



NARG NEWSLETTER

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NorthWest FossilFest

By Dan O'Loughlin

The NW Fossil Fest was a hot event this year. I mean literally! Daytime temperatures reached 97° F for setup followed by 95°F on Saturday. Regardless, this popular event managed to attract nearly 450 guests. Our theme this year was "Teeth". The T-shirt design by Lisa Schenk and Aaron Currier was very popular. OMSI and The Rice Museum had tables to entertain the guests. Wayne King from Mt Hood Rock Club joined us to demonstrate Bonsai techniques, which complimented our tree sales of Ginkgo and Metasequoia. We had plenty of kids' events including a water feature appropriate for the weather.



Fossil teeth by Lisa Schenk

Our speakers this year included:

Victor Perez, University of Florida. "*C. megalodon*: How Tooth Morphology Relates to Functionality and Evolution."

Dr. John Bershaw, PSU Geology Dept. "High Altitude Dentistry: Using Fossil Teeth to Understand How and When the Andes Formed".

MacKenzie Smith, OSU Graduate. "Teeth Talk" An overview of teeth, their function and their importance in paleontology. (NARG member)

The lectures were very well attended. Food was supplied by The Snack Shack. They served up delicious paninis and smoothies for this sweltering day. Robert Rose set up a demonstration of petrified wood as viewed through magnification. Aaron Currier and Eric Gustafson were present to identify fossils brought in by guests. Joe Cantrell, while encountering a few glitches, was photographing fossils using his new mobile photo booth. With the help of my family and the many NARG members, we put on a successful show.



John Day vertebrate fossil by Larry Purchase



Astoria formation fossils by Nick



No, this is not Sasquatch. It's our elusive member Tim Fisher.



The O'Loughlin family brought in to set up, take down and staff the show.



Stonerose leaf fossils by Rick and Peg Johnson



The Rice Museum's display of various petrified woods



Fossil Teeth by Debbie Shannon



Julian Gray, Joe Cantrell and Aaron Currier examining fossils

Sharon and Melory staffing the Rice Museum booth



Refreshing food for a very hot day!



Anguilla fossils by Rick and Peg Johnson



Dinosaur tub toy races



MacKenzie O'Loughlin staffing the "Guess the number of dinosaurs" booth



NARG member Joanne West discussing fossils

Houston Museum of Natural Science

By Robert Rosé

Between Christmas and New Years 2015 my wife and I visited the Houston Museum of Natural Science. Although the museum is huge with four floors of exhibits we wanted to visit the temporary display of Fabergé jeweled treasures and the permanent Morian Hall of Paleontology. This Hall is huge and is greatly expanded from what it was when I visited more than a decade ago.

As you enter the Hall of Paleontology you are directed along a serpentine-shaped tour along geologic time starting with the Proterozoic. Along



this path you see superb specimens of trilobites, fish, crinoids, dioramas of several geologic periods, eurypterids, and mollusks. The Stumm collection of trilobites is really outstanding. Most are from Morocco and very well prepared and show a variety from fairly plain to highly spinose. At certain points along the path there are openings in the pathway you can use to move to any part of the collection. This is

helpful to those not interested in certain types of fossils or periods of geologic time.

The collection displays many examples of the dominant animal fossils for each period of geologic history. In the Mesozoic you see cephalopods, marine reptiles, turtles, and dinosaurs. The best display of dinosaurs outside the Royal Tyrell Museum in Canada is present here in Houston. Very impressive and I am not a dinosaur aficionado. There are three *Tyrannosaurus rex* skeletons; all real bones and a mummified *Triceratops* called Lane. As you move through the rooms be sure to look up and you will see turtles, pterosaurs, and marine reptiles. The pterosaur above you is a replica of the huge one with a 35 feet wide wing span.



T-rex





Even though there is a lack of fossil leaf material there is one room of petrified wood. This is one person's collection and it consists of many huge rounds of *Araucarioxylon* (colorful Arizona wood), some *Woodworthia*, and a few rounds of wood from Oregon. There are also several sections of wood trunks. The entrance to this room has a round that is about four feet in diameter.

The Cenozoic Era. I did not spend much time in but did note many nice mammal skeletons including mammoth, mastodon, giant cave bear, and horse. There is a detailed display showing human evolution with images of skulls along a time line which explains much of the recently gathered knowledge.

My error here was not to take my camera and not allow enough time to peruse the displays. You can spend several hours viewing all the wonderful fossils exhibited here. This is a wonderful place to visit for all of us fossil lovers! In addition to the paleo exhibits there is a world class permanent display of minerals and gems: the Cullen Hall of Gems and Minerals and the Lester and Sue Smith Gem Vault. A must see!



Woodburn: Where Paleontology and Archaeology Intersect

By Alison T. Stenger,

Institute for Archaeological Studies

The Woodburn paleoarchaeological project began in 1995. Even today, the intent of our work is to investigate paleontological sites from an archaeological perspective. In other words, we are exploring ancient plant and animal sites, while employing the methods that need to be used in sites containing archaeological material. Happily, some of these areas do have it all, from plants and animals to naturally shed human hair. But there is another wonderful aspect to these projects. It is almost impossible to hurt anything. Whether volunteers are working on troweling techniques or documentation skills, these field opportunities provide a great environment in which to do this, and people manage to have fun in the process (figure 1).



Figure 1. Volunteers working at a real paleontological site, honing their skill sets, and still having fun.

When we excavate sites such as these, which are contained far below the surface, we bring in commercial excavating equipment. This makes our field time much easier and safer. The more recent soils are mechanically stripped off and placed to one side. The older sediments are then removed, and placed apart from the recent layers. Then, before we begin inspecting the older deposits, the newer material is looked at and then put back in the trenches. This makes the trench area much more stabile.

Our focus is upon the late Pleistocene to the early Holocene sediments and their contents. In Woodburn, this is from 12,300-10,800 BP. The first job of volunteers is to trowel through the soils, looking primarily for ancient animals and hints of a human presence. Each soil type has its own color, texture, age, and depositional history. Thus, people can identify these distinct strata when they first start troweling (figure 2).

Because we have already documented the age of each stratum, or layer, we know the approximate date for anything that is uncovered, based upon the sediments from which the item emerges (table 1).(See pg 9)



Figure 2. Each stratum has a distinct color, texture, and age. Any specimen removed from one of these layers can thus be assigned an approximate date.

Stratum	Appearance	Age ~	Contents
1	Topsoil: grasses & loam	Modern to 6,800 BP	Occasional historic items
2	Dense blue-gray clay	6,800 BP	Missoula ash in the clay
3A	Dark brown soil and old tree material	10,480 BP	Spruce & fir cones, limbs, leaves
3B	Orange-brown traditional bog (peat moss)	10,800 BP	Beetles, leaves
3C	Med. brown soil and desiccated bog	11,720-10,920 BP	Animal bone, artifacts, some tree material
4	Dark brown soil, including mica & desiccated bog	12,290-11,910 BP	Animal bone, artifacts
5	Gray-blue silty sand	14,300-12,310 BP	Sparse animal bone, artifacts
Note:	In some areas of Woodburn, a 2 nd bog replaces stratum 4. This bog material is very dark brown.	Dates approximate	Fauna includes megafauna, microfauna, and avifauna (bone that is large, little, of from birds)

Table 1. Introductory description of strata, contents, and verified dates.

Once the soils are initially inspected, they are moved to a water screening table for further investigation (figure 3). This is where our recovery of microfauna (tiny bones) increases tremendously.



Figure 3. After troweling, sediments are processed with water (L). This allows us to recover very small specimens (R). The bone shown here is the partial mandible to a very small frog teeth, about 1" (2.54 cm) in length. A dime is used for scale (LR). 12,000 year old minnow fish. Photos provided by Joe Cantrell.

The involvement of NARG members has led to the expanded recovery, documentation, and identification of numerous specimens. The insights and carpentry skills of Richard Kimbell resulted in the development of specialized water screening stations, complete with splash shields and chairs adapted to hillside use. To this, Debbie Shannon added stacked screens, having different sizes of mesh, which greatly expand our recovery ability. The newly recovered microfaunal specimens were then documented by Joe Cantrell, who merged specialized software with photographic and microscopic inspection. His talents in capturing images brought forth many macro details that were not evident to the unaided eye. Bone identification was a fascinating process, with the generous sharing of expertise by Dr. Lyle Hubbard and Dave Ellingson.

Experienced members of NARG and OAS (Oregon Archaeological Society) introduced the methods and goals of our project to the new volunteers of 2016. The seasoned participants then acted as mentors, both when excavating and at the water screens. By working with other members of these organizations, new volunteers learned about excavation and water screening, as well as about minerals and other interesting parts of the natural world—what we oldies call natural history, of course.

The sites in Woodburn are particularly compelling. With their consistent stratigraphic sequences (layering of sediments), the depositional history of the last 16,000 years is available for us to inspect (figure 4). The environment that changed so significantly over time, from bog to forest, is clearly portrayed. Because of this, we are joined throughout the field season by other archaeologists, geologists, paleontologists, and botanists. Specialists from natural history museums, and from some tribal groups, also venture here when we are working, and they often share their expertise with us. This gets especially interesting, when we journey with them to one of the specimen repositories and share the materials that have emerged from the sediments during our years of working here (figure 5).



Figure 4. Each independent layer of soil has its own characteristics, from color and texture to age.



Figure 5. Specialists from many disciplines, including some tribal groups, share their expertise with us. This is true in the field and during lunch breaks, making our days at work very special.

To date, we have recovered the remains of multiple species of extinct Ice Age fauna, as well as the remains of animal populations that still exist today. The animals range in size from huge to tiny! Included in the list of larger species are newborn and mature examples of giant bison (*Bison antiquus*), Harlan ground sloth (*Paramylodon harlani*), and camel (*Camelops hesternus*). The Western horse (*Equus occidentalis*) is present at two Woodburn sites. Also represented are the oversize Pleistocene elk (*Cervus canadensis*, sp) and black bear (*Ursus americanus*), the later the size of a Grizzly. Coyote (*Canis latrans*) and dire wolf (*Canis dirus*) are present, as well as an unspecialized large feline, possibly the scimitar cat (*Homotherium crenatidens*). The only faunal material that has clearly been modified is that of the ancient bison. Both Cut bone and charred bone have been observed (figure 6)



Figure 6. Intact digits from *B. antiquus* show no charring or other damage from fire. All of the fractured bones show evidence of being heated.

In several excavations, avifauna was noted. Remains include migratory birds, as well as other avian species of both small and large scale, including the sandhill crane (*Grus canadensis*), pintail (*Anas acuta*), and teal (*Anas crecca*). A huge predator bird, with a 12'-14' wingspan, was also documented. It proved to be a new species of teratorn (*Teratornis woodburnensis*), and 15 distinct bones from this animal were recovered.

Microfauna, predominately muskrat (*Ondatra zibethicus*) and leopard frog (*Rana pipiens*), were distributed throughout the Pleistocene strata. Recoveries also included western pond turtle (*Actinemys marmorata*), southern alligator lizard (*Elgaria multicarinata*) and snake, including the western rattlesnake (*Cortalus viridis*). Rodentia and insectivores are currently being studied, but both gopher and mole are represented. As most of the microfauna are index species for this low elevation Pleistocene landscape, previous speculation regarding this specific environment is now validated.

Occasionally we see flaked stone or naturally shed hair. All are from pre-Clovis strata, dating from more than 12,200-11,200 yBP. Some of the hair is human, and some is from animals. There is never very much, but it is enough to make a statement about the Ice Age inhabitants of the area. The same is true of the culturally modified lithics. Flaked material includes cryptocrystalline silicate (CCS), basalt, red jasper, and chert. These are archaeological designations, and not mineralogical, but the crew knew what was being described.

The sediment layers change dramatically and quickly, over the fifteen hundred years that represent the ending of the Pleistocene. From the time before the very last Missoula Flood affects the Valley, just over 12,300 years ago, until the Pleistocene's end at 10,800 years ago, we see four stunning changes in the environment. Then, after the ending of the Ice Age, we see another three very different ecosystems represented. Thus, in total, our volunteers experience seven different ecologies. Their job for much of the project is to focus upon the oldest four.

One of the many fascinating things about this long term project is that the presence of Pleistocene animals and Ice Age humans terminates with the transition into the Holocene. At 10,800 years ago, these valley inhabitants completely drop out of the stratigraphic record. The early post-Ice Age here is archaeologically and paleontologically sterile. From our field work, we know that preservation is not the cause of this sudden absence of these population groups. The early Holocene sediments reflect the same neutral pH level as the layers from over 11,000 years ago. Therefore, as wood and teeth from the Pleistocene are remarkably well preserved (figure 7), the same level of preservation should be reflected in the more recent sediments. This expectation is clearly supported by the early Holocene botanical materials that are excavated. But, animals and any evidence of a human presence have disappeared.

What happened to cause this change, leaving the valley floor remarkably barren? That question is part of what keeps us coming back.



Figure 7. Sometimes a tooth, instead of bone, represents an animal from the past (L) and (C). Preservation here is excellent. Even wood, after being left out in the sun for a week, is remarkably well preserved (R). Left and center image provided by Talia Berman.

Central Oregon Trip Report:

August 14-16, 2016

MacKenzie Smith

The sounds of Taylor Swift accompanied University of Florida PhD student Victor Perez and I as we made it “Out of the Woods” from the Doug-fir forests to get to the sagebrush lands of central Oregon. In Prineville we met up with Aaron Currier and Robert Rosé for our outreach fossil collecting trip.

In exchange for having Victor come speak on megalodons at Fossil Fest we (NARG) promised to collect over 100 *Metasequoia* fossils for Fossil Project. The *Metasequoia* will help make up fossil teaching kits for K-12 traditional and charter classrooms across the US. In addition to *Metasequoia*, Fossil Project is also gathering fossils such as shark teeth, ammonites and bivalves for the kits. While the kits can be used to teach a variety of STEM (Science, Technology, Engineering and Mathematics) lessons, a lesson is being designed specifically for the *Metasequoia*. It will be a botanical comparative anatomy lesson, comparing *Metasequoia* to *Sequoia*.

After obtaining supplies in Prineville the four of us headed to the “Painted Hills Site” (note that this is not part of the monument). The site contains the Bridge Creek flora which occurs within the Middle Big Basin Member of the John Day Formation. It has been dated between 32.99 and 32.66 million years old (Retallack et al., 2000; Dillhoff et al., 2009). The flora is preserved in shale varying between white fossil on white matrix, black fossil on beige matrix, orange fossil on beige matrix to black fossil on orange ironstone. Aaron and Robert primarily dug while Victor and I surface collected, perusing back and forth along the steep hillside. While collecting *Metasequoia* we also picked up several complete leaves including oak (*Quercus*), as well as some fruiting and seeding bodies. Had we not been paying attention we would have missed the beckoning pleasan-trees of the petrified *Metasequoia* wood scattered around the site. It only took us a few hours to exceed our *Metasequoia* quota though the afternoon heat was taking its toll on a few of us. So we called it a day.

The next morning we went to the Suture site for ammonites. The ammonites occur in the Hudspeth Formation which is between 113 and 93 million years old (Retallack 1991). *Breweriaceras hulensis* and *Leconteites lecontei* are the most common species there (Jones et al., 1965).



“Painted Hills” locality.

Victor was able to find a whole one and Robert and Aaron found whole ones though they had to be brought back in pieces. Aaron then showed us the Exchange Station locality before heading back. Robert, Victor and I all found full ammonites and much easier than at the last site. We probably got three whole ammonites each from concretions. After all the digging we decided to head back to camp in order to finish packing the *Metasequoia* for their journey to Florida.

When the sun rose we broke camp and drove east to hike the Blue Basin (part of the Turtle Cove Member of the John Day Formation) interpretive trail near the John Day Fossil Beds National Monument Headquarters. The blue-green sediments caused by the celadonite creates the effect of the cliff faces appearing as aquamarine waterfalls. At that point we had killed enough time for the Thomas Condon Paleontological Center to open. Though the exhibits

have not changed from two years ago, the last time I was there, the displays are still stunning and worth a visit.



Ochoco Pass.

On our way back to the valley we made our last stop along the Ochoco Pass to collect plant fossils from the Clarno Formation. Initially, we had hoped to find fish fossils as described by Cavender (1968). The Clarno is Eocene in age ranging from 54-39 million years ago. We managed to recover some angiosperm leaves that should be identifiable as well as some fern pinna.

All in all it was a successful. We exceeded our *Metasequoia* goal and everyone brought back something that they liked. There will always be a "Blank Space" for those specimens since fossils never go out of "Style".

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Amber Alert, or, I Actually Went to Woodstock, Woodburn's More Fun

By Joe Cantrell

There was a contest on Tulsa's steam-powered smoke-signal television when I was pre-kindergarten, where they showed macrophotos of various things, and people called in with their best guess of its identity. I won the contest so consistently, they disqualified me. The prize: My parents drove us 70 miles to be on the show, receive a 3-lb. can of Folger's coffee, and be treated to a chicken dinner at Smilin' Bob's Chicken Shack. Smilin' Bob was the emcee and sponsor of the program.

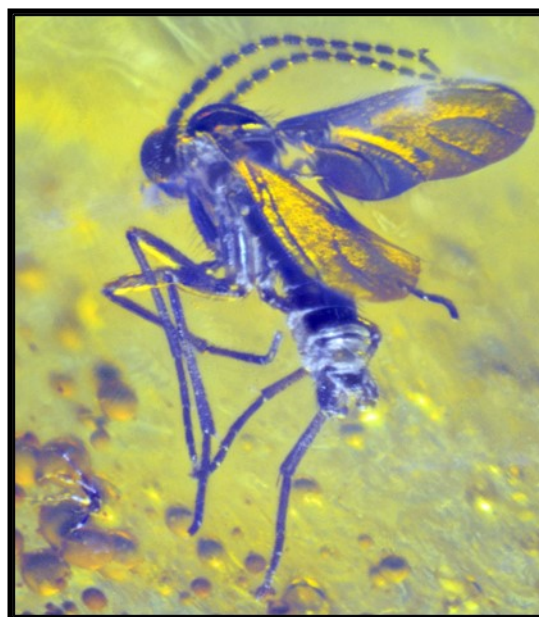
In 1959, mid-Cretaceous Oklahoma Ozarks, they handed me the school camera and banished me to the darkroom. At age 14, I was even more easily bored than I am now, so once I knew f/16 from an Air Force jet of the distant future, I started experimenting with close-up photography. I taped my \$32 wide angle lens backward on my first 35mm camera, chilled a lacewing in the refrigerator, put it on my finger which I held up toward the sun, and got the image as the insect revived and stood on its hind legs as though it were worshipping the warmth. Which it may have been, who knows? But that's not science.

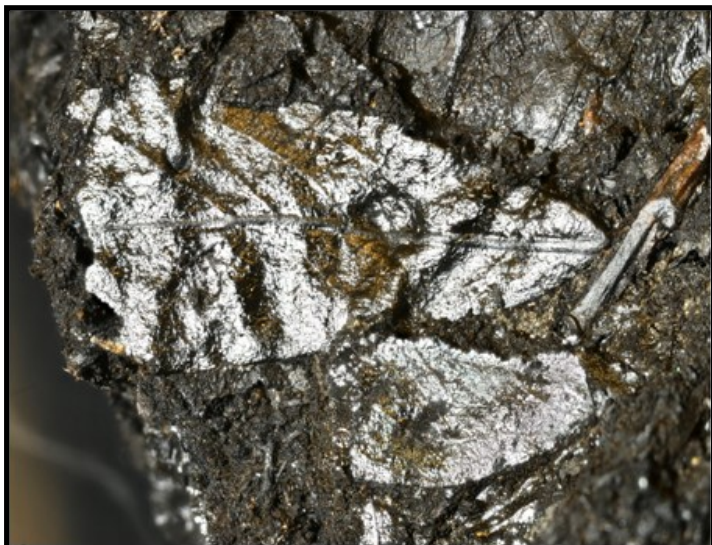
And who knows now, as we photoprobe the critters trapped in amber, the flora and fauna of the Woodburn High School pre-Clovis dig, what they might tell us if they had consciousness and voice?

Folks, there is an answer to that question, and a number of them are members or friends of NARG. What a trip to get close to these artifacts from the past, and have them explained by people who actually did get that degree in Science, and who have spent their careers honing their knowledge.

I've only been back to shooting rocks and fossils since early this year, but look forward to diving deep into the NARG mission, or as deep as an English BA and 56 years' photo experience will take me. Hope you'll come along for the rides!

In full disclosure, I was in US Navy Deep Sea Diving School when Woodstock happened. Several of us drove all night to get there, arrived exhausted, found a Mess, realized that our gung-ho officers' haircuts fit in like cell phone rings at the symphony, and drove back to Washington DC. Dave Ellingson's Woodburn High School digs over the last few weeks have been a LOT more fun.





Choke cherry leaves from "PCC/NARG Week" 2015 at Woodburn High School, and Baltic amber insect with what may be parasite eggs along its back, and, a couple millimeters in front of it, what may be a parasite with a similar black mass on its "nose." Tell me gentle reader, is this an incredible coincidence captured in amber?



Spider, <1mm length, in Aaron Currier's Dominican amber, and beetle elytron recovered from the Woodburn High School Ice Age Dig.

Acrylic slot blocks

By Dan O'Loughlin

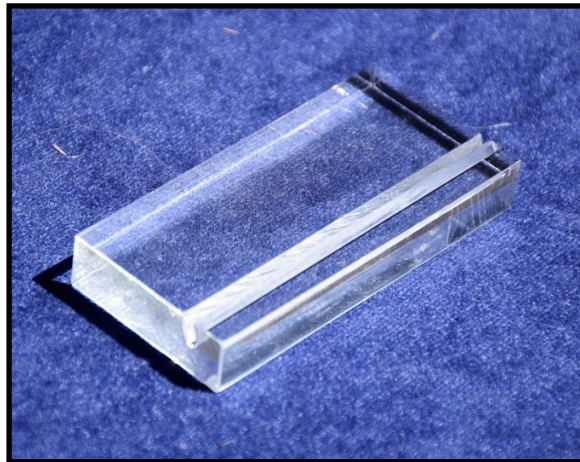
While setting up your displays for NARG events, many of you have borrowed these simple devices from the NARG supply to hold up your labels. I recently received several requests from people wanting to purchase their own. The problem is if you don't know what they are called, they are difficult to find on the internet. A thank you needs to go out to NARG member Michael Santino for giving me the proper name of these items many years ago. They are called acrylic slot blocks. Those carried by NARG measure 1 1/4" x 1" x 3/8" and 3" x 1 1/2" x 1/2". The larger ones are better looking for the types of labels we usually use. Remember to print your labels on heavier paper or card stock so that they don't curl from the heat in the displays. Below are several sites you can order them from.

<https://www.riogrande.com/Product/clear-acrylic-angled-slot-jewelry-card-holder/401712>

<http://www.ccpdisplays.com/SPD/acrylic-slot-block-card-sign-holder--80000E8D-1225120151.jsp>

<http://thefixturezone.com/acslcasha.html>

<https://www.jule-art.com/> Not listed. So call them.



A beautiful display of teeth by Debbie Shannon

NARG at the National Show

By Robert Rosé

The AFMS and NFMS joint national rock show “Treasures of the Northwest” was held on July 29-31, 2016 in Albany, Oregon at the Expo Center. For its part NARG entered 30 display cases of mostly Oregon fossils.

The most impressive was Greg Carr’s use of four cases end-to-end to display his mock-up of a Triassic Thalattasaur that he has been freeing from a very large concretionary mass. He has duplicated all the parts of the creature using his 3-D printer.



Other displayers were Margaret Johnson showing Stonerose plant fossils and marine invertebrates from Anguilla (one of the lesser Antilles islands east of Puerto Rico). Linda Harvey, Robert Rosé, Joe Start, Bob Manley and Phil Knutsen all displayed petrified wood. Joe Start also showed pink limb casts from Congleton Hollow and a very well done case of cycad material as well as marine vertebrates from the Astoria Formation. Cindy Yarblock displayed shells of the world, Dan O’Loughlin showed Metasequoia specimens and Dave Ellingson filled two cases with terrestrial vertebrates from digs at Woodburn High School.



Stonerose Interpretive Center

Lyons Flora



"Cont. from page 17"

Greg Gentry displayed Pacific Northwest crabs and fossilized feces (coprolites). Bob Manley displayed two superior cases – one of Clarno plant material and one of Astoria fossils (both invertebrates and vertebrates). Aaron Currier displayed fish and Astoria invertebrates. More Astoria formation vertebrates were displayed by Nick Oberzill. Phil Knutsen displayed plants from Lyons flora and Debbie Shannon showed teeth from all sorts of creatures. Eocene plant fossils from Stonerose were displayed by Margaret Johnson. A special case of nuts, seeds and limbs from the Clarno formation collected by Tom Bones was also displayed. Mr. Bones collected the material during the 1940's, 50's and 60's.

The National Show included more than 180 displays, counting NARG contributions, making a very impressive demonstration of fossil and rock specimens from the Pacific Northwest. Willamette Agate and Mineral Society hosted the show.

NARG also had seven tables set up along one side of the building where Joe Cantrell had set up his very impressive camera equipment which is able to take pictures of the smallest detail in rock, amber, agate, or petrified wood. At the booth we sold Ginkgo and Metasequoia trees, gave away plastic dinosaurs and small pieces of petrified wood and packets of Metasequoia seeds. We also sold some shirts and caps.



A big thank you to all of you who put so much effort in to make this show a success!

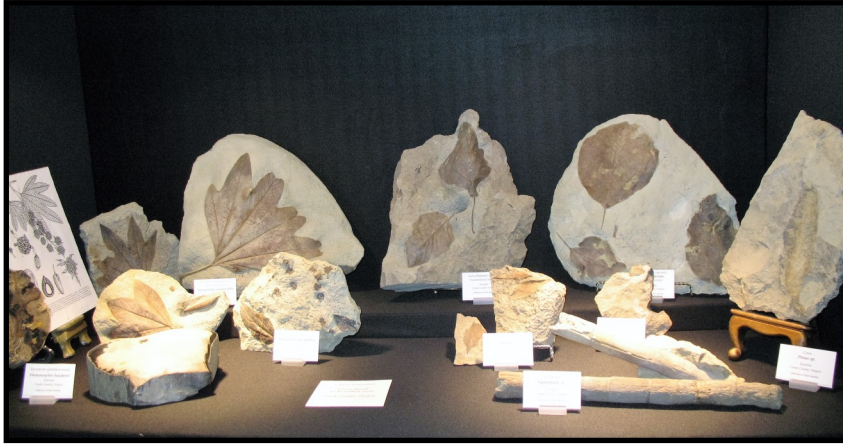
Greg C with Bernie the Thalattosaur



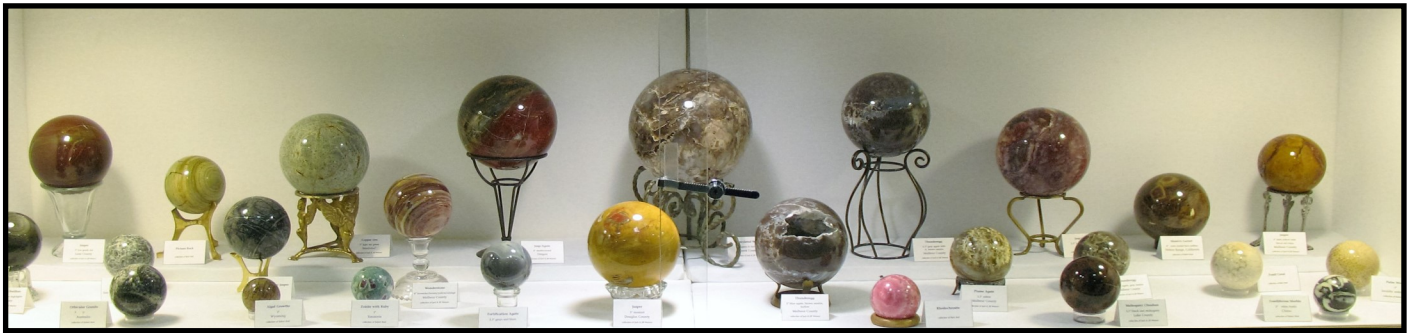
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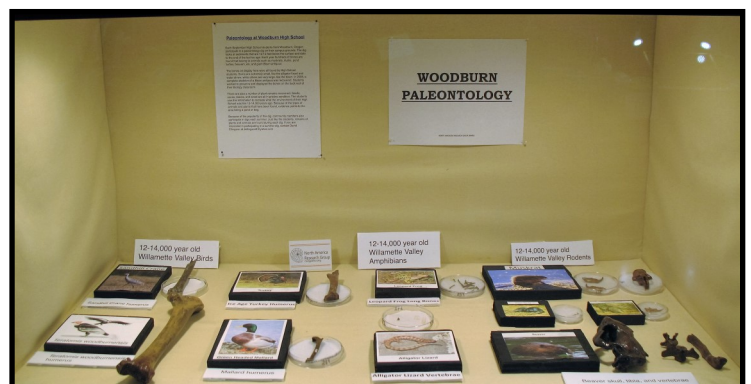


Clarno Formation



North American Fossil Teeth

Woodburn High School Paleontology





coprolites



Fossil crabs of Oregon



Fossils from Oregon Coast



Petrified Wood



Pink limb cast from Clarno Formation, Paulina, Oregon

High Tech Development From the Art Cart

By Joe Cantrell

The stone in my hand shows the typical backside of a piece of sliced, polished agate. Note that it would be very difficult to balance the agate at any desired angle so it could be photographed at a suitable angle.

The Institute of Empirical Blunders' Q-Division has developed the highly successful solution shown in the second image, aquarium sand in a WINCO salad container. Simply embed the rough side of the specimen to be photographed or studied, move it to position, and proceed. Voila!



Return to Jurassic World

August, 2016

By Jerry Dodson



The road in was dry and dusty. But the Morrison is so, so cool.

and led by Jerry Dodson and Greg Carr have ventured to the infamous Como Bluff and Como Ridge area of Wyoming. A high plateau created by tectonic forces pushing up great mountain chains that can only be imagined and recreated, nay animated for visual perspective. Great mountains, perhaps 20,000 feet or more above sea level, that have been eroded by wind and water over millions of years, leaving a system of basins and ranges, and particularly the 7000 foot plateau we have come to know, enjoy, love and hate. Medicine Bow. Rock River. Laramie. Rawlins. Como.

And Nail quarry. On private land – 40,000 acres owned by the Carlin Foundation – the fossilized dinosaur bones will eventually be part of the Tate Museum collection (Casper College, Casper WY). We are here to dig dinosaurs. Armed with a bit of knowledge and a lot of imagination, we can think of the Mesozoic Era, a time before primates. Yet even as we indulge our curiosity, we can still imagine a much later time, when the early peoples of North America lived this great landscape, never owning it, and perhaps seeing bones of prehistoric creatures, accepting the relationship of the land, the animals that provided them their livelihood, and found thousands of years of peace in the winds and rains and snows that blew across them from the West. By recognizing and honoring past lives we honor who we are today.

The Morrison Formation, 153 million years ago, a wide streambed twisting and turning across a miles wide drainage system. Dead dinosaurs, rotting and disarticulating, small scavengers grabbing what they can from whatever is left that may be atop the silty sand covered bones. Bones that they cannot see and probably not smell as the bones have been covered for a day, a year, or perhaps a thousand years. And there the bones of Apatosaurus, Allosaurus, Camarasaurus, Diplodocus, Stegosaurus and an occasional Pterosaur await the foraging paleontologists, mostly amateurs and burgeoning professionals, absorbed in finding and learning about and collecting dinosaur parts.

The NARG crew hailing from the great Northwest

We have a mix of NARG and non-NARG participants at Nail. Albeit that the Boulder, Colorado rock club has dig privileges at the Carlin Ranch, it is the NARGies of the NW, who are central to the work at the dig. We are continuing to develop the relationships that allow us to continue our work – Jim Seigwarth, Anita Colin, Glenn Doyle and others from Boulder; JP Cavagelli and Melissa Connely from Casper College; and the Ranch management at Carlin. NARG returnees Sue Brown (and friend Sandy), the Reynolds family (Francis, Nikki, Kaleb and Elliot), brothers Ira and Jack Pollock, Lisa Schenk, Greg Carr and Jerry Dodson, and Canadians Rick and Julie Lavasseur are providing a strong base of experience in digging and field prep. A Portland Boy Scout group of seven led by OMSI fellow volunteer Hank Becker helped out the first week this year.



Accomplishments of the 2016 dig: Worked with Melissa Connely to begin mapping of the nearby trackway using photogrammetry techniques. Surveyed upper limits of the quarry overburden that has to be removed. Projected bone layer of being as much as 7 feet – we have not found bottom yet and the fossils are of higher quality and from larger creatures. Prepped a huge (800-1000 lbs.) articulated section of eight Stegosaurus dorsal vertebrae; readied for removal by the Tate. Dug and plaster cast over 30 fossil bones and placed in shed for Tate. Dug pit and erected toilet – no more peepee teepee, yaaaaa.



Ahh, the comforts of home - a toilet with a door that shuts.

Anita Colin set up a secret Facebook page dedicated to the Nailheads – all of us who have worked at the Nail quarry over the past 4 years. We have at least 10 more years of digging before the quarry will become too dangerous. The matrix will not support mining and tunneling, at least in the manner we could afford to do. Next year – August 2017 – the plan is for 10 days of digging. The dates are not set so if there are more NARG members who want to become Nailheads, please advise the author of your desire. It is a 2-day drive to get there (and back of course). Rock River will have a new restaurant in 2017; those of us who are already planning to return will be staying at the Longhorn Lodge or the Rock River campground. A more detailed survey of the quarry site is needed in order to determine the depth and breadth of the bone layer. The author is excited over a last day find (by Lisa Schenk) of a small vertebra possibly from an *Othnielia*. I can hardly contain my excitement of searching for more of it next year.



Same tracks before cleaning. Ira Pollock for scale.



Three small and one large Theropod. Sauropod manus middle left of shot.

Sauropod tracks. Note "slip" track with high compression ridge upper middle. Sauropod was walking from lower right to upper left. Examples of both large pes and smaller manus prints.



Elliot, Kaleb and Nia.



Nia with proud papa at terrific lunch under the tarp at the Nail.

Fossil Calendar

2016

October 7-9	Portland Regional Gem and Mineral Show http://www.portlandregionalgemandmineral.org/	Washington County Fair Complex	Hillsboro, Oregon
October 12-13	National Fossil Day http://stonerosefossil.org/	Stonerose Interpretive Center	Republic, Washington
October 15	Fossil Family Day https://calendar.uoregon.edu/event/fossil_family_day#.V-fmgPArLb0	Museum of Natural and Cultural History (UofO)	Eugene, Oregon
October 26-29	Society of Vertebrate Paleontology http://vertpaleo.org/Annual-Meeting/Home.aspx	Salt Lake, Utah	
November	NARG Auction http://NARGPaleo.org	Rice NW Museum of Rocks and Minerals	Hillsboro, Oregon

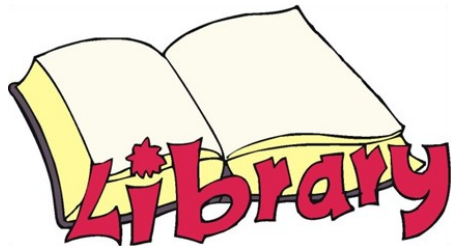
2017

February 13	Fossil Fest	Hatfield Marine Science Center	Newport, Oregon
April ?	Stonerose Member dig http://stonerosefossil.org/		Republic, Washington
March ?	Dino Days http://www.burkemuseum.org/calendar/dino-day	Burke Museum	Seattle, Washington
August 5-6	Summer Fest http://ricenorthwestmuseum.org/category/events	Rice NW Mineral Museum	Hillsboro, Oregon
August 12	NARG FossilFest	Rice NW Mineral Museum	Hillsboro, Oregon



Fossil Insects in amber. Photos by Joe Cantrell

NARG



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 2017 are due January 1, 2017

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
P.O. Box 726
North Plains, OR 97133

* 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.

Use the following links:

Family Membership \$40 https://www.paypal.com/cgi-bin/webscr?cmd=_s-xclick&hosted_button_id=AXASMFK8MZU4

Single Membership \$25 https://www.paypal.com/cgi-bin/webscr?cmd=_s-xclick&hosted_button_id=438FVX4E6CTQY

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NATIONAL FOSSIL DAY



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