Alberta Palæontological Society Bulletin

VOLUME 30 • NUMBER 1 www.albertapaleo.org MARCH 2015

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 $20.00 annually
Family or Institution $25.00 annually

SOCIETY MAILING ADDRESS:
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THE BULLETIN WILL BE PUBLISHED QUARTERLY: March, June, September and December. Deadline for submissions is the 15th of the month prior to publication. Material for the *Bulletin* should be sent to:

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Requests for missing *Bulletin* issues should be directed to the Editor. Send changes of contact information to the Membership Director.

Upcoming APS Meetings

Meetings take place at 7:30 P.M. in **Room B108**,
Mount Royal University, 4825 Mount Royal Gate SW, Calgary, Alberta.

Friday, April 17, 2015—Arnold Ingelson, Alberta Palaeontological Society.
Where have our Alberta dinosaurs gone? Try New York City! (See Page 5)

Friday, May 8, 2015 (SECOND FRIDAY!)—Angelica Torices, University of Alberta.
The charm of small things: The study of microvertebrate assemblages (See Page 6).

June, July, August, 2015—No meetings. See Field Trips Schedule, Page 7.

Watch the APS website for updates on upcoming programs.

ON THE COVER: The Society's new logo! See story, Page 12.

In Memoriam

It is with deep and genuine sadness that we must report the untimely passing of two friends of the Society and note the passing of a renowned artist.

University of Calgary

Dr. Russell Hall, Associate Professor Emeritus of the University of Calgary was a great teacher and mentor to many of our members. He fell victim to cancer and passed away in Perth, Western Australia, February 12, 2015 at the age of 72.

An invertebrate palaeontologist who specialized in Jurassic and Cretaceous ammonites, he joined the University of Calgary in 1978 and retired to his native Australia in 2004. Dr. Hall presented three talks to the APS, in March 1999 (on ammonites); February 2002 (William Smith and his geological map); and February 2003 (Charles Darwin, geologist). He also presented a poster display (on a Jurassic crinoid) at our 1999 Symposium.

Dr. Hall is survived by his wife, Donna, to whom, along with his many students, friends and colleagues, we offer our sympathy.

The loss of **Kimberley Johnston** is particularly tragic given her youth, her many talents and the potential for a long and productive career in Earth Science that was cut far too short. In a protracted and bravely-fought battle with cancer, she died at home in the company of her devoted husband, **Dr. Paul Johnston** on February 27, 2015, aged 53.

An APS member from 2001 to 2009, Kimberley presented a talk at our 2002 symposium, discussing her research on new Cambrian Burgess Shale-type faunas. She assisted Paul with a workshop at the 2006 symposium and co-presented a talk on Burgess Shale geology at the 2007 symposium. Kimberley served as APS Secretary in 2003–2004 and donated material to the library. Our heartfelt sympathy goes out to Dr. Johnston and to her wide circle of family and friends.

Her obituary is reproduced here in full.

JOHNSTON, Kimberley Joy
June 10, 1961—February 27, 2015

Kimberley Johnston (formerly Motz, née Adkins) passed away quietly at her home, Friday, February 27, 2015, after a courageous struggle with cancer. She is beloved by husband Dr. Paul A. Johnston (Calgary, AB), son William Motz (Vancouver), daughter Katherine Dubé (Waterloo, ON), mother and stepfather Carole and Paul Pizzolante (Burlington, ON), brother Dr. L. John Adkins (Orillia, ON), stepdaughters Meadow Johnston (South Slocan, BC), Sunny Bray (Dartmouth, NS), Brook Atkins (Edmonton, AB), stepson Sky Johnston (Edmonton, AB), and grandchildren Adrian Dubé, Ember and Sylvan Johnston, Trey Atkins, and Juno, Nova and Lily Bray. Born in Hamilton, ON, Kimberley attended Aldershot High School in Burlington. In 1983 she graduated from the University of Waterloo (B.Sc., Biology). A talented singer and actor, Kimberley performed in theatre, opera, television and film projects in Ontario (National Film Board of Canada, Canadian Opera Company, Theatre Laurier inter alia). She was founder of Dead Funny Productions (1989–1993), a Kitchener-based dinner theatre company. In 1993 she moved to Calgary with her children and continued her acting career, hosting the Access TV series *Biologix* and performing as Maria in Front Row Centre's 1997 production of *Sound of Music* (**www.frontrowcentre.ca/show/19971998/TheSoundofMusic/**). In 1997 she was awarded Woman of the Year, Calgary with her gold medal women's cancer patient dragonboat team. She later pursued studies in geology and in 2008 graduated from the University of Calgary (M.Sc., Geology). Thereafter, she worked as a contract research geologist with Statoil, Calgary before winning a scholarship to Imperial College London in 2012 to pursue a Ph.D. (dolomitization in northern Spain). Her talents extended to quilting, knitting, drumming, belly dancing, calligraphy, and scientific editing (*Palaeontographica Canadiana*). Kimberley's warm spirit, keen wit, and creative mind will be celebrated at Eden Brook Memorial Gardens (24223 Township Rd 242, Calgary, AB) at 7 P.M. on June 10, 2015. In lieu of flowers, donations to the Kimberley J. Johnston Memorial Research Fund at Mount Royal University would be welcomed.

Obituary and photo courtesy of Dr. Paul Johnston.

Those who follow the world of palaeo-art should take note of the passing of Czechoslovakian-born artist **Vladimir Krb** in Drumheller, Alberta, January 25, 2015 at the age of 71. Mr. Krb's paintings of ancient animals and their environments are iconic (just Google his name) and include murals on the walls of the Royal Tyrrell Museum and many books. Our condolence to his family, friends and admirers. An obituary can be read at **www.drumhellermail.com/obituaries/obituaries/14842-krb-vladimir**

[*Thanks to Dr. Charles Henderson, Dr. Chris Collom, Wayne Braunberger, Dr. Paul Johnston, Dan Quinsey and Vaclav Marsovsky.*] ❑

2015 Annual General Meeting

By Dan Quinsey

The Alberta Palaeontological Society (APS) Annual General Meeting will be held on May 8, 2015 at 7:30 p.m. in Room B108, Mount Royal University, 425 Mount Royal Gate SW, Calgary, Alberta.

Proposed actions on the Agenda will include the election of Officers and Directors, Bylaw amendments and any other business as may be placed before the Society by the Board. **All eligible voting Members are requested to attend!**

Elections

Any eligible Member (membership dues must be paid in full prior to the May Executive Meeting) may be nominated for any Officer or Director position. The positions open to nominations this year are: President; Vice-President; Treasurer; Secretary; Program Coordinator; and Field Trip Coordinator. The positions of Editor and Membership Director are currently held by **Howard Allen** who is serving the second year of a two-year term making these positions ineligible for nominations. Committee Chairperson positions are appointed by the Board and are not usually discussed during the AGM.

Members are encouraged to review the APS Bylaws regarding voting, elections and the positions of Officers and Directors for more details. Bylaws are available in the *Information Handbook for Members*, at **http://www.albertapaleo.org/guide8.pdf** Members without internet access, who do not already have a printed copy of the Bylaws, may request one by contacting the Membership Director (Page 2). Related Bylaw articles include:

2.2 Voting
5.7 – 5.9 (Nominations, eligibility, term commencement)
6.1 – 6.13 (Officers and Directors)

If you would like to chat about the possibility of serving on the APS Board of Directors, nominate a Member or be nominated for any of the open positions, please contact Past-President **Wayne Braunberger** at (403) 278-5154 or by e-mail: **past-pres@albertapaleo.org**. All inquiries will be held confidential.

Notice of Motions

The following Motions are submitted to the Alberta Palaeontological Society membership for consideration in compliance with Section 4.1 of the Alberta Palaeontological Society Bylaws.

Motion: To amend the first portion of section 4.5 *Quorum,* of the APS Bylaws, Approved and Filed by Alberta Corporate Registries, January 2013, to lower the minimum number of members needed to conduct business from twenty to fifteen at the Annual General Meeting and from fifteen to twelve at a General Meeting.

The issue of quorum deficiency should be solved by lowering our minimum number of Voting Members needed to conduct business. The section would then read:

> *Fifteen percent of the Voting Members or fifteen Voting Members, whichever is smaller, shall constitute a quorum to transact business at any Annual General Meeting or Special Meeting. Ten percent of the Voting Members or twelve Voting Members, whichever is smaller, shall constitute a quorum to transact business at a General Meeting.*

Motion: To amend the third sentence of section 4.5 *Quorum,* of the Alberta Palaeontological Society Bylaws, Approved and Filed by Alberta Corporate Registries, January 2013, to change the wording "…at the same time and place." to "…at a time and place as predetermined by the Board."

Any Annual General Meeting or Special Meeting is adjourned and rescheduled for one week later at the same time and place if quorum is not present within one-half hour after the set time of the meeting. It is prudent to change "…at the same time and place." to "…at a time and place as predetermined by

the Board." This would give the Board more flexibility in rescheduling the second meeting. The sentence in the Bylaws would be changed to read:

> *If a quorum is not present within one-half hour after the set time of any Annual General Meeting or Special Meeting, the President shall adjourn the meeting and reschedule it for one week later at a time and place as predetermined by the Board.*

Motion: To amend the second last sentence of section 4.5 *Quorum* of the Alberta Palaeontological Society Bylaws, Approved and Filed by Alberta Corporate Registries, January 2013, to change the two words "met" to "achieved" in order to maintain consistency throughout the document.

To maintain consistency within the document, the words "met" should be changed to "achieved" in the second-last sentence. The sentence would then read:

> *If the minimum quorum of 5 Voting Members cannot be achieved, the President shall adjourn the meeting and reschedule it for the next scheduled General Meeting at which a minimum quorum of 5 Voting Members can be achieved.*

Related Bylaw Article

4.5 Quorum

Fifteen percent of the Voting Members or twenty Voting Members, whichever is smaller, shall constitute a quorum to transact business at any Annual General Meeting or Special Meeting. Ten percent of the Voting Members or fifteen Voting Members, whichever is smaller, shall constitute a quorum to transact business at a General Meeting. If a quorum is not present within one-half hour after the set time of any Annual General Meeting or Special Meeting, the President shall adjourn the meeting and reschedule it for one week later at the same time and place. The Board shall provide notice of the rescheduled meeting. If a quorum is not present within one-half hour after the set time of the rescheduled Annual General Meeting or Special Meeting, the meeting shall proceed with a minimum quorum of 5 Voting Members. If the minimum quorum of 5 Voting Members cannot be met, the President shall adjourn the meeting and reschedule it for the next scheduled General Meeting at which a minimum quorum of 5 Voting Members can be met. The Board shall provide notice of the rescheduled meeting. ❑

Bulletin back issues are available on the Web

A complete archive of *Bulletin* back issues from 1986 to 2013 is available to download as PDF files.
www.albertapaleo.org/bulletinarchive.htm

Upcoming Events

April

William Arnold Ingelson

Alberta Palaeontological Society

Where have our Alberta dinosaurs gone? Try New York City!

Friday, April 17, 2015 7:30 P.M.
Mount Royal University, Room B108

On two recent trips to New York City, the dinosaur display at the American Museum of Natural History held a special interest. In his presentation, Arnold will share a number of photographs and descriptions of Alberta dinosaurs collected during the first three decades of the 20th century. These original specimens represent a significant number of dinosaurs collected by Barnum Brown and the Sternberg family during the so-called Great Canadian Dinosaur Rush. Methods of displaying these original specimens will also be shared.

Biography

Arnold Ingelson is a native Calgarian and has been involved in searching for fossils and dinosaur bones for the past five decades. As young boys, Arnold and his younger brother Allan were taken on field trips to the badlands by their uncle Bill Downton, one of the founding members of the Calgary Rock and Lapidary Club. This inspired a life-long interest in both palaeontology and landscape painting.

Following high school, Arnold pursued a Bachelor of Education from the University of Calgary, majoring in Secondary Art. Arnold also completed three diplomas in the areas of Speech Arts and Drama from Trinity College of London, England; the Royal Conservatory of Toronto; and Mount Royal College, Calgary. This provided the opportunity to teach Speech Arts for a number of years at Mount Royal Conservatory. He later completed a Masters in Educational Leadership from the University of Portland, Oregon. Arnold taught at both the elementary and secondary levels in a career spanning 34 years with the Calgary Board of Education. He was Principal at

five different schools prior to his retirement in 2012.

Arnold has continued his passion of painting as well as palaeontology during his retirement. He and his wife also have a strong interest in travelling throughout the world. His recent trips to the American Museum of Natural History form the basis for this presentation.

May

Angelica Torices

University of Alberta

The charm of small things: The study of microvertebrate assemblages

Friday, May 8, 2015, 7:30 P.M.
Mount Royal University, Room B108

In popular media like the Jurassic Park movies palaeontologists are portrayed digging complete spectacular skeletons. The reality is that recovering these fossils is not as simple as it looks in the movies. It is rare to find perfect and complete specimens and it requires exceptional preservation conditions.

The ecosystems of the past were not only composed of gigantic animals. Among the giants of the Mesozoic there were also smaller dinosaurs, mammals, lizards, fishes and other vertebrates. Maybe their rests (what is left after part is taken away) are not as spectacular as complete skeletons but they are fundamental because they provide primary data on fossil assemblages where no other material has been found.

The techniques to find these smaller rests are very different from the ones used to dig macrovertebrates. One of the methods used is prospecting the surface of the terrain carefully and picking the fossils that our eyes can locate. The other method, called quarrying, is more intensive and implies the collection of hundreds of kilograms of sediment. This sediment is processed afterwards by screenwashing and the fossils removed manually with the help of stereo microscopes. This work is laborious and hard but the taxonomic assignation of the obtained fragmentary material is very important for palaeoecological and faunal studies.

My studies have focused mainly in the microvertebrate part of the dinosaur sample, especially teeth. Isolated teeth are the most abundant remains of these animals found in all Mesozoic sediments worldwide. In some areas they are the only remains found of these carnivorous dinosaurs and have no relation to skeletal remains attributable to any defined theropod taxon.

In my studies, I use a statistical approach to distinguish Late Cretaceous theropod taxa based on isolated teeth. With this method I have been able to identify six species of toothed theropods in the Southern Pyrenees Basin in Spain at the end of the Cretaceous. The taxa identified include two morphotypes of an indeterminate big theropod, an indeterminate coelurosaurian, cf. *Paronychodon* sp., cf. *Richardoestesia* sp., cf. Dromaeosauridae indet., and cf. *Pyroraptor olympius*. This study exponentially increases the number of theropod taxa known from the South Pyrenees Basin from two previously known taxa to eight species. Moreover, thanks to the establishment of a chronostratigraphical framework and the accurate placement and dating of the different sites it has been possible to assess the evolution of theropod dinosaurs at the end of the Cretaceous. In this case, apparently, theropod diversity in the North of Spain does not experience a significant decline at the end of the Mesozoic.

The same kind of analysis has been used in a recent study in the Danek Bonebed site (Horseshoe Canyon Fm.) to verify if the isolated tyrannosaurid teeth found in the bonebed belonged to *Albertosaurus* and *Daspletosaurus*. The results clearly identify the shed teeth as belonging to *Albertosaurus*.

The study of the wear and microwear patterns in these teeth allowed me to infer indirect evidence of diets and chewing mechanisms, independently of tooth morphologies. The microwear structures showed that the dromaeosaurs and other theropods from South Pyrenees were biting using a "grip and rip" model, removing flesh from bone selectively from larger prey or swallowing small prey whole.

This shows the value of studying microvertebrate assemblages, especially isolated teeth to reconstruct the composition of dinosaur palaeofaunas when other more complete material is not present. These studies allow us to complete the diversity of the palaeofaunas and make interpretations about the palaeobiology, palaeogeography and evolution of their diversity through time.

Biography

Angelica Torices is a Postdoctoral Researcher at

the University of Alberta, Edmonton, Canada, under the supervision of **Dr. Philip J. Currie** since 2011. She was born in Madrid, Spain and wanted to become a palaeontologist since she was four years old.

Graduating in Geology with a specialization in palaeontology at the University Complutense of Madrid, she earned her M.Sc. in 2002 at the same school and a Ph.D. in palaeontology in 2007. The research focus of her Ph.D. was "Theropod dinosaurs from the Upper Cretaceous of the South Pyrenees Basin".

As a researcher she focuses on the study of Upper Cretaceous theropod dinosaurs from North America and their comparison with European faunas, the palaeobiogeographic origin of the European theropod faunas and the evolution of the diversity of these dinosaurs in the Cretaceous. Her current research has triggered a palaeoenvironmental and palaeoecological study of the dinosaur fauna from the Horseshoe Canyon and Dinosaur Park formations through isotope analysis. She has been involved in several scientific projects studying palaeoclimate and palaeoenvironmental factors in critical periods, with special emphasis on the K/T boundary and has published twenty-six peer reviewed papers and forty-four peer reviewed abstracts in national and international conferences. ❑

Two New Open Access Journals

The Open Access movement in science literature is making steady advances, as shown by the appearance of two new scientific journals hosting articles in palaeontology.

Frontiers in Earth Science is a Swiss-based online journal that is part of a larger group publishing in all fields of science (**www.frontiersin.org**). Being a new journal, the palaeo offerings are a little thin (three articles published to date), but its Paleontology Chief Editor is a heavy-hitter, **Dr. Robert Reisz**, of the University of Toronto and it definitely merits bookmarking: **www.frontiersin.org/Paleontology**.

Vertebrate Anatomy Morphology Palaeontology is based right here in Alberta, at the U of A. As the title suggests, it deals strictly with vertebrates (only two articles so far) but promises to be a valuable resource. **http://ejournals.library.ualberta.ca/index.php/VAMP/** ❑

2015 Field Trips

By Wayne Braunberger

Planning is underway for this year's trips. For more information please contact **Wayne Braunberger** at (403) 278-5154 or by email at **fieldtrips@albertapaleo.org**. The field trip registration form is included with this issue of the *Bulletin* and is also available on the APS website, **www.albertapaleo.org/fieldtrips.html**. Information will also be available at the monthly meetings.

Please note that all fees are due at the time of registration. Fees for trips are $10.00. This is to cover increased costs as guides will be featuring more colour photographs and diagrams. Unfortunately guides are only produced in small numbers and volume discounts are not available.

Non-members and unaccompanied minors will not be allowed to attend field trips. **All participants are required to have their membership in good standing. Any membership applications received after April 29, 2015 will not be reviewed and voted on by the Board of Directors until September, 2015. Therefore, if you are a non-member and would like to join be sure your application is received prior to April 29, 2015.** All participants will be required to read and sign a release form (waiver). Detailed information will be provided to all those registered shortly after the registration deadline. **After the registration deadline no refunds will be given; however, you will receive the guide for the trip. No late registrations will be accepted.** Registrations are accepted on a first-come-first-served basis. Sign up early to avoid disappointment.

For the 2015 field trips I will be sending you the waiver and medical forms along with the trip information. This information will be sent to you via e-mail or Canada Post. Please ensure that your address is correct and legible when sending in registration forms. When you arrive at the meeting place please have the forms completed. **All participants are required to have fully completed all waiver and medical forms in order to attend the trip. There will be no exceptions**. All personal information is held in confidence and ultimately destroyed.

Field Trip Participant Responsibilities

It is understood that risk is inherent to some degree in outdoor activities. Before registering for a trip please ensure you understand the risks involved and are prepared to accept them.

- As a participant you are responsible for your own safety and equipment at all times.
- Inform the trip leader of any medical conditions they should be aware of in an emergency.
- Ensure that your previous experience, ability and fitness level are adequate for the trip.

Trip 2015-1, May 9 – 10, 2015
Edmonton Alberta

We'll visit the Danek dinosaur bonebed (located within the Edmonton city limits) on Saturday, May 9, under the guidance of **Dr. Philip Currie** and **Dr. Eva Koppelhus** of the University of Alberta (U of A). Depending on the weather, we will be helping the University excavate fossils from the bonebed and prospecting nearby. All fossils will remain at the University: private collecting is not allowed.

Sunday morning we'll tour the U of A fossil preparation lab and Palaeontology Museum. On Sunday afternoon **Dr. Chris Jass** will give us a backroom tour of the Royal Alberta Museum.

Due to space limits, **this trip is restricted to 20 participants**, so register early to ensure your place.

Registration deadline is April 24, 2015.

Trip 2015-2, June 20 – 21, 2015
Eastend Saskatchewan

The Eastend area has localities ranging in age from early Maastrichtian to Pleistocene, is near the site where Canada's most complete *T. rex* ("Scotty") was found, has one of the finest (and fossiliferous!) exposures of the K/Pg Boundary in Canada, and has been a haven for Cenozoic mammal palaeontologists for decades. The valley around Eastend ("Valley of the Hidden Secrets") also has a rich archaeological record. Accommodation would be available at the Riverside Motel, the Cypress Hotel and in the town campsite. The *T. rex* Centre and the golf course will also be open.

A guide book for the trip will be provided and possibly a lecture in the *T. rex* Centre auditorium on Saturday evening. **Dr. Emily Bamforth** and **Tim Tokaryk** of the Royal Saskatchewan Museum will be our hosts for the weekend.

Registration deadline is June 5, 2015.

Trip 2015-3, July 18 – 19, 2015
Grassi Lakes Alberta

One of the classic geological/palaeontological field trips in the Rocky Mountains, a trip to Grassi Lakes above the town of Canmore is not to be missed. This trip will introduce participants to the fascinating world of Devonian reefs and the organisms that built and inhabited them.

We will visit Grassi Lakes on Saturday and if there is interest we will visit Jura Creek on Sunday (if accessible). Jura Creek is another of the classic field trips in the Rockies. At this site the type section of the Exshaw Formation is exposed as well as the contact with the underlying Devonian Palliser Formation. This trip will also allow participants to explore the overlying Carboniferous formations.

Registration deadline is July 3, 2015.

Trip 2015-4, August 15 – 16, 2015
Waterton Dam Alberta

On this trip we will return to the Cretaceous and examine the St. Mary River and Blood Reserve formations and their fossils. If access can be arranged, Sunday will include a trip to the Hillspring oyster quarry. If the oyster quarry is not accessible, other sites in the area will be visited.

Registration deadline is July 31, 2015. ❑

Exchange Newsletters

We have reciprocal arrangements with a few other Earth science clubs and societies for exchanging newsletters. Most of these are now available in electronic (PDF) form and we encourage members to check them out.

Paleontological Society of Austin (PSoA), Austin, TX: *Paleo Footnotes*. Monthly. Open Access, available from **www.austinpaleo.org/newsletter.html**

British Columbia Paleontological Alliance (BCPA): *Newsletter*. Three issues per year. Paper copies only, available in the APS library.

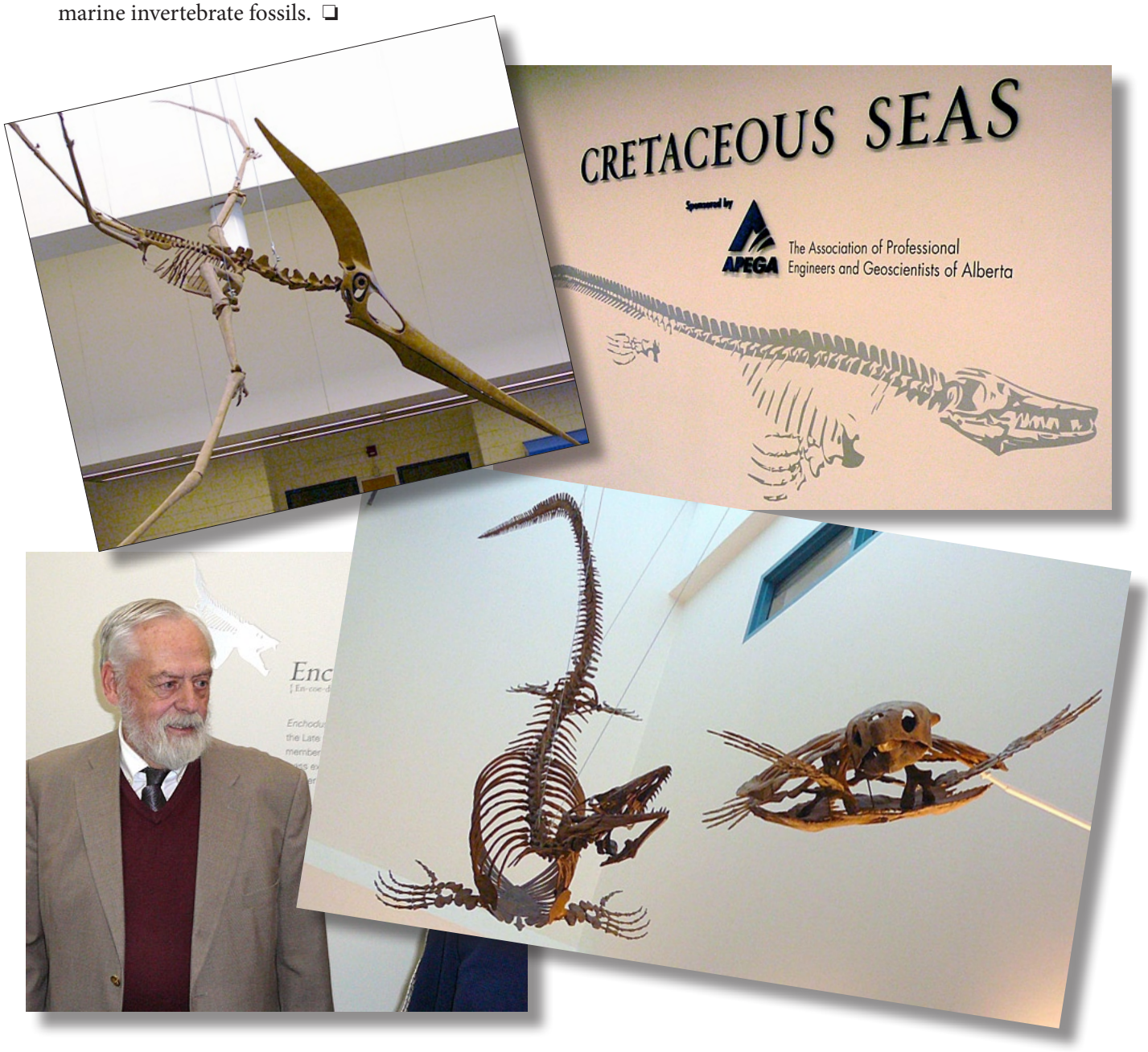
Calgary Rock and Lapidary Club (CRLC): *Calgary Lapidary Journal*. Monthly. Open Access, available from **www.crlc.ca/crlcnews.htm** (for archive, click "Documents" / "Journal" / "Historical").

Western Interior Paleontological Society (WIPS), Denver, CO: *Trilobite Tales*. Monthly. Restricted Access: to obtain a PDF copy, contact the APS editor (see Page 2). ❑

Cretaceous Seas exhibit launched at Mount Royal University

Photos by Harold Whittaker

The Grand Opening of the Mount Royal College Cretaceous Seas exhibit went ahead January 8, 2015, showcasing life-size model skeletons of some of the vertebrate fauna that swam in and flew over the Late Cretaceous Western Interior Seaway. We are pleased to see the project, which was supported in part by a donation from the Alberta Palaeontological Society (see *Bulletin*, March 2013, p. 3 and Sept. 2013, p. 11) come to fruition in such a spectacular fashion. Congratulations and thanks to **Dr. Wayne Haglund** (pictured) for his vision and hard work in seeing the project through! The display is a permanent fixture and can be viewed in the lower level of the University inside the East Gate entrance. Dr. Haglund hopes to expand the exhibit with displays of marine invertebrate fossils. ❑



Four Fossils

By Howard Allen, APS Collection Curator

Since last issue's *Four Fossils* item went over fairly well, I've decided to continue it as a regular feature. Once again I've randomly selected four specimens from the APS collection to showcase. The scale bar is 1 cm long in all photos except APS.1990.20, in which it's 5 cm long.

APS.2008.07

Donations over the years have included specimens from a whole range of geological ages and geography. These four small shells are a good example. Their age is Holocene ("Recent"), so their status as "real fossils" is debatable. And they came from the other side of the world—a beach at the port city of Aden, Yemen, on the Arabian Sea. The donor of these specimens was **Mike Clark**, of Mount Royal University, a longtime Friend of the Society.

The circumstances of their collection is not known, but it's probable that they came from a third party. A hand-written label enclosed with the specimens identified the little clams as: "Mactra lilacina Lamorcic". This was an apparent phonetic misspelling of *Mactra lilacea* Lamarck, a species uncovered by an internet search. Online images tend to cast doubt on the identification, however; other than the lilac-coloured (hence *lilacea*) interior, these shells do not agree particularly well with photos of *M. lilacea*, which has a slightly different outline and typically displays radiating colour bands on the outer surface. A more likely candidate, in terms of form, size and colour would seem to be *Mactra olorina* Philippi, 1846, which according to some sources occurs in the same area (*e.g.* **www.marinespecies.org/**).

APS.1992.18

Another dinosaur bone fragment in the collection would appear at first glance to be an unidentifiable scrap. But a better look with an experienced eye resolves this specimen into a fragment of the outer rim of a horned dinosaur's neck frill.

Most of the Dinosaur Park Formation ceratopsians sport a row of knobs along the rim of the frill, called epoccipitals. In *Styracosaurus* they were developed to an extreme degree into the spectacular, pointed spines that make the dinosaur instantly recognizable to every 6-year-old. Several other horned dinosaur

***Centrosaurus* skull**, AMNH 5427 (cast, Museum of Victoria, Melbourne). An epoccipital is circled. Public Domain photo by Sainterx, from Wikipedia. Scale = huge.

genera, such as *Centrosaurus*, figured here, had much more modest epoccipitals: the APS specimen is an example. We have member **Don Sabo** to thank for this specimen from southern Alberta.

APS.1995.02

Perenially popular items for sale at rock-and-gem shows are shark teeth, inevitably from Morocco, which probably supplies more fossils to the retail market than all other countries combined.

In 1995 Life Member and former Curator **Harvey Negrich** purchased a box full of Late Cretaceous shark, ray and other marine vertebrate fossils at the CRLC's annual show and generously donated the contents to the APS collection. Included was this specimen, identified as "Corax pristodontus". The tooth is very distinctive, with its almost ridiculously oversized bony root and relatively tiny blade. A quick online search leads to the conclusion that this specimen has probably been misidentified.

The shark genus name "Corax" was changed to *Squalicorax* (Whitley, 1939, p. 240) supposedly because the name Corax was already in use for ravens (the birds) when Agassiz applied it in 1843 to shark teeth. In any case, *Squalicorax pristodontus* teeth bear little resemblance to this specimen. They have wider blades with no lateral cusps and are well serrated; this specimen has definite lateral cusps and no serrations at all, even under the microscope. *Squalicorax pristodontus* may have gained the dubious honour of becoming a "trashcan species": a popular name applied to anything shark-like that can't be identified. What type of shark this specimen really belonged to will have to remain a mystery for now.

APS.1990.20

This decidedly unspectacular specimen (scale bar = 5 cm) represents a spectacular series of deposits found in scattered localities through central British Columbia and northern Washington state. The Driftwood Creek locality, east of Smithers, BC, is the northernmost of the so-called "Okanagan Highlands Eocene" fossil sites. Another is McAbee, near Cache Creek, well-known to many APS members.

The Okanagan Highland sites, besides being all Eocene in age, are all fine-grained, light-coloured lake deposits with exquisitely-preserved plant, insect, and vertebrate (fish, bird, mammal) fossils. These beds qualify as *lagerstätten*, a German term for rare fossil sites that preserve soft-parts of often highly diverse fauna and flora (Archibald *et al.*, 2011).

The Driftwood Creek site has been protected from collecting in Driftwood Canyon Provincial Park since 1967. Our specimen is one of nine donated by former APS member **Jill Fryling**. The catalogue records that the specimens were from "Driftwood Creek, other side of park; talus slope finds". Apparently there are other fossiliferous exposures outside of the park boundaries. The specimen is described as an "unknown plant seed," to which there's not much I can add. The preservation is typical of the Okanagan Highland sites: dark brown carbon films on siliceous, light coloured shales. The Archibald *et al.* reference is nicely illustrated and recommended reading. ❑

Archibald, S.B., Greenwood, D.R., Smith, R.Y., Mathewes, R.W. and Basinger, J.F. 2011. Great Canadian lagerstätten 1: Early Eocene lagerstätten of the Okanagan Highlands (British Columbia and Washington State). Geoscience Canada, **8**(4): 155–164. Available online at **http://journals.hil.unb.ca/index.php/GC/issue/view/1429**

Whitley, G.P. 1939. Taxonomic notes on sharks and rays. The Australian Zoologist, **9**(3): 227–262. Available online at **www.biodiversitylibrary.org/page/38926861**

Society Members Have Chosen a New Logo!

By Howard Allen

After nearly thirty years, the Alberta Palaeontological Society has a new logo. The eventual choice of members (front cover of this issue) was an updated look that pays homage to the original 1986 logo design.

The logo search commenced two years ago (*Bulletin*, March 2013) with a call for design ideas from the membership. Four new designs were submitted within the first year (*Bulletin*, March 2014) and the search was ongoing until November 2014 (*Bulletin*, September 2014). At that point, a vote was put to the membership by email and paper ballot to make sure all members had an opportunity to vote. To be fair to those who voiced a strong desire to retain the original 1986 logo, that design was included as a fifth choice (it was actually included as "Design 1").

The voting deadline was the January 16, 2015 general meeting, where any members in attendance who had not already voted were given a final opportunity to cast their ballot.

When ballot counting was done, "Design 5" was declared the winner. The voting went like this:

Eligible voters: 163
Votes cast: 68 (41.7% of eligible voters)
Design 1 . . . . . 17 votes (25% of votes cast)
Design 2 . . . . . 10 votes (15%)
Design 3 . . . . . 5 votes (7%)
Design 4 . . . . . 8 votes (12%)
Design 5 . . . . . 28 votes (41%)

A motion to adopt the new logo was passed at the February 11, 2015 Executive meeting and the Logo Committee was officially dissolved.

Our new logo will go into use gradually, as new promotional and printed material is generated. Its first significant appearance will be on the exciting new T-shirt design, to be unveiled—and available for sale—at our annual symposium, Paleo 2015, March 21 of this year!

Thanks to those who submitted and commented on the designs, and thanks to all those who voted! ❑

Library Donation

A big thanks to APS member **Georgia Hoffman** who recently donated an important book on palaeobotany (fossil plants) to the APS library. The title is *Paleontology of the upper Eocene Florissant Formation, Colorado*, by H.W. Meyer and D.M. Smith; Geological Society of America Special Paper 435. The book can be examined or signed out at APS general meetings. ❑

Fossils in the News

CBC News Online
January 13, 2015

Fossil found by PEI boy fills gap in reptile evolution

PRINCE EDWARD ISLAND—This is a good news/bad news story. The good news: a well preserved and nearly complete fossil reptile has been found on Prince Edward Island, a Canadian province that's not well-known for producing fossils of any sort. The fossil, of a 25 cm long, lizard-like reptile called *Erpetonyx arsenaultorum*, fills a gap in the fossil record of the Gzhelian Stage, 304–299 million years ago, the final episode of the Carboniferous (Pennsylvanian) Period. In fact, it's the only reptile known from the Gzhelian, according to lead researcher Sean Modesto, of Cape Breton University, Nova Scotia.

The bad news is all the time and wrangling that went on before the specimen was made available for study, casting a less than favourable light on the motives of some fossil collectors. The specimen was found by 9-year-old Michael Arsenault (hence *arsenaultorum*), on a PEI beach in 1995. The boy and his father excavated the fossil and kept it in a box under Michael's bed for "many years" while the family tried to attract buyers (Prince Edward Island had/has? no resource protection laws). The price must have been exceptional because the fossil went unsold, beyond the reach of the Nova Scotia and Royal Ontario museums until 2004 when a ROM patron's bequest made funds available for the purchase. Read the article at **www.cbc.ca/** (Search "Erpetonyx").

Happily, the story ends with more good news: the description of the fossil is Open Access, published in *The Royal Society Proceedings B*: **http://rspb.royalsocietypublishing.org** (search "Erpetonyx").

[*Thanks to Phil Benham in Malaysia! –ed.*] ❑

A Fossil . . . *Or Not?*

By Howard Allen

At a recent Saturday microfossil sorting session, APS member **Renee Mullins** brought along an interesting specimen for identification. It's a buff-coloured, fine-grained rock riddled with holes—moulds—left by some weathered-out objects (Figure 1). Renee found the stone in Ontario, in the Niagara River gorge, below the falls. She said it caught her eye because there was nothing else like it in the area.

Several of us examined the specimen under microscopes and while no one had an immediate identification, several ideas were offered. My first thought was that the small holes were weathered-out ostracodes ("seed shrimp") or tiny bivalve molluscs; someone else suggested crinoid ossicles. Both these suggestions seemed convincing for some of the holes, but not all of them. Ostracode shells typically leave almond or crescent shaped holes; crinoid columnals (stem segments) leave circular, coin-shaped or rectangular holes; but these seemed a mixture of many shapes that were inconsistent with either.

Without much conviction, I suggested they might be intraclasts: chips of ripped-up limestone sea floor redeposited in a muddy matrix. But the shapes seemed too uniformly sized for that. In the short time we spent looking, no satisfying conclusion was reached, just "probably some sort of fossils."

Figure 1. (This page) The specimen. Scale bar = 1 cm. All photos by the author.

In the end I gave Renee the standard geologist's advice to smash it with a hammer and see what it looks like inside. I quickly added, "or cut it," since it's a shame to wantonly destroy an interesting specimen. At that, she handed it to me and the ball was in my court!

Back at home, with more time to look and think, I gave the specimen a closer examination, making a mental checklist of my observations:

• The rock appears to be an extremely fine grained carbonate of some sort, likely dolostone or limestone (clayey dolostone was confirmed with an acid test).

• The moulds are all empty: no trace of whatever made them is visible, inside or out (Figure 2).

Figure 2. Cut surface of the specimen, showing that the objects that created the holes are also completely dissolved inside the rock. Scale bar = 1 cm.

• Despite the very fine texture of the matrix, none of the mould surfaces preserve any imprint of surface features that one might expect with, say, crinoid columnals, which typically have patterned surfaces.

• The majority of the holes seem either lens- or coin-shaped, or some variation on these forms.

• Most of the holes "float" in the matrix and don't form layers but seem randomly oriented and somewhat spaced apart.

• A number of the holes appear to intersect or merge, often at high angles (Figure 3).

This last observation is important because it almost single-handedly rules out any sort of fossil organisms: the hard parts of dead creatures just don't "intersect" one another; shells might come in contact in a sedimentary deposit, but they sure don't intersect or merge. So what does? Crystals.

All of these observations are consistent with mineral crystals that grew in the sediment. The shape of the crystals and the fact that they are completely dissolved—even inside the rock—suggests an easily weathered, very water soluble mineral. Gypsum is a good candidate. Figure 4 shows a typical gypsum crystal aggregate ("rosette") that forms in sediments containing heavy concentrations of dissolved minerals left by evaporating water. Such sediments in the modern world include shallow marine bays, lagoons or tidal flats in hot, dry regions. A classic example is the so-called *sabkha* environment that exists in areas like the Persian Gulf. In these settings, gypsum (calcium sulphate, $CaSO_4 \bullet 2H_2O$) reaches high enough concentrations in the sediment pore water that it begins to crystallize within the soft sediment. This crystallization can become so pervasive that it eventually forms a gypsum "mush" of lens-shaped crystals. See, for example, **www.crienterprises.com/Edu_Evap_Coastal_Sabkha.html** and **www.southampton.ac.uk/~imw/Purbeck-evaporites.htm**.

Renee's specimen could be interpreted as an intermediate stage of crystallization between no crystals at all and a full-scale gypsum "mush". The very fine grained carbonate rock matrix would be consistent with a dolomite mud sediment (perhaps originally a lime mud sediment that became dolomitized later) that commonly occurs in these evaporitic settings.

Figure 3. Close-up images of some of the moulds, showing intersection and fusion of lens- or disc-shaped objects. Scale varies slightly; refer to Figure 1.

Dolomite rock (= "dolostone"), even as fine-grained as Renee's specimen, almost always has a network of pore space between the matrix particles, if only on a sub-microscopic level, which would eventually lead to the complete dissolution of embedded small gypsum crystals by infiltrating fresh water after the rock was exposed to groundwater, rain and river water over the most recent few hundreds or thousands of years.

Where did the rock come from? As previously noted, Renee was attracted to the rock because of its uniqueness among the other river rocks. In our initial speculation it was put forward that an odd rock like this could have been transported into the area by glaciers during the last ice age from parts unknown. This possibility exists almost anywhere in Canada, where most of the landscape has been influenced by glacial processes and "erratic" stones are scattered everywhere. But in this particular case, a bit of research reveals that the stone is just as likely to have been found close to its original home.

A geological map of the bedrock in the Niagara Falls area (Figure 5) reveals that the Niagara River has cut down through beds of Middle Devonian to Upper Ordovician rocks on its relatively short path across the peninsula from Lake Erie to Lake Ontario. According to various sources, all of these formations contain dolostone. So on that basis alone the specimen could have originated anywhere along the river from Fort Erie downstream to the Niagara gorge, where it was found.

Of particular interest, though, are the Upper Silurian formations, which the Ontario Geological Survey (1991) map legend says include "Limestone, dolostone, shale, sandstone, gypsum, salt."

The Salina Formation, which underlies a major section of the riverbed, is a thick unit of shale, carbonate rocks and evaporites—gypsum and salt—that was probably deposited in a sabkha-type setting and is economically important across southern Ontario. This is the formation from which table salt is produced at Windsor, Sarnia and other places, and gypsum has been mined from beds up to 2.5 m thick at Hagersville and Caledonia among other places

Figure 4. A gypsum rosette from the author's collection. Note the lens-shaped crystals and the fact that some crystals penetrate one another at high angles. Scale bar = 1 cm.

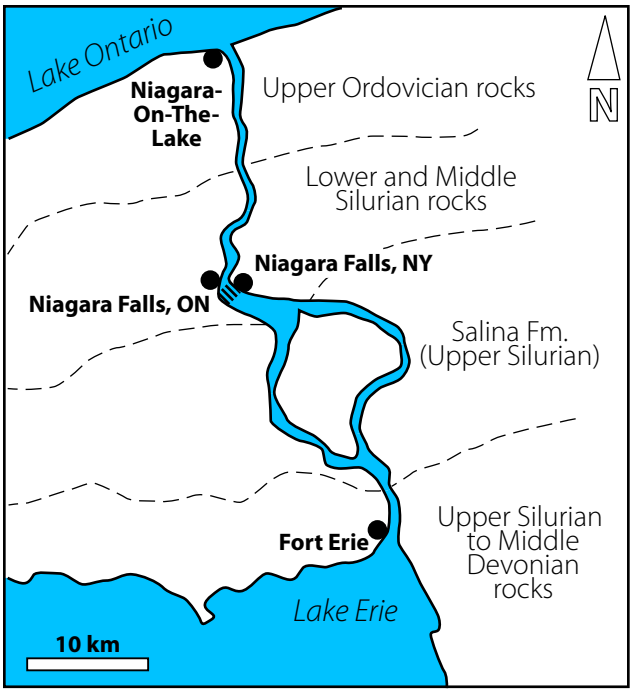


Figure 5. Bedrock geology in the Niagara Falls region. The specimen was found below (north of) the falls. Geology simplifed, after Ontario Geological Survey, 1991.

(Guillet, 1964). An earlier writer (Roliff, 1949, quoted in Guillet, 1964, p. 9–12) states that "Small quantities of white anhydrite and gypsum are present throughout practically the entire [Salina] formation".

The fact that the Salina Formation has a lot of soft, easily-eroded rocks—shale, gypsum, salt—means it isn't well exposed on the surface (Armstrong and Dodge, 2007) and outcrops would tend to be weathered and overgrown with vegetation or covered in recent sediments. It's unlikely that much rocky material would be eroded by the river upstream of Niagara Falls and samples would tend to be few and far between in the riverbed gravel below the falls. This might explain why Renee's specimen was so unusual; but if it really is a local rock, it's possible that a diligent search would turn up more specimens. ❑

References

Armstrong, D.K. and Dodge, J.E.P. 2007. Paleozoic geology of southern Ontario. Project Summary and Technical Document, Misc. Release—Data 219. Sedimentary Geoscience Section, Ontario Geological Survey, 27 pp. Available from: **http://maps.niagararegion.ca/Metadata/md/DocumentUpload/2007-08-08%2014-44-38.pdf**

Guillet, G.R. 1964. Gypsum in Ontario. Ontario Department of Mines, Industrial Minerals Report 18, 126 pp. Available from: **www.geologyontario.mndmf.gov.on.ca/mndmfiles/pub/data/imaging/IMR018/IMR018.pdf**

Ontario Geological Survey. 1991. Bedrock geology of Ontario, southern sheet. Map 2544, scale 1:1,000,000. Available from: **www.brocku.ca/maplibrary/maps/geology/bedrock/M2544-SouthernSheet.pdf**

APS Balance Sheet for 2014 ENDING DECEMBER 31, 2014

Revenues		Expenses	
Memberships	2110.00	Bulletin Printing	275.19
US$ Exchange	3.08	Bulletin Postage	163.04
T-shirts	20.00	Speaker Expenses	96.53
Pins	9.00	PO Box Rental	0.00
Field Trip Guides	0.00	Membership Printing	0.00
Abstract Volumes	8.00	Membership Postage	130.17
APS Book	1760.00	Field Trip Expenses	24.15
Shipping and Handling	149.42	Workshop Expenses	190.09
Misc. Sales	1.00	Symposium Speaker	229.29
Refreshments	37.88	Symposium Abstract Printing	241.73
Field Trip Fees	220.00	Postage for Sales	144.98
Workshop Fees	495.00	Website Expenses	324.10
Donations	60.00	Refreshments	106.47
Symposium Abstract Sales	322.00	Bank Charges	0.00
Symposium Donations	6.00	Miscellaneous	36.75
Bank account interest	187.68	APS Book printing	1320.14
PublicOutreach (150.00)+Library (0.00)	220.00	Public Outreach	9.19
Subtotal Revenues	**5609.06**	**Subtotal Expenses**	**3291.82**
Plus Revenue Received in 2013 for 2014		**Plus Expenses paid in 2013 for 2014**	
2014 Membership Fees	240.00	PO Box rental	157.50
Savings for 2014 Symposium	1261.00		
Savings for Library	497.25	**Minus Expenses paid 2014 for 2013**	
Savings for Public Outreach	294.00	Dec 2013 bulletin+Membership	121.25
Subtract Revenue Received in 2014 for 2015		**Minus Expenses paid 2014 for 2015**	
2015 Memberships Fees	410.00	Website for 2015 and 2016	216.07
Donations for 2015 Symposium	3220.00		
2015 Workshop fees	60.00		
Savings for 2015 Library	497.25		
Savings for 2015 Public Outreach	504.81		
Savings for 2015 Refreshments	91.41		
Total Revenues	**3117.84**	**Total Expenses**	**3112.00**

Excess of Revenues over Expenses = $5.84

Total Fund Raising Proceeds	**1,855.23**	**GICs due Jan 17, 2015**	**15,000.00**
Inventory Cost	**$1,024.67**	**Dec 31, 2014 Bank Account**	**10,452.60**
Values Current to Date:	**08-Jan-15**		

Audited by APS Members as per the APS Bylaws: SECTION 8.6

Printed Name: Todd Ashton **Signature:** Todd Ashton **Date:** Jan 25/2015

Printed Name: DAN QUINSEY **Signature:** Dan Quinsey **Date:** Jan 30/2015

A - agreed to supporting document 1/24/2015 TA