North America Research Group

NARG NEWSLETTER

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NARG Holiday Party & Silent Auction

On November 9, NARG hosted a successful potluck event attended by approximately 30 members and their families. The evening featured a potluck that included a variety of snacks and cookies brought by attendees giving us a chance to chat and eat around the table.

The highlight of the event was the silent auction, which showcased an impressive array of items and experiences tailored to our club's interests. Members had the opportunity to bid on exclusive field trips to the coast led by **Kent Gibson**, our own fossil man at the Oregon Coast. Additionally, participants could win a tour at **Bruce Thiel's** home, where they would explore his fossil preparation area and extensive prepped fossil crab collection.

Among the auction items were unique fossils, including petrified wood, trilobites, and fossil concretions. It is important to note that no fossils collected on public lands were auctioned as required by law. These items generated a lot of interest, reflecting our members' diverse interests in paleontology and fossil collecting. Altogether, the auction raised more than $800 for the club's future activities.

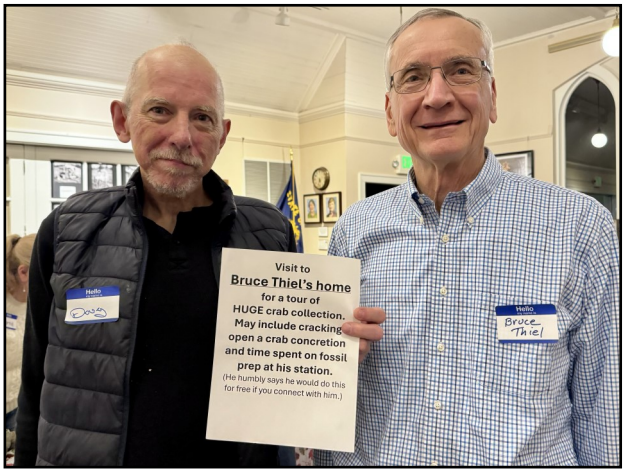
The event not only provided an excellent opportunity for building community and sharing knowledge but also reinforced our club's commitment to promoting education and appreciation for paleontology. Thank you to all who attended and contributed to the success of this gathering. We look forward to more engaging events in the future!

Great potluck with snacks and cookies

Folks enjoying good food and conversation

Holiday Party continued...

Lorna and Debbie looking over auction items



Doug won the auction to visit Bruce's house!

Tim and Aaron talk about new fossil discoveries at the auction table

Bill enjoying snacks before the auction

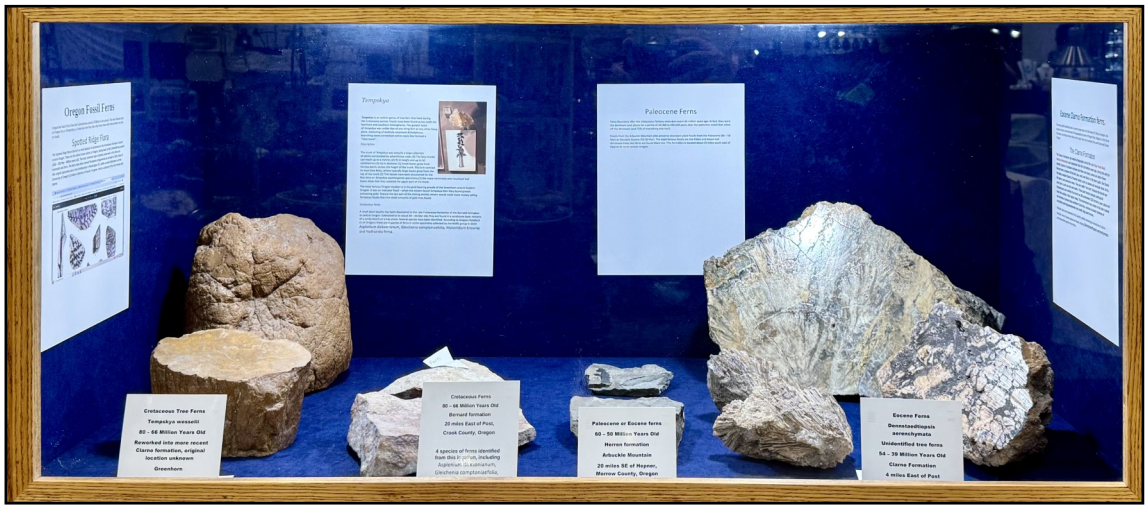
Last minute bidding at the silent auction

Portland Regional Gem and Mineral Show 2024

The Portland Regional Gem and Mineral show happens on the first weekend in October. Five regional rock clubs, including NARG, organize it throughout the year. Our club's representatives are **Tara Baker, Debbie Shannon,** and **Dan O'Loughlin**. However, more NARG members are on the Board representing other clubs, including **Linda Frenette, Greg Gentry, Gordon Hale, Bill Harvey,** and **Cindy Yablok.** It is a huge show with more than 40 rock vendors and 70 display cases, along with presentations and demonstrations throughout the weekend. Thousands of people attend every year.

While NARG has fewer members compared to the other organizing clubs, we have many who participate in every part of the meeting. We had many beautiful display cases up this year, including "Marine Mammal Fossils from the Oregon Coast" by **Kent Gibson**, "Fossilized Teeth" by **Lisa Shenk** (a first-time display presenter), a new display by **Dan O'Loughlin** "The Beauty of Fossils," and **Greg Carr's** "Tempskya." We had additional displays as well, so many that we won the "Square Footage" award for the most displays by one club. We have won this award several years in a row! This is something to take pride in, as again, we have one of the smaller clubs in the organization.

Lisa Shenk's display on Fossil Teeth



Greg Carr's display on Tempskya, a type of huge extinct species of fern

Portland Regional continued...

Another activity where we really excel is in providing demonstrations and offering information about paleontology and our club. We had many people volunteering in this area including **Greg Carr**, **Greg Gentry, Dan O'Loughlin, Larry Purchase, Bruce Thiel,** and new members**, Andrew Niehus** and **Logan Greenwood**. **Joe Cantrell** demonstrated his stacked fossil and rock photography, while **Greg Carr** had his 3D printer running. This last was especially enjoyed by children as they are ever more comfortable with this kind of technology. Many visitors came by to touch fossils, ask questions about fossils they had collected, and learn about the club. We had at least six new members join after talking to people at the NARG table.

Greg Carr answering questions about the use of 3D printers in paleontology

Joe Cantrell's art is always a big draw. His photography of fossils shows amazing detail.

Paleontology is a huge interest to barnd-new member, Logan Greenwood. His help at the NARG table was welcome!

Larry Purchase and Greg Gentry gave welcoming vibes from the NARG club table

The PRGMS also has several speakers present on Saturday. This year's meeting focus was on fluorescent rocks which was promoted heavily for kids. It was great to see so many interested in these amazing types of rocks. Additionally, **Greg Carr** gave a talk about meteorites: not fossils, but still a great presentation! Newer NARG member, **Clark Niewendorp**, gave an excellent presentation entitled, "Gold Along the Cascades."

NARG was in-charge of the Raffle Table this year. We collected and organized the raffle items from clubs and the prizes for hourly drawings as well. **Greg Gentry**, who is moving to Mexico and cleaning out his fossils, donated several nice items, including a large conglomerate of baculites and ammonites, as well as a prepared crab. These were popular and had a lot of entries.

Portland Regional continued...

Finally, NARG members showed up and volunteered in different capacities, like helping as Greeters and Monitors. **Tara Baker** and her daughter, **Meghan**, helped direct guests after they paid their entry fees, and **Debbie Shannon** walked the vendor aisles to deter theft and assist sellers. Other NARG members attended and visited, helping make the event a success. NARG is an integral part of this show! We are a smaller club, but our members are engaged and active!

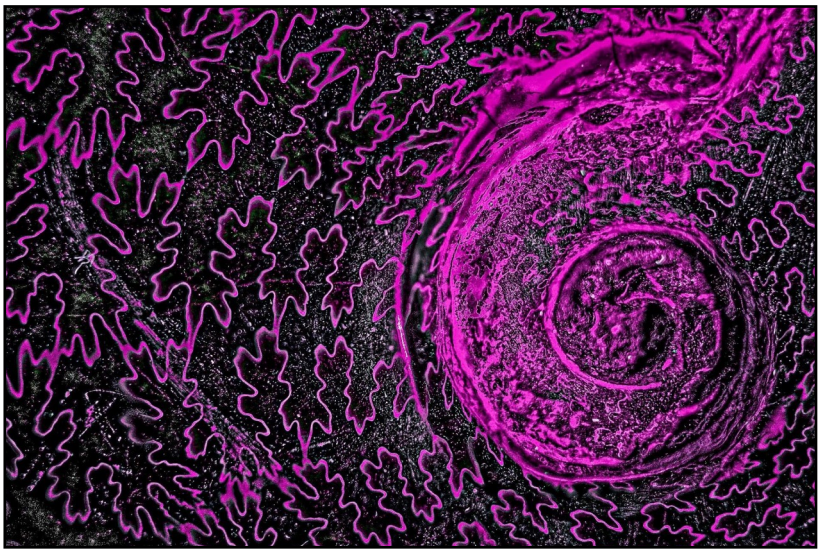
After the show, NARG receives part of the proceeds from the event. This is an important part of our annual budget. It takes so many volunteers to organize and put-on this annual event. Thank you for all who helped in some way!

Meghan and Tara Baker were a daughter-mother duo as they volunteered as Greeters

Friends and crab preparers, Greg Gentry and Bruce Thiel, chatted and were available to answer questions at the NARG table

Ammonite Art

NARG member, **Joe Cantrell**, continues to add interest to his stacked photography of fossils. This image is the result of using UV light to brighten the suture lines and swirls in this ammonite fossil.



Record-Breaking Attendance at Northwest FossilFest 2024!

NARG held another successful Northwest FossilFest on August 3, 2024. We hosted a record-breaking 560 visitors to our activities at the Tualatin Heritage Center. This annual event takes many members to put on for the public. It meets one of our core missions: to educate the public about paleontology. It really is a huge group effort, and everyone's participation is important. The following highlights only some of the many people it takes to put on a successful show.

NARG members had display cases showcasing our fossils. **Scott Kraker** put together a very educational display on stromatolites for his first-time FossilFest display. Another first-timer, **Austin Heitzman**, exhibited Oregon leaf fossils he had collected. **Weylin Charland** and **Kent Gibson** brought many of their Oregon Coast marine fossils to display, with Kent's fossils taking up half of the indoor space.

Meghan, Tara Baker's daughter, helps with set-up

Austin and his son next to their filled display case

Weylin and Arnold looking at marine fossils with visitors

Greg Carr was very busy all day. He had two nice display cases, one filled with Bernie the Thalattosaur information and another showcasing recent spiketooth salmon discoveries. Additionally, he was running his 3D printer alongside his printed *T. rex* skeleton. This was a big draw for kids especially. Finally, he offered Airscribe demonstrations for anyone who wanted to try out these fossil preparation tools.

We had so many great activities for kids this year! **Dan O'Loughlin** always brings great games and prizes! Children were able to guess the number of dinosaurs in a jar, participate in a raffle, spin the Epoch wheel, sift for fossil shark teeth, and touch many fossils on display. New this year, **Elena** and **Laurie Anderson** offered hand drawn temporary fossil tattoos. **Tara** and **Anthony Baker** constructed a dinosaur bean bag toss game which was a new addition to the kids' fun. New member, **Daniel Kauffman**, manned a table educating folks about many different types of fossils.

Greg & his 3D printed *T.rex*

Lucy and Dan run the raffle booth

Daniel K., is a paleontology educator. He brought his own puppet to help at his booth.

NW FossilFest continued...

This year, we also invited two vendors to have booths displaying their paleontology materials. The Rice Northwest Museum of Rocks and Minerals has been a partner with NARG and **Alice Kitchin**, who is also a NARG member, brought hands-on fossils and materials about the Rice Museum. (Don't forget, NARGers get into the Rice Museum for free with membership!) **Nico Spadafora**, a founder of The Fossil Team and NARG member, filled multiple tables with fantastic replicas of saber-tooth tigers and more. Many enjoyed his fossils and enthusiastic, educational explanations.

Nico, with The Fossil Team, brought fossil replicas that excited the kids.

Inside the Heritage Center, **Joe Can**trell was showcasing his stacking photography of fossils and other beautiful rocks. See later in the newsletter for some of his beautiful work. **Aaron Currier** was again helping guests to specifically identify the fossils they brought in. It is always exciting to see what the public has been collecting and help them get more information about their own collections.

Guests taking pictures of Joe's photography set-up

Aaron identifies fossils for guests

Kent filled half of the center with his marine mammal displays

Some of the 500 visitors who attended NW FossilFest 2024

NW FossilFest continued...

Again, it takes so many people to make this event happen. From the many who showed up for set-up and teardown to the t-shirt sales folks to the people running the kids' tables.

Some of the Northwest FossilFest volunteers not mentioned specifically above in no particular order:

Debbie Shannon
Megan Gagner
David Kleubert
Sara Kauffman
Lucy Crouse
Meghan Baker
Kristina Kauffman
Andree Kraker
Bernie Kleutsch
Larry Purchase
Holly Crouse
Pam Ruble
Arnold Williams

Thank you so much!

Larry giving Greg a break at his booth

Holly, Lucy's mom, watches as a guest plays Dino Bag Toss

Andree and Sara help at the information booth and with t-shirt sales

Joe, Bernie, Greg, and Scott, the 4 amigos, wearing the same style

Just some of the NARG members who helped make the NW FossilFest a success this year. Looking a little worn out after tear-down.

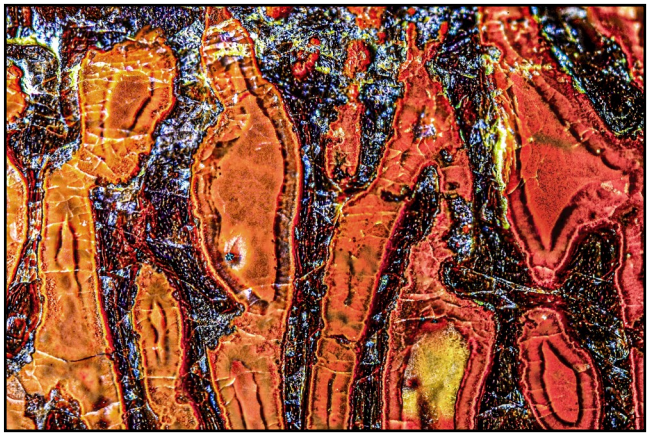
Joe Cantrell's Photos from NW FossilFest 2024

Some photos from Fossilfest. Various software now enables detail enhancement beyond what was possible even recently. This is NOT A.I., Each detail is actually there, the software is more sensitive and capable of making it visible. So these aren't necessarily "pretty," but look at all that information to consider.

Joe

Insect in amber from Dan O'Loughlin

Opalized petrified wood from Eastern Oregon



Dinosaur bone with structure emphasized

Petrified wood

Salamander skull fossil

Petrified wood

Greg Gentry donates crab collection to the Smithsonian

Bruce Thiel

Greg Gentry recently donated 300 prepared crab fossils from the Keasey Formation near Vernonia, Oregon, to the Smithsonian Natural History Museum. The Vernonia area where the crabs were found dates from 33 - 35.6 million years old. Kirk Johnson, director of the Museum inspected the crabs after they were unpacked and praising them said:

"What a magnificent collection. This is a great addition to the national collection. It is so rare that we get large collections that have had this amount of careful preparation. This is going to be a very important research collection and I am so grateful for the donation."

While many of the crabs were fairly complete, Greg was reluctant to include some of the lesser quality or incomplete specimens, of just claws and legs, however Conrad Labandeira, Senior Research Scientist and Curator of Fossil Arthropods, after reviewing pictures encouraged him to send them all, saying:

"We would like to accession the entire collection, partly to establish the range of morphological variation within these species—a rare opportunity in the fossil record. We are also interested in the relationships between the crabs and their various epizoans, including parasites, which also are rarely reported in the fossil record (at least for arthropods). I envision that this collection would be studied not only by carcinologists, but also by paleoecologists interested in fossil marine ecosystems."

Greg packed the crab concretions in eight empty wine boxes with padded dividers. The museum paid the freight for the 146 lbs. of fossils. Most of the crabs were identified as *Macroacaena schencki* (258), which is the most common crab found in that formation. The next most common crab found and included was *Megokkos macrospinus* (31). Greg also included 5 *Macrocheira sullivani* crabs—a recent discovery named after the late Bill Sullivan, a Vernonia resident who served as president of North America Research Group (NARG) for seven years, a local group of mostly avocational paleontologists, of which Greg is a member, based in Portland, Oregon. Some of the prepared crabs showed Serpulids, or tube worms attached to their carapace. A few other crabs upon close inspection, included small shells, gastropods and pteropods.

A photo album including samples of the collection follows:

Trivia Tidbit: A Carcinologist is a scientist who studies crustaceans.

Here are two of the five trays of Macroacaena schencki crabs that were donated.

Greg Gentry donation continued…

Here is a tray of the smaller Megokkos microspinus. Thirteen Megokkos had Serpulids or tube worms attached--photographed separately or in groups.

On the left below are five *Macrocheira sullivan*i - named after previous NARG president, Bill Sullivan. On the lower right are schencki crabs that included shells and/or gastorpods.

Greg Gentry donation continued…

Here are some of the assorted claws and legs that they asked also to be included.

In other crab news….

The Rice Northwest Museum of Rocks and Minerals is working with NARG's **Bruce Thiel** to present a display of Northwest crab fossils. Bruce has a large collection of crabs he has collected and prepared. Some of his best will be displayed starting on **March 1, 2025** at the museum. Remember that NARG members have FREE admission to the museum. We are looking forward to seeing this new display featuring expertly prepared crabs that have been frozen in time.

First Early Eocene Shark Assemblage from Western North America

Jim Goedert, an advisor for NARG, continues to discover and share new marine fossils from the state of Washington. This recently published paper describes the discovery and description of an assemblage of shark teeth and dermal ossicles from older Eocene rocks on the Olympic Peninsula. The teeth were used to classify sharks and fish that lived in deeper water during this epoch.

An early Eocene fish assemblage associated with a barite deposit in the lower part of the Crescent Formation, Olympic Peninsula, Washington State, USA

Abstract
Abundant shark and rare actinopterygian teeth are reported from a locality within the early Eocene (Ypresian) lower part of the Crescent Formation exposed in the Hamma Hamma River valley on the eastern Olympic Peninsula, Washington State, USA. This part of the Crescent Formation is predominantly submarine volcanic basalt with some sedimentary interbeds deposited in deep water. The teeth are derived from sediments that appear to directly overlay and in places interfinger with the margins of an anomalous lenticular barite deposit; one tooth was found in the barite. Genera represented include deep-water taxa (aff. *Chlamydoselachus*, *Mitsukurina*, *Notorynchus*, *Odontaspis*) and open marine, epipelagic sharks (*Alopias*, *Brachycarcharias*, *Jaekelotodus*, *Macrorhizodus*, *Otodus*, *Striatolamia).* The only other fossils found were two fragmentary shark vertebrae, numerous shark dermal ossicles, a single teleost tooth (*Egertonia*) and abundant, minute valves of a discinid brachiopod. This is the first report of macrofossils from the lower part of the Crescent Formation and the only early Eocene shark assemblage described from the North Pacific Basin. The shark assemblage also corroborates paleodepositional interpretations of the lower Crescent Formation as being in part ancient volcanic seamounts during early Eocene time.

Goedert, J.L., Kiel, S., Thomas, E.J. *et al.* An early Eocene fish assemblage associated with a barite deposit in the lower part of the Crescent Formation, Olympic Peninsula, Washington State, USA. *PalZ* **98**, 443–467 (2024). https://doi.org/10.1007/s12542-024-00692-y

Tsai and Goedert

NARG's Financial Support of a Satsop Whale Preparation

In April, NARG advisor, **Jim Goedert** et.al. published an important article in Current Biology - "The oldest mysticete in the Northern Hemisphere". This documented an important find by Jim many years ago. At that time, NARG contributed $500 in 2020 towards the fossil preparation that helped in its publication.

Jim is currently working on what's called the "Satsop whale". Jim shared, "This one is a world first - at least that is our interpretation currently. It is late Eocene, and appears to be a toothless mysticete, i.e. baleen bearing. And it is big. Found in situ, in the middle of the river, and pointed almost straight down. It was a big job just collecting it, and wet."

Bruce Crowley, the retired fossil preparator from the Burke Museum in Seattle, had been working on it the past 20 years mostly in his spare time and especially since his retirement.

Jim says: "It is not a particularly easy specimen but will be one of the most important for sure. We expect this whale to make a big splash. We are going to try for Science or Nature - **it is that significant.**"

Jim worked to raise funding to support Bruce Crowley's work and has appealed to some of his close friends who have supported him in the past. He hopes to make significant progress before Dr. Tsai, a visiting researcher from the University of Taiwan, arrives this summer from to study it.

In May 2024, NARG officers and members agree to donate $500 to support preparation of this remarkable specimen. We will receive acknowledgment in the paper, and it continues to add credibility to NARG's commitment to preserve and study NW fossils. With NARG's contribution, a total of $2,500 was raised for the preparation, in addition to earlier monies paid by Jim Goedert and Dr. Tsai.

For our donation, NARG received the following thank you note from the Burke Museum:

"Thank you so much for supporting Bruce Crowley's work on the Satsop whale. It's an important fossil, but a daunting project to prepare--and thanks for organizing the additional support from NARG! So generous and going to a great cause." - Christian Sidor, Curator of Vert. Paleo.

In talking about Dr Tsai's visit from Taiwan, Jim said that the whale he came to study was sealed in a display case that could not be opened with great trouble and some expense. Jim mentioned the Satsop whale to Tsai and--

"He wasn't too excited until we got it all out and started reassembling it (it was in 7 drawers in one cabinet, and something of a jumble). When we put the-already-prepared pieces together and he could see it all--with the earbones--and I explained the age--then this one became the focus of now two visits, and soon to be 3."

"Everything went great when Dr. Tsai was here. We even found another whale low in the section - the front end of a small odontocete. Got lots done at the museum, and I have an official museum ID now so I don't have to sign in as a visitor to get a key. Also got some photography done on some specimens that Steffen and I will work on, and found out I have access to this fancy setup whenever needed. Focus stacking and all that stuff, and a photographer that will do this stuff (a retired Boeing employee). We are waiting now on some Strontium isotope ages for the Satsop whale. We submitted some samples of shell from Bathybembix (snails) and Aturia from above where the whale came from (we couldn't find anything datable in the whale layer). Tsai submitted 3 samples to 3 labs, and we are keeping our fingers crossed. Hoping for something like 33.9 Ma - the Eocene/Oligocene boundary. Older would be even better. I have been prepping a mass of bones from the back of the skull here at home, mostly acid etching, and will rinse it this afternoon. It contains one of the occipital condyles, the atlas vertebra, and part of the axis vertebra and some other bits. It was really hard to interpret before, but these will be important additions to the description. Now we have to figure out what another weird mass of bone is that we thought contained an occipital condyle because we know now what the real one looks like. This whale has some strange features that make it even more exciting. Did I tell you we eventually figured out that the forelimb looks a bit like Popeye's arms? Usually in whales the ulna and radius are similar to each other in dimensions. In this whale however, the radius is inflated and almost twice the size of the ulna (in the width and depth of the shaft). Very odd."

A Momma's Visit to Nebraska

Megan Gagner

In July 2024, I was able to take a field trip to Nebraska to visit my son and NARG member, **Isaac Gagner**. Isaac had finished his first year at the South Dakota School of Mines and was spending his summer working as an intern at the Ashfall Fossil Beds State Historical Park. Ashfall is in the very out-of-the-way northeast corner of Nebraska. The nearest motel is 30 miles away in the town of O'Neill boasting 3600 people.

Isaac Gagner, far left, with other interns and supervisors

Isaac and fellow intern, Katie, walking into the pit to start digging

Ashfall preserves the fossils of many mammals showing abnormal, pathological bone growth, termed Marie's disease. The bone growth is secondary to lung problems, in this case most likely caused by ash and gasses from an eruption at Yellowstone about 12 million years ago.

The original dig in the 1970's with National Geographic removed the fossils to the University of Nebraska Natural History Museum in Lincoln, NE.

Baby Rhino formerly on display in Morrill Hall at UN, now residing behind the scenes in collections.

The current dig at Ashfall is encapsulated in the Hubbard Rhino Barn, which covers an ancient ash-covered watering hole. I was able to follow an L-shaped boardwalk to view many fossils *in situ* and in various stages of preparation. This gives visitors a fantastic chance to appreciate the way that the animals died in stages.

The stratification indicates the death order. Small mammals' dead bodies partially covered by ash and then walked over by the rhinos who died last and are uncovered first in the ash. Here you can see the horse is at a lower layer than the rhino.

Ashfall continued…

University of Nebraska's Natural History Museum in Lincoln contains a lovely upright specimen to get an idea of what these animals looked like in life.

In the summertime you can watch the additional prep work on the Ashfall veranda behind the Visitor Center. Be sure to stop by the store in the Visitor Center as Sandy keeps an interesting variety of books in stock. This out of the way stop is definitely worth the stop if you get a chance. It does close completely for the winter.

**Isaac Gagner is home for Winter Break and will be giving a presentation on his internship at NARG's January monthly meeting. He is always organized and informative: an excellent speaker! Please note that the meeting is on a different Wednesday AND in a different location this month! We will meet on January 8, 2025 at the Rice Northwest Museum of Rocks and Minerals in Hillsboro. We will return to our normal first Wednesday of the month meeting at the Tualatin Heritage Center for February.

Oregon Coast Fossil Report

Kent Gibson who lives in Newport near the Oregon Coast has been finding many great marine mammal fossils. The Winter storms have been hammering the coast bringing high tides that wash away the sand and reveal the rocks below. So far, some of Kent's best fossil finds have been skulls (possible porpoise and dolphin), a huge rock containing multiple whale vertebrates, cetacean phalanges, and more. Kent has a warehouse full of marine mammal, shark, and mollusk fossils. **Ray Troll**, fossil illustrator and celebrity, stopped by Kent's place to take a tour recently. Not his first and won't be his last tour of Kent's amazing collection.

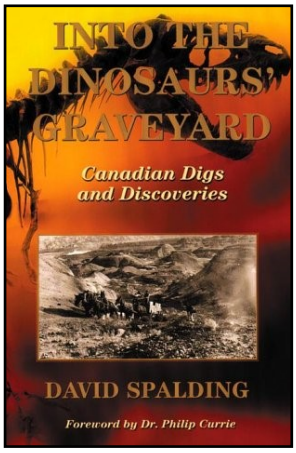
Arnold Williams and **Weylin Charland** have been out scouring the sands as well. Arnold travels to the coast, specifically South of Newport, from his home in Albany often. He has found some beautiful fossilized Musashia shells, whale vertebra and bone. Weylin is an avid fossil collector and has found some nice pieces as well, including a partial dolphin skull.

If you want to collect these types of fossils, the best time to go is in Winter during a negative tide. You can see forecasted tides using an app like "Tides" or an online site like Tideschart.com. The Newport area is usually a great area to collect from, with beach access at: Beverly Beach State Park, Moolack Beach, NW 68th Street, and north of Lost Creek State Recreation Area. Please, never turn your back on the ocean and do not attempt to walk the beaches at incoming very high tides.

Kent hauling large rock containing multiple whale

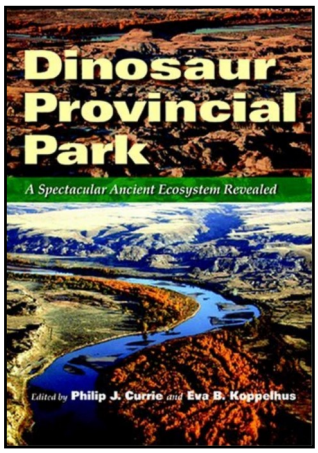
Whale phalanges (finger/fin bones)

Ray Troll brought his family to see Kent's warehouse of Oregon Coast fossils



Book Reviews: Canadian Dinosaurs

Harold E. Hinds, Jr.



David Spalding, Into the Dinosaurs' Graveyard: Canadian Digs and Discoveries (1999; Toronto, Canada: Doubleday Canada 2000). The paperback edition includes "small corrections."

Philip J. Currie and Eva B. Koppelhus, eds., Dinosaur Provincial Park: A Spectacular Ancient Ecosystem Revealed (Bloomington, Indiana: Indiana University Press, 2005).

In the Spring of 1956, my family was camping at Beverly Beach on the Oregon Coast when my parents struck up a conversation with a couple visiting from Alberta, Canada. "What's that boy doing up on the cliff," inquired the Canadian Andersons. "Hunting for fossils" (it was legal then), was my parent's reply.

The visitors informed my parents that our family should come to Drumheller, Alberta so I could hunt for dinosaurs. Incredibly, my parents had always wanted to visit Glacier National Park and the Canadian Rockies. So the following summer, we traveled to Drumheller via the Park and the Canadian Rockies, and I got to search for fossils at the Park, at Munson Dinosaur grounds near Drumheller, and the Burgess Shale in British Columbia (all quite legal then!).

In preparation for the trip, I visited one of my favorite Portland used bookstores, Hyland's Old Book Store at SW 4th in downtown Portland. In Hyland's basement was a collection of probably every National Geographic Magazine issue ever published, including a 1919 issue, with Barnum Brown's account of "Hunting Big Game of Other Days: A Boating Expedition in Search of [Dinosaur] Fossils in Alberta, Canada." Clearly for a fifteen-year-old budding paleontologist, the forthcoming trip would be very special, and it was.

In August 1956, the Andersons met my family at Drumheller, and we proceeded into what just the year before had been set aside by the government of Alberta as the Dinosaur Provincial Park. Fossils littered the ground: I literally picked up Albertosaurus and Edmontosaurus teeth, small vertebrae, corprolites, etc. Luckily, Dr. Wan Langstron, Jr., and his field crew, from the National Museum of Canada, had just finished collecting a duckbill dinosaur. He took time from his field work to chat with and encourage this young fossil collector. When I discovered an Edmontosaurus femur, he incredibly allowed me to collect the distal end for my personal collection. Such collecting was quite legal then—in a few years that would change. Later, I donated these fossils to the University of Oregon's Condon Fossil Collection.

David Spalding's volume on Canadian dinosaurs is both a history of discoveries across Canada and vignettes about past and current research, museums, expeditions, paleontologists, dinosaur fossils and species, and dinosaur trivia. Basically, Spalding seeks to correct the record since "Canadian dinosaurs are not as well known- even in Canada- as American ones. When they are, it is often because they also occur in the U.S., or because specimens were collected by Barnum Brown or Charles Sternberg and are now on display in American museums" (pp. 246-247).

There does not appear to be a logical development to this volume, other than the thesis of introducing some aspect of Canadian dinosaurs. Rather each chapter is a collection of vignettes relating- occasionally relating quite loosely- to a theme. For example, chapter 7, "The Crown Jewel of Paleontological Museums," is devoted to the history, development, and notable aspects and shortcomings, of the Tyrrell Museum of Paleontology. Vignettes are devoted to the following: an important fossil discovered during the Museum's construction; the challenge of creating the Museum; the importance of Phil Currie, Curator of Vertebrate Paleontology; displays vs. research; the Museum's devotion to solving riddles; the Dinosaur Park's Centrosaurus Bone Bed; dinosaurs as the Tyrell's "meat and potatoes"; "the scale and drama of the [Museum's] exhibits; and their popular subject matter"; Museum personal and public support for the Museum; relationship of the Dinosaur Park to the Tyrell Museum at Drumheller; etc.

Book reviews continued…

If you are interested in a highly accessible, non-technical introduction to nearly every conceivable aspect of Canadian dinosaurs, David Spalding's volume will inform and delight.

For the more advanced student and scholar, turn to Philip J. Currie and Eva B. Koppelhus' comprehensive "first scientific overview of the [Dinosaur Provincial] Park, its flora and fauna, its major fossil discoveries, and its ecology" (book jacket). In depth chapters are devoted to the following: "studies of the Park's geology, paleoecology, bone beds, taphonic modes…palyomorphs, mollusks, fishes, reptiles, lissamphians, crocodylians, and pterosaurs," orthithischian dinosaurs, theropods, birds, eggshells, and mammals (jacket and Table of Contents). Although its nearly 20 years since this 2005 state-of-the-knowledge was published, and undoubtedly technical journals will have disclosed new theses, discoveries, and interpretations, the reader will be richly rewarded by these scientific, in depth, topical summaries and analysis.

Each authoritative chapter will be worth pursuing, e.g. Chapter 2, "Identifying Lost Quarries," by Darren H. Tanke, is a fascinating example of historical archaeology. Lost or mystery quarries have been relocated via historical photographs, field notes, garbage left behind, newspapers used to wrap specimens, etc. Accurate location data "can be passed on to the respective institutions curating the field photographs and specimens, greatly enhancing their historical and scientific value" (p. 50). The author adds that "Much work remains to be done in the Park" (p. 50). Indeed, David Spalding briefly mentions that Philip Currie was "excavating an Albertosaurus site first found by Barnum Brown and then lost for years… it's only a quarter excavated. It's the first evidence of packing behavior in tyrannosaurs." (p. 282).

Selecting just one additional chapter to illustrate the volume's value: Chapter 21, "Vertebrate Ichnology," by Richard T. McCrea, Philip Currie, and S. George Pemberton. Dinosaur footprints are rarely found in the Dinosaur Provincial Park, given their "appear[ing] so similar to the nondescript concretions that are commonly found in the Park." And when discovered, are of poor quality. But, the authors comment that, "Vertebrate ichnological research in the Park is in a preliminary stage" (p. 416). To date, fossil footprints of both theropod and ornithopod dinosaurs have been discovered. And those few that have been detected are superbly illustrated and diagnosed in Chapter 21.

As David Spalding observes, the best preservation of dinosaur footprints and trackways "have been found…along the Peace River canyon in northeastern British Columbia" (p. 91). Spalding also in a highlighted aside notes that "It is impossible to know with certainty what animal made an individual footprint unless it literally dropped dead in its tracks." Thus, "The solution is a parallel nomenclature, applied to tracks alone, in which they are given scientific names just as if they were animals" (p. 92). A fact not mentioned by McCrea, Currie, and Pemberton. Perhaps none of the Park footprints were of sufficient quantity and/or quality to merit being named.

Both of these volumes have been donated to our library.

Call for Volunteers

We have several needs in the club for volunteers. Would you consider stepping up and filling in some of these upcoming vacancies? We have people who will support you as you learn the ropes and step into your new position. Please consider if you could help NARG out in these spots.

1) In February, our long-time Secretary, **Tami Smith,** will be retiring. We will be electing new officers at our February meeting. **Greg Carr**, our current Vice President, has requested to run for Tami's empty spot. That will leave the Vice President spot open. If you are interested in this position, please let our President, **Aaron Currier** know (fossils@curriergraphics.com).

2) This is the last newsletter that current coordinator, **Tara Baker**, will be putting out. She is willing to train a new incoming Newsletter Coordinator for the next edition. The newsletter was originally planned to come out four times a year and includes a lot of news and NARG accomplishments. To use the current format of the newsletter, you need to have a PC computer that can run Microsoft Publisher. Attention to detail and ability to learn new programs is important for this position. For more information, please email Tara at tbakeror@yahoo.com.

3) Finally, we are in need of volunteers for the Board of the Portland Regional Gem and Mineral Show. Many people have stepped down from important positions like Treasurer and Marketing. Without new members, there is the potential that the PRGMS will fold next year. To learn more about needs, please contact Tara Baker (tbakeror@yahoo.com).

New Descriptions and Insights to Behavior of Spike-Toothed Salmon

Ed Davis, an advisor for NARG and faculty at University of Oregon, organized an in-depth study of new fossil specimens collected and donated by **Greg Carr** and the North America Research Group. Previous salmon specimens from the Gateway Quarry near Madras, OR were partial skeletons with skulls misshapen during fossilization. Greg Carr saw and purchased a nicely preserved skull and partial backbone from eBay. NARG saw the importance of the specimen and purchased it from Greg, so that it could be donated to the University of Oregon for study. It is this specimen and ithers that Ed Davis used for the basis of this study. This recently published paper describes accurate descriptions of the fish and insights into their behavior based on the new information.

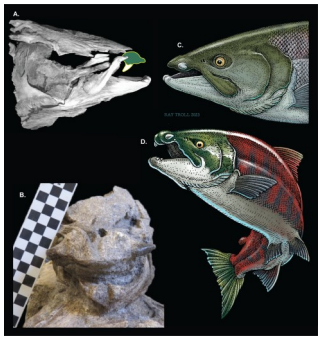


Fig 1. †*Oncorhynchus rastrosus*.
(A) CT model of Holotype, UO F-26799, skull in right lateral view with a stylized drawing of the originally proposed "sabertoothed" position of the isolated premaxilla; (B) UO_A in anterior view of skull, prior to complete preparation and CT scan; (C) Artist's rendering skull of male iconic fish with accurate spike-tooth configuration; (D) Artist's rendering of complete female iconic fish with accurate spike-tooth configuration. Scale bar blocks = 1 cm each.

Greg Carr led two NARG excavations of the quarry that yielded more than 15 more salmon. Some of these were partially articulated and included better preserved skulls. These will yield even more data for future research about this interesting species.

From sabers to spikes: A newfangled reconstruction of the ancient, giant, sexually dimorphic Pacific

Abstract
The impressive †*Oncorhynchus rastrosus* of the Pacific Northwest's Miocene and Pliocene eras was the largest salmonid ever to live. It sported a hypertrophied premaxilla with a pair of enlarged teeth which the original describers reconstructed as projecting ventrally into the mouth, leading them to assign the species to "*Smilodonichthys*," a genus now in synonymy. Through CT reconstruction of the holotype and newly collected specimens, we demonstrate that the famed teeth projected laterally like tusks, not ventrally like sabers or fangs. We also expand the original description to characterize sexual dimorphism in mature, breeding individuals. Male and female †*Oncorhynchus rastrosus* differ in the form of the vomer, rostro- dermethmoid-supraethmoid, and dentary, much as do other extant species of *Oncorhynchus*. Male specimens possess a more elongate vomer than do females, and female vomers have concave ventral surfaces and prominent median dorsal keels. The dentary of females has no evidence of a kype, though some specimens of †*O. rastrosus* have a non-uniform density mesial to the tooth bed, which we interpret as a male kype. Unlike extant *Oncorhynchus*, male and female †*O. rastrosus* do not differ in premaxilla shape. Because male and females possess hypertrophied premaxillae and lateral premaxillary spikes, the former common name "Sabertoothed Salmon" no longer reflects our understanding of the species' morphology. Accordingly, we redub †*O. rastrosus* the Spike-Toothed Salmon and postulate that its spikes were multifunctional, serving as defense against predators, in agonism against conspecifics, and as a practical aid to nest construction.

Acknowledgments
We thank Gateway Quarry Landowners for access to the land and donation of specimens. **G. Carr and North American Research Group for donating specimens**; P. Konstantinidis and G. R. Smith provided helpful discussion and insight about premaxillary tooth morphology among fishes.

Claeson KM, Sidlauskas BL, Troll R, Prescott ZM, Davis EB (2024) From sabers to spikes: A newfangled reconstruction of the ancient, giant, sexually dimorphic Pacific salmon, †Oncorhynchus rastrosus (SALMONINAE: SALMONINI). PLoS ONE 19(4): e0300252. https:// doi.org/10.1371/journal.pone.0300252

Shark-Like Egg Capsule Described from the Lincoln Formation

NARG member from Washington, **Thomas Stevens**, and NARG advisor, **Jim Goedart,** published a paper with Stephen Keil. The paper describes one of only two fossilized chimaeroid egg capsules from the Pacific Northwest. Chimaeroids are a group of mostly deep water, cartilaginous fish. Their closest living relatives would be sharks and rays. Some species still exist, but they were much more numerous and diverse in past ages. This fossil was discovered by Thomas Stevens in 2023.

An Oligocene chimaeroid egg capsule from western Washington State, USA, and priority of *Vaillantoonia* Meunier, 1891

Introduction

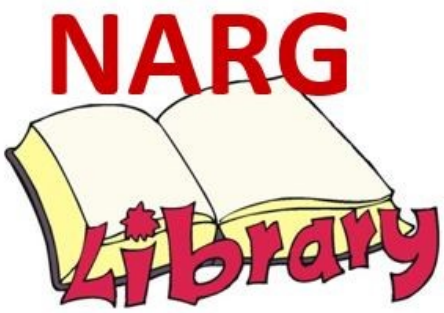
Fossil egg capsules of chimaeroids (holocephalian fishes), although rare, have been known for more than 150 years (Bessels, 1869; Meunier, 1891a) and have been found in rocks as old as Upper Triassic (Gottfried and Fordyce, 2014). Egg capsules of extant chimaeroids are spindle shaped, with a smooth central body where the embryo develops, an elongate anterior beak through which the hatchling emerges, and an elongate posterior pedicle. The capsules are flanked by a lateral membrane or web on both sides, and the web is reinforced with branching or unbranching rib-like costae that extend laterally from the central body, beak, and pedicle. Specimens are typically about 10–30 cm long. Egg capsules of extant chimaeroids are made of collagen (Hamlett et al., 2005) and as fossils, chimaeroid egg capsules are typically preserved as external casts (Fischer et al., 2014).

There are two schools of thought on how to handle these fossils taxonomically. One assigns them to extant chimaeroid genera that produce morphologically similar egg capsules (Obruchev, 1967; Vozin, 1968; Stahl, 1999). However, it was pointed out that Mesozoic chimaeroid teeth are different from those of modern genera, hence, egg capsules with a morphology nearly identical to that of extant chimaeroids have apparently been produced by completely different genera (Jaekel, 1901; Fischer et al., 2014; Duffin et al., 2022). Therefore, the second school favors a parataxonomic scheme of ichnogenera and ichnospecies, already in use by the late 1800s (Meunier, 1891a) and adopted by most modern scholars (Brown, 1946; Fischer et al., 2014; Gottfried and Fordyce, 2014; Harrison et al., 2021; Duffin et al., 2022). Such a system is widely used and accepted for fossil shark egg capsules ranging as far back as the Carboniferous (Böttcher, 2010; Fischer et al., 2014; Krüger et al., 2021; Mottequin et al., 2021, 2022).

The currently used ichnogenus for chimaeroid egg capsules is *Chimaerotheca* Brown, 1946 (Brown, 1946; Gottfried and Fordyce, 2014; Harrison et al., 2021; Duffin et al., 2022). Here, we argue that *Vaillantoonia* Meunier, 1891a, being the first generic name introduced for a fossil chimaeroid egg capsule, has priority over *Chimaerotheca* and should be used instead.

The specimen reported here is from Oligocene deep-water deposits of the Lincoln Creek Formation in western Washington State, USA. Western Washington hosts a wide range of deepwater deposits of Eocene to Miocene age, which have produced a number of elasmobranch fossils (e.g., Jordan and Hannibal, 1923; Welton, 1974, 2015; Welton and Goedert, 2016; Goedert et al., 2024). This record includes egg capsules of catsharks, found at a late Eocene methane-seep deposit (Treude et al., 2011). The parataxon *Scyliorhinotheca goederti* Kiel, Peckmann, and Simon, 2013, was introduced for these fossils, which feature a mineralized capsule wall rather than being casts.

Kiel, Steffen & **Stevens, Thomas** & **Goedert, James**. (2024). An Oligocene chimaeroid egg capsule from western Washington State, USA, and priority of *Vaillantoonia* Meunier, 1891. Journal of Paleontology. 10.1017/jpa.2024.26



The NARG library has just become easier for members to use. The 430 books can be viewed by using the link below. Once you find a book you want, click on it and find its "index" number. Requests for books using the index number are made to danolough@aol.com. He will notify you if the book is already checked out. If it is not, he will bring it to the next NARG meeting. Members can check out 2 books at a time and should return them at one of the following 2 meetings.

http://cloud.collectorz.com/danolough/books

NARG Membership

NARG's annual membership dues are due January 1, 2025.

Individual Membership	$25
Family Membership	$40
Student Membership	$10

Pay your membership by:

***Mail a check and application to:**
NARG (North America Research Group)
Membership
PO Box 233
Tualatin, OR 97062

***Renew membership and pay via credit card with PayPal (No account necessary):**

Use the following links:
Family membership: $40, click here.
Individual membership, $25, click here.
Student membership, $10, click here.

Fossil Calendar

Jan 8	NARG Monthly Meeting, Isaac Gagner, speaker in-person, Rice NW Museum of Rocks and Minerals @ 7PM
Feb 5	NARG Monthly Meeting, Dave Grossnickle (mammal origins), speaker via Zoom, Tualatin Heritage Center @ 7PM
Feb 8	FossilFest at the Hatfield Marine Science Center, Newport, OR
Mar 1	Grand Opening of Bruce Thiel's Crab Display at the Rie NW Museum of Rocks and Minerals
Mar 5	NARG Monthly Meeting, George Frandsen (coprolites), speaker via Zoom, Tualatin Heritage Center @ 7PM
Apr 2	NARG Monthly Meeting, Tualatin Heritage Center @ 7PM

Check the website, emails, and Facebook for any updates.

For a listing of local gem and mineral shows, check out:
http://www.mineralcouncil.org/shows.pdf

http://orerockon.com/ Click on Portland Area Rock Clubs (includes PNW Clubs)

NARG Officers:

President:	**Aaron Currier**	**paleorun200@gmail.com**
Vice President:	**Greg Carr**	**greg.fossil.hunter@gmail.com**
Secretary:	**Tami Smith**	**dtm.smith3@frontier.com**
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Debbie Shannon	**dsbshann@gmail.com**
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MacKenzie Smith
Michael Santino
Larry Purchase

Committees:

Newsletter:	**Tara Baker (coordinator)** **Dan O'Loughlin, Peg Johnson,** **Bruce Thiel, Robert Rosé (proof-readers)**
FossilFest:	**Tara Baker** **Debbie Shannon**
NARG Holiday Party:	**Tara Baker** **Debbie Shannon**
Portland Regional:	**Debbie Shannon** **Tara Baker** **Dan O'Loughlin**

NARG's Mission Statement

To encourage responsible stewardship of earth's paleontological resources; to promote scientific research, communication,