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GRANT FUNDS NEW MAMMAL COLLECTION

Museum To Acquire Memphis Collection

A TASTE FOR ADVENTURE

Vertebrate Paleontology Curator Rich Cifelli

NATIVE AMERICAN LANGUAGES

Department Receives Quintero Osage Collection "Breath of Life" Helps Tribes Help Themselves



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OUR MISSION

The Sam Noble Oklahoma Museum of Natural History at the University of Oklahoma inspires minds to understand the natural and cultural world through collection-based discovery, interpretation and education.

We do this by:

- Collecting and maintaining specimens, cultural objects and associated data, including linguistic and ethnographic, for current and future research
- Conducting and disseminating research to increase knowledge
- Teaching university students to develop critical-thinking skills
- Educating the public through programs and exhibitions to increase scientific literacy
- Conducting K-12 school programs to enrich classroom experiences

OUR VISION

As one of the finest museums, we are at the heart of our community, collectively working to inspire understanding, appreciation and stewardship of the earth and its peoples.

> Tracks Editor-in-Chief: Michael A. Mares Managing Editor: Linda Coldwell

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FROM THE DIRECTOR



Dear Members and Friends,

On March 4 we had a very special ribbon cutting reception for our newest permanent exhibit in the museum—Black Mesa. We started this project in the 1990s, but the construction of this exhibit was made possible by a \$1 million gift from Reggie and Rachelle Whitten and the Whitten-Newman Foundation. Located in the Hall of Natural Wonders, Black Mesa is a 1,500 square foot diorama of Oklahoma's Panhandle, home to the highest elevation in the state. When you walk into the Hall of Natural Wonders, you can now view major habitats of our state from the forest to the prairie to the Black Mesa. In the first month since Black Mesa opened, we have had over 31,000 visitors.

On April 4 & 5, the museum hosted the 9th annual Oklahoma Native American Youth Language Fair. During this two-day event, 1,753 pre-K thru 12th grade students, teachers, parents, grandparents and judges filled the Great Hall, Kerr Auditorium and Plains classroom. 700 students from 71 different schools, tribal and family programs competed in plays, performances and individual presentations. This year's fair, "Elder Voices, Youth Choices," focused on saving Native languages through the youth as the tribal nations continue to lose the voices of their elders. It showcased 32 Native languages, from Absentee Shawnee to Zuni.

In 2010 we saw museum attendance up 14.5% over 2009 with s 172,600 visitors. One of our busiest times each year is Spring Break week. This year, we had 8,579 visitors and offered a variety of educational activities and programs for all ages. School field trips to date have brought 9,452 students, teachers and adult chaperones to classes and exhibits in the museum. The Fossil Fuel Fund, an ongoing funding project of our Board of Visitors, makes it possible for any school to receive funds to pay for bus fuel and a bus driver so their students can visit the museum.

We recently determined that the Sam Noble Museum collection includes 10 million objects and specimens. Discovery is an ongoing activity at the SNM: a new genus of dinosaur was recently named by Dr. Rich Cifelli. The museum's Vertebrate Paleontology Collection houses the bones of this *Brontomerus*, now known as "thunder thighs," from a quarry in Utah. You can read about it on page 6 in this issue of *Tracks*.

During this summer, and over the rest of this year, I encourage you, your family and friends to visit the Sam Noble Museum and to enjoy Black Mesa, our upcoming "Art and the Animal" exhibit and our many classes and workshops for students, adults and families.

M. Mars

Michael A. Mares, Ph.D. Director

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COLLECTIONS

GRANT FUNDS NEW MAMMAL COLLECTION

The Sam Noble Museum in Norman currently houses more than 10 million specimens and objects in its collections. This summer, that number will be increased by some 26,000 specimens of mammals from the University of Memphis. The museum has received a \$445,000 Improvements to Biological Research Collections grant from the National Science Foundation to prepare a place for this major addition to its mammal collection.

The Memphis collection is the largest collection of Tennessee mammals anywhere and serves as an important resource to scientists and the general public. Amassed over the past 50 years, it holds several rare and unusual species from Tennessee and the southeastern United States, with a particular focus on whitetailed deer, medium-sized carnivores such as raccoons, coyotes and river otters, and shrews.

The NSF grant will provide for the computerization of specimen records, curation and long-term storage. This includes the installation of mobile storage units or "compactors" that will allow the museum to fit many more specimens into the existing collection space, plus some additional new cases and shelving. The 3-year grant also provides for the hiring of graduate and undergraduate assistants, as well as a summer museum intern, to assist in the packing, curation and cataloging of the Memphis collection. Installation of the compactors, new cases and shelving will be completed in mid-summer. Packing of the Memphis



A view of one small sample of the 26,000 specimens in the mammal collection currently housed at the University of Tennessee. Photo: Marcy Revelez

collection will begin in late summer, for movement to the Sam Noble Museum in the fall.

Since the 1970s, the Memphis collection was expanded through the fieldwork of Michael L. Kennedy, professor of biology at the University of Memphis, and his students. The university does not have a natural history museum where a large collection could be maintained indefinitely. In looking to the future, Kennedy, who received his PhD from the University of Oklahoma in 1976 under the direction of

Gary D. Schnell, began to seek a permanent home for the collection that would ensure its long-term safety and accessibility to the scientific community.

Janet Braun, curator of mammals at the Sam Noble Museum and former master's student of Kennedy, said "Dr. Kennedy felt that this institution has the stability – not only in physical structure but in institutional support and personnel – to provide for the long-term care and preservation of an important mammal



Collection manager Marcy Revelez tries out the new compactors in the mammals collection. Photo: Linda DeBerry

collection of this size. Because it was collected within a limited geographical area over more than 40 years, this collection has good potential for use in studies about habitat and biodiversity changes over time. There is a great deal of utility for this collection, especially for student projects."

The Memphis collection will increase the Sam Noble Museum's mammal collection to more than 65,000 specimens and elevate the Sam Noble mammal collection to the eighth largest university-based mammal collection in the Western Hemisphere and the 15th largest overall. The combined collection will boast the largest collection of white-tailed deer in the Western Hemisphere. It will also be the second largest collection of raccoons, the third largest of coyotes and river otters, and the fifth largest collection of beavers.

Museum Director Michael A. Mares noted "One of the major challenges facing natural history collections is the preservation, study, and databasing of the earth's biological diversity and relating this knowledge to the broader context of global environmental systems. The Memphis collection is an outstanding addition to the Sam Noble Museum, one that will yield important research information in the future."



A TASTE FOR ADVENTURE: RICH CIFELLI: VERTEBRATE PALEONTOLOGY CURATOR



Upon meeting Rich Cifelli, you probably wouldn't think he was one of the world's foremost authorities on prehistoric mammals. Most commonly seen in tie-dyed shirt, worn jeans and shoes bearing the lingering clay of dig sites gone by, he bears the air of an enthusiastic graduate student rather than an

Rich Cifelli, curator of vertebrate paleontology, with the fossil jaw of a prehistoric dog. Photo: Linda DeBerry

academic. But if you need to know the latest scientific story about the deep history of mammal evolution....he's your guy. Several years ago, when *National Geographic* was doing a major issue on the evolution of mammals, a senior science editor for the venerable journal flew in to Norman from New York for a single day, because he couldn't do the story properly without talking to Rich.

Cifelli specializes in mammals of the Cretaceous Period: from 65 million years old back to 140 million years old, and even further, if he can find them. The animals he studies are not what Cifelli himself would refer to as "eye-popping display specimens." Mostly what he has to work with are jaw fragments and tiny teeth: some less than a millimeter long. But he is charting new scientific territory every time he goes into the field – mapping our evolutionary past.

This isn't what he set out to do. In fact, quite the opposite. Cifelli's father, also named Richard Cifelli, was a paleontologist himself, specializing in single-cell organisms. "I grew up in the 1960s," Cifelli explains, "the last thing I wanted to do was something connected with my dad."

So when it came time for college, he signed on as a philosophy major, eventually finishing with a sociology degree. But his real course of study was travel and adventure. As an undergraduate, Cifelli took a year off from school and went to Africa to do volunteer work at the Kenyan National Museum in Nairobi. In a way, the time in Africa set the tone for Cifelli's overall life and career: go with the flow, take advantage of the opportunities presented, and above all, get out in the field and find adventure. When his undergraduate degree was complete, Cifelli decided to go back for a master's degree. "I stayed in school because that's what I knew," Cifelli said. "We weren't goal-oriented about our educations then. Education was just good for its own sake. I was just doing what felt good without any thought to a career."

And what "felt good" – what came easily – was science, particularly if it could be paired with travel, fieldwork and adventure. Cifelli was inspired by stories of discovery at exotic locales in the pages of *National Geographic*, and was drawn to the study of early humans by the work of Louis Leakey. His graduate work, therefore, started off with a focus in physical anthropology.

Before long, however, it became apparent that his chosen field was crowded."There were just too many people for the number of specimens available," he explained."The niche space for somebody coming into the field was extremely narrow."

So he wrote to Malcolm McKenna, curator of vertebrate paleontology at the American Museum of Natural History, asking if he could help with his fieldwork in Wyoming and Greenland. His offer was accepted, and McKenna, one of the lions of prehistoric mammal research at the time, eventually became

Cifelli's graduate advisor for his PhD research.

While working toward his PhD, Cifelli got the opportunity to do some work at the Museum of Arizona in Flagstaff.While he was there, he and some friends decided to take off for southern Utah to look for mammal fossils in Cretaceous rocks that nobody had studied before. The site they chose was one of the most remote locations in the contiguous United States: thousands of miles of uninhabited rocky badlands, sweeping rock formations ... and fossils. Fossils in abundance. The group



Cifelli, hiking out of a remote Utah dig site carrying packs of rock. Most prehistoric mammal fossils are found by screenwashing rock in the lab. Photo:

found so many promising early mammal fossils that the following year, the National Geographic Foundation funded the team to return to the spot for additional exploration.

CURATOR



Here is where his true career was born. "It started with just a discovery," Cifelli explained. "What we stumbled onto in southern Utah was a great stratigraphic column spanning a lot of Cretaceous time. It provided the discovery of mammals from a time not previously represented; and an opportunity to study changes through time in one place."

It was a boon to a young paleontologist looking for his niche."Early mammals was a wide-open field, and it required dedicated hard fieldwork in the middle of nowhere to get it," Cifelli said."It was right up my alley."

In 1986, PhD in hand, Cifelli began to look for a job. He found the Oklahoma Museum of Natural History, then a small museum with collections housed in leaky ramshackle buildings. Director Michael Mares, however, was determined to rescue the museum's treasures, and Cifelli saw a chance to "take this mothballed collection and try to revive it." Besides, Oklahoma was a good base from which to launch field-based research, which was his primary passion. Cifelli accepted the position.

Since that time, Rich Cifelli's body of research has been more than impressive. Beginning with the southern Utah site, Cifelli has been systematically seeking out rocks of older and older ages, seeking the origin of modern mammal types.

"The Cretaceous is the time period when we shifted from archaic, extinct mammal groups that have no modern counterparts to the placentals and marsupials that we have today," he explained. "That process was already completed by 75 to 65 million years ago, and the rest of the record was relatively blank. I was interested in finding out who the principle players were during the blank periods and when modern types came in."

So far, Cifelli has traced mammal evolution back 140 million years, at sites in Utah, Oklahoma, Montana, Wyoming and South Dakota. "In the oldest rocks, those in South Dakota, all the mammal forms are archaic," he explains. "By 110 million years ago, we get dentally modern mammals in abundance, and by 100 million years ago we can begin to recognize placentals and marsupials. They don't really take off until about 85 million years ago, however."

Because Cifelli is working in a niche that very few other scientists are studying, he is discovering new species with every field trip.At last count, the "type" specimens in the vertebrate



Cifelli (left) and crewmates haul the plaster-jacketed fossil of a prehistoric crocodile out of a remote site in South Dakota. Photo:

paleontology collection – the original individual specimens on which the scientific descriptions of new species are based – numbered about 150. Of those, more than 100 have been added to the collection since Cifelli came on board.

Finding them is no easy issue. Cifelli and his crew hike into remote areas and seek out sites with the right "indicator fossils" – bits and pieces such as turtle shell or crocodile and fish teeth – to suggest they could be in the right place. Then they begin looking for mammal fossils in the rock.

"Basically this is a matter of making little

rocks out of big ones," Cifelli quips. "Most commonly all you see is little black things" that may or may not be mammal teeth. Once those are spotted, the crew packs out a "small sample" of 500 to 1,000 pounds of rock which is then washed through a series of screens to loosen the bits of fossil from surrounding clay. Microscopes are then needed to locate the tiny teeth. On average, Cifelli guesses they find one to 10 mammals per 100 pounds of rock.

"It's enormously labor intensive work, mostly in the field," Cifelli admits."But a great virtue in this sort of sampling is that you pretty much sample most of the animals in an area by looking at screen-wash. If you went into a site looking for things you can see, you'd find six or seven species. From one of our sites in central Utah, we found 89. That includes salamanders, turtles, frogs, crocodiles, fish, toothed birds, mammals and dinosaurs. Nobody would have known the dinosaurs were there except for their teeth. If you want to know



This tooth of an ancient mammal is so small it is literally mounted on the head of a pin. Photo: Linda DeBerry

all the animals around in an area, this is the way to go."

This summer, Cifelli returns to his latest field location: the South Dakota site where the fossils are more than 130 million years old. His research has opened windows on more than 50 million years of mammal evolution, but he is still fascinated with filling in the missing pieces.



HIDDEN TREASURES IN RECENT INVERTEBRATES

Last fall, the museum received a prestigious "Museums for America" grant from the federal Institute of Museum and Library Services. The 3-year, \$149,206 grant provided funding for the personnel needed to catalog, database and georeference 270,000 specimens in the museum's recent invertebrates collection – about half of the estimated total number of specimens in that collection. Now - under the direction of Janet K. Braun who serves as curator – the process has begun, and a longinactive collection is beginning to come to life again.

This spring the museum hired Katrina Menard to serve as collection manager for invertebrates. Her resumé is impressive. She holds a master's



A member of the Gelasticoridae (Toad Bugs). Seen from above, the Skittlesized bug can resemble a miniature toad as it "hops" along rocks and moist sandy areas looking for prey. The position of their eyes on the top of their heads, as seen in this photo, helps these predacious bugs find prey and gives them their unique appearance. Photo: Katrina Menard

degree and PhD in entomology from Texas A&M and has worked with two of the largest entomology collections in the country: those of the Smithsonian Institution and the American Museum



Katrina Menard, collection manager, recent invertebrates. Photo: Linda DeBerry

of Natural History.

It might seem that working with such large, impressive collections would make the Sam Noble Museum's halfmillion invertebrates seem like child's play. But on the contrary, Menard says the collection has already produced a number of hidden treasures and she looks forward to delving deeper.

Among the treasures are a collection of European beetles dating from the turn of the

last century. The collection includes beetles from Transylvania, Romania, Austria, Switzerland, France and Hungary, among others. Each species is represented by a male and a female and labeled with its general location. "A European collection of this sort that predates the first World War is extremely valuable," Menard said. "A lot of collections were damaged or destroyed in World Wars I and II, so anything from before that time is very important. There have been many environmental changes since then, as well, so this collection helps to document that."

It is probable that the European specimens were acquired through a trade with another institution. This is still a common practice among entomologists who often have dozens, even hundreds of specimens of a single species and so can easily spare a pair in exchange for specimens of a species not represented in their collection.

To Menard the trade indicates a certain level of legitimacy and respectability for the museum's collection at the time. "It means that someone in the 1900s thought that our collection was important enough for them to send these specimens here," she explains. And the more she explores, the more she is convinced. "This collection has some things that are not to be found anywhere else but the large museums."

In addition to the surprises Menard has uncovered, her work on the collection is also unveiling important holdings that have not previously been readily available to the scientific public. Former curator Harley Brown, known internationally for his life-long work on Byrrhoidea, a superfamily of riffle-beetles, deposited his collection of some 150,000 specimens with the museum. It is the largest collection of these beetles in the world, and already Menard has received inquiries about when it will become accessible.

The cataloging and digitization of the invertebrates is an ambitious project. Believe it or not, for various reasons, most invertebrate collections in museums around the world are not fully cataloged and digitized. By setting a goal of cataloging half the specimens in this collection in three years, the Sam Noble Museum is helping to set a new standard for best

COLLECTIONS



on the pin of each specimen,

labels and catalog numbers

location for a specimen can

be determined, the latitude

Finally, many of the most

striking specimens will be

resolution digital camera.

photographed using a high-

So far about 45,000 individual

specimens have been cataloged:

that number includes all of the dragonflies, grasshoppers and

"true bugs." Menard herself

beetle collection. Jamie Lentz,

a full-time collection assistant,

has begun cataloging Harley

Brown's riffle beetles. Tamaki

Yuri, a museum collection

divided between birds and

manager whose time is

has started work on the

and longitude also is included.

with new computer-generated

added below. Where a specific

practices in the field. Our museum is well placed to do this – such a project would be virtually impossible in the huge collections held by national museums. With "only" half a million specimens, however, it's a goal that can actually be accomplished. Having a catalog will also mean that scientists around the world will be able to access the collection and find what they need quickly and easily.

"Collections are living," Menard commented, "they're dynamic. They need resources. If a collection isn't used, it essentially doesn't exist."

The work Braun, Menard, and their team are doing will certainly rejuvenate the museum's invertebrate



A close-up image of a member of the Mutilidae (Velvet Ants), which is actually more closely relate to wasps than ants. Most have bright patches of bright red, white, orange, or black hairs that give it's velvety texture namesake. Photo: Katrina Menard

collection, but it takes a lot of painstaking work. Three years may seem like a lot of time, but many of the older specimens have not been examined in over 60 years, and each one can prove to be a miniature research project. In Europe, whole country names have changed in the past 100 years – some more than once. This means that, to pin down the exact locality of some of the European specimens, Menard must compare old maps with current ones to try to determine in which modern country the specimens were collected. Species names have changed for

some specimens, as well, and must be verified and updated. In some cases, experts will need to be called in to positively identify specimens.

Alongside the cataloging process, the collection is also receiving an update in curation. Pinned specimens are moved from crumbling cork bases and replaced in archival foam unit trays. Some will need to be re-housed, and all must be carefully handled so that none of their historic labeling is lost. Tiny paper labels with hand-written names and locations are preserved invertebrates, has begun on the moths and butterflies. There also is a part-time undergraduate student assistant funded by the grant, plus a part-time graduate student and an undergraduate student, supported by museum funds.

"There's a lot of potential in this collection," Menard said. "Few museums have the ability to database the entirety of their invertebrates collection with this level of detail, and effectively disseminate the information of our holdings to the research community and the public. There are also excellent resources



Collection manager Katrina Menard holds a specimen of the family Cerambycidae, or long-horned beetles. Photo: Linda DeBerry

here: a great building, and great opportunities for growth, and continued support from the university. When the cataloging and re-curation efforts are done, other scientists will also recognize that our long-term preservation and care of invertebrates at the museum matches any of the larger institutions. This also will hopefully encourage more people to deposit their research materials here."



LANGUAGE DEPARTMENT RECEIVES QUINTERO **OSAGE COLLECTION**

Carolyn Quintero was a linguist who devoted her life's work to the study of the Osage language. Over her long career she amassed hundreds of recordings on reel-to-reel and cassette tape, as well as field notes on grammar, lexicons of words, and a host of other materials and resources. In (year?) Quintero succumbed to cancer. Upon her death, Quintero's entire body of work was deposited with the museum's Native American Languages collection.

Like nearly all Native American languages, the Osage language is endangered. With no living fluent speakers and only a handful with a working understanding of the language, Osage has been hovering on the verge of extinction for a generation. However, in recent years, the Osage Nation has launched an all-out rescue effort with the Osage Language Program which offers Osage language classes and a library of audio and video materials to anyone who wishes to study them.

Eventually, a complete digitized set of all the Quintero materials will be provided, at no cost, to the Osage Nation. But to decide which materials should be digitized first, Mary Linn, curator of Native American Languages, met with Osage tribal leaders to review the collections and set priorities.

KO-TSI

WAH-ZAH" PEH They

KAH-SHE-HAH Uncle there, last.

DAVED YOH I-EH THE-KI-AH-KAL "Cataloging the collection will

take years," explained Linn."We asked the elders where we needed to start to best meet their needs. They set the priority list."

Top priority was given to digitization of the field notebooks of Robert Bristow. Bristow was a self-trained artist and language learner who had been fascinated by the Osage language. He was working to compile the first Osage dictionary when he died in the 1980s. Bristow's audio recordings seem to have been lost, but his notebooks were among the materials in Quintero's



collection. Rich with drawings and doodles, peppered with notes, these books offer a strong, consistent style that makes them an invaluable resource.

Digitization of the Bristow notebooks is being done by Lydia Chessawalla, an Osage fine arts student whom Linn pays from her department's operating budget to devote several hours a week to scanning and saving page after page, with help from museum volunteer Nancy Coleman. The Osage Nation has also donated the time for one of their language teachers, Veronica Pipestem, to work at the museum digitizing many of the Quintero cassette tapes.

(Name), a graduate student with experience in library science, helped create a "finding aid" to the collection. The guide provides an overview of which items are where so they can begin to be used as a resource, even while they await digitization and cataloging.

While the cataloging process will be an enormous undertaking, it will be a labor of love for Mary Linn and her colleagues in the Osage Language Program."There are no fluent speakers of Osage, so every recording is very valuable." Linn said.

In the year ahead, Linn hopes to partner with the Osage Nation on a grant which could fund additional digitization of the collection, as well as a more in-depth finding aid.

Above: Some of the many boxes of recorded materials that make up Carolyn Quintero's Osage collection. Left: A page from Robert Bristow's Osage notebooks. Photos: Mary Linn

8

NATIVE LANGUAGES



"BREATH OF LIFE" HELPS TRIBES HELP THEMSELVES



Last spring, the museum's Native American Language department hosted its first "Breath of Life" workshop, funded by (who?). The workshop is designed for members of Native American tribes who have no living speakers of their language. Its purpose is to train tribal members in the skills they will need to bring their languages back from the brink of extinction.

Breath of Life 2010 participant (Name?) uses the phonetic alphabet to write words in (language?). Photo: ??

The Breath of Life

program was first developed by the University of California at Berkeley. The Sam Noble Museum's program is the first franchise of the program outside of California. Breath of Life trains participants in linguistics, as well as how to locate and utilize archives that have Native American language holdings.

"We teach them linguistics because most materials are written by linguists for linguists," said Mary Linn, curator of Native American Languages. "We spend the first day learning the reading and pronunciation of the phonetic alphabet and how language works."

The participants also receive information on where language archives can be found and how to use them. Each group of participants in the workshop is paired with a liaison who can assist them throughout the workshop and be available as a resource for the tribe after the workshop is concluded. The liaison can also help the participants look at their own tribal materials and begin to bring some of what they have learned to bear upon these resources.

"For some participants, who had never heard or spoken their languages, it was very emotional to begin to sound out words and learn their meanings," Linn commented. Linn sites the story of Darryl Badwin, a member of the Miamia tribe, whose family brought the Miamia language back from the dead through scholarship, determination and sheer force of will. "Miamia was not spoken after the 1960s," she explained. "Darryl and his wife started learning the language from manuscripts, and taught it to their children. It became the language of their home. Their later children were true first speakers of the language."

"Outside of Hebrew, this is the only case of a language coming back after having been completely dead," Linn continued. "It can be done. It's a very long, very slow process, but it can be done. We are just scratching the surface, but these tools get them started."



2010 Breath of Life participants spend time in the University of Oklahoma Western History collection to learn how to research archives. (Photo: ??)

The museum will offer another Breath of Life workshop in the spring of 2012. For information about the program, call the Native American Languages department at (405) 325-7588.



BABY APATOSAURUS WILL SOON JOIN THE TITANS

here against a diagram of the full skeleton. Photo: Kyle Davies

Thanks to a generous donation from the Whitten-Newman Foundation, the museum will soon unveil a new member of the family in "The Clash of the Titans," the centerpiece exhibit in the Hall of Ancient Life.



was done by using a computer to reverse the 3-D image of one bone and printing out its opposite – thus creating a left forelimb from the scan of a right forelimb, for example.

Another technique

was used to create

dinosaur's body. This

"Since the early planning stages for

exhibits in this gallery, we wanted to mount a baby *Apatosaurus*," said museum Director Michael Mares. "Now, thanks to the Whitten-Newman Foundation's gift, we will be able to do it at last. We will be one of only a handful of museums in the world with a juvenile *Apatosaurus* on display, and ours is based on fossils from our own collection, found right here in Oklahoma."

The Sam Noble Museum is one of only a few museums with an extensive collection of baby sauropod bones. To reconstruct the full skeleton, some of these bones have required repair of broken pieces, a task that has been painstakingly done by fossil preparator Kyle Davies. With the help of scale drawings, Davies begins with the actual fossilized bones and uses clay to build up the areas that are missing. He sculpts the attached clay to the proper shape based on similar bones in our collection or from reference illustrations in the scientific literature.

Davies goes through a similar process to sculpt the missing bones, but begins with a wood or metal framework, rather than actual fossils. With 298 bones to be repaired or sculpted and then cast and painted, the reconstruction is time-consuming. Davies has received help on the project from student workers and volunteers and they have been working on the baby *Apatosaurus* mount for over a year and a half.

Not all of the missing bones are being created by hand. Davies has some help from a program at the University of Oklahoma School of Industrial Engineering known as SEAM (The Center for Shape Engineering and Advanced Manufacturing). SEAM uses lasers and 3-dimensional manufacturing technology to scan existing bones in the collection and then "print them out" in plastic. In some cases, scans were made of existing juvenile bones in order to create missing bones for the opposite side of the small-scale juvenile bones based on scans of the adult bones. Using a photon scanner, scans were taken directly from the *Apatosaurus* on display in the Hall of Ancient Life. These images could then be scaled down to baby dinosaur dimensions. In some cases, the bones of juvenile apatosaurs are shaped slightly differently those those of the adults. These bones were "sculpted" using a computer program that allows Davies to digitally manipulate the shape in much the same way that real clay is sculpted. The necessary changes could be made on the computer image much

"It's been a real learning experience seeing what can be done three-dimensionally these days on a computer," Davies said. "In the not-too-distant future we might be doing most of our sculpting there."

more quickly than if they had had to be sculpted by hand.

Standing at just under three feet tall at the hip, the juvenile *Apatosaurus* will look especially diminutive in contrast to its enormous parent. Based on studies of juvenile sauropod fossils like those in our collection, scientists expect that sauropod babies likely reached their full size in less than 30 years... some in as few as 15 years! With that kind of growth rate, a live baby *Apatosaurus* would not remain this small for very long. This one, however, will be small and on view for museum visitors to enjoy for generations to come.

Currently the museum is anticipating a late August or early September unveiling for the new baby. Watch the museum's website for the latest information: <u>www.snomnh.ou.edu</u>.

UPCOMING EVENTS

COMING UP Wolf to Woof: The Story of Dogs Oct. I through Jan. 5

We will never know exactly how or when it began. Some think that toward the end of the last Ice Age, about 15,000 years ago, a wolf wandered into a human community in search of food. Others believe than man and wolf had had a symbiotic relationship which started thousands of years earlier and at some point along the way humans began raising baby wolves. However and whenever it began,

A view of one of the dioramas in "Wolf to Woof: The Story of Dogs." that bond which was forged long ago continues today.

Recent fossil and genetic evidence has confirmed that all modern-day dogs are the descendants of wolves. Ancient clues from cave paintings and burial sites reveal that dogs and people have lived together for thousands of years. Over this time humans have transformed, through selective breeding, wild canids

Woofstock! Sunday, Oct. 2, I to 5 p.m.

Celebrate the opening of Wolf to Woof with an afternoon of canine capers! Enjoy demonstrations by canine agility stars, meet helper dogs and their human trainers, or enter your pup in the Pooch Parade for a chance to win in a variety of categories.

Second Chance Animal Sanctuary will have dogs available for adoption, and visitors may bring donations of food and other dog necessities for chances to win prizes.

Museum admission will be free from 1 to 5 p.m. Visitors can browse a variety of dog-related booths in the Great Hall, from breed rescue societies to pet supply vendors to clubs and organizations. Canine crafts, indoor and outdoor demonstrations and more are all free. Watch the museum's website for more information as the date approaches.

Members Night Behind the Scenes

Mark your calendars for Members Night on Thursday, Oct. 20. This annual open-house event, in which museum members are treated to a glimpse at what goes on in museum collections, laboratories and other usually-off-limits areas. View demonstrations by and specimens that have

never been on display,

into the first domesticated animal; the tamable, the trainable, the incredibly diverse dog. No other species in the animal kingdom has the dog's variety in shapes and sizes. And dogs' abilities as hunters, workers, guards – and, above all, as companions - have made them truly our 'best friends.'

Wolf to Woof: The Story of Dogs is the largest and most comprehensive traveling exhibition ever created on the history, biology and evolution of dogs. The exhibit features

multi-media displays, artifacts, photo murals and dioramas of taxidermied wild canines and sculpted modern dog breeds, plus interactive, hands-on components. Visitors can enter a "howling area" and guess what dogs are saying, test their noses against a dog's great sense of smell, and climb into an avalanche scene to see what it's like to be saved by a search-and-rescue dog.

Collection manager Roger Burkhalter shows off museum staff, view objects specimens from the invertebrate paleontology collection during Members Night 2010. Photo: Linda DeBerry

meet curators, and learn more about the fascinating work of the museum behind the scenes.











RETIRED CURATOR DON WYCKOFF RECEIVES HONORS



Don Wyckoff, who retired this summer as curator of archaeology, has received The Rip Rapp Archaeological Geology Award from the Geological Society of America. The award is given annually in recognition of outstanding contributions to the interdisciplinary field of archaeological geology. The award will be presented at the society's Presidential Address and Award Ceremony in Minneapolis in October.

June 10, 2011, was named Don Wyckoff Day by the University of Oklahoma Board of Regents with a resolution recognizing

Wyckoff's many years of service to the University and to the study of archaeology in Oklahoma, his contributions to the understanding of Oklahoma's prehistoric past, and his passionate teaching of students and avocational archaeologists alike. "Dr. Wyckoff's life is a thread in the fabric that links generations of the OU family – students, faculty, donors, volunteers – one to the other." Wyckoff's day also included a public reception in his honor in the museum's café.

In addition to these academic recognitions, Wyckoff was honored by the Caddo Nation during the annual Caddo Conference at Ft. Smith, Ark. The tribe presented Wyckoff with a plaque recognizing his contributions to the understanding of Caddoan prehistory. He was also presented with a traditional blanket and a shawl for his wife, Ruth, and an Honor Dance was performed on his behalf.

A PENTACERATOPS BY ANY OTHER NAME?



In a paper published in the June issue of *Cretaceous Research*, Nick Longrich, of Yale University, argues that the enormous *Pentaceratops* specimen on display in the Sam Noble Museum's Hall of Ancient Life is, in fact, another species altogether, one he has dubbed *Titanoceratops ouranos*.

Since it was first chipped out of its rocky matrix in the 1990s, scientists have puzzled over the sheer size of the museum's

Pentaceratops. It is at least 15 percent larger than any other specimen of its species ever discovered, with a skull that - at ten-and-half-feet tall - is recognized in the *Guinness Book of World Records* as the largest of any dinosaur.

Some scientists think our *Pentaceratops* is larger due to advanced age. Dinosaurs, like many reptiles, continued to grow all their lives. Other scientists speculate that our specimen could be a larger species in the *Pentaceratops* family. Longrich, on the other hand, claims that differences in the shape and placement of our *Pentaceratops*' nostrils, as well as other openings in the skull, set

it in a different category altogether. He believes our specimen to be an early ancestor that is closer to the *Triceratops* branch of the ceratopsid family tree than the *Pentaceratops* branch within that family.

The overall scientific community remains divided on the issue. It will take time for scientists who specialize in the field to follow up Longrich's research, compare it to other specimens and to previous research, and eventually publish papers of their own that either confirm or refute Longrich's assertion. Until the species change is sufficiently and widely accepted, the specimen on display in our museum will continue to be labeled *Pentaceratops*. By *any* name, it still sports the largest skull of any animal ever to walk the earth.

LANGUAGE DEPARTMENT CHOOSES NEW COLLECTION MANAGER

The Native American Languages department is pleased to announce the addition to their team of Nicholas Wojcik as collection manager. Wojnik holds a master's degree in Library and Informaton Studies from the University of Oklahoma and has interned at the OU History of Science Collections. His Research background is in Byzantine and Ottoman art and archaeology, and he has won research travel awards to study in Turkey. He comes to the museum from OU's Bizzell Library, where he was the head of the audio-visual circulation area and oversaw more than 3 million current periodicals and supervised twenty student employees.





PALEO EXPEDITION STUDENT RECEIVES PRESITIGIOUS SCHOLARSHIP

Nancy Ha, a high school senior from Muskogee and former student of the museum's Whitten-Newman ExplorOlogy[®] Program, has been selected as one of the 1,000 Gates Millennium Scholars for the GMS Class of 2011.The scholarship will provide funding for Ha to attend the university of her choice through graduation. Ha was chosen from more than 23,000 applicants, the largest and most competitive group of candidates in the program's history.

The Gates Millennium Scholars Program, established in 1999, was initially funded by a \$1 billion grant from the Bill and Melinda Gates Foundation. The goal of GMS is to promote academic excellence and to provide an opportunity for outstanding minority students with financial need to reach their highest potential. The GMS Scholarship Award is renewable each year, and will additionally provide funding for graduate studies in the areas of computer science, education, engineering, library science, mathematics, public health or science. The program also provides leadership development programs. Ha currently plans to study biology. Nancy Ha was a participant of the 2009 Paleo Expedition, part of the Whitten-Newman ExplorOlogy[®] Program at the Sam Noble Museum. The program provides handson science experiences for Oklahoma students. Ha also served as a mentor to the 2010 Paleo Expedition students.

"We are so pleased to see one of our students succeed in this manner," said museum Director Michael Mares."Our programs are truly life changing experiences."



Nancy Ha excavates fossils during Paleo Expedition 2010.

FORMER PALEONTOLOGY CURATOR DIES

David B. Kitts, who served as curator of vertebrate paleontology at the then-Stovall Museum from 1958 to 1963, died Oct. 30, 2010, at the age of 87. He joined the faculty of the University of Oklahoma's School of Geology in 1954, and taught here until his retirement in 1988. His appointment eventually changed to History of Science, where he served as department chair from 1973 to '79. But he also served as adjunct faculty in OU's Philosophy department. Kitts was an innovative thinker who endeavored to examine geology in the light of modern philosophy of science, a study he dubbed "Metageology." In the past year, volunteers at the museum have opened field jackets collected by Kitts and his team in the late 50s that revealed fossils of a horned rodent that may be a new species.

MUSEUM DIRECTOR RECEIVES AWARDS FOR SCREENPLAYS

Museum Director Michael Mares has received the Golden Palm Screenplay Competition award from the Beverly Hills Film Festival for his original screenplay "God's Architect." The annual Beverly Hills Film Festival is an international competition dedicated to showcasing the art and talent of emerging filmmakers and screenwriters.

Mares' screenplay deals with the life of Antonio Gaudí, the great Spanish architect. Mares was moved when he learned how Gaudí's attempt at constructing one of the great churches in history, the Sagrada Familia, ultimately broke the spirit of the architect and led him to become a beggar seeking alms for his great church.

"Through the 1980s and 1990s I was leading efforts to construct the Sam Noble Museum, which was a most challenging 17-year period in



Museum Director Michael Mares, with his Golden Palm Award for Best Screenplay. Photo: Linda DeBerry

my life," Mares said. "I knew what it was like to have to continue to fight for a building over almost two decades. I could identify closely with Gaudí."

Mares also won Best Script in the Los Angeles Movie Awards this year for his screenplay "Open Borders."



Sam Noble Museum

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