

ROTUNDA



AMERICAN MUSEUM OF NATURAL HISTORY

Members' Magazine
Summer 2011 Vol. 36 No. 3

SEARCH FOR THE SITE OF THE MOUNTAIN GORILLA DIORAMA

*SCIENCE,
ILLUSTRATED*

Stories
from
the
Museum's
Collections

From the President

Ellen V. Futter



At the Museum, summer means lots and lots of visitors, happy camp groups, and, for our scientists, a busy field season. Field research is at the heart of the Museum’s work, and each year our curators and scientists embark on about 120 field expeditions to locations around the world—with the great majority taking place during the summer months. From the Museum’s beginnings in the 19th century, fieldwork has been a key way the Museum has explored the world and amassed its invaluable collections of 32 million specimens and artifacts, providing the building blocks, both intellectually and materially, for research as well as for the Museum’s exhibition halls and educational programs. In this issue, we are pleased to highlight a unique expedition that took place late last year. During the 1920s, the great Carl Akeley conducted field expeditions on behalf of the Museum to create the extraordinary Akeley Hall of African

Mammals, which remains one of the most powerful natural history galleries in the world. Akeley died while on expedition in Africa and was buried at the site depicted in the mountain gorilla diorama. Stephen Quinn, senior project manager of Exhibition and himself a part of the Museum’s storied lineage of diorama artists, traveled to the eastern Congo basin to retrace Akeley’s steps, visit the site of his grave, and document, through painting and sketches, the area today, highlighting the role artists can play in conservation efforts. Perhaps this summer, you and your family can embark on an expedition of your own—whether that be an afternoon in the park, a day hike, or a longer journey—and document what you see in the natural world around you. And don’t forget to take a field trip to the Museum to see what’s on tap this season, including our exhibition *The World’s Largest Dinosaurs*.

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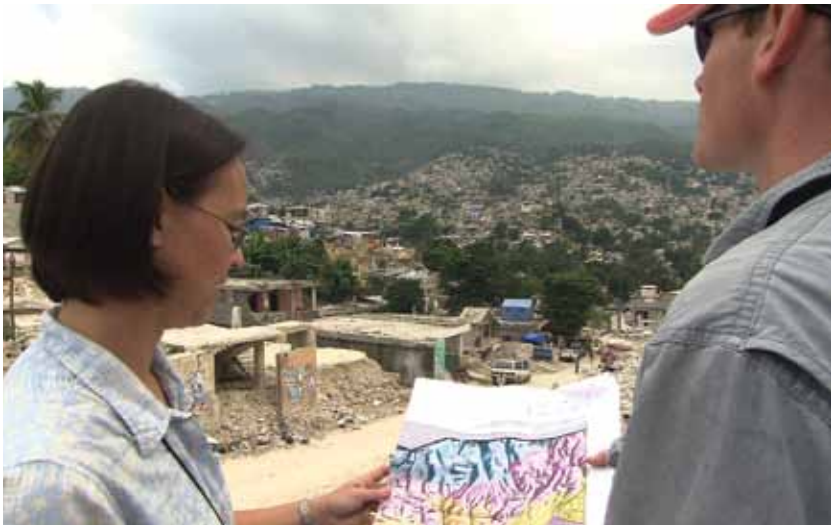
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Editor Eugenia V. Levenson
Contributors Laura Allen, Joan Kelly Bernard, Cynthia Franks, Tiffany Gibert, Mary Beth Griggs, Jill Hamilton, Kristin Phillips, Stephen C. Quinn, Joseph Rao, Elena Sansalone, Sandya Viswanathan, Michael Walker
Design Hinterland

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Science Bulletins Films in Post-Quake Haiti

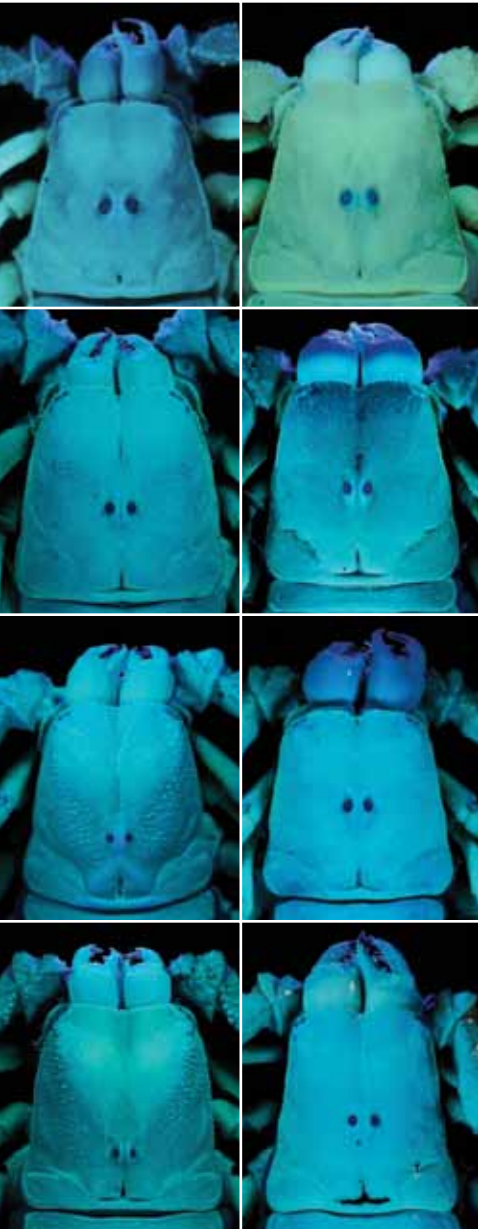
In the wake of the devastating earthquake that struck Haiti last year, a group of U.S. scientists flew to Port-au-Prince to complete the first technical survey of the city’s geology. A film crew from Science Bulletins, the Museum’s innovative online and exhibition program, joined them to document the fieldwork, producing an Earth Bulletin now on view in the David S. and Ruth L. Gottesman Hall of Planet Earth and at amnh.org. “The earthquake in Haiti was such a momentous event that we felt we had to talk about the science behind it,” says Edmond Mathez, curator in the Department of Earth and Planetary Sciences and the curator for Earth Bulletins. Hundreds of thousands of Haiti’s earthquake victims died in building collapses, but not simply because of poor construction or materials. A huge hurdle to mitigating seismic hazards in Haiti has been that builders worked without information about the area’s underlying rock. Different rock types will magnify the shaking of a quake to different degrees, so understanding the geologic composition of an earthquake zone is crucial to designing buildings that can compensate for those effects. But as of 2010, no modern geologic map of Port-au-Prince existed. With the city struggling with a cholera epidemic and bracing for a national election, November 2010 wasn’t the easiest time to travel to Port-au-Prince. But the scientific team organized by geophysicist Eric Calais of Purdue University, who was appointed to the task by the United Nations, was committed to finishing their survey before reconstruction began. The researchers fanned out across the city with maps and local engineers, seeking areas where destruction had exposed the earth beneath the urban concrete. Using sledgehammers and basic vibration sensors, they measured how much the ground amplified force. Weeks of work resulted in a map that can be used to develop building codes and other guidelines for safer construction. On January 12, 2011, the one-year anniversary of the quake, scientists handed over the updated map to Haitian authorities.

To learn more about the fieldwork behind this historic project, view this Earth Bulletin in the Gottesman Hall of Planet Earth or online at amnh.org.



Understanding geologic composition is key to designing safer buildings in Haiti’s Port-au-Prince.

Now on View: Picturing Science



Museum scientists use a range of sophisticated optical tools in their research. For example, Lorenzo Prendini, associate curator in the Division of Invertebrate Zoology, uses ultraviolet fluorescence imaging to identify differences among *Opisthophthalmus* scorpion species, eight of which are pictured above. These intriguing images are among more than 20 sets featured in *Picturing Science: Museum Scientists and Imaging Technologies*, curated by Curator Mark Siddall, Division of Invertebrate Zoology. The exhibition is now on view in the Akeley Gallery on the second floor.

Scorpions image © AMNH/L. Prendini and S. Thurston

Photo 5 © AMNH/J. Beckett; photo 6 © MGVH/M. Feltner; illustration 10 D. Grimaldi; photo 21 © AMNH/R. Mickens

HANDS-ON EXPERIENCE

Visitors to *The World's Largest Dinosaurs* can touch actual fragments of a fossil dinosaur egg laid by a titanosaur, possibly *Ampelosaurus*, about 65 million years ago. Eggs of this type were first discovered in 1859 near Aix-en-Provence, France. At the time, they were thought to have belonged to giant birds.

THE CARDINAL CLUTCH

Dinosaur eggs have a long history at the Museum. In 1923, Roy Chapman Andrews, future Museum director, led an expedition to Mongolia and China. In Mongolia, in the red sands of the Flaming Cliffs, a lab technician named George Olsen found fossils that made headlines around the world: the first well-documented clutches of fossil dinosaur eggs.

IN NAME ONLY

Andrews and the expedition's chief paleontologist, Walter Granger, concluded the eggs belonged to *Protoceratops* because the area was rich with skeletons of that primitive horned dinosaur. Atop one egg cluster, field crews also found a small carnivorous dinosaur they assumed had been killed while trying to get at the nest. They named it *Oviraptor*, which means "egg-robber"—a misnomer stemming from a mystery that would take 70 years to crack.

A CASE OF MISTAKEN IDENTITY

After a long hiatus, Museum scientists returned to the Gobi in 1990. In 1993, the team found a fossilized egg identical to those found by Andrews and Granger with one key exception: it contained the embryo of an oviraptorid. Here was direct evidence that the earlier clutches were not *Protoceratops* eggs. The *Oviraptor* found atop the 1923 cluster, far from trying to steal and eat the eggs, was likely brooding them.

MORE EVIDENCE

In 1994, Museum scientists made another striking find in Mongolia: the fossilized remains of an oviraptorid female with its arms wrapped around the perimeter of a nest of more than 20 eggs. This position, similar to a nesting chicken's, confirmed that some non-avian dinosaurs incubated their eggs like modern birds, which are, in fact, living dinosaurs. A cast of this specimen is on permanent view on the Museum's fourth floor.

Titanosaur Nest: Incredible Eggs

They are some of the rarest of rare artifacts: fossil dinosaur eggs with the embryo still inside. And they are prized for what they can tell paleontologists about the adults that laid them.

The exhibition *The World's Largest Dinosaurs* features a scale model of a nest found at Auca Mahuevo, Argentina, one of the largest known dinosaur nesting sites in the world. While it isn't always possible to figure out which dinosaur laid a particular egg, in this case, an embryo within an egg found at Auca Mahuevo site allowed scientists to identify these eggs as those of titanosaurs, a group of sauropods that included such species as *Ampelosaurus* and *Saltasaurus*. Herds of female titanosaurs are thought to have laid the thousands of eggs—15 to 40 at a time—in shallow nests dug out with their huge feet in dry mud and sand over miles of ground at Auca Mahuevo.

Titanosaurs are among the biggest sauropods, the group of saurischian dinosaurs featured in this exhibition. Titanosaur fossils have been found on every continent except Antarctica, and some of the biggest titanosaurs have been discovered in South America. These include the massive *Argentinosaurus*, which greets visitors at the entrance to the exhibition. In life, an adult *Argentinosaurus* could weigh up to 90 tons.

Size is a curious part of the story of dinosaur eggs. One might think such huge creatures would have equally super-sized eggs. But consider that the extinct elephant bird, which weighed about 880 lbs., had, on average, a 26-lb. egg compared to the average 9-lb. egg of the *Ampelosaurus*, which grew to about 7.7 tons. Also, there is a limit to the size any egg can be. Eggshell is very brittle, so the larger the egg, the thicker its shell must be to keep from shattering. However, the shell must also allow oxygen and water to get through to the embryo growing inside, and, above a certain size, the egg wouldn't be both suitably strong and porous. So although the sauropod young grew big very fast, they started out relatively tiny. The hatchlings of the 13-ton female *Mamenchisaurus* at the center of the exhibition, for example, would have weighed about as much as a small goose.

For more about *The World's Largest Dinosaurs*, visit amnh.org/wld.



A titanosaur hatchling emerges from its nest.

SEE IT NOW

Members receive free admission to *The World's Largest Dinosaurs*.

Photo © AMNH/D. Finnin



Catalog no. AMNH 35866

A Vanished Species: Thylacinus cynocephalus

Thylacinus cynocephalus goes by many common names: Tasmanian wolf, Tasmanian tiger, zebra dog, pouched wolf, and marsupial dog, among others. A quick look at the animal explains the confusion. Shaped like a dog, striped like a tiger or zebra, pouched like an opossum, and reputed to behave like a wolf, it became many different creatures in the popular imagination.

But the thylacine is, or was, a unique species. Now considered extinct, the thylacine was a carnivorous marsupial that lived in Tasmania and fed primarily on kangaroos, wallabies, small mammals, and birds. Nocturnal and shy, it was seldom seen by humans. Nonetheless, beginning in the 19th century, settlers believed the animals threatened their livestock and, spurred on by a bounty offered by the government, hunted them relentlessly. Despite numerous unconfirmed reports of sightings in recent decades, no definitive sightings have occurred since the 1930s.

To learn more about this vanished species and how it relates to other species, researchers study old eye-witness reports, films, photos, zoo archives, and other material. But the most reliable record for scientific investigation is preserved specimens: skins, bones, teeth, tissues preserved in alcohol, and mounted figures, all of which provide data and clues to physiology, behavior, and genetic makeup.

The Museum, which has one of the largest and most diverse collections of marsupial specimens in the world, has 12 thylacine specimens, one of which is featured in the Museum's exhibition *Extreme Mammals: The Biggest, Smallest, and Most Amazing Mammals of All Time*, now on view at the Canadian Museum of Nature in Ottawa.

All told, the Museum's marsupial collection includes some 17,000 specimens, including rare and extinct species like the thylacine. It is extraordinary in its size, breadth, and geographic coverage, and was assembled over more than a century by numerous expeditions to South and Central America, Australia, and New Guinea.

For more about the Mammalogy Collection, visit research.amnh.org.

Photo © AMNH/J. Beckett

THYLACINE BY THE NUMBERS

The thylacine was about 6 feet long including its long, stiff tail. It weighed up to 70 pounds, and had a tan coat with 13 to 21 dark stripes on its back. The female had a rear-facing pouch in which she nursed up to four young.

THE QUESTION OF RELATION

Despite the physical resemblances, the thylacine was not related to dogs or wolves but instead to Australian marsupial "mice," quolls, and the Tasmanian devil. The resemblance to the Canidae or dog family results from what is called convergent evolution, in which unrelated species that fill similar ecological niches in different places develop similar characteristics.

EXTINCT BUT NOT FORGOTTEN

In Tasmania, images of the thylacine are everywhere: on the national coat of arms, medal, and seal; engraved on rocks; on beer labels and road signs; and in newspapers, magazines, books, and cartoons. The last known animal died in Tasmania's Hobart Zoo in 1936, three years after the government decreed it a protected species.

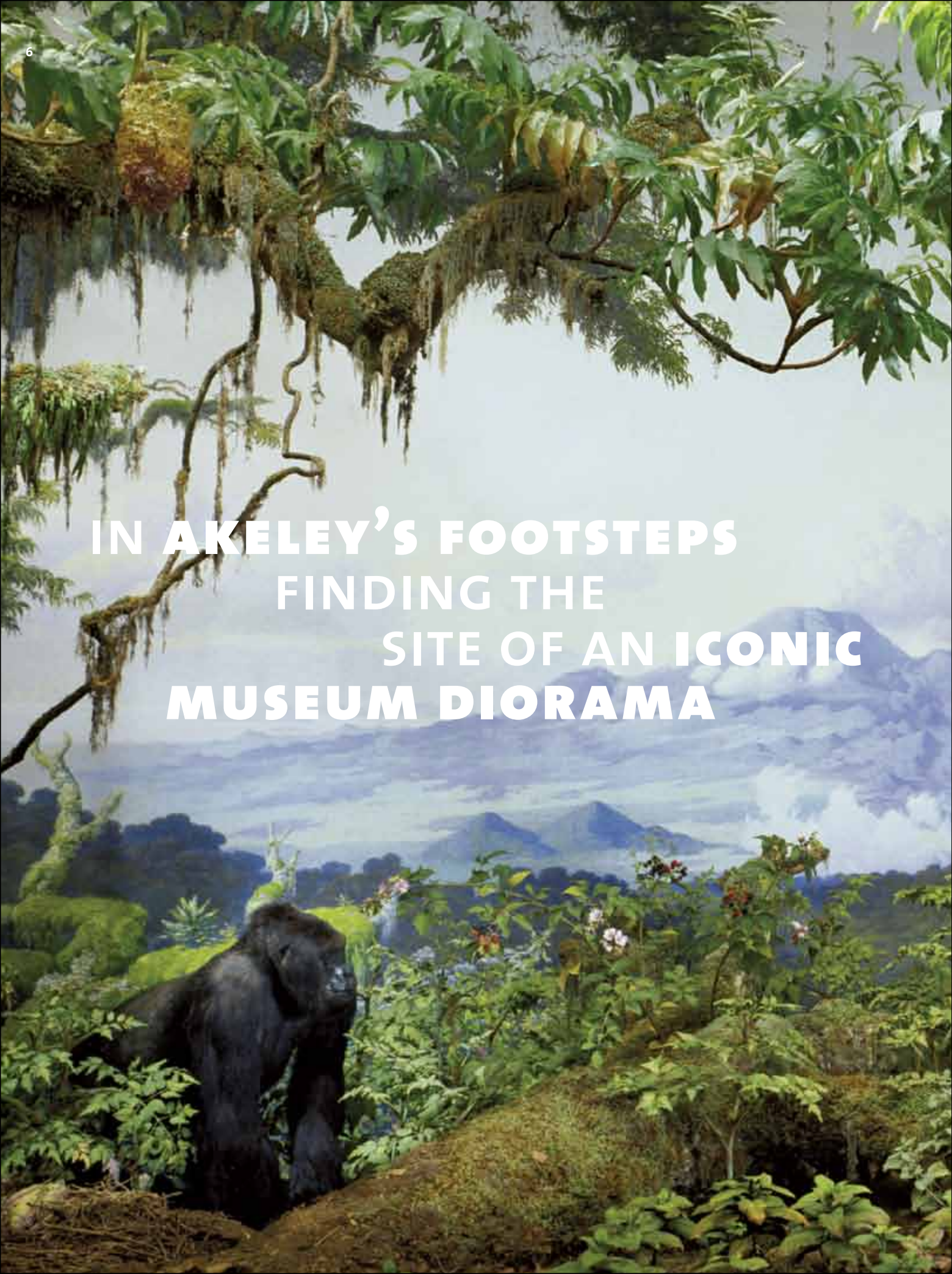
A RESOURCE FOR STUDYING MAMMALS

The Museum's Mammalogy Collection, founded in 1869 and now one of the largest in the world, includes some 278,000 specimens housed in six buildings and an off-site facility. It includes representatives of all taxonomic orders and specimens of almost 200 endangered species and 15 extinct species. This invaluable collection attracts about 170 visiting researchers annually and lends some 1,500 specimens to outside scientists each year.

MARSUPIAL SPECIMENS ON THE MOVE

The Mammalogy Department is currently involved in a three-year project funded by the National Science Foundation (NSF) to re-house its marsupial collection and to update the database. Cleaning and re-installing the specimens and upgrading the database will improve maintenance, reduce crowding, and enhance access to the collection. The department recently completed a similar effort, also funded by the NSF, to re-house its extensive bat collection.

**IN AKELEY'S FOOTSTEPS
FINDING THE
SITE OF AN ICONIC
MUSEUM DIORAMA**



Each of the Museum's treasured habitat dioramas depicts a scene from a real place, cast in the light of a particular time of day. These re-creations are based on meticulous observations of scientists in the field and the on-site sketches of the artists who accompanied them. Last fall, Stephen C. Quinn of the Museum's Exhibition Department took a remarkable trip to locate the exact site of the Museum's mountain gorilla diorama and record the changes that have taken place in the 80-plus years since Carl Akeley's final visit. Here, Quinn describes his journey.

When Carl Akeley—explorer, naturalist, artist, and taxidermist who created the Museum's Akeley Hall of African Mammals—first encountered the mountain gorilla (*Gorilla beringei beringei*) in 1921, it was a creature steeped in myth and folklore. Akeley, who was researching and collecting specimens to create the now-famous mountain gorilla diorama, was among the first to accurately document mountain gorillas as intelligent and social animals that, even then, were under grave threat from over-hunting. His research inspired him to dedicate the last few years of his life to the conservation and protection of the mountain gorilla. Akeley convinced King Albert of Belgium to set aside 200 square miles that would be their sanctuary, creating Africa's first national park, which today lies in the Democratic Republic of the Congo, on the border with Uganda and Rwanda, and which has been classified a World Heritage site by UNESCO since 1979.

As an exhibit designer, diorama artist, and naturalist at the Museum for the past 56 years, I have been immersed in the great history of its many accomplishments in promoting wildlife conservation. My book, *Windows on Nature: The Great Habitat Dioramas of the American Museum of Natural History*, documents the role these unique works of art and science—and their creators—played as powerful instruments for environmental education. Among them, Carl Akeley stands apart.

To share and better understand the extraordinary story and historic example of how his art influenced international policy, I traveled to the Democratic Republic of the Congo last fall with a fellowship grant from Artists for Conservation and support from the Museum, the Mountain Gorilla Veterinarian Project, the Houston Zoo Wildlife Conservation Program, the University of California, Davis, and the Explorers Club. My expedition took me

deep into the Virunga Massif to climb Mount Mikenno, an extinct volcano, to seek out Akeley's original research site, which he had called "the most beautiful place in all of Africa." After he had successfully campaigned to save the Virungas, Akeley would die at that very location during a return visit in 1926.

From the same location and vantage point that Akeley took nearly a century ago, I created a plein-air painting to illustrate the changes to the ecology and topography in the last century. The lower valley that appears in the diorama background in New York as untouched wilderness is now a landscape dramatically altered by humans. Though the volcanoes and near forests look much the same, the distant valley below is a patchwork of farms, large areas cleared for firewood and charcoal production, roads, radio towers, and refugee camps from the ongoing civil war in the Congo.

About 780 mountain gorillas remain in the wild, living in the Virunga Mountains where the borders of Uganda, Rwanda, and the Democratic Republic of the Congo intersect. Political instability, deforestation, and illegal poaching leave much of Akeley's legacy threatened. Poaching is still so prevalent that frequent interventions are made to anesthetize and untangle ensnared animals that would otherwise die a slow and agonizing death. When visitors to the Museum stand before this diorama, they must know that the area no longer exists as rendered in the background scene.

To reach the Congo, we flew from New York to Kigali, Rwanda, then drove to cross into the Democratic Republic of the Congo at the border town of Goma, where threats from rebel fighters have made United Nations troops a necessary presence. After a night in Goma, our team drove about 50 miles north to reach the ranger station at Virunga National Park and meet the armed ranger patrol that would accompany us to Mount Mikenno.

The climb up Mount Mikenno was steep, and as we made our ascent I felt the effects of altitude sickness. I could only imagine how Akeley must have felt as he climbed Mount Mikenno in 1926, when he was suffering from malaria and dysentery. We reached Kabara, the site of Akeley's camp, to enjoy the same



After locating the site, Quinn painted for six hours before heading back to camp.

Previous spread, photo © AMNH/D. Finnin and J. Beckett. Page 8 photo © MGVP/M. Feltner

view of Mikenno's jagged peak that Akeley and his team saw 85 years ago. We were only a short walk from Akeley's gravesite, which I located that evening: a dark sinkhole in the forest floor, overgrown by the jungle.

On the third day, we hiked up the slopes of Mount Karisimbi to find the site of the gorilla diorama. To serve as my "map," I brought images of the field sketch that the artist William R. Leigh had completed while on the 1926 expedition and which were later used as the basis for the diorama painting at the Museum. We bushwhacked through the forest, and, whenever I could get a clear view, I saw the landscape elements—volcanoes, hills, and valleys—aligning. After several hours of climbing, I finally stepped out into a clearing and found myself in the very place depicted in the sketch. We took GPS coordinates and named the site officially as "AMNH Akeley Mountain Gorilla Diorama Site—AFC, 2010."

Now it was on to the second goal of the expedition: capturing the scene on canvas. It was a perfect day for painting. The two volcanoes, Nyiragongo and Nyamuragira, were billowing smoke and steam in the morning light in all their glory. But while Leigh had worked at a leisurely pace, making his sketch over two weeks and painting only an hour or two each morning to capture the same light and shadows every day, I had to work fast. After setting up my field easel, I painted for six hours using fast-drying acrylic paints before heading back to our campsite for the final night on Mikenno.

Early the next morning, I was happy to be on my way down the mountain to begin the long trip home. Akeley, on his 1921 descent, wrote that his mind was filled with thoughts of saving the mountain gorillas and fears that they might be lost before action was taken. My own mind, as I hiked down through a magnificent *Hagenia* forest and dense bamboo, was filled with the hope that the art I made on the mountain would, in some way, assist in inspiring efforts to protect this wilderness for future generations.

Returning to work at the Museum after my expedition, I stopped before the mountain gorilla diorama and marveled at how Akeley's mounted specimens convey the personal character of each animal depicted. Every botanical specimen is perfectly modeled: the *Hagenia* and *Hypericum* trees, the wild celery gorillas love to eat, even the Ruwenzori blackberries that I feasted on up on Mikenno. Despite the changes that have taken place in the valley below, the exhibit is so powerful that to stand before it is to be there still. 📍

SCENE CHANGES

The Museum's habitat dioramas are based on actual sites, some of which have undergone dramatic transformations over the last century.



KLIPSPRINGER DIORAMA

Quinn also visited the site of this diorama on his trip. Located about 40 miles outside of Kenya's capital city, Nairobi, the area depicted now encompasses flower farms but is still home to klipspringers, giraffes, and zebras.



AFRICAN BUFFALO DIORAMA

Set in the shadow of Mount Kenya, the second-highest peak in Africa, the area depicted in this diorama lies outside of Mount Kenya National Park and has been turned over to agriculture.

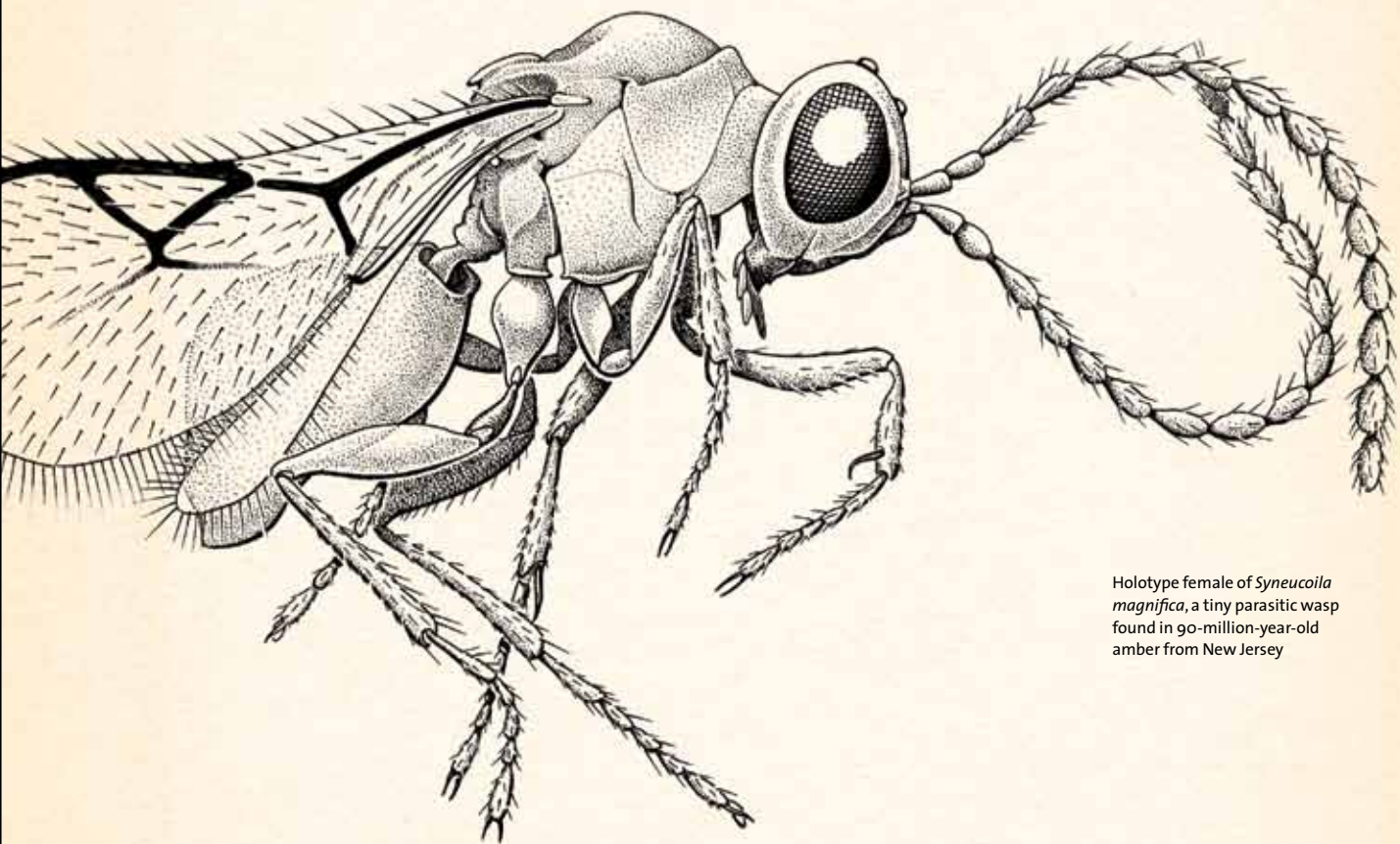


AFRICAN PLAINS DIORAMA

The site of this diorama is located in Tanzania's Serengeti National Park, a vast preserve famous for the annual migration of animals, including wildebeests, zebras, and gazelles. A protected area since 1940, today the Serengeti remains largely unchanged.

WELL AND TRULY DRAWN

SCIENTIFIC ILLUSTRATION AT THE MUSEUM



Holotype female of *Syneucoila magnifica*, a tiny parasitic wasp found in 90-million-year-old amber from New Jersey

Before the camera, scientists depended on drawings to replicate the natural world, its flora and fauna, on the printed page. But even today, well after the arrival of photography and other sophisticated imaging techniques, old-school illustration persists as the method of choice in books, articles, and professional research papers. So how has this craft survived alongside photos and high-tech scans?

First, there are some instances—such as portraying an extinct animal no human has ever seen—that demand creative rendering. Mick Ellison, senior principal artist in the Division of Paleontology, employs two art forms to realize an extinct species. He sculpts a 3-D clay model based on what is known, then paints a finished portrait of the model. To get the plumage right on one of his most famous illustrations, a feathered dinosaur from China’s Liaoning Province, Ellison covered the clay model with feathers purchased in New York’s Garment District that best matched fossil impressions from the field.

Artist Patricia Wynne, who has worked with Museum scientists for decades, describes the challenge of working on old specimens stored in alcohol.

“No one has seen the animal alive, and most of the alcohol specimens have no bones left in their limp little bodies,” says Wynne. “There is a lot of guesswork, imagination, conversations with the scientist, and many sketch revisions. I love doing these projects. The satisfaction is in breathing visual life into the animal.”

With extant species, scientists say that, with the possible exception of presenting small areas of minute surface detail, there is simply no substitute for putting pen to paper. Even 3-D scanned images can lack the resolution needed to represent complex structures, color gradations, and other essential details.

“Pen and ink are my mainstay,” says David Grimaldi, curator in the Division of Invertebrate Zoology and a skilled illustrator whose drawings accompany his publications. “You get a very nice line.” And, while this may not be true for all artists, for Grimaldi drawing is simply faster and speeds the pace at which he can publish his research. “I can bang out a drawing quicker than a computer,” he says.

It is not a matter of resisting technology. Many scientific illustrators use computer software to execute their drawings or to tweak pen or pencil images after they have been digitized. And most consider computed tomography, scanning electron microscopy, and other high-resolution imaging techniques important tools, enhancements of the eye that allow for ever more detail in the finished drawing. (*Picturing Science: Museum Scientists and Imaging Technologies*, an exhibition showcasing examples of such imaging and its use in Museum research, is now on view in the Akeley Gallery on the second floor.)

Renderings done by hand also have critical advantages over photographs, key among them the ability to focus on several areas at once.

“Photographs don’t have multiple depths of field,” explains Wynne. “Let’s say you are drawing a skull from the bottom. You want to see every little ridge on the teeth so the camera focuses on those details. That means that the zygomatic arch, or the ear

anatomy, or the nose area are all slightly out of focus. And if you focus on one of those areas, the tooth ridges will be a little fuzzy. Drawings can fix that.”

The camera and high-res scanners also cannot eliminate features that are unimportant or in the way. Grimaldi often works with specimens “frozen” in amber, photographs or scanned images of which would pick up extraneous debris, including specimens other than the one at the center of the research. As for the specimen under study, a body might be shriveled or an appendage might be missing or folded over an important feature, obscuring it. In a drawing, all of these problems can be corrected to achieve the complete reconstructed image that is needed as a reference by colleagues around the world.

“Artwork is an idealized version,” says Grimaldi. “Idealized not in the sense of distorting but putting in what’s scientifically meaningful, omitting what’s superfluous, trivial.”

Beautiful as it may be, the finished product is not art as much as it is an essential component of the research.

“A picture is scientific data,” says Mary Knight, manager of the Museum’s peer-reviewed scientific publications, *Bulletin of the American Museum of Natural History*, *Anthropological Papers of the American Museum of Natural History*, and *American Museum Novitates*. “The visual presentation helps you grasp information, apprehend it in a different way, and, in this regard, it can lead to a better understanding.”

Grimaldi says drawing has helped him become a better morphologist. “It forces you to connect the dots correctly,” he says. “As you’re rendering, you have to ask yourself, where does that line connect to?”

For the scientist working with an artist, the same process goes on as a dialogue, with the scientist reviewing early sketches, suggesting changes according to his or her most recent research, and finally, when satisfied, marking the last proof with the final stamp of approval, the words “Go to finish.” It is a balancing act in which both contribute in their own way.

“The artist might have a question the scientist hasn’t thought of,” says Knight, but in the end, “the scientist calls the shots.”

A SAMPLING OF ART IN THE SERVICE OF SCIENCE

Fossil Turtle Skull Before drawing the fossil for Curator Emeritus Eugene Gaffney, senior scientific assistant Frank Ippolito created a virtual skull with a CT scan and manipulated it to correct for bones disarticulated during fossilization. A second skull was also referenced to fill in missing details.	Melaleuroides Senior scientific assistant Steve Thurston of the Division of Invertebrate Zoology perfected preliminary drawings by Curator Randall T. Schuh of the genitalia of a new Australian genus of a true bug for a <i>Bulletin of the American Museum of Natural History</i> .	Game of Hounds and Jackals For an archaeological journal article by Assistant Curator Alex de Voogt, Jennifer Steffey, senior artist in the Division of Anthropology, used a computer touch tablet, stylus, and graphic design software to draw a 14th–12th century BC ivory board game.	Goblin Spider Nadine Dupérré, a scientific assistant to Curator Emeritus Norman Platnick, drew a magnified color image of a 1.14-millimeter golden goblin spider found in leaf litter in Brazil for the cover of a <i>Bulletin of the American Museum of Natural History</i> .	Old World Marsupial Skulls Freelance artist Patricia Wynne did 20 black-and-white plates of Old World marsupial skulls for Robin Beck, postdoctoral research fellow in the Department of Mammalogy, to complement already-published New World marsupial skulls she had done for Curator Rob Voss.
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See a slide show of these and other scientific illustrations at amnh.org.

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ROTUNDA DELVES DEEP INTO THE MUSEUM’S COLLECTIONS TO TELL THE STORIES BEHIND SELECT SPECIMENS AND ARTIFACTS.

CHOCOLATE POTS FROM CHACO CANYON

From the collections of the Division of Anthropology

More than 100 years after joining the Museum’s archaeological collection, a remarkable set of 11th-century pottery excavated in New Mexico’s Chaco Canyon is at the center of a delicious discovery.

Found at Pueblo Bonito, one of the great ceremonial complexes of the Ancestral Pueblo peoples, the rare ceramics were collected for the Museum by George Pepper at the turn of last century. Only recently, however, have researchers looked to the set to search for chemical traces of the vessels’ long-lost contents. The results were electrifying: tests revealed the presence of theobromine, the biomarker for cacao, confirming the earliest known use of chocolate north of the Mexican border.

“The cool thing is the way the new Pueblo Bonito research validates the importance of our collections,” says David Hurst Thomas, curator of North American Archaeology in the Museum’s Division of Anthropology. “We have artifacts dug up a century ago, and those collections are invaluable for modern researchers using cutting-edge technologies and asking brand new questions.”

To enjoy chocolate, which was highly prized in the Maya and Aztec cultures, Ancestral Puebloans would have had to obtain it from their Mesoamerican neighbors. Cacao trees require high rainfall and humidity, growing mostly in tropical areas far to the south of Chaco. Other imported goods, such as copper bells and Scarlet Macaws, had already been discovered at Pueblo Bonito, and the confirmation of chocolate adds to evidence of a robust commercial exchange. Even more exciting are the implications for cultural connections between these ancient societies. When trade carried cacao north to Chaco, special skills for preparing beverages and rituals surrounding chocolate may have traveled as well.



From left to right, catalog nos. H/3243, H/3251, and H/3252.

Photo © AMNH

METEORITE MEMENTOS

From the collections of the Department of Earth and Planetary Sciences

A crater’s scar on the landscape is the most recognizable remnant of a meteorite impact. But meteorites have left other, much smaller markers of their presence on the surface of the Earth: splash droplets called tektites.

During a meteorite impact, “the ground and the object are trying to occupy the same space instantaneously,” says Denton Ebel, associate curator in the Museum’s Department of Earth and Planetary Sciences. “It’s an explosion at that point.”

The force of the impact is so strong that some parts of the Earth’s surface are not just cast into the air but are heated into molten rock that behaves like liquid glass. As droplets of the melt fly through the atmosphere, they are swiftly quenched into solids, often retaining their droplet form. The Museum has hundreds of these specimens, which range in scale from mere millimeters to the size of a fist.

Some of the most prized tektites are the unique bottle-glass green Moldavites from the Czech Republic. Moldavites were formed by the massive impact 15 million years ago in what is now Germany. The impact left the 16-mile-wide Ries crater and scattered bright green glass droplets across Eastern Europe. This spread is what geologists call a “strewn field,” which can cover hundreds and even thousands of miles. Over the years, tektites were buried by sediments, to be later revealed by erosion or human efforts.

Though widespread around impact sites, tektites are relatively ephemeral geologic specimens. “Glass doesn’t last that long in the geological record,” says Ebel, explaining that glass, even glass made from molten rock, will start to break down after a few million years. Tektites eventually develop pitted surfaces or break down entirely. But despite their short lives, they remain beautiful physical reminders of Earth’s tempestuous relationship with space.

TRUE BLUE FOSSILS

From the fossil amphibian, reptile, and bird collections of the Division of Paleontology

Nestled deep within the Museum’s vertebrate paleontology collection are several gloriously blue bones.

They are vertebrae of the long-extinct *Champsosaurus*, a crocodile-like creature that lived between about 60 and 45 million years ago, straddling the non-avian dinosaur extinction. They were found in 1882 in the San Juan Basin, New Mexico.

“The overwhelming majority of vertebrate fossils fall into the earth tones, browns, black, and white,” says Carl Mehling, collections manager for fossil amphibians, reptiles, and birds at the Museum.

Specimens that deviate from this drab palette are rare, which makes finding them all the more exciting. Mehling, who discovered the fossils in the vast collections, couldn’t believe the color was natural. “I thought, ‘Get out of here!’” says Mehling. “I thought somebody had put a coating on it that just happened to be blue.”

The muted sapphire tone was no coating but rather a part of the bones, which had undergone a process called mineralization after burial. Dissolved minerals in groundwater deposited minerals in the bones, changing their chemical composition.

What minerals could possibly turn a bone blue? Without extensive lab work, it’s hard to be sure.

“Typically, it only takes a very little amount of a mineral to change the color [of an object],” says George Harlow, curator of minerals and gems in the Department of Earth and Planetary Sciences.

But, so long as the structure of the bones is intact, what mineral caused this metamorphosis would be just a secondary concern to those who study fossils.



Catalog no. AMNH FARB 1098

A BORNE BOTFLY

From the collections of the Division of Invertebrate Zoology

As he hiked out of his field site in French Guiana in August 1999, Curator Rob Voss was heedlessly unaware of freeloaders hitched to his back. But soon after returning to New York, he felt pinpricks and noticed that two red spots were widening.

He sought help. “The dermatologist promptly said that I had myiasis, a fly larva burrowing in my skin, rapidly shot me full of lidocaine, and pulled out a chunk of my back,” says Voss. “He even kept the maggot! I decided to bring the second one to term.”

So hatched a unique plan to add a specimen of *Dermatobia hominis* to the Museum’s collection. Restricted to the American tropics, adult botflies hijack a mosquito mid-air to carry their eggs for them. The larvae enter their hosts—typically monkeys or kinkajous rather than humans—through the mosquito’s puncture.

Over two months, Voss bonded with the botfly. “It’s the closest that I’ve come to gestating,” he says. “It has a daily rhythm. There were moments of excruciating pain, especially at 2 or 3 in the morning when it seemed to be moving.”

By mid-October, the pain ceased. His wife, Curator Nancy Simmons, and their son Nick could see the pinky-sized larva, ringed with hooks, hanging out near the surface of his back. Fortuitously, they also saw the maggot heave itself out of the hole before collecting it in a jar and placing it next to a warm flue until, just after Thanksgiving, an adult fly emerged. In the wild, botfly larvae burrow into warm soil before pupating and emerging as a fly.

Voss donated the fly and its pupal case to the collections of the Division of Invertebrate Zoology, where the “pristine specimen” is stored with other flies of the Cuterebridae. The wound healed rapidly. “Within a few weeks, you could not see where it had been,” he says. “But I have a scar from the first one.”

Photo © AMNH/C. Mehling

Next AT THE MUSEUM

Programs and Events

For more programs and to purchase tickets, visit amnh.org/calendar.

JULY

Brain: The Inside Story Hall Tour

Tuesday, July 12

6:30–8 pm

Free (Space is limited; registration required; call 212-769-5200)

Join a Museum tour guide for this special after-hours tour of *Brain: The Inside Story*.

Experience Manhattanhenge

Wednesday, July 13

7 pm

Members’ tickets are \$13.50

As the Sun sets on July 13, it will be perfectly aligned with Manhattan avenues.

This program, led by Jackie Faherty, will begin in the Hayden Planetarium and end with a view of the sunset from 79th Street.

Evening Bat Walks in Central Park

Friday, July 15,
Friday, July 22, or
Friday, July 29

8:30 pm

\$40 adults; \$25 children
ages 12 and younger

Enrollment is limited; register at least a week in advance

Join members of the New York City Bat Group for a walk through Central Park to catalogue local species.

Great Gull Island Research Project

Thursday, July 21

8 am–7 pm

\$125 (Includes transportation by private coach; bring your lunch; space is limited)

Spend a day on Great Gull Island, a Museum research station in Long Island Sound, with ornithologist Helen Hays to watch hatching chicks, track nests, and explore the island.

A Night at the Museum Sleepover

Saturday, July 23

Friday, August 26

Saturday, September 24

Members’ price is \$119 per person

This unique after-hours experience will thrill kids ages 7 to 13 and their caregivers.

World Astronomy

Tuesday, July 26

6:30 pm

Members’ tickets are \$13.50

This presentation by Emily Rice combines unparalleled views of the night sky from the Zeiss Mark IX star projector and soaring flights across the Earth’s surface with the Digital Universe Atlas.

AUGUST

The World’s Largest Dinosaurs Camp

Monday–Friday, August 1–5

9 am–4 pm

For grades 4 and 5 (Grades refer to grade child enters in Fall 2011)

\$450

To register, call 212-769-5200

Travel back to a time when giants, such as the 60-foot-long *Mamenchisaurus*, roamed the Earth! Explore dinosaur biology and behavior in the Museum’s special exhibition.

Sail on the Clearwater

Thursday, August 4

6–9 pm

\$75 (Space is limited; register early)

Join a sunset sail aboard the historic *Clearwater*, a 106-foot wooden sailing sloop modeled after the Dutch cargo vessels that traveled the Hudson River in the 18th and 19th centuries.

Frogs Camp

Monday–Friday, August 8–12

For grades 6 and 7

9 am–4 pm

\$450

To register, call 212-769-5200
Catch a behind-the-scenes glimpse of the Museum’s exhibition of live frogs and learn about frog movement, feeding, and adaptation.

Brain: The Inside Story Hall Tour

Wednesday, August 10

6:30–8 pm

Free (Space is limited; registration required; call 212-769-5200)

Join a Museum tour guide for this special after-hours tour of *Brain: The Inside Story*.

Tickets

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

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

Exhibitions and Attractions

Admission is by timed entry only.

The World’s Largest Dinosaurs

Through Monday, January 2

Free for Members

This exciting exhibition features cutting-edge research about super-sized sauropods and offers new insights into how their colossal bodies functioned.

Brain: The Inside Story

Through Sunday, August 14

Free for Members

Step into the amazing, changing brain! This exhibition explores how the brain—a product of millions of years of evolution—produces and processes thoughts, senses, and feelings.

Frogs: A Chorus of Colors

Through Sunday, January 8

Members’ tickets are \$12 adults, \$7.50 children

This dynamic exhibition introduces visitors to the colorful and richly diverse world of frogs.

Journey to a Lost World
Saturday, August 13
9 am–4 pm
\$85 (Includes transportation by private coach; bring your lunch)
Pack your collecting bag, old sneakers, and lunch, and travel back in time with **Paul Nascimbene** to pan for Late Cretaceous sediments in Big Brook, New Jersey.

Fossils and DNA Camp
Monday–Friday, August 15–19
For grades 2 and 3
9 am–4 pm
\$450
To register, call 212-769-5200
Explore the Spitzer Hall of Human Origins, learn about DNA, examine casts of hominid tools—and have fun doing it!

Frogs Camp
Monday–Friday, August 15–19
For grades 4 and 5
9 am–4 pm
\$450
To register, call 212-769-5200
Catch a behind-the-scenes glimpse of the Museum’s exhibition of live frogs and learn about frog movement, feeding, and adaptation.

Fossils and DNA Camp
Monday–Friday, August 22–26
For grades 4 and 5
9 am–4 pm
\$450
To register, call 212-769-5200
Explore the Spitzer Hall of Human Origins, learn about DNA, examine casts of hominid tools—and have fun doing it!

Frogs Camp
Monday–Friday, August 22–26
For grades 2 and 3
9 am–4 pm
\$450
To register, call 212-769-5200
Catch a behind-the-scenes glimpse of the Museum’s exhibition of live frogs and learn about frog movement, feeding, and adaptation.

The World’s Largest Dinosaurs Camp
Monday–Friday, August 22–26
9 am–4 pm
For grades 6 and 7
\$450
To register, call 212-769-5200
Travel back to a time when giants, such as the 60-foot-long *Mamenchisaurus*, roamed the Earth! Explore dinosaur biology and behavior in the Museum’s special exhibition.

Our Solar Neighborhood
Tuesday, August 30
6:30 pm
Members’ tickets are **\$13.50**
Go on an unparalleled 3D adventure through our local solar neighborhood with **Jackie Faherty**.

SEPTEMBER

Members-only Highlights Tour
Saturday, September 10
3–4:30 pm
Free (Space is limited; registration required; call 212-769-5200)
Join a Museum guide for an insider’s introduction to all the Museum has to offer.

Credits
Public programs are made possible, in part, by the Rita and Frits Markus Fund for the Public Understanding of Science.

Popular Science is the media partner for Hayden Planetarium monthly astronomy programs and lectures.

The Museum’s Youth Initiatives programming is generously supported by the leadership contribution of the New York Life Foundation.

Picturing Science: Museum Scientists and Imaging Technologies
Through **June 2012**
Free with Museum admission
More than 20 sets of large-format images showcase the wide range of research being conducted at the Museum using various optical tools.

Hayden Planetarium Space Show
Journey to the Stars
Members’ tickets are **\$12** adults, **\$7.50** children
Journey to the Stars launches viewers through time and space to experience the life and death of the stars in our night sky.

Credits
The World’s Largest Dinosaurs is organized by the American Museum of Natural History, New York (www.amnh.org) in collaboration with Coolture Marketing, Bogotá, Colombia.

*The World’s Largest Dinosaurs is proudly supported by **Bank of America**.*

Additional support is generously provided by Marshall P. and Rachael C. Levine, and Drs. Harlan B. and Natasha Levine.

Brain: The Inside Story is organized by the American Museum of Natural History, New York, (www.amnh.org) in collaboration with Codice. Idee per la cultura, Torino, Italy in association with Comune di Milano - Assessorato Cultura, Italy; Guangdong Science Center, Guangzhou, China; and Parquede las Ciencias, Granada, Spain.

Generous support for Brain: The Inside Story has been provided by The Eileen P. Bernard Exhibition Fund Susan W. Dryfoos and the JRS Dryfoos

JULY

4 Monday
Tornado Alley IMAX film opens

12 Tuesday
Brain: The Inside Story Hall Tour

13 Wednesday
Experience Manhattanhenge

15 Friday
Evening Bat Walk

17 Sunday
Body and Spirit: Tibetan Medical Paintings closes*

21 Thursday
Great Gull Island Research Project

22 Friday
Evening Bat Walk

23 Saturday
A Night at the Museum Sleepover

26 Tuesday
World Astronomy

29 Friday
Evening Bat Walk

30 Saturday
Evening Bat Walk rain date

AUGUST AND BEYOND

1 Monday
The World’s Largest Dinosaurs Camp for grades 4 and 5 begins

4 Thursday
Sail on the Clearwater

8 Monday
Frogs Camp for grades 6 and 7 begins

10 Wednesday
Brain: The Inside Story Hall Tour

13 Saturday
Journey to a Lost World

14 Sunday
Brain: The Inside Story closes

15 Monday
Fossils and DNA Camp for grades 2 and 3 begins

Frogs Camp for grades 4 and 5 begins

22 Monday
Fossils and DNA Camp for grades 4 and 5 begins

Frogs Camp for grades 2 and 3 begins

The World’s Largest Dinosaurs Camp for grades 6 and 7 begins

26 Friday
A Night at the Museum Sleepover

30 Tuesday
Our Solar Neighborhood

SEPTEMBER
10 Saturday
Members-only Highlights Tour

24 Saturday
A Night at the Museum Sleepover

Charitable Lead Trust Virginia Hearst Randt and Dana Randt The Mortimer D. Sackler Foundation, Inc. Mary and David Solomon

*Additional support for Brain: The Inside Story and its related educational programming has been provided by **Roche**.*

**The Museum is deeply grateful to Emily H. Fisher and John Alexander, whose vision and generosity supported the acquisition and conservation of this collection of Tibetan Medical Paintings.*

Body and Spirit is made possible by a very generous gift from the Estate of Marian O. Naumburg.

Frogs: A Chorus of Colors is presented with appreciation to Clyde Peeling’s Reptiland.

Journey to the Stars was produced by the American Museum of Natural History, the Rose Center for Earth and Space, and the Hayden Planetarium. Journey to the Stars was developed by the American Museum of Natural History, New York 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**. 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.*

The Starry Scorpion

Joe Rao, who has served as an instructor and guest lecturer at the Hayden Planetarium since 1986, offers this guide to the season's most striking constellation.

In summer, many head out of the city to rural locations where the stars can be seen in their entire splendor. "All nature is now attuned, and the stars glow softly in the tepid temperatures, stirred by faint breezes like veritable flowers of the sky," astronomer Garrett P. Serviss once wrote of this season. "The firmament becomes a vast garden lit with beautiful lamps, which seem to have been placed there to dimly illuminate nocturnal wanderers in the transparent gloom beneath."

The most beautiful of all the summer constellations is now visible: Scorpius, the Scorpion. Though it lacks anything as distinct as the belt of Orion, winter's dominant stellar pattern, Scorpius forms a rather striking fish-hook shape and is the most easily learned of all the deep southern constellations seen from the United States. Orion and Scorpius are linked in legend: according to Greek mythology, the Scorpion's sting killed the boastful Hunter, giving rise to the belief that these constellations never appear in the sky together. While this is true for northern latitudes, for regions south of the equator both constellations can be glimpsed simultaneously on opposite sides of the sky.

The whole figure of the Scorpion, with its long stinging tail curled over its back, is a magnificent sight, best appreciated in a dark sky without any interference from bright moonlight. The upper stars of this pattern form its body, while its tail slants toward the horizon, then curves to the left and upward with a fine stream of stars that ends in the wide pair that marks the Scorpion's stinger. These are the stars Shaula and Lesath, which astronomy popularizer Hans A. Rey christened "Cat's Eyes."

Where else in the sky can we find as many as 15 stars of third magnitude and brighter that form a more conspicuous, distinctive constellation figure than the Scorpion? Two-thirds of these look white or even bluish-white, for they are hot, highly luminous stars moving through space together. The standout is Antares, a cool, red sun of gigantic size that outshines the others and marks the heart of the Scorpion. To the ancients, its distinctive red color suggested the planet Mars and, in fact, the name Antares means "The Rival of Ares," Ares being the Greek name for the God of War. Antares is a red supergiant star, 9,000 times more luminous than our Sun and about 700 times its size. Were it located where the Sun is, Antares would easily encompass the orbits of Mercury, Venus, Earth, and Mars. To put it another way, if the Sun were the same size as the 87-foot Hayden Sphere in the Rose Center for Earth and Space, Antares would be a globe 11.5 miles in diameter! However, despite its large size, Antares has a total mass only 10 or 15 times that of the Sun. Its overall density is less than one-millionth that of the Sun, so inside it may resemble a very hot vacuum.

Scorpions have two large claws in front, but this one seems to have had his clipped. The Romans decided that there should be 12 constellations in the zodiac instead of 11, so they made Scorpius's two claws into the arms of the star pattern immediately to its west: Libra, the Balance.

Lastly, it's important to note that the accepted name of this constellation is Scorpius, not Scorpio. It is principally astrologers, and some older astronomy books, that use the latter to refer to the zodiacal sign of that name.

Find monthly Hayden Planetarium programs and lectures at amnh.org/calendar.

Research Program Pairs Teens with Scientist Mentors

Ailan Hurley-Echevarria removed a pebble-sized piece of dark amber from the variable speed grinder-polisher and looked at the now-smooth and clear surface under the dissecting microscope.

"I think there's something here in the corner," he said. Hurley-Echevarria had uncovered an ancient biting midge (Ceratopogonidae) which had been trapped in amber about 52 million years ago, perhaps after feeding on an Eocene mole or other small mammal in the prehistoric tropical jungles of India.

Within the first few weeks of their investigation of the Cambay amber deposit, a collection of ancient tree resin recently excavated from western India, Ailan and research partner Charlotte Isaac had already discovered a number of significant ancient invertebrates. They uncovered a spider that may be the oldest recorded member of the family Pholcidae as well as the earliest representatives of highly social insects such as rhinotermitid termites. Their mentor, Paul Nascimbene, a scientist in the Museum's Division of Invertebrate Zoology, ticks off the list of hidden treasures revealed through their work: 62 diverse ants, five complete termites, some remarkable flowers, and four bees, including a *Protobombus*, an early bumblebee.

What is even more remarkable is that both Hurley-Echevarria and Isaac are 17-year-old high school students whose discoveries took place in the Museum's state-of-the-art laboratories. They are among about 40 students from high schools across New York City who participate in the Science Research Mentoring Program (SRMP), a two-year project that pairs teens, mostly from groups underrepresented in the sciences, with Museum researchers. The students work in Museum laboratories with mentors from the Center for Conservation Genetics, the Sackler Institute for Comparative Genomics, the Department of Ornithology, the Department of Herpetology, Division of Paleontology, and the Microscopy and Imaging Facility on projects that range from identifying parasites in Amazonian river turtles to studying the diversity of snakes in Southeast Asia.

"The collaboration between students and scientists can do a lot to make science education fresh and relevant. It makes it more about the real process of discovery," says Hilleary Osherooff, director of the program. "Giving these kids the chance to build one-on-one relationships with actual scientists, to see what it's like to work in a real lab, is one of the best possible exposures you can have."

Collaboration between students and scientists makes science education fresh and relevant.

SRMP students Anika Rastgir and Caitlin King, for example, are exploring dinosaur diversity. Under the supervision of Steve Brusatte, a graduate student advised by Curator Mark Norell in the Division of Paleontology, they are studying the evolution of skull shape in ceratopsians, the group of horned dinosaurs that include *Triceratops*. Their project tracks ceratopsians from the Jurassic, when the animals had small frills and horns, to the Late

Cretaceous, when enormous species like *Triceratops* were many ecosystems' largest herbivores. Using statistical programs to model and quantify complex skull shape of each species, Rastgir and King have so far mapped over two dozen landmark features on each of the 30 ceratopsian skull photos they "collected" from literature. "This will allow us to see whether the diversity of skull shape changed over time, and exactly what features of the skulls changed," says Brusatte.

Working with Rebecca Rudolph, manager of the Microscopy and Imaging Facility, students Ivan Ibarra and Dale Prentice are learning to study and conserve delicate specimens using the Museum's new high-resolution computed tomography (CT) scanner. In addition to examining specimens that include bat skulls and primate teeth, the students have developed a low-contrast imaging protocol for investigating soft tissue specimens. "Their work helps us to define best practices and techniques for a large portion of the work we do here in the lab," says Rudolph. "Much of the work they do will continue to be implemented when they are off tackling bigger and better projects in college and beyond, which is a fine reward for all of their efforts in SRMP."

For more information about the National Science Foundation (NSF) Science Research Mentoring Program, visit amnh.org/education.

The Science Research Mentoring Program is supported by the National Science Foundation.

Generous support for this program is provided by Wells Fargo.

Additional support for this program is provided by the Louis and Virginia Clemente Foundation, the Adolph and Ruth Schnurmacher Foundation, and the Charles and Mildred Schnurmacher Foundation.



Rastgir and King are studying ceratopsian skull shapes with a Museum scientist.

Photo © AMNH/D. Finnin

Museum Library: A Top Resource



The library is a treasury of archival materials, such as this field photo of Roy Chapman Andrews.

Even frequent Museum visitors may not be familiar with the wealth of information available in the Research Library—or realize that it is one of the few scientific research libraries open to the public. “We’re all about access,” says Tom Baione, Harold Boeschstein Director of Library Services.

Established with the Museum’s founding in 1869, it is one of the world’s largest natural history libraries and a key resource for the Museum’s scientists. In addition to a vast research collection on the natural sciences, its holdings include rare books, archival materials and personal papers, films, art, Museum memorabilia, and more than a million photographs.

To provide even greater access, the Library has a growing digital collection that allows visitors to search each of the Museum’s Annual Reports, download any of the Museum’s scientific publications, or browse historic photos of exhibition preparation and education programs in its “Picturing the Museum” collection. With grant support from the Council on Library and Information Resources’ “Hidden Collections” program, the Library is also at work cataloging slides, photographic prints, and archival collections.

Say you’re curious about the life of Roy Chapman Andrews—the avid explorer who served as director of the Museum from 1935 to 1950. If you visit the Library, you can start by perusing Andrews’s “bio file” and a corresponding photo cabinet containing his portraits, many from the field.

Or you can search for “Roy Chapman Andrews” in the online Annual Reports (his name appears in 51 reports). The digitized scientific publications yield a rich crop of his articles, including “Description of a new species of *Mesoplodon* from Canterbury Province, New Zealand,” from a 1908 *Bulletin of the American Museum of Natural History*.

Whether you’re fascinated by Museum history or studying a specific scientific topic, the Library staff is happy to help you explore.

Search the catalog at library.amnh.org, or visit on Tuesdays through Thursdays after 2 pm or by appointment.

Host a Celebration at the Museum

The opportunity to host a child’s birthday party in the Museum is one of the great benefits of higher-level memberships. The Museum collaborates with an event-planning company to arrange unforgettable themed parties in the most popular halls.

Member Kris Herndon and her daughter, Kay, were thrilled to discover this membership benefit and had a difficult time choosing between the party themes: *Cosmic Blast-Off*, featuring the exhilarating Space Show, *Safari Adventure* in the Akeley Hall of African Mammals, or *Underwater Treasures* alongside the blue whale. Says Herndon, “Kay’s one of those kids who knows the names of every dinosaur, and many of her friends are budding paleontologists as well...so eventually *Dinosaur Discoveries* in the fourth-floor fossil halls won out.”



With any theme, children will love celebrating at the Museum, and parents will appreciate the educational component when party-goers reveal what they’ve learned. “It’s amazing to hear a bunch of 5- and 6-year-olds shouting out five-syllable words with Latinate roots,” says Herndon.

Parties require a minimum of 10 children and are available to Members at the Family level and higher. For more information, call the Membership Office at 212-769-5606 to start planning for your child or grandchild’s upcoming birthday.

Photo © AMNH

Brain Games: Teaching Tools Get Second Life

Visit the current exhibition *Brain: The Inside Story* and you are likely to find people gathered around a desk where visitors are challenged to copy a shape seen only in a mirror. Or they might be queued up to try their skill at describing a list designed to trick the tongue into making a mistake. Or watching a video that poses a familiar choice from childhood: listen to your mom or eat a forbidden snack.

These and other compelling interactive exhibits illuminate various aspects of human brain function as nothing else can. And now, through the generosity of The Mortimer D. Sackler Foundation, a number of them will endure beyond the exhibition when it closes on August 14, replicated and installed as a new attraction in the Sackler Educational Laboratory: the Sackler Brain Bench.

Not literally a “bench”—the term was chosen because scientists in genetics labs work at benches—the Brain Bench, in the Sackler Educational Laboratory within the Anne and Bernard Spitzer Hall of Human Origins, is a selection of artifacts and interactive features from the exhibition at the core of adult courses, student classes, and family workshops to help children and adults gain new understanding of the human brain.

“It was an exciting opportunity to modify these for educational purposes,” says Samara Rubinstein, manager of the Sackler Educational Laboratory and the coordinator of five part-time science educators who staff the Brain Bench.

Artifacts and interactive features from *Brain: The Inside Story* are at the core of adult courses, student classes, and family workshops.

Included in the offerings, which are recommended for visitors ages 8 and up, are the popular “build-a-brain” puzzle, which piece by piece conveys the evolutionary path from the reptilian brain to the neocortex unique to humans; artist Devorah Sperber’s clever installation on the mechanics of sight in which a famous painting is rendered—and disguised by—colorful spools of thread;



Students in the After School Program piece together the “build-a-brain” puzzle.

a pyramid stacking station that looks like child’s play but requires sophisticated planning; and a variety of computer games designed to sharpen basic brain functions like focus and memory. Here too are the interactive exhibits noted above, including one in which participants are asked to name the color of ink in which each word in a series is printed. But there is a twist that sends conflicting messages to the brain: the words themselves are names of colors and more often than not, a person is inclined to read the color that’s named rather than call out the color they see. “Kids who can’t read yet do great,” says Rubinstein. “They do better than their parents.”

Another interactive exhibit presents the user with the deceptively easy task of tracing the outline of a star from its mirror image. A visitor to the Brain Bench recently struggled with the tracing stylus as red lights flashed furiously, denoting slips outside the lines.

“This is just how your mind works,” reassured Rubinstein. “Some people are better at it, but it has nothing to do with intelligence.”

Whew. Good to know. But don’t take our word for it. Go in one weekend and see for yourself.

Sackler Brain Bench Information and Hours

The Sackler Brain Bench is located on the first floor, in the Sackler Educational Laboratory for Comparative Genomics and Human Origins in the Anne and Bernard Spitzer Hall of Human Origins. It is open to the public and free with Museum admission.

Brain Bench is open on Saturdays and Sundays from 1–4 pm. In July, hours will expand to Fridays from 2–5 pm and noon–5 pm on Saturdays and Sundays.



LAST CHANCE
.....
Brain: The Inside Story closes August 14.

Photos from top © AMNH/D. Finnin, © AMNH/R. Mickens



1. On March 3, tweeters gathered at the Museum for the Dinosaurs Tweetup, which included tours of the Exhibition design studio.
2. *The World's Largest Dinosaurs*, which opened April 16, features a 5.5-foot cube that represents a *Mamenchisaurus's* daily feast.



3. The dig pit in *The World's Largest Dinosaurs* lets visitors hunt for fossils.
4. Janet Asimov and guest caught up with Director of the Hayden Planetarium Neil deGrasse Tyson at the reception before the 2011 Isaac Asimov Memorial Debate on March 7.

5. Chairs of the 21st Annual Spring Environmental Lecture and Luncheon were congratulated by Museum President Ellen V. Futter on the April 12 event.

Photos 1, 3, 4 © AMNH/R. Mickens; photos 2, 5 © AMNH/D. Finnin



1. Zibby and Andrew Right and Dana Wallach Jones and Michael T. M. Jones, 2011 Museum Dance chairs, enjoyed the festivities on April 28.
2. Museum Dance Chair Blair Husain began the evening in the Theodore Roosevelt Rotunda.

3. Guests celebrated with drinks and dancing in the Akeley Hall of African Mammals.
4. Museum Dance Chair Elizabeth Kurpis (left) caught up with friends in the Akeley Hall of African Mammals.

Photos 1, 2, 4 © AMNH/D. Finnin; photo 3 © AMNH/R. Mickens

Save the Date!
Upcoming Events at the Museum



OCTOBER
10/18 Join us for the **18th Annual Family Party**, one of the Museum's best-loved traditions. Children will have the opportunity to interact with live animals, measure skulls, walk with a giant tortoise, explore the Museum Science Center, and more. For ticket information, please call 212-313-7161 or visit amnh.org/familyparty.

10/31 More than 30 of the Museum's halls will open from 4 to 7 pm for the annual **Halloween Celebration**, with trick-or-treating, arts and crafts, roaming cartoon characters, and live performances.



NOVEMBER
11/10–11/13 The **Margaret Mead Film Festival** will screen a selection of titles culled from more than 2,000 submissions in a special program celebrating its 35-year anniversary.

11/17 Celebrate at the dazzling **Museum Gala**, which helps support the Museum's educational and scientific programming. For ticket information, please call 212-769-5932.



Mid-November; date forthcoming. Be the first to see the exciting new exhibition **Beyond Earth: The Future of Space Exploration** at a Members-only preview before the exhibition opens to the public on 11/19.

11/21 The delightfully decorated **Origami Holiday Tree** returns to mark the start of the holiday season at the Museum with an array of amazing paper creations.

DECEMBER
12/31 A feast for the soul and senses, the annual **Kwanzaa Celebration** will include live performances, traditional crafts, and a bustling **Kwanzaa Marketplace** in the Milstein Hall of Ocean Life.

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



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This diorama in the Akeley Hall of African Mammals depicts mountain gorillas as seen by the explorer, naturalist, artist, and taxidermist Carl Akeley while on an expedition for the Museum in 1921.

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,
The Shop for Earth & Space,
Cosmic Shop, Brain Shop, Sauropod Shop,
and Online Shop (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:  (weekdays) or  to 81st Street;
 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.