

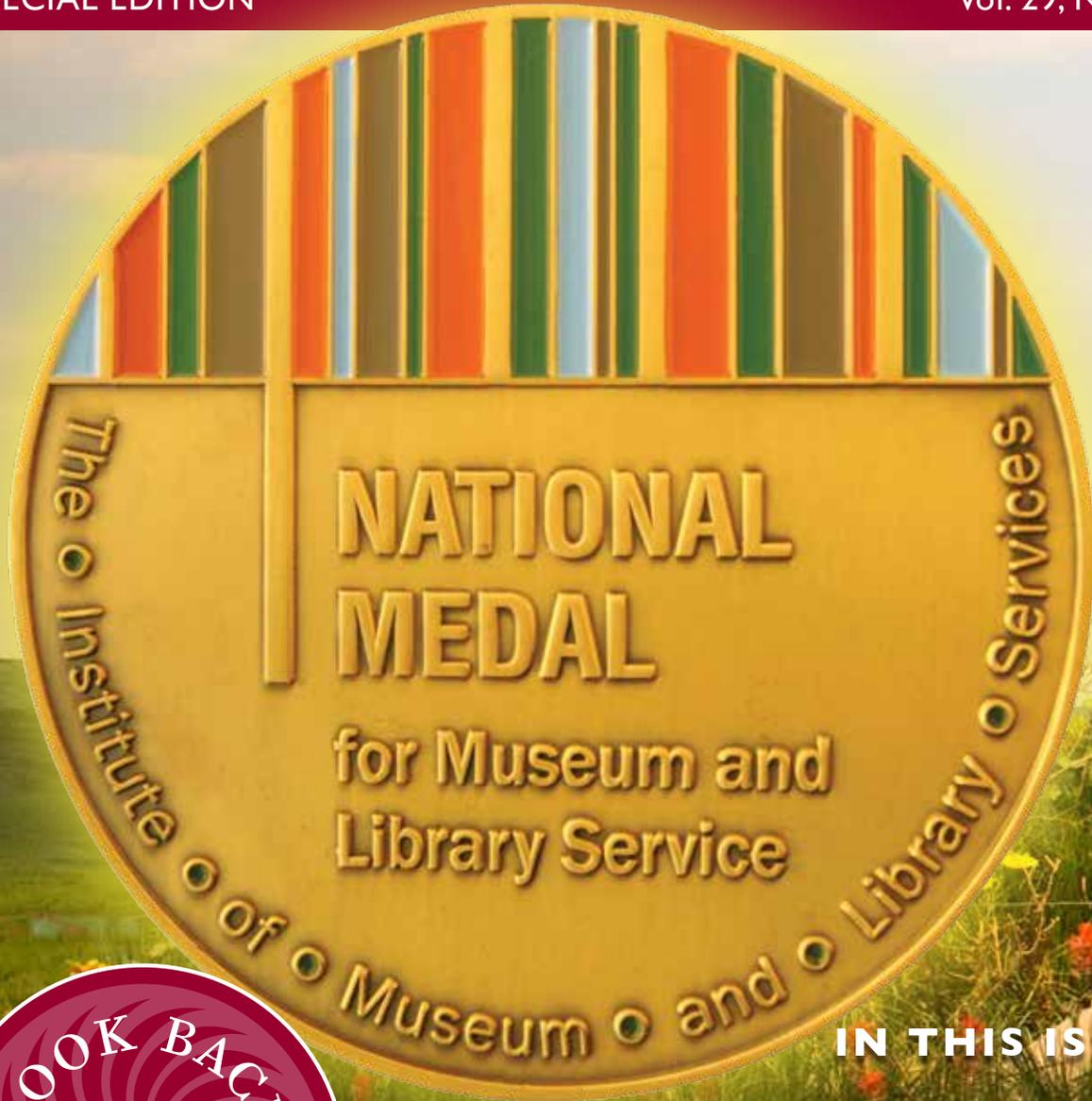
Tracks



Sam Noble Museum

SPECIAL EDITION

Vol. 29, No. 5



IN THIS ISSUE

Read through stories from our archives to celebrate 30 years as the state's natural history museum.



Become a part of the legacy

To celebrate our 30th anniversary, please consider a gift to the museum's endowment fund and become a part of the Oklahoma Heritage Walkway.

Please contact Pam McIntosh, (405) 325-5020 or pjmcintosh@ou.edu for more information.



TRACKS, SPECIAL EDITION 2017

VOLUME 29, NO. 5

MUSEUM INFORMATION

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OUR MISSION

The Sam Noble Museum at the University of Oklahoma inspires minds to understand the world through collection-based research, interpretation and education.

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

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From the Director



This is our final special edition of Tracks. It covers the third decade, 2007-2017, as the state of Oklahoma's natural history museum. Thirty years ago, Gov. Henry Bellmon signed a bill designating the Stovall Museum as the Oklahoma Museum of Natural History. On May 1, 2000, we opened our doors to the new facility and the Sam Noble Oklahoma Museum of Natural History. This outstanding museum — first known as the Stovall, then the OMNH and now the SNOMNH or 'Sam Noble Museum' — has been recognized with national and international prizes and by any standards has been remarkably successful.

Founded in 1899, the university and the museum persisted through the turmoil of the 20th century and faced great challenges at the height of the oil crisis and the economic downturn of the 1980s. During this period, the people of Oklahoma came to the assistance of their museum. In 1987 the Legislature approved a bill designating the Oklahoma Museum of Natural History as the state's official natural history museum. In 1991, a petition drive led to a bond election held in Norman to provide \$5 million as seed money for a new museum and in 1992, the museum and university initiated a fundraising plan for a new home for the museum. In November 1992, a state bond issue provided \$15 million more toward a new facility.

The Noble family and their associated businesses and foundations gave \$10 million to the new museum in February 1994, a magnificent donation to preserve Oklahoma's heritage. Other major donors stepped forward to donate funds to build a new facility and by February 1996, fundraising was sufficiently successful that OU President David L. Boren and other dignitaries broke ground on a 40-acre site on the south campus of the University of Oklahoma.

Since the museum opened its doors on May 1, 2000, over 2.7 million people have visited! Oklahoma has one of the finest museum buildings in the world and has been recognized with three exceptional awards. In 2005, the museum was one of three institutions nationwide to be honored with the Award for Outstanding Commitment to the Preservation and Care of Collections. In 2014, the museum received the nation's highest honor for libraries and museums, a National Medal from the Institute of Museum and Library Services. The museum is the only institution in Oklahoma to ever receive this honor. In 2015, the museum was included in the Best in Heritage by the European Heritage Association and was inducted into the Club of Excellence of museums of the world. No other museum has won these three awards.

I want to thank each of you for your continued commitment as members and supporters. Members, friends of the museum, the city of Norman, the state of Oklahoma, President Boren, the museum's board of visitors over the years and many generous donors have played a role in making the Sam Noble Museum what it is today. There will always be a need to protect collections, teach students and serve the people of Oklahoma. By being part of this project, your children, your grandchildren and your great-grandchildren will continue to visit and learn from the Sam Noble Oklahoma Museum of Natural History. Long after we are gone, this great museum will stand as a testament to the vision and generosity of the people of Oklahoma.

A handwritten signature in black ink that reads "M. Mares". The signature is fluid and cursive, with a large initial "M" and a long, sweeping underline.

Michael A. Mares, Ph.D.
Director

New Permanent Exhibit Will Help Visitors Get Oriented

TRACKS, SUMMER 2007, VOLUME 19, NUMBER 2

Designs are in the final stages for a new orientation gallery to be built on the museum's ground floor. The Noble Corporation and Noble Energy Orientation Gallery, scheduled to open in spring of 2009, will include plenty of hands-on interactive exhibits and answers the questions "What does the museum do?" "Why do they do it?" and "How does it get done?"

Design for the gallery is being done by Formations, Inc., in Portland, Oregon. The designs include an introductory exhibit featuring some "wow!" specimens, most impressive of which will be a reproduction of the 40-foot neck and head of *Sauroposeidon proteles*, the world's tallest dinosaur, whose enormous neck bones were found in southeast Oklahoma by museum paleontologists in 1994. The huge neck and skull will extend slightly into the Great Hall, drawing visitors into the orientation gallery as soon as they enter the museum.

A display case at the entrance also will feature a selection of showy, curiosity-grabbing specimens and objects from each of the museum's collections. These might include an assortment of skeletons, brightly colored Ethiopian birds, mounted mammal heads, fish, snakes and other specimens in jars, eggs, minerals and crystals – all arranged to give a sensation of the breadth and wonder of museum collections.

"Why Collections Matter" will include five themed areas and comprise the bulk of the new gallery's exhibits. These themes are: tracking changes to Earth's geology and climate, monitoring the planet's ecological health and diversity, protecting natural resources, exploring ancient mysteries and providing materials to make new

discoveries in the future. Exhibits planned to illustrate these themes feature museum research and include a reproduction of a western Oklahoma paleontology dig site, a biologist's field camp, an interactive game fish exhibit, an eagle's nest and illustrations of ways in which emerging technologies make new discoveries possible, even on very old specimens.

The "Caring for Collections" area will showcase the ways museum professionals preserve and care for the many different objects in collections through a variety of interactive elements, including a time-lapse video of the museum's dermestid beetle colony as it cleans the flesh from a small skeleton.

The gallery will include a small video theater for screening of the museum's introductory video, and an exhibit called "Inside the Treasure Box" that will introduce visitors to the 12 different collections housed at the museum. Finally, a removable display unit is planned that may be included whenever there are recent scientific discoveries or ongoing research of interest to museum visitors.

"We are very excited about the way this new gallery is coming together," said Ellen Censky, museum director. "It is important to be able to communicate and share the ongoing scientific work of the museum with our visitors in a way that is engaging and understandable. We are looking forward to being able to offer these new experiences to visitors."

The Orientation Gallery will be constructed at the north end of the Hall of Ancient Life, where temporary exhibitions are currently housed. This area, as well as the current Paleozoic exhibits in Ancient Life, will be closed at the beginning of August in order to begin preparing the gallery for construction of both the Orientation Gallery and the new Paleozoic and geological exhibits.

Paleozoic Gallery Construction

TRACKS SPRING 2008 VOLUME 20, NUMBER 1

There is an intriguing racket of activity going on these days behind the temporary walls surrounding the north end of the museum's Hall of Ancient Life. Fabricators from Chase Studio will be on site throughout the spring working to build and install exhibits for the new Paleozoic gallery, set to open May 31.

The new gallery is a large multi-faceted and complex project, totaling some 4,600 square feet, with more than a dozen exhibit areas that will guide visitors through roughly 4 billion years of Earth's history, from the formation of the planet through the mass extinction at the end of the Permian Period, 251 million years ago. There are many scientific concepts to be encompassed as well – big ideas like evolution, classification and radiometric dating of rocks and fossils hundreds of millions of years old. Museum scientists and developers have worked carefully with designers to break these concepts down into pieces that will be easy for museum visitors to grasp.

"We couldn't tell everything that happened over four billion years," said Steve Westrop, curator of invertebrate paleontology, who heads the museum team involved in the development of the gallery. "We had to decide what was important and what we could fit into the available space. As it is, the gallery is large and covers a number of important episodes in the history of life. Many of the exhibits are based on fossils from Oklahoma.

"The overall goal of the new gallery is to illustrate evolution . . . literally as change through time," Westrop explained. "Walking through these exhibits, you will see that ancient ecosystems generally are similar to those of today, but the plants and animals that filled the ecological roles are quite different."

Visitors entering the gallery will view a large, illuminated model of the Earth, with cutaways to reveal the planet's core and explanations of how it was formed. Additional panels nearby will explain plate tectonics – movement of the land masses across the surface of the planet over the millennia – and the formation of Earth's atmosphere. This area of the gallery also will explain how scientists use both radiometric dating and relative dating of rocks and fossils to work out the ages of the layers of rock that are the pages of Earth's history.

Some of the earliest life forms on Earth were a type of bacteria that built up finely layered, often dome-shaped rocks called stromatolites. Several models of stromatolites will be grouped in the early part of the gallery for visitors to touch and even sit on, along with a chunk of fossilized stromatolite from Oklahoma. The gallery also will include the oldest fossils in Oklahoma – trilobites that lived in a shallow sea that covered the state about half a billion years ago.

"Every place we can emphasize Oklahoma history in the exhibit, we have done so," explains Deborah Kay, the exhibit's developer and an education officer at the museum. "In some places we have no specimens from Oklahoma because we just don't have rocks of that age here, but in other places, we have lots of Oklahoma specimens and we have been able to tell the Oklahoma story really well. The early part of the exhibit tells the story of the planet overall, with an emphasis on Oklahoma wherever we can."

Oklahoma's story in the fossil record begins toward the end of the Cambrian period, about 500 million years ago. Hundreds of Oklahoma fossils will be on display in a series of exhibits and dioramas that illustrate Earth's early marine environments, including trilobites, ammonites and crinoids. Oversized models of some of these creatures also will be included, to give visitors an idea of what they may have looked like in life.

In addition to Oklahoma fossils, there will be dioramas that show the fascinating, unearthly creatures from the Burgess

Shale, layers of fine, muddy rocks in Canada that revealed imprints of previously unknown soft-bodied creatures from the Cambrian period, and from Chengjiang, a similar deposit in China. Oversized models of many of these strange-looking animals will hang overhead, including the fearsome *Anomalocaris*, the Cambrian's master predator. Visitors will enjoy an interactive exhibit through which they can discover how some of these strange creatures fed and an animated display that will show how some of them may have moved.

A diorama of the Devonian period will illustrate the evolution of fish, and will include a full-scale, fleshed-out model of *Dunkleosteus*, the enormous bony-plated marine predator that visitors to the museum previously had seen only in the form of a disembodied skull at the entrance to the Hall of Ancient Life.

"I like using the fleshed-out reconstructions because they create images of these fossils as living animals, and not just a collection of bones or shells," said Westrop. "When you can show them as 'real' animals, with an attempt at reconstructing the habitat that they lived in, it lets visitors see that the whole ecosystem was different in the past. The climate was often different from today; even sea level was different."

One of the showstoppers of the new gallery will be the walk-through Carboniferous swamp diorama. Based on fossils found at Oklahoma sites, this full-scale diorama recreates the unearthly beauty of an ancient coal swamp, complete with the strange, patterned trunks of ancient trees and full-scale models of bizarre beasts that prowled Oklahoma more than

300 million years ago. One of the most arresting of these is *Arthropleura*, a 6-foot-long arthropod related to millipedes and centipedes. The exhibit also will feature full-scale models of giant dragonflies that lived in Oklahoma during the late Carboniferous and sported wingspans of more than 2-and-a-half feet.

A special section of the new gallery will focus on a unique Oklahoma fossil site near Fort Sill that is recognized as the richest source of Permian vertebrate fossils in the world. Several fleshed-out models and fossil skeletons will illustrate some of the remarkable discoveries of early reptiles that this site has afforded during the years.

In addition to the entirely new specimens and models to be added to the gallery, some old favorites will be returned with new dioramas in the Permian area. Visitors will be able to welcome back *Dimetrodon*, *Edaphosaurus* and *Eryops* as well as a diorama featuring *Cotylorhynchus*, the large-bodied Permian animal that was common to central Oklahoma 280 million years ago. A touchable model of this creature's remarkably tiny skull will let visitors get a closer look than ever before and will allow them to see for the first time the teeth this strange-looking, ungainly animal had in the roof of its mouth.

"There are many more interactives in the new gallery than there are in any of the current exhibits," said Kay. "There are a lot more things to touch and do."

"There is going to be so much more to see now," said Westrop. "We are going to be covering a lot, and you may not be able to take in the entire gallery in one visit."



Sauroposeidon Installation Complete

TRACKS FALL 2008, VOLUME 20, NUMBER 3

What's forty feet long and watches you as you enter the museum's Great Hall?

The neck and head of *Sauroposeidon proteles*.

This amazing reconstruction is the latest of the museum's new permanent installations. It is one of the centerpieces of the new Orientation Gallery, which will open in the spring of 2009. The impressive neck reaches down from the gallery's ceiling and stretches into the Great Hall, appearing to peer down at visitors as they arrive in the museum.

Sauroposeidon is a one-of-a-kind dinosaur. In 1994, vertebrate paleontology curator Richard Cifelli and his team found four vertebrae of a single specimen in southeastern Oklahoma. Each vertebra measures four feet or more in length. The bones were so enormous that Cifelli himself was unsure what he had uncovered at first.

"I thought we had a petrified tree trunk," Cifelli said. "I just could not get my mind around the size of these bones."

Once a closer look confirmed that the find was, indeed, fossilized bones, Cifelli knew he had something special. No neck bones of this size had ever been found. In addition, the find included several "cervical ribs" – long slender bones found in long-necked dinosaurs that extend from the base of each vertebra down the length of the neck, overlapping one another to help lend support and flexibility to the neck's structure. These ribs are delicate and are rarely found intact, yet the *Sauroposeidon* bones included cervical ribs up to 12 feet in length.

Once in the lab, the bones revealed more surprises. After running one of the vertebra through a CT scanner, then-graduate student Matt Wedel found that, despite their size, the fossils are extremely delicate. In some places the bone is no thicker than a fingernail, and the vertebrae are full of holes – air pockets surrounded by thin membranes of bone. The structure is similar to that found in the bones of birds, and would have served the same purpose in both species: to reduce the bones' weight without compromising their strength.

The new dinosaur appears to be a relative of *Brachiosaurus*, and like *Brachiosaurus*, likely held its neck upright like a giraffe, rather than out in front of it like the *Apatosaurus*. Basing their estimates on *Brachiosaurus*, Cifelli's team believes *Sauroposeidon* would have been nearly 100 feet long and stood some 60 feet tall: the tallest dinosaur ever found. It could have stood flat-footed and looked into a sixth-story window. *Sauroposeidon* is recognized by the Guinness Book of World Records as the world's tallest dinosaur.

The name *Sauroposeidon* refers to the Greek god of earthquakes. Proteles (also Greek) means "perfected before the end," which alludes to the fact that this enormous dinosaur was one of the last and most specialized of its kind. It lived during the Cretaceous Period, around 110 million years ago. Though long-necked sauropods were abundant in North America during the earlier Jurassic Period, their numbers waned in the Cretaceous, finally dying out around 100 million years ago. *Sauroposeidon* was among the last of a dying breed.

Despite several return trips to the site of the initial find to search, no additional fossils of *Sauroposeidon* have been uncovered.

Top: Frank Wick, left, Tom Luczycki, back right, and Mike Thom of RCI, front right, prepare to attach a vertebra in the Sauroposeidon neck reconstruction.

Below: Kyle Davies, left, Mike Thom, center, and Tom Luczycki, right, assist in holding the Sauroposeidon neck in place during installation.



“The chances of finding more are remote,” Cifelli admitted. Compared to the delicate neck bones, most of its other bones would have been very large and robust. If the skeleton had still been all together when it was fossilized, the team would have found other bones nearby. It is likely that the neck bones were moved – by water or predators, for example – from the rest of the carcass. There is no way of knowing where to look.

Nevertheless, visitors to the museum need now look no further than the Great Hall to get a glimpse of this record-setting dinosaur. Though the head and part of the neck is visible now, the full reconstruction of the neck will not be on view until the opening of the new gallery, targeted for spring 2009.

Mystery solved?

Cifelli believes that *Sauroposeidon* is the likely maker of gigantic dinosaur tracks in the Paluxy River bed near Glen Rose, Texas. These stone footprints are enormous – some more than three feet across. “We may never know for certain,” Cifelli said, “but so far *Sauroposeidon* is the only Early Cretaceous sauropod known from the entire North American continent large enough to have made the Paluxy tracks.”

Museum Celebrates 111th Anniversary

TRACKS SPRING 2010, VOLUME 22, NUMBER 1

On May 1, 2000, the Sam Noble Museum opened the doors of its new facility to an eager public.

After 101 years of waiting, at last the museum was housed in a building in which its vast and priceless collections could be safely maintained and showcased under one roof.

On May 1, 2010, we will kick off a month-long celebration of the 10th anniversary of that opening, as well as 111 years of collecting, studying and preserving the treasures of Oklahoma.

The museum was founded by an act of the Territorial Legislature in 1899 – part of a bill that also created the position of a “territorial geologist.” Albert Heald Van Vleet was named to the position and also became the first curator of what was then referred to as the “Territorial Museum.” Van Vleet began collecting and preparing specimens of birds, mammals and reptiles, as well as botanical specimens. Unfortunately, this entire collection was stored in the university’s administration building which was lost to fire, along with everything in it, in 1903.

After Van Vleet stepped down in 1916, scientists in the departments of zoology and biology continued to contribute to collections and soon the need for a permanent museum facility became evident. After a promotional push led by OU President Stratton Brooks, Oklahoma’s ninth legislature approved funding for a new museum in 1923. It was not to be, however. Gov. Jack Calloway Walton vetoed the measure. It was the first in a series of political setbacks to the construction of a museum.

Twice more the Oklahoma legislature set aside funds to provide for a new building. Both times the tables of history were turned against them. In 1929 Gov. William Holloway allocated funds that were then lost to the Great Depression.

In 1945 the legislature again allocated funds for construction, but this time the funds were redirected when World War II ended and housing facilities were needed at OU for all the veterans attending the university on the G.I. Bill.

In 1947, at the urging of the museum’s first official director, J. Willis Stovall, the OU Regents assigned the old ROTC building and adjoining stables as a “temporary” home for the museum. Throughout his career, Stovall campaigned for a new permanent home for the museum’s exhibits and collections. In 1953, Stovall retired without having succeeded in this dream.

Michael Mares became the museum director in 1983 and began anew the campaign to save Oklahoma’s priceless treasures from neglect. Thanks to his efforts, a \$5 million bond issue was passed by the city of Norman to provide seed money for the new facility in 1991. In 1992 a statewide bond issue passed providing another \$15 million. Over the next few years, an additional \$32 million was raised in private funding, including the culminating \$10 million gift from the Samuel Roberts Noble Foundation, Samedan Oil Corporation and Noble Drilling Company, for which the planned facility was renamed the “Sam Noble Oklahoma Museum of Natural History.”

Now, 10 years later, the Sam Noble Museum remains one of the finest university based museums in the world. Our museum serves as a national model for successful public-private partnerships, and sets the standard for best practices in exhibit design and construction, as well as in conservation and curation of collections. Through the vision and determination of generations of scientists and museum-goers, the wheels set in motion in the 19th century have brought us, strong and healthy, into the 21st century. We look forward to seeing where they will lead us next.

Black Mesa Exhibit Open

TRACKS SPRING 2011, VOLUME 23, NUMBER 1

More than 300 museum members and special guests turned out on Friday, March 4, for the ribbon cutting and preview reception for the new Black Mesa exhibit. University of Oklahoma President David Boren, Sam Noble Museum Director Michael Mares and Reggie and Rachelle Whitten of the Whitten-Newman Foundation were among the special guests who helped cut the red ribbon and open the new diorama to waiting guests. Black Mesa opened to the public on Saturday, March 5, with a day of free admission, courtesy of the Whitten-Newman Foundation. More than 1,200 visitors attended.

Black Mesa is located at the extreme west of Oklahoma's panhandle, where the mountain West meets the Great Plains. The mesa itself – at 4,973 feet elevation – is the highest point in Oklahoma. The arid habitat creates a unique ecosystem featuring many plants and animals found nowhere else in the state.

“The Black Mesa is that special habitat that moves Oklahoma into the small group of states that are the richest in numbers and types of species of animals and plants,” said museum director Michael Mares. “With habitats ranging from the southeastern swamp forest to the mesas of the Colorado Plateau in the Panhandle, Oklahoma is blessed with a virtual cornucopia of nature. Black Mesa is key to that diversity.”

The exhibit tells the ecological stories not only of the Black Mesa itself, but also of the unique short-grass prairie habitat of the Oklahoma panhandle. Designed

to simulate a season stream shaded by enormous cottonwood trees, the exhibit features plants and animals native to the arid environment of Black Mesa as well as those that thrive in the short-lived streams and ponds that appear and disappear with the spring rains.

Water is scarce on the high plains, and animals that rely on water for part of their life cycle here are adapted to respond quickly when water is available. Some species of amphibians, freshwater shrimp and other animals are able to withstand long periods of drought either by burrowing into the earth or laying eggs that can withstand dry conditions. When the water returns, some of these animals are able to reanimate, breed and reproduce within a matter of days. The plains spadefoot toad can burrow as deep as 15 feet to escape arid conditions, and is able to remain underground for years, waiting for the rains to return.

The exhibit is chock-full of specimens and facts: More than 150 animals and 57 species of plants are represented. Touch-screen displays allow visitors to dig deeper for information, including recordings of the calls of birds and frogs, territory maps for animals, and in-depth information about many of the species represented. Two mini dioramas associated with the exhibit provide in-depth looks at particular stories: the fascinating life cycle of the American burying beetle, and the diversity of life associated with year-round rivers and ponds.



Above: Ribbon cutting (left to right): Museum Director Michael Mares, OU President David Boren, Melissa Newman, James Newman, Hannah Whitten, Rachele Whitten, Reggie Whitten and Dylan Cheatwood. Photo: Konrad Eek

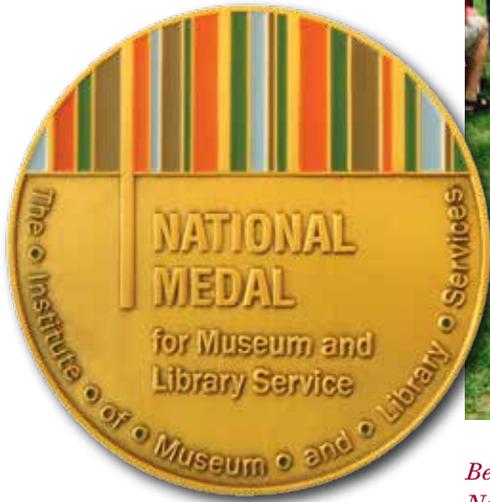
Below: A view of the Black Mesa exhibit in the Hall of Natural Wonders.



PHOTO GALLERY 2007-2017

*Right: Museum Board of Visitors members with Michael Mares, director.
Left to right: Mary Beth Babcock, Lars Noble, Michael Mares and Jonathan Fowler.*

Below: IMLS National Medal for Museum and Library Service.



Below: (left to right) Museum director Michael Mares beside the Sam Noble Museum exhibit poster in Best in Heritage exhibition in Dubrovnik. The J. Willis Stovall Museum ca. 1980.



Behind the Scenes: The Making of an *Apatosaurus*

TRACKS FALL 2011, VOLUME 23, NUMBER 3

The Sam Noble Museum waited decades for a technology advanced enough to shed light on fossils packed in drawers at the museum since the 1920s and whose significance was discovered by curator Richard Cifelli in the late 1980s.

The next time you visit the museum, it will have a tender new addition to the “Clash of the Titans” exhibit, thanks to a generous donation from the Whitten-Newman Foundation and SEAM (The Center for Shape Engineering and Advanced Manufacturing), the technology provided by the University of Oklahoma School of Industrial Engineering.

SEAM was founded in 2009 by two OU College of Engineering faculty, Shivakumar Raman and Binil Starly, from the School of Industrial Engineering. State-of-the-art laser-scanning equipment and rapid prototyping technology were set up to provide a much-needed service to the local and regional industry. Laser-scanning equipment allows virtual point cloud capture of physical objects and rapid prototyping technology that prints 3-D objects for virtual 3-D models.

Starly was invited to give a brief preview to the museum curators and staff of the scanning prototyping technology. Coincidentally it was during the same time the museum staff was looking to adopt new techniques to reconstruct an *Apatosaurus* skeleton. Traditional techniques would simply have been too time consuming, laborious and error prone.

SEAM provided an opportunity for the museum staff to utilize digitally enabled reconstruction technology to make the whole process easier while meeting time

constraints. Putting together an entire *Apatosaurus* skeleton in the manner performed here has never been attempted before.

Several advanced 3-D digitization technologies, including cutting-edge hardware and software techniques, were used in the virtual reconstruction process. A large-object 3-D scanner was employed to scan the large adult *Apatosaurus*, currently on display at the museum, and the scan was used as a template for the baby skeleton. Actual bone specimens and reconstructed clay models were scanned using small-object scanners while force-feedback devices were used to manipulate virtual models on the computer to create freeform shapes of bones. Finally, computer-aided design and reverse engineering software performed the bulk of the reconstruction process. The 3-D printing technology was used to print the master patterns for each of the bones on the skeletal structure.

Many challenges faced the team as they attempted a first-ever digital reconstruction of the *Apatosaurus*. Because of the varied disciplinary knowledge of the technical glossary used by paleontologists, engineering students first had to ensure they completely understood the requirements defined by Kyle Davies, museum preparator, and his staff. Methods of communication were established to ensure limited chances of error.

The very essence of SEAM-based technology is the ability to manipulate virtual objects of data obtained from physical objects. The technology has broad implications for the museum, especially in the making of 3-D models of biological specimens. These models can then be manipulated by the user in ways impossible with real specimens.

This technique may lead to avenues of research previously not studied. In addition, the technology allows complex specimens to be printed on a 3-D printing machine, scaled up to a much larger size and then used as educational kits for students to handle and study.

One of the museum's major missions is to perform biological specimen collection-based research, curation and management. With the advent of the Internet, the museum's scientific collections can be digitized and shared online benefitting the scientific community and the general public in many ways.

However, digitization of scientific collections is no easy task. Both Raman and Starly believe significant engineering and computing challenges must be overcome to achieve the goal of digitization of BioCollections. Through the collaborative efforts of the faculty and staff at SEAM and the Sam Noble Museum, Raman and Starly believe these goals are achievable.

Top left: Kyle Davies displays a portion of the Apatosaurus skull.

Top right: Rapid prototyping of the head of Apatosaurus.

Bottom: Apatosaurus on display in the "Clash of the Titans" exhibit.



Museum Receives National Medal

TRACKS SUMMER 2014, VOLUME 26, NUMBER



Community member Ernesto Vargas and museum director Michael Mares receive National Medal from First Lady Michelle Obama.

In a White House ceremony in May, the Sam Noble Museum was awarded the nation's highest honor conferred on museums and libraries for service to the community.

The Institute of Museum and Library Services honored only five museums and five libraries nationwide with the 2014 National Medal for Museum and Library Service.

"The work that you do in the summers and throughout the year is filling a crucial role in our country as we strive to give our young people a world-class education," said First Lady Michelle Obama.

Medalists were chosen because of their significant and exceptional contributions to their communities from nationwide nominations of institutions that demonstrate innovative approaches to public services, exceeding the expected levels of community outreach.

"This prestigious national award confirms that our museum is one of the most important university-based natural history museums in our nation and indeed, in the world," said OU President David L. Boren. "As Oklahomans, we are privileged to have it in our state."

The Sam Noble Museum was founded in 1899 by the Territorial Legislature of the future state of Oklahoma and located on the OU campus. In 1987, the museum was designated as the state's natural history museum and in May 2000 opened its doors to a new 198,000-square-foot facility, welcoming 2.1 million visitors since that time.

"The Sam Noble Museum is proud to be selected for this national honor. We share this award with the people of Oklahoma who made this museum and its programs possible and who continue to support us in every way," said Michael Mares, museum director.

"We are very proud to announce Sam Noble Oklahoma Museum of Natural History as a 2014 National Medal winner," said Susan Hildreth, director of the Institute of Museum and Library Services. "This year's National Medal honorees illustrate the many ways museums and libraries can excite lifelong learning and civic engagement."

Hildreth noted that museums and libraries serve as civic gathering places, bringing together individuals in pursuit of educational resources, community connections, skills development and multifaceted lifelong learning.

On June 1, the Sam Noble Museum hosted a free Historic Block Party and National Medal Celebration featuring live music from Oklahoma artists.

Museum Awarded Accreditation

TRACKS SUMMER 2014, VOLUME 26, NUMBER 2

Museums among other things, are society's collective memory. According to a study from Indiana University, museums are considered a more reliable source of historical information than books, teachers or even personal accounts by relatives.

Museums also employ more than 400,000 people while contributing \$21 billion to the U.S. economy each year. Despite these impressive figures, the American Alliance of Museums reveals that more than two-thirds of museums reported economic distress at their institutions in 2012.

The United States has more than 17,500 museums, and a shrinking percentage of those receive federal funding. Considering that 37 percent of museums did not charge admission in 2012, this places enormous pressure on museum staff to obtain external funding for things like facility maintenance, research, collection care, exhibits and public programs.

In an effort to help museums build credibility and establish rapport, the American Alliance of Museums (AAM) offers accreditation for those institutions that have proved their commitment to excellence and high professional standards of operation. Only 8 percent of natural history museums are accredited. Accreditation can be key in the successful continued development of an institution.

"Accreditation assures people that their museum is among the finest in the nation," said Ford W. Bell, president of AAM. "As a result, the citizens can take considerable pride in their homegrown institution for its commitment to excellence and for the value it brings to the community."

Museums must undergo a reaccreditation review every 10 years, and in 2014 the Sam Noble Museum was again awarded accreditation for the fourth consecutive time. Like any professional certification, accreditation offers a wide variety of benefits, including greater credibility. This establishes accountability with financial institutions and allows stakeholders to see that the museum's obligation to the public trust is fulfilled.

According to the Accreditation Visiting Committee Report, a major strength of the museum is the visionary leadership. Committee members noted how the Sam Noble Museum surpassed what many university museums are able to achieve.

Accreditation also provides museums with a clear sense of purpose and leverage in local and state legislatures. Additionally, this improves relationships among museums, which can result in greater loans for research and an increase in traveling exhibits. Though many museums apply for accreditation through AAM each year, not all are accepted, making this a significant achievement.

"This means the museum continues to meet the National Standards and Best Practices for U.S. Museums," explained museum director Michael Mares.

As one of just 1,005 accredited museums in the nation, the Sam Noble Museum is proud to claim many great achievements in professionalism. The certificate of accreditation, framed and matted just beside the Redbud Café, is on display for all Oklahomans to see, so they can continue to have confidence in the nationally recognized quality of their museum.

Bom Bom's Legacy

TRACKS FALL 2014, VOLUME 26, NUMBER 3

On June 25, 2012, the Oklahoma City Zoo announced the tragic death of Bom Bom the gorilla – a local icon, beloved friend of many and father of three. His passing came as a devastating blow to zoo-lovers and was covered by nearly every major news outlet in the state – the *Oklahoma Gazette*, KFOR, KWTW and the *Oklahoman*, among others.

“Bom Bom was such a magnificent animal; his loss will be felt by our entire zoo family,” said Dwight Scott, zoo executive director, shortly after Bom Bom’s death.

Now, nearly two years later, his legacy lives on. The Oklahoma City Zoo donated Bom Bom’s body to the Sam Noble Oklahoma Museum of Natural History, and the museum decided to preserve Bom Bom and tell his story, which speaks to the heart of wildlife conservation.

Bom Bom was born at the Audubon Zoo in New Orleans 38 years ago. In 2002, he joined the Oklahoma City Zoo as part of a national breeding program intended to boost the dwindling numbers of western lowland gorillas.

According to Robin Newby, supervisor of apes at the Oklahoma City Zoo, Bom Bom was a great silverback. He understood his role in relation to the group and fostered peaceful relationships among his troop.

In January 2010, Bom Bom was diagnosed with heart disease – a common threat for captive male gorillas. Two years later, after significant weight loss, he suffered a deadly ruptured aneurism in his heart. Although it was the end of his life, it would not be the end of his story.



Bom Bom at the OKC Zoo courtesy of Gillian Lang.

The Sam Noble Museum requested the help of artisan taxidermist Paul Rhymer, who lives near Washington, D.C., and has worked for the Smithsonian Institution. Because the specimen was preserved so well by the museum, Rhymer was able to sculpt a stunningly realistic live mount for the museum.

“To ensure this mount was identifiable as Bom Bom, I made molds of his face so we could try to capture the facial features that make him different from other gorillas,” Rhymer said. “From that mold I was able to sculpt a form that was a portrait.”

Bom Bom’s body became an educational vehicle in more ways than one, as his skeleton also left insights for scientists about the way western lowland gorillas age. According to Brandi Coyner, Sam Noble Museum mammalogy curatorial associate, zoo animals live longer than their wild counterparts, which allows scientists to observe effects of aging that seldom occur naturally.

In fact, the Smithsonian has already studied the bones of Bom Bom's hands and feet and returned these pieces to the museum's mammalogy collection.

"We could tell by the way he walked he was getting older. The museum helped us understand why and did a great job with him," Newby said.

Bom Bom also left the zoo staff one final surprise – a son. He had been selectively chosen to mate with one of the zoo's female gorillas, Kelele. After nearly a decade with no success, Kelele conceived just one month before Bom Bom's passing. Leom – named after his parents – was born on Valentine's Day of 2013.

Candice Rennels, manager of marketing and public relations for the Oklahoma City Zoo, said the zoo supports conservation initiatives by working with various organizations and causes such as the Diane Fosse Foundation and the Great Ape Heart Project.

"I think it's awesome that Bom Bom is going to be a frontrunner of conservation," Rennels said. "He's going to be educating for years and years to come, and he has an important story to share." Rennels also stated that Bom Bom and Leom serve as "ambassadors for wild relatives" in regard to wildlife conservation as a whole, and the Sam Noble Museum incorporated this belief into Bom Bom's future.

Bom Bom currently is displayed within "RARE: Portraits of America's Endangered Species," a photographic exhibit designed to raise awareness about endangered wildlife in America. Signage displayed beside Bom Bom helps to inform visitors of his purpose, legacy and relevance in preserving biodiversity.

"Bom Bom is an extremely rare gorilla who will continue to influence people's views on conservation as a part of the Sam Noble Museum's collections and exhibits," said museum director Michael Mares. "I decided to prepare him as a mount so that he would carry a message of the

fragility of life on Earth in the face of the enormous environmental changes that gorillas, and people, face."

The Sam Noble Museum invites all Oklahomans to discover a remarkable cause while rediscovering an old, familiar friend. With full support from the museum and zoo faculty and staff, the Sam Noble Museum could not be more excited about combining the museum's legacy of conservation with the life of this locally famous icon.

Bom Bom on exhibit in the lobby of the Sam Noble Oklahoma Museum of Natural History.



Eagle Eyes Now on Display at the Museum

TRACKS SPRING 2015, VOLUME 27, NUMBER 1 BY DEVON GREEN, OKLAHOMA GAZETTE

While the writers behind “Jurassic World” — the fourth installment in the “Jurassic Park” franchise — were busy dreaming up new and creative ways to thrill audiences, paleontologists with the Sam Noble Museum in Norman have been building a display so the public can experience a real and completely new dinosaur.

Although the fossil is a skull the size of a lemon, this diminutive creature has big implications for what we know about the horned-face dinosaurs called ceratopsia. The better-known members of this family include *Triceratops* and *Pentaceratops*. The museum has one of the largest examples of *Pentaceratops* on permanent display.

The new specimen was formally named *Aquilops americanus* by Curator of Vertebrate Paleontology Richard Cifelli for the Sam Noble Museum, who, along with his team of researchers, discovered the fossil in the Cloverleaf formation outside of Billings, Montana. The name translates to American eagle face — *Aqui* is Latin for eagle, and *ops* is Greek for face.

The discovery has given us a better understanding of what we know of the beasts that once roamed the American West.

Uncovering connections

Cifelli led the team of paleontologists and researchers from Oklahoma and California. At the time of the discovery, the team had no idea they had unearthed anything remarkable, much less a fossil that changes

our understanding of the ceratopsian lineage. The team that excavated the tiny, mostly intact skull was convinced it was the fossil of a small, plant-eating dinosaur found throughout the Cloverleaf.

“It was a fist-sized piece of rock, and all we could see was a couple of teeth. We sent it back with Scott (Madsen, a paleontologist and fossil preparator) because it was a nice specimen,” Cifelli said. “It wasn’t until he’d had it a year or a year and a half (that) it hit him with a force of a blinding ‘I know what that is!’”

Cifelli, who has worked with Madsen since the ’70s, explained that Madsen’s task as a preparator is meticulous and slow-going. Working with needles about the size of leather sewing needles, he removed about one to three grains of rock at a time to reveal the skull’s beak and a bone unique to ceratopsia called a rostral bone. These two characteristics distinguished it as a member of the same family that produced the giant *Triceratops* and *Pentaceratops* millions of years later.

American paleontologists have struggled with the lineage of horned dinosaurs, especially in North America, because of a lack of evidence in the fossil record. To be certain about the skull’s potential meaning in terms of the North American ceratopsia lineage, Cifelli called on Andrew Farke.

“(Farke) is not only a specialist on horned dinosaurs but has studied all the specimens in China,” Cifelli said.

China’s examples of fossil ceratopsia are far more complete. In some cases, they predate North American’s varieties by a few million years.

“(Paleontologists) all pretty much agree the group originated in Asia because the oldest and most primitive forms are there,” Cifelli said.

Aquilops' age is the most compelling evidence that members of the horned-face family migrated to North America several times over the course of millions of years rather than in one single migration, most likely over the land bridge that once connected Alaska and Russia.

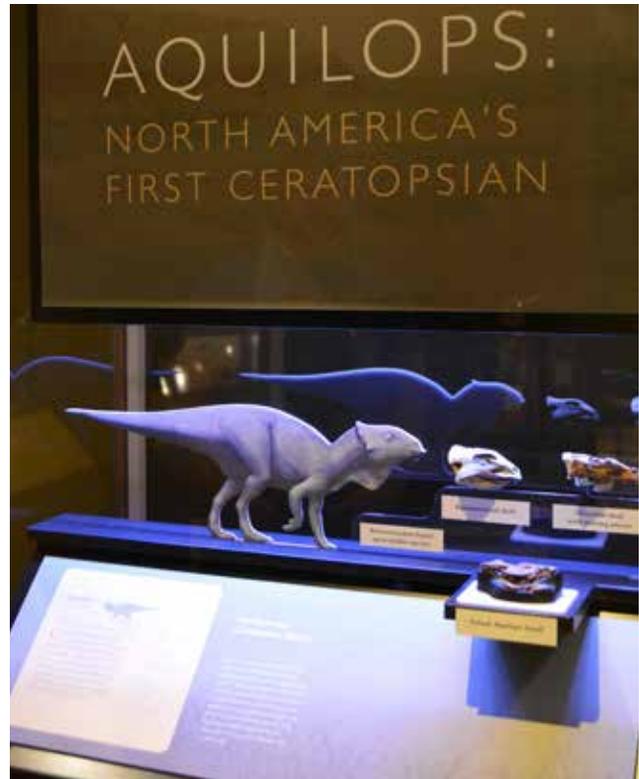
“There had been bits and pieces of the same era (as *Aquilops*) before, but nothing identifiable,” Cifelli said. “This (specimen) shows us that they are really basic; they don't belong to the great groups we see later in North America.”

On display

The fact that the skull is relatively intact is remarkable. Skulls are usually the first to crumble in the preservation process because of their hollow nature. For the first discovery of the dinosaur's kind to be a skull is a rarity. This can also be problematic, as some characteristics in the skull appear to be juvenile, and juvenile remains sometimes exhibit characteristics that are not found in adults. When there's only one, this can skew the evidence and the implications for a new species. Luckily, with Farke's analytical help, the group was comfortable with the skull being an older juvenile.

The team's findings were first published in PLOS ONE, an open-access, peer-reviewed publication of research, resources and materials that is free to academics and the public. Farke and Cifelli, along with two others, published *A Ceratopsian Dinosaur from the Lower Cretaceous of Western North America, and the Biogeography of Neoceratopsia* in 2014. The article immediately gained attention in academic circles and popular science publications, including National Geographic and Discover.

The fossil has captured academic and public imaginations alike, especially those interested in evolution. How could something develop from such a small creature to one of the largest dinosaurs to roam



The Aquilops fossil exhibit in the Hall of Ancient Life.

the continent? The contrast is especially striking when viewed at the museum. The Hall of Ancient Life, where the specimen is on display, is arranged chronologically. The museum staff highlighted *Aquilops*' time period as well as its contrast in size to its formidable relative, *Pentaceratops*.

“It actually goes with the community where the raptors are in space and time, but it actually is a relative of the *Pentaceratops*. We're going to stick this thing right in between, at opposite extremes,” Cifelli said. “So you have this teeny, tiny primitive one, which has got a beak but no frills to speak of, and then this kick-ass, gigantic descendant.”

The visitors will see three versions of the skull on display: the actual skull, a cast of the skull with restoration and repair and a 3-D, interactive model. The skull is part of the museum's permanent collection and is now on display in the vertebrate paleontology collection.

From Barns and Stables to Best in Heritage

TRACKS FALL 2015, VOLUME 27, NUMBER 3

How do museums worldwide stay relevant in a cultural environment growing more and more competitive? The Best in Heritage Conference offers an opportunity each year to meet, collaborate and discuss topics in response to a changing audience.

At this year's conference held in Dubrovnik, Croatia, Sam Noble Museum director Michael Mares was named a Best in Heritage Laureate. As a presenter, Mares shared the story and subsequent success of what is today the Sam Noble Museum.

"Museums from all around the world were represented at this conference – the best of the best – and all had remarkable stories," said Mares, who has served as director of the Sam Noble Museum from 1983-2003 and again from 2008 to the present. "Our struggles were the same in many ways, and it was wonderful to share stories and understanding."

The Sam Noble Museum was one of only two museums in the United States to be selected to present at the 2015 Best in Heritage Conference.

Organized in 2002 by the European Heritage Association, Best in Heritage is an international, annual conference of award-winning museum, heritage and conservation projects hosted every year in Dubrovnik, the UNESCO World Heritage site. Presenters included 28 laureates from 22 countries, proclaimed the best in 2014 on national and international levels.

Selected for its 2014 National Medal for Museum and Library Service, national medalists were

chosen because of their significant and exceptional contributions to communities demonstrated through innovative approaches to public service, exceeding the expected levels of community outreach.

"We've made great progress as an institution since the time we were housed in barns and stables," Mares said. "The presentation was about the remarkable story of a museum that has developed into a leading museum in the world and on two of our programs, ExplorOlogy and Native American languages."

Upon becoming director in 1983, one of his chief efforts was to launch a campaign to build a facility to house the world-class collections. With support from the city of Norman, the people of Oklahoma, private donors, the Oklahoma Legislature and the University of Oklahoma, his 17-year effort culminated in one of the finest university-based natural history museums in the world.

As a result of presenting at the Best in Heritage, the Sam Noble Museum was inducted into the Excellence Club, an opportunity only granted to a few projects that have been presented in Dubrovnik over the past 13 years.

"What we've done to preserve our heritage gives hope to museums around the world," Mares said. "As an institute of excellence, the museum will continue to represent Oklahoma and the nation by offering exceptional exhibitions, engaging in cutting-edge research and providing compelling educational programs and events. This recognition further supports our efforts to offer a quality learning institution to Oklahomans and life-long learners worldwide."

Mural Welcomes Visitors at Will Rogers World Airport

TRACKS FALL 2017, VOLUME 29, NUMBER 4

What does a bighorn sheep, ammonite, Monarch butterfly, Columbian mammoth and crystal quartz all have in common? They all harken back to Oklahoma's rich natural history, and they're painted larger than life on a 44-foot-long wall in the Will Rogers World Airport.

The museum has partnered with the airport to install a natural history-inspired mural, "Hidden Treasures," in the airport's baggage claim area. The mural, ideated and painted by local artist Nick Bayer, is a gift from the museum and found its temporary home in the airport in mid-June. It will be on display through May 2018. The mural features museum objects and specimens originating from all over the world as well as objects that highlight Oklahoma's rich cultural and historical past.

"We opened the opportunity up to several local artists, but we were particularly taken by Nick's use of objects and specimens that tell the story of Oklahoma, like the Monarch butterflies that use Oklahoma as their center of migration, the Columbian mammoth found in North America for about a half million years whose last specimens in Oklahoma were from 10,000 years ago,

and the bivalves and ammonites that represent the early Cretaceous period in the southern part of the state," said museum spokesperson Morgan Day.

Bayer compared a trip to the museum to going on a treasure hunt.

"Around every corner are little bits of our treasured world, and I am always finding new things to marvel over," he said. "More than 10 million natural and cultural history objects and artifacts can be found there. The work I created is full of hidden treasures that are tucked away at the museum. I hope the mural sparks the interest of the viewer and that they will try to find their own hidden treasures when they visit the Sam Noble Museum."

The museum celebrates 30 years as the state's natural history museum this year, and the mural helped kick off a year-long celebration that featured vintage editions of *Tracks* and a month-long look back on museum history on the museum's social channels.

The museum became the Sam Noble Oklahoma Museum of Natural History when it opened its doors at its current location on May 1, 2000.

Mural by artist Nick Bayer at the Will Rogers World Airport.

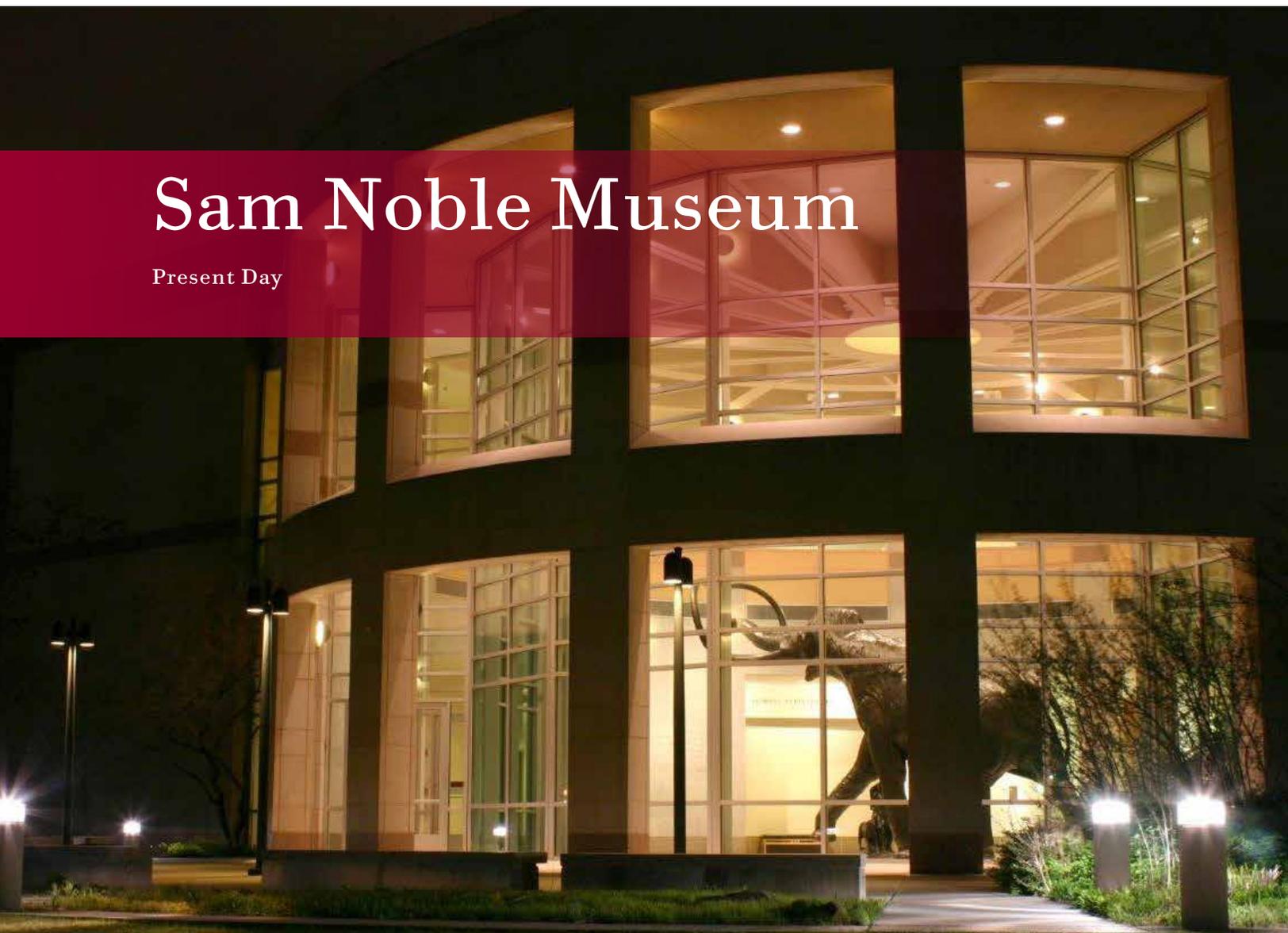




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