and other societies on our newsletter. All we can say is if something is missing, write it down and send it in. After all, that's what makes the *Bulletin* what it is.

Our programs are, again, satisfactory to the majority of our members. We are doing our best to encourage presentations from our members, both professional and novice. We feel presentations aimed at children would not attract a large number of kids on a Friday evening; however, we will look at possibly putting together special events for kids. A number of events aimed at kids already run during our symposium.

We have been working to clean up the library and utilize the locking cabinet as a permanent book case. An index of material would require a great deal of work and anyone interested in volunteering to assist the Librarian in this task is welcome to step forward.

Many members are happy with our field trips. We received comments that some trips can be out of the way and exhausting, but to get to the sites and material the membership is looking for, these are the only locations available to us. We will try to schedule at least one trip each year close to home and less demanding. Publishing and distributing notes in advance adds additional costs to events. An effort will be made to review the guidebooks prior to the beginning of each trip. It is not feasible for the leader to visit all sites ahead of time.

On another note, "prospecting" trips were ranked very high in popularity in the 1999 Field Trip Survey. A 4x4 is sometimes the best vehicle to take on trips and members are warned far in advance of this necessity. Lastly, a field trip safety kit has been put together.

As suggested we are going to bring a sampling of the APS collection to meetings when possible. Members are encouraged to bring along bits and pieces of their own collections for all to enjoy.

The December pot luck dinner is starting to grow and we will take into consideration comments made by the membership. We will try to keep in mind those who are diabetic in our Society. However, those members with food-related health concerns also need to recognize the meaning of "pot luck": you bring along something that you can eat and are willing to share with others. It would be next to impossible to coordinate meals that would address all the potential food allergies or dietary concerns of a normal cross-section of society.

Fundraising is a subject we are working on. One project currently under way is the Charity Garage Sale. Another will be the Silent Table Auction at general meetings. We will not charge for outside education to schools and groups such as cubs. If anyone has any fund raising ideas, please submit them to the Fundraising Director.

We will be looking at educational and training courses for members. We have to be assured of a minimum number of attendees to put on a course. Members will be solicited.

We will do our best to communicate with members who don't own computers, though this concern may have more to do with perception than reality. The frequent appearance of website and email addresses in the *Bulletin* may make it appear that non-computer-users are somehow being left "out of the loop." In fact, there is very little in the way of communication or substance that requires members to own a computer, and the Board has made an effort to accommodate non-users.

There is nothing available on the APS website that isn't already distributed to members in printed format or (in the case of photo contest entries) available for viewing at general meetings. The *Bulletin*, of course, is still distributed on paper, as are field trip signup sheets, membership surveys, and anything else that must reach all members. Telephone numbers are provided for contacting executive members or event coordinators; email addresses are simply an extra convenience for those who can make use of them.

Other items such as the *Bulletin* CD-ROM and index are made available to computer users simply because this is by far the most convenient and cost-

effective method of distribution. Back issues of the *Bulletin* are still available in printed format.

The annual Symposium has been a great success. We moved our last event down the hall where lighting is better. A good suggestion was made to have table displays of fossils. Members are encouraged to contact the Symposium Coordinator if they are interested in doing this and if it can be accomplished, arrangements will be made.

All the comments made, even if not listed here, were appreciated and the Board would like to take this opportunity to thank the members who participated in the survey. □

– Alberta Palaeontological Society  
Board of Directors

# Personal Safety in the Field

## 10 Items Everyone Should Carry

by Wayne Braunberger

**P**ersonal safety is everyone's responsibility. You should not leave it up to someone else to have the items you may need if an emergency situation arises. Whether you are a participant on an APS field trip or just out for a day hike, everyone should carry the following items at all times. Relatively minor incidents can become serious if you are not prepared.

- 1) **First-aid kit.** You should be able to take care of any minor injuries (cuts, scrapes) that occur. Everyone should take a basic first-aid course and if you are in the outdoors much of the time a wilderness first-aid course is highly recommended. Wilderness first-aid courses are geared specifically to the prevention and treatment of injuries that can occur while hiking and camping.
- 2) **Whistle.** Everyone should carry whistles, as they are one of the most effective ways to call for help or alert others. You can blow a whistle longer and louder than you can yell and the sound carries much farther. Whistles should be carried

where they are accessible to your mouth, not in your pocket or pack.

- 3) **Knife.** A good pocket knife can be a handy item to carry. Multitools such as those made by Leatherman are excellent but expensive. A very inexpensive and effective knife is a "Mora" knife, available at most outdoor stores.
- 4) **Flashlight/headlamp.** Hiking in the dark can be a real pain. Also great for signalling at night.
- 5) **Waterproof matches/lighter/fire starter.** You may need to start a fire for any number of reasons (signal fire, to dry out, keep warm).
- 6) **Extra food and water.** Besides your lunch, carry extra food as you may be out later than you planned. Always carry more water than you think you need. On a hot day you will drink it all. (By the time you feel thirsty you are already dehydrated.) Water is also useful for washing off cuts and scrapes.
- 7) **Bad weather clothes.** Always be prepared for bad weather. You can always take clothes off but if you did not bring extra you can be in trouble very quickly.
- 8) **Toilet paper.** Besides the obvious use, it's great for wrapping specimens.
- 9) **Sunscreen, sunglasses, brimmed hat.** Direct sunlight as well as light reflected off rock surfaces can cause severe sunburns.
- 10) **Map, compass, GPS receiver.** You need to know where you are, where you've been and where you are going. Many people become lost by not knowing how to return to their vehicle. Also, you need to be able to locate any significant fossil discoveries and be able to tell others where they are or to find your way back to them. If you do not know how to read a map or use a compass or GPS receiver, take a course.

Other useful items to bring along include: one or two emergency (space) blankets to provide warmth or form part of a shelter; a small tarp to provide shelter; a ski pole or walking stick to provide extra stability when hiking, and a small foam pad to kneel on. □

**Important Field Trip  
Updates—See Page 13!**

# Argentina Revisited

## Patagonia 2002: summary of trip and museum stops

by Vaclav Marsovsky  
(Copyright © 2002)

With some apprehension Mona and I proceeded on a second tour of Argentina in March of 2002. With the recent financial crisis in Argentina and subsequent political unrest we were not sure what to expect. But as with our first visit to the country in 1997, the trip was great, and a good learning experience.

Some of you may recall our write-up in the *Bulletin* [June 1997, September 1997] of our earlier trip and the presentation we made at the APS general meeting. While we covered the northern half of the country on the first trip, this time we covered the southern half. We did not go as far south as the glaciers of the Santa Cruz province however. When I say “covered,” you can’t cover that much in two weeks—just the highlights.

In the 7000 km we put on the Avis rent-a-car, we travelled through more than a hundred checkpoints but fewer were manned this time than in 1997. There were police checkpoints and agricultural checkpoints and other checkpoints in a class by themselves.

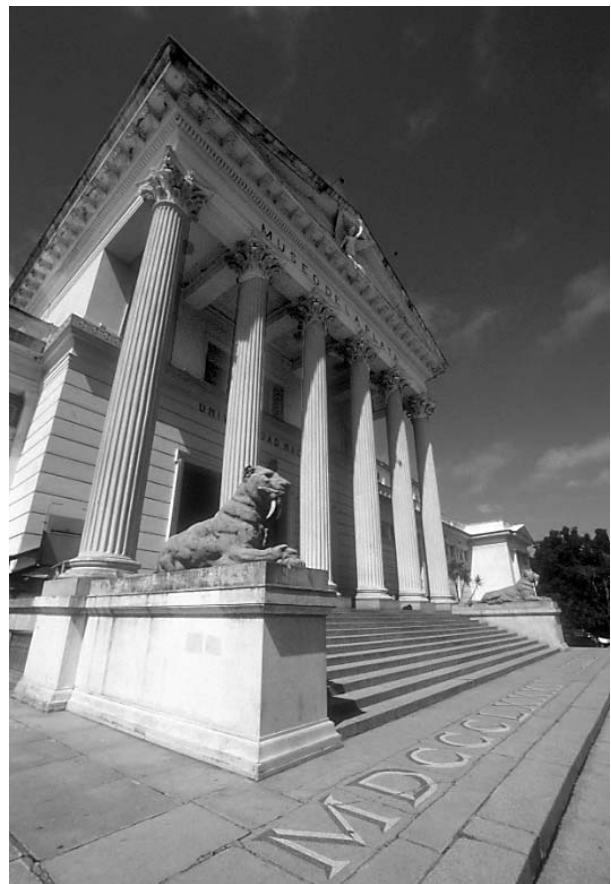
We drove a loop through seven provinces. The three Patagonian provinces we visited were Rio Negro, Chubut and Neuquen.

In Buenos Aires we stopped again at the Museo Argentino de Ciencias Naturales. Most of the displays here have been up for years and could use a facelift. The displays are poorly lit and the problem was compounded by broken light fixtures. Signage is in Spanish only but is generally informative and professionally done except in a few of the older exhibits, where the labels look like they were typed thirty years ago on a manual typewriter—which they probably were.

But there were some new exhibits since 1997 and

other interesting palaeontological exhibits worth mentioning:

- A fleshed out *Giganotosaurus*: a very nicely done life-size sculpture.
- *Ligabuesaurus*, excavated in 1999 near Neuquen. These were the actual fossils on display including series of vertebrae, a hind leg, a foot, shoulder blade and front leg. A sign mentioned that this sauropod has osteoderms, though none were on display.
- An extensive collection of fossil plants, leaf prints from all ages and all parts of the country, such as Jurassic *Araucaria* cones from Santa Cruz province and plants from the Lower Tertiary of Chubut.
- Dinosaur eggs and a dinosaur nest. The four individual sauropod eggs were large, round and crushed and the shell looked very thick—about 4 mm—and just slightly textured. The nest consisted of five eggs about 10 cm in diameter; the shell on these eggs was thinner, about 1–2 mm, and was ornamented. The



**The imposing entrance of the Museo de La Plata, guarded by a pair of sabre-toothed cats.**



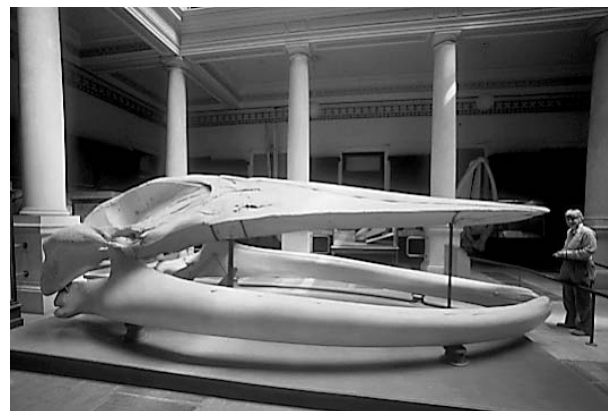
Life-size *Gigantotyrannus* model in the Museo Argentino de Ciencias Naturales, Buenos Aires.

mother of the eggs and location information was not provided.

- Footprints of small therapsids (mammal like reptiles) and footprints of small dinosaurs.
- A new gallery for the glyptodonts such as *Panochthus*, 10 Ma old, Buenos Aires province. These are animals like an armadillo but larger, with the body completely protected by a solid shell. The head is short and deep (bulldog-faced). The top of the head has a carapace made up of fused scutes. All had an armored tail of some kind; some had banded rings, some had an armored sheath and some had spikes on the end. Glyptodonts were common on the Argentinean pampas during the Pleistocene. Glyptodonts are named for their teeth which are fluted, as if they were carved, and are very distinct.
- South America's ungulates (the notoungulates) including *Toxodon*, 10 Ma old, which lived only in South America and which went extinct when mammals from North America invaded. This animal looks like a modern hippo with large incisors.
- The ground sloths, *Glossotherium* and *Scelidotherium*. These are sloths that lived 10 Ma ago in South America and were about the size of a rhino. Ground sloths did migrate to North America.

La Plata is a historical city just beyond the southern suburbs of Buenos Aires. La Plata has a large natural history museum associated with the university. The Museum of La Plata University is a must-see for anyone interested in natural history. It is the largest museum in Argentina.

The entrance to the building is guarded by two larger-than-life statues of sabre-toothed cats. The museum is known for its large number of skeletons of extant animals from all areas of the globe, fabulous displays of extinct Tertiary mammal faunas and South American mummies. The whale exhibit is extensive, with several complete skeletons hanging from the ceiling.



The enormous skull of a modern blue whale, in the Museo de La Plata.

The palaeontological exhibits are displayed chronologically, as in most museums, starting with the oldest at the entrance. The lighting is acceptable for photography, which is allowed for a nominal fee.

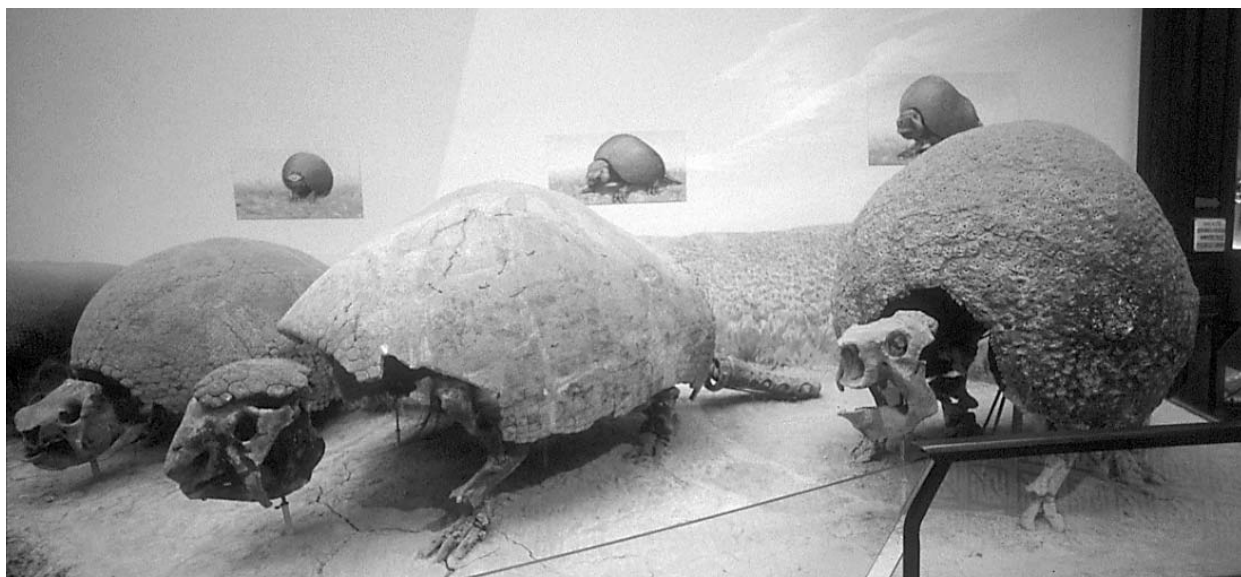
I found these of interest:

- Type specimen of the Triassic amphibian *Pelorocephalus mendozensis*, about 3 m long, from the Mendoza province. This is an animal like a *Metoposaurus*.
- Type specimen of *Massetognathus pascuali*, including the skull and part of the post-cranial skeleton. This was a mammal like reptile (or “reptile-like mammal” as is becoming more accepted) and a herbivore. The skull is about 10 cm long with simple, cylindrical teeth. It was found in the Talampaya Canyon country in the San Juan province and is Triassic.

imen has undergone an extensive gluing job. Obviously someone spent many hours gluing this specimen together. *Genyodectes* is an obscure dinosaur named from fragmentary fossils and is classified in dinosaur books as “dubious.”

- Two dorsal vertebrae of *Amygdalodon patagonicus*, a Jurassic sauropod from Patagonia. This genus is also classified as “dubious.”

After the Mesozoic gallery, a person enters the Cenozoic gallery. This gallery is dominated by the Miocene, Pliocene and Pleistocene fauna of Argentina. There are several skeletons of *Toxodon*, *Megatherium* (giant ground sloth) and an army of glyptodonts. Murals on the walls depict Paleo-Indians wiping out the poor glyptodonts.



Glyptodonts, 10–8 Ma (Miocene), Museo de La Plata.

- Casts of dinosaurs from the northern hemisphere, namely *Iguanodon* from Europe and *Diplodocus* from the Carnegie Museum.
- The sauropod *Nequenosaurus*, which is similar to *Titanosaurus australis*. This mount is a reconstruction of real fossil bone from three individuals. Because the individuals were comparable in size and the light brown fossil bone of all three is the same colour, it is impossible to tell that this is a composite. For sauropods this genus was relatively small, only about 1.8 m tall at the hips.
- A maxilla and dentary labelled as *Genyodectes serus*, an *Albertosaurus*-size theropod, also from the Cretaceous of Patagonia. This spec-

This museum actually has a lighter side to it. One must visit the museum’s cafeteria. Not for the food, which is nothing to write about, but rather for a large mural depicting a bar scene. The scene has dinosaurs at a “western” bar. Obviously someone had fun with this. The bartender is a *Protoceratops*. He is serving a *T. rex* at the bar who is armed with a big knife. A *Plateosaurus* is playing cards across a small round table from a *Parasaurolophus*, who has a revolver in a holster. The *Parasaurolophus* is reclining his chair back, and keeping himself from falling backwards by propping himself up with his tail. Two iguanodonts are dancing the tango (after all, this *is* Argentina!). Nearby, a *Pterodactylus* is perched on a stand like a parrot.



While visiting the La Plata museum, be sure to see the mural.

From Buenos Aires we drove south to Trelew in the Chubut province. Trelew, a city of just under 100,000 contains South America's largest and most modern dinosaur museum (in terms of displays and exhibits). The museum is named after Dr. Egidio Feruglio. He was a geologist who explored the Chubut province in the 1920s to 1940s. The displays are almost exclusively of South America's fossils, set out chronologically in a series of four galleries. Due to the recent economic crisis the museum was cutting power for part of the day to reduce costs. During these times the gallery is totally dark. Displays are a mixture of real fossils and casts, both open mounts and panel mounts. Displays are well lit and well identified in Spanish and English, providing the name of the animal, its full taxonomic classification, its age, formation and locality.

One first enters the Pliocene-Pleistocene gallery which includes *Homo sapiens* and several skeletons of animals such as *Smilodon* (sabre-toothed cat), *Megatherium* (giant ground sloth) and *Hippidion*, a Late Pliocene horse.

The second gallery covers the Tertiary Period. This gallery includes the Cetacea (whales) such as *Misticeto* (Miocene, Rio Negro province), some bivalves and other molluscs, and notoungulates such as *Toxodon* and *Periphragnis*.

The third gallery is the dinosaur gallery. Here are casts of *Amargasaurus* (130 Ma), *Carnotaurus* (85 Ma), *Epachosaurus* (a sauropod, 95 Ma), *Piatnitzkysaurus* (South American Jurassic theropod, 165 Ma), *Titanosaurus* (70 Ma) and *Gasparinisaura* (90 Ma). Sorry, but to see the originals you will have to go to Buenos Aires.

In this same gallery, the real fossils on display included the shoulder blade of a Jurassic sauropod, *Tehuelchesaurus benitezzi* (160–170 Ma). This animal was found in 1995 in the Canadon Afalto Formation at Cerro Condor (which means Condor hill), about 400 km west of Trelew. It took two years to get it out of the ground; the animal was described and named in 1999. The skeleton was found mostly articulated and the animal resembles *Brachiosaurus*. Apparently the excavation left a hole the size of a swimming pool. This must have been a huge amount of work. The teeth of this sauropod are chisel shaped.

Other displays in this gallery include a nest of titanosaur eggs (70 Ma) that look like they could be real; *Notosuchus*, a crocodile (80 Ma) and a therapsid



**Excellently preserved oysters are abundant in the Miocene rocks near Península Valdés, north of Trelew, in southeastern Argentina.**

called *Dinodontosaurio* (225 Ma).

The fourth gallery is the Palaeozoic gallery. There are two separate glass floors over which the public can walk—similar to the Burgess Shale gallery at the Royal Tyrrell Museum. Both glass floors display models and fossils of the ancient sea life. This gallery contains Palaeozoic plant fossils such as the lycophytes from the lower Permian (290 Ma) and *Limnoscelis* sp.

The path then takes you upstairs where you get an excellent overview of the dinosaur gallery. From there you walk through the unfinished extinct whale gallery, currently under construction, and lastly beside the lab where you can look through a window into the lab and see technicians at work preparing fossils. The prep lab, which is about 93 square metres in size (1000 square feet) was dominated by a series of dorsal vertebrae of *Tehuelchesaurus* which were being removed from the hard rock with air-scribes.

While we were in the museum we were fortunate to arrange a visit with Dr. Oliver Rauhut who took us for a behind-the-scenes tour of the prep lab and col-

lections. We got a chance to see only the second medium-sized Jurassic theropod from South America (the first is *Piatnitzkysaurus*), which has yet to be named. Dr. Rauhut found part of the post-cranial skeleton of this new theropod and is working on the description. The quarry it came from contains at least two individuals of different size, perhaps a juvenile and an adult. The animal is thought to be smaller than *Allosaurus*.

We also saw the large bones of yet another unnamed and yet-to-be-studied theropod, this one from the Lower Cretaceous of Chubut province, which has extensive exposures. Until the discovery of this spectacular specimen, the Lower Cretaceous had been barren, yielding no fossils. This animal will be the size of *T. rex* but is thought to be a carcharodontosaurid (large theropods from Gondwana). The femur we saw was close to 1.2 m long and the lower jaw with one original tooth still attached (the rest missing or broken off) was comparable in size to *Giganotosaurus*. It is encased in bright red rock. By the large number of plaster jackets, it looks like a great deal of the skeleton was found. A palaeontologist has yet to be assigned to study it.

Many of the Jurassic fossils come from the area of Cerro Condor in the western part of Chubut province near the banks of the Chubut River. The fossils from the *north* Cerro Condor area, where the *Tehuelchesaurus* sauropod came from, are black in colour and are thought to be equivalent to the Morrison Formation of the United States. The fossils from the *south* Cerro Condor area, where the new Jurassic theropod was found, are instead grey in colour and are thought to be a little older.

In the past all the material collected in the Chubut province got carted off to Buenos Aires. Now the Trelew museum is the depository for the Chubut fossils and it is expected that the collection will grow quickly. Most available floor and rack space is dominated by jackets of the *Tehuelchesaurus* and the unnamed Cretaceous theropod. In the prepared collections we were able to see several bones and a skin impression of *Chubutisaurus* (a large Cretaceous sauropod) and Jurassic fish from the lake deposits near Cerro Condor. (Later, driving along the Chubut River, we saw the extensive beds of these deposits of a lake which persisted for a long time).

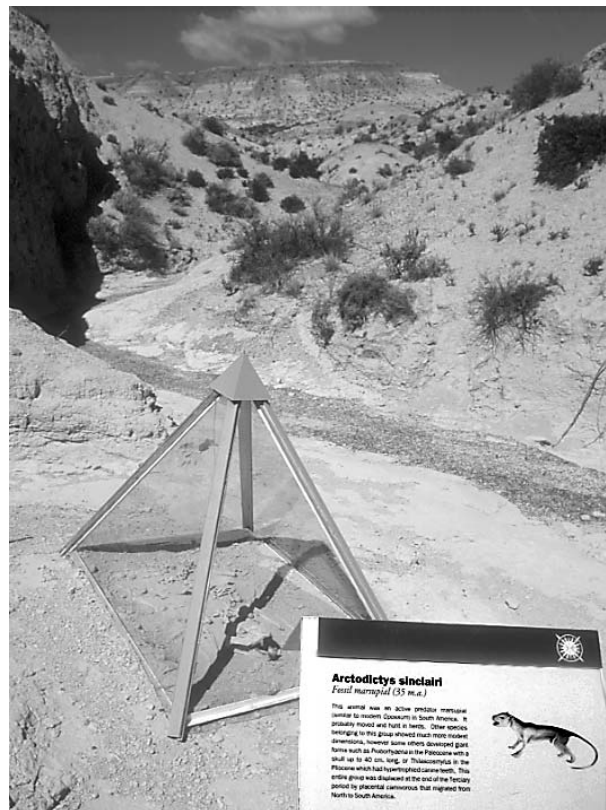
While at the museum we also spoke with the Director, Dr. Nesto Ruben Cuneo, who told us about the plans to expand the museum and the progress they have made toward organizing palaeo-tours to the

Chubut province.

About 10 km west of Trelew is a palaeontological preserve known as Bryn-Gwyn. This is an extensive set of tan-coloured badlands that yield Tertiary fossils of whales, penguins, seals and oyster shells from the marine environment, and toothless edentates and marsupials from the terrestrial environment.

There is a well-marked trail with exhibits. The exhibits are set up under glass pyramids for the benefit of the visitor and are mainly copies of original fossils. Mysteriously, the *in situ* fossil displays have concrete platforms underneath them. You walk through strata beginning with the oldest at the visitor's centre at the bottom of the cliff and walk up to the youngest, at the top of the cliff, about 330 m higher. The whole trip takes about two hours. Admission to the palaeo-preserve is 4 Pesos per person.

About 400 km west of Trelew we made a side trip to the village of Cerro Condor. This is a sleepy little place consisting of a schoolhouse and a few small private dwellings. The village has a few trees, in contrast



**Badlands of the Bryn-Gwyn palaeontological preserve, near Trelew, where casts of Tertiary vertebrate fossils are displayed under glass pyramids; descriptive signs are printed in both Spanish and English.**

to the surrounding hills which are barren of vegetation. We spent a couple of hours in the area but did not find even a scrap of bone. The wind was so strong that you could hardly stand up—apparently this is normal.

A further 200 km west of Cerro Condor we entered the Andes. At this latitude (around 43 degrees south) the Andes are short, reaching a mere 2300 metres in elevation, and are very wet. In the fall it rains for three



**The village of Cerro Condor on the Chubut River, southwestern Patagonia. Cliffs in the background are Jurassic rocks that have produced fossils of the sauropod dinosaur *Tehuelchesaurus*.**

months straight, with snow at higher elevations. We were there in March and the weather was being its typical self: steady rain with snow obscuring the tops of the mountains.

Because the mountains receive so much rain, the forests are lush. The forest canopy is dominated by the “southern beech,” (*Nothofagus*), a broadleaf tree; the Patagonian cypress (*Fitzroya cupressoides*) and the Chilean incense cedar (*Austrocedrus chilensis*). The southern beech and the cypress grow to gigantic proportions due to the wet climate, with trunks reaching several metres in diameter. There is a boat excursion to see a granddaddy of one of the cypress trees. We did not see the largest of these big trees (it was inaccessible due to all the rain). The forest understory is dominated by bamboo (*Chusquea*), which makes the forest impenetrable without a hiking trail.

From there we went north and the rain stopped. Near 40 degrees latitude the Andes start to take on a different appearance. The mountains are taller, the forests are thinner and you begin to see *Araucaria araucana* trees, also known as the monkey puzzle tree.

These relics from the Triassic and Jurassic occur naturally only in the southern hemisphere. We visited one such forest of these trees at the foot of Volcán Lanin. Stands of these trees are rarely pure—they are

usually mixed with smaller deciduous trees. The *Araucaria araucana* get as big as their Australian cousins (*Araucaria bidwillii*; see *Bulletin*, June 1999, p. 6) with some trunks approaching a diameter of two metres.

Further north we stopped at the Museo Municipal Carmen Funes museum in Plaza Huincul, Neuquen province. It was a lucky coincidence that Dr. Rodolfo Coria was in—we were expecting that he would be in the field.

A new exhibit on display at the museum is a copy in a panel mount of *Aucasaurus garridoi*, a large Cretaceous theropod found near the famous egg site. This is an animal about the size of an adult *Albertosaurus*. One side of the articulated skeleton is prepared. It includes complete feet, but the skull is a bit crushed. The actual specimen is in another building right now, but once the museum is expanded, the specimen will be brought over. The museum has a complete skeleton of *Giganotosaurus*—a copy—and the remains (mainly vertebrae) of *Argentinosaurus*, the largest sauropod ever found, by mass. Dr. Coria kindly showed us the collection of the four-year-long venture at the monospecific theropod bonebed worked by the Canada-Argentina expedition.



**“Monkey puzzle” trees (*Araucaria araucana*), near Volcán Lanin, western Patagonia.**



Patagonia offers many spectacular vistas: Volcán Lanin and *Araucaria* trees, western Chubut province.

Near Plaza Huincul and Zapala we checked out the badlands where *Amargasaurus*, *Megaraptor* and *Patagonykus* were found. These badlands are banded in yellow, red and burgundy hues. It reminded us of the Morrison Formation of western United States and the Cloverly Formation of southern Montana.

Argentina has a lot to offer to the palaeo-enthusiast. We hope to return in the future. □

## Reviews

### **The Bone Museum: Travels in the Lost Worlds of Dinosaurs and Birds**

by Wayne Grady, 2000. Penguin Group, ISBN 0-670-88542-8, hard cover, 291 pages, \$32.99.

Having enjoyed Grady's earlier book, *The Dinosaur Project*, which covered the expeditions of the Canada–China Dinosaur Project, I was looking forward to receiving the same experience from this book. I am

sorry to say I was sadly disappointed.

The focus of the book is to document one of the four dig seasons of the Canada–Argentina Project. The fossil quarry site is located near the community of Plaza Huincul in the Neuquen province of Argentina. Some of you may have followed this venture by viewing the updates on the Royal Tyrrell Museum of Palaeontology website.

The book was a quick and easy read, not technical. I missed having general maps and photographs to refer to. These were an important part of the first book. There was no development at the beginning to “set the scene.” It would have been nice to develop some background to these expeditions. Dr. Philip Currie doesn't just go to Patagonia to dig up dinosaurs. I think there is a story to be told here.

The book is broken into three parts. The first part (53 pages) is a general discussion on palaeontology and nothing to do with the dig in Patagonia. There is a review of the work and ideas of Darwin, Huxley, Dollo and Conan Doyle. The author bounces around from one idea to another. (There is even a reference to the *APS Bulletin* on Page 10.) At the end of this section, I was left wondering, “what did I just read?”

The second section is the best part of the book. This includes a diary approach to the days out in the field in Patagonia. There is good character development and the reader gets a good sense of the people at the site and the conditions. This is where I missed photographs the most. Perhaps a deal could have been worked out with RTMP to download a few of their pictures from the website into the book.

I would have liked to hear more about what Drs. Coria and Currie thought about what they were finding. I would have liked to hear about the paleoenvironment from Dr. Johnston. I think I received more information from Dr. Coria about the bonebed and its taphonomy in a 3-minute dialog during our recent visit to Plaza Huincul than from this book. Part 2 takes the reader up to Page 177. There is no closure to say where we go from here—will this expedition go on forever or is there a goal to be achieved, and are the scientists getting close?

Part 3, which takes us to the end of the book, covers the travels of Wayne Grady from Ontario west to Alberta. A great deal of time is spent on things that have nothing to do with palaeontology or science, such as turning around a broken-down VW bus in the middle of the Trans Canada highway somewhere in the Canadian Shield. After that the writer makes stops in Eastend Saskatchewan and then Dry Island Buffalo Jump and Dinosaur Provincial Park. The author spends a few weeks digging and prospecting with the curators from the RTMP, including Dr. Currie and Dr. Brinkman. There is nothing to tie Part 2 to Part 3 other than the fact that the author had been to both places.

My recommendation would be to borrow this book rather than spending the \$32.99 to buy it. After being read, it is likely to sit on your library shelf for years, never to be opened again.

– Vaclav Marsovsky

### **The Mammals that Conquered the Seas**

by Kate Wong, *Scientific American*, May 2002, p. 70–79.

To understand this article a background of mammal classification, bone nomenclature, distribution of continents and seas through geological time and an ability to follow cladistic analyses would be helpful.

The order of mammals that comprises living whales, dolphins, porpoises and their extinct ancestors the archaeocetes is Cetacea. Living members fall into two suborders: (a) the odontocetes or toothed whales,

including sperm whales, belugas and all dolphins and porpoises and (b) the mysticetes or baleen whales, including blue and fin whales.

Another order is the Artiodactyla which contains even-toed hoofed mammals such as camels, cows, hippos and—it now appears—whales.

In 1851 Herman Melville in *Moby Dick* referred to whales as fishes. Charles Darwin grouped whales with mammals. Over the last twenty years palaeontologists have uncovered a wealth of whale fossils spanning the Eocene Epoch, 55 million to 34 million years ago, when archaic whales made their transition from land to sea. Fossil material from the Oligocene Epoch plus DNA analyses from living animals has enabled scientists to present a detailed picture of when, where and how whales evolved, one of the most profound evolutionary metamorphoses on record.

Alan Boyden of Rutgers University and a colleague have shown that whales are most closely related to the even-toed hoofed mammals or artiodactyls. Leigh Van Valen, then at the American Museum of Natural History, discovered striking resemblances between the three-cusped teeth of fossil whales and mesonychid mammals and then on to artiodactyls.

This report contains a chart which shows evolutionary possibilities in order through *Pakicetus*, *Ambulocetus*, *Kutchicetus*, *Rodhocetus*, *Durodon* and *Basilosaurus* over a 20 million year period with a set of associated cladistic diagrams. The ankle bones of fossil whales bear the distinctive characteristics of artiodactyl ankles. Molecular studies indicate that whales are more closely related to hippopotami than to other artiodactyls.

A study of the Tethys seas led Philip Gingerich's team from the University of Michigan to explore sediments in the Himalayan foothills of northern Pakistan, then on to Egypt to find more important fossils. After 1992, Thewissen, of Northern Ohio, found a nearly complete skeleton of *Ambulocetus natans*, the walking and swimming whale.

A series of brilliant skeletal diagrams and explanations with analyses shows evolutionary changes. Also fossil teeth can be analysed to show which animals ingested sea water and which animals ingested fresh water from the occurrence of oxygen isotopes, leading to maps of distribution patterns of whales across our planet past and present. Astragalus (ankle bone) studies are particularly useful.

Not all investigators are convinced. Additional fossils are required that can illuminate the beginnings

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# APS 2002 Field Trips

**For Onefour and Fernie-Sparwood trip details please refer to your March 2002 *Bulletin*, and note the following updates:**

## **Onefour, Alberta June 22 – 23, 2002 (Saturday & Sunday)**

Cost is \$5.00 per membership; you should have signed up by now if you are interested in attending since we will be printing the guidebooks shortly. Please sign-up ASAP if you wish to attend.

## **Fernie-Sparwood, British Columbia July 20 – 21, 2002 (Saturday & Sunday)**

Cost is \$5.00 per membership; you should have signed up by now if you are interested in attending since we will be printing the guidebooks shortly. Please sign-up ASAP if you wish to attend. Mine tour fees will be incurred the day of the trip.

## **August 16, 17 & 18, 2002 Little Rocky Mountains, Zortman, Montana**

### **Day 1: Friday, August 16, 10:00 A.M.**

Meeting Place: Zortman “trailers.” APS past-president Wayne Braunberger will help lead this trip into the Little Rocky Mountains southeast of Havre, Montana (Wayne has explored the Little Rockies on three previous trips). The Little Rockies were formed when intrusive igneous rocks pushed upward into the overlying older sediments. Subsequent erosion has yielded not only exposures of gold-bearing igneous rocks, but Mississippian, Jurassic and Cretaceous-aged formations, containing a variety of marine invertebrate fossils (corals, brachiopods, crinoids, belemnites & ammonites). This unique occurrence, in the middle of the prairies, has served as a training ground for geology students from the University of Saskatchewan. We have decided on a three-day trip (instead of four), where we plan to visit a variety of well-known fossil localities. We may also tour the nearby gold operation (now in reclamation).

### **Driving Conditions**

Zortman is a 7-hour drive from Calgary without delays. However, plan for delays at the border. Road conditions are paved between Calgary and Zortman. A variety of paved, gravel and dirt roads will be used

while in the Zortman area. Car-pooling will be encouraged at Zortman.

### **Accommodations**

APS member June Barrett has volunteered to help arrange accommodations for the trip. June and her husband Geoff have both visited Zortman several times and they recommend the “Zortman trailers” as



they are popularly called. The trailers are actually nice mobile homes which accommodate at least six people each at about \$50 US/night (sure beats camping!) A downpayment will not be required. Participants may also wish to stay in Havre, Montana on the way down to Zortman, to help break-up the long drive. Havre is only 5 hours from Calgary (Zortman is another 2 hours from Havre). A good basic motel in Havre is the Siesta Motel (406) 265-5863 (this booking is optional, and is up to the individual participant to book).

### **Important Information**

Passports are now essential for crossing the US-Canada border (including for children). Parents: if you are crossing the border with your children, but without your spouse, you now need a letter, signed by your spouse, giving permission to travel with your children in his/her absence (this stems from parental abductions). Several border crossings now require this letter. Do not take the border crossing lightly—plan ahead.

### **Cost**

\$5.00 per membership, due, at the latest, by June 30.

A down-payment for group accommodations is not required, but the final list of participants will be made on June 30 in order to book the “trailers.” The APS cannot guarantee the availability of accommodations after June 30, so please sign-up today if you are interested. Mine tour fees are extra, and will be incurred the day of the tour. There is no attendance limit. □

## Questions?

For more information on all field trips, contact Keith Mychaluk, APS Events Coordinator (403) 228-3211, or email: [events@albertapaleo.org](mailto:events@albertapaleo.org)

## Reviews (continued from Page 12)

of artiodactyls and hippos in particular. With the extraordinary advances made over the last twenty years and with continued probing, answers to many of the questions that have been raised will surface from the sands of time.

Further references are provided including a video from the National Geographic Channel.

– Les Adler

**Time Traveler: In Search of Dinosaurs and Ancient Mammals from Montana to Mongolia** by Michael Novacek, 2002. Farrar, Straus & Giroux, ISBN 0-374-27880-6, hard cover, 368 pages, \$41.00.

Michael Novacek is the Curator of Paleontology at the American Museum of Natural History (AMNH), New York. On the dust cover is a beautiful picture of a *Velociraptor* skull collected by the AMNH expeditions to the Gobi during the 1990s and inside is a picture of the author standing in front of the *Protoceratops* skulls collected by the Andrews expeditions to the Gobi in the 1920s.

This is a non-technical book spanning the entire life of the author (approximately 50 years) and his lifelong pursuit of the science of palaeontology.

Michael Novacek takes you on a journey from his time as a youth, growing up in Los Angeles and the trips he made with his buddies to the Mojave desert of California in pursuit of exploration and minerals. One particular trip into an abandoned mine shaft stands out as being particularly dangerous.

This is followed by his high school and university undergraduate days and summer expeditions to the Permian rocks of New Mexico and Colorado to find mammal-like reptiles with trip leader Dr. Peter Vaughn. During his undergraduate days, through his connection with Dr. Vaughn, Novacek landed employment with the Los Angeles County Natural History Museum and their project at the La Brea Tar Pits. There, he obtained great hands-on exposure to the oily and tar covered fossils of the 9,000 to 30,000 year-old mammals.

In the early 1970s, Novacek’s attention focused on the Tertiary (Eocene) mammals as he went through the Masters program as a student of Jason Lillegraven in San Diego. They collected fossils in the San Diego area using the screen washing technique and sorted through thousands of bones and teeth of snakes, fishes, lizards and mammals.

For his Ph.D. program, Novacek entered UC Berkeley. He describes the expeditions he made to Montana and Wyoming with Don Savage, looking at vertebrates in Mesozoic and Cenozoic rocks. Novacek not only describes what they did and the conditions they were working under, but also the significance of what they found.

Throughout the book, the reader is guaranteed to pick up new information on the early evolutionary history of mammals and the relationships between multituberculates (extinct rodents of the Cretaceous), monotremes (e.g. Australia’s platypus), marsupials (e.g. kangaroos) and the placentals.

His Ph.D. program focused on archaic mammals called leptictids, from the Paleocene, which are long-snouted, sharp-toothed insectivores. In his view the leptictids held the key to many questions concerning early radiation of placental mammals.

From there Novacek did a faculty term at San Diego State. He describes the expeditions in Northern Mexico in the El Gallo Formation, looking at Late Cretaceous dinosaurs and Eocene mammals at Occidental Buttes.

In 1983 Novacek left for New York for a distinguished career with the American Museum of Natural History. His research took him to the excruciating heat of Baja California in Northern Mexico in search of Eocene mammals.

He tells how one day a visitor, delayed at New York’s JFK airport, dropped in to the museum with news of what turned out to be whales in mountaintops in Chile. This launched a series of expeditions into the southern part of Chile in pursuit of fossils in remote areas high up in the Andes. On these trips Novacek

was joined by John Flynn, Mark Norell, Andy Wyss and Malcolm McKenna. Vertebrates were not well known from this part of the world. These expeditions were plagued by miserable weather with high winds and snow in January (note: this is midsummer in the southern hemisphere). There is one episode where Novacek sustains a serious injury by falling off of a horse—but the expedition continues on.

Extinct fossil mammals previously known from the flat Argentinean pampas were turning up high in the Andes near the Pacific Ocean. The Andean Paleontological Expeditions gathered momentum though the late 1980s and into the early 1990s. New areas were found further north by looking at rocks from the right age. In these pages, Novacek spends time comparing the fauna of South America with that of North America and discusses first the isolation and then the great—and what could be seen as catastrophic—faunal exchange between the two continents with many forms becoming replaced and extinct.

Concurrently, while North American winters were spent down in South America, the summers were spent in the northern hemisphere, in Yemen on the Arabian Peninsula. Novacek writes about the travels through dangerous areas controlled by the militia, run-ins with many “bad men” and intimidation. Unfortunately these expeditions were a failure in terms of finding fossils.

In 1991, after Mongolia was released from the grip of Soviet control, the Mongolians extended an invitation to the AMNH to come and visit their country and the Flaming Cliffs. The AMNH has a famous historical link with the dinosaurs of the Gobi going back to the 1920s and the Andrews expeditions.

In this chapter Novacek provides an update on the Gobi expeditions that lasted almost the entire decade (and I believe are still ongoing). This chapter picks up from Novacek’s previous book, *Dinosaurs of the Flaming Cliffs*, published in 1996. He goes on to describe in a non-technical manner the shrew-sized Cretaceous mammals, abbreviated as “multi’s” and “delta’s.” The terms refer to multituberculates and deltatheridians. He goes on to tackle the question: “What killed these Cretaceous creatures?”

He talks about the finding of an oviraptorid embryo inside an egg by Mark Norell at Ukhaa Tolgod in 1993, and the finding of 200 dinosaur skeletons, 1000 mammals and 1400 lizards over a period of seven years, making it one of the richest places on Earth for fossils.

The last chapter of the book is a summary of an expedition to the Cerro Condor area of Argentina in

search of Jurassic mammals for the purpose of comparing the evolution of early mammals between the continents.

The book is an excellent overview of expeditions to the far ends of the Earth over the past 40 years in pursuit of an understanding of the history of life on this planet. I highly recommend it.

– Vaclav Marsovsky □

## SILENT TABLE AUCTION

An exciting new fund raising project begins at the September general meeting. A table will contain items up for auction. Members may bid on items before and after the meeting. Bids will be recorded on bids sheets. A bell will ring 5–10 minutes after the close of the meeting to signal the end of bidding. Those with the highest bids will then pay for their items. Rules will be printed on bid sheets. Don't forget to bring some money!

## Design our next T-shirt!

Society artists are invited to enter designs for a new edition of the APS T-shirt. Designs should be suitable for single-colour silkscreen printing, and should include the Society name and an Alberta theme.



Submissions should be photo-ready, on 8.5" x 11" to 11" x 17" paper. Deadline for entries is September 1, 2002, and the winning design will be selected at the September general meeting (Friday, September 20, 2002.)

Contact any member of the Executive (Page 1) to submit an entry, or for more information.