

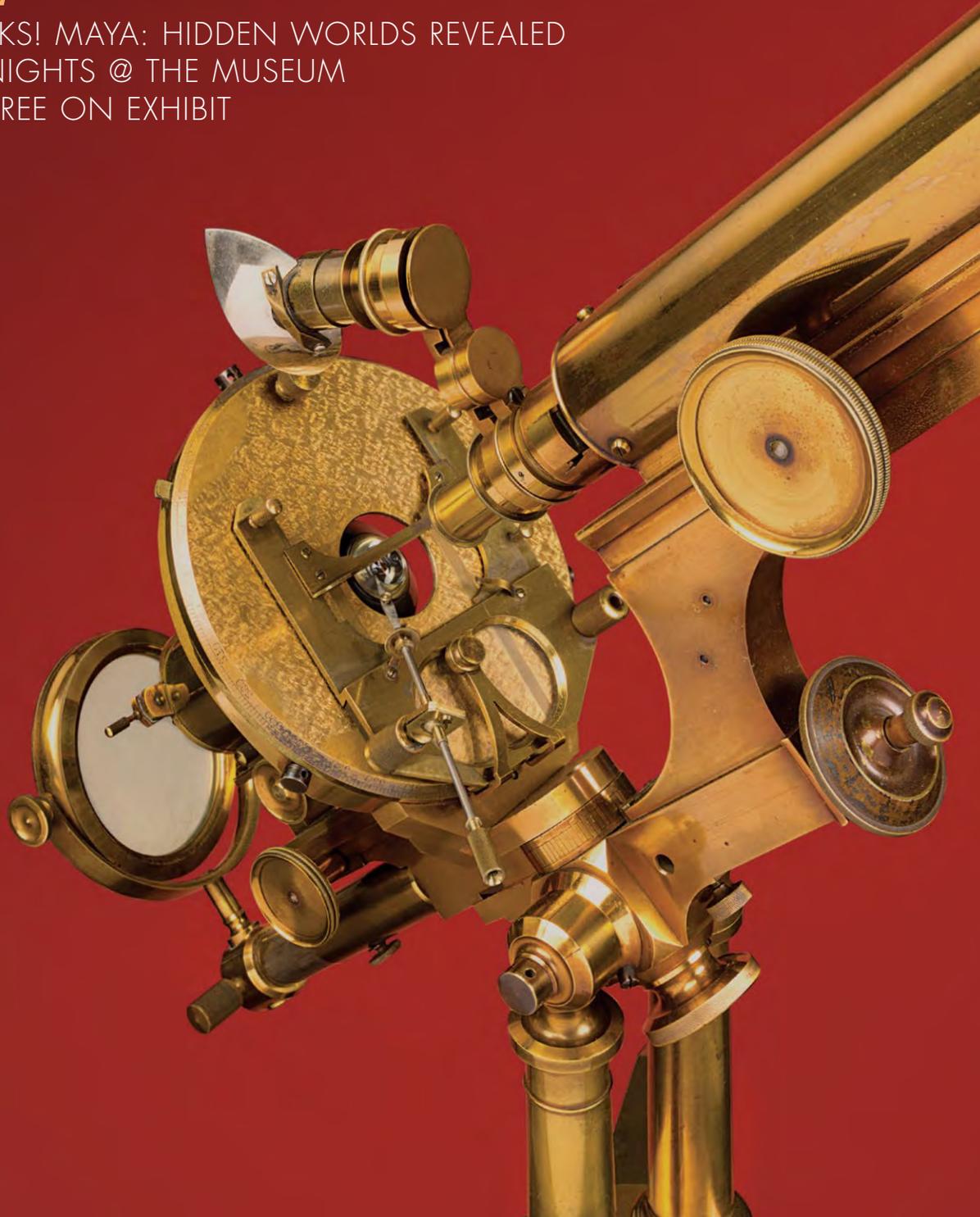
CATALYST

DENVER MUSEUM OF NATURE & SCIENCE MAGAZINE

AUGUST | SEPTEMBER 2014

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FINAL WEEKS! MAYA: HIDDEN WORLDS REVEALED
SUMMER NIGHTS @ THE MUSEUM
JURASSIC TREE ON EXHIBIT





SUMMER NIGHTS @ THE MUSEUM

FRIDAY NIGHTS THROUGH AUGUST 22, 5-8 P.M.

\$12/MUSEUM MEMBER | \$15/NONMEMBER **CASH BAR**

Amplify your Friday nights this summer with local food, science fun, and more! Your all-access ticket includes admission to Maya: Hidden Worlds Revealed, Discovery Zone, IMAX films, and Laserium shows. Tickets and schedule of special events @ www.dmns.org/summernights. **New date added! August 29**



Dear Members,

We are having a great summer at the Museum! We hosted nearly 13,000 guests during SCFD Free Day on June 30, our new offering Summer Nights @ the Museum is a hit, and the Discovery Zone appears to be one of the hottest tickets in town, with more than 50,000 visits to date.



We are particularly pleased by the response to the Discovery Zone, made possible by Kaiser Permanente. The Discovery Zone is home to play-and-learn experiences for young children and their families. Research has found that play begets success, especially from birth to age five. Children at this stage begin to develop key social and problem-solving skills through play, which helps establish their lives as students and later as self-sufficient adults.

Economists consistently find that quality early education programs provide significant return on investment and have enormous implications on the overall health and vitality of our nation. According to the Organization for Economic Development, however, the United States ranks almost last compared to other western nations in the share of government spending for early childhood education.

The future of our state and our country depends on our children. How should we be investing to improve science literacy among children, particularly during the critical infant and toddler years?

The answer partly lies outside the traditional education system with museums, theaters, libraries, health care providers, social service providers, and other organizations whose missions include cultivating an early joy of learning. Using funds from the Better Denver bond and with generous support from many others, the Museum completely relocated, upgraded, and reprogrammed our already very popular Discovery Zone. Now we've got a new place for thousands of young learners to do what scientists do: look, ask, discover, make, and share.

By being a Museum member you too are investing in our children's future. Members provide about 13 percent of the Museum's annual operating budget each year, helping to ensure that we can serve the community by offering quality science education programs for all ages.

The Museum is in a unique position to supplement school lessons with hands-on experiences in environments outside the classroom. Thank you for partnering with us to engage young minds and inspire an early fascination with the world.

George Sparks
President and CEO

You may contact George Sparks by e-mail at president@dmns.org.

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A beautiful petrified tree now on display began its journey to the Museum nearly 160 million years ago in a cool, wet landscape in China.

FIND IT @ DMNS.ORG

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Join Our Community:



ON THE COVER

From the scientific instruments collection
Zentmayer Centennial binocular microscope
#ESI.3
Philadelphia, 1876
Created and patented by Joseph Zentmayer



FRESH LEAVES FOR THE DINOSAURS

Although the scene is millions of years old, the plants look brand-new. In the Cretaceous Creekbed “enviorama” in Prehistoric Journey, the branches of the prehistoric trees were drooping with the weight of time and grime. For seven months, 57 volunteers on the “Leaf Squad” spent 4,000 hours cleaning and refurbishing 18,000 leaves and helping to install 117 newly fabricated branches and saplings, under the leadership of Terry Brown of Museum Professionals Inc. (pictured at right). Many of these volunteers also worked on the original Leaf Squad when Prehistoric Journey was built nearly 20 years ago.

The result of these volunteers’ incredible commitment is a fresh place for the two bony-headed *Stygimoloch* to battle for the attention of a nearby female as *T. rex* approaches through the trees. Check it out in Prehistoric Journey on Level 3 while you’re at the Museum this summer.



RESEARCH ASSOCIATE DISCOVERS NEW SPECIES

For many years, David Steinmann, a research associate in the Zoology Department, has explored Colorado caves and collected invertebrates never before seen. Steinmann has discovered about 100 new species of millipedes, beetles, and pseudoscorpions in caves in Glenwood Caverns and Eagle County, and near Steamboat Springs and Colorado Springs.

In fall 2012 in Bonnie’s Hall Cave in Eagle County, Steinmann came across a small, 14-millimeter-long millipede of the genus *Austrotyla*. This genus contains several species distributed in the Rocky Mountains from southern Alberta to Mexico, and in the Mississippi Valley from Wisconsin to Missouri, but none that lived in caves. It appeared that Steinmann had discovered yet another new species.

The millipede had characteristics typical for cave arthropods, such as reduced pigmentation, longer legs, and a reduced number of ocelli (small simple eye). Steinmann described this remarkable species together with William A. Shear, of Hampden-Sydney College in Virginia, in the journal *Zootaxa*. Steinmann named the invertebrate *Austrotyla stephensoni* to honor Jeff Stephenson, collections manager for the Museum’s Zoology Department, to recognize him for his assistance with Steinmann’s research projects.



The Museum is now home to the *Austrotyla stephensoni* type specimen, which is the name bearer for the species and the one by which all others are compared. A head shot of the millipede is pictured at left. Find out more about research in the Zoology Department @ www.dmns.org/science/research/zoology.

IMPROVEMENTS CONTINUE OUTSIDE THE MUSEUM

You may have noticed that improvements have continued in City Park near the Museum since the opening of the Morgridge Family Exploration Center earlier this year.

Denver Parks and Recreation is installing native, low-water plants on the south side of the building. These areas will be isolated by orange fencing until the plants have been established. In addition, the landscaping on the west side of the building will be upgraded in the coming months. As part of this process, the bear statue *Grizzly’s Last Stand* will be removed from its current location and go into hibernation for several weeks. When

the statue re-emerges in early fall, it will be relocated to the southwest side of the Museum and placed in landscaping that represents its natural habitat.

The new landscaping and upgrades are also presenting an opportunity for the Museum to place a totem pole from our collections in the park, just south of Boettcher Plaza. The totem pole is currently in storage, and installing it in the park will give Museum visitors and park users a chance to experience a little bit of natural history while enjoying the great outdoors.



©AAO/STScI/WIKISKY

HEAVENS ABOVE

Summer evenings in the northern hemisphere are the most favorable time of year for viewing the stars Zubenelgenubi and Zubeneshamali in the constellation of Libra. These tongue-twister stars are fun to pronounce—

zoo-BEN-al-je-NEW-bee and zoo-BEN-ess-sha-MAH-lee—and rewarding to spot in the night sky.

Their names are derived from Arabic. Zubenelgenubi means “the southern claw” and Zubeneshamali means “the northern claw,” harkening back to when they were viewed as the outstretched claws of Scorpius. In a more modern image derived from Greek mythology, the two stars depict the balance beam that holds the scales of Astraea, or Virgo the goddess of justice.

These stars are relatively easy to locate in dark skies just after sunset. Look for the constellation of Libra in the south-southwestern sky between Scorpius to the east with its bright star Antares, and Virgo to the west with its bright star Spica. Zubenelgenubi (pictured above) shines midway between the two bright stars, and Zubeneshamali is nearby and slightly brighter. They are easier to find this year because Saturn is passing in front of the constellation, providing a guidepost to Libra’s two brightest stars.

If you use binoculars or a small telescope to view Zubenelgenubi, you’ll see not one but two stars. It is a visual binary star about 77 light years from Earth that shines 25 times brighter than the sun. Zubeneshamali is 140 light years from Earth and over 150 times brighter than the sun. Even though their brightness is greater than the sun, their distance keeps them shining modestly in our night sky. Saturn appears brighter than the two stars and its rings are easily viewed with a backyard telescope.

Find sky information for August and September @ www.dmns.org/heavensabove.



A DAY FOR THE SKIES

Mark your calendar for Astronomy Day on Saturday, September 27, at the Museum, copresented with the Denver Astronomical Society. Enjoy hands-

on demonstrations, mini presentations by space scientists and explorers, and other special activities throughout the day. Weather permitting, you will also have a chance to safely view the sun through solar telescopes. Astronomy Day is included with general admission. That evening the Denver Astronomical Society will host a telescope viewing at Chamberlain Observatory. Find out more @ www.denverastro.org.

NOW SHOWING

Come in from the heat and enjoy these shows in the Phipps IMAX 3D Theater and Gates Planetarium. Members save on tickets every day! Find showtimes and tickets @ www.dmns.org.

D-DAY: NORMANDY 1944



© NSD Land Films

PANDAS: THE JOURNEY HOME



© National Geographic Films

ISLAND OF LEMURS: MADAGASCAR



© Warner Bros. Entertainment Inc.

LASERIUM: THE COSMIC LASER CONCERT



© Laserium

FINAL WEEKS FOR MAYA: HIDDEN WORLDS REVEALED

Maya: Hidden Worlds Revealed—the largest exhibition about the ancient Maya ever to be displayed in the United States—closes on Sunday, August 24! You, your family, and your summer visitors will experience a wide cross-section of ancient Maya life through rarely seen artifacts, hands-on activities, and immersive environments.

The Museum collaborated with three other U.S. museums to develop the exhibition. The result is an in-depth experience showing how the Maya had a sophisticated worldview that rivaled any civilization in Europe during the Maya Classic Period (AD 250–900). You will understand why the ancient Maya have captured human imagination and garnered extensive archaeological research since news of ruined cities in the jungles of Central America was first published in 1839.





- Stand among replicas of massive stone monuments.
- Interpret glyphs and print your Maya name and your birth date.
- Admire more than 250 artifacts, including several from our own collections.
- See the “Denver Panel,” a mysterious stone carving from Mexico shrouded in mystery.
- Discover how the Maya ball game is reflected in team sports that are played today.
- Experience immersive environments, such as an underworld cave and a re-created tomb and its treasures.
- Conduct a virtual excavation and interpret your finds.
- Weave Maya patterns and build Maya arches.
- Find unique gifts in the Maya shop where members save 10% every day.
- Maximize your Maya experience and see the show *Tales of the Maya Skies* in Gates Planetarium.

SEE IT

- Maya: Hidden Worlds Revealed is open daily from 9 a.m. to 5 p.m. through August 24. Timed tickets are required. Book your print-at-home tickets @ www.dmns.org/maya and avoid a handling fee.
- The exhibition is open during Summer Nights @ the Museum. Find it @ www.dmns.org/summernights.
- Reservations are also available at 303.370.6000 (daily, 9–5). There is a \$2 fee per ticket by phone. Afternoon is the best time to call.
- Bring your membership card and photo ID, even if you have your print-at-home tickets with you.
- Please allow time for parking and queuing during these busy summer months.
- The Maya exhibition is displayed in two galleries, the Phipps Gallery and the new Anschutz Gallery. Please wear comfortable shoes and plan to be in the exhibition for up to two hours.

REDISCOVER NORTH AMERICAN INDIAN CULTURES HALL

The Museum was one of the organizers of Maya: Hidden Worlds Revealed, continuing a long tradition of sharing stories of the native cultures of the Americas. Tucked away on Level 2 of the Museum is an entire hall dedicated to North American Indian Cultures that has delighted visitors for 40 years.

As you wander through, you will see models of Native American homes and an amazing array of objects from everyday and ceremonial lives—clothing, tools, saddles, boats, jewelry, cradles, and toys. Exquisite beadwork or quillwork, distinctive designs, and fine craftsmanship make many of them beautiful as well as functional.

The hall is often known as Crane Hall because it owes its existence largely to Mary and Francis Crane. From 1951 to 1968, the Cranes collected 14,000 Native American and Mesoamerican artifacts and displayed their collection in a museum in Florida. When the Cranes decided to find a new home for their collection, they chose Denver. The hall opened in phases from 1974 through 1978 with assistance from an advisory group of Native Americans. Over the years, staff have continually updated the exhibits and rotated objects on and off display to ensure their long-term preservation.

SEE IT

There is a lot for visitors of all ages to enjoy in this hall.

- See the only two life-size dioramas in the Museum depicting humans in scenes from everyday life. The Cheyenne scene takes place in the 1860s, just 20 miles east of the Museum, along Coal Creek. The other portrays a Miccosukee family in the Florida Everglades in about 1950.
- Explore two miniature dioramas that are a hit with kids. One shows a Northwest Coast potlatch celebration and the other shows American bison on the range.
- Walk into a life-size Navajo hogan and stand outside a Hopi stone-and-adobe house.
- Take a treasure hunt through the hall looking for many toys and miniatures, including an array of pottery and baskets measuring from four inches high down to no larger than a dime.



THE MAKING OF MAYA BEER

BY NICOLE GARNEAU, PhD,
AND MICHELE KOONS, PhD

For the past three years, the Museum has been collaborating with Denver Beer Co. to explore how science and the art of brewing beer can intersect and lead to some tasty beverages. The resulting beers have been served at Science on Tap, an annual summer event for the Museum's Young Professionals. One year we used a native thistle to develop a historic kolsch to commemorate Denver's brewing history, and in 2013 we brewed an isolated yeast strain collected in City Park that resulted in something of a slurry of unconverted sugar, or mostly wort. Brewing isn't always an "exact" science!



For the 2014 Science on Tap, we were inspired by our current temporary exhibition, *Maya: Hidden Worlds Revealed*. This past spring, we put together an interdisciplinary team to see if we could come up with yet another new beer inspired by our findings.

From happy hour and celebratory events to the holiest of religious and cultural rituals, alcoholic beverages have had a wide-ranging role in human history as far back as 10,000 BC. The ancient Maya drank alcohol socially and also believed that alcohol aided in communicating with the ancestors and gods. Our scientific understanding of the relationship between natural resources, alcohol production, and the role of fermented beverages in cultures as geographically diverse as they are in their place in time is only as good as the research tools available to us. Advances in noninvasive archaeological techniques to study residue left on drinking vessels, sometimes rare and fragile pottery, are shedding new light on the role of alcohol in ancient societies.

For the Maya beer study, we decided to use a combination of techniques, including archaeochemistry—the chemical analysis of archaeological specimens—to examine the molecules that remain in ancient pottery from the Museum’s anthropology collections. Following data collection and analysis, we planned to brew a beer inspired by the results.

While the two of us each brought our respective expertises in Latin American archaeology and in molecular biology to the research team, the study itself became part of a larger project undertaken by De Regan, an archaeology and chemistry student at Metro State University. Her advisor, Dr. April Hill, is a chemist with expertise in chemical solvents and gas chromatography. The four of us were joined by Travis Rupp, an instructor at the University of Colorado and an expert on ancient alcohol, and Dylan Clark, a PhD candidate at Harvard and expert on Maya culture, who helped select vessels that had a higher probability of having held a fermented beverage.

Typically, archaeochemical techniques involve grinding the pottery specimen and then testing the powder for residue molecules. While effective, this is destructive and prevents future study of the object. We set out to develop and test new noninvasive techniques that are just as successful at finding and identifying molecule residue.

A sonicator is a tool that uses physical vibrations in a water bath to dislodge particles. It is often used to clean jewelry. Using the sonicator and solvents to dissolve the molecules, we took a series of samples to analyze using gas chromatography. We separated out a variety of molecules that might help us identify exact ingredients from the residue in the vessels. We tested several vessels using this method to get a picture of the fermentation style and which natural ingredients were used for the beverages.



Our experiment with the noninvasive technique paid off. We were able to isolate molecules from the residue and found signs of beeswax. Comparative analysis with purchased beeswax showed an identical molecular signature! We selected honey to be the primary flavor for the beer, and we chose other geographically and culturally accurate ingredients, including corn, chilies, chocolate, balché tree bark, agave, and flowers such as morning glories. Patrick Crawford and Charlie Berger, founders of the Denver Beer Co., built a flavor profile and developed a new beer. We named it “Tippy Tzolk’in” in honor of the Maya ritual calendar.

Not only is this brew project a unique way to bring science to life and join the past to the present but the successful results of our noninvasive technique could help change some of the approaches used in the field of archaeochemistry, one ancient vessel at a time.

TRY IT

Tippy Tzolk’in, the Maya-inspired beer created by Denver Beer Co., will be served during Summer Nights @ the Museum on Friday, August 8. Get tickets and find out more @ www.dmns.org/summernights.

FIND IT @ DMNS.ORG

Dr. Nicole Garneau is curator of human health and Dr. Michele Koons is curator of archaeology. Find out more about their research @ www.dmns.org/science/museum-scientists.

Don’t miss the exhibition *Maya: Hidden Worlds Revealed*, now in its final weeks in Denver! Get tickets and find out more @ www.dmns.org/maya.

Find out more about the Museum’s Young Professionals group @ www.dmns.org/YP.

Facing page: A Museum research team tested ancient Maya vessels, such as this jaguar-faced cup from the Classic Period (AD 250–900), to look for residue from beverages. Above, from left: Michele Koons and Nicole Garneau test the vessels in the Museum lab.



1933 DENT SITE FILM

BY BRENT K. WAGNER, RENÉ PAYNE, SAMUEL SCHILLER, AND KRISTINE A. HAGLUND
BAILEY LIBRARY AND ARCHIVES

These days we take for granted that just about anything that happens—whether particularly significant or not—will be captured on video. Eighty years ago, however, filming was not common, making some of the black and white 35 mm nitrate silent films we have in our Image Archives collection especially precious.

One of these films captures a group from the Museum excavating a mammoth site in Dent, Colorado. The clip is a centerpiece of the Museum's early work in archaeology and contributes to the larger narrative of human activity in North America. Although the discovery itself was important, it was also the latest volley in the Museum's sustained fight for recognition from the scientific community as a worthy archaeological contributor.

From its founding in 1900 into the 1920s, the Museum curated only a few archaeological materials, and these tended to be curiosities rather than scientific specimens. The pursuit of scientifically excavated archaeology began when the Museum's director, Jesse Figgins, started searching for Pleistocene megafauna. As early as 1924, Figgins's crew excavated specimens found in association with extinct forms of bison at various locations, but not without controversy.

A Museum dig at the Lone Wolf Creek site in Texas appeared to show evidence of humans and Ice Age bison coexisting, but since untrained professionals excavated the site, the scientific community questioned its authenticity. In 1926, Figgins's son Frank and Carl Schwachheim discovered a spear point embedded in the ribs of an extinct bison near Folsom, New Mexico. But they removed a matrix with the point and rib bone and brought it to the Museum for examination, so it also was not recognized.

In 1927, the Museum team uncovered another point at Folsom, and this time they invited three other scientists to come and verify that the bone and point had occurred in direct association with each other. At the time, scientists believed that humans had lived in North America for about 4,000 years. The Folsom point placed people here more than 6,000 years earlier, making it one of the most important archaeological discoveries of the 20th century. The Museum had made a name for itself as an archaeological force.



Fortunately, this would not be a lone incident. In 1932, Father Conrad Bilgery of Regis College received word that a flood had exposed large bones in a gully along the railroad tracks in Dent (near today's town of Milliken). Bilgery and his students investigated and uncovered not bison but mammoth bones, with what appeared to be a large spear point lying under the pelvis of one of the animals. Bilgery turned the excavation over to the Museum in 1933. Figgins sent a professional crew to the site, and they documented two additional spear points clearly articulated with the bones. He also had the excavation filmed.

Why is this discovery so important? Because the evidence uncovered at Dent demonstrated for the first time that humans and mammoths coexisted in North America at the end of the Ice Age—even earlier than Folsom—and until Dent, there was no evidence to support this. Unfortunately, Figgins did not publish the findings in a major academic journal, thus the discovery did

not garner the attention it deserved. Similar points were found a few years later near Clovis, New Mexico, and the points are known today as Clovis points, not Dent points.

The Dent site lay relatively dormant for decades, but the 1970s saw a resurgence of interest. Since then, there has been noteworthy research on Dent and the 14 mammoth specimens it yielded. By studying amino acid fractions in bone collagen, scientists have pegged the date of the Dent incident at 10,810 radiocarbon years before present day. They have conducted tests and examined skulls, mandibles, and teeth to determine the mean age of the herd to be equivalent to 15 African elephant years. Through analysis of the types of marks on the bones, we also see that the early humans hunting mammoths had systematic butchering methods.

So this modest film clip, less than two minutes long, is part of a larger story of human activity in the Americas and of the scholars who study them. Preserving this film and many other archival materials ensures they will be available for researchers for many years to come.

SEE IT

View a clip from the Dent site film on the digital edition of *Catalyst* @ www.dmns.org/catalyst.

You may also see the film clip and a real Dent spear point in an exhibit toward the end of Prehistoric Journey on Level 3.

FIND IT @ DMNS.ORG

Bailey Library and Archives is home to 53,000 publications, 2,500 rare books, 9,000 volumes of scientific periodicals, and 700,000 images. Find out more @ www.dmns.org/science/bailey-library-and-archives.

The Museum is responsible for preserving items from the collections, such as the Dent site film, that are timeless in origin and value. To fulfill this responsibility, the Museum opened the new Rocky Mountain Science Collections Center. Find out more @ www.dmns.org/newwing.

The Dent film was recently selected as one of Colorado's Top 10 Most Significant Artifacts. Find out more @ <http://collectioncare.auraria.edu>.

Learn more about the Museum's past in the new volume *Denver's Natural History Museum: A History*. Find it as a free download @ www.dmns.org/science/museum-publications or purchase a hard copy @ lulu.com.

Facing page: At work on the Dent site, clockwise from left, Father Conrad Bilgery, unidentified Regis student, Walter C. Mead, Charles H. Hanington, and Fred J. Howarth. This page: Three Dent spear points.

NEW PLAZA NAMED FOR BOETTCHER FAMILY

The airy new plaza outside the Museum's new wing has been dedicated as the Boettcher Plaza in recognition of the Boettcher Foundation's decades-long history of supporting the Museum. The new plaza was dedicated at a special event on July 17. The Foundation's recent grants helped construct and equip the new wing.

BOETTCHER[®] FOUNDATION

Since 1947, Boettcher Foundation grants to the Museum have totaled more than \$6 million and supported a variety of key capital projects including:

- An addition to the west side, dedicated in 1953, that stood for nearly 50 years
- Diorama halls in the Charles Boettcher II Wing on Level 2, including Edge of the Wild and Australia and South Pacific Hall
- Boettcher North American Hall and Africa Hall
- Phipps IMAX Theater and the T-Rex Cafe and Deli
- Prehistoric Journey, Space Odyssey, and Expedition Health permanent exhibitions
- Morgridge Family Exploration Center and Rocky Mountain Science Collections Center

In addition, Claude K. Boettcher served on the Museum's Board of Trustees from 1928 to 1957.

Founded in 1937 by Claude K. Boettcher and his father, Charles, the Boettcher Foundation invests in Colorado through "minds and mortar." The Foundation funds scholarships, biomedical research, and teacher training, as well as capital grants for nonprofits.

Foundation leaders say they want the plaza to serve as a testament to the power of charitable giving and as a reminder that cultural institutions like the Museum help make Colorado the wonderful place it is. They hope others will be inspired to start their own traditions of giving.

The Boettcher Plaza dedication also honored two outgoing Trustees of the Boettcher Foundation, Pamela D. Beardsley and Edward D. White, both of whom have deep ties to the Museum:

- Pam Beardsley is a Trustee Emeritus who served on the Museum's board from 1990 to 2009, including three years as board chair and two years on the DMNS Foundation board.
- Ted White's great grandfather, Henry M. Porter, was among the Museum's founders. White's great uncle, John T. Mason, voluntarily helped manage the Museum and curate the collections from 1901 to 1910, and in 1918 donated his worldwide collection of more than 20,000 butterflies and moths to the Museum.



TRAVELING THE

Silk Road

MUSEUM *after* DARK

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LEGACY SOCIETY MEMBERS HELP SUSTAIN THE MUSEUM

The Museum was pleased to honor the members of the Edwin Carter Legacy Society during their annual luncheon in May. These special friends were recognized for supporting the Museum through a planned gift. Dr. Michele Koons, curator of archaeology, gave the group an exclusive perspective of the incredible exhibition *Maya: Hidden Worlds Revealed*.

The Edwin Carter Legacy Society is named for Edwin Carter, a pioneer naturalist who assembled an impressive collection of Colorado fauna. This collection eventually became the nucleus for the Museum's establishment in 1900. Supporters who notify us that they have named the Museum in their will, trust, or as a beneficiary are invited to join and deepen their relationship with the Museum through a variety of special events and benefits.

Carter said, "As Denver is destined to be among the great cities of the continent, so will a museum be here founded ... grow up and be one of the great entertaining and educational institutions of the country." We are grateful to the Legacy Society for ensuring the Museum will continue to be a great institution for generations to come.

Find out more about making a planned gift to the Museum @ www.dmns.org/give/individual-giving or by contacting Mary Pat Rooney at 303.370.8251 or marypat.rooney@dmns.org.



The Edwin Carter Legacy Society recently gathered for their annual luncheon, including from left Jane Quinette, Sally Plummer, Jan Shellhammer, Mary Gwyn Fitzgerald, and Richard Ramsey.

THIRTY-FIVE YEAR VOLUNTEER HAS UNUSUAL JOB

Volunteers are an integral part of our Museum family, and their tireless commitment has helped the Museum become one of the renowned science museums in the country and a vibrant part of Denver's cultural community. In 2013, 1,780 volunteers contributed an incredible 214,525 hours. In May, the Museum honored these volunteers for their significant contributions last year.

Nickie Pliler was recognized for 35 years of service. (She is pictured with President and CEO George Sparks.) Pliler has an unusual volunteer job at the Museum: caring for the colony of bugs that clean bones in the Zoology Department.

Years ago, Pliler took over the maintenance of the "dermestarium" when a curator went on vacation. The thousands of dermestid beetles have been her responsibility ever since. The bugs clean flesh off of zoological specimens before they go move into their permanent home in the collections.

As a retired Army colonel and nurse, Pliler uses techniques and practices she learned in Army hospitals around the world. "I treat them like germs," she said. "I'm in and out of their boxes turning the bones. Just as you have to be careful about bacteria

in a hospital, you've got to keep those bugs in their boxes or they'll tear down the place!"

Other longtime volunteers recognized at this year's event were Tom Hardy, for 30 years of service, and Robert Bruner, Ann Groshek, Alan Keimig, Virginia Lyons, and Marcia Ornstein, all for 25 years of service. These valued individuals dedicate their time to a variety to departments across the Museum.

The Museum's volunteers are truly valued, and there's a place for you too. Find out more @ www.dmns.org/join/volunteering.



DID YOU KNOW?

There are many ways to support the Museum! Donate your used car, boat, motorcycle, truck, or RV to the Museum and support your favorite cultural institution while receiving a tax deduction. The Museum is partnering with Cars Helping Charities to give you the opportunity to quickly and easily donate a vehicle in any condition. Find out more or schedule a pickup @ 866.697.0697 or www.dmns.org/give/vehicle-donation. Thank you for your support!

PREHISTORIC PINES

BY JAMES W. HAGADORN, PhD

The Museum has a new pair of guardians flanking the entrance to Coors Gems and Minerals Hall. At over four tons and nine feet tall, a pair of split timbers from a massive Jurassic tree are statuesque sentinels greeting visitors like a crystalline version of an open book.

Their journey to Colorado began nearly 160 million years ago in a wet but cool landscape. Huge pinecone-bearing trees thrived, forming evergreen forests that were later buried by flooding rivers and lakes. Trees akin to modern cypress and kauri were trapped below the sediments. Before wood rot could compost these conifers, stagnant silica-rich groundwater began to ooze into the sediments, and the plant tissues were replaced by milky-white chalcedony, which is microscopic crystalline quartz. Small amounts of iron in the water allowed some of the wood to be petrified by more colorful forms of quartz. The trees' tissues turned into a palette of red, yellow, orange, and brown banded minerals known as jasper, carnelian, and sardonyx.

For ages the trees lay hidden in the earth's depths, waiting for the tectonic dance of continents and erosion to expose them. Dinosaurs came and went. Finally, mere millennia ago, they came to rest just below the surface in what today is known as Xinjiang Province—an arid area of northwest China, a stone's throw away from Mongolia and its Gobi Desert.

While perched below this parched landscape, desert brines oozed into the wood's cracks and fissures. As the fluids evaporated, a second phase of mineralization began, depositing calcite and halite (known as table salt) in the fallen logs. You can test this yourself by licking the trees—you will notice they have their very own salty flavor.

Graham Sutton, of Collector's Edge Minerals in Golden, Colorado, was an early and fortunate visitor to this region of China. He inquired about the source of the abundant amounts of petrified wood he was seeing in shops throughout Xinjiang. In 2006, Graham was taken to Qitai, where petrified forests had begun eroding on the surface, causing logs and stumps to tumble from hillsides just like those in Arizona's Petrified Forest National Park.

Outside of the protected areas of the Qitai deposit, Chinese commercial paleontologists were mining fossils en masse, sometimes exposing logs nine feet in diameter and 75 feet long. The scene was surreal, with occasional village streets lined by trunks from these ancient forests.

Awestruck by the scene, Sutton made six trips over the next year to Qitai, and on one trip an exceptional log was found. In 2008 he arranged for the specimen to be transported 2,600 miles to Yunfu (Guangdong Province) where a nine-foot diameter saw spent two days splitting the tree in two. After a month of polishing, the two halves made their way to the United States in 2009 where they were displayed for the first time at the Tucson Gem and Mineral Show. Afterward, they were bought by the Stone family and graciously donated to the Museum.



Since 2010, these Chinese forests have been protected as part of the Qitai Silicified Wood-Dinosaur National Geopark. The park's logs and bones are not just iconic mineral mementos but tell a fascinating climate story. Both its tree rings and bone growth lines record massive monsoonal weather rhythms that dwarf anything known from human history. So when you snap a selfie or family photo between these stalwart relics on display at the Museum, imagine them growing next to you in a forest unlike anything on Earth today.

SEE IT

The petrified tree is on permanent display at the entrance to Coors Gems and Minerals Hall on Level 1 of the Museum.

FIND IT @ DMNS.ORG

Dr. James Hagadorn is the Tim and Kathryn Ryan Curator of Geology. Find out more about his research @ www.dmns.org/science/museum-scientists/james-w-hagadorn.

See a slide show of photos related to the story of the petrified tree @ www.dmns.org/catalyst.



SIGN UP FOR AUTORENEW AND GET A FREE GIFT

There is an easy way to keep your membership current. Members who sign up for AutoRenew will enjoy having their membership automatically renewed each year. One month prior to the renewal date, the Museum will send a reminder e-mail that your membership will be auto-renewed and your credit card charged.

In the spirit of going green, you will receive a free water bottle when you sign up for AutoRenew. Enroll today @ 303.370.6306 (daily, 9–5).



DON'T MISS BEHIND-THE-SCENES NIGHT

Thank you for your membership support! You not only receive great benefits but your membership dues also help the Museum inspire and serve our community.

We invite you to upgrade your membership today and join the Giving Club at \$300 or above. As a Giving Club member, there are many special opportunities and customized events that greatly enrich your Museum experience.

A perennial favorite among our Giving Club members is Behind-the-Scenes Night. This free event will be held on Tuesday, September 16, featuring special access to Museum scientists, treasures, and collections not on public display, and a complimentary buffet dinner and cash bar.

Additional benefits greatly increase your access to the Museum:

- Free “anytime” vouchers to all surcharged exhibitions. No reservations are needed, even if it’s sold out! The number of vouchers you receive is determined by your membership level.
- Free IMAX and Planetarium tickets you may use for yourself or share with friends and family. (Passes not accepted for Laserium shows.)

It is easier and more affordable than ever to become a Giving Club member with monthly installments starting at just \$25 per month! Find out more @ www.dmns.org/join/giving-club.

GET THE eCARD

Go electronic and keep your membership card on your smart phone. Simply download the free eCard app from your device’s app store and carry one less card in your wallet! Details @ www.dmns.org/membercard.

Don’t have a smart phone? You may pick up and activate your new plastic card the next time you visit the Museum. You may keep your old blue card as a memento if you prefer. Your membership number stays the same; only the bar code changes to complement our improved ticketing system.



MEMBERS APPRECIATION DAYS

Sunday, August 17
 Sunday, September 14
 9 a.m.–5 p.m.

Enjoy these special discounts just for you! Thank you for your membership support!

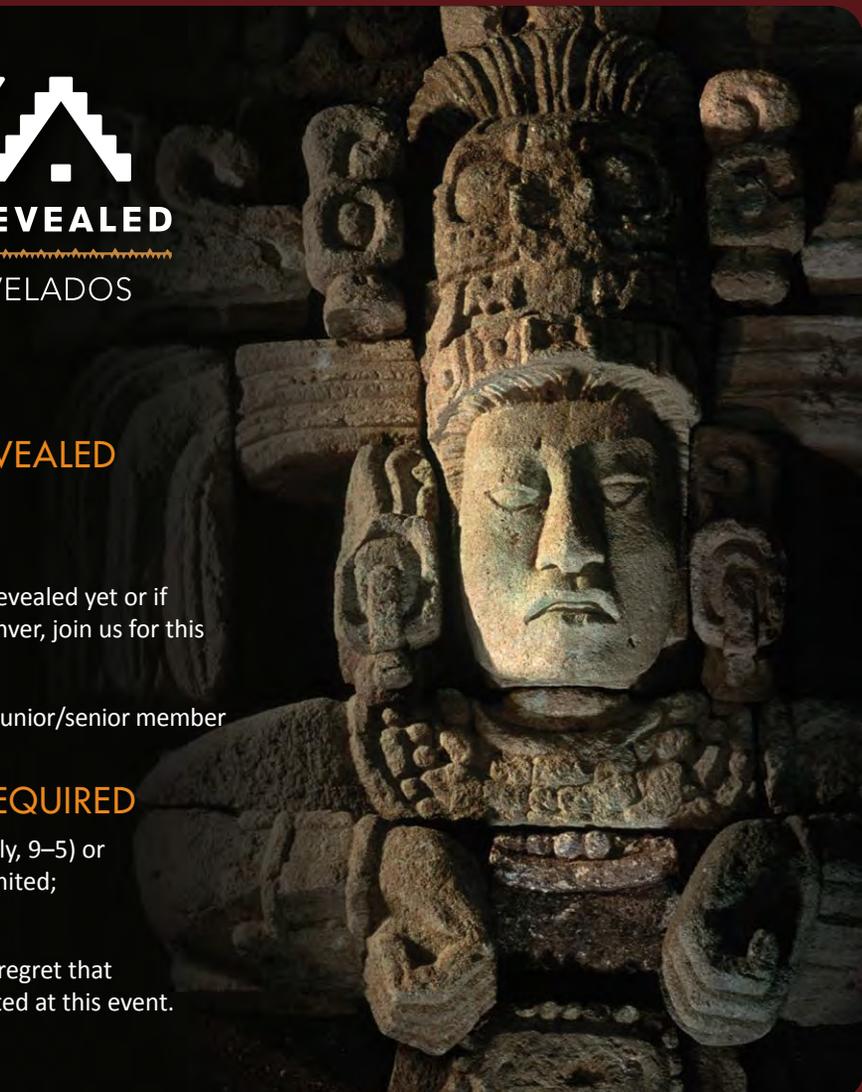
- 20% off in the T-Rex Cafe and Deli
- 20% off in all Museum Shops*
- 10% off gift memberships
- 50% off IMAX and Planetarium tickets

Special offers are valid in person only on August 17 and September 14, 2014, and are not redeemable over the phone or online. *Extra 10% discount does not apply to DVDs, CDs, and books.

QUESTIONS?

- Stop by the Members Express Lane at the Museum
- Call 303.370.6306 (daily, 9–5)
- E-mail members@dmns.org
- Online @ www.dmns.org/members

THANK YOU FOR YOUR MEMBERSHIP SUPPORT!



MAYA
HIDDEN WORLDS REVEALED
MUNDOS OCULTOS REVELADOS

LAST CALL!
MEMBERS-ONLY NIGHT IN
MAYA: HIDDEN WORLDS REVEALED

Tuesday, August 5
6–9 p.m.

If you haven't seen Maya: Hidden Worlds Revealed yet or if you want to see it again before it leaves Denver, join us for this exclusive members-only after-hours event!

Exhibition admission: \$8 adult member, \$5 junior/senior member

ADVANCE RESERVATIONS REQUIRED

Reservations available at 303.370.6000 (daily, 9–5) or www.dmns.org/memberevents. Space is limited; no walk-up tickets.

Exhibition entry is by timed ticket only. We regret that nonmember guests cannot be accommodated at this event.