

the SAM NOBLE OKLAHOMA MUSEUM *of* NATURAL HISTORY



Tracks

Fall 2007 Newsletter, Volume 19, Number 3

SPECIAL ISSUE: COLLECTING OKLAHOMA

The Rare, the Wonderful
and a Museum's Century of Discovery in the Sooner State

THE UNIVERSITY OF OKLAHOMA



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OUR MISSION

The Sam Noble Oklahoma Museum of Natural History 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 in the country, we are at the heart of our community, collectively working to inspire understanding, appreciation and stewardship of the earth and its peoples.

Tracks

Managing editor: Ellen J. Censky
Editor / layout: Linda Coldwell

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SNMNH

THE UNIVERSITY OF OKLAHOMA

CONTENTS

MUSEUM EVENTS AND HIGHLIGHTS



Donors : Page 3



Paleontology : Page 9



The Art of Science : Page 8



Upcoming Events : Page 10



Membership : Page 13

FEATURES & DEPARTMENTS

Letter From the Director ...	2	Art of Science	8	News	12
Donors	3	The Making of a Monster: Painting With Debby Kaspari		El Reno Dig Yields Mammoth Bones	
ExplorOlogy! Major Gift Will Fund New Education Initiative		Paleontology	9	Museum Garners Awards Vitt Receives Recognition	
Philanthropist Mary Jane Noble Dies at 81		The Lost Camels of Oklahoma		Mares Named to National Council	
Biodiversity	4	Upcoming Events	10	Wyckoff to Participate in First Americans Conference	
Location, Location, Location		Muse-A-Palooza Guests Will Preview New Gallery		Burnham Site Subject of New Exhibit	
Ethnology	5	Treasures of Native American Art: Selections From the Brown Collection		Construction Begins in Paleozoic Gallery	
Fancy Dress: A Look at Two Native American Traditions		Tales From a Changing Planet: A Special Scientific Presentation		Membership	13
Archaeology	6	What On Earth! I.D. Day Expands to a Science Exploration Extravaganza		Alison Mainers, Museum Development Officer	
Palm, Fossil, Tool: Three Lives of an Ancient Plant		Kid Tracks	11	Thank You to Director's and Curators' Circle Members	
Paleontology	7	Digging Up Fossils		A Special Offer for Members	
A One-of-a-Kind Crinoid		Fossil in Matrix Cookies			
		Paleo CSI: An Oklahoma Fossil Mystery			

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TRACKS, FALL 2007 : VOLUME 19 NO. 3

SNMNH



A CENTURY OF COLLECTING



On a pedestal under a plexiglass vitrine at the Sam Noble Oklahoma Museum of Natural History lies a dead squirrel. Stuffed with cotton, stretched out flat on its belly, a paper tag on a string attached to its leg, it looks like any dead squirrel you might find in a scientific collection in any natural history museum anywhere in the world. But a close look at the tag on its leg reveals what is unique about this squirrel. In a cramped, old-fashioned handwriting, the date on the tag reads 1901. This squirrel is 106 years old.

The squirrel has a story to tell – a story of mysterious survival. Collected at the dawn of the 20th century, the squirrel was cataloged in the collections of the infant Territorial Museum, housed in University Hall on the windswept, treeless grounds of the University of the Territory of Oklahoma. Two years later, this stately building would burn to the ground, taking with it the entire holdings of the museum... all except this squirrel. Somehow, this mundane stuffed specimen of a common rodent survived the blaze. Nobody knows why. Perhaps it was in use in a classroom or laboratory in another building. Whatever the reason, it is the sole remaining specimen from the museum's original collections.

Like the squirrel, every specimen tells a story – maybe even multiple stories on many levels. For some, it is a story of life on earth at a particular time and place. To that may be added the story of its discovery and collection, the story of the person who found it, and the history of the specimen itself. Together, all of the museum's specimens and objects provide us with the stories of our past – good and bad. They are the tracks in the ancient swamp, the voices of Indian Territory and the ghosts of the Dust Bowl.

On the occasion of the state's 100-year celebration, it is a good time to reflect on the past. This issue of *Tracks* provides some of the stories from our past on which to reflect. The collections in the Sam Noble Oklahoma Museum of Natural History provide us with the materials to understand the rest of the stories. They also provide us with the materials to guide us to make good decisions for our future. Your support helps us to preserve these priceless collections. Thank you.



EXPLOROLOGY! MAJOR GIFT WILL FUND NEW EDUCATION INITIATIVE

The museum has received a \$950,000 gift from the Whitten-Newman Foundation of Edmond. The gift will fund *ExplorOlogy*, a new education project designed to engage children and teachers in doing science by immersing them in the world of field exploration.

The Whitten-Newman Foundation, established by Reggie Whitten; his wife, Rachelle, and her brother, Robert Newman, made the formal presentation to museum director Ellen Censky at a museum ceremony on Oct. 23.

ExplorOlogy will expand museum educational programs to include interactive scientific

training and field experiences for Oklahoma youth ages 4 to 18 as well as professional development programs for teachers and outreach to their schools. The program includes several elements, including a week long summer field experience at an Oklahoma field research site for middle-school-age youth, where they will interact with scientists to engage in field exploration. The youth will be introduced to a variety of "ologies," ranging from archaeology and paleontology to ornithology and herpetology. There also will be an intensive three-week program for 15- to 18-year-olds who will spend two weeks studying geol-

ogy, zoology and paleontology with museum and University of Oklahoma scientists, followed by a week long experience at a field site in the western United States.

"We hope this new program will inspire kids just like you to go on into science, or to at least understand what science is about," said Ellen Censky, museum director, speaking to the school children at the event.

In addition to these field programs, *ExplorOlogy* also will include summer programs for elementary-age children at the museum, professional development workshops for teachers, outreach programs to Oklahoma



schools and field trips for students to visit the museum. The program is scheduled to begin in the summer of 2008.

Additional information about the Whitten-Newman Foundation is available at whitten-newmanfoundation.org.

PHILANTHROPIST MARY JANE NOBLE DIES AT 81

Mary Jane Noble, prominent Oklahoma philanthropist and civic leader, died Oct. 26 at the age of 81. Noble served as a member of the Samuel Roberts Noble Foundation board of trustees, the University of Oklahoma Board of Regents, and numerous other civic and charitable organizations. She was an enthusiastic advocate for education, and a major benefactor of the University of Oklahoma and the museum.

The Noble Foundation, in conjunction with the Samedan Oil Company and Noble Corporation, together donated \$10 million to complete the museum's capital campaign in 1999, for which the new

building was subsequently named in honor of Samuel Russel Noble, Mary Jane Noble's late husband. The Noble Foundation has funded special exhibitions and special projects at the museum. Mary Jane Noble's granddaughter, Jessie Noble-Nance, currently serves on the museum's Board of Visitors.

Mary Jane Noble was born in 1925 in Marshall, Ark. She met Sam Noble while attending OU, where she received her bachelor of science degree in business administration in 1946. She married Noble the same year. Later the couple established a home in Ardmore, where she lived until her death.

Noble's service to the community gained her many honors during her lifetime. She was inducted into the Oklahoma Hall of Fame and received an honorary doctorate from the OU. These honors can only begin to represent the leadership, spirit and generosity of this remarkable woman.

"Mary Jane Noble was a strong-willed and inspirational woman," said Ellen Censky, museum director. "We will always be grateful for the leadership that she and her family provided in making this museum a reality."



Top: Reggie Whitten (left) and Robert Newman, co-founders of the Whitten-Newman Foundation, present a check for \$950,000 to museum director Ellen Censky to fund ExplorOlogy. Photo: Robert Taylor.

Above: Mary Jane Noble



LOCATION, LOCATION, LOCATION

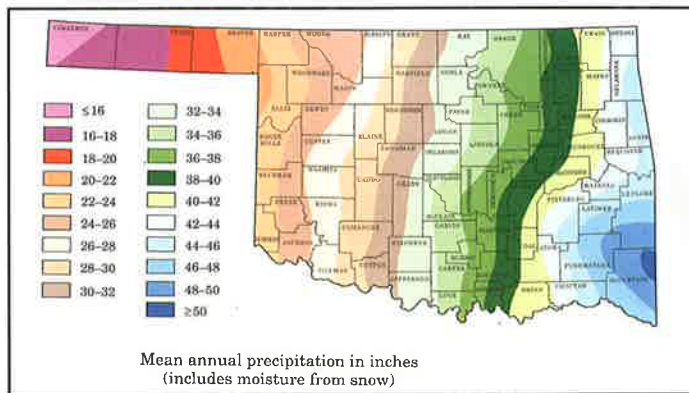
biodiversity: n. biological diversity in an environment as indicated by numbers of different species of plants and animals. — Merriam Webster's Collegiate Dictionary

It may be surprising to some that Oklahoma has the fourth highest biodiversity in the United States, and the highest among landlocked states. Less surprising is the fact that most of the state's species count goes to insects. This is true not only in Oklahoma. Worldwide, insects far outnumber other species. But once we have taken the insects and other invertebrates (plus microorganisms like bacteria) out of the equation, what species are we talking about?

Oklahoma is home to roughly 100 species of mammals, 135 species of reptiles and amphibians, 177 species of fish and some 400 birds — overall, more than 800 species.

What makes Oklahoma so special? Whether it's birds, mammals or reptiles, a recurring theme occurs in answer to that question: *location, location, location*. Situated in the center of the continental United States, Oklahoma is literally where East meets West. Here, the habitats typical of the eastern part of the continent meet those typical of the west.

Though many people may think of Oklahoma as a prairie state, it is in fact a state of deciduous hardwood forest, semi-arid mesa, boggy lowland, tall grass prairie, thick crosstimbres and rocky highlands. More habitats mean more species. And Oklahoma has lots of habitats.



Map by Charles R. Goins, *Historical Atlas of Oklahoma, Fourth Edition*, by Charles R. Goins and Danney Goble, University of Oklahoma Press.

Habitats are affected by factors such as highest and lowest temperatures, average rainfall, relative humidity and topographical changes, among others. While some states may have a fairly homogenous aspect in these factors, a look at these variables charted across Oklahoma (like the chart of annual precipitation above) will show graduated changes from east to west. This means that, for many animal groups, the western species that thrive in a drier climate and the eastern species that require greater moisture both find habitats in the state. In the center of Oklahoma, you will even find some examples of both.

Where the east/west conjunction comes into play most evidently is with Oklahoma's bird populations. The official designation separating the moist East from the arid West is the 100th meridian, which forms the boundary between western Oklahoma and Texas and passes through the Panhandle. The area of overlap between the two regions runs right through the central part of Oklahoma,

and birds from both sides are regularly seen here, as well as migrating birds moving south for the winter. "Collecting Oklahoma" features an exhibit that shows how northern flickers from eastern and western populations that were separated for thousands of years have met and formed hybrids in Oklahoma. The northern flickers are not the only example of hybrid birds in the state. Eastern and western meadowlarks have formed hybrids in Oklahoma, as have Baltimore and Bullock's orioles and several species of buntings.

Reptile and amphibian populations in Oklahoma follow a similar pattern: related species from both the eastern and western faunas can be found within the state. Because the diversity of reptiles and amphibians tends to increase as you move into warmer, wetter climates, the number of "herps" in Oklahoma is much higher than those of a northern state such as Michigan, but slightly lower than the more southern states.

Of Oklahoma's mammal population — and in fact, worldwide — rodents make up

about half of the total number of species. Oklahoma's diversity of rodents correlates directly with the diversity of plants and habitats. Many rodents have evolved to rely on specific types of plants or seeds within a local environment for their food, so their range is defined by the habitat of the plants they feed on. Again, more habitats mean more species.

The number of fish species correlates clearly with moisture levels in the state. There are significantly more species in southeastern Oklahoma, where rainfall is higher and there is more water in lakes, streams and other waterways year-round. Besides the amount of water, one of the main factors affecting number of fish species is the harshness of the environment. Much of central and western Oklahoma suffers regular seasons of drought, which can greatly reduce or completely dry up some streams and rivers. Few species are evolved to tolerate these extremes.

With human population ever increasing, preservation efforts will have a powerful effect on the number and quality of Oklahoma's many habitats, and therefore on its biodiversity. It is important that the state's unique amalgamation of habitats be protected. "Collecting Oklahoma" showcases and celebrates our state's place in the fascinating and complex web of life on our continent, in hopes that we can help to inspire the understanding, respect and care it so richly deserves.

FANCY DRESS: A LOOK AT TWO NATIVE AMERICAN TRADITIONS

Cheyenne War Bonnet: Icon or Stereotype?

The dramatic Cheyenne feathered war bonnet is a beautiful example of a Plains Indian tradition that is so well known as to be an icon — even a stereotype — of Native American culture in the American

psyche. The warbonnet has been used as an emblem of "Indianess" for generations. But the war bonnet is a distinctly Plains Indian tradition and is not, in fact, universal among all Native American people.

The Plains Indian tradition is closely associated with the hunting of bison and antelope. With the introduction of the horse, the Plains people were able to become equestrian nomads, following the herds and living off the resources provided by the Great Plains.

The warbonnet, like the tipi, was a common element to this culture, but probably meant different things to different people.

"The difficult thing about a stereotype is that at the core of it is a kernel of truth," said Dan Swan, curator of ethnology. "The bonnet was a symbol of prestige and honor. We tend to focus on meanings and usages from the military conflict era of the 19th century — the bonnet as symbol of a warrior — but it goes back much further than that. We find evidence of these types of bonnets with upright feathers going back into antiquity. North American rock art dating to between 450 and 600 CE depicts similar headdresses."

"It doesn't seem that everyone wore them," Swan continued, "so the wearer must have been someone of some social status, and that status may have been military, but may also have been a hunting honor or a sign of spiritual status. Typically, the bonnets were worn by men, but there are ledger drawings depicting women wearing them as well."

Today, the war bonnet continues to be a revered symbol among many Plains tribes. They honor tribal ancestors and tradition, and continue to function as symbols of authority and respect.

Osage Wedding Coat: The Evolution of Tradition

Like the Cheyenne war bonnet, the coat is an example of ceremonial or special occasion dress. But unlike the war bonnet, which came to represent, in popular culture, a time of war and conflict, the Osage wedding coat represents a blending of Native American and European cultural objects into something new and unique.

During the main push of European colonization of North America, colonial powers frequently sent representatives into Native American lands to meet and deal with the tribal powers. A number of symbolic goods were often bestowed upon Native leaders as part of these meetings, often including top hats and military coats. The coats were distributed among many different tribes, but for the Osage, they came to take on a special significance.

Among the Osage these came to be known as "chiefs coats." They were a symbol of prestige and became part of the dowry price for Osage weddings. The coats were embellished with trade goods, including brooches and ribbons, and the top hats adorned with colored plumes. The bride was dressed in the adorned coat, complete with top hat, for the marriage ceremony.

Over time, there were more Osage brides than official "chiefs coats" to adorn them, and so the Osage people began buying and making coats to fill the bill. Sometimes they were

military coats, but other dark wool overcoats were pressed to service as well, and ranged from band uniform jackets to coats specially made for the purpose.

After World War II, the tradition of the Osage wedding coat began to wane. In more recent years, however, the coat has seen a resurgence. The wearing of the coat has reemerged as part of a giveaway ceremony performed among the members of the Ilo'shka, a special society, at an annual ceremony that takes place at the Osage June dances.

Since the return of the wedding coats in the 20th century, new coats are now being made among the Osage tribal members. These coats now bear traditional Osage ribbon-work, rather than military-style trim, but the basic shape and style of the dark wool coat remains the same.



Photos: Krysten Marshall



PALM, FOSSIL, TOOL: THREE LIVES OF AN ANCIENT PLANT

Every object tells a story. For some, like the museum's amazing 5,000-year-old spear point buried in a bison skull, the story is fairly evident. But for others, a viewer must delve a little deeper to unearth the true meaning and history of the object. The piece of fossilized palm wood displayed in "Collecting Oklahoma" is one of this latter group.

Compared to some of the splashier objects on display, this reddish chunk of rock may seem unremarkable. But its history is actually a long and layered one that began more than 40 million years ago. At that time, this unassuming bit of rock was a living, growing palm tree. Trees such as this one grew in Colorado and New Mexico as well as possibly in Oklahoma from as far back as the late Cretaceous Period to the end of the Eocene Epoch, around 38 million years ago. This one likely grew in the area between Oklahoma and the Rocky Mountains.

The palm tree died and was fossilized by the usual process of permineralization. In the location the tree fell, the water was rich in silica dioxide, a fine and very hard material that is the principle component of glass and quartz.

In a series of events that spanned some 20 million years beginning in the early Paleocene, the mighty Rocky Mountains arose – lifted up through the enormous pressures exerted on the Earth's crust by the movement of the tectonic plates. The uplift caused

changes in the water runoff, and quantities of water rushed down from the mountain peaks as new rivers, tossing loads of debris along with it into the plains of New Mexico and Colorado, and even as far as western Oklahoma. Among this debris were many fragments of fossilized palm. They lay jumbled among the gravel, quartzite and flint along riverbanks in the western part of the state, waiting for the next chapter of their story to begin.

Some 4,000 years ago, groups of hunters and gatherers foraged along these rivers for materials with which to make stone tools. Pickings along this area were not ideal. The flint and quartzite commonly washed out of the Ogalalla formation was hard, grainy and difficult to work, but there was plenty of it, and the enterprising craftsmen among these people had found ways to fashion points from it, despite its difficulty. To the toolmakers who discovered the compact fossilized palmwood, this new stone was a wonderful new resource. Though not as durable as the grainy quartzite so common to the area, the palmwood was much easier to work. The fossil palmwood has a higher silica content than the quartzite, making it a finer, less grainy stone. Also, unlike other fossilized woods, palm wood did not have rings, but was made up of a bundle of fibers that allowed it, when fossilized, to be fractured and shaped in any direction. This was an improvement over the quartzite, which was prone

to flake off at the wrong angle, spoiling a tool and undoing hours of painstaking work.

For some 2,000 years, the hunter-gatherer people of western Oklahoma and the Texas panhandle gathered and worked the fossil palmwood to make their tools whenever they could, fashioning biface points up to 3 inches long. These worked tools are rarely found, and no complete points exist in the museum's collection.

Sometime around 2,000 years ago, the fossil palm tools ceased to be made. Don Wyckoff, curator of archaeology, says the reason is unknown, but around 2,500 to 1,500 years ago, the bow and arrow became the weapon of choice, and toolmakers switched to using flint to make the smaller arrow points. Palmwood arrow points are very rare. Perhaps the palm was not a good material for fashioning smaller points. Perhaps the people of western Oklahoma gained access to areas where alibates flint – a fine stone for toolmaking found in the Texas panhandle – could be more readily obtained, or traded for with neighbors. Whatever the reason, fossil palmwood went the way of the eight-track tape – replaced by newer technology.

A ONE-OF-A-KIND CRINOID

One of the stand-out displays in "Collecting Oklahoma" is the amazing 10-foot stem of a 310-million-year-old crinoid found in Tulsa. It is a record-setting specimen. No other crinoid stem of this type found before or since has come close to equaling its length. In fact, it towers over its brethren, which seem typically to have achieved a maximum height of around 3 feet. What could be the reason for this individual's amazing growth?

In 2000, Dr. William I. Ausich, from Ohio State University, published a paper on this specimen in *Oklahoma Geology Notes* in which he suggested that different species of crinoids may have grown to different heights in order to avoid competing for the plankton on which they fed. Since the top and bottom of this particular specimen were not preserved, it's impossible for scientists to say for sure to which species the museum's mega-crinoid belonged. Steve Westrop, curator of invertebrate paleontology, estimates that there could have been hundreds, even thousands of crinoid species.

"Crinoids first appeared more than half a billion years ago and are still around today," Westrop explained. "That's plenty of time for them to develop into many species. We probably underestimate the number because it is relatively unusual to find complete crinoids. Usually they are found in bits and pieces."

Crinoids were made up of literally thousands of small pieces. Despite their appear-

ance, they were animals, not plants. They are members of the phylum *Echinodermata*, or "spiny skin," a group that also includes the modern sea urchin, sea star and – the crinoid's closest living relative – the feather star, an animal that looks nearly identical to the crinoid but lacks a stem and the "hold tight" structure that anchored crinoids to the sea bed. This long stem was made up of a stack of calcite rings held together by muscle tissue that allowed it to bend in the current, and possibly even to flex itself. Though the crinoid is considered to have an exoskeleton, its stem was actually covered with a thin layer of soft tissue.

At the top of the stem sat the crinoid's body: a cup shape encircled by a ring of feathery arms that caught plankton and funneled it down to the animal's mouth at the center. The entire cup, as well as each of the arms and all their tiny appendages, was covered with a shell of tiny plates. When the crinoid died and the soft tissue disintegrated, the hard plates and rings that made up its skeleton broke apart, littering the sea floor with calcite pieces. In some places, crinoids were so plentiful that their fossilized skeletons have crushed together over millennia to become whole limestone formations.

It seems likely that there were other super-sized crinoids like this one, feeding on the plankton in the oceans over Oklahoma, but until more are discovered, we cannot be sure. For now Debby Kaspari's beau-

tiful life-size mural illustrates this animal in all its willowy and mysterious possibility – anchored to the floor of the ancient ocean among a forest of towering, feathery crinoids.

A Fantastic Find

In the 1970s, amateur rockhound Charles Cousins recognized the shape of an intact crinoid stem along an embankment where road crews were working on 31st Street in Tulsa. He went out to investigate, and was astonished to discover that the piece he had seen was part of an amazingly long column of crinoid segments, broken apart, but still in a line, that went on foot after foot. With extreme care, Cousins numbered and collected the many parts and kept them in his home as conversation pieces for nearly 30 years.

His daughters laugh today about the crinoid stem that Cousins kept for a time lined up and snaking along the baseboards under the sofa in the family living room.

On Cousin's death, the family agreed that the crinoid stem that had been in their family for so long should be donated to the SNOMNH where it could be protected and studied by scientists around the world. It was only then that they came to understand the true rarity of their father's find.



Top: A rare find: the fossilized body of a crinoid: *Dicromyocrinid*, from Pontotoc County, Okla. Photo: Roger Burkhalter

Above: A close view of the crinoid stem from "Collecting Oklahoma" reveals its ringed structure. Photo: Krysten Marshall



Top: Modern palms share the same fibrous structure of ancient palm trees.

Above: The high silica content of the palm in fossilized form gave some pieces of ancient palm wood a third life as a material for stone tools. Photo: Krysten Marshall



THE MAKING OF A MONSTER: PAINTING WITH DEBBY KASPARI

As a natural history artist Debby Kaspari draws and paints a variety of animals, from birds to rhinos. Sometimes she paints from life, sometimes from preserved specimens in museum collections, and sometimes from photographs. But where does an artist begin when faced with the daunting task of recreating an enormous monster that no longer exists? Kaspari, who painted the murals featured in "Collecting Oklahoma," sheds some light on the process of creating the life-sized elasmosaur for the exhibit.

The first step in the process, Kaspari explains, is to tackle the basic design question of how to fit a 30-foot animal into a 20-foot wall space. To begin with, she built a small model of the animal's ponderous body and long neck with duct tape and wire so she could try out a variety of poses.

She also sculpted a small model of the head, based on drawings of a thelassodont skull, an animal similar to the elasmosaur in body shape and size. She sketched from photographs of the models taken from various angles, working with museum fossil preparator Kyle Davies to get the details of anatomy just right. Finally, the working sketch was scanned into Kaspari's computer, where she could begin to experiment with color and patterns on the animal's skin.

"I didn't want to just do a gray animal," Kaspari said. "There are so many possibili-



ties for color. So I worked from living animals with a similar lifestyle. I started out looking at dolphins. There are some with a beautiful pattern on their sides. They look like they're going very fast – very sporty looking. I also looked at the orca and at penguins. The final coloring is a mixture that was inspired by the magellanic penguin, the orca and a couple of dolphins."

At last, several weeks into the design process, the drawings were finalized and it was time to begin creating the murals, which were painted at 1/2 scale. The finished painting, measuring 15 feet long and more than 6 feet tall, was photographed and enlarged to full size – some 30 feet in length – for display in the exhibit.

Working with two large housepainting brushes, Kaspari began with an underpainting, or *grisaille*, in shades of brown. With a wet brush, she applied paint in broad strokes, then

used a dry brush to move it around and achieve the right tones of light and dark. Afterward, the colors and details were layered over the *grisaille*.

Kaspari had never worked on a painting of this size before, and the work required a different range of movement than the smaller works she was accustomed to.

"I loved working at that size," Kaspari says. "There's something liberating about the bigger arm movements, something freer. This experience has definitely given me a lot of inspiration for larger works."

"I love doing paleo-reconstruction," she said. "I like using my imagination to conjure up something that is gone and will never live again. To me, it's like fairy tales. These were fabulous creatures – but these were real."

THE LOST CAMELS OF OKLAHOMA

Camels in Oklahoma? It's a question that is asked often as visitors view the long camel leg-bones on display in "Collecting Oklahoma." Yes, one of the lost chapters in Oklahoma's ancient history is the reign of the camel. These long-legged mammals first evolved in North America during the late Eocene Epoch, some 30 million years ago. Later, camels migrated to Asia and into South America, where they continued to thrive until the present day as modern dromedaries, llamas, alpacas and vicuñas. But they disappeared from Oklahoma and other parts of North America at the end of the Pleistocene Epoch, around 10,000 years ago.

Oklahoma's fossil camel record does not begin until the late Miocene: around 7 to 8 million years ago. There are camels that were likely native to Oklahoma during the early Miocene, but there is no record of them because no rocks of that age exist in the state. *Stenomylus* is one of these – a small "gazelle camel" from the early Miocene period whose fossils have been found in the Dakotas, Nebraska and Wyoming. Visitors can view examples of this small, light-bodied camel in the Hall of Ancient Life.

By the late Miocene, there were at least three groups of camels native to the Sooner state. During this time, Oklahoma's landscape was similar to that of the African savannah: open grasslands marked by copses of trees and fringed by

forest. *Megatylopus*, the animal seen in "Collecting Oklahoma," was built much like the modern camels we see today, though larger. Standing 12 to 14 feet tall, *Megatylopus* was one of the larger camels of Oklahoma, but not the biggest. Oklahoma was also home to *Aepyccamilus*, an even larger "giraffe-type" camel, with very long legs and a long neck, built for browsing on leaves of trees. There was also a third type, the smaller *Hemiauchenia*, that had long thin legs.

As the open grasslands of the Great Plains enlarged during the Pliocene, some of the large browsing animals became extinct and more grass-eaters took their place. In Oklahoma, around 6 million years ago, the high-browsing *Aepyccamilus* disappeared, and a new genus of camel can be found in the fossil record. *Alforjas* was more closely related to modern llamas than dromedaries, but was much closer in size to today's camels. *Megatylopus* and *Hemiauchenia* continued into this period as well.

During the Pleistocene Epoch, the climate in Oklahoma and surrounding areas underwent a change and became very dry. The conditions changed from a savannah-like environment to something closer to the high steppes: drier and cooler than before. Much of the diversity of species seen in previous eras disappeared.

"I would venture to guess that arid adaptation goes back a long way in camel history," said vertebrate paleontology curator Richard Cifelli. "The most diag-

nostic bones in camels are the toe bones. Unlike those of cows, the camel's toes are splayed, making them well adapted to walking in sand."

In Oklahoma, a common Pleistocene camel was the *Camelops*, a llama-like form related to the living species of South America. *Camelops* was the last camel known from Oklahoma. It disappeared at the end of the Pleistocene.

What happened to Oklahoma's camels? Opinions differ. The end of the Pleistocene Epoch saw the disappearance of not only the camels, but of almost all North America's large animals, or "megafauna," including the mammoths, saber-toothed cats, the giant *Bison latifrons*, *Arctodus* the short-faced bear, the dire wolf and many other species. The beginning of the Holocene Epoch, which continues today, saw a land dramatically devoid of the vast diversity that had characterized the epochs that preceded it. Some scientists favor a climatic change explanation. Others argue that the appearance of humans on the scene in North America at around the same time points to human overkill as the main reason. Or it could be a combination of these factors.

Whatever the reason, when the camels and other large animals disappeared from North America, they changed the pattern of diversity for the entire continent. In comparison to communities such as the African savannah, North America's grasslands after the



Pleistocene show an "unbalanced fauna" – a notable lack of diversity. Bison dominated the scene, along with a handful of deer species, elk, moose and antelope. There were few of the ecological "partnerships" seen today among animals in high-diversity areas like Africa. Whatever happened in the Pleistocene, whether human- or climate-caused, left its mark even today. So next time you visit "Collecting Oklahoma" and see the mighty *Megatylopus*, imagine an Oklahoma filled with camels and elephants, tigers, giant sloths and wild horses of many sizes and shapes. An Oklahoma of the ancient past.

Above: *Megatylopus* was a camel of some stature: the one in Debby Kaspari's painting from "Collecting Oklahoma" stands some 12 feet tall. Photo: Linda Coldwell



Top: Debby Kaspari at work on the Elasmosaur painting in the exhibits fabrication shop at the museum.

Above: The sculpted clay head Kaspari used as a model for her painting's head and face.

Photos: Linda Coldwell



UPCOMING EVENTS

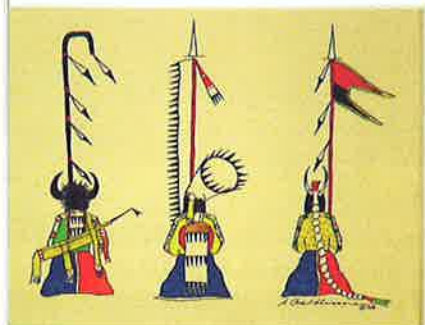
MUSE-A-PALOOZA GUESTS WILL PREVIEW NEW GALLERY



Construction has begun on the new Paleozoic gallery that will open in the Hall of Ancient Life late next spring. Construction is also the theme of this year's Muse-a-Palooza fundraiser, set for April 5.

Guests at this evening of food and fun will be treated to a hard-hat preview of the new gallery under construction, with an opportunity to meet some of the designers, craftsmen and artists from Chase Studios who will be building the exhibits before their eyes.

"This is just too good an opportunity to miss," said museum director Ellen Censky.



Native American Masterworks: Selections from the Fred and Enid Brown Collection

Opening in the spring, this exhibition from the museum's extensive Fred and Enid Brown collection will feature 150 works of art and ethnographic objects spanning more than a century of Native American history.

The Brown Collection is a significant historical collection, including 235 works ranging from paintings and sculpture to textiles and pottery. Both traditional and contemporary works from many tribes are represented. A must-see for any lover of Native American fine art.

Watch the museum's Web site for exhibition dates.



Top: An artist's rendering of the Pennsylvania coal swamp forest diorama. Artwork: Chase Studios.
Center: "The Chiefs" by Sherman Chaddleson, 1984, tempera on board.
Above: Ethnology curator Dan Swan talks with a visitor about an object he has brought to the museum for identification. Photo: Krysten Marshall.

"It is fascinating to watch the fabricators from Chase at work, plus our visitors will get to see how the museum is continuing to grow and provide better and better exhibits to fulfill our mission."

In addition to the special tours, guests at this year's Muse-a-Palooza will have an opportunity to bid on one-of-a-kind silent auction items and be treated to fine food and live music in an elegant but relaxed atmosphere.

"Our fundraiser committee is committed to keeping Palooza an informal event," said development officer Alison Mainers.

"We really feel it is more in keeping with the spirit of the museum and allows our guests to relax and enjoy the evening."

The Paleozoic gallery is being constructed on the north end of the Hall of Ancient Life on the museum's ground floor. Exhibits will include interactive audio-visuals, hundreds of specimens, and a walk-through diorama of a Pennsylvanian coal swamp forest.

For information about the event, or to request an invitation, contact Alison Mainers, development officer, at (405) 325-5020.

Polar Palooza: A Multi-Media Scientific Presentation

Polar Palooza: Stories From a Changing Planet is a traveling science program funded by the National Science Foundation and NASA. The program will visit the museum on April 22 with a public performance that includes in-person presentations by leading polar researchers and Arctic residents. This lively multi-media event will be augmented by High Definition video created on location at the Poles, plus authentic artifacts from polar expeditions.

Polar Palooza scientists will also make presentations for school groups and conduct workshops for teachers at the museum during their visit.

Watch the museum's Web site for additional information and program times.

What On Earth! I.D. Day Expands to a Science Exploration Extravaganza

The museum has expanded its popular "What on Earth! Object I.D. Day" to include demonstrations and family-friendly activities focusing on science in all its many forms. Set for Sunday, Feb. 24, from 1 to 5 p.m., the new expanded event will be called "What on Earth! Science Exploration and I.D. Day," and will include activity booths from a number of the museum's partner scientific institutions, including the University of Oklahoma Biological Survey, the Weather Center, and others. Visitors will still be encouraged to bring their natural history items to be identified by museum and other scientists. Admission to the event will be free.

DIGGING UP FOSSILS

Paleontologists don't just take the fossils from the ground when they find them. Fossils are usually very fragile and need to be handled with care. So scientists take out a big chunk of rock and fossil together to be prepared in the laboratory.

To do this, they first dig out the rock and dirt all around the fossil (1). Next they layer plaster and burlap fabric all over the fossil in the rock that surrounds it, called the "matrix." The plaster hardens into what they call a "field jacket" (2). Then the jacket, with the matrix and the fossil in it, is brought back to the museum.

In the museum's laboratory, the jacket is cut open and the matrix is slowly and carefully removed from the fossil (3). Removing the matrix can take a few weeks or months. It's a slow process, but it's worth it.



FOSSIL IN MATRIX COOKIES

2 cups sugar
½ cup milk
¼ cup unsweetened cocoa powder
½ cup butter (1 stick)
1 teaspoon vanilla extract
½ cup peanut butter
3 cups of rolled oats (not instant)
"Fossils:" these could be Gummi worms, raisins, nuts, or use your imagination. (Just be sure your fossils are edible!)

1. Line two cookie sheets with wax paper.
2. In a medium saucepan, stir together sugar, milk, cocoa, butter, vanilla, and peanut butter. Bring to a low boil over medium heat, then boil for about 2 minutes while stirring.

3. Remove pan from heat and stir in oats until completely combined.
4. Use a spoon to drop clumps of batter onto the lined cookie sheet.
5. Let the cookies sit out at room temperature (don't refrigerate) for 1-2 hours, until they just start to set up. You can carefully lift the cookie off the tray and peel the waxed paper from the back. The underside of the cookie should be a little sticky.
6. Choose two cookies that are about the same size, and lay them upside down on a clean surface. Place your "fossil" on one of the cookies, then place the other cookie on top to make a sandwich. Gently press the edges of the cookies together. Let your cookie continue to set up for another 2-3 hours, or until the top is not shiny anymore.
7. Eat your cookie! You may choose to use a tool to remove the cookie matrix from your fossil. Good tools include forks (used like a pick), butter knives, pickle forks, tooth picks, and nut picks. Don't forget to eat the matrix as you remove it! And then eat your fossil!
8. For even more fun, try wrapping your matrix cookie in a field jacket! Tortillas, egg roll wrappers, or fruit leather make a great substitute for plaster and burlap!

PALEO CSI: AN OKLAHOMA FOSSIL MYSTERY!

The exhibit "Collecting Oklahoma" features a mysterious, plaster-covered package under the heading "Paleo CSI: Collection Specimen Identification." The plaster-covered object is called a "field jacket." The jacket contains fossils that were collected in 1947 near Alex, Oklahoma.

What fossils are inside the jacket? We don't know – that's the mystery! All we know is the information that was written on the jacket: "Alex, 1947."

However, this little bit of information can give big clues! The fossils were found in a place that has rock from two different time periods. Knowing the age of the rock tells us what animal fossils could be hidden in the jacket. Here are some of the likely "suspects."



Photo: Robert Taylor

The Permian Period (299-251 million years ago)

This was a time before the dinosaurs. Animals of this time could include the sail-backed *Dimetrodon*; *Eryops*; or *Diplocaulus*, an amphibian with a head like a boomerang.

Dimetrodon

Eryops; or *Diplocaulus*, an amphibian with a head like a boomerang.

The Pleistocene Epoch (1.8 million – 11,000 years ago)

The Pleistocene ("Ply-sto-seen") Epoch was long after the dinosaurs had become extinct. Animals from this time could include bison, mammoth, or *Smilodon*, the saber-toothed cat.



Smilodon

After the exhibit closes in early 2008, museum staff will open the jacket to identify the fossils inside.



NEWS

El Reno Dig Yields Mammoth Bones

In June, the Archaeology and Paleontology teams joined forces with Oklahoma State University soil scientist Brian Carter on a massive dig operation near El Reno, Okla. The dig was a return to a site excavated in the 1940s by J. Willis Stovall, where some assorted Pleistocene mammals and a stone biface were found.

In hopes of learning more about the ecology of the area during full glacial times, and possibly uncovering more human artifacts, Wyckoff's archaeological team excavated four large pits – some more than 20 feet deep – to reach some ancient pond deposits estimated at more than 20,000 years old.

More than 40 volunteers from the Oklahoma Anthropological Society assisted in the dig, some coming from as far away as Arkansas, north Texas, Ponca City and Tulsa to take part.

The team discovered unexpected changes in soil showing evidence of dramatic erosion and re-filling of parts of the pond during its relatively brief 100-year existence. This meant major changes in the landscape during a relatively short period of time and could point to dramatic climate changes. No definitely human artifacts were uncovered, but several small bones of horse, bison, peccary, pocket gopher and land turtles were found.

Several large bones of a mammoth also were found in a soil layer above the pond deposits. Paleontology team members collected these bones and brought them back to the museum to be prepared.

Museum Garners Awards

The museum has been the recipient of several annual awards this fall. The museum's volunteers received a certificate of recognition from the Oklahoma Museums Association. The information kiosk that stands in the museum's lobby, produced by head of Information Technology Patrick Fisher, also received an OMA award for Best Promotional Piece.

From the Oklahoma Department of Tourism and Recreation, the FY2007 Annual Report, designed by museum graphic designer Cathryn Rowe, received a Redbud Award, the tourism department's highest honor.

Vitt Receives Recognition

Laurie J. Vitt, curator of herpetology and George Lynn Cross Research Professor, is the recipient of Western Washington University's 2007 College of Sciences and Technology Distinguished Alumni Award.

Mares Named to National Council

Michael Mares, curator of mammals, has been named to a three-year term on the Council for the International Exchange of Scholars' Peer Review Museology Specialist Committee. The CIES is the organization that manages the Fulbright Scholar program. The Museology Specialist Committee reviews all Fulbright grants related to topics dealing with museums throughout the world, including administration, collection management, research on collections, public programs and museum development.

Wyckoff Invited to Participate in First Americans Conference

Don Wyckoff, curator of archaeology, has been invited to a special working conference established by the Center for the Study of the First Americans, the Texas Archeological Research Laboratory, the Southeastern Paleoamerican Survey and the Smithsonian Institution. The purpose of the conference is to gather together archaeologists and other scientists intensively involved in first American studies. Many of the invited participants have what they consider to be evidence of human occupation in North America prior to 13,500 years ago, and others provide an alternative perspective.

The conference will review and evaluate the nature of the evidence for pre-Clovis occupation of the Americas, hopefully come to some kind of resolution as to the validity of sites, and identify the issues important to future research.

Wyckoff has been nationally known for his work on the Burnham site in northwestern Oklahoma, where he discovered flakes of flint that show evidence of having been worked by human hands. Dating at some 35,000 years old, these flakes would indicate a much earlier human occupation of North America than scientists had previously believed. Wyckoff published a monograph on the Burnham site in the museum's "Occasional Papers" in 2003.

Burnham Archaeological Site Subject of New Exhibit

The Burnham site, potentially the site of the evidence of human occupation in North America more than 10,000 years earlier than previously believed, is now the subject of a new exhibition at the Freedom Museum in Freedom, Okla., near the site of the original excavations.

SNOMNH archaeology curator Don Wyckoff and archaeologist in charge of the Burnham site excavations, was instrumental in helping the museum to develop its Burnham exhibit, titled "Find of the Century: An Archaeological Exhibit." Wyckoff also served as keynote speaker at the exhibit's opening in September.

Construction Begins in Paleozoic Gallery

In September, crews began building walls in the north end of the museum's Hall of Ancient Life in preparation for exhibit construction to get under way for the new Paleozoic gallery. The new exhibits will cover more than 500,000 million years of Earth's history and will include displays on plate tectonics, early life in Earth's ancient oceans, the Burgess Shale and a walk-through Pennsylvania coal swamp forest diorama.

Exhibit construction has begun and the new gallery is set to open in the spring of 2008.

Guests at Muse-A-Palooza, the museum's annual fundraiser in April, will have an opportunity to take a hard-hat tour of the exhibits under construction. See page 10 for information on this upcoming event.

MEMBERSHIP



THANK YOU!

Each fall, we recognize the members of our Curators' Circle and Director's Circle for their generous support of the museum.

Director's Circle

Craig and Maria Abbott
Mike and Whitney Alvis
Mervin and Eleanor Barnes
Chet and Maureen Bynum
Rod and Janene Davis
Josie Freede
Dolores Gammill
Lauren Guhl
Patrick and Melanie Hall
Jeff Hargrave
Cal and Elaine Hobson
Sandy Kinney
Ken and Sharon Lease
Suzanne Lunsford
Richard Mallinson
Jay Mitchel
Jessie and Chris Nance
Robert Newman
Mary Jane Noble (*deceased*)
Bill and Barbara Paul
Bill and Doann Reed
Les and Paul Risser
Rachelle Whitten
Reggie Whitten

ALISON MAINERS MUSEUM DEVELOPMENT OFFICER



Alison Mainers, museum development officer

Curators' Circle

Henry and Iris Brigman
James and Teresa Day
John Dyer and Lynn Ozinga
Mark Goodman
Beth Harris (*deceased*)
Sarah Jawm Marie
Jan Meadows
Dallas Pryor
Gene and Jeannine Rainbolt
Lee Sargent
Ben and Robbie White
Earl Ziegler

Meet Alison Mainers, the museum's new development officer in charge of membership activities for the museum as well as cultivation of corporate sponsorships and stewardship of museum donors.

Mainers comes to the museum from Chesapeake Energy, where she recently served as scholarship coordinator in the corporate communications department. She also has served as campus community life coordinator for the University of Oklahoma Health Sciences Center.

Mainers received her bachelor of business administration degree from Southwestern Oklahoma State University and a master of education degree with an emphasis in student personnel services from OU.

"Alison has a combination of enthusiasm and professionalism that will serve her well as development officer for the museum," said museum director Ellen Censky. "She is committed to higher education in general and to the educational mission of the museum in particular. We are looking forward to working with her and introducing her to our members, donors and corporate partners."

DINO BANKS FOR THE HOLIDAYS

Who can resist the lovable face of the baby dinosaur on the museum's famous DinoBanks? We're once again offering members a limited-time opportunity to take one home for free. These limited-edition banks make perfect gifts for a special child or grandchild for the holidays.

From Dec. 1 through Dec. 24, bring this coupon to the museum to receive one free dinobank.

Start your child's "nest egg" now!



Members: Turn in this coupon at the museum information desk to receive one free DinoBank!

Offer valid through Dec. 24, 2007.

Limit one bank per coupon. Void if photocopied.

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