



North America Research Group

NARG

Pacific Northwest Paleontology, Paleobotany, and Geology

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Artwork by
Gail Saunders-Boyle
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Region 6

Significant Fossil Find in Oregon

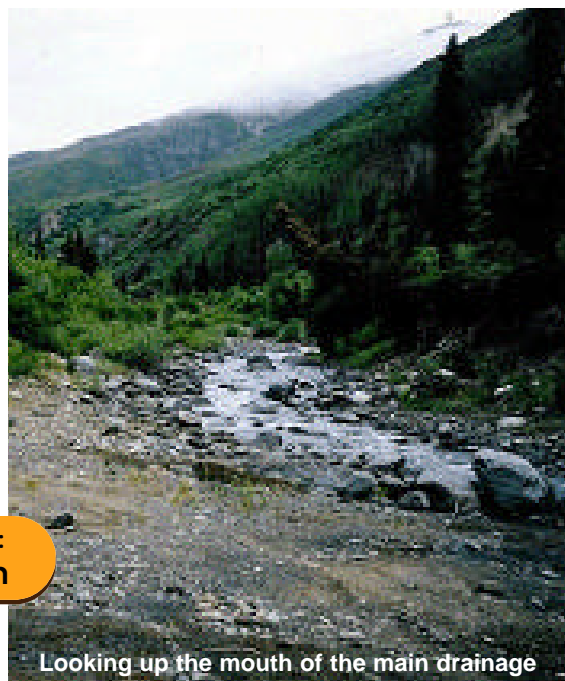
Amateur Paleontologists Find Rare Fossil

A fossil discovered by amateur paleontologists in Central Oregon is the lower jaw of a plesiosaur, a marine reptile that swam in the ocean that covered most of Oregon 90 to 100 million years ago during the Cretaceous. Plesiosaurs were primarily fish eaters and grew to a length of about 25 feet. The recovered specimen will be housed at the Museum of Geology in South Dakota. The museum staff is currently removing the rock from the fossil to determine the specimen's condition. The BLM is working with local entities to find a more permanent home for a replica for public education purposes.

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Up The Creek - An Alaskan Fossil Adventure II

By Don Brizzolara & Greg Keith



Looking up the mouth of the main drainage

My name is Don and I'm a geologist living in Alaska. Together with my friend Greg, a geophysicist, we have explored the wilds of Alaska in pursuit of fossils. We would like to share one of our many field adventures. Our voyage takes us into the rugged Talkeetna Mountains of south central Alaska, in pursuit of Cretaceous ammonites. It is our story of a challenging traverse up an Alaskan creek, but in many ways it is a trip back in time.

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vini, vidi, fossum

"I never expected to see such a specimen from Oregon in my lifetime! This is an extremely exciting and important fossil discovery," said Dr. Martin.

Significant Fossil Find in Oregon

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PRINEVILLE, OR— Imagine an ancient marine reptile with a very large seal-like body, a long tail and an extended head and neck. The head is rather long and sleek, like an alligator, with sharp, pointed teeth. The reptile has a thick abdomen and flat, elongated limbs that serve as powerful paddles for moving through the ocean that once covered most of Oregon 90 to 100 million years ago. Now, imagine you are out for a day hike and you stumble upon the skeletal remains of such an animal. You may not be sure of what you have found, but you have a feeling it is something special. And special, it is.....



A tooth fragment from the lower jaw of the plesiosaur.

In the summer of 2004, amateur paleontologists Mike Kelly and Greg Kovalchuk made such a proverbial needle-in-the-hay-stack kind of discovery on public lands in the grey hills of central Oregon. While looking for fossil sea shells (known as invertebrate fossils), Kelly noted a rock with an odd shape in it. That odd shape turned out to be an inch-long tooth. Closer examination revealed more teeth scattered down the slope. They realized that those teeth belonged to a creature with a backbone, a vertebrate fossil. Both Kelly and Kovalchuk knew then they had made an important discovery.

They also knew that collecting vertebrate fossils off public land was not allowed and was, in fact, illegal. So, what to do?

Fortunately, Kelly and Kovalchuk knew exactly what to do. They noted the location of the find with their Global Positioning System (GPS) and left the site undisturbed. Later, Kelly and Kovalchuk contacted John Zancanella, Paleontology Program Coordinator for the Bureau of Land Management (BLM) in Oregon and Washington. They made arrangements to meet in the field to confirm the discovery. Once verified, the BLM acquired the services of paleontologist Dr. James E. Martin, Curator of Vertebrate Paleontology of the Museum of Geology, South Dakota School of Mines and Technology, to help recover the specimen.

Dr. Martin, one of the leading experts on marine reptile fossils, has spent many years in Oregon looking for and studying a diverse array of fossils.

The specimen discovered by Kelly and Kovalchuk turned out to be a lower jaw of a plesiosaur, a marine reptile that swam in the ocean that covered most of Oregon 90 to 100 million years ago during the Cretaceous. Plesiosaurs were primarily fish eaters and grew to a

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length of about 25 feet. The three-foot long lower jaw represents the third vertebrate specimen fossil found from the end of the Age of Reptiles in the Pacific Northwest, the other two fossil fragments having been discovered 85 years ago. The fossil is the first plesiosaur from the area and appears to represent a group that was worldwide in distribution during the end of the Age of Reptiles.

The recovered specimen will be housed at the Museum of Geology in South Dakota. The museum staff is currently removing the rock from the fossil to determine the specimen's condition. The BLM is working with local entities to find a more permanent home for a replica for public education purposes.

"Kelly and Kovalchuk did everything right! Without their exemplary actions – finding the specimen, recognizing its importance, leaving it in place and intact and contacting the right people – we wouldn't have this story to tell. Their responsible actions have advanced the science of paleontology and made it possible to share this unique discovery with the rest of the public," said Zancanella.

Zancanella is hopeful that this story will encourage others who find fossils or cultural artifacts on public lands to follow their good example and report the find to the appropriate land management agency.



Pictured above:
Dr. James E. Martin works carefully to remove rock from a portion of the plesiosaur fossil as co-discoverers Greg Kovalchuk and Mike Kelly look on.



Pictured left:
Co-discoverers Mike Kelly and Greg Kovalchuk sit proudly with the plastered lower jaw of the first plesiosaur reported from the Pacific Northwest.

NARG Fossil Collecting Policy

- All fossil specimens collected on NARG sponsored trips are for educational and research and may not be used for commercial purposes.
- Participants in field trips agree to abide by the rules of and policies of the site owners and managers.

NARG Advisors

NARG welcomes two new Advisors

- **Dr. James Martin** - *Vertebrate Curator, South Dakota School of Mines and Technology*
Dr. Martin will be assisting NARG in the area of Marine Reptiles and Terrestrial Mammals

- **James Goedert** - *Affiliate Curator, Fossil Marine Vertebrates, The Burke Museum of Natural History and Culture, University of Washington*
Mr. Goedert will be assisting NARG in the area of Marine Mammals.

NARG Advisors are professionals in the fields of paleontology, paleobotany, and geology. In a collaborative and cooperative association, Advisors provide NARG with instructional guidance and consultation on NARG's ongoing paleontological research activities in areas of collection, preparation, curation, and publication.

Up The Creek - An Alaskan Fossil Adventure II

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It was July of 2001 and we were restless. It was time for a major field adventure. Planning for the trip had occurred during the previous winter. Meeting at our local coffee shop, we poured over maps and publications and plotted potential courses through the wilderness to one of our favorite locations, Flume Creek in the eastern Talkeetna Mountains. Both Greg and I had visited Flume Creek several times in the past. My visits were usually as a member of geologic field party whereas Greg had made trips with a friend, but we had never collected at Flume Creek together.



The 80 pounder *Pachydiscus*

The outlet of Flume Creek into Alfred Creek is situated some 100 miles north of Anchorage. The geology along its course is quite complex and poorly understood. The upper Cretaceous (75 million years ago) Matanuska Formation was our main objective, for it possesses a prolific ammonite fauna. The Matanuska is composed of ancient deepwater marine silts and shales. The uppermost Matanuska commonly displays large concretions that range from round to flattened. It is the semi-flattened concretions that we seek out. My enormous 80 pound *Pachydiscus* ammonite I have come from one such concretion. The lower Matanuska (100 mil-

lion years ago) holds another treasure within much smaller and rounded "cannonball" concretions. In the latter, fossil coloration brought out by the prismatic and nacreous shell layers can be spectacular with beautiful opalescent hues of purple, pink and blue. Yes, we had much to look forward to, but the job would not be easy. It never seems to be in the "Land of the Midnight Sun."

Getting to this fossil wonderland is not easy. We planned to get as close as possible by 4-wheelers (14 miles) and do the remaining distance (6 miles) on foot. Our bruising trek on foot would entail hiking up a steep, narrow stream bed floored by cobbles and boulders. We would be climbing nearly 3500' in our 6 mile hike. Hiking uphill on cobbles and boulders for that distance is pure agony on the feet. We would also have more than 20 icy stream crossings. We would have to be prepared for bear and moose encounters. Yes, at close quarters smart Alaskans respect moose! Perhaps more people have been injured in Alaska by startled moose than bears!! The weather would also be an unknown variable. In July, frequent rains can be heavy in the high country. A narrow stream valley can become a flash flood quickly. Then the omnipresent mosquitoes and biting flies can make any outing absolutely miserable.

Neither Greg nor I owned 4-wheelers so arrangements were made in advance to rent them in a nearby community. Since we planned on staying in the field for two nights, considerable logistical coordination's had to be made. Greg provided a two-man tent, cooking gear, med kit, bear protection, and food. I provided a ground to air hand held transceiver, tarp, rock sample bags, and a water purification system. We each brought personal items like sleeping bags, ground pads, bug dope, toiletries and field snacks. It doesn't sound like much but it adds up and the goal is always have more room to carry the beautiful, yet heavy, fossils. Heavy packs com-

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bined with walking on slippery cobbles and boulders in streambeds can be hazardous so I carried a pair of collapsible hiking poles. For bear protection Greg provided the “ol equalizer”, his trusty .44 magnum revolver.

To take advantage of the long Alaskan day I reported to Greg’s home at 5:45 a.m. sharp. We made our “critical fuel” stop at our local coffee stand for a big caffeine jolt before loading up our 4-wheelers at the rental shop. We received a copious lecture on the “dos” and “do nots” of the responsible ATV operator. It seemed there were a lot more “do nots” to pay attention to but we were finally able to put the machines on our trailer and get started. Somehow it had already become 9:30 a.m. and we still were on the highway. We enjoyed a “pleasant” 50-mile ride up the winding Glenn Highway to our trailhead, often wincing at the steep drop-offs and oncoming truck traffic that our poorly balanced trailer kept trying to careen into. After several lengthy stops for road construction (and silent prayers that our trailer would stay attached) we arrived at the trailhead 2 hours behind schedule.

We unloaded our machines and made preparations for the first leg of our off-road adventure. When it dawned on me that I had never been on a 4-wheeler before, only one of its 3-wheeled precursors. I remembered once going up a steep grade on a 3-wheeler only to have it back-flip, leaving me pinned under its weighty frame. It was good to have the stability offered by a fourth wheel but I was still nervous about what lay ahead. We had an upward climb to Belanger pass that allowed access to the back country followed by a fairly gentle descent from the pass into the Alfred Creek valley. We were traveling in light rain but the muddy trail seemed negotiable. We proceeded westward along Alfred Creek crossing it on numerous occasions. Greg noted it was running higher with the increasing run-off, but our machines seemed capable of handling it. Greg’s confidence in our ability to tackle what lay ahead strengthened my resolve. We rumbled through the old mining equipment near the confluence of Flume Creek and Alfred Creek. It was then I began to notice problems with my machine. Occasionally it would lose energy and barely move forward. Greg later diagnosed the problem as a wet drive belt which would periodically slip and cause a failure of the forward drive mechanism. Upon arriving at the confluence we noted the day’s rain had visibly deepened the channels and created wild turbulence. “Greg, I don’t like the looks of this!” I yelled. I watched Greg attempt the crossing slightly downstream from me and below the confluence. After diving like a German U-boat into the

first standing wave, he resurfaced and powered across the remaining stretch of water, but it did nothing to raise my comfort level. I had completely lost confidence in my machine and had no stomach for such a challenging crossing. I yelled across to Greg, “I feel real uncomfortable doing this. Do you want to give it a try?” Greg then struggled

through the ever deepening water to my machine and took over. His last experience taught him to cross above the confluence where, in theory, the stream was shallower. After a wave and a prayer he plowed ahead. His progress was good at first, but then the belt failed leaving him

to flounder in the middle of the creek. I had already used my trusty hiking poles and hip waders to make the crossing so I was in no position to assist my waterlogged friend. Next to aviation disasters the biggest cause of unnatural death in Alaska involves water and I really have a policy against unnatural death. Greg made limited forward progress and finally jumped off the 4-wheeler into the churning water. With some colorful language and a mentality left over from his college football days he managed to manhandle the untrustworthy machine from the grip of the merciless stream. After drying off, we collected ourselves and proceeded about a quarter mile up Flume Creek and stashed our 4-wheelers in the alders. After our ordeal at the confluence we already had worries about our return trip

Our long walk was about to begin. We kept our hip boots on as we knew some swift water crossings lay ahead. The stream crossings were somewhat treacherous and both Greg and I were glad we brought the hiking poles which I was now sharing with him. After a mile of rock hopping and thigh deep crossings, we encountered our next obstacle, a waterfall. The waterfall, which was about 20 feet high, came at a topographic nick point in the Flume Creek drainage.

There was no physical way of climbing it. We would have to sidetrack around over steep, rugged terrain. After a sweaty, bug-filled climb, we arrived at a ridgeline overlooking the Flume Creek drainage to the north. A cool breeze kept the bugs at bay while we took a much needed snack break to refuel our depleted reserves before descending to the valley floor beyond the falls.

At this stage we were growing weary of hiking in our waders and decided to cache them under some alders and pick them up on our return trip. It was time for our secret weapon to facilitate stream crossings.

We called them “frog legs”. “Frog legs” are lightweight, waterproof cordura waders that can be slipped on,

“Next to aviation disasters the biggest cause of unnatural death in Alaska involves water”



First find of the trip. Greg’s much coveted *Pseudophyllites indra*

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Metasequoia - Oregon's State Fossil



Oregon finally shed the distinction (notoriety?) of being the only western state lacking a state fossil when it named the fossil leaf Metasequoia its official symbol last spring. These conifer trees, relatives of living pines, junipers, and yews, were widespread members of northern swamp forests during the latter half of the Tertiary Period.

Although the Metasequoia fossils found in Oregon date from the Miocene Epoch (25 - 5 million years ago), the genus itself is not officially extinct. In a vegetational reprise of the coelacanth story (see dinofish.com), Metasequoia was known only from fossils until a grove of living trees was discovered in a remote valley in China in 1941. The tree is known in the horticultural trade as the "dawn redwood."

After an intense effort by Newport fossil buff Guy DiTorrice (who once presented each and every legislator with a Metasequoia fossil) and student MacKenzie Smith, with the help of State Rep. Alan Brown, the Oregon legislature passed House Joint Resolution #3 on May 4, 2005. Honoring a fossil tree seemed appropriate to Oregon residents because it recognizes their timber heritage.

To see what other
states have adopted
as their state fossil
visit:
www.statefossils.com

NARG - Semi Annual Auction and Raffle

When: December 7th, 2005
(7:00 pm to 9:00 pm)

Where: Rice Museum, Hillsboro, OR

NARG Members had such a great time with the last Auction and Raffle we decided to hold them semi annually.

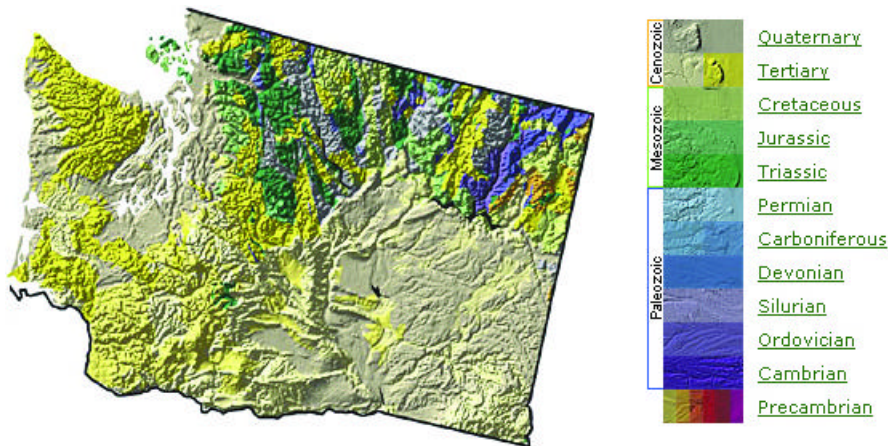
Auction

Bring in those extra fossils, books, and excess tools you have laying around and donate them to be auctioned off.

Raffle

NARG will be raffling off some great items and recommend you purchase lots of tickets to increase your chances of winning!

Washington Paleontology and Geology



The Precambrian: Precambrian rocks exist only along the northeastern portion of the state. Since the Precambrian, huge amounts of crust have been added to the western edge of the North American continent. All the land west of the Precambrian rocks has been created through complex tectonic processes along an active continental margin or transported from elsewhere and accreted onto the continent of this region.

Paleozoic: In the early Paleozoic, easternmost Washington was at the edge of a large ocean. Early Paleozoic fossiliferous sandstone, shales, and limestone were deposited along this ancient shoreline. Other Paleozoic sedimentary rocks of Washington were transported as exotic terranes and accreted to the margin of the continent in the Mesozoic. These terranes contain unrelated slivers of Devonian-, Carboniferous-, and Permian-aged rocks, originally formed far from their present location.

Mesozoic: During the late Jurassic and early Cretaceous, numerous blocks of exotic terranes were added to the western edge of the North American continent to form most of what we know as Washington state today. British Columbia and Oregon are also made up primarily of these terranes. Most of these terranes consist of narrow, banded, rock sequences, often overturned and formed far from their current location—much like a badly shuffled deck of cards. They include volcanic island rocks and fossiliferous marine sediments that originated elsewhere in the Pacific Ocean. Jurassic and Cretaceous fossils occur in the north-central and northwestern part of the state. By the end of the Mesozoic, approximately two-thirds of the state was assembled.

Cenozoic: Cenozoic marine sediments make up the western part of Washington and were formed as the sea gradually retreated westwards. Marine fossiliferous sandstones and siltstone cover most of Washington west of the Cascades Mountains. The Olympic Mountains consist of marine sedimentary rocks uplifted about 10 million years ago. The Cascade volcanic began in the mid-Cenozoic and has been active ever since. Continental sedimentary rocks are not common. Continental ice sheets covered the northern third of the state during the late Cenozoic, and alpine glaciers covered the Cascades and Olympic Mountains. Large and small mammals lived at the edge of the ice, and salmon swam up the rivers to ice-blocked dams.

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**“If we knew what
we were doing, it
would not be
called research,
would it?”**

Albert Einstein

Up The Creek - An Alaskan Fossil Adventure II

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much like a pair of socks, over leather hiking boots. We only had one pair which we planned to share. Slip them on, cross the stream, remove them, place a rock in each, toss them back to your partner so he too can don them and cross. This we did time, after time, after time. It was sheer drudgery taking the “frog legs” off and going through the time consuming procedure. It would have been much easier to wear our hip boots, but hiking in hip boots over cobbles and boulders was unacceptable. True, we could have crossed with hip boots then hiked in our leather boots, but that would have meant packing our heavy waders. We wanted to travel light so that more fossils could be packed out. After our fourth crossing, our “frog legs” ruptured and our feet and legs became inundated. In our packs we carried that indispensable product of the 20th century that every Alaskan has grown to appreciate, duct tape. We patched up the “frog legs” as best we could and continued our long march up the valley.

It continued to drizzle with the temperatures in the high 40's to low 50's. It was rapidly moving towards 6 o'clock and we were already tired, wet and hungry. Still we were less than halfway to our chosen campsite. Even with good hiking boots, walking on boulders and cobbles for such a long distance is extremely uncomfortable. Time and again some of the stream crossings gave me pause. Greg is younger and stronger than me and had the athletic ability to step across slippery boulders with ease. Such boulder crossings terrified me...a broken leg up here was no good. It would probably require an emergency call on our transceiver to get me out by helicopter so I made all my crossings with the greatest care. I would avoid some of Greg's bold crossing points and seek out “wimpy” shallower crossings. Suffice it to say we weren't making very good time. Well after 8 p.m. we were starting to turn westwards towards the headwaters of Flume Creek. We proceeded through a narrow, craggy canyon very demoralized and now facing the possibility of darkness catching up to us. Just then, off in the far distance we could see our final objective, the black cliffs of the Flume creek headwaters. So close, but still so far and virtually nothing to raise our spirits between us and trails end. We had started to contemplate giving up for the day, a mere mile from our final

objective, when Greg found the only thing that could boost our weary souls. There at his feet lay a weathered ammonite of the genus *Pseudophyllites*. Not only did this little piece offer us a new found strength to continue but it actually was the one genus neither Greg nor I had located in our previous forays into this location. Was it luck, or had we passed the

test thrown down by the powers of fate and this was our reward?

The final stretch to our camp site was over hummocky tundra, the only surface harder to walk on than a cobble-strewn streambed. Imagine stepping from one loose beach ball to another all tossed out on a shallow lake bed and you start to understand what the last quarter mile stretch to camp felt like. We were both absolutely exhausted. At this point

not even more fossil finds could have erased the zombie like expressions on our faces. All we desired was a warm meal, a dry tent and sleep. Staggering, tripping and mumbling, we arrived at our camp site at around 9 p.m., more than 4 hours later than what we had originally planned. By 9:30 p.m. camp was established. Greg's “2 man tent” was erected and my much needed tarp covered it. Still in drizzling rain, we sat in silence as we consumed our well deserved hot meal prepared over a light weight, one-burner stove. We then unfurled our sleeping backs and retired for the evening. Greg's tent was a brand new 2-man affair purchased just for this trip. It was selected for its extreme light weight and easy packing qualities. Greg had failed to mention that it was built for bicycle riders who are generally of a smaller, leaner body design. Greg is definitely not a “smaller” type. At about 235 lbs. he more than filled his side of the tent. The “lightweight” nature of the tent caused it to sag and, had it not been for my tarp, it would have leaked like old cheese-cloth. I regretted not bringing my heavier 3-man tent. Despite the uncomfortable accommodations we both were off to fossil dreamland moments after squeezing into what we later deemed the sausage casing (the tent)!

The next morning we awoke to fairly clear skies. We had slept hard and felt well rested. It was our big day “up the creek”. Our planned morning hike would take us initially along a north facing slope of Matanuska Formation where on



Don at "Camp". Note raingear, web socks, and gloomy look. Greg's "2-man tent" is the small triangle under the tarp.

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previous trips the shale strata had produced many ammonites of varied upper Cretaceous genera. We had big hopes as we walked upstream encountering the cast away relics of previous collectors. Greg recognized some of the big *Inoceramus* clam fossils as pieces he had set aside on his trip some two years earlier. We also located some huge outer whorls of *Pachydiscus* ammonites that Greg had previously left behind. Even though the whorls were broken they would have been valued treasures in any collection; unfortunately they were just too massive to pack out. If only we had a helicopter! As we continued our trek we became increasingly disheartened that very few new concretions had eroded out. It appeared the previous two winters had eroded few new specimens out of the shale wall. Greg went into salvage mode looking for any castaways or partial ammonites that would fit his collection. I didn't have the patience for such



Greg on the treacherous slope above creek with an unusually large *Pachydiscus* whorl.

work and desperately wanted to make the "big find" first. I took the lead, a fact which Greg to this day needles me about. "You are always cutting in front of me Don, always taking advantage of me!" "Oh, the poor guy" I thought. "His collection is much better than mine; don't I deserve the first shot?" So goes the petty rivalries of field paleontologists. It brought to

mind the famed paleontologists of the 19th century, Cope and Marsh, who

were continually at each others throats to collect the best dinosaur fossils for eastern museums.

As I proceeded upstream I continued to whack away at any concretion I came upon. Most were non-productive or contained only poor quality fossil "hash", but then it happened. Partially buried in the stream bed was a large concretion that was semi-flattened and had that wonderful appearance that, could it speak, would say, "Crack me open and you will find treasure!" I silently extricated the concretion while Greg continued to toil over some broken material downstream from me. The concretion was manipulated on edge and with my pick I deftly struck (with the care of diamond cutter) my treasure. The concretion split with ease and there exposed

"His collection is much better than mine; don't I deserve the first shot?"

was an absolutely beautiful ammonite doublet; a perfect 4 inch *Neophylloceras hetonaiense* and next to it an absolutely, drop dead gorgeous, 7 inch *Patigiosites alaskensis*. I calmly stated to Greg, "Come here." He looked with his mouth ajar and said, "What? Oh man!!" The concretion still needed some work to further extract the two ammonites. To honor my good friend, I turned the final field preparation over to him while I once again struck out to make the next big find. Once he completed the extraction I returned and avoiding his icy stare, (could he be jealous?) I carefully packed away my new prizes before proceeding onward. Greg climbed high on the steep, north facing scree slope scouting out more concretions. He knew I would never follow him up the steep slopes and, perhaps, he thought he could gain the lead there. He found several concretions with this ploy but most were devoid of our quarry. I continued to work the stream bed with little more success than Greg. Just as Greg was forced off the slope by the increasing gradient we both spotted one large ammonite high on the scree in a location of questionable accessibility. We decided to tackle it later on our return to camp. We continued westward and climbed the headwall of the drainage on the north side of the valley.

We continued to pick up fragmental ammonite and pelecypod (clam) material but nothing of real note. A few large ammonite whorl sections with beautiful suture patterns were found but their weight kept them out of our packs. We struggled upward to the top of the ridgeline where I knew a special prize would be found. I called it ".50 Caliber Ridge" based on my past discoveries there. A different treasure was to be found there in great quantities in the shale member of the lower Cretaceous Nelchina Formation, the unit that immediately underlies the Matanuska. You may ask what looks like a .50 caliber projectile in these parts?

Why of course it was the scourge of fish and zooplankton in the lower Cretaceous, the squid-like belemnite. The location was truly amazing. Littering the narrow ridgeline and its slopes were hundreds of cigar-shaped belemnites,



Headed up towards .50 caliber saddle



Some typical .50 caliber "shells"



An atypical "mortar round"

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The Taxonomy Report #3 - Ammonites

Submitted by Aaron Currier

One of the important aspects of research is not only the labeling of specimens with accurate scientific binomial names, but understanding how a species fits into the hierarchical tree of life... otherwise known as the scientific system of classification, or taxonomy. In the "Taxonomy Report" we look at how species fit together, both in relation to other related species, as well as their ancestry.

Another popular fossilized animal among NARG members is the extinct cephalopod known as "ammonite." The word ammonite comes from the ancient Greek word Ammon meaning ram's horn – it's obvious from the look of many coiled ammonites where they came up with this name. So, what is an ammonite and how does it compare to nautilus, orthocerans, baculites, and belemnites, the latter three which happen to be straight in shape? Are the straight ones ammonites too?

I hope you already know the fossils we are talking about here are mollusks as well as cephalopods so we can focus on the Orders within the Class Cephalopoda, because that's where it gets interesting.

Once again, we must sift through various resources to "decide" for ourselves how we want to classify ammonites – well actually ammonoids – since names change over the years, people disagree with common phylogenetic characteristics, and numerous self-professed "educators" post incorrect information on the net, either due to ignorance or laziness toward performing the research themselves.

During my internet fossil hunting, I discovered a few sites where people had posted classified lists of ammonoids supported by potentially trustworthy resources. I compared and compiled the lists, and then confirmed the higher orders with a few of the universities' postings. Here are my conclusions, at least for use in classifying the cephalopods in my collection. (Have I used enough qualifiers to convince you this is suppositional reporting?)

The Class Cephalopoda can be divided into three key SubClasses – Ammonoidea, Nautiloidea, and Coleoidea. There are others, but these three contain the organisms we're likely to find. In this report I want to focus on the ammonoids and "ammonites" so I'll just touch on the other two. You have probably all heard of nautilus and how they are the closest thing to an ammonite we have living today. There is only one Genus left after most of the Nautiloids died out with the ammonites and the rest (like *Aturia*) back in the late Miocene. The Class Nautiloidea has two key Orders – Nautilida, which includes *Nautilus*, *Aturia* and *Eutrephoceras*; and Orthocerida which includes "*Orthoceras*." Yes, the orthocerans you see for sale from Morocco at all the rock shows and tourist traps (dark grey with white marble-like inclusions) are in fact straight nautiloids and are very different from a baculite or a belemnite. Unfortunately most of the specimens labeled "*Orthoceras* sp." are usually not *Orthoceras*, but any one of numerous other genera that have been identified. Very few collectors in the field seem to bother with a name other than what is now more-or-less a common name of orthocerans.

We'll get to the baculites in a moment, but let's look at the belemnites first. They are classified into the Order Belemnoidea which is placed in a third SubClass, Coleoidea. They are similar to today's squids, although the belemnoids are now extinct. The only part that typically fossilizes is the "cuttle bone" that looks like a small torpedo and provides the animal's "shape" internally. They don't have an external hard shell like the nautiloids or the ammonoids, but they are still a cephalopod.

So then, what exactly is an ammonite? The SubClass Ammonoidea contains all the ammonites, all the cephalopods that look like ammonites (except the nautilids), and a whole bunch that don't look like ammonites. This gets clearer when we divide the SubClass into Orders: Ammonitida; Ancyloceratida; Ceratida; and Goniatida – again, these are key Orders among many obscure ones. A large majority of what we typically call ammonites are indeed classified under the Ammonitida Order, which would therefore actually be correct. Ammonitida includes common genera such as *Platoniceras*, *Desmoceras*, *Dactylioceras*, *Pleuroceras*, *Hoplites*, *Mortoniceras*, and *Macrocephalites*. However a lot of the ancyloceratidites look like they could also be ammonites and really are not. I admit it's easier to say "ammonite" than "ancyloceratidite," but scientists and serious collectors more often refer to them by generic names such as *Scaphites*, *Jeletzkytes*, *Baculites*, and heteromorphic ammonoids. So, basically, the ancyloceratidites are the ammonoids that are loosely coiled or thought to be the ancestors of the loosely coiled, yet resemble the ammonites. *Baculites* are not even curved – they are straight-shelled like an orthoceran, but still an ammonoid.

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Up The Creek - An Alaskan Fossil Adventure II

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some up to 4" long. Being a former military man they reminded me of .50 caliber machine gun rounds. Greg and I scoured the outcrop like kids on an Easter egg hunt. "Wow! Look at this one, Greg!" "Don, check this monster out!" Such was the conversation that continued for at least 45 minutes. On a day when ammonite hunting wasn't stellar for all, we were both finally having fun. My luck with finding big belemnites was fantastic. As I had collected this exposure a few years before and because Greg hadn't scored well on ammonites, I backed off (after some subtle warnings from Greg) and let him have free rein in collecting. Satiated on belemnites we took our lunch break and spent time just soaking in the beauty of the Alaskan landscape. It was a very special moment. Two friends sharing their mutual passion of



fossil collecting in the stillness and grandeur of a totally untamed and wild land, an experience we will always cherish.

We next plodded up slope to the ridgeline that separates the Flume Creek and Billy Creek drainages.



Upon cresting we viewed the spectacular panorama before us. Below us to the west lay a side drainage to Billy Creek known as Ammonite Creek, just the kind of name that makes you circle the map! As we pondered our next move we saw movement on a steep, craggy outcrop to the immediate southwest. Out came the binoculars. It was a huge Dall sheep ram guarding the local treasures like a lone sentinel. I knew what could be found below from my previous trips.



Contained in small, cannonball concretions would be absolutely gorgeous lower Matanuska

ammonites displaying incredible iridescent hues of purple, pink and blue. We stood high above our quarry and contemplated our next move. The sheep was able to deftly cross the slope without a thought for footing or trail, but we lowly bipeds stared down the mile long gradient and wondered if it might be more than we could manage on this day. Ultimately we decided that we would have to leave it for another trip. Later we would greatly regret that we didn't descend into Ammonite Creek as we truly did have time for such a venture and our packs still had room for more samples. At the decision point though, weariness and concerns over our long return trip home were starting to set in. At 3:30 p.m. it was time to begin our descent back to camp and scour the previously bypassed areas for any remaining bounty.

The descent down to Flume Creek went well. I picked up a fair *Pachydiscus kamishakensis* ammonite giving me the honored distinction of finding the "Big Three": *Pachydiscus*, *Patigiosites* and *Neophylloceras*. I was feeling good. Greg continued to pick up small pieces that later, with proper identification would fill in his fauna list for the area. He did make one other major score, a large upper Cretaceous partial nautiloid which was missing from his collection. He was able to reconstruct the whole beast at a later date and it turned out even better than he hoped. We also tackled the large ammonite that both of us had spotted high on the scree slope earlier. Greg, being the mountain goat, took on the challenge of retrieving it. To me Greg took on the air of Spiderman as he approached the large ammonite. It was so



heavy that Greg only photographed it to document its existence and then returned down the hill trying not to do cart wheels on the steep slope. Greg has proven to be uncanny in his ability to repair these wonderful Cretaceous creatures so he may have been able to reincarnate the beast; however, I'm not sure he would have survived the trip out as the piece would have added over 60 lbs to his pack. We hiked

the final 500 yards down to camp both a little disappointed in the trip results (perhaps Greg more than me). At this stage we were both dehydrated from our exertions and empty water bottles. Out came my high tech water purifying system. This was to be my big moment as I had promised crystal clear, mountain, spring water for our trip. (Greg had promised fine accommodations!) Proudly I carried it to a nearby stream and proceeded to pump life-giving fluid into a canvas container. Drip, drip, trickle, trickle... it was hopelessly plugged. "Nice maintenance on your purifier, Don" Greg said. "That's really going to quench our thirsts!" I felt

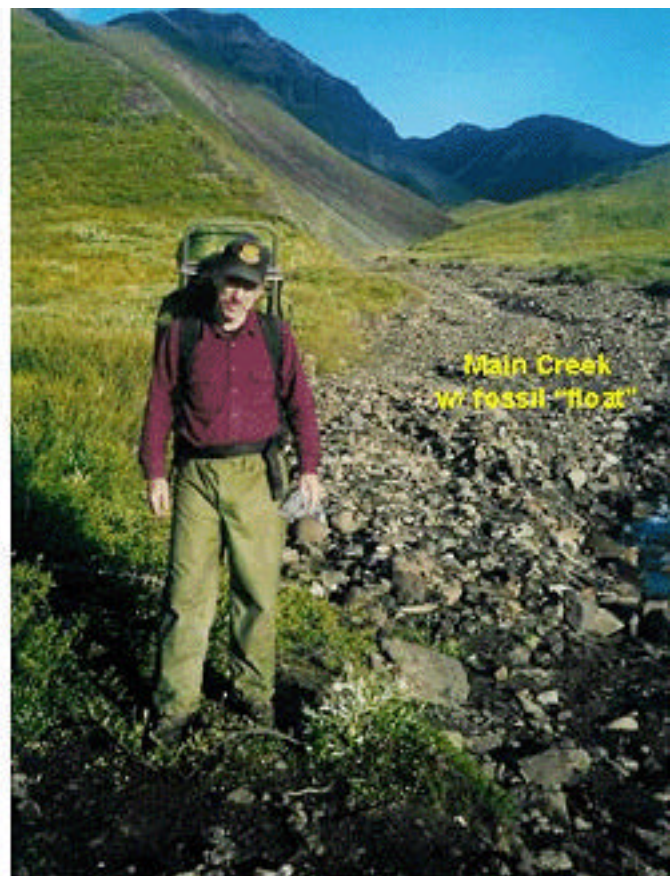
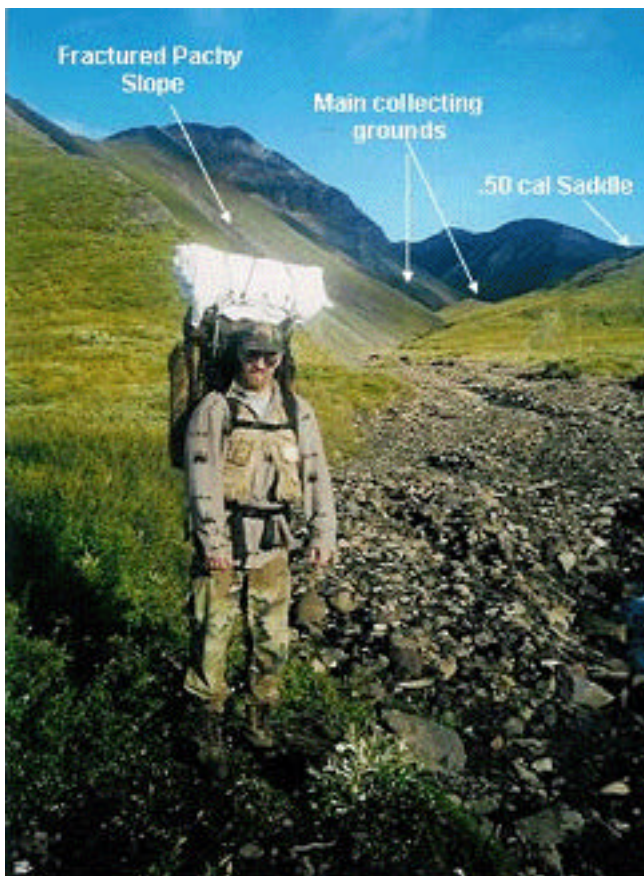
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Up The Creek - An Alaskan Fossil Adventure II

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badly. We were desperate for water and my gizmo had let us down. Fortunately Greg knew not to rely on single solutions to major problems so he pulled a vial of ancient sodium iodide tablets out of his pack. We popped them into our water bottles, filled them up with stream water, and quickly guzzled down the foul tasting liquid. Then I turned and noticed Greg adding grape flavored crystals to improve his beverage. Had he simply forgotten to offer this little treat to me or was he remembering who had collected the nicest pieces most of the day. Surely he wasn't so petty, but he seemed to enjoy his drink much more than I did. At least we were both protected from the nasty giardia parasite. With our thirsts satisfied we settled into the routine of back-country camping, consuming freeze-dried food, drying gear, repacking everything twice, and, most importantly, figuring out how to reduce weight in our packs. Even after the rigors of this routine we found ourselves with 2 hours of daylight and nothing to do except explore around

Greg noted that his pack should have been a lot heavier than the 80 pounds he estimated upon lifting it. On a previous trip he had returned with a verified 120 pound pack load. Greg is, indeed, one powerful man, with Charles Atlas shoulders and massive arms like thick oak limbs. Of course he uses common sense in knowing that it is all downhill to the 4-wheelers, so a bit of extra weight is allowable. My pack weight was just right, about 10 lbs heavier than when I came in. Greg maintained my pack was actually lighter and accused me of stuffing extra gear into his pack when he was not looking. As we trudged out of camp Greg began to bemoan his poor showing and vowed that this drainage would never see his boot soles again when, out of the blue, like a gift from the gods, he struck pay dirt some 100 yards from camp. Lying in the middle of the streambed was an absolutely lovely lower Matanuska *Breweriaceras hulenense* ammonite with bright purple coloration. This was a great



Headed for home, collecting grounds in background. Note Greg's much heavier looking pack.

camp for any overlooked materials. If only we had headed down into Ammonite Creek! We decided to repack ourselves into the sausage casing tent for an early sleep, but as we lay there we both were thinking of tomorrow. The fun was now over and a new ordeal was about to begin.

The next morning we awoke once more to a mostly clear, bug-free day. We were in a somber mood as we prepared breakfast. We broke camp to commence the long haul home.

trophy and a much needed addition to his collection. Finally, after a trip of hard work and hard luck on the outcrop, I saw that great smile return to Greg's face. How such a piece, more commonly found on Ammonite Creek, came to be found perched atop a large boulder in everyone's open view still remains a mystery.

Our step was lively and quick for the first 100 yards follow-

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The final price, Greg's Albian aged Brewericerias.

ing Greg's discovery. We then settled back into our stumbling, bumbling downhill march filled with endless stream crossings and mile after mile of cobbles and boulders. The "frog legs" had become so tattered and "holey" that they were left in the pack. We splashed our way down the trail until we arrived at the location of our cached waders. Once more we donned our hip boots and negotiated the waterfall section of the trail. It was much easier going downhill and much quicker knowing our machines and cold drinks lie but a mile or so away. Finally, totally exhausted, we arrived at our stashed machines. I approached my failing machine with great foreboding as, in my heart, I knew something dreadful was about to happen.

We started our engines and once more approached the Flume Creek/Alfred Creek crossing. The water had receded a bit and Greg went first powering his way across the 100 foot wide torrent. After some lateral drifting and difficulty clawing up the far bank he parked, safely across. I decided to give it a go this time. I couldn't always count on Greg to come to my rescue and it was time to conquer my fear. I gave my machine full throttle and went in, happily powering ahead. Then my greatest fear materialized at the deepest section of the crossing. Instead of lumbering forward as Greg did, my machine faltered. I was hung up on massive boulders and surrounded by standing waves of ice cold deadly water. I was terrified. To get off the machine could mean being swept away to God knows where. To stay on the machine would ultimately bring disaster as the vicious current would ultimately turn us both over. As I looked shoreward for guidance I saw that my rescue was already in progress. Without saying anything this friend of mine had entered water and was plowing through standing waves to reach me. Only someone with his strength could have done this. Somehow, with Herculean power and the benefits of adrenaline, he got behind me and pushed the machine over the boulders and into shallower water. The wet engine belts finally engaged and I was able to limp shoreward. I truly felt that I had cheated death (or at least a good soaking). We both agreed a certain 4-wheeler rental mechanic was going to get a lengthy lecture on the do's and don'ts of belt maintenance.

The remainder of the return trip went relatively well. My machine, like a stubborn donkey, would occasionally balk after even the most benign water crossing and then re-engage just in time to clear the hurdle, only to repeat the performance further up the trail. The stream crossings

became less threatening and we both breathed great sighs of relief as we re-crossed the pass and started down to the truck. We were homeward bound. We had traveled "up the creek" into the land of the Mesozoic and returned intact. We returned with treasure but, more importantly, we made it back safely with wonderful memories and a profound sense of comradeship. That night as we returned home we looked forward to family, good food, and warm beds, but our conversation turned to those wonderful fossils left behind. Ultimately it was decided that much like MacArthur in the Philippines, we would return. We could not resist the siren like song of life long ago. Yes we would return. THE END

Newsletter Submissions

Do you have an interesting story or article that you'd like published in the NARG Newsletter?

If so, submit your story/article to:

Jerry Rawdon

jrawdon@narg-online.com

Fossil Fest 06'

The Fossil Fest is held each year in February at the OSU Hatfield Marine Science Center in Newport, OR.

The event includes fossil swaps, displays and presentations. Dr. William Orr, a professor of oceanography, geology and paleontology at the University of Oregon, will be on hand to identify fossils brought in by people attending the festival as well.

NARG's Fossil Casting was a huge hit at the 05' Fest and we plan the same again, plus expanding by including another activity for kids. In addition the 2 tables for the Kids we will also have 2 tables for fossil display.

Fossil Fest 06' will mark NARG's 3rd year of participation and it has been great to see the show grow with each year.

Want to participate? NARG is looking for volunteers for this year show to help with coverage of the 4 tables that will be setup. Please contact Andrew Bland (abland@narg-online.com), if you're interested in participating. We can use all the help we can get.

More info to come as the show draws near.

Fossil Preparation

Repair, Reconstruction, and Enhancement

Submitted by Andrew Bland

Almost all fossil specimens will have some repair, reconstruction, or enhancement. Seldom are fossils found or recovered intact; almost all require some work to bring the specimen to a presentable level.

For purposes of clarification, repair means to restore after damage from the pieces recovered. This includes gluing fragmented pieces together or filling in small crack and gaps to aid in the specimens stability; enhancement means the use of coloration, shading, or highlighting to match or improve the visibility and appearance of the specimen, and reconstruction means the replacement of missing pieces or parts of the fossil. Keep in mind that repairs, for the most part are OK, but reconstruction or enhancement may affect the fossils scientific value.



When this concretion containing a *Nostoceras hornbyense* ammonite was split in the field, not only was there damage to the ammonite from the break, which needed repaired, a section of the specimen came up missing, which required reconstruction.



Not until the fossil was completely prepared did reconstruction start. Filler was used to reconstruct the missing "wedge" area. General shaping was done and after the filler dried completely was an exacto knife and rotary tool used for final shaping.



Probably the most difficult part in any reconstruction is painting the filled in area to match. This was especially difficult with this specimen since the shell material was pearlescent and it took several coats of water color paint to match the rest of the fossils.

The human eye can pick up on the subtlest changes in color, texture, and pattern and it sometimes takes several tries to get it right, especially during coloration. Take your time and use reversible products so you have the option of starting over.

Don't get carried away with reconstruction or enhancements. If you find a crab that only has 7 legs, don't reconstruct the remaining 3 as it misrepresents the fossil. Also, information on the type of material used on a specimen's repair/reconstruction/enhancement should be included on the identification label.

Adhesives and consolidates

Cyanoacrylate - Super Glues: Since being a relatively new product (dating only from the 1980s), knowledge of their long-term efficacy is limited, but you can't beat it's versatility and it's always good to have a variety of viscosities on hand.

Acrylic Copolymer - Vinac: With the possible exception of the Butvars, the acrylic polymers may be the most popular adhesives used in paleontology. Their reversibility and long-term integrity make them ideal as an adhesive or consolidate. Most use common solvents such as acetone, ethyl alcohol, or water. It can be mixed to a thick consistency to be used as a glue or a dilute solution for a consolidate. Available at: www.paleobond.com

Filler Material

Paleo Sculp: This is a two-part type product that is extremely versatile. You mix equal parts of this putty like product from which it can be shaped, molded, or applied to your fossils. Pot life is about 1 hour and has a 24-hour setup period at which time you can work it with tools to fine tune the shape and texture. Paleo Sculp is water-soluble and readily accepts paint. Available at: www.paleobond.com

Elmer's Interior Wood Filler: Available at most hardware stores Elmer's wood filler is great at filling small gaps and cracks. It sets up quickly and accepts paint. It is fairly soft even when it has setup so limit its use to small areas.

The Taxonomy Report #3 - Ammonites

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The family names are quite numerous and scientists and taxonomists continually re-name, re-classify, and re-confuse everyone with new information about what Family the Genera should be placed in, so cross-referencing is important for accurate labeling. Technical papers provide both the most accurate – and the sometimes most confusing – data on how to classify ammonoids into a Family. Don't be surprised that many of the Family names are the same as the Genus with "idae" added to the end of it.

In summary:

- Ammonoid: Cephalopods belonging to the SubClass Ammonoidea
- Ammonite: Ammonoids belonging to the Order Ammonitida

Web References:

- Yale Invertebrate Paleontology Online Catalog
<http://george.peabody.yale.edu/ip/>
- Ammonites: It's French, but go to the Index... the names are Latin after all!
<http://perso.wanadoo.fr/herve.chatelier/familles.htm>
- The Ross Ammonite Collection
<http://www.geocities.com/ammonite3/>
- Fossil Cephalopods of Utah
<http://www.ammonoid.com/ufc-list.htm>
- CretaceousFossils.com – Quick Identification Gallery
http://www.cretaceousfossils.com/invertebrates/ammonites/ammonites_index.htm

Publications

- Ammonites and the Other Cephalopods of the Pierre Seaway
An Identification Guide, by Larson, Jorgensen, Farrar and Larson, 1997, Geoscience Press.

Who's Who?

NARG Members

Andrew Berkholtz	Deborah Bland	Curt Burbach	Ernie Butts
Skip Cadman	Steve Hetrick	Chuck Hunt	Charles Jackson
Richard Johnson	Margaret Johnson	Gregory Keith	Mike Kelly
William Krause	Karen Letourneau	Patrick Lloyd	Gail Matthews
Larry Oblack	Greg Peters	Dale Peterson	Joe Pohl
Earl Rottsoik	Michael Santino	Mike Schlabach	

NARG Officers/Board Members

Bill Sullivan - <i>President</i>	Aaron Currier - <i>Board Member</i>	Jerry Rawdon - <i>Board Member</i>
Steven Bland - <i>Treasurer</i>	Andrew Bland - <i>Trip Coordinator</i>	

NARG Advisors

James L. Geodert - <i>Marine mammals</i>	Dr. James Martin - <i>Marine reptiles and terrestrial mammals</i>
Dr. Jeff Myers - <i>Paleobotany</i>	Torrey Nyborg M.S. - <i>Pacific NW decapods and isopods</i>
Dr. David Taylor - <i>Jurassic ammonites</i>	Rudy Tschernich - <i>Geology</i>

NARG Affiliates

OMSI - Oregon Museum of Science and Industry	Remains to be Seen Paleo Lab
Rice Northwest Museum of Rocks and Minerals	Willamette Agate and Mineral Society, Inc.

Classifieds

Wanted

Publications: Looking for out of print publications on Oregon/Washington geology and paleontology.

Andrew Bland
abland@narg-online.com
360-574-7678

Services

Learn to prepare fossils: Using various fossil preparation tools such as air scribes, air abrasive, and rotary tools learn to prepare your own fossils. The 5 hour 1 on 1 course includes everything you need including the fossil, or bring in your own material to work on. Course Fee: \$75.00

Andrew Bland
abland@rtbspaleolab.com
360-574-7678

For Sale

Micro Abrasive System: A.E. Aubin 501ABFR with 1/16" carbide tip. Works great when using Dolomite or Sodium Bicarbonate as an abrasive media. Price: \$150.00

Andrew Bland
abland@rtbspaleolab.com
360-574-7678



Rice Northwest Museum of Rocks and Minerals

Open to Visitors
1:00-5:00 P.M. Wed-Sun

ADMISSION:
Adults - \$5.00
Seniors - \$4.00
Students - \$3.00
Under 6 - Free

26385 NW Groveland Drive
Hillsboro, Oregon 97124-9315
Phone: 503-647-2418

Remains to be Seen Paleo Lab



With state-of-the-art tools and innovative techniques, the fossil technicians at RTBS Paleo Lab accomplish some of the most amazing fossil preparation seen in the world today. The lab's technicians are skillful and possess a high level of artistic ability, which is employed to exquisitely prepare fossil specimens.

For more information visit us at:
www.rtbaspaleolab.com



Oregon Museum of
Science and Industry

Founded in 1944 and one of the nation's top ten science museums, the Oregon Museum of Science and Industry is a world-class tourist attraction and educational resource that puts the "WOW!" in science for the kid in each of us.

www.omsiedu

Classified Ad Rates

NARG Members: Free
Non-Members: \$5.00 per issue

Size requirements

12 lines of type or a business card size (3.5" x 2")

Submissions

Please submit your ad verbiage and artwork to Jerry Rawdon at: jrawdon@narg-online.com

STONEROSE INTERPRETIVE CENTER & EOCENE FOSSIL SITE

Stonerose Interpretive Center: Stonerose is the name of a fossil site, a place where impressions of plants, insects and fish that lived in and around a large lake nearly 50 million years ago can now be found in a large shale deposit. These fossils are the result of events that happened long before there were people to observe them.

Visitors to Republic can see examples of local fossils at the Stonerose Interpretive Center where if interested, they may purchase an admission sticker to hunt for fossils at the Stonerose Boot Hill fossil site. Visitors can bring their own tools (hammer and cold chisel) or they may rent them (\$3.00 plus tax for the day) at the Center. All finds must be shown to the Curator or staff personnel. You may take home three fossil pieces per person per day. The Center's purpose is to further educational interests, to encourage scientific study and to preserve the fossils for public enjoyment. The Stonerose Interpretive Center reserves the right to retain any fossils that are of scientific value or significant to the Stonerose collection.



Stonerose Interpretive Center is located at 15-1 N. Kean Street, on the corner of Kean Street and Highway 20 W., across from the city park in beautiful Republic, Washington. The fossil site is just a short walk from the Interpretive Center.

Hours of Operation

May 4-29 Wednesday-Sunday 10:00-5:00
Memorial Day to Labor Day Daily 10:00-5:00
Sept. 7 - Oct. 30 Wednesday-Sunday 10:00-5:00
Fossil Site Closes at 4:00

Fees to the Fossil Site

Per person admission fee: \$5.00
Children under age of 6: free
6 - 18 years of age: \$3.00
Senior Citizens (62+): \$3.00
Stonerose members: free
All individuals visiting the fossil site must have an admission sticker.

For more information please contact us at: (509) 775-2295, or visit us on the web at: www.stonerosefossil.org

About NARG

NARG is a non-profit organization, founded June, 2004. Our mission is to provide a forum for individuals who possess a passionate interest in fossils. In the Pacific NW, we are responsible for a wealth in fossil record. We document our findings and strive to improve communication for scientific contribution and public benefit.

Our goal is to develop an affiliation of fossil enthusiasts working together, to continue research, perform site investigation, have fun, and contribute to the growth and development of an active, premier group of avocational paleontologists.

Our belief: The total can be greater than the sum of its parts: By working together, we can create an informative, educational experience for a dynamic group of people. Our individual pursuits and interests will contribute and enhance scientific knowledge and the public record.

If your interests are research and exploration, collection or preparation, we welcome your participation and invite your enthusiasm!

NARG Membership

Membership dues are due by June 1. If you join between June and December, pay the full amount. If you join between January and May, pay half the amount.

Membership Dues:	Individual:	\$25.00
	Family/Couple:	\$40.00
	Junior:	\$10.00

Guests are welcome and encouraged to attend NARG Meetings!

NARG Meetings

Unless otherwise noted meetings are held on the first Wednesday of each month at the Rice Northwest Museum of Rocks and Minerals.

Board members meeting: 7:00PM - 7:30PM

Regular members meeting: 7:30PM - 9:00PM

**Rice Northwest Museum of
Rocks and Minerals**
26385 NW Groveland Drive
Hillsboro, OR 97124
(503) 647-2418

NARG Opportunities

Information Coordinator: The Information Coordinator shall keep meeting minutes of all meeting of the Members and of the Board of Directors, and shall conduct the correspondence and maintain the records of the Members as the Board of Directors may direct; shall be prepared at all times to furnish information on the rulings of the Group.

If you're interested, please bring it to the Board's attention.

NARG Meeting Topics

Meeting	Speaker	Topic
Nov 2, 05	Casey Burns	Methane seeps
Dec 7, 05	Semi Annual	Auction and Raffle
Jan 4, 05	TBD	

Next Issue

Here are a few things to look forward to in the next issue of the NARG Newsletter.

- Why state's oldest bone isn't on display
- Snow Crabs: An Alaskan Fossil Adventure
- Kid's corner
 - Heather's Amazing Discovery
 - How to make Trilobite Cookies
- Fossil Preparation
- and more.....



NARG - North America Research Group