



NARG NEWSLETTER

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14th Annual NW Fossil Fest

“When the Buffalos Roamed”

By Dan O'Loughlin

This year our annual event was threatened with rain which, thankfully, never happened. We had 572 visitors with a large majority being kids. Our standard free toys, free Moroccan shark teeth, water feature, and fossil prep stations kept them busy. Ten exhibit cases full of beautiful fossils intrigued everyone. Aaron Currier was kept very busy identifying fossils and pseudo fossils for people. Joe Cantrell displayed his prowess in stack photography with visuals brought to life on a large HDTV. Greg Carr always attracts blossoming paleontologists with his hands on aircsibe station where visitors were allowed to operate the actual tools we use in fossil preparation. This year we had three of our members give talks related to fossil bison. Jauhn Brasseur gave one on “Megafauna of the Pacific Northwest’s Pleistocene Epoch”, while Greg Carr and Debbie Shannon spoke on “Recent Bison Discoveries in the Willamette Valley”. Both were well attended. Lisa Schenk drew our theme fossil the Pleistocene Bison (*Latifrons* sp.). The logo made for a great t shirt and poster! I wish to thank all the members that helped set up, park cars, staffed the event, and packed up the event for a long but enjoyable day. Now for next year’s theme....



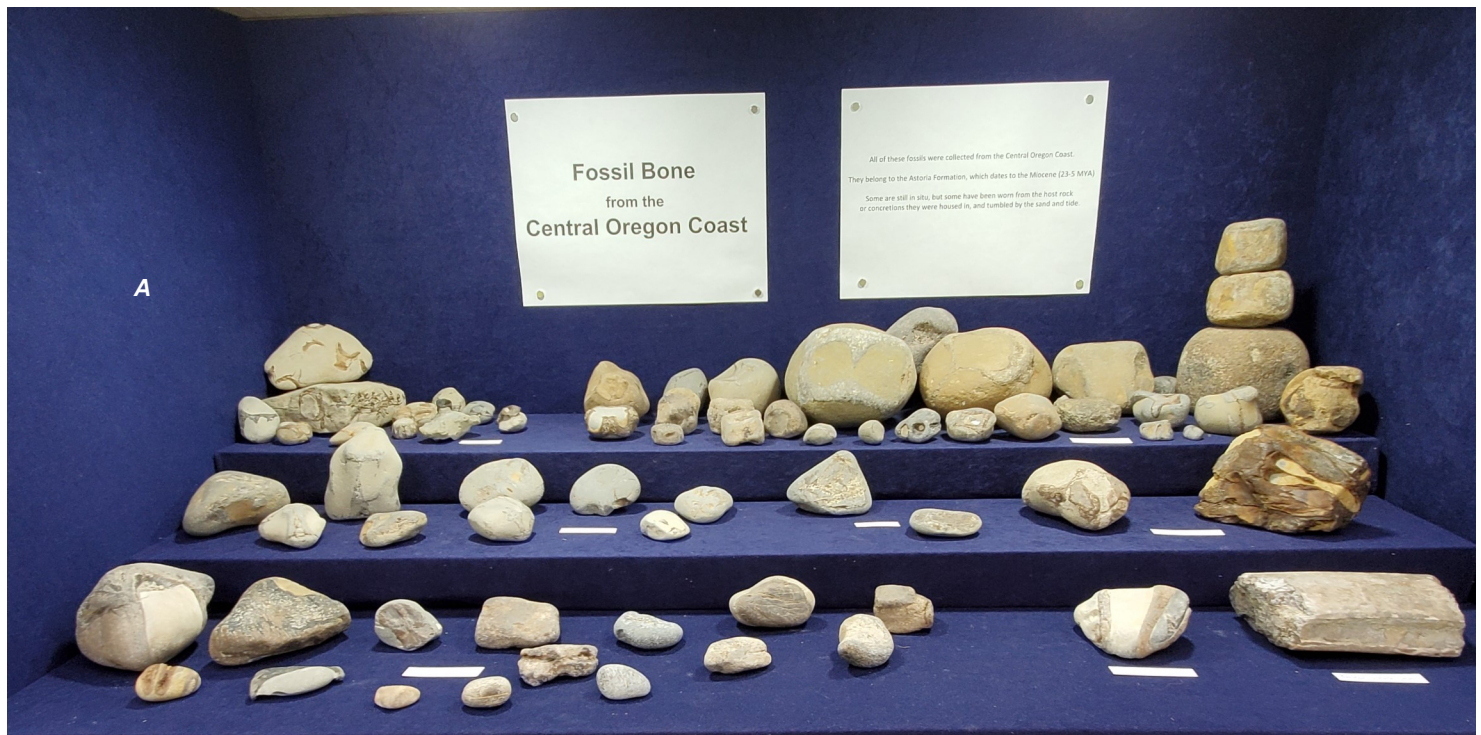


nargpaleo.org









Pollen in the Paleogene: Creating a Clarno Collection

MacKenzie Smith

Pollen is not just all allergies. Because floral assemblages reflect the climate we can use pollen to reconstruct climate from the past. Some floral assemblages are heavily biased and reflect only trees growing near deposition. Thus, pollen can provide evidence of herbaceous taxa and or plants growing some distance away from deposition. A small, cubic centimeter of rock or sediment can yield hundreds and hundreds of pollen grains which is incredibly useful for statistics. We can even use it to date younger strata (generally late Pleistocene). However, it is not without its own problems. For one, we don't often find pollen from certain plants pollinated by animals because they have efficient pollinators and do not put their pollen to the wind. Secondly, (similar to the first reason) different plants produce different amounts of pollen and thus our sense of abundance can be skewed. And thirdly, different polynomorphs can travel different distances, which can once again, skew our view on abundance. But despite these pitfalls, pollen still remains an important dataset to acquire information about the past especially where no data might exist or to corroborate records.

When most people talk about studying pollen, they are actually referring to studying polynomorphs which is a term used to describe both plant spores and pollen. Both are made of the same material, sporopollenin, a heavily resistant substance (nature's microplastic) which is great for preservation. Spores are structures produced by the sporophyte generation of a plant which in turn, produces a gametophyte (these are not to be confused with fungal spores, which preserve and can be studied too but are somewhat a neglected group). Spores can be identified by their aperture (opening). They can have one slit (monolete) or three slits (trilete). The body of the spore is generally flatter than pollen with ornamentation varying widely from species to species from being folded, smooth or ornate. Examples of plants that we get spores from are mosses, ferns and lycopods (club mosses, which are not true mosses). In contrast, pollen is a structure only produced by seed plants. It is a capsule for sperm cells produced by the gametophyte generation to prevent desiccation. The sperm will then find an ovule to form a seed. Pollen grains also look different than spores. They can be spheres to football shaped. The apertures for pollen vary in number and may be pores, slits (colpus or sulcus), a combination of a colpus and pore (colporeate) or have no opening at all. The sculpture (texture) of pollen can vary widely like in spores with ridges, spikes, reticulate mesh or smooth surfaces. Various combinations of these characters help us identify spores and pollen.

Unlike macrofossils, we can't see fossil pollen in the field. Instead, we have to process rock or sediment samples back at the lab. This involves cutting out an uncontaminated surface, crushing it and putting the sample through various solutions and centrifuging it each time. These solutions (in order) are HF, HCl and DARVAN's #4. The concentration and number of times a solution is added to a sample can vary by rock. Processing should only be done wearing closed toed shoes, full armed and legged clothes, rubber gloves and protective eyewear either under a fume hood or with proper respiratory gear. Once the solution has been poured out of the last sample, the residue in the test tube can be swiped on a slide or disk for study under a microscope. Microscopes often used in pollen studies are light microscopes, SEM (Scanning Electron Microscope) and TEM (Transition Electron Microscope).

For about a year I have been working on identifying pollen and spores from two localities in the Clarno Formation of central Oregon. Both the White Cliffs Jr. and Nut Beds localities are between 44-43 million years old but are about ten miles apart and represent different depositional environments, lacustrine and fluvial respectively. Preliminary examination of the macrofossils suggests that there are differences in the plant communities with White Cliffs Jr. containing more temperate floral elements and the Nut Beds containing more subtropical floral elements. So far, the following families are shared based on the pollen record between White Cliffs Jr. and the Nut Beds:

Pinaceae (Pine family)

Juglandaceae (Walnut family)

The following families so far have only been identified from White Cliffs Jr.:

Acanthaceae (Acanthus family)

Betulaceae (Birch family)

Cyperaceae (Sedge family)

Eucommiaceae (Eucommia family)

Fagaceae (Beech family)

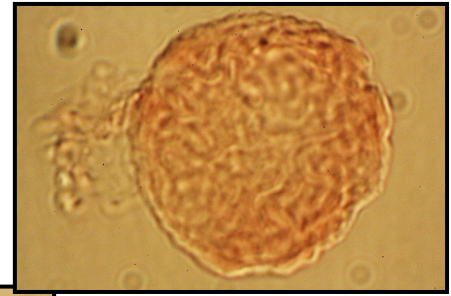
Poaceae (Grass family)

Platanaceae (Sycamore family)

Sapindaceae (Maple family)

Ulmaceae (Elm family)

Sapindaceae
(Maple Family)



Ulmaceae
(Elm Family)

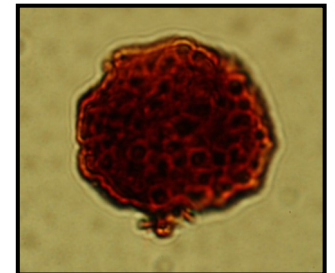
Pollen from Betulaceae, Juglandaceae, Fagaceae and Ulmaceae appear to be the most abundant and several genera can be identified from Betulaceae and Juglandaceae. Macrofossils of Acanthaceae, Cyperaceae, Eucommiaceae, Poaceae and Sapindaceae are not known from this site and thus their pollen is our only record of knowing of their existence at White Cliffs Jr. Pollen of Sapindaceae has been recovered before though from Clarno paleosols (fossil soils). A fungal spore that looks to be identifiable was also recovered.

The following families so far have only been identified from the Nut Beds:

Amaranthaceae (Amaranth family)

Ephedraceae (Ephedra family)

Amaranthaceae
(Amaranth family)



Neither of the above families are known from the macrofossil record at the Nut Beds. There are several other grains from the Nut Beds that have yet to be identified.

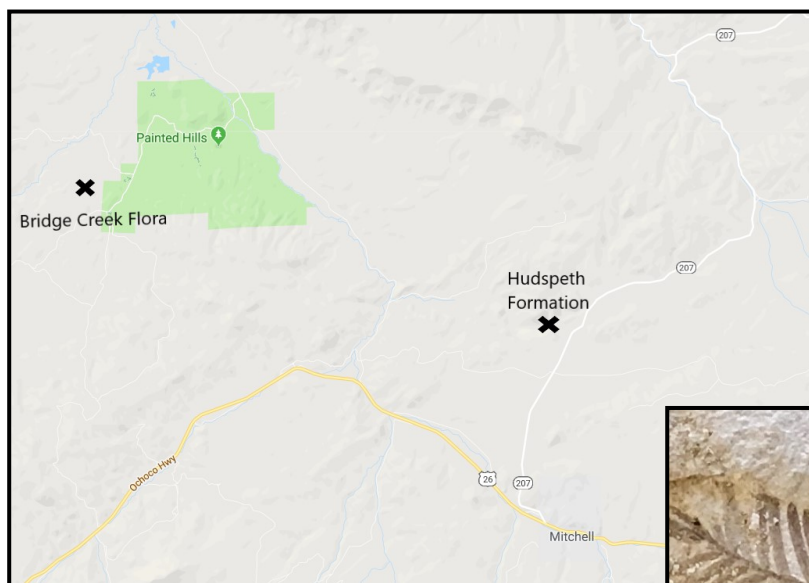
So far, studying the pollen from these two localities has proven to achieve a more accurate understanding of the diversity in these mid-Eocene communities. Additional identification and official counts will be needed though in order to have a more meaningful discussion regarding the pollen record in this formation. Stay tuned!

Mitchell Field Trip: Oligocene Bridge Creek Flora and Cretaceous Hudspeth Formation Ammonites

By Tara L. Baker

On July 20, 2019, a small group of NARG members met in the little town of Mitchell, Oregon before visiting two fossil sites in the area. The group consisted of Rawdon Tomlinson (leader), Debbie Shannon, Bryn Cram, and myself (Tara Baker).

First, we visited a site located to the west of the Painted Hills Unit of the John Day Fossil Beds National Monument. This site is known for having preserved Oligocene Bridge Creek Flora (35-32 MYA), consisting mostly of plant impressions on fine-grained white shales. This type of rock is indicative of a previous lake-bed or other water body with little to no current. The most common plant fossil found at this site is the *Metasequoia*, or Dawn Redwood. During the Oligocene Epoch, this area of Oregon was most likely forested with these redwoods and stands of *Ulmus* (elm), *Quercus* (oak), *Acer* (maple), and *Alnus* (alders), all of which are found in the Bridge Creek Flora.



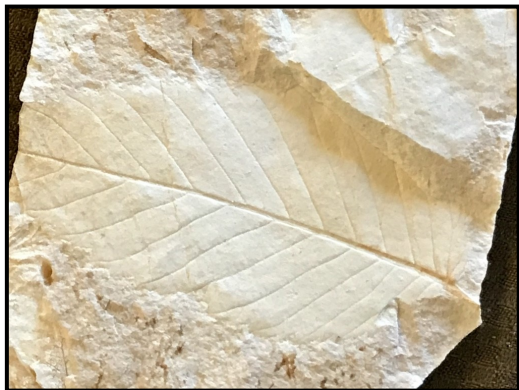
Map of two sites visited during July 20, 2019 NARG field trip.

the hillside in the morning heat. Most of our fossil finds were of *Metasequoia*. Debbie collected these specifically to hand-out to children who might attend the 2019 Fossil Fest activities. We also found examples of elm and other unknown plant species.

To reach the site, it is necessary to drive through the Painted Hills Unit and outside the park onto BLM land. Once parked, our group hiked 0.8 miles ending at the top of a short hill (See Tara for GPS ordinances). At the site, it was obvious that we had reached the correct location as others had obviously been there before us; multiple shallow pits spread across the summit. Pieces of white shale covered the hillside, many of these containing partial or full plant leaf impressions. We spent two hours at the site collecting shale rocks from



Metasequoia fossil from the Bridge Creek Flora site.



Ulmus fossil from the Bridge Creek Flora site

After a shaded picnic lunch back at Mitchell City Park, we went out to a second site north of town known for ammonites. The Hudspeth shale formations are older than Bridge Creek, being laid-down in the Cretaceous Period (65-144 MYA). The rock here is made-up of a darker marine mudstone that breaks into larger blocks rather than layers like the shales of Bridge Creek. 100 million years ago, this area of Oregon was covered with a saline ocean teeming with ammonites, an animal much like the modern-day octopus or squid. The spiral shells of these ammonites have not been preserved well in these mudstones, but as the shell was removed over time, the internal sutures of the animals were mineralized in the rock. This explains why this specific site is called the "Suture Beds." Other fossils marine animal of the time can be found here, as well as wood and reed fossils. Importantly, this site is the location where University of Oregon professor Greg Retallack, discovered a disarticulated dinosaur toe bone; this is the first confirmed dinosaur bone found in Oregon. So the exposed hillside at Hudspeth Formation was covered with a salty inland sea at the time when dinosaurs roamed the area.

Our group drove north of Mitchell on Highway 207 for 2.5 miles, then turned left onto a gravel road. We parked the cars on the side of the road about $\frac{3}{4}$ miles from the turn and climbed a small hill on the north-side of the road (See Tara for GPS ordinances). Again, it was easy to see that others had been looking for fossils, as shallow pits covered the hillside. Here, we had to use our hand-picks and shovels to slowly dig into the exposed layers of mudstone. We were looking for 2" to 4" round ammonite fossils and concretions.. We all found suture fossils, mostly partial remains of ammonites. Rawdon also found a nice impression of a bi-valve mollusk. The temperature had reached into the high-80's by this time under unrelenting sun, so we spent less than two hours at this site. We left sweaty and very dirty, but happy with our fossil finds.



Field trip members in a previously dug pit at the Hudspeth Formation site.



A partial bivalve fossil found at the Hudspeth Formation site.

Rawdon Tomlinson, field trip leader, showing off his ammonite find.



An ammonite fossil found at the Hudspeth Formation site. Top left, a close-up of the sutures.

For more info on the site, contact Tara or Rawdon.

2019 Pilgrimage to Fossil Lake, Hole-in-the-Ground and Paisley Caves

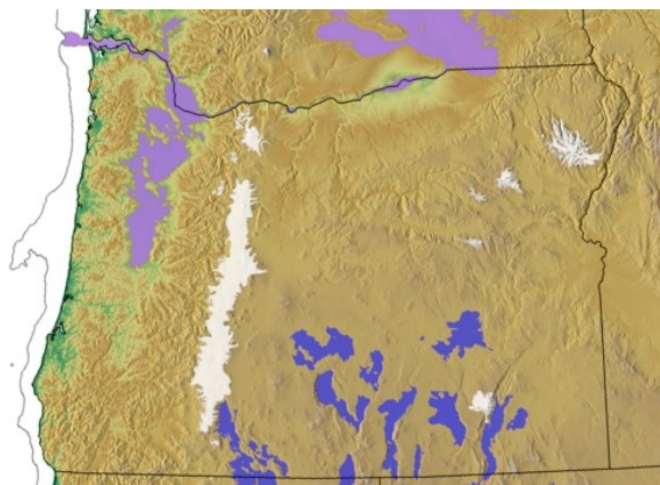
By Gregory Carr

This summer I visited two of the most famous geographical spots in Oregon – Fossil Lake and Paisley caves. These sites are two very special areas of Oregon that contain extraordinary glimpses of the past.



Note – this sign has been torn down!

Fossil lake, located by the community of Christmas Valley, contains some of the best fossil bone collections from the Ice Ages (Pleistocene) in Oregon. It is an old lake/wetlands/shoreline deposit, once covered with blowing sand and now uncovered by the same blowing winds. It has a large collection of bones (not as large as it once was) of all the animals that once lived there, but not plants. During the Ice Ages central Oregon was wetter and colder than present day, and many



large interconnected lakes covered what is now flat dry sagebrush and juniper basins. The 'Lake' has supplied fossils to collectors and researchers since the mid-1800's. The first noted occurrence of fossils was in 1867 during a visit of John Whiteaker, a former governor of Oregon. He delivered some collected fossils to Thomas Condon and it went from there. Check out the Wikipedia entry: [https://en.wikipedia.org/wiki/Fossil_Lake_\(Oregon\)](https://en.wikipedia.org/wiki/Fossil_Lake_(Oregon)).

Nowadays only permitted collecting of bones by accredited organizations is permitted as it is BLM land.



The area can be accessed from the north and south, though signs have been removed and a GPS is recommended. The blowing wind removes the smaller sand grains, leaving a 'desert pavement' of bones and small rocks. See these small and delicate fish backbones for example. The most recent discovery here is a set of Mammoth footprint trackway by Dr Retallack and a student field crew from the U of Oregon. Read about it here:



https://www.heraldandnews.com/news/local_news/mammoth-steps-found-at-fossil-lake/article_72c659d4-38f6-545f-b7a2-5718be8c4d51.html



Look but don't collect!



Along the way, just west of Christmas Valley, I visited "Hole-in-the-Ground", another Ice Age remnant – in this case a groundwater explosion crater called a "Maar" (German for a crater lake in Germany). The groundwater under the shallow lake was heated up by volcanic activity and had a large steam explosion, creating a hole a mile across and 700 feet deep. If you've got a small 4x4 you can drive to the bottom, but my pickup seemed a bit too large so I didn't try it. I did drive around the whole rim, though. There is another one called "Big Hole" nearby but it is all covered with trees and is harder to see. Link here: <https://www.atlasobscura.com/places/hole-ground>

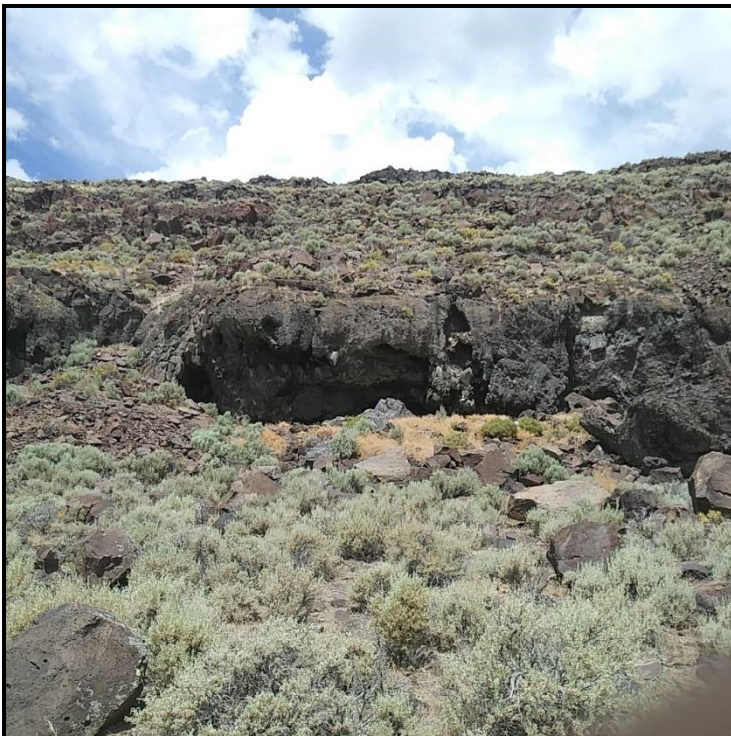


My last stop is the famous Paisley caves, oldest date human occupation site in Oregon. Human coprolites about 14,000 years old have yielded DNA analysis which have helped figure out the history of people in North America. It has recently been surpassed in age by a site in Idaho along the Snake river dated to 16,000 years ago. And yes, these dates are older than the last Bretz floods – some “First Peoples” did witness the floods! Located just to the East of the southern end of Summer Lake, you can drive to them in an ordinary vehicle.

The caves are wave-worn sites undermining a lava flow that was alongside an Ice Age lake. Now dry and miles from the lake, it must have been a welcome shelter and hunting lookout.

Routinely excavations by the University of Oregon find new artifacts and remains. If you enter, wear a dust mask! The caves are literally filled with pack rat droppings where they haven’t been excavated!

Enjoy these visions of sites of pilgrimage in the High Desert of Central Oregon.



Rogueus Orri Crab

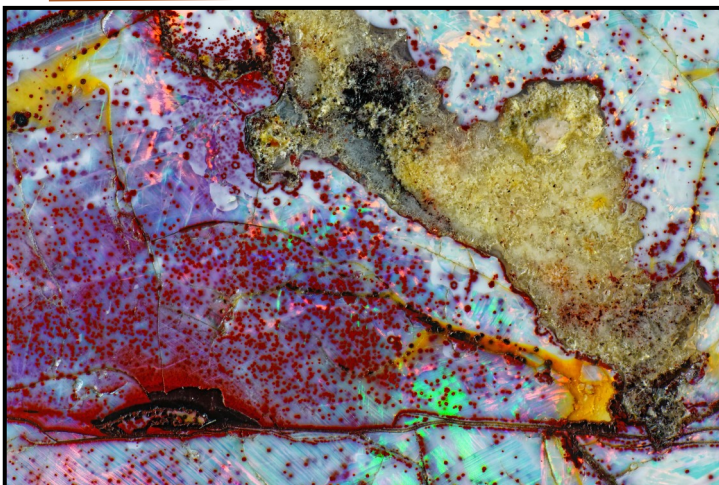
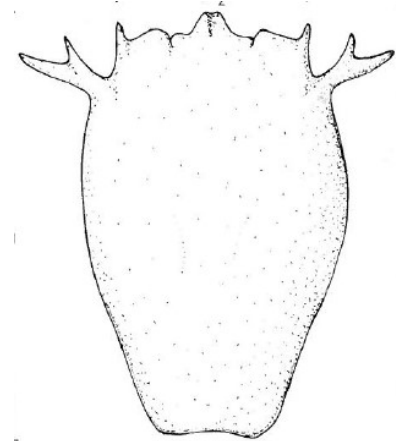
by Bruce Thiel

The *Rogueus orri* crab was discovered and named in 1989 as a new genus and species to honor Dr. William N. Orr, at U of Oregon. When Dr. Orr came to our March meeting to give his talk on Super Predators, he was photographed holding his namesake crab. The crab was recently prepared for the Eric Gustafson collection donated to the University of Oregon Natural History Museum.

Dr. Orr said that in 1973, when he was on faculty at U of O, he named a crab they discovered after fellow faculty member, Dr. Ewart Baldwin, who was on faculty from 1947 until his retirement in 1980. He said Dr Ewart didn't like it at all and was maybe thinking they were implying he was cantankerous or crabby. The crab, *Lophapanopeus baldwini* is now known as *Panopeus baldwini*.

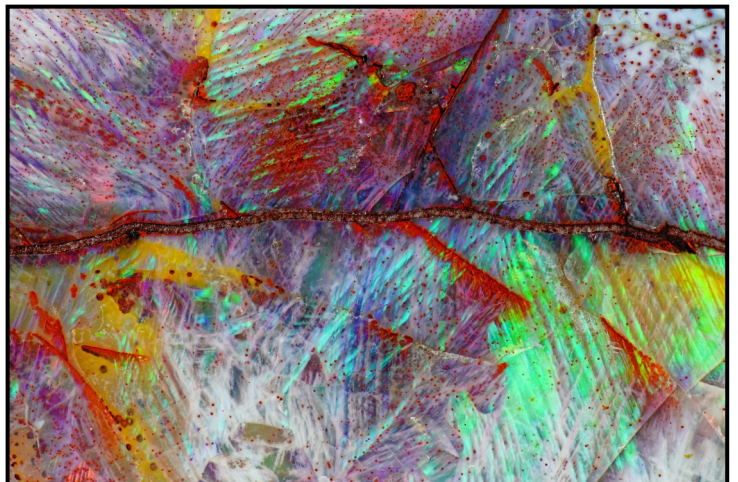
Dr. Orr said however that he was honored to have a crab named after him.

Here is a drawing of the Orri crab from the Journal of Paleontology in 1989, when it was first described by Ross Berglund and Dr. Rodney Feldmann.



Casey Trueman's opalized wood. Photos taken by Joe Cantrel using micro stacking photography.

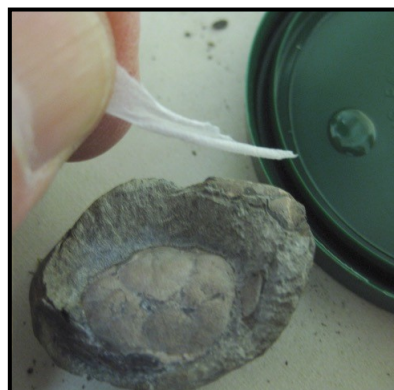
Opalized Wood



Fossil Prep Tip - For Applying Glue

Bruce Thiel

I've found this method works best for me. Separate double-ply paper into a single-sheet thickness. Tear a 1/4" wide strip at an angle so it comes to a point. Take you thumb and forefinger and twist the end to make a small pointy-wick and touch it to a drop of superglue, so as to just absorb a small amount. Touch this wick to a crack in the fossil and the glue will transfer over or use it to dab on a small quantity to the piece you are trying to reattach. I've tried several homemade applicators over the years, toothpicks carved to a point, needles or stick pins, but I would always end up applying too much glue. This method seems to give me the most control.



The End of an Icon

By Dan O'Loughlin

For any of you that venture over to Baker City, Oregon you may have stayed at The Always Welcome Inn. It is located on the east side of highway 84 as you enter the city. Its bright signage and inexpensive rates made it a favorite stopping place. This motel became famous to fossil collectors when Terry Frest, a malacologist from Seattle discovered fossils while sifting through the slope just north of the motel in 2002. Dr Jay van Tassell of Eastern Oregon University took lead on excavating the site with local students. The site is an early Pliocene lake/stream bed, which was described in Oregon Geology Volume 68, number 1, 2007. Anyone staying at the Inn is allowed to dig in the slope and keep what vertebrate fossils they find. Common items include sunfish spines, egg shell, amphibian and reptile bones and mice bones.



The motel was sold to Motel 6 but maintained its original signage. I happened to visit it this summer the day before the old "Always Welcome Inn" was taken down. The fossils are still there for the taking, but our new reference will have to be "the Motel 6 on the east end of town". For years I have been taking out of state friends and locals there when I hear complaints that fossil shells and leaves are not exciting. I promise them vertebrate specimens and have never come up empty. Plaster jackets not required.

Citation for Jim and Gail Goedert, upon receipt of the 2019 Paleontological Society's Strimple Award

Delivered by Kirk Johnson, Director of the National Museum of Natural History

I have an enduring admiration for paleontologists whose day jobs are not paleontology. I am here to introduce you to Jim Goedert of Gig Harbor, Washington. Jim and his late wife Gail were partners in paleontology and this award is for both of them.

As a Seattle native and fossil lover, I have been hearing stories about Jim and Gail for most of my adult life. I finally had the pleasure of meeting Jim two years ago. Jim is a signal inspector for the Burlington Northern Santa Fe Railroad. He and Gail have been doing amazing things in Washington State paleontology for over 30 years. The people who told me about Jim and Gail related that they were relentless prospectors who braved weather and tides to search remote and unexplored outcrops in search of new fossil sites. Early in their practice, they realized that new fossil sites often yielded new fossil species and new scientific insights and that these fossils belonged in museums and in the hands of paleontologists who would study, describe and publish them. As a result, they maintained no personal collection, instead choosing to direct their fossils to destinations most likely to land them in the published literature of paleontology.

As servants of paleontology, Jim and Gail began to correspond with an increasingly wide circle of scientists who worked with them to publish their findings. Because of these collaborations, their curiosity and extensive field experience, Jim and Gail embarked on an intense Odyssey of self-directed geological and paleontological training. They didn't just collect fossils, they also learned the local stratigraphy, became adept fossil preparators, and wrote and published scientific papers.



Many species and genera have been named after the Goederts and many more of their finds are now located in museums around the world, waiting to be analyzed. Counting authors on his papers, I esln so doing, they became invaluable collaborators to a surprisingly diverse group of scientists.

By 1988, Jim had begun to write scientific papers. When I asked him to share his publication list with me, he sent me a list of more than 100 titles. I shared this list with Larry Barnes, one of Jim's earliest collaborators, who pointed out an additional nine papers that Jim had forgotten to list. This bibliography would be a credible record for a tenured professor yet Jim has accomplished this in his spare time, working out of his garage. In my discussions with his collaborators, I learned that Jim had joined them for field work in Oregon, California, Japan, Mexico, China, and Europe. His papers cover a broad spectrum of taxa that includes algae, plants, worms, crabs, bivalves, gastropods, brachiopods, pteropods, ostracodes, fish, sharks, birds, whales and other marine mammals. Collectively, these records paint a picture of the evolving biota of the active margin of the North American continent.

Many species and genera have been named after the Goederts and many more of their finds are now located in museums around the world, waiting to be analyzed. Counting authors on his papers,

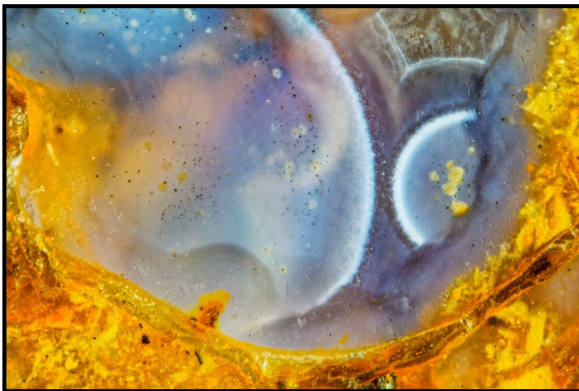
I estimated that Jim has collaborated with more than 65 paleontologists from places as far away as Germany, Japan, New Zealand, and Australia. I've also talked with local fossil enthusiasts in the Pacific Northwest who have collected with Jim and Gail and have come to respect them as the professionals they are. Many people speak of the generosity and humility of the Goederts and their impact on lives of both professional and amateur paleontological community.

The Goederts personify all of the attributes of the ideal Strimple award and it is my deep honor and privilege to present the 2019 Strimple award to Jim and Gail Goedert.

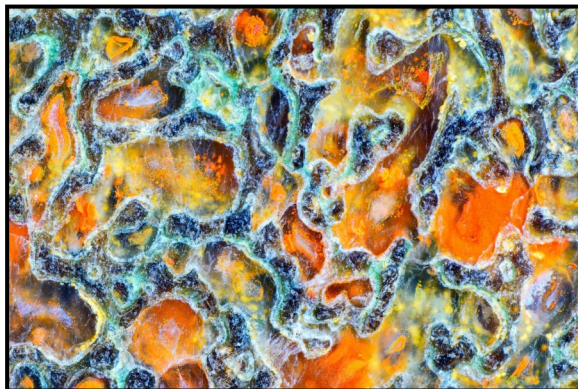
The Paleontological Society has an annual award (called the Strimple Award) to recognize outstanding achievement in paleontology by amateurs. Smithsonian Natural Museum Director Kirk Johnson nominated our advisor Jim Goedert who received the award from President Bruce McFadden at their annual meeting this September. Here is Kirk's address given at the ceremony highlighting Jim's achievements.

Dino Fossil Bone Closeup Pictures

NARG president, Aaron Currier asked Joe Cantrell to check this dinosaur bone photographically. The colors are as rendered by the camera's jpeg interpretation.



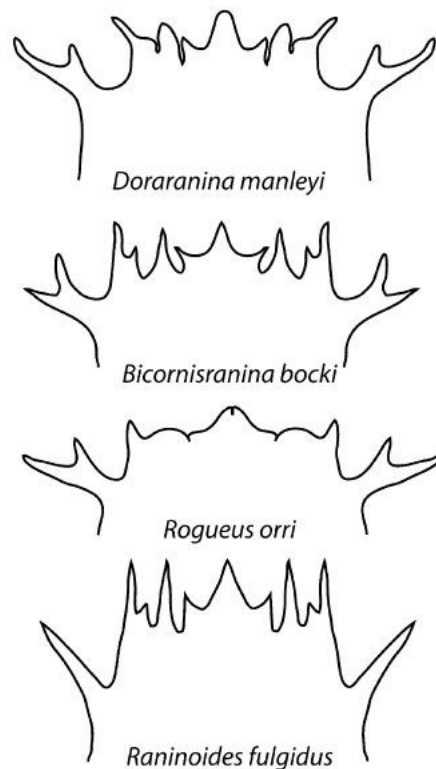
On right is the slice of dinosaur bone the close up pictures are taken from. The darker area is a thin coat of olive oil.



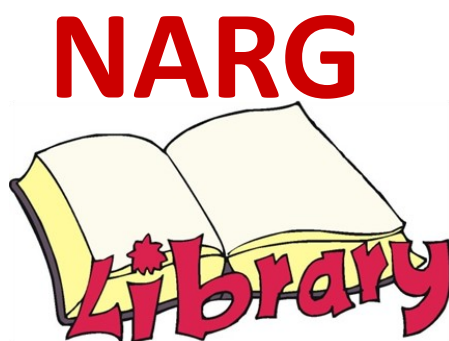
Photos by Joe Cantrell

NARG Member Bob Manley Has Crab Named After Him

NARG member Bob Manley has recently discovered a crab which is the second species named after him—a *Dorarinina manleyi*. A few years ago Bob found a lobster named *Scyllarella manleyi*. The crab was described and recently published in a German scientific journal. NARG member Eric Gustafson was the lead author and it was described and studied with co-authors Torrey Nyborg and Barry W.M. van Bakel. Barry is a specialist in raninoid crabs and is affiliated with the natural history museum in The Netherlands. The title of the paper is: **A new genus and species of raninid crab, *Dorarinina manleyi* (Decapoda: Raninoidea: Lyreididae) from the lower Eocene of Oregon.** It is behind a subscription paywall however if you are interested, some NARG members may have copies.



The crab is similar to some of the other Pacific NW raninid crabs, however Eric made a diagram detailing the differences which was in the paper.



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 membership dues for 2020 are due January 1, 2020

Individual Membership = \$25

Family Membership = \$40

Student Membership = \$10

You may pay for your membership by:

* Bring your money to our next NARG meeting..

* You can mail your payment to:

NARG
Margaret Johnson
2220 179th Ave E
Lake Tapps, WA 98391

* You can pay your dues thru Pay Pal. You don't need a Pay Pal account to pay this way. You can pay using a credit Card.

Fossil Calendar 2019

Portland Regional Gem & Mineral Show Oct 11, 12 & 13 Jackson Armory, Portland, OR
<https://portlandregionalgemandmineral.com/>

NARG Potluck and Auction Nov 9 Rice Museum, Hillsboro, OR

2020

Newport Fossil Fest Feb Hatfield Marine Science Center, Newport, OR

NARG FossilFest Aug Rice Museum, Hillsboro, OR

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 (503) 364-2979

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Larry Purchase (360) 254-5635

Committees:

Newsletter: Peg Johnson
 Aaron Currier
 Dan O'Loughlin

FossilFest: Linda Harvey
 Dan O'Loughlin

NARG Auction: Linda Harvey
Portland Regional: Dan O'Loughlin

NORTHWEST FOSSIL FEST

August 11, 2020

*A Celebration
of Paleontology in
the Pacific Northwest*

at the Rice Museum
in Hillsboro, Oregon



presented by the
North America
Research Group

FREE ADMISSION
nargpaleo.org