Alberta Palæontological Society Bulletin

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ALBERTA PALAEONTOLOGICAL SOCIETY

THE SOCIETY WAS INCORPORATED IN 1986 as a non-profit organization formed to:

- Promote the science of palaeontology through study and education.
- Contribute to the science by: discovery; responsible collection; curation and display; education of the general public; preservation of palaeontological material for study and future generations.
- Work with the professional and academic communities to aid in the preservation and understanding of 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

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THE BULLETIN IS 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:

Howard Allen, Editor, APS
editor2@albertapaleo.org

Back issues are available at **albertapaleo.org/resources/bulletinarchives/**

Upcoming APS Meetings

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

No meetings in June, July and August. See Field Trips on Page 8.

Friday, September 20, 2024—*Meeting topic to be announced.*
Friday, October 18, 2024—*Meeting topic to be announced.*

Check the APS website for updates! albertapaleo.org/events/monthlymeetings

ON THE COVER: Alberta fossils! The tabulate coral *Syringopora* sp., Mount Head Formation (Lower Carboniferous, Mississippian). "Mount Glasgow North," Rocky Mountain Front Ranges. Photo by Howard Allen.

2024 Annual General Meeting

Election results

By Vaclav Marsovsky, Secretary

The annual general meeting (AGM) was held on Friday, May 10 with elections taking place in person at Mount Royal University as well as on Zoom. Quorum was met with 24 voting members in attendance. The minutes of the meeting may be requested from the Secretary and will be made available prior to the next AGM scheduled for May 9, 2025.

Here are the results. Elected for 1 year term were **Cory Gross** as President, **Dr. Emily Bamforth** as Vice-President, **Vaclav Marsovsky** as Secretary and **Mona Trick** as Treasurer. Directorships (Programs, Editor, Membership and Field trips) were not up for election this year because they are beginning the second year of their two-year term.

The President, who chaired the meeting, recognized and thanked the past board members and committee chairpersons for their volunteering and tireless service over the past year. The financial information and financial audit were presented and a motion to appoint next year's auditors was approved. ❑

Program Summary

April

Dr Jason Anderson

University of Calgary

An update on the "Romer Gap" in the fossil record

Friday, April 19, 2024, 7:30 P.M.
Mount Royal University, Room B108.

There is a global hiatus in the fossil record between the Late Devonian and Early Carboniferous, which has received the name "Romer's Gap." Intensive work in recent years has greatly reduced this gap by actively hunting fossils from this time period, especially from the Tournaisian deposits of the Scottish Borders and at Blue Beach, Nova Scotia. The tetrapod fossils demonstrate the presence of taxa characteristic of faunas from both the Devonian and Carboniferous, suggesting a minimal impact of the end Devonian extinction event upon tetrapods.

More recent work in Dr. Anderson's lab has been to determine whether actinopterygian and sarcopterygian "fish" communities present at Blue Beach demonstrate similar patterns. Dr. Anderson reviewed some of the history of Romer's Gap, what the tetrapods demonstrate, and what he has found to be the case for ray and lobe finned fishes.

May

Dr Gavin Bradley

University of Alberta

Dinosaur or dragons: The cultural identity of fossils

Friday, May 10, 2024, 7:30 P.M.
Mount Royal University, Room B108.

The traditional history of palaeontology, as told through the lens of the Scientific Revolution, teaches that fossils were first discovered and recorded by Robert Hooke in his 1665 work *Micrographia*. However, over the past 20 years, as there has been a greater push to explore antecolonial scientific narratives, a growing body of evidence suggests encounters between early peoples and fossils were occurring as far back as the Neolithic, continued into Ancient Greece, and are evident in the history of the earliest Indigenous people in North America. These interactions are recorded in the documentary and archaeological record, and have been preserved to this day through mythology, folklore, and place names across different continents and cultures.

The dual identity of fossils as foundations of our palaeontological theories and as items of cultural, historical, and archaeological importance, should be considered by institutions when displaying fossils to the public, as well as by palaeontologists when naming new species or prospecting for fossils, particularly when on or near traditional Indigenous lands. ❑

Visit our website for talk abstracts and updates when they are made available.

albertapaleo.org

Paleo 2024 Summary

Article and photos by Mona Trick

We were blessed with excellent weather (+14° C) for Paleo 2024, our 27th annual symposium, on Saturday, March 16 at Jenkins Theatre in Mount Royal University. We hosted a hybrid symposium with a Zoom link provided for those who could not physically attend. About 100 people attended in person while thirteen took advantage of the Zoom link to view the presentations live on line. Thanks to **Eric Campbell**'s work, three of the talks are also now available to view at any time on the APS YouTube Channel at **https://www.youtube.com/@AlbertaPaleo**.

APS President **Cory Gross** welcomed the symposium attendees and provided an overview of the upcoming talks. **Lacey Holoboff**, APS Program Coordinator, introduced each speaker.

Tako Koning, consulting senior geologist, showed the excellent preservation of the Middle Eocene (47 million years old) fossil treasures excavated from the Messel Pit, in central Germany. Tako also presented a poster on this topic and displayed some fossils from other Lagerstätten formations.

Dr. Jon Noad, of Stantec Consulting, described the fossil recovery work done for the Springbank Off-stream Reservoir Project, which is located 15 km west of Calgary. The Historical Resources Act of Alberta requires palaeontological and archaeological assessments of construction projects. He described the geology of the area, which includes the Late Cretaceous Brazeau Formation, Paleocene Coalspur Formation and Paleocene Paskapoo Formation.

They found one microvertebrate site containing crocodile, turtle, fish and champsosaur fossils. Also found were detailed leaf impressions, fossil wood, possible dinosaur footprints, dinosaur bones, freshwater bivalves and several *in situ* rooted tree stumps. Surprisingly, they also found evidence of a potential marine incursion as shown by a 2 m thick oyster bed which contained one ammonite. They are currently testing for the presence of iridium in the bed of limestone filled with oncoids (fossil algal balls) that were found near the Cretaceous/Paleogene (K/Pg) boundary. A bison graveyard from Quaternary deposits topped the excavation.

Dr. Jessica Theodor, professor of Zoology at the University of Calgary, described the protoceratids, horned artiodactyls (even-toed hoofed mammals) which lived in North America from the late Eocene to early Pliocene. She noted that the protoceratids

Life membership award is presented to APS member Darren Tanke during the talk sessions in Jenkins Theatre.

were the first artiodactyls to evolve headgear and the first to show clear sexual dimorphism (females have a smaller body size and smaller horns). She discussed her research to determine to which group the protoceratids are more closely related—Tylopoda (which includes llamas, camels and oreodonts) or Ruminantia (which includes cows, deer, pronghorn and giraffes). Her team's recent work studying ear morphology of different lineages of protoceratids shows a completely different ear morphology than either the Ruminantia or Tylopoda. She concluded that these differences plus the lack of fusion of certain bones in the ankle (which is a characteristic of the Ruminantia), indicates that the protoceratids are even more basal than Ruminantia or Tylopoda in the evolutionary tree.

Jared Voris, Ph.D. student at the University of Calgary, discussed the evolution of the brains of theropods (meat-eating dinosaurs), using evidence from recent X-ray computed tomographic (CT) scans of skulls. Our current understanding of brain structure in theropods has been restricted to CT scans of the more derived theropods (such as troodontids, dromaeosaurids and oviraptorosaurs). The thick dural envelope in the more basal theropods (such as tyrannosaurs, allosaurs and ornithomimosaurs) obscures the brain structure. He noted that juvenile (rather than adult) tyrannosaur brain cases are better indicators of the shape of the actual brain mass, because it is slightly easier to determine what part of the brain lies in each section of the skull. He compared the juvenile tyrannosaur skull to those of lizards and birds. He concluded that some of the characteristics of bird brains (such as the displacement of the optic lobes towards the sides of the brain) are already present in the brains of tyrannosaurs.

Just before the lunch break, APS President **Cory Gross** presented the 2023 Hope Johnson Award to **Harold Whittaker**. This award recognizes Harold's many years of public outreach including presentations at elementary schools, his outreach work as APS Program Director from 2011 to 2023 and his fossil donations to the Royal Tyrrell Museum of Palaeontology. Harold could not attend the symposium in person, but he attended virtually (via Zoom). Cory later presented the award plaque and a cheque for $250 to Harold (in person) at the April 19, 2024 APS General meeting.

Jack Milligan, Master's student at the University of Saskatchewan, showed how the marks on fossil *Triceratops* bones illustrate the taphonomy (what happens from death to burial to discovery) of these dinosaur fossils. He used fossils from several specimens of *Triceratops prorsus* from the Late

Young symposium-goers enjoy a break at the kids' activities table.

Cretaceous (Maastrichtian) Frenchman Formation of Saskatchewan. On all these fossils, he found extensive biological modification of the bone, including tunnels, channels and pupation chambers (perhaps from beetles) and marks left by ancient plant roots. He noted that studying these biological modifications on fossils can help us understand the insects and plants that lived with the dinosaurs as well as the taphonomic history of the fossil.

Darren Tanke of the Royal Tyrrell Museum of Palaeontology described their progress on removing the "Kaskie hadrosaur" from Dinosaur Provincial Park. This articulated subadult specimen is particularly important due to its extensive skin impressions. During the 2023 excavation season, while digging a trench around the skeleton, they found that the orientation of the individual was different than expected —the neck (and possible skull) extended into the cliff. Now more excavation to expose this specimen is scheduled for this summer. So far, more than 213 metric tonnes (from 2,024 full wheelbarrow loads) of overburden have been removed. Darren estimates that by the end of the 2024 field season, 272 metric tonnes will have been removed.

After his talk, APS President **Cory Gross** presented Darren with APS Life Membership to recognize Darren's many contributions to the APS over the years. Darren volunteered for the APS Board of Directors for several years. He presented many talks to the APS and wrote even more articles for the APS *Bulletin*. Darren wrote the APS book *Now There Was*

a Lady! Hope Johnson LL.D. 1916–2010, which APS currently sells.

Dr. Jenni Scott, associate professor at Mount Royal University, discussed using sequence stratigraphy to help determine locations of vertebrate fossils. Sequence stratigraphy tries to understand the changes in rock units over time, as caused by events such as flooding (transgression) and drying (regression). Typically this approach has been applied to marine successions, but Jenni noted that it could also be used for non-marine areas such as lake-basins, wetlands, delta plains and coastal plains. She used sequence stratigraphy to identify cyclical climate change in the Late Pliocene lake-basin Chemeron Formation of the Kenya Rift Valley in Africa. Knowledge of the local climate cycles helped to predict and locate hominin fossils. She applied sequence stratigraphy to the Lake Cretaceous coastal plains of the Dinosaur Park Formation in Alberta. The wide-spread macrofossil bonebeds are repeatedly seen at the base of channel sandstones as sea level dropped. Microsites are found within channel fills often during initial sea-level rise. This information helps to find new fossil sites and answer questions about how and why fossil assemblages change over time.

Hard-working APS volunteers at the sales and information table.

Matthew Rhodes recruited thirteen posters, which featured a wide variety of topics. Due to the delay in the delivery of the poster stands, the poster presenters had to quickly set up their posters during the first coffee break at 10:30 A.M. There were also interesting displays provided by the **Archaeological Society of Alberta** and **Don Sabo**'s "Rock and Hide" leather handicrafts. Fossil displays were provided by each of **Mount Royal University**, **Cory Gross** and the APS collection (thanks to **Howard Allen**). Cory also provided toys and colouring books for the children's activity table.

The APS organizing committee included **Howard Allen** (editor of the abstracts volume and organizer of the APS fossil display), **Eric Campbell** (Zoom and YouTube host, and website), **Lacey Holoboff** (organizer of the speakers), **Matthew Rhodes** (coordinator of the posters and displays), **Dan Quinsey** (information and sales table), **Mona Trick** (symposium organizing committee chair, advertising), Mount Royal University (**Candace Toner**) and **Cory Gross**. I would like to thank those who volunteered at the APS sales table: **Walter DiMattia**, **Virginia Goodman**, **Georgia Hoffman**, **Vaclav Marsovsky**, **Dan Quinsey**, **Anita Reilander**, **Matthew Rhodes**, **Jyoti Roy**, **Doug Shaw** and **Lorraine Stratkotter**.

We would like to thank all of those who helped to publicize this event. The **Canadian Energy Geosciences Association** (CEGA) advertised the

symposium in their publication *The Reservoir*. We would like to thank the **Calgary Public Library** branches for displaying our posters advertising the event. Information on Paleo 2024 was listed online on numerous websites. From **Global TV**, **Gil Tucker** interviewed **Dr. Jon Noad** and showed the interview during both their 5:00 P.M. and 6:00 P.M. news on Thursday, March 14. **CTV News** featured an interview by **Kevin Fleming** with **Tako Koning**, **Jared Voris** and **Cory Gross** during the 6:00 P.M. news hour on Friday, March 15. The interview can be viewed at **https://calgary.ctvnews.ca/the-alberta-palaeontological-society-hosting-its-annual-symposium-open-to-dinosaur-enthusiasts-of-all-ages-1.6809606**. **CTV Community Calendar** also promoted Paleo2024 during the evening news hours in the week before the event. Thanks also go to **Judith Horan** who tweeted the message to her social networks.

We would like to thank all of the speakers, poster presenters and display staff for their contributions to the symposium.

APS is able to hold this event without cost to the general public due to the support of the **Department of Earth Sciences of Mount Royal University** (especially **Candace Toner** and **Dr. Jonathan Withey**) and **Dr. Jon Noad** and the **Paleontological Division of the Canadian Energy Geoscience Association** (CEGA) (formerly known as the Canadian Society of Petroleum Geologists). Thank you all.

Mark your calendar for next year's symposium, scheduled for March 15, 2025. Contact **Lacey Holoboff** (**programs1@albertapaleo.org**) if you would like to present a talk or workshop or have ideas on a talk or workshop which you would enjoy. We will finalize our speaker program by the end of October, 2024 so be sure to submit your suggestions now. ❑

Thank You!

Dr. Brian Hitchon made a financial donation to the Society when he renewed his membership. ❑

As if they didn't have enough to do this month, Cory and Dan manned an APS booth on March 17—the very next day after our Symposium! Thanks to our APS members for going the extra distance, including **Lorraine Stratkotter,** who took the photo!

2024 Field Trips

By Keith Mychaluk

Each year we try to offer a diverse array of field experiences for our membership, catering to different member interests, abilities and ages. Fortunately, Alberta and surrounding areas have a seemingly endless bounty of sites to visit. We hope you like this year's line-up! We will visit new territory both close to home (near Dorothy, Alberta) and further afield (near Jordan, Montana) for a variety of Upper Cretaceous fossils and geologic sites. We will also revisit the amazing dinosaur trackway site near Grande Cache, AB and visit the Phillip J. Currie Museum (and nearby dinosaur bone beds) close to Grande Prairie, AB in August. Once again, we will explore the Cretaceous-Paleogene boundary site at Knudsen's Farm and see Ordovician-aged fossils within building stone at some Calgary city landmarks. This year's line-up would not have been possible without the help of fellow APS members **Mona Trick**, **Dr. Emily Bamforth** and **Tako Koning**. Thank you Mona, Emily and Tako! Let us dive into the details below!

Please watch the APS website for further updates as these plans may change. **Remember, you must be a member to participate in a Society field trip.**

Trip 2024-1. Saturday, June 22, 2024
Upper Cretaceous of the Dorothy area, AB

Leader: Steve Kary

Registration for this field trip is now full. See the March *Bulletin*.

Trip 2024-2. Saturday, July 6, 2024
K/Pg Boundary, Knudsen's Farm, Huxley, AB

Leader: Tako Koning

If you missed this tour previously, Tako will again lead us to the famous Cretaceous-Paleogene boundary (formerly the "K/T boundary") site on Knudsen's farm near Huxley, AB. This boundary marks the end of the dinosaurs and this particular site has contributed materially to our knowledge of what happened to the world at that time. Huxley is about a 2-hour drive from Calgary. This is a single-day trip. The fee is $10 and the **registration deadline is July 1.**

Trip 2024-3. Thursday–Monday, July 25–29, 2024
Phipps Ranch, near Jordan, Montana, USA

Leader: Keith Mychaluk

The Upper Cretaceous Hell Creek Formation in Montana is world-famous for its cache of iconic dinosaur remains such as *Tyrannosaurus rex*, *Nanotyrannus* and *Triceratops*. However, gaining access to sites to hunt for vertebrate fossils in the "Treasure State" are extremely limited. Through its contacts, the APS has secured access to a private ranch within rich Hell Creek fossil beds south of Jordan, Montana. Jason Phipps, the older brother of Clayton Phipps (from the TV Show *Dino Hunters*), has recently been allowing groups to collect on his land for a fee.

We expect to excavate at an extremely rich microvertebrate fossil site on the ranch that regularly yields theropod, herbivore and mammal teeth. We will be allowed to keep what we collect—with the exception of very valuable fossils (Jason uses these funds to supplement his family income on his small cattle ranch). We are hoping to add an additional site (possibly an invertebrate locality) and/or a facility tour (such as a museum or preparation lab) to this trip. Again, watch the *Bulletin* for updates.

Here is the proposed itinerary

Thursday, July 25: Travel to Jordan, MT.

Friday, July 26 and Saturday, July 27: Caravan (40 minutes) each day to and from Jason Phipps Ranch; Expect long, hot days with lunch in the field with no facilities.

Sunday, July 28: TBD: Explore nearby Bearpaw Formation invertebrate sites and/or museum tour.

Monday, July 29: Return to Calgary.

Jordan is a 9-hour drive from Calgary (excluding the time required to cross the USA-Canada border, which can be quite variable). Participants will have to find their own way to and from Jordan.

NOTE! There are very limited basic accommodations in Jordan (Garfield Motel, K&K RV Park, Old Dorm RV Park and Motel 200) with camping likely the best option (Contact Keith for more information). Participants will have to make their own sleeping and travel arrangements to and from Jordan. **The fee for collecting on Jason's ranch is US$125 cash per person, PER DAY (total US$250 for two days**—payable to Jason directly on July 26). There may be additional fees so watch for updates in future issues of the *Bulletin*. There are no restrictions for attendance but motel space could be a limiting factor. **The registration deadline is July 1.**

Trip 2024-4, August 24–26, 2024
Grande Prairie & Grande Cache, AB

Leaders: Dr. Emily Bamforth and Mona Trick

Two trips in one! This extended three-day trip is organized into two parts, namely:

Part 1—Grande Prairie. You can either choose to be a "Digger" or a "Fossil Preparator." Both groups will tour the museum and collections of the Philip J. Currie Dinosaur Museum near Wembley (west of Grande Prairie) at a special museum entrance price kindly offered by the museum. The Philip J. Currie Dinosaur Museum features a wide array of fossils, specializing in those from the nearby Pipestone Creek bone bed.

"**Diggers**" will tour the museum starting at 1:00 P.M. on the afternoon of Saturday August 24. Then on Sunday, August, 25, the "Diggers" will excavate dinosaur bones at the nearby Pipestone Creek Bone Bed, for the full day (9:00 A.M. to 4:00 P.M.). Lunch will be provided. Maximum of 10 people. Minimum age is 12 years old. **Each** minor child must be accompanied by one adult. The fossils from at least 27 individuals of *Pachyrhinosaurus lakustai* were excavated from the Pipestone Creek bone bed of the Wapiti Formation (approximately 72.6 million years old, Campanian Age of the Late Cretaceous). This is one of the densest bone beds in North America. It extends at least 1 km into the hill and contains fossils from hundreds of individuals.

"**Fossil Preparators**" will tour the museum starting at 9:00 A.M. on the morning of Sunday, August 25. Lunch will not be provided. Prepare fossils for the afternoon in the museum's lab. At 2:30 P.M. you can join an optional outing to hike to the Pipestone Creek Bone Bed to watch the "Diggers" in action. Maximum of 5 people. Minimum age is 12 years old. **Each** minor child must be accompanied by one adult.

Part 2—Grande Cache. On the morning of Monday, August 26, 2024, we will tour the extensive dinosaur trackways near the CST Coal mine outside of Grande Cache. Gather at 8:00 A.M. at the Grande Cache Tourism and Interpretive Centre (9701 Highway 40, Grande Cache) for the safety orientation and then we will board the provided bus, passing through the CST Coal Mine to see the tracks. We then return to the Grande Cache Tourism and Interpretive Centre at about 1:00 P.M. For the afternoon, we will visit couple of nearby sites and enjoy our lunches in the field.

The tracks are in the Grande Cache Member of the Gates Formation (middle Albian of the Early Cretaceous). There are a variety of different tracks, including those from quadrupedal dinosaurs (nodosaurid ankylosaurs?), bipedal dinosaurs (theropods and ornithopods?) and invertebrate burrows. Most tracks are on nearly vertical rock faces, tilted upwards by mountain-building processes. Bring your binoculars to better view the tracks.

Maximum 20 people. Minimum age is 12. **TWO** adults are required for **EACH** child aged 12 to 16 years. **ONE** adult per **EACH** child aged 17 to 18. **CSA certified safety glasses and work boots** are **MANDATORY**. **Hard hat and high visibility vests** are also **MANDATORY**. Hard hats and high visibility vests can be borrowed from the CST Coal mine if you notify **Mona Trick** (**giftshop@albertapaleo.org**) when you register.

You can select both parts or just a single part of this trip (for example only the Grand Cache tracks). Note the maximum numbers for each part and requirements for number of adults for each minor. **For this field trip, you MUST send the completed waiver, Grande Cache Tracksite Tour Agreement and emergency contact form to Mona Trick (giftshop@albertapaleo.org or phone 587-578-4579) BEFORE August 13, 2024.**

You can drive (7.5 hours from Calgary) or fly to Grande Prairie Airport and rent a car (several car rental places are available). In any case, you will need your own transportation for the 20 minute drive from Grande Prairie to the Philip J. Currie Dinosaur Museum near Wembley and for the 10 minute drive from the Museum to the Pipestone Creek Day Use Area on the next day. Several hotels in Grande

Prairie offer discounts for those registered with this museum program. Contact Mona Trick for details.

Grande Cache is a 7 hour drive from Calgary. Grande Cache and Grande Prairie are 2 hours apart via Highway 40. Arrange your accommodation in Grande Cache early because it has only four motels, and some may already be booked. Grande Cache also has several nearby Provincial Parks with camping. Contact Mona Trick for details.

Registration deadline is July 19, 2024.

FEES

Part 1—Grande Prairie.

"Diggers"—Tour Philip J. Currie Dinosaur Museum and dig in Pipestone Creek Bone Bed (maximum 10.)

Adult: $212.00
Child (12–17): $174.00

OR

"Fossil Preparators"—Tour Philip J. Currie Dinosaur Museum and prepare fossils in the lab (maximum 5).

Adult: $12.00
Child (12–17): $6.00

Part 2—Grande Cache.

Tour Dinosaur Tracks (maximum 20)

Adult or child (12–17): $40.00

Trip 2024-5, September 14, 2024
Tyndall building stone walking tour, Calgary

Leader: Tako Koning

Once again, Tako Koning has agreed to conduct his popular tour of Calgary structures adorned in Ordovician-aged Red River Formation limestone originally quarried in Tyndall, Manitoba. See impressively preserved fossils of corals, gastropods, orthocones and receptaculitids at Calgary landmarks like the historic Bank of Montreal building. This will be a walking tour of several buildings in downtown Calgary, the community of Kensington and the SAIT campus and is suitable for all ages. The fee is $10 and **the registration deadline is September 1**.

For more information on any of the field trips please contact **Keith Mychaluk** at **(403) 809-3211** or by email at **fieldtrips@albertapaleo.org**. A field trip registration form is included with this issue of the *Bulletin* and is available on the APS website (**https://albertapaleo.org/events/fieldtrips**). **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 applications received after May 1, 2024 will not be reviewed and voted on by the Board of Directors until September, 2024.

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. Registrations are accepted on a first-come-first-served basis so sign up early to avoid disappointment. For the 2024 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 email or Canada Post. Please ensure that your addresses are correct and legible when sending in registration forms. When you arrive at the meeting place please have all 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.

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. ❑

Article on fossil photography

Readers thinking of photographing specimens in their collections would benefit from reading an article that appears on the "Dry Dredgers" website. Dry Dredgers is a palaeontology club based in Cincinnati, OH. The article, *Photographing your fossils*, by **Jack Kallmeyer**, discusses all aspects of specimen photography, from camera mounting to light sources to providing scale. **http://drydredgers.org/photographing_your_fossils.htm** ❑

Thanks to Dan Quinsey –ed.

How to write and format scientific names

By Dan Quinsey

Precise terminology is vital in scientific writing. Therefore, the current system of taxonomy ensures authors use standard scientific terms.

While naming and categorizing plants and animals has been a common practice for years, early attempts were not so systematic, and sometimes a bit flawed.

The creation of a universal system of scientific names is relatively recent, starting in the eighteenth century with the foundational work of naturalists such as Carl Linnaeus. The modern system of taxonomy ensures that no matter a person's spoken language, they can be confident they are referring to the exact same species or taxa as other scientists.

Accordingly, learning and following a few rules for writing scientific names is essential for any scientific work. Below is an overview of the taxonomic system of living organisms and how to write a scientific name of any plant or animal.

Binomial Nomenclature

The system of binomial nomenclature was first developed by Carl Linnaeus (1707–1778) and is still used today. In it, each individual species of any group of organisms is given a Latin name consisting of two parts (hence "binomial"—literally "two names"): genus and species—in that order.

It is important to note that in some cases a scientific name can also contain a subspecies (roughly equivalent to a "race" or "breed") if additional information is necessary to specify a subgroup within a species of animals.

For instance, the name of the domestic housecat is *Felis catus*. Scientific names of species are in Latin and they are *always italicized* when written[1], and the first part of the binomial—the genus name—is always capitalized). In this example, *Felis* denotes the genus and *catus* denotes the species. To better understand how kitty fits into the natural order of things, the seven main classification levels of the domestic cat is demonstrated below.

While these classifications are useful and interesting, only genus, species, and if applicable, subspecies are necessary to create a standard binomial scientific name.

Kingdom: Animalia—encompasses all animals.

Phylum: Chordata (subphylum Vertebrata)—includes all animals that have spinal cords or backbones.

Class: Mammalia—includes all mammals.

Order: Carnivora—includes all carnivorous mammals.

Family: Felidae—both wild and domestic cats.

Genus: *Felis*—encompasses cats that are smaller and/or cannot roar.

Species: *catus*—a small cat that has become a friend of humans. This species includes approximately fifty breeds of cats.

The scientific name of a Siamese cat would be *Felis catus siamensis*. In this case, *siamensis* denotes the subspecies.

How to Format Scientific Names

Italicization—Publications and style guides may vary. However, the scientific name of any species of plants or animals should almost always[1] be italicized.

Capitalization—In addition, the genus should always be capitalized, while the species and subspecies are kept in lowercase, even when the species or subspecies refers to the name of a place or person.

Taxonomic names above genus level—As mentioned, binomial scientific names should always be italicized, but any category above the level of genus is typically written in Roman (non-italicized) text. The exceptions are bacteria, fungi, and viruses. For these taxa, italics are also used at the family level.

1. The only exception to this rule is when the main text of an article is already set in Italic, then the scientific name is set in Roman (upright) text, to emphasize that it is a scientific genus and/or species name.

Multiple appearances—When writing a scientific name multiple times in a text, the genus is often abbreviated to include only the first letter after the first use of the name. Example: "*Felis catus* belongs to the order Carnivora. This means *F. catus* subsists primarily on meat." In the case where two different genera have the same abbreviation, genus is written out in full.

Subspecies—is always formatted the same as species: lowercase and italicized. If the subspecies name is the same as the species name, the species can be abbreviated to the first letter (*e.g.*, the tiger *Panthera tigris tigris* can then be written *Panthera t. tigris*).

Unknown species—If a species is unknown, or cannot be identified with confidence, the abbreviation "sp." is used in place of the species name and it is non-italicized. The abbreviation "spp." is used to indicate a group of unknown species. The abbreviation "sp. nov." (Latin, species novum) or, more commonly, "n. sp." (new species) is used to indicate a species that is being described for the first time, or that the author suspects has never been described.

Common name—if you must use a common name, first define it in terms of the scientific name followed by the common name in brackets. (*e.g.*, "*Felis catus siamensis* (Siamese cat)".

Authors' names—sometimes, the abbreviated or full surname of the person who named the species is included after the scientific name. (e.g., "*Felis catus* Linnaeus" or "*Felis catus* L."). The author name is never italicized.

Occasionally the year of authorship is included, especially if the author named numerous species over several years—this would be written ("*Felis catus* Linnaeus, 1758" or "*Felis catus* L., 1758")

Ensure Consistency

Make sure you format scientific names consistently. Beware when working with word processors, your scientific names may be automatically formatted (or spelling "corrected") when you don't want them to be. Proofreading your final draft can be labour-intensive and time-consuming. Get a second set of eyes to look over your work. By ensuring consistency, your reader will easily understand and appreciate your work without being put off by any errors or inconsistencies.

References and further reading

AJE.com. 2022. How to write scientific names of plants and animals. **https://www.aje.com/arc/how-to-write-scientific-names-of-plants-and-animals/#** (accessed May 2024).

Allen, H. 1993. What's in a name? Alberta Palaeontological Society Bulletin, vol. 8, no. 3, September 1993, pp. 7–9. **https://albertapaleo.org/bulletinArchives/bulletin083.pdf** (accessed May 2024).

Kazlev, M.A. 2024. The Linnaean system of nomenclature. Palaeos: Life through deep time. **http://palaeos.com/systematics/linnaean/index.html** (accessed April 2024). ❑

Fossils in the News

Popular Science

Enormous snake in ancient India was longer than a school bus

Readers willing to put up with the appalling mess of popup ads and clickbait on this site can read about a newly described giant snake, *Vasuki indicus*, found in the middle Eocene of western India. Extrapolating from the size of the vertebrae found, researchers estimate the animal was up to 15.2 m in total length. **https://www.popsci.com/environment/giant-snake-india-fossil/**.

BBC online

Enormous ancient sea reptile identified from amateur fossil find

The latest titleholder of "world's biggest marine reptile" (sorry, *Shonisaurus sikanniensis*: **https://tyrrellmuseum.com/whats_on/exhibits/triassic_giant**) has been found on a beach near Minehead, Somerset, England. The first jaw bone fragment was discovered by Ruby Reynolds, an 11-year-old girl fossil hunting with her father. The Late Triassic ichthyosaur has been named *Ichthyotitan severnensis* and is estimated to have been "more than 25 m long." The paper describing the new fossil, by Lomax *et al.*, is open access: **https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0300289**. News items: **https://www.bbc.com/news/science-environment-68831349** and **www.cnn.com/** [search "Ichthyotitan"].

[*Thanks to Vaclav Marsovsky and Georgia Hoffman – ed.*] ❑

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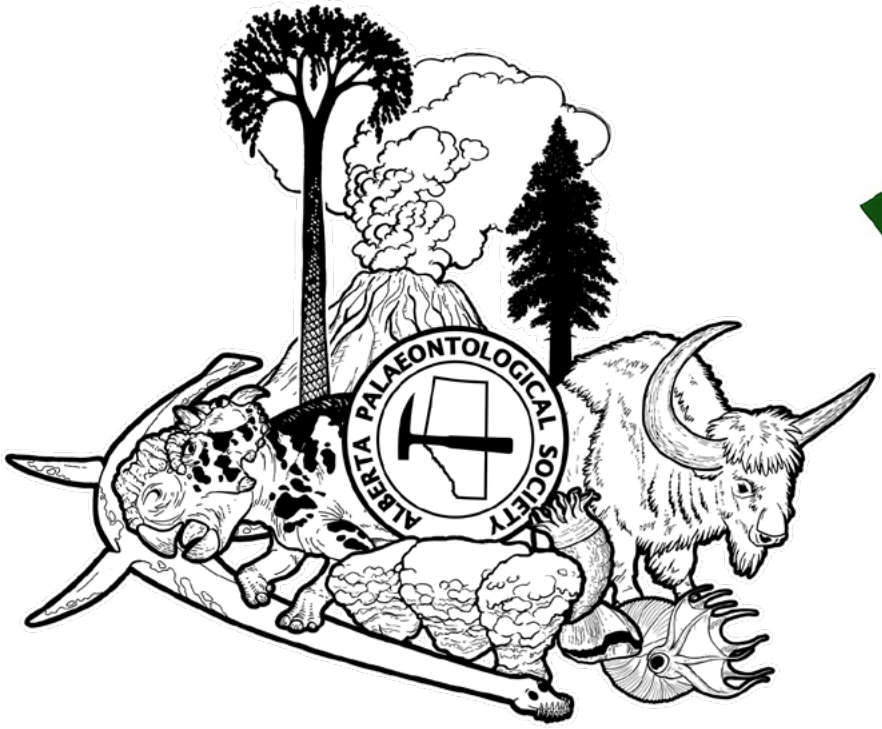

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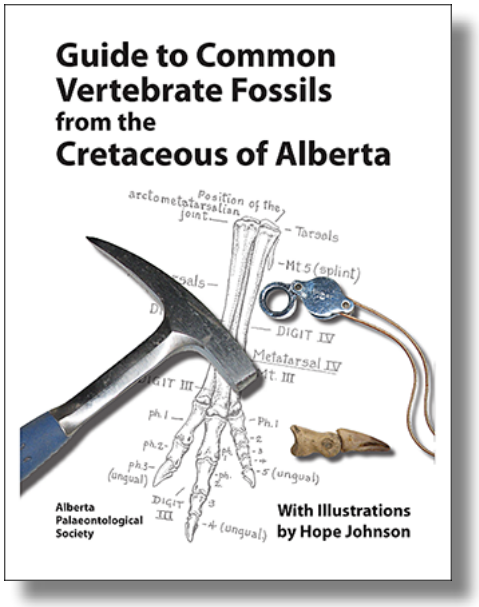

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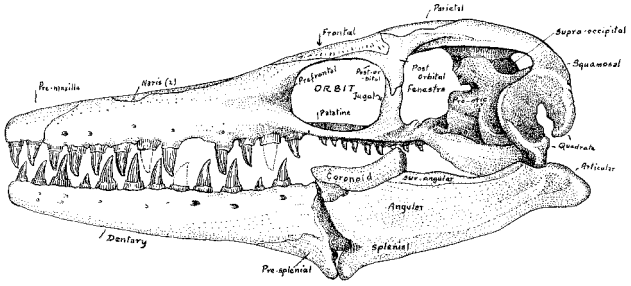

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