

# ROTUNDA

 AMERICAN MUSEUM OF NATURAL HISTORY

Member Magazine  
Fall 2012 Vol. 37 No. 4

FARMING  
IN THE CITY

THE  
SCIENCE  
*of*  
FLAVOR

**Our Global Kitchen:  
Food, Nature, Culture  
Opens Nov. 17**

**THEODORE ROOSEVELT MEMORIAL  
AND HALL OF NORTH AMERICAN MAMMALS  
REOPENING THIS FALL**



# From the President

Ellen V. Futter



As the Museum continues to expand its reach globally through traveling exhibitions and digital outreach, it remains rooted in its magnificent campus in Manhattan—home to our scientists, educators, and galleries and a destination for millions who visit each year. This fall, we celebrate the power of our “home base” as we unveil the Museum’s Central Park West entrance following a comprehensive three-year restoration.

The Central Park West building is New York State’s memorial to Theodore Roosevelt, a longtime friend and champion of the Museum. Long before he was President, TR was a boy whose father helped found the Museum. And Roosevelt’s ongoing relationship with Museum scientists such as ornithologist Frank Chapman helped seed the American conservation movement.

This fall, visitors will be greeted by a majestically restored façade and plaza. Once inside, the

Roosevelt Rotunda provides a gathering spot that is both thrilling and comfortable, highlighted by the restored William Andrew Mackay murals depicting major events in TR’s life and offering new traffic patterns and vistas enabled by the “split” in the mount of the iconic *Barosaurus* exhibit.

The Theodore Roosevelt Memorial Hall directly below the Rotunda now offers a refreshed presentation on the life and legacy of our Conservation President and a gateway to the painstakingly restored Hall of North American Mammals and its historic habitat dioramas, widely considered the finest in the world.

Having reimagined the north side with the Rose Center in 2000 and elegantly restored the historic 77th Street façade to the south in 2009, the Museum now celebrates a restored east side with a grand public reopening on October 27. We hope you will join us!

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## ROTUNDA

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*Director of Membership* Louise Adler

**Magazine**  
*Editor* Eugenia V. Levenson  
*Contributors* Laura Allen, Whitney Barlow, Joan Kelly Bernard, Jill Hamilton, Elena Sansalone  
*Design* Hinterland

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# New and Improved AMNH.org



The new home page of AMNH.org features a modern and streamlined visual design.

Whether you’re looking to find a program for yourself or your family, explore the Museum’s world-class collections, go behind the scenes at an upcoming exhibition, or hear from curators about their field of expertise, you’ll find these and much more on the new [amnh.org](http://amnh.org).

Members who checked the Museum’s website this summer have already noticed an elegant new design and found several features that improve navigation and offer a better browsing experience to help visitors discover a variety of rich content from the Museum. The first stop for Members: the new **Join & Support** section, with helpful resources that include frequently asked questions about benefits, listings of upcoming Members-only programs, and digital versions of this magazine.

The new website can also help guide you to a wealth of information about what you can do at the Museum today, tomorrow, or later this season. An enhanced **Plan Your Visit** section is a helpful starting point, with listings of current exhibitions and upcoming events, popular self-guided tours, and information on dining and shopping options. For Members interested in courses, workshops, and programs, a new **Learn & Teach** section provides a gateway to discovering

the extensive educational resources at the Museum, which can be easily filtered by age range to find specific offerings for learners of all ages and educators.

There are also several exciting ways to explore the Museum from home—or from anywhere with access to the web—in the aptly named **Explore** section. Browse Science Topics for a slate of in-depth, subject-specific collections of videos, articles, and activities about current topics in science and the Museum’s areas of research. Check out News and Blogs for updates about Museum research, highlights of upcoming events, interviews with scientists, and podcasts of recent programs and lectures. Click on Behind the Scenes to take a peek at the Museum’s collections, exhibitions, and some of the extraordinary things that happen in the course of a day at the Museum. And tune into AMNH.tv, a new video player that showcases recent Museum videos with channels featuring the latest Science Bulletins, a series all about dinosaurs, interviews with Museum curators, and more.

You can also learn about the important work being carried out by the 200 scientists across the Museum’s five scientific divisions and multiple research centers by visiting **Our Research** and even dive into the Museum’s collections through extensive online catalogs like the one maintained by the Division of Anthropology. A helpful **Calendar** highlights upcoming events, and the **Exhibitions** section offers a way to find out about special exhibitions currently at the Museum as well as learn more about favorite halls and iconic artifacts and specimens on permanent display, from the blue whale in the Milstein Hall of Ocean Life to the *Tyrannosaurus rex* and *Apatosaurus* in the fourth-floor Fossil Halls.

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TAUGHT BY THE BEST

As an adolescent in 1871, Roosevelt had his first lessons in preserving and mounting animals and preparing bird skins. His teacher was the master taxidermist John G. Bell, who had accompanied wildlife artist John James Audubon during his travels on the Missouri River. The Snowy Owl specimen shows the level of Roosevelt’s skill: the owl is still in good condition after more than 135 years.

AN EARLY ROLE MODEL

As a child, Roosevelt was enthralled by the work of Charles Darwin and hoped to emulate his combination of far-flung fieldwork and detailed analysis of wildlife. After reading Darwin’s *On the Origin of Species by Means of Natural Selection*, Roosevelt drew whimsical diagrams of the evolution of family members. He pictured himself as evolving from a stork, and his brother Elliott from a bull.

BIRDS OF PREY

Snowy Owls (*Bubo scandiacus*) are large, spectacular birds usually found in the Arctic. In some winters, population crashes of Arctic lemmings—the owls’ major food source—cause the birds to head south to seek other small prey, typically in open fields and along shorelines in the northern U.S. Originally listed as the sole member of the genus *Nyctea*, Snowy Owls, DNA analysis reveals, are related to the Great Horned Owl (*Bubo virginianus*) and are now included in the *Bubo* genus.

A BUDDING ORNITHOLOGIST

While at Harvard, Roosevelt kept live snakes, turtles, and lizards in addition to ornithology books and taxidermy tools. In 1877, with classmate Henry Davis Minot, he published a leaflet listing 97 bird species they identified in the Adirondacks. The following year, Roosevelt won the respect of many ornithologists at the Nuttall Ornithological Club when he challenged their benevolent views about the English or House Sparrow and argued that this interloper was threatening native bird species. He backed up his thesis with detailed observations from the field.

THE CONSERVATION PRESIDENT

By the time he left office in 1909, Roosevelt had designated 51 national bird reservations and four game preserves, which evolved into today’s system of national wildlife refuges. Along the way, he was instrumental in the creation of five national parks, the establishment or expansion of 150 national forests, and the designation of 18 national monuments.

Roosevelt’s Snowy Owl

In 1867, two years before this Museum was founded, eight-year-old wildlife enthusiast Theodore Roosevelt Jr. created his own Roosevelt Natural History Museum in his family’s home on East 20th Street in Manhattan. The collection included the skull of a seal acquired from a fishmonger, birds’ nests, insects, and mouse skeletons, and it soon expanded to include some 250 specimens—items Roosevelt later donated to the Museum and the Smithsonian Institution.

An avid student of the natural world, young Roosevelt spent long hours studying animal anatomy, behavior, and habitats, compiling notebooks and sketches of what he saw, and reading scientific texts. His special interest was birds. By the time he was in his teens, Roosevelt was able to identify most species in the northeastern U.S. by their song, flight pattern, courtship behavior, and plumage.

During summers on Long Island and family trips in the Hudson Valley, the Adirondacks, western Europe, and Egypt, Roosevelt collected hundreds of specimens. He collected and mounted this Snowy Owl near Oyster Bay in 1876, the same year he entered Harvard. Intent on becoming a naturalist, he was already gaining a reputation as a skilled amateur ornithologist.

By graduation, however, Roosevelt turned to politics; at age 23, he became the youngest man to be elected to the New York State Assembly. But his passion for natural history remained even as his career advanced. He kept in touch with a network of naturalists, including Frank M. Chapman, the Museum’s long-time curator of ornithology, whose concern for endangered birds Roosevelt shared. “I would like to see all harmless wild things, but especially birds, protected in every way,” he wrote to Chapman in 1899, as millions of birds were being routinely slaughtered to provide feathers for the ladies’ hat trade. When Roosevelt became president, Chapman appealed to him to protect Florida’s Pelican Island, home to spoonbills, herons, and egrets, whose plumes were especially prized. At Chapman’s urging, Roosevelt declared Pelican Island the nation’s first federal bird reservation in 1903.

In 1911, Roosevelt gave the mounted Snowy Owl to the Museum, and it was later exhibited in the Theodore Roosevelt Memorial Hall. It will return to public view when the renovated hall reopens on October 27.

Visit one of Theodore Roosevelt’s bird-watching sites on the November 3 Member trip to Oyster Bay. See p. 29 for details.



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GRAND  
REOPENING  
OCTOBER  
27<sup>TH</sup>

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A Landmark Law

In 1896, a Museum-led team began excavating ruins of an Ancestral Pueblo settlement in New Mexico’s Chaco Canyon. That work would yield tens of thousands of artifacts, including the jet frog pictured here, and generate one of the most intensely researched collections of its kind in the world. It would also inspire an act of Congress under which the site and others like it would be protected as national monuments.

The Antiquities Act of 1906, signed by President Theodore Roosevelt, addressed concerns about the plunder of ancient sites by vandals and relic hunters. This simple act ultimately brought more than 100 significant archaeological sites within the broader scope of the more general push for the conservation of the country’s natural resources for which Roosevelt is justly famous. Sidestepping a Congress under pressure from mining, lumber, and other special interests, Roosevelt made wide use of the law to declare 18 national monuments, including Chaco Canyon in 1907.

The Antiquities Act also outlined the terms under which permits would be granted for working within archaeological sites and directed that all materials gathered be permanently preserved in public museums. This was pivotal in a still-emerging field.

Prior to the passage of the law, standards for fieldwork and the disposition of archaeological finds were a hodge-podge and too often caught between the competing interests of purely scientific investigation and the pilfering of antiquities for profit. “The Antiquities Act professionalized archaeology,” says David Hurst Thomas, archaeologist and curator in the Division of Anthropology who is also curator of the newly renovated Theodore Roosevelt Memorial Hall. “It required that only professional and public institutions go in and that they be vetted.”

This frog’s story is telling. The roughly 1,000-year-old figurine, a symbol of water for Ancestral Pueblo people and their living descendants, was discovered in 1897 in Pueblo Bonito, one of the largest and most artifact-rich settlements at Chaco Canyon. The frog disappeared soon after and months later turned up at a trading post some 50 miles to the north. A local coordinator for the Museum bought it for \$50 and quietly returned it to the collection.

Ceramics and turquoise from Chaco Canyon will be on display in the Theodore Roosevelt Memorial Hall when it reopens October 27.

Rotunda / Fall 2012 / AMNH.org

NATIONAL TREASURES

The Antiquities Act of 1906 allowed the president to make national monuments of “historic landmarks, historic and prehistoric structures, and other objects of historic and scientific interest.” Roosevelt used it to safeguard cultural sites beyond Chaco Canyon, notably Montezuma Castle in Arizona and the Gila Cliff Dwellings in New Mexico.

A WIDER MANDATE

With its broad language, the law was also a perfect tool for preserving the country’s natural wonders, Roosevelt’s passion. In fact, his first use of the law was to declare Devils Tower, Wyoming, a national monument. This volcanic monolith is pictured in the mule deer diorama in the Museum’s Hall of North American Mammals.

POLYMATH PRESIDENT

While Roosevelt is best known as a student of wildlife, especially birds, his scientific curiosity extended to a range of fields. For example, historian Paul Russell Cutright observed that “Not since Thomas Jefferson had a President of the United States demonstrated an interest in fossils.” Roosevelt embraced archaeology as well. “Theodore Roosevelt understood that the broader sweep of natural history included human beings,” says Dr. Thomas.

LIVING CULTURES

Roosevelt also argued for nurturing living traditions as “an important constituent element in our national cultural development.” In 1913, he traveled to Navajo and Hopi reservations in Arizona, where he saw a Snake Dance and visited the celebrated Hopi potter Nampeyo. A bowl by Nampeyo, ceremonial dance wands, and Katsina rain-spirit dolls are on display in the renovated Theodore Roosevelt Memorial Hall.

MYSTERY SOURCE

The frog from the Chaco Canyon collection resembles species common to northwest New Mexico (*Anaxyrus woodhousii*, *Scaphiopus intermontanus*, and *Scaphiopus bombifrons*), but these animals lack the artifact’s color pattern, says Curator Darrel Frost, a herpetologist who maintains an online taxonomic catalog of the world’s living amphibians.

© AMNH/D. Finnin





# Calling all Senses

why Flavor Is Not  
Just a Matter of Taste

A few years ago, psychologist Charles Spence decided to test why potato chips taste so good.

In his experiment, participants were given a hearty sampling of 180 chips and asked to rate their staleness or crunchiness. They also chewed into a microphone while wearing headphones. Behind the scenes, researchers fed the sounds from the microphones, in real time, back to the headphones while varying the volume and frequency of the crunching. The correlation was strong: subjects who heard louder, higher-frequency sounds of chewing found the snacks crisper and fresher.

"Sound is the forgotten flavor sense," Spence says. "No one thinks of sound as affecting taste, yet it shapes it in so many ways."

Spence, who is based at Oxford University, is one of the researchers at the forefront of a relatively new field of study—multisensory flavor perception—that measures how all the senses shape our experience of flavor. The influence of culture and upbringing, not to mention genetics and age, on whether someone enjoys a specific food is widely acknowledged. For breakfast, an American might opt for a bowl of cornflakes or gulp down a bold cup of coffee—choices that would seem odd to a Russian raised on breakfasts of buckwheat in hot milk, or, in the case of coffee, too bitter to ultra-sensitive "hypertasters" and children. What is less well known and only beginning to be understood is that humans of all backgrounds experience food with far more than their tongues. It turns out that the sounds of what we are eating—along with the weight of the utensils we're using, the aroma of each part of the dish, the color of our meal, even the brightness of a room—don't merely contribute to the experience of eating; they fundamentally form it.

Before diving into this new science of flavor, it's important to note that "flavor" and "taste" are not interchangeable terms.

Taste is one of the five senses. Flavor, on the other hand, is the combined experience of taste and the other four senses—the brain's effort to integrate a rich set of pathways into one unified experience of what we're consuming.

"The flavor is not in the food," says Gordon Shepherd, a neurogastronomist at Yale University. "Flavor is created by our brains from the molecules that are in the food. It's very much like how we create color, not from color that's in the things we're seeing but rather from the wavelengths that are reflected by what we see. Our sense of flavor is so deeply embedded because our brains create this sense."

For decades, the study of flavor and taste concentrated on the tongue. The textbook "tongue map," which divided the organ into regions perceiving sweet, sour, bitter, and salty tastes, has been largely debunked by recent science. This erroneous diagram actually resulted from a mistranslation of German data into English. "Even though the basic foundation was incorrect, the allure of having a tongue map was so appetizing and seductive that it captured the imagination of the public," says Charles Zuker, a molecular geneticist at Columbia University.

What was wrong with the picture? For one, the original tongue map left out a crucial fifth taste—"umami," a Japanese word for savory (think meat or mushrooms). And while certain regions of the tongue may be slightly more sensitive to bitter foods than others, it turns out that no part of the tongue holds a monopoly on any one taste. It's the individual taste receptors, which are distributed across the tongue, that are wired to send a particular taste to the brain, as Dr. Zuker's research revealed. These receptors go far beyond the tongue, too, and have been found all the way down to the gut and even in the lungs.

In fact, a complete anatomical map of flavor should show



Our Global Kitchen:  
Food, Nature, Culture  
Opens Saturday, November 17

Celebrate cultures and cooking, historic meals and markets, and moments in our lives that we mark with food—as well as the ingredients that we have discovered and shaped over the course of thousands of years. As this exhibition takes visitors on a journey of growing, transporting, cooking, eating, and celebrating food, it also examines contemporary issues of environmental and human health, food security, and feeding the world’s growing population today and tomorrow.

*This exhibition is curated by Eleanor Sterling, director of the Museum’s Center for Biodiversity and Conservation, and Mark Norell, chair of the Division of Paleontology.*

Our Global Kitchen: Food, Nature, Culture was organized by the American Museum of Natural History, New York ([amnh.org](http://amnh.org)).

The exclusive corporate sponsor for Our Global Kitchen is J.P.Morgan.

The Tools of Taste

Scientists use a number of tools to study human flavor perception:

**Brain Scans**  
Neuroimaging technologies such as fMRIs allow researchers to visualize what happens in the brain during food consumption by mapping brain activity in real time.

**Olfactometers and Gustometers**  
These devices deliver precisely measured pulses of aromas and tastes, respectively, to subjects in the lab. In some studies, these tools are used along with fMRI machines to see how these bursts of smells and flavors register in a subject’s brain.

**A Box of Chocolates**  
Sometimes, even the most scientific flavor studies require a few old-fashioned treats. Dana Small at Yale University, for instance, used chocolate in fMRI studies to show that brain activity migrated to different regions of the brain when self-described sweet tooths were asked to eat squares of chocolate to the point of repulsion.

not only the tongue, but also the eyes, ears, nose, throat, and hands. The throat and nose are especially important in this process. To smell an orange or enjoy a symphony, we draw in odors or sounds. But flavor perception requires more than mere intake. “This is the least understood thing about flavor,” says Shepherd. “It’s only when we’re breathing out that we have flavor perception.” As we chew and swallow, we exhale small gusts of air. The smells from our food are pushed up and outward from the throat and travel through backdoor passages into our nose, where sensory receptors relay that information to the brain. This “retronasal olfaction” explains why smell dominates our experience of food, as anyone who has suffered through the flavor-dulling effects of a stuffy nose knows.

Less familiar is how touch, sight, and even sound make up the flavor experience. New research shows that as far as food goes, we’re all synesthetes, experiencing multiple sensations that shape our perceptions. As Spence’s potato-chip experiment demonstrated, sound matters more than we suspect. And it’s not just the sound of food being chewed and swallowed: crinklier-sounding snack packaging, for instance, can also make chips taste crunchier. “It’s like Pavlov’s dog,” says Spence, referring to the famous conditioning experiments in which dogs learned to salivate at the ring of a bell that preceded food. “We anticipate the crunch of the crisp while hearing the rattling of the package in the way a dog salivates at the arbitrary sound of a dinner bell.” Even non-food sounds have been shown to influence our consumption: for instance, one study demonstrated that playing French accordion music in a grocery store prompted shoppers to choose French over German beer. (The reverse happened when German Bierkeller music blared over the store’s speakers.)

It’s not surprising, then, that people selling food are very interested in this research’s application. Restaurateurs are paying more attention to how sound environments affect the dining experience, which goes far beyond creating a mood with background music. Recent studies have found strong associations between certain flavors and specific sounds or instruments. For example, people



MEMBER PREVIEW  
WEDNESDAY, NOVEMBER 14,  
4 TO 9 PM

Be among the first to view **OUR GLOBAL KITCHEN: FOOD, NATURE, CULTURE**, which takes visitors on a journey of growing, transporting, cooking, tasting, and celebrating food and examines contemporary issues about the environment, human health, and how we will eat today and tomorrow. After touring the exhibition, join us for a glass of wine in the recently reopened Theodore Roosevelt Memorial Hall and the Hall of North American Mammals.

Please use the first-floor entrance under the main steps at the Central Park West entrance. Wheelchair and stroller access is available.

RSVP to the Membership Office at 212-769-5606 by November 10.

Multisensory Health

It would seem that as once-rare and biologically valuable sugars and fats became abundant in many countries, we would be fated to suffer the health consequences of over-consumption. But new research on how all five senses shape flavor offers hope for engineering healthier foods that taste just as good.

Recent studies have shown that red food coloring alone can make fruit drinks taste sweeter by toying with our expectations. The sound of potato chips crunching—are carrots next?—has been shown to enhance their perceived freshness. And as Charles Spence, a psychologist and expert on multisensory flavor perception at Oxford University, says, “You can make something taste fattier and creamier just by changing the smell.” Each sense, it seems, offers another opportunity for making the food we eat more desirable.

Could our awareness of these tricks nullify the effects? Spence says the answer is probably not. “Though you understand what’s happening in a ventriloquist act,” he explains, “you still experience it as if the doll were talking. Some illusions are immune to knowledge or willpower.” That’s true for many foods as well: the human brain is hard-wired to combine all our senses into flavor perception, even if we know it’s being tricked.

tend to associate sweet tastes with high-pitched piano music and bitter tastes such as caffeine with low-pitched and brassier sounds. “Once you know the synesthetic mappings,” says Spence, “then you can construct pieces of music that subliminally set up expectations about dishes without diners realizing it. We can change the taste by changing the music.” Spence, along with his colleagues at The Fat Duck restaurant’s research kitchen in England, recently published a study showing that ambiguous foods—those with traces of both bitter and sweet, for instance—can be manipulated with music to draw out one flavor over another.

This element of taste is being taken to sci-fi extremes. One of Spence’s recent ventures is to design sonic plates that could enrich diners’ sound and flavor experiences without weighing them down with headphones. It could be the extra kick needed for Swiss chef Denis Martin’s frozen gin and tonic. To make this concoction, Martin pours gin and tonic into a balloon, then rolls the balloon in liquid nitrogen, which freezes the cocktail into a hard sphere. After removing the rubber shell, he’s left with a hollow crystalline orb of gin and tonic that can be illuminated and cracked open to eat. But one thing’s missing: the sound of the carbonated tonic water, so central to enjoying this classic combination. A plate that makes fizzing sounds when raised could be the missing ingredient.

The visual presentation of food may be less exotic than musical plates, but its importance is just as powerful. Most consumers realize that food advertisers and magazines depend on expert stylists and photographers to make their fare look appealing. And with good neurological basis: when we see a delicious meal, the sight trips nerves that activate our salivary glands. But beyond making us hungry, the visual appearance of food also modulates our perception of the food’s flavor. For example, studies have shown that adjusting the color and brightness of room lighting has an effect on people’s flavor perception of wine and coffee. Wine tastes sweeter under red light and spicier and fruitier in blue or green. Coffee consumption, too, is increased under bright lighting—at least by those who take their coffee strong.

Much of vision’s effect on flavor perception has to do with expectation. The coloring of a fruit drink, for instance, may significantly alter its perceived sweetness or sourness. In some studies, participants ranked fruit drinks colored red to be sweeter by as much as 11 percent—a perception that may be linked to the fact that as most fruits ripen and redden, they sweeten. Color is also a crucial cue when it comes to flavor identification: in experiments, subjects have been easily fooled into thinking green-colored orange juice tasted like lime. “We often taste the flavor that we see,” says Spence. That’s part of what makes mystery flavors—such as Skittles Riddles, where each candy is “incorrectly” colored—so hard to pin down. Not only do we lack a word to associate with the taste, but the taste itself is often obscured in the “wrong” color.

Even texture, though it is the least understood and hardest to replicate in the lab, can change or enhance flavor. The feeling of food in our mouths is important, as is the texture of what we use to eat that food. A heavy bowl, for instance, has been shown in experiments to make participants perceive yogurt as more pleasant (and more expensive) than the same yogurt in lighter bowls. As with sound, smells, and sights, textures create moods and expectations, but all these senses do so much more. Each adds another variable to the sensory highway of food perception, allowing the brain to combine each input into a single, unified flavor experience. That’s why flavor is ultimately a product of the mind, not the mouth.

And eating is a sensory act unlike any other. “Sight involves photons, hearing involves vibrations, but not something coming into our bodies,” says Shepherd. “When we eat, we willfully take food into our bodies. And that means that from the very start, we’re extremely sensitive to what it is and whether it’s something we want.”

Even if that something’s a fizzing ball of gin and tonic. ☎

Our Global Kitchen, which opens on Saturday, November 17, is free for Members.



# GROW IT FROM THE ROOFTOPS

OUR GLOBAL KITCHEN EXPLORES THE VARIED  
WAYS PEOPLE GROW, MOVE, AND CONSUME  
FOOD ALL OVER THE WORLD. WE FOLLOWED AN  
INGREDIENT FROM FARM TO TABLE  
WITHOUT LEAVING NEW YORK CITY LIMITS.

## FARM

- ▲ In densely populated cities, land for growing food is scarce. In Hangzhou, China, high-rise residents cultivate fruits and vegetables on balconies. In Dakar, Senegal, many garden on rooftops. In New York City, commercial farm Brooklyn Grange grows on a 40,000-square-foot roof in Queens and a 65,000-square-foot roof in Brooklyn's Navy Yards using millions of pounds of special lightweight soil. Among the benefits of growing on a roof: lots of sunlight, fewer pests.

## MARKET

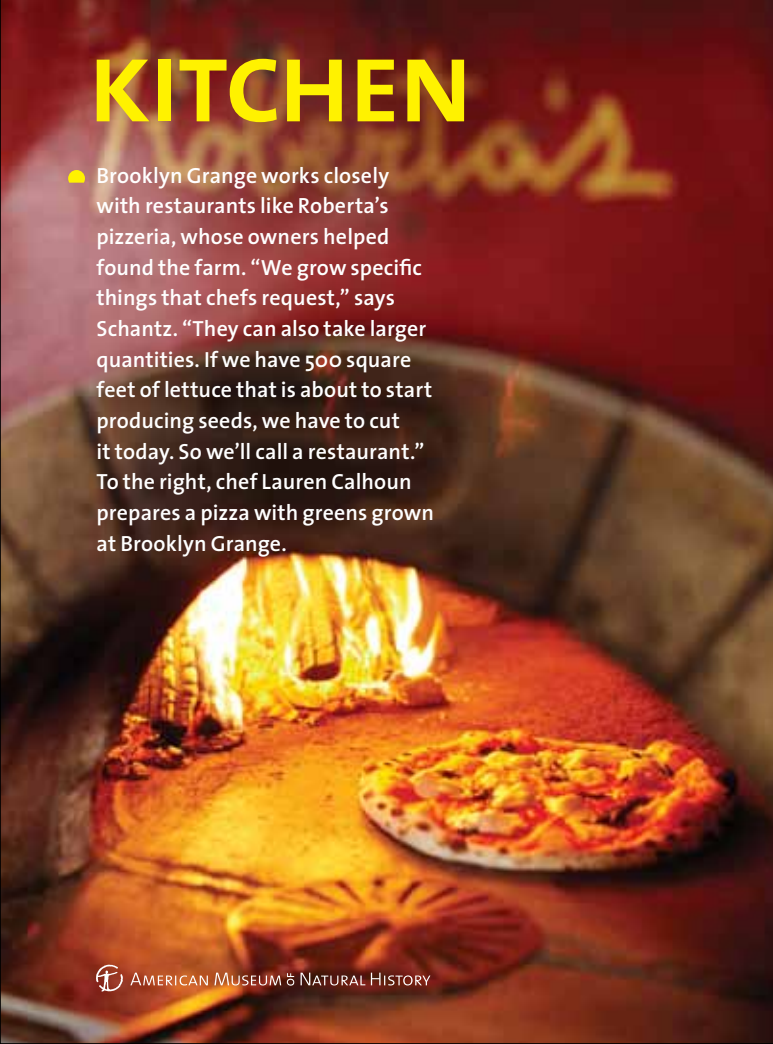
- ▲ Farms such as Brooklyn Grange are part of a regional system that provides fresh seasonal food to New York residents. "There are educated consumers in New York City who love local food and know about seasonal growing," says farm COO Gwen Schantz. "If they wait until July or August, their tomato is going to be superior." Limiting its delivery radius to about 5 miles helps the farm's bottom line and reduces greenhouse gas emissions.





# KITCHEN

● Brooklyn Grange works closely with restaurants like Roberta's pizzeria, whose owners helped found the farm. "We grow specific things that chefs request," says Schantz. "They can also take larger quantities. If we have 500 square feet of lettuce that is about to start producing seeds, we have to cut it today. So we'll call a restaurant." To the right, chef Lauren Calhoun prepares a pizza with greens grown at Brooklyn Grange.



# TABLE

● Chefs root for local ingredients, and increasingly, diners do too. In opening their Navy Yards farm earlier this year, Brooklyn Grange has more than doubled its acreage and its commitment to rooftop growing. With half of the world's population now living in cities, urban agriculture is taking off. Schantz thinks that New York is at a turning point. "Urban farming is becoming less of a hobby and more of a livelihood," she says.



© AMNH/Jason Wyche

**LEARN  
MORE**

.....  
About how food travels  
from farm to table in  
*Our Global Kitchen*





# LEADING

# *the* WAY

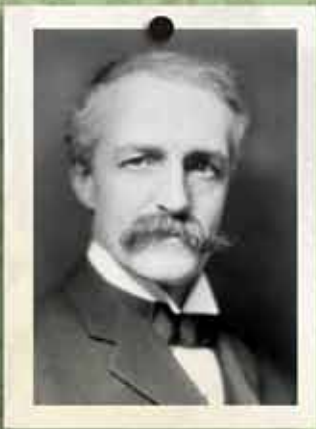
A LIFELONG PASSION FOR  
WILDLIFE AND WILDERNESS  
LED THEODORE ROOSEVELT  
TO CHAMPION CONSERVATION  
AS PRESIDENT.

As the only U.S. President to be born in New York City, Theodore Roosevelt may have seemed an unlikely candidate to become one of the nation's greatest defenders of wild lands. But by the end of his last term, Roosevelt had added five national parks; had enabled the commander-in-chief to protect areas of natural beauty, scientific, or historic value as national monuments; and had stood on the edge of Yellowstone's geysers and slept beneath the giant sequoias of Yosemite.

Ever since his childhood, Roosevelt had a sharp eye for natural history and a love for the outdoors. When he took office in 1901, he was poised to use his lifelong passion to direct public policy at a peculiar environmental moment. At the turn of the century, America was in the midst of a nature renaissance. The public appreciation for wildlife was escalating through the growing nature study movement, widespread reading of authors such as naturalist John Burroughs, and declining transportation costs—not to mention inventions such as the bicycle and binoculars—that facilitated amateur nature exploration. On the other hand, industrial America was encroaching on wild landscapes, species such as the Passenger Pigeon were disappearing en masse, and, in 1893, Frederick Jackson Turner had declared the frontier “closed.” At this juncture, a strong leader to direct the nation's attitudes toward wildlife was in high demand.



A CLOSE CIRCLE  
OF ADVISORS  
SHAPED  
THEODORE  
ROOSEVELT’S  
ATTITUDES  
TOWARD  
CONSERVATION.



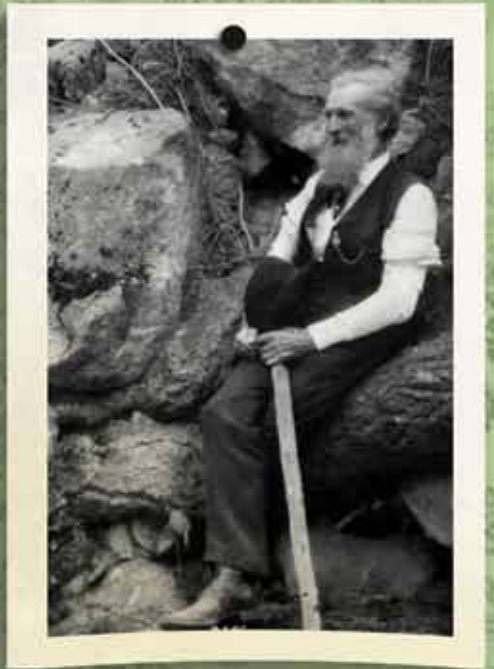
GIFFORD PINCHOT  
.....

As the first chief of the United States Forest Service and a founder of what is now the Yale School of Forestry and Environmental Studies, Gifford Pinchot would become one of Roosevelt’s top advisors on conservation issues during his presidency. Pinchot’s philosophy of wisely using natural resources laid the groundwork for the modern “sustainability” movement and greatly influenced Roosevelt’s policy. Throughout his two terms in office, Roosevelt created or enlarged 150 national forests.



FRANK CHAPMAN  
.....

Ornithologist Frank Chapman was a long-time curator at the Museum and helped shape Roosevelt’s views on protecting birds. Roosevelt once told Chapman in a letter now housed in the Museum Library that “the destruction of the wild pigeon and the Carolina paraquet [sic] has meant a loss as severe as if the Catskills or the Palisades were taken away.” Inspired by Chapman’s photographs of pelicans and moved by his plea to save Florida’s Pelican Island, Roosevelt made it America’s first federal bird reservation in 1903.



JOHN MUIR  
.....

A preacher of the wonders of wilderness, preservationist John Muir led Theodore Roosevelt on a famous camping tour of Yosemite in 1903. Roosevelt recalled a night sleeping under the sequoias: “It was like lying in a great solemn cathedral, far vaster and more beautiful than any built by the hand of man.” Soon after his return, Roosevelt began persuading Congress to add Mariposa Grove and Yosemite Valley to Yosemite National Park, a measure that would succeed in 1906.



JOHN BURROUGHS  
.....

Theodore Roosevelt formed a bond with the famous nature essayist John Burroughs, whom the President viewed as one of the greatest American nature writers of all time. So close was their relationship that Roosevelt called John Burroughs “Oom John,” Dutch for uncle. In 1903, Burroughs launched a crusade to safeguard writing from so-called “nature fakers” in a highly publicized literary controversy, and in 1907, Roosevelt publicly entered the still-raging debate by officially endorsing Burroughs. The John Burroughs Association has been headquartered at the Museum since Burroughs’s death in 1921.

Images of Burroughs, Chapman, Muir © AMNH; Pinchot, courtesy of the Library of Congress, LC-USZ62-103915

Image of Theodore Roosevelt on pages 14 and 18 courtesy of Houghton Library, Harvard University, Roosevelt 8560.51 1903-117

While Roosevelt’s executive power allowed him to translate his passion for nature into policy, he didn’t act alone. This was also a time when the leaders of politics and industry took famous excursions and kept personal correspondence with environmentalists and nature writers. Roosevelt “camped and tramped” through Yellowstone with naturalist John Burroughs, who was also a close friend of Henry Ford and Thomas Edison; kept a steady correspondence with Museum ornithologist Frank Chapman about the state of American birds; and spent several days exploring Yosemite with John Muir, founder of the Sierra Club. “I fairly fell in love with him,” Muir recounted after his famous 1903 camping trip with the President, who would go on to add all of Yosemite to Yosemite National Park.

Roosevelt’s cohorts taught him not only the art of preserving nature in its pristine state, but also that of conservation: sustainably using nature in a way that would keep it from running dry for future Americans. In Gifford Pinchot, the first Chief of the United States Forest Service, Roosevelt found a trusted guide on forestry policy and an advisor for developing wild lands without destroying them. As Roosevelt said of Pinchot in his autobiography, “[A]mong the many, many public officials who under my administration rendered literally invaluable service to the people of the United States, he, on the whole, stood first.” All of these alliances left a lasting impact on Roosevelt’s views of nature and how it might be protected. What was more, Roosevelt was the friend they needed in office to realize their dreams for saving the Yosemite Valley, the egrets, the Catskills, and the forests at a time when the future of such things was uncertain.

Part of Roosevelt’s love for nature and hope to preserve it also included hunting. While Roosevelt was not merely a man of his times, and often received sharp criticism from contemporaries for his hunting excursions, the President’s outdoor pursuits stemmed from his vast knowledge of the natural history of wildlife. “I have never been disturbed by the President’s hunting trips,” wrote John Burroughs. “It is to such men as he that the big game legitimately belongs—men who regard it from the point of view of the naturalist as well as from that of the sportsman, who are interested in its preservation, and who share with the world the delight they experience in the chase.” The Boone and Crockett Club, cofounded by Roosevelt, established a hunters’ code of ethics and was one of the first conservation groups to effectively protect wild game. Looking to the future, Roosevelt envisioned a new model for America’s pursuit of wild animals, partly inspired by the photographs of Frank Chapman. “More and more, as it becomes necessary to preserve the game, let us hope that the camera will largely supplant the rifle,” Roosevelt wrote in the introduction to A.G. Wallihan’s 1901 *Camera Shots at Big Game*.

Roosevelt’s contagious love for wildlife and wild places may be his most enduring legacy, living on through policy and legislation. While President, he designated five national parks, including Crater Lake National Park in Oregon, depicted in the marten diorama of the Hall of North American Mammals. And in 1906, Roosevelt signed the Antiquities Act, which allowed the president to designate national monuments—sites of scientific or cultural importance on federal lands—without waiting out the long, often contentious congressional haul of adding national parks. Today, scientists from the Museum’s Center for Biodiversity and Conservation are among those who build on Roosevelt’s work in their study of Palmyra Atoll, part of the Pacific Remote Islands Marine National Monument established in 2009 under the legislation Roosevelt signed into being. As scientists plumb the atoll’s relatively untouched coral walls and isles, they’ll research how to save ecosystems that Roosevelt never saw, but whose protection he surely would have championed. ①

Visit the Theodore Roosevelt Memorial Hall to learn more about Theodore Roosevelt’s life, his conservation efforts, and his enduring legacy.

Theodore Roosevelt Memorial  
Reopens October 27

On October 27, Theodore Roosevelt’s 154th birthday, the Museum will officially reopen the Theodore Roosevelt Memorial and the Hall of North American Mammals. The reopening launches a year of celebration of Theodore Roosevelt’s dedication to nature and his instrumental role in fostering the American conservation movement, both of which were inspired by his lifelong association with the Museum.

Designed by John Russell Pope and dedicated in 1936, the two-story Memorial—which includes the Central Park West entrance, the Theodore Roosevelt Rotunda, and the Theodore Roosevelt Memorial Hall on the first floor—serves as New York State’s official memorial to its 33rd Governor and the nation’s 26th President, a lasting tribute to Roosevelt’s powerful conservation legacy.

The Theodore Roosevelt Memorial Hall on the first floor will tell the story of Roosevelt’s life and passion for protecting wildlife and wilderness through never-before-seen objects from the Museum’s collections and interactive exhibits.

Sections of the exhibition profile Roosevelt the *Young Naturalist*, discovering his passion for the natural world and for science during his childhood and adolescence; Roosevelt as a *Firsthand Observer* of the near-extinction of bison during his adventures in the American West; Roosevelt as the *Conservation President*, the first to make environmental conservation a priority of his administration; and Roosevelt the *Lifelong Explorer*, whose passion for natural history and adventure continued long after he left office.

At the center of the hall, a life-size sculpture of Roosevelt seated on one of four benches around a large medallion invites visitors to take a moment to contemplate Roosevelt’s legacy and the urgency of conservation efforts today.

Restoration of the Theodore Roosevelt Memorial Rotunda, Memorial Hall, and exterior façade were made possible by

- The State of New York
- Empire State Development Corporation
- New York State Historic Preservation Office
- City of New York
- Council of the City of New York
- New York City Department of Cultural Affairs
- New York City Department of Parks and Recreation
- New York City Landmarks Preservation Commission
- New York City Department of Design and Construction
- New York City Public Design Commission





# THEODORE ROOSEVELT TOUR OF THE MUSEUM

## EXPLORE CONNECTIONS TO THE CONSERVATION PRESIDENT



The Theodore Roosevelt Memorial Hall reopens October 27. At its center is a bronze floor medallion quoting Roosevelt from a 1912 speech: "There can be no greater issue than that of conservation in this country."

THEODORE ROOSEVELT MEMORIAL HALL MEDALLION

From boyhood summers in the Adirondacks to years spent in the American West, Roosevelt treasured America's forests. "A grove of...sequoias should be kept just as we keep a great and beautiful cathedral," he once wrote.

HALL OF NORTH AMERICAN FORESTS GIANT SEQUOIA



"He probably knew tenfold more natural history than all the presidents who had preceded him," John Burroughs wrote of his friend and fellow nature writer Theodore Roosevelt. Since 1926, the John Burroughs Association, headquartered at the Museum, has awarded a medal for outstanding nature writing.

JOHN BURROUGHS CORRIDOR JOHN BURROUGHS MEDAL



HALL OF BIODIVERSITY ENDANGERED SPECIES CASE

In a letter to Museum ornithologist Frank Chapman in 1899, Theodore Roosevelt wrote, "When I hear of the destruction of species I feel just as if all the works of some great writer had perished."

HALL OF NORTH AMERICAN MAMMALS ALASKA BROWN BEAR

This hall exemplifies one of Theodore Roosevelt's greatest legacies: championing careful management of America's natural resources. "We are not building this country of ours for a day," he said. "It is to last through the ages."



SANFORD HALL OF NORTH AMERICAN BIRDS GREAT EGRET

Museum ornithologist Frank Chapman used habitat dioramas to call attention to the plight of threatened birds. He also urged Roosevelt to establish the first federal bird reserve, on Florida's Pelican Island, in 1903.



Explorer Carl Akeley, who conceived of this hall, met Roosevelt in Africa in 1909 and wrote that the ex-President "had the observing eye and keen mind of the ideal naturalist."

AKELEY HALL OF AFRICAN MAMMALS AFRICAN ELEPHANT GROUP



DOWNLOAD AMNH EXPLORER

For the iPhone or iPod touch for the full tour on October 27

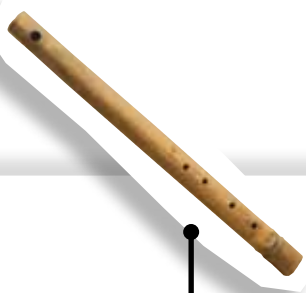
HALL OF NEW YORK CITY BIRDS PASSENGER PIGEON

Roosevelt, an avid bird watcher, may have been among the last to see a flock of Passenger Pigeons, in 1907 in Virginia. Once one of the most abundant birds in North America, the species was driven to extinction in the early 1900s.



HALL OF SOUTH AMERICAN PEOPLES PARESSÍ BAMBOO FLUTE

This hall includes artifacts from Roosevelt's arduous 1914 expedition down an uncharted tributary of the Amazon called the River of the Doubt. Today, the tributary is known as Rio Roosevelt.



THEODORE ROOSEVELT ROTUNDA ALLOSAURUS

Look closely around this hall, famous for its imposing mount of a *Barosaurus* protecting its young from an *Allosaurus*. Roosevelt's quotations, inscribed on the walls, highlight his skill as a writer and celebrate his passion for nature.







# NEW SCIENCE FOR A CLASSIC HALL

DECADES OF SCIENTIFIC DISCOVERY  
OFFER INSIGHTS INTO ICONIC SCENES



After more than a year of restoration work, the classic habitat dioramas in the Hall of North American Mammals, which reopens this fall, seem more vibrant and realistic than ever.

Based on meticulous field observations, they re-create real places and encounters with the natural world, from the Grand Canyon company of cougars to the icy peaks of Denali. But while the diorama scenes haven’t changed, decades of scientific research and discovery are offering new insights into the stories they tell.

In some instances, additional time in the field has given scientists fresh ways of understanding the hall’s iconic scenes, whose latest science stories are illuminated by new wall labels that accompany the dioramas. These include the drama unfolding in one of the largest dioramas. At first glance, it appears as if two male moose battle in an Alaskan peat bog during the fall rut while a female stands off to the side, waiting for a winner, her would-be mate.

New field research has revealed this scene isn’t so simple. “For many years, we thought females were quite passive in these encounters,” says Ross D.E. MacPhee, a curator in the Department of Mammalogy who served as the supervising scientist on the restoration. “But females may also exert a choice.”

The discovery appears in a study by a team of biologists who traveled by ski and foot to observe these giant mammals for over 500 hours in the Alaskan wilderness. They found that as smaller male moose tried to woo, females objected with a “protest moan” that could ignite male-male battles and tip the odds in the females’ reproductive favor. “The females will emit a low wailing sound, which garners the attention of other males in the vicinity,” explains MacPhee. “It’s a signal that she’s not satisfied with the suitors and that others may apply.” This type of indirect female choice, also found among elephant seals and pronghorns, is rarely documented in large mammals, where the focus traditionally has been on clashing males.

Scientific frameworks that have emerged since the hall first opened in 1942 also offer new lenses through which to consider the dioramas’ carefully recorded scenes. One major shift has been the rise of ecology: the view of habitats as interconnected, self-regulating systems. Naturalists including Charles Darwin had recognized closely woven relationships in nature for centuries, but ecology became a dominant paradigm for studying nature only in the mid-20th century.

This discipline adds another dimension to the Alaska brown bear diorama, in which two giant bears lumber toward a salmon after scaring off the original predator, an otter who scowls in disappointment. Ecology reveals yet another important salmon story in this scene. These bears and salmon sit at the helm of the hall much as they do in their native ecosystems. Together, they are commonly identified as “keystone species,” organisms that

have a disproportionately large effect on the surrounding habitat: take the top out, and like a stone archway, the whole thing falls apart.

On the West Coast, bears bolster the biomass of forests by consuming sockeye salmon that swim upriver each year. Salmon tissue is rich with nitrogen, which the fish bring from the ocean back to the freshwater rivers where they were born before spawning and dying. As bears scatter salmon carcasses and their own nutrient-rich scat through nearby forests, that nitrogen enters the soil and boosts trees’ growth. The more nitrogen in the tree leaves, the more those leaves enrich the streams they fall into, providing habitat for the next generation of salmon—and then the whole cycle starts anew.

While ecology offers another way to consider some of the scenes in the hall, changes wrought by the genetic revolution have been more radical. Alaska brown bears, DNA analyses confirm, are not a distinct species from grizzly bears, which are featured in the hall in a nearby diorama that shows a mother and cubs searching a log for grubs.

In one of the hall’s corridors, two wolves run through the midnight snow while two coyotes howl in the Yosemite sun just a few feet away. Both belong to the genus *Canis*, and new research is revealing that the adjacency of the dioramas is appropriate for another reason. Through sequencing the mitochondrial DNA of 686 coyotes, a team of scientists recently found that many coyotes in the eastern United States are actually part wolf.

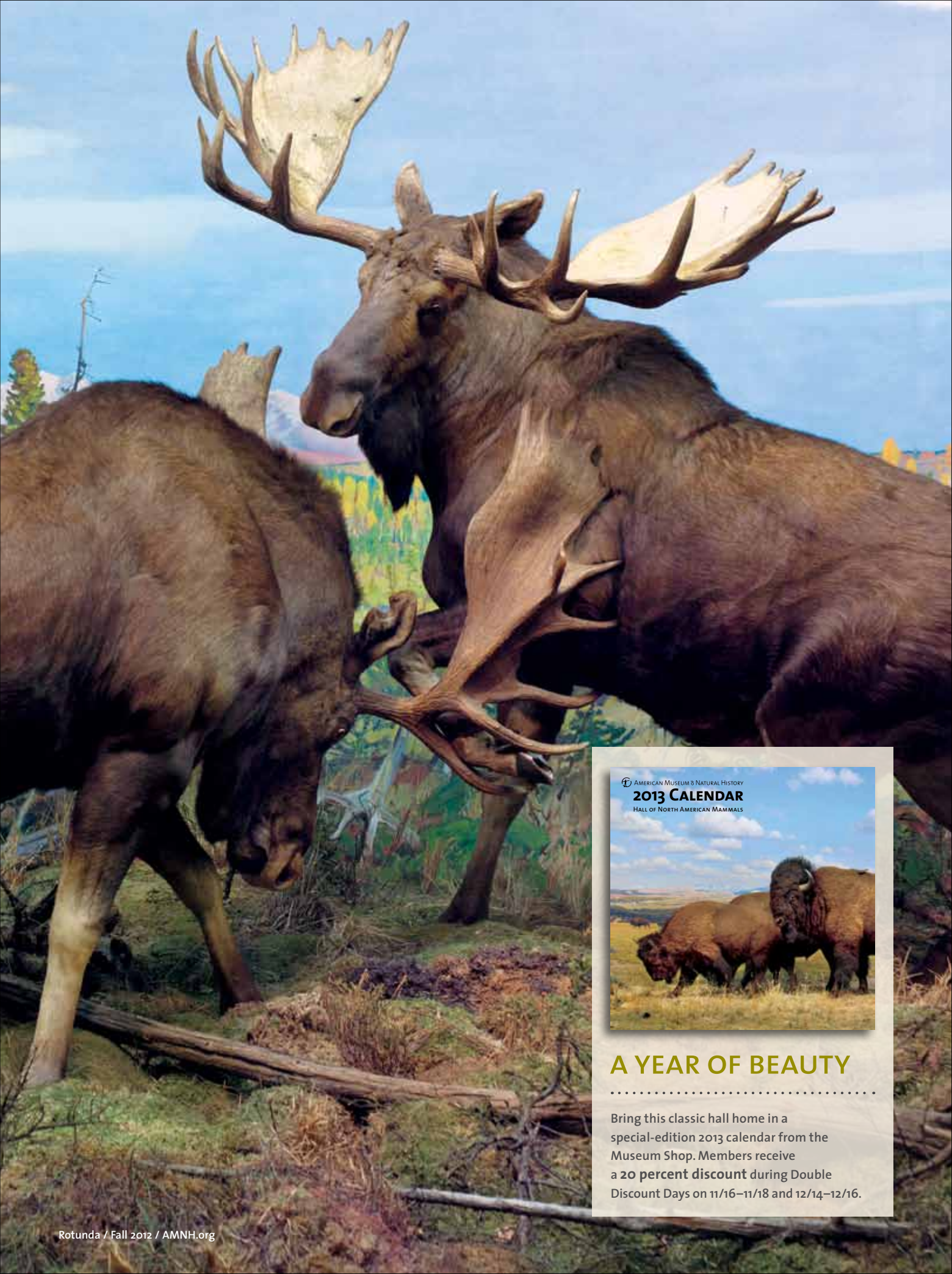
By tracing which genes in a given DNA sample belong to each wild canine, researchers were finally able to understand why northeastern coyotes are larger than those in the West. Nearly a century ago, coyotes mated with wolves in the Great Lakes region and produced fertile offspring. These hybrids, larger than coyotes but smaller than wolves, then migrated east through Canada. They could hunt deer and colonize more effectively than a second front of coyotes—all non-wolf—that arrived east via Ohio. “In the 1950s, researchers knew eastern coyotes looked different and thought they were hybrids, but there was no way to evaluate that by looking at skull measurements,” says Roland Kays, a professor at North Carolina State University who conducted the research and advised on the development of the hall’s new wall panels. “DNA sequencing allows us to show they were right.” (And, it shows that eastern coyotes are part domestic dog, too.)

DNA sequencing continues to challenge the notion of “species” as distinct units in nature, complicating the understanding of what a species really is. “The idea is a human-made concept that doesn’t necessarily fit the variation in nature,” says Kays. “The lines are not always black and white.”

Given how new observations and frameworks have enriched—and at times overturned—the understanding of these scenes since 1942, imagine what stories the dioramas will be telling 70 years from now. 🦌

The fully restored Hall of North American Mammals officially reopens on October 27.

Previous page © AMNH/D. Finnin; opposite page © AMNH/R. Mickens



## A YEAR OF BEAUTY

Bring this classic hall home in a special-edition 2013 calendar from the Museum Shop. Members receive a **20 percent discount** during Double Discount Days on 11/16–11/18 and 12/14–12/16.



# Footnotes to a Diorama

## Famous Landscapes

The background painting, by James Perry Wilson, depicts the famous granite El Capitan, which was formed by glaciers that carved Yosemite Valley and is a popular destination for rock climbers.

## Perfect Match

The colors of the background paintings served as a reference for conservators for several of the dioramas. The flowers of this azalea plant, for example, were cleaned and repainted to match those in the background.

## Call of the Wild

These coyotes, which were recolored during the restoration, howl and dig for burrowing animals.

## Tying it Together

One mark of a masterful diorama is a seamless tie-in, the spot where the vertical background painting meets the horizontal foreground. In this diorama, it's in the gravel stream bank.

*June Morning, Yosemite National Park, California*

New interpretive panels in the Hall of North American Mammals feature illustrations by artist Patricia Wynne. Here, we add a few fun facts.

## Historic Grounds

In 1903, John Muir and Theodore Roosevelt went on a camping trip that included a visit to Bridalveil Fall, which is depicted in this diorama's background painting. Roosevelt later successfully persuaded Congress to add Yosemite Valley, which includes Bridalveil Fall, to Yosemite National Park.

## Hidden Gem

A delicate hummingbird is anchored to this Western azalea plant by a wire connected to its beak.

## Hanging by a Hair

This California tortoiseshell butterfly is suspended by a thin human hair to give the appearance of flight. Fine human hair is less noticeable than a wire support.

## Rare Reprint

A damaged echo blue butterfly specimen was replaced with a scientifically accurate paper model, which was dusted with mica flakes for iridescence.



# Bloch's Remarkable Fishes

A monumental work, still studied today



The first in a four-part series, this excerpt from the forthcoming *Natural Histories: Extraordinary Rare Book Selections from the American Museum of Natural History Library* (Sterling Signature, October 2012) highlights an essential ichthyological text from the 18th century.

By Melanie L. J. Stiassny

The scientific study of fishes came rather late in life to the German physician-surgeon Marcus Elieser Bloch, yet from the age of 47, when he began his ichthyological studies, Bloch established himself as one of the founding fathers of the modern discipline. Publication of his magnificent *Allgemeine Naturgeschichte der Fische* (General Natural History of Fishes), a stunningly illustrated and scholarly compendium of all fishes known at that time, received universal recognition and established Bloch's place among the scientific elite of the European Enlightenment—a position of esteem he maintains to this day.

Bloch was born into very modest circumstances. His father was a respected but poorly paid Torah writer in the Jewish community of Ansbach, Germany. Bloch's secular schooling was minimal, and by the age of 19 he could not read or write, neither in German nor Latin. Through much hard work under the tutelage of a Hamburg surgeon, he gained sufficient linguistic and medical knowledge to study anatomy in Berlin. As a Jew he was barred from obtaining a doctorate there, so he moved to Frankfurt to continue his medical studies. It was not until the age of 42 that he received a license to practice as a physician in Berlin. There, he maintained a busy and apparently lucrative medical practice and published a number of influential medical papers.

Bloch married three times, and the considerable dowry of his second wife probably helped support his studies of natural history in addition to the amassing of a renowned cabinet of natural objects. (Most of the fishes in Bloch's famous collection—some 1,400 in all—are today housed in the Natural History Museum of Humboldt University in Berlin.) It seems that Bloch's interest in fishes was established after he observed that certain well-known German fishes were not included in the authoritative reference works of his day, such as those of Carl Linneaus and Peter Artedi. Bloch set about compiling a comprehensive guide to all fishes of the German states. Between 1782 and 1784, he published the three-



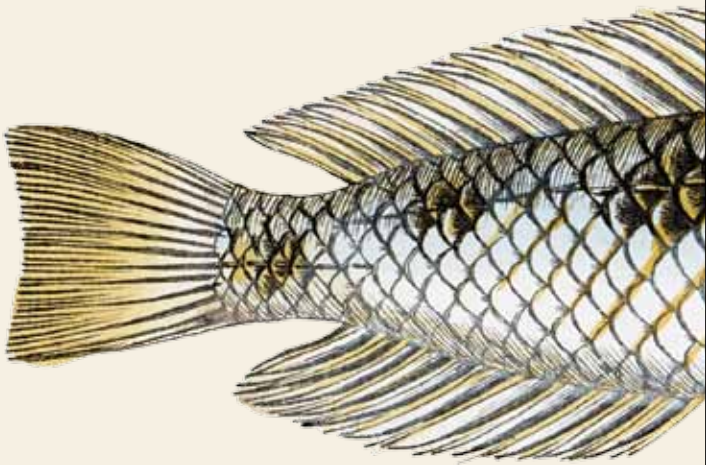
volume *Oeconomische Naturgeschichte der Fische Deutschlands*. Among the accompanying 108 large-scale, colored, copper plate engravings is a depiction of the gibel, a carp common in German waters but apparently unknown to any of his predecessors, and for which Bloch provided the first scientific description and the name *Cyprinus gibelio*. While our understanding of relationships as reflected in their generic assignment has changed since Bloch's day, and the fish that he described as *Cyprinus gibelio* is currently placed, along with the common goldfish, in the genus *Carassius*, his species description remains valid.

Bloch extended his studies with the ambitious goal of describing all known fishes. His growing recognition as a scientific authority, his wealth, and a network of collectors and colleagues overseas provided him with many specimens. Some were dignitaries of high rank including King Friedrich II of Prussia and notables such as Sir William Hamilton—English envoy to the court of Naples—but most were missionaries and surgeons working in the far-flung corners of European empires. The result, published between 1785 and 1795, was the *Naturgeschichte der ausländischen Fische* in nine volumes with 524 color plates. The combined *Oeconomische Naturgeschichte der Fische Deutschlands* and *Naturgeschichte der ausländischen Fische*—bound together in 12 volumes with 432 consecutively numbered color plates—have come to be known as Bloch's *Allgemeine Naturgeschichte der Fische*.

Fishes are notoriously difficult subjects to capture visually, and many of Bloch's illustrations not only are accurate depictions but also beautifully capture the sense of the animal in life. His spot-fin porcupinefish (*Diodon hystrix*) is accurately depicted in its inflated state, clearly displaying 20 or so spines between its snout and dorsal fin. This characteristic number of spines and some features of color pattern allow us to easily distinguish this species from a similar-looking relative, the balloonfish (*Diodon holocanthus*), which appears in the same waters. It is interesting to note that many of Bloch's original illustrations show an eye glint, indicating that each specimen was removed from its liquid preservative for examination and artistic rendering (underwater, no such glint is present). Accompanying most images is a diagrammatic cross section through the abdomen, thereby providing a sense of the three-dimensionality and disposition of body musculature in each species—suggesting that Bloch may have dissected many of the species he described in his opus.

It is surely a testament to the enduring importance of Bloch's work that centuries after he labored on it, contemporary ichthyologists are still actively engaged in studying it. As recently as 1987, one of my mentors at the British Museum of Natural History, Ethelwynn Trewavas, an authority on African fishes, was able to determine, based on Bloch's meticulous drawing and description of the fish *Labrus melagaster* from Suriname, that it was, in fact, the West African cichlid *Sarotherodon melanotheron*. Apparently, Bloch often omitted locality information from his growing handwritten catalog of specimens and relied on memory to fill in data in his publications. Given the tremendous scope of this monumental work, it is not at all surprising that a few mistakes have crept in here and there. Rather more surprising is the fact that so much of what he wrote remains valid to this day.

Melanie L. J. Stiassny is Herbert and Evelyn Axelrod Research Curator in the Division of Vertebrate Zoology.



## Rare Treat

Opening *Natural Histories: Extraordinary Rare Book Selections from the American Museum of Natural History Library* is like stepping inside a glorious curiosity cabinet with dozens of expert guides. This unique volume, edited by Tom Baione, the Harold Boeschstein Director of Library Services at the Museum, showcases spectacular holdings from the Rare Book Collection, with 40 essays by Museum curators, scientists, librarians, and other specialists that describe the unique features and enduring values of these works. There's more: each deluxe edition includes 40 prints, suitable for framing.

Members receive a 20 percent discount in the Museum Shop during Double Discount Days on 11/16–11/18 and 12/14–12/16.



Programs and Events

For more programs and to purchase tickets, visit [amnh.org/calendar](http://amnh.org/calendar).

For updates and reminders, sign up for monthly eNotes for Members by sending your membership number and request to [members@amnh.org](mailto:members@amnh.org). The Museum does not trade, rent, or sell this information.

**Tickets**

Tickets are available by phone at 212-769-5200, Monday–Friday, 9 am–5 pm, or by visiting [amnh.org](http://amnh.org). Please have your Membership number ready.

Availability may be limited. Please purchase tickets or make reservations in advance.

Please be aware that ticket sales are final for all Member programs. All programs go ahead rain or shine. There are no refunds unless the program is cancelled by the Museum.

OCTOBER

**SciCafe: The Whole-Life Catalog**  
**Wednesday, October 3 7 pm**  
Free with cash bar 21+ with ID  
Museum Provost of Science **Michael Novacek** discusses how we map the biosphere.

**Field Trip to the Moon**  
**Thursday, October 4 6–6:45 pm**  
Member tickets are **\$12.50** adults, **\$8** children  
Take a virtual trip to the Moon in the Hayden Planetarium.

**A Night at the Museum Sleepovers**  
**Friday, October 5**  
**Saturday, October 20**  
**Saturday, December 15**  
**\$119** for Members  
Break out your sleeping bags for an after-hours adventure.

**Behind the Scenes in Mammalogy: Bats, Rats, and Cats**  
**Thursday, October 11 6:30–7:30 pm** (family tour)  
**7–8 pm**  
**7:30–8:30 pm**  
**\$35**  
Explore the Museum’s extensive mammal collections of Chiroptera, Rodentia, and Felidae.

**Adventures in the Global Kitchen: Modernist Cuisine**  
**Thursday, October 11 6:30 pm**  
**\$30**  
Learn about science-inspired techniques with a co-author of cookbook *Modernist Cuisine*.

**Geology and History of Woodlawn Cemetery**  
**Saturday, October 13 10 am–Noon**  
**\$25**  
Join geologist **Sidney Horenstein** on a tour of Woodlawn Cemetery in the Bronx to learn about its 140-year history and the area’s geology.

**Family Astronomy: Creatures in the Sky**  
**Saturday, October 13 6 pm**  
**\$10** for Members  
Enjoy an evening of astronomy and stories inspired by the night sky.

**Spectacular Supernovae**  
**Monday, October 15 7:30 pm**  
Free (Reservations required; call 212-769-5200)  
Learn how various stars in the universe end their lives as supernovae with **Joanne Bibby** and **Graham Kanarek**.

**Birding in Green-Wood Cemetery**  
**Saturday, October 20 10 am–Noon**  
**\$25**  
Join Museum ornithologist **Paul Sweet** on a birding excursion to Brooklyn.

**Members-Only Highlights Tour**  
**Saturday, October 20 10:30 am–noon**  
Free (Registration required; call 212-769-5200)  
Join a tour of the Museum’s most popular displays.

Exhibitions

*Admission is by timed entry only.*

**Our Global Kitchen: Food, Nature, Culture**  
Opens **Saturday, November 17**  
Free for Members  
Celebrate culture and cooking, historic meals and markets, and the ingredients that we have discovered and shaped over the course of thousands of years.

**Creatures of Light: Nature’s Bioluminescence**  
Free for Members  
Discover an astonishing variety of bioluminescent organisms and explore the various ways they glow, the functions of bioluminescence, and how scientists study this remarkable phenomenon.

**The Butterfly Conservatory: Tropical Butterflies Alive in Winter**  
Opens **Saturday, October 6**  
Member tickets are **\$12.50** adults, **\$8** children  
This annual favorite returns with up to 500 live, free-flying tropical butterflies housed in a vivarium that approximates their natural habitat.

**Spiders Alive!**  
Closes **Sunday, December 2**  
Member tickets are **\$12.50** adults, **\$8** children  
This exhibition immerses visitors in the fascinating and complex world of spiders, among the most versatile animals on the planet. Featured species include the goliath bird eater, the black widow, and African whip spiders.

**Theodore Roosevelt Memorial Opening Day Celebration**  
**Saturday, October 27**  
Free  
Celebrate the official reopening of the Theodore Roosevelt Memorial and the Hall of North American Mammals with a day of special family-friendly activities and nature walks.

**Exploring Exoplanets with Emily Rice**  
**Tuesday, October 30**  
**\$13.50** for Members  
Journey among exoplanets and learn how scientists study them.

**Halloween Celebration**  
**Wednesday, October 31**  
**\$10** for Members  
Trick or treat in the Museum’s iconic halls.

**NOVEMBER**

**Creatures of Light After-Hours Tour**  
**Thursday, November 1 6:30–7:30 pm** (family tour)  
**7–8 pm**  
**7:30–8:30 pm**  
Free (Registration required; call 212-769-5200)  
Enjoy *Creatures of Light* at night in this after-hours tour.

**Members-Only Nature Trip to Oyster Bay**  
**Saturday, November 3 9 am–5 pm**  
**\$90** (Includes transportation by private coach)  
Museum ornithologist **Paul Sweet** will lead a Member nature excursion to Oyster Bay, one of Theodore Roosevelt’s bird-watching sites; tour the gardens and farm at Roosevelt’s home at Sagamore Hill; and visit the Theodore Roosevelt Sanctuary and Audubon Center.

**MESSENGER Update with Sean Solomon**  
**Monday, November 5 7:30 pm**  
Member price is **\$13.50**  
Learn about the MESSENGER spacecraft, which entered Mercury’s orbit in March 2011.

**SciCafe: How Plants Domesticated Humans**  
**Wednesday, November 7 7 pm**  
Free with cash bar 21+ with ID  
Hear from biological anthropologist **Fatimah Jackson**.

**Behind the Scenes in Paleontology**  
**Thursday, November 8 6:30–7:30 pm** (family tour)  
**7–8 pm**  
**7:30–8:30 pm**  
**\$35**  
Get an exclusive peek at fossils behind the scenes.

**Human Behavior and the Brain**  
**Five Thursdays, November 8, 15, 29 and December 6 and 13 6–8 pm**  
**\$240** for Members  
This five-part course examines how the brain, genes, and other factors influence how humans behave.

**Live Bat Encounter**  
**Saturday, November 10 11 am** (recommended for ages 5 and under)  
**1 pm**  
**2:30 pm**  
**\$10** for Members  
Join bat expert **Rob Mies** for a live bat presentation.

**Adventures in the Global Kitchen: Organic Wine**  
**Thursday, November 15 6:30 pm**  
**\$35**  
Sip wine with vintner **Barbara Shinn**.

**Double Discount Days**  
**Friday, November 16–Sunday, November 18** and **Friday, December 14–Sunday, December 16**  
Members receive 20 percent off regularly priced merchandise in Museum shops, including **amnhshop.com**.

**Members-Only Highlights Tour**  
**Sunday, November 18**  
**Sunday, December 16 10:30 am–Noon**  
Free (Registration required; call 212-769-5200)  
Join a tour of the Museum’s most popular displays.

**The Grand Tour of the Universe with Brian Abbott**  
**Tuesday, November 27**  
**\$13.50** for Members  
Travel from Earth to the most distant objects in the universe.



**36th Annual Margaret Mead Film Festival**  
**Thursday, November 29–Sunday, December 2**  
Member tickets are \$10 except for opening and closing nights  
Join us at the 36th annual Margaret Mead Film Festival for documentary filmmaking, animation, and archival work that illuminate the complexity and diversity of peoples and cultures around the world. For a full schedule, visit [amnh.org](http://amnh.org).

**DECEMBER**

**Holiday Party for Young Members**  
**Tuesday, December 4 6–8 pm**  
Free for Family Adventurer-level Members and above  
Enjoy family entertainment in the Fossil Halls and visit *Creatures of Light* before it closes.

**Behind the Scenes in Anthropology: Food**  
**Thursday, December 6 6:30–7:30 pm** (Family tour)  
**7 pm–8 pm**  
**7:30–8:30 pm**  
**\$35**  
See harvest costumes and more from the collection.

**Observe and Collect**  
**Saturday, December 8 \$12**  
Artist **Stephen C. Quinn** leads this family drawing course in the Hall of North American Mammals.

**Theodore Roosevelt Tour of the Museum**  
**Sunday, December 9 3–4:30 pm**  
Free for Members (Registration required; call 212-769-5606)  
Join a guide for a tour of the Museum that explores connections to the Conservation President.

**Black Holes and the Fate of the Universe**  
**Monday, December 17 7:30 pm**  
**\$13.50 for Members**  
**Gunther Hasinger** discusses black holes.

**Origami Fest**  
**Sunday, December 16**  
Members only  
**10:30 am–2 pm**  
**\$5**  
Fold, crease, and create an assortment of ornaments to ring in the holidays.

**Kwanzaa**  
**Saturday, December 29**  
Free for Members  
Experience the rich traditions of Kwanzaa with family-friendly activities and live performances.

**JANUARY**

**Walk on the Wild Side**  
**Wednesdays, January 2–March 27 8–9:30 am**  
Free for Adventurer-level Members and above (Registration required; call 212-769-5606)  
Follow trainers on early-morning fitness walks through the Museum before it opens to the public. Walks are followed by breakfast in the Akeley Hall of African Mammals.

*Program credits:*  
*The Presenting Sponsor of the Museum's cultural public programming is*  
**MetLife Foundation.**

*The Margaret Mead Film Festival is made possible by the New York State Council on the Arts with the support of Governor Andrew Cuomo and the New York State Legislature.*

*SciCafe is proudly sponsored by*  
*Judy and Josh Weston.*

*Human Health SciCafes are supported by the National Center for Research Resources and the Division of Program Coordination, Planning, and Strategic Initiatives of the National Institutes of Health through Grant Number R25 OD011093.*

*Hayden Planetarium Programs are proudly supported by*  
**Con Edison.**

*The Museum greatly acknowledges The Mortimer D. Sackler Foundation, Inc. for its support to establish the Sackler Brain Bench, part of the Museum's Sackler Educational Laboratory for Comparative Genomics and Human Origins, in the Spitzer Hall of Human Origins.*

*Journey to the Stars was produced by the American Museum of Natural History, the Rose Center for Earth and Space, and the Hayden Planetarium.*  
  
*Developed by the American Museum of Natural History, New York (amnh.org), in collaboration with the California Academy of Sciences, San Francisco; GOTO INC, Tokyo, Japan; Papalote • Museo del Niño, Mexico City, Mexico; and Smithsonian National Air and Space Museum, Washington, D.C.*

*Journey to the Stars was created by the American Museum of Natural History, with the major support and partnership of NASA, Science Mission Directorate, Heliophysics Division.*

*Made possible through the generous sponsorship of*  
**Lockheed Martin Corporation.**

*And proudly sponsored by* **Accenture.**

*Supercomputing resources provided by the Texas Advanced Computing Center (TACC) at The University of Texas at Austin, through the TeraGrid, a project of the National Science Foundation.*



1. Young visitor examines specimens displayed in the Grand Gallery on Identification Day on June 16.  
2. Members get the first look at *Spiders Alive!* during a Member preview on July 27.

3. In addition to about 20 species of live arachnids, *Spiders Alive!* features a climbable spider model.  
4. The live-animal exhibition *Spiders Alive!* opened on July 28.

**Save the Date!**  
**Upcoming Events at the Museum**

**OCTOBER**  
10/6 Mingle with free-flying tropical butterflies when *The Butterfly Conservatory* returns.

10/17 The annual **Family Party** features activities for children of all ages, including opportunities to interact with live animals and hear from Museum scientists. For ticket information, please call 212-313-7161.

10/27 The restored **Theodore Roosevelt Memorial Hall** and the **Hall of North American Mammals** reopen to the public.

10/31 Celebrate **Halloween at the Museum** as more than 30 halls open for trick-or-treating and live performances.

**NOVEMBER**  
11/14 Members will have a chance to see the new special exhibition *Our Global Kitchen* at an **exclusive preview**.

11/15 The dazzling **Museum Gala** helps support the Museum's scientific and educational work. For ticket information, call 212-769-5932.

11/16–11/18 Members receive 20 percent off Museum Shop purchases during **Double Discount Days**.

11/17 *Our Global Kitchen* opens to the public.

11/19 The delightfully decorated **Origami Holiday Tree** returns to ring in the festive season.

11/22 The Museum is closed on Thanksgiving.

11/29 The **Margaret Mead Film Festival** returns through December 2 with documentaries, discussions with filmmakers and film subjects, and more.

**DECEMBER**  
12/14–12/16 Members receive 20 percent off Museum Shop purchases during **Double Discount Days**.

12/25 The Museum is closed on Christmas Day.

12/29 A cultural festival commemorating the seven principles of **Kwanzaa** will include live performances, traditional crafts, and a bustling Kwanzaa Marketplace.

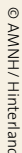


AMERICAN MUSEUM OF NATURAL HISTORY  
MEMBERSHIP

Central Park West at 79th Street  
New York, New York 10024-5192  
**amnh.org**



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## General Information

## HOURS

Museum: Open daily, 10 am–5:45 pm; closed on Thanksgiving and Christmas.

## ENTRANCES

During Museum hours, Members may enter at Central Park West at 79th Street (second floor), the Rose Center/81st Street, and through the subway (lower level).

## RESTAURANTS

Museum Food Court, Café on One, Starlight Café, and Café on 4 offer Members a 15% discount. Hours are subject to change.

## MUSEUM SHOPS

The Museum Shop, DinoStore, Shop for Earth and Space, Cosmic Shop, Our Global Kitchen Shop, Creatures of Light Shop, and Online Shop ([amnhshop.com](http://amnhshop.com)) offer Members a 10% discount.

## PHONE NUMBERS

Central Reservations 212-769-5200  
Membership Office 212-769-5606  
Museum Information 212-769-5100  
Development 212-769-5151

## TRANSPORTATION AND PARKING

Subway: **B** (weekdays) or **C** to 81st Street;  
**1** to 79th Street, walk east to Museum  
 Bus: M7, M10, M11, or M104 to 79th Street;  
 M79 to Central Park West  
 Parking Garage: Open daily, 8 am–11 pm;  
 enter from West 81st Street. Members can park  
 for a flat fee of \$10 if entering after 4 pm.  
 To receive this rate, show your membership card  
 or event ticket when exiting the garage.

Celebrate cultures and cooking, historic meals and markets, and ingredients that have been discovered and shaped over thousands of years in the new exhibition *Our Global Kitchen: Food, Nature, Culture*, which opens on November 17.