

CATALYST

DENVER MUSEUM OF NATURE & SCIENCE MAGAZINE

OCTOBER | NOVEMBER 2014

INSIDE ///

WHALES: GIANTS OF THE DEEP
TRAVELING THE SILK ROAD
SNOWMASTODON SCULPTURE





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Dear Members,

The Museum hosted a live broadcast of the launch of the WorldView-3 satellite in August, showcasing a collaboration among some of Colorado's leading aerospace companies. The enthusiastic crowd once again showed their perennial passion for space science as they built their own water rockets, heard from space scientists and engineers, and counted down together as the satellite blasted off.



Following the event, Steve Lee, curator of planetary sciences, was approached by a Broomfield father and his two school-aged children. The dad thanked the Museum for presenting the event because it gave him and his children a unique educational experience to enjoy together. He searched Google for a place to watch the launch, and the Museum was at the top of the list. These first-time visitors purchased a membership and were already planning their next visit. The Museum values being the place where families can spend the day together and have fun, meaningful experiences.

We strive to build family opportunities into nearly aspect of our work. Our grant-funded school programs, Urban Advantage Denver and Passport to Health, are dedicated to engaging more than 5,500 underserved students and getting them excited about science. Both programs include Family Days where the entire family is invited to spend the day together at the Museum. We work closely with local schools to coordinate these days so that families feel welcome while they are visiting the Museum, many for the first time.

We have also been developing more nonschool-related programs for families, including weekday programs for parents and their young children and family fun events such as special IMAX screenings. Due to popular demand, this fall we are offering an all-new Family Overnight at the Museum on Halloween. Our newest temporary exhibition Whales: Giants of the Deep is also certain to be a favorite destination for you and your family, and admission is free for members!

At the WorldView event, I watched our guests of all ages enthusiastically calling "5-4-3-2-1," and I realized how fortunate the Museum is to be a catalyst in the community that can truly ignite a passion for science and nature within families. Thank you for your support which helps make all of this possible.

A handwritten signature in black ink that reads "George Sparks".

George Sparks
President and CEO

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

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Join Our Community:



ON THE COVER

FROM THE ANTHROPOLOGY COLLECTIONS

Carved whale tooth

A1348.1

Northwest Coast

Collected ca. 1920, Juneau, Alaska



Rick Wicker



BEAR SCULPTURE MOVES TO NEW HOME

The Grizzly's Last Stand, an iconic sculpture that has stood outside the Museum for nearly 85 years, has been relocated to the southwest side of the Museum to prepare for the installation of a new bronze sculpture entitled *Snowmastodon* (see p. 8). The sculpture was created by Louis Paul Jonas in 1930 in tribute to grizzly bears as they were disappearing from the Colorado landscape. It has been placed in new landscaping that represents grizzlies' natural habitat.

SHOW OFF YOUR FAVORITE MUSEUM

Bring a friend for free to the annual Night at the Museums during Denver Arts Week. On Saturday, November 8, the Museum will be open for free for all guests from 5 to 10 p.m. The entire Museum will be available, including the new temporary exhibition *Whales: Giants of the Deep*. Find a complete list of events for Denver Arts Week @ www.denver.org/denver-arts-week.

HEAVENS ABOVE

The second total lunar eclipse of 2014 can be observed in the early morning hours of Wednesday, October 8. This type of eclipse occurs at full moon and only if the moon passes through some portion of Earth's shadow. The moon's disk can become dramatically colorful, from bright orange to blood red and more rarely dark brown to very dark gray.

One of the great things about lunar eclipses is they are completely safe to view with the naked eye. No special filters are required to protect your eyes like those used for solar eclipses. You don't even need a telescope, although a good pair of binoculars enhances viewing. In Denver, the final phase of the

eclipse will not be visible because the moon will slip below the horizon before then.

The two total lunar eclipses in 2014 make up half of a four-eclipse series known as a lunar eclipse tetrad. Total lunar eclipses in April and September 2015 complete the tetrad.

The final eclipse of the year occurs on Thursday, October 23, with a partial solar eclipse. This type of eclipse occurs when the new moon passes between Earth and the sun, and the moon's shadow happens to fall upon Earth's surface, covering only part of the sun. Partial solar eclipses are dangerous to view without special filters because they are still very bright.

For this eclipse, the penumbral shadow will first touch Earth in eastern Siberia. As the shadow travels east, much of North America and Canada will be treated to the eclipse. From Denver, the moon will slowly glide across the upper portion of the sun, obscuring 45 percent of the solar disk.

Find out the phase times for these eclipses and other sky information for October and November @ www.dmns.org/heavensabove.



© Greg Hewgill

A REDISCOVERED TREASURE

In mid-July, Museum Archives was the first collection to begin moving into new Rocky Mountain Science Collections Center. Through the end of the year, the archivists and their volunteers will carefully move 7,200 linear feet of records, images, and ephemera. New environmentally sound compactor shelving allows Archives to roughly double their storage capacity and plan for 20 years worth of growth. The new accommodations also include cold (4°) and cool (45°) storage to protect fragile film collections. The anthropology and zoology collections are scheduled to begin moving in early fall.

While preparing for the move, photo archivist René Payne found still photography taken by former Museum director Alfred Bailey during his 1962 Alaska expedition. Payne said she had come across Bailey taking photos of brown bears in a motion picture of the expedition, but she had never found the actual photos. She is sure to discover even more treasures in the coming weeks and months.





HISTORY IN POTTERY

A new exhibit outside Crane North American Indian Cultures Hall on Level 2 examines Pueblo pottery and how it has changed over 1,500 years. Twenty pieces of pottery from the anthropology collections are on display, many for the first time, including below, from top, the Jeddito Yellow Ware ladle (1350–1625) developed in the Hopi region of northern Arizona, and the Hopi canteen (ca. 1880–1900) that shows the face of a spirit called Katsina Palhik Mana, or Butterfly Maiden.



FIELD TRIPS IGNITE YOUNG MINDS

Spread the news to your favorite student—reservations for Field Trip Adventures are now available! These specially planned experiences are a new approach to school visits that take the best of what the Museum has always offered and combine it with engaging new opportunities. Students learn about wildlife and their habitats and adaptations, dinosaurs and paleontology, and heart and lung science. Field Trip Adventures are also available to enhance this fall's temporary exhibitions, Whales: Giants of the Deep and Traveling the Silk Road.

A free Educators Night will be held on Tuesday, October 14. Teachers, PTSA members, and school administrators are invited to enjoy the Museum after hours and explore the wealth of educational opportunities available for their students. Find out more @ www.dmns.org/teachers.



FOSSIL FUN

Celebrate National Fossil Day on Sunday, October 12, with free activities for all ages from 10 a.m. to 4 p.m. Visit Prehistoric Journey and walk through the newly refurbished Cretaceous Creekbed "enviororama," watch volunteers clean fossils in the Earth Sciences Lab, meet Museum paleontologists, and see cool specimens from behind the scenes. Find out more about the Museum's paleontology research @ www.dmns.org/science/research/earth-sciences.



WHALES

GIANTS OF THE DEEP

Whales photos: © Museum of New Zealand Te Papa Tongarewa

OPENS FRIDAY, OCTOBER 10
MEMBERS RECEIVE FREE ADMISSION!

Whales: Giants of the Deep, a new exhibition that transports you to the vibrant underwater world of the mightiest animals on Earth, opens at the Museum on Friday, October 10. With life-size models and more than 20 real specimens on display—including the skeleton of a sperm whale that measures an astonishing 58 feet long—you will see why these highly intelligent mammals have been a source of human fascination for centuries.



On tour from the Museum of New Zealand Te Papa Tongarewa, home to one of the largest collections of marine mammals in the world, *Whales: Giants of the Deep* is popular among family audiences because it features a blend of cool skulls and skeletons, hands-on objects, digital interactives, immersive projections, and rare artifacts.

Crawl through a life-size replica of the heart of the humongous blue whale, touch real and replica whale teeth, build your own dolphin and see how it swims, accompany a sperm whale on a deep-sea hunt for a giant squid, see the model of a southern right whale featured in the acclaimed film *Whale Rider*, and enter an immersive sound chamber to hear the “songs” whales use to navigate, find food, and communicate.

You will also examine and touch real whale specimens from the Museum’s collections and the U.S. Fish and Wildlife Service. The exhibition experience concludes with a fun photo opportunity featuring a beautiful humpback whale.

The origin of whales extends back 50 million years, and their family tree includes dolphins, porpoises, beaked whales, and more. Visitors will be surprised to discover that whales greatly range in size, from the tiny Hector’s dolphin to the world’s largest animal, the blue whale. Although whales have an ancient history, the exhibition shows how scientists continue to make new discoveries about the animals’ streamlined bodies, remarkable feeding methods, and vast migrations through the Pacific Ocean.

The exhibition also traces the long-held connections between humans and whales, particularly for the Māori of New Zealand, whose tradition of “whale riding” was made world-famous by the *Whale Rider* film. See historic cultural objects—from impressive weapons made from large whale bones to delicate ornaments fashioned from whale teeth—and watch first-person interviews about the changing attitudes that have led people from hunting whales to protecting them.



Developed and presented by the Museum of New Zealand Te Papa Tongarewa. This exhibition was made possible through the support of the New Zealand Government (and the Smithsonian Institution).



MEMBERS TIPS

Whales: Giants of the Deep opens on Friday, October 10, in Phipps Gallery, Level 3. Admission is free for members. Please be prepared to present your membership card at the entrance to the exhibition.

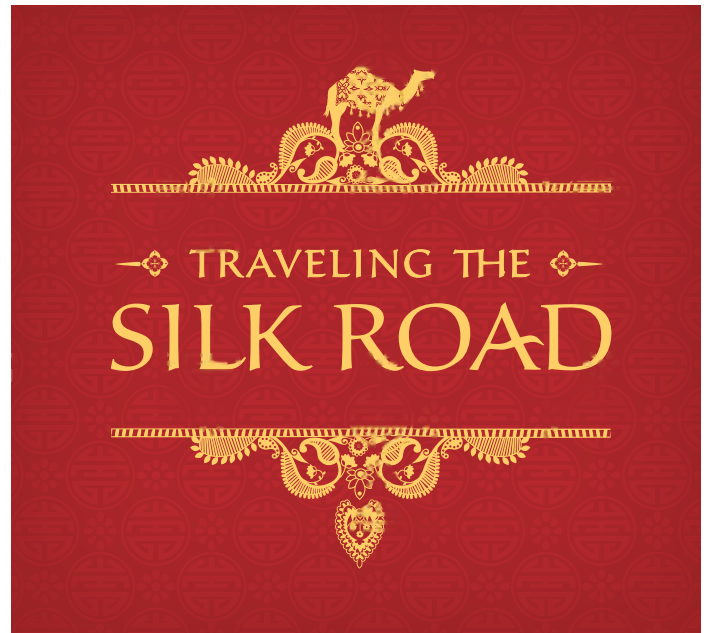
Traveling the Silk Road opens on Friday, November 21, in Anschutz Gallery, Level 3. Members receive a deep discount to this surcharged exhibition and a timed ticket is required. Tickets go on sale on Monday, October 13. Book your print-at-home tickets @ www.dmns.org and avoid a handling fee.

Reservations for *Silk Road* 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.

Weekday late afternoons and weekend early mornings tend to be less busy in these exhibitions. School groups generally visit during weekday mornings.

Complimentary guest tickets that came with your membership are valid for general Museum admission and may be used for entry into *Whales*. The passes may be upgraded for admission to *Silk Road*.

Find out more @ www.dmns.org/whales and www.dmns.org/silkroad.



OPENS FRIDAY, NOVEMBER 21 MEMBERS RECEIVE DISCOUNTS ON TICKETS!

Long before the Internet and overnight deliveries, the Silk Road connected humanity. Under vast starry skies and across some of the most treacherous landscapes, this legendary trade route stretched 5,700 miles from China through Central Asia to the Middle East and the Roman Empire. Along the way were the world’s most progressive cities, teeming with the lively exchange of exotic goods and new ideas. In the exhibition *Traveling the Silk Road*, you will take a journey accented by the spectacular sight of camel caravans, the pungent scent of spices, the luster of exquisite silks, and the energy of creative thinking. Immerse yourself in the ancient pathway that led to the modern world.

- Explore bazaars filled with gems and luxury goods.
- Watch live silkworms at work.
- See replicas of ancient scrolls filled with the secrets of technology and religious beliefs.
- Look inside a long-ago cargo ship.
- Examine astronomy tools that helped mariners navigate the seas.



Traveling the Silk Road is organized by the American Museum of Natural History, New York (www.amnh.org), in collaboration with the ArtScience Museum, Singapore; Azienda Speciale Palaexpo, Roma, Italy and Codice. Idee per la cultura srl, Torino, Italy; the National Museum of Australia, Canberra, Australia and Art Exhibitions Australia; and the National Museum of Natural Science, Taichung, Taiwan and United Daily News, Taipei, Taiwan.



TEENS SPEND THE SUMMER IMMERSSED IN SCIENCE

Most teens spend the summer swimming, seeing blockbuster movies, and going on family vacations. In addition to these activities, 19 teens spent their summer at the Museum splitting DNA, studying how ultraviolet light affects fragile pottery, and following the tracks of a prehistoric frog. Now in its seventh year, the Teen Science Scholars program continues to place high school students right in the middle of scientific discovery.

Teen Science Scholars is a research-focused internship—supported by a generous group of donors—that allows high school students to conduct real science in the Museum’s key scientific specialties: anthropology, geology, paleontology, health sciences, space sciences, and zoology. Since its inception in 2007, there have been 121 teen scholars, most of whom have gone on to pursue STEM-related educational opportunities and careers. The program continues to grow: this year, the Museum added conservation to the research tracks.



Each project is student-driven, which has been critical to the program's success. Scholars are given data, and in turn must formulate questions they work to answer over the course of the summer. Lyndsey Nold and Maggie Gelber—the first scholars to participate in conservation—studied the techniques used for preserving and repairing pottery. Lyndsey compared different adhesive methods used to repair clay and ceramic pottery, and found that low-fire techniques work just as well as high-fire techniques. Maggie studied different light variables and how they damage or fade specimens, including temperature level, physical radiation, ultraviolet radiation, and relative humidity. She found that rooms with smart glass and low light levels were ideal for preserving collections.

A future goal of the program is to create interdisciplinary research opportunities, allowing for more complex work for the teens as well as a chance for them to explore multiple science fields. Joshua Garcia, one of the health sciences scholars, pursued this line of thinking with his project. An anthropology buff, Joshua set out to study ancestral origins and their relation to bitter taste. Using data sets from African and Asian descents, Joshua found that the ability to detect bitter tastes did not vary significantly between the two groups. However, he developed the hypothesis that groups located at greater geographical distances from one another may have a more notable distinction.

Equally important to the scholars' scientific findings were the nonscientific discoveries they made during their experience. Both Lyndsey and Maggie thought they would be studying environmental conservation, but they discovered a realm of science they had no idea existed. Their research made them feel as though they were truly making a difference in preserving the Museum's treasures.

"I know that someday, someone will find value in our research and the work the Museum is doing to preserve different types of pottery," said Lyndsey. "I will be able to say 'Yes, I helped with that!'"

Colin Turner was a paleontologist for the summer. He researched and concluded that the Museum team had found fossilized frog tracks in the Kaiparowits Formation in southern Utah, the first discovery of frog tracks from this prehistoric period.

More than 150 applications were received for the 2014 program. The curators look for students who have the passion and ability to ask questions but also those who may be overlooked in a traditional academic setting and have the potential to gain the most from the program. This year's scholars exceeded expectations and made important contributions to their respective fields, said Dr. Nicole Garneau, curator of human health and director of the Teen Science Scholars.

Garneau said the self-confidence students develop is her favorite part of the program. "In high school, I didn't believe in myself, but I had teachers who made me believe," Garneau recalled. "This program is my way to give back, and also show teens that they can contribute to science not only for a few months during the summer but well into the future."

FIND IT @ DMNS.ORG

Applications for the 2015 class of Teen Science Scholars will be accepted early next year. The Museum is proud to partner with the Denver Film Society on various programs, including an endeavor between the Young Filmmakers Workshop and Teen Science Scholars. Collaborations with our SCFD partners enrich Museum experiences for our community. Find out more @ www.dmns.org/sciencescholars.

Facing page: Tyra Jordan at work in the health sciences lab; above, left: Colin Turner examines the tracks of a live frog to compare with fossilized frog tracks; above, right: Museum conservator Jude Southward (center) mentors Lyndsey Nold and Maggie Gelber on a pottery project.



ICE AGE ICON CELEBRATES HISTORIC SITE

Wading around in deep mud on a blustery, cold day does not sound like conditions that would inspire a generous gift to the Museum, however, this wasn't just any mud. When Peter and Cathy Dea visited the Ice Age site near Snowmass Village in 2010, they knew they were a part of something that nearly defied description.

"Hand digging for mastodon, bison, and sloth bones unearthed a passion within our family and guests who were at the site," said Peter Dea, past chair and current member of the Museum's Board of Trustees. "This real-life treasure hunt, where every other shovel full of red dirt revealed a mystery of the Ice Age, gripped us and truly epitomized the act of discovery."

Cathy Dea recalls being “in the right place at the right time” at the site when an enormous Ice Age bison (*Bison latifrons*) was revealed. “My life began to change before my own eyes as I gently scraped the layers of dirt from her with a bamboo scraper,” she said. “She spoke to me in a very loud spiritual way, saying you have found us, now you need to share me with the world.”

Within days after a bulldozer operator overturned some interesting looking bones at a construction site high in the Rockies on October 14, 2010, Museum scientists realized that something extraordinary had been uncovered. News of the discovery went global, and the effort was soon dubbed The Snowmastodon Project. Assisted by dozens of Museum staff and volunteers, such as the Deas, the scientists eventually pulled more than 6,000 bones from 50 different species, including the largest accumulation of American mastodons ever found. The specimens have been extensively studied and a major scientific paper about the project will be published this fall.

The Deas and their sons, Drake, Austin, and Cort Carpenter, all had a chance to work at the Ice Age site and wanted to share the power of their experience in a tangible way. Thanks to the Dea Family Foundation, a magnificent new bronze sculpture of an American mastodon (*Mammuth americanum*) will be permanently installed outside the Museum. Internationally acclaimed artist and conservationist Kent Ullberg sculpted the life-size replica, entitled *Snowmastodon*, which makes its public debut in October.

Creating *Snowmastodon* brings Ullberg’s relationship with the Museum full circle. The Swedish-born Ullberg was working at the Botswana National Museum in Africa in 1969 when he guided a field crew from our Museum during a collecting expedition. In 1972, Ullberg’s new Denver friends invited him to visit the Museum, and while here he sculpted animals for a couple of dioramas. Two years later, he moved to Denver and began supervising the development of Botswana Hall. He was one of the masterminds and the sculptor of the cheetah-impala diorama, a visitor favorite.

In 1976, Ullberg left the Museum to pursue his ultimate dream of becoming a bronze wildlife sculptor. Today, Ullberg’s work is widely collected, and his monumental sculptures are displayed in major cities around the globe. He resides in Texas but maintains a studio in Loveland, Colorado.

Ullberg worked on *Snowmastodon* for about two years. Ullberg examined actual Snowmass fossils and consulted with leading mastodon expert Dr. Daniel Fisher and Museum paleontologists Dr. Ian Miller and Dr. Kirk Johnson to develop a physiologically accurate mastodon. To Ullberg, art is about communication, so he pays particular attention to the animal’s facial expressions and how the sculpture is oriented. He decided to place the mastodon in a less aggressive stance because Ullberg wanted to convey his passion for nature through the mastodon.

Snowmastodon arrived at the Museum in late September. The behemoth was loaded onto Ullberg’s custom trailer and made its way down Interstate 25, going around overpasses to accommodate the sculpture’s massive size and protect it from damage. Ullberg said getting the piece into City Park was particularly challenging, given all the tight turns, trees, and power lines.

In its new home, *Snowmastodon* is sure to bring much pleasure to the millions of Museum and park visitors who will see and touch it each year. “We are thankful to the Museum for an incredible once-in-a-lifetime experience,” said Cathy Dea. “Hopefully the bronze mastodon will bring wonder to others as it looks toward the west to where it roamed thousands of years ago.”

SEE IT

Snowmastodon will officially be unveiled and dedicated on Thursday, October 23, at 10 a.m. This event is free and open to the public. This new Museum treasure’s permanent home will be at the northwest corner of the building, near the main entrance.



Facing page: *Snowmastodon* in its clay stage. This page, from top: Kent Ullberg (left) and Dr. Dan Fisher, mastodon expert, consult on details for the sculpture; Ullberg with the sculpture’s foam structure, which is covered with clay and used as the basis for creating the molds for the bronze casts; Art Castings of Colorado in Loveland assembling the sculpture, about 180 separate bronze pieces welded together, smoothed, and finished.



LEAVING A LEGACY: CHARITABLE GIFT ANNUITIES

Since 1900, the Denver Museum of Nature & Science has served Colorado and beyond by providing world-class science experiences for visitors of all ages. A charitable gift annuity offers you the opportunity to support the Museum in its mission to be a catalyst and ignite our community's passion for nature and science while providing fixed payments for life—regardless of interest rate fluctuation.

A charitable gift annuity establishes an agreement between you and the DMNS Foundation in which you agree to make a minimum gift of \$10,000 in cash, stock, or other assets to the foundation. In return, you (and one other individual, if you choose) receive a fixed, quarterly payment for the rest of your lifetime. Along with income payments, a charitable gift annuity may provide several tax advantages. After your lifetime, the remaining balance will continue to support the Museum and its mission.

For a personalized illustration showing how a gift annuity could work for you, please contact the manager of planned giving @ 303.370.8251 or marypat.rooney@dmns.org. Find out more @ www.dmns.org/give/individual-giving; click on Planned Giving.

CURRENT GIFT ANNUITY RATES

ONE LIFE		TWO LIVES	
AGE	RATE	AGE	RATE
70	5.1%	70–75	4.8%
75	5.8%	75–80	5.3%
80	6.8%	80–85	6.1%
85	7.8%	85–90	7.3%
90+	9.0%	90–95+	8.8%



GIVE BACK, KICK BACK, MAKE A BIG IMPACT!

Young Professional (YP) members are the next generation of leaders who are passionate about igniting our community's passion for nature and science.

YP members enjoy exclusive events throughout the year, including free tickets to the monthly Science Lounge—cocktails! mind-expanding science! entertainment!—and the popular Science on Tap party held each summer. YP members who join today may use their free event tickets to attend the After Dark Soiree on Friday, November 21.

Join or find out more @ www.dmns.org/YP. You can also find the YPs on Facebook and LinkedIn.



© Brandon Cole, SeaPics.com

GET A SNEAK PREVIEW OF WHALES: GIANTS OF THE DEEP

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 and receive an exclusive invitation to see Whales: Giants of the Deep before it opens to the public. Giving Club members at the Curator level (\$300) will receive two complimentary tickets to the Whales VIP Night on Thursday, October 9, to enjoy hors d'oeuvres, a cash bar, and an evening in this feature exhibition.

As a Giving Club member, there are many special opportunities that greatly enrich your Museum experience:

- Free “anytime” vouchers to all surcharged exhibitions, including Traveling the Silk Road, opening in November. 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.
- Invitations to popular annual events, such as IMAX Family Night and Behind-the-Scenes Night.

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.



TRAVELING THE

Silk Road

MUSEUM *after* DARK

11.21.14

Join us for the Museum’s annual fundraising gala on opening night of Traveling the Silk Road. Be transported to a golden age of oasis cities, night markets, camel caravans, and spice merchants as you enjoy cocktails, dinner, dancing, and a unique silent auction.

6:30–11:00 p.m.
Black-tie
Tickets start at \$300*

OR JOIN US LATER FOR THE

AFTER DARK SOIREE

The Museum’s Young Professionals host as you explore, sip, dance, and bid. Tickets include exhibition entry, live entertainment, two drinks, appetizers, and desserts.

9:30 p.m.–1:00 a.m.
Cocktail attire. Tickets are \$50.

Tickets and information
www.dmns.org/mad or
303.370.6000

**After Dark Soiree ticket included in price.*



IN THE BLINK OF AN EYE

By JOHN DEMBOSKI, PhD

One hundred years ago, a very lonely bird died in the Cincinnati Zoo, the last of her kind. Martha, a passenger pigeon, belonged to an incredibly prolific, nomadic, and social species that had just 50 years earlier darkened the skies in enormous flocks. With a population size suggested to be as high as 5 billion, passenger pigeons were the most numerous birds on the continent, representing upward of a quarter of all birds alive at the time in North America. An account by a naturalist in 1860 speaks of an unbroken torrent of birds a mile wide and possibly 300 miles in length taking several days to fly overhead.



These passenger pigeons were rescued from the auction block and donated to the Museum in 2011. This was likely a homemade display, a practice common in the late 19th century.

Passenger pigeons (*Ectopistes migratorius*) looked similar to the common mourning dove found in many backyards, but were larger (up to 18 inches long), with the males sporting an orangish breast. They were strong flyers with bodies adapted for speed (up to 60 mph) and traveling long distances. They inhabited the historically widespread, primal deciduous forests of eastern North America where their main roosting sites and food sources, beechnuts and acorns, were found. The migratory nature of passenger pigeons allowed them to fly great distances to take advantage of seasonally and locally abundant mast harvests.

The main culprit for the incredibly rapid demise of passenger pigeons during the late 1800s was over-harvesting combined with habitat loss throughout their range. Accounts of pigeon harvesting by Europeans settling North America begins in the early 1600s and continues right up to when the last wild passenger pigeon was killed in Illinois in 1901.

Pigeons were an important part of many settlers' diets but were also considered to be agricultural pests. Among the methods used to kill them were fire, chemicals, nets, poles, and firearms. As human technology and mobility improved, the fate of the passenger pigeon was sealed. The rail system moved people west, and great swaths of forest disappeared as land was cleared for settlement and agriculture. In addition, a 2014 genetic study examining museum specimens suggests the species was experiencing a natural population decline at about the same time the human threats were heightened.

The only places left now to see passenger pigeons are museums. Not surprisingly, given their ubiquity, passenger pigeons are quite common in museum collections. Our Museum has 43 specimens in the ornithology collection, including taxidermy mounts, study skins, an unusual desiccated carcass, and five egg sets. Some of our specimens have been subsampled to provide material to support a population genetics and genome project at the University of California at Santa Cruz.

The centennial of the passenger pigeon's demise has created a great deal of press attention about an effort to resurrect the species. This is known popularly as "de-extinction," an effort to bring back extinct animals using cutting-edge genomic techniques. Extinct Pleistocene animals such as mammoths and mastodons have been suggested as possibilities, but the passenger pigeon has become a top candidate.

The closest living relative of the passenger pigeon, the band-tailed pigeon, a bird found in Colorado, would provide additional genetic material to fill in holes in the passenger pigeon genome and could also serve as surrogate parents to bring the pigeon back to life. The project is not without controversy as it brings up a lot of philosophical and ethical issues around new technologies and their applications.

When Martha died of old age, at about 29 years, on September 1, 1914, she was placed on a block of ice and moved to her permanent home at the Smithsonian National Museum of Natural History, where she is on display for the 100th anniversary. With her death, the passenger pigeon joined the rapidly growing list of species that have disappeared or come very close to extinction over the last several hundred years.

SEE IT

Rare Birds Hall on Level 3 features a diorama with passenger pigeons from our collections. There is also a diorama with Carolina parakeets, another species that has vanished.

FIND IT @ DMNS.ORG

Dr. John Demboski is chair and curator of vertebrate zoology in the Zoology Department. Find out more about his research @ www.dmns.org/dembo-lab.

Author Joel Greenberg will present a lecture about his new book *A Feathered River Across the Sky: The Passenger Pigeon's Flight to Extinction* on Wednesday, November 5. Find out more @ www.dmns.org/afterhours.



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.



GET THE MOST FROM YOUR MEMBERSHIP!

- Read the monthly Members eNews that contains members-only news, tips, and special offers, such as discounts for sports and cultural events and goods and services. Not getting the eNews? Send your e-mail address to members@dmns.org.
- Take advantage of advance registration offers for members for exclusive access and discounts to our popular Summer Day Camps and special events, such as Meet Dr. Scott (see p. 9 in the insert).
- Visit other museums using your free admission to more than 330 science centers and museums worldwide, outside a 90-mile radius of Denver and your residence, through the ASTC Passport Program. Find out more @ www.astc.org/members/passlist.htm.
- Enjoy extra discounts during the annual Members Holiday Appreciation Weekend and Shop Sale. Mark your calendar now for December 5–7!
- Keep your membership current with Auto-Renew, an easy automatic renewal process. Enroll in Auto-Renew and get a free gift @ 303.370.6306 (daily, 9–5).
- Add a caregiver to your membership. The Add-on option allows members to add another person to their membership for just \$20. It's great for nannies, grandparents, and grandchildren! Add-on members must be enrolled by name in case they want to visit on their own.
- Upgrade to the Giving Club level and gain even more access and benefits, such as free "anytime" tickets to surcharged exhibitions, free tickets to IMAX and Planetarium shows, and invitations to exclusive events, such as the popular annual Behind-the-Scenes Night.

NO MORE WAITING IN LINE! USE PRINT-AT-HOME TICKETS

Save time at the Museum and use print-at-home tickets for surcharged exhibitions, IMAX and Planetarium shows, and lectures and programs. Print-at-home allows you to print your tickets as soon as you finish making your purchase online—with no handling fee! When you arrive, proceed directly to the Ticket Taker booth with your printed tickets and begin enjoying the Museum.

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 SUPPORT!

Your membership helps us provide outstanding science education programs, exhibitions, and research 364 days a year. Your dues are fully or partially tax-deductible, based on your membership level.

MEMBERS-ONLY EVENTS

WHALES GIANTS OF THE DEEP

Reservations now open.

MEMBERS-ONLY PREVIEW DAY

Thursday, October 9 • 9 a.m.–5 p.m.

Entry by reserved timed ticket. Admission to Whales is free for members.

MEMBERS-ONLY AFTER-HOURS PREMIERE

Wednesday, October 15 • 6–9 p.m.

Entry by reserved timed ticket. Optional prepurchased dinner available, 6–8 p.m. \$10 adult/junior/senior member, \$7 child member (ages 3–12); dinner reservations due by October 7.

AFTER-HOURS ADULT PREMIERE (AGES 21+)

Thursday, October 30 • 6–9 p.m.

Enjoy a four-course meal and the exhibition. \$50 member, \$60 nonmember. Reservations due by October 22.

—❖ TRAVELING THE ❖— **SILK ROAD**

Reservations for these events
open on October 13.

MEMBERS-ONLY PREVIEW

Thursday, November 20 • 9 a.m.–5 p.m.

Entry by reserved timed ticket. \$7 adult member, \$6 senior member, \$4 child/junior member

MEMBERS-ONLY AFTER-HOURS PREMIERE

Wednesday, December 3 • 6–9 p.m.

Entry by reserved timed ticket. \$7 adult member, \$6 senior member, \$4 child/junior member. Optional prepurchased dinner available, 6–8 p.m. \$10 adult/junior/senior member, \$7 child member (ages 3–12); dinner reservations due by November 25.

AFTER-HOURS ADULT PREMIERE (AGES 21+)

Tuesday, December 9 • 6–9 p.m.

Enjoy a four-course meal and the exhibition. \$50 member, \$60 nonmember. Reservations due by December 1.

ADVANCE RESERVATIONS REQUIRED FOR ALL EVENTS

Call 303.370.6306 daily, 9–5, or reserve online at www.dmns.org/memberevents.

Walkup tickets will not be available. We regret that nonmember guests cannot be accommodated on 10/9, 10/15, 11/20, and 12/3.
See full menus @ www.dmns.org/memberevents.