

 AMERICAN MUSEUM OF NATURAL HISTORY

# ROTUNDA

Member Magazine  
Summer 2013 Vol. 38 No. 3



# From the President

Ellen V. Futter



For many people, summer means vacations and precious time away from professional responsibilities. At the Museum, summer is a time of tremendous activity!

Field season kicks into high gear and many of our scientists head to locations around the world to further their research. Of course, field expeditions are a long-standing tradition at the Museum—part of our DNA, if you will. Museum scientists now undertake some 120 expeditions each year, and that work advances not only each investigator's research but also builds the Museum's collections, facilitates special exhibitions, and drives larger institutional goals and initiatives.

There's also plenty going on at the Museum itself. This summer, our exhibition staff is busy designing, modeling, writing, and building our Fall exhibition *The Power of Poison*, which will explore this intriguing subject from biological and

cultural points of view, presenting the roles, both positive and negative, that poison has played and continues to play in nature and human history. At the same time, scientists, computer engineers, and visualization experts in the Rose Center for Earth and Space are putting the finishing touches on a thrilling new Hayden Planetarium Space Show, which will reveal dramatic recent discoveries in the fast-moving field of astrophysics and forecast what's in store in cosmology in the years ahead. The Space Show will premiere on October 5 and *The Power of Poison* will open on November 16.

The work isn't just behind the scenes, of course. Summer is one of the busiest times in the Museum's galleries as well. We look forward to welcoming visitors from all over the United States and around the world, as well as those closer to home—families, neighbors, Members, and camp groups. We hope to see you here!

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## ROTUNDA

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# Ancient Mariners: Rare Display of Trilobites

The Museum's Grand Gallery recently became home to a remarkable case of trilobites. Called "butterflies of the sea," "frozen locusts," or simply "bugs" by the researchers who study them, these ancient arthropods are distant relatives of modern lobsters, horseshoe crabs, and spiders.

The temporary exhibition, overseen by Neil Landman, curator in the Museum's Division of Paleontology, includes 15 fossils of various trilobite species from the Museum's permanent collection. They are set out on shelves in a sleek 21st-century version of a cabinet of curiosities.

Trilobites are of great interest to evolutionary biologists because, despite their eventual extinction 225 million years ago, they are a great success story. They evolved some 520 million years ago in the Cambrian Period, when the planet was mostly covered by water. They existed for nearly 300 million years, longer than the non-avian dinosaurs. They also emerged at a time when life on Earth was increasing in diversity and complexity. Trilobites, for example, are the earliest known life forms with compound eyes—eyes with multiple lenses, a characteristic shared by insects today. Some species evolved even more specialized adaptations, such as long eye stalks, which may have allowed them to peer up out of the sand or sediment in which they burrowed.

More than 20,000 species of trilobites have been discovered, and their fossils have been found all over the world: from the Russian steppes to North American cities, the top of the Himalayan Mountains, and areas surrounding California's Death Valley. But then, during the long period in which they thrived, the distribution of continents and oceans was very different from today. For example, places as far apart as Morocco and Oklahoma were all part of the same ocean floor.

*This exhibition is made possible thanks to Martin Shugar, M.D., and Andy Secher.*



Trilobites are of great interest to evolutionary biologists.

Top right photo © AMNH/C. Chesek; bottom left photo © AMNH/D. Finnin

# New Initiative Makes Membership Card Count



Expired cards can be dropped off in boxes like the one above.

Sometimes it's easy being green!

In a move that is both practical and symbolic—reminding us all to recycle wherever we can—the Museum's Membership office recently implemented a recycling program for old Membership cards.

Here's how it works: When you receive your plastic replacement card after renewing your annual Membership, don't throw away the old card. Simply bring your expired card into the Museum the next time you visit and drop it off in one of the boxes specially designated for this purpose at the Membership desk in the Rose Center for Earth and Space-Hayden Planetarium or the Theodore Roosevelt Rotunda. Your card will be recycled into new cards for future Members or other Members renewing just like you.

The card recycling boxes were installed on Earth Day, April 22, and the response so far has been enthusiastic. "We've already heard from Members how excited they are that we've initiated this program, which supports the Museum's mission of environmental conservation," says Membership Director Louise Adler.

**A CULTIVATED FAMILY**

Chile peppers are part of the Solanaceae, or nightshade, family, a group of flowering plants that includes potatoes, tomatoes, eggplant, and petunias, as well as toxic species such as tobacco, datura, and belladonna. The *Capsicum* genus includes more than 2,000 cultivars among five domesticated species and more than 20 wild species. Most cultivated chile peppers—such as jalapeño, pimento, cayenne, paprika, and bell pepper—belong to the *C. annuum* species. Notable exceptions include tabasco (*C. frutescens*) and habanero (*C. chinense*).

**HEAT WAVE**

Chile peppers originated in the Americas and began to spread in the 15th century after Christopher Columbus, who was seeking a shorter route to eastern spice markets in 1492, encountered Arawaks on Hispaniola. They were cultivating plants whose fruit was as pungent as black pepper and easier to grow. In the decades that followed, Spanish and Portuguese traders helped disseminate capsicums worldwide.

**SOME LIKE IT HOT**

Diverse and adaptable, chile peppers are popular in cuisines around the world, in raw and cooked form, in various dishes, sauces, and condiments. Communities worldwide have enthusiastically adopted chile peppers, adding them to traditional dishes and developing new pepper varieties. Today, it is estimated that one quarter of the world's people consume capsicum.

**THE VERSATILE PEPPER**

While capsaicin and capsaicinoids give peppers their pungency and antimicrobial properties, numerous carotenoids supply color, flavor, and nutritional value, including high levels of beta-carotene and vitamin C. Various pepper products are used to treat medical conditions and reduce pain, to repel pests, and as a human and animal deterrent in pepper spray.

**PUNCTURING PEPPER MYTHS**

Although seeds are thought to be the hottest part of a pepper, the fire resides in the white inner membrane where seeds attach. Drinking water will not stop hot peppers from burning your mouth because capsaicin is not water-soluble. Milk products offer a better remedy because they contain casein, a substance that surrounds the capsaicin molecules so they can be washed away.



Cayenne peppers

## The Curious Pepper

When it comes to chile peppers, how hot is hot? Visitors to *Our Global Kitchen: Food, Nature, Culture* can see a chart ranking varieties of peppers by their level of Scoville Heat Units (SHU), a score created in 1912 by Detroit chemist Wilbur Scoville. Scoville's "Organoleptic Test" was simple: he mixed an extract of ground-up peppers with sugar water and fed the solution, at increasingly diluted concentrations, to a panel of taste-testers until they could no longer detect the heat. The higher the score, the hotter the pepper, from the benign bell pepper (0 SHU) to the jalapeño (2,500–4,000 SHU) and the Trinidad moruga scorpion pepper (up to a stratospheric 2 million SHU).

The Scoville test is still used by some chile enthusiasts but scientists, producers, and processors commonly use a more precise method. Called high performance liquid chromatography, it helps determine the level of capsaicin, the chemical that gives peppers their pungency. Together with related compounds, capsaicin serves an important evolutionary function: protecting plants from threatening microbes, animals, and insects. For example, capsaicin targets a pain receptor in mammals and repels predators like deer and mice, whose chewing can destroy seeds. But it does not affect birds, which digest the seeds intact and disperse them widely, boosting the pepper population's survival rates.

Of course, not all mammal species are deterred by capsaicin's sting. Archaeological evidence indicates that humans gathered wild peppers as early as 10,000 years ago in the Central Andes. Cultivation began 6,000 years ago, and in addition to eating the fruit, early farmers likely took advantage of peppers' antimicrobial properties for food preservation. Humans soon found medicinal applications as well: the Mayas used *Capsicum* to treat asthma, infections, and sore throats, and the Aztecs used chiles to relieve toothaches. Today, chiles are found in everything from chocolate to beer to pharmaceuticals.

Don't miss *Our Global Kitchen: Food, Nature, Culture*, which closes on August 11 and is free for Members.

© iStockphoto.com/E. Azenova

## Fantastic Fossil

In the spring of 1925, a group of Museum researchers who had recently embarked on the second year of the Central Asiatic Expeditions made camp at Irdin Manha—the Valley of the Jewels—in Inner Mongolia. Named for the brilliantly polished pebbles of agate, chalcedony, jasper, quartz, and other minerals found there, Irdin Manha immediately proved a rich trove of fossil "jewels" as well.

A day or two after the team's arrival, Kan Chuen Pao, a young Chinese paleontological assistant, made an amazing find: "the superb skull of a gigantic beast," as described by the expedition's leader Roy Chapman Andrews, who would later become the Museum's director. At nearly three feet long, the skull was massive, and its teeth were huge.

Andrews decided the animal was a carnivore. But there was disagreement in the camp. The lead paleontologist, Walter Granger, thought that the skull belonged to a member of an extinct group of pigs, which were omnivorous. Another expedition member drew the skull and jaw and forwarded the illustration to the Museum for further study. The specimen soon followed, becoming part of the collection later that year. It was given the name *Andrewsarchus mongoliensis*, in honor of the expedition's leader, and remains the only specimen ever found of the species, which lived about 45 million years ago.

At the time, Museum researchers dubbed *Andrewsarchus* "the giant mesonychid of Mongolia," classifying it as a member of an extinct group of hoofed carnivores called mesonychids. Later on, mesonychids were thought to be closely related to whales, animals Andrews had spent nearly a decade studying in waters around the world. But while it turns out that *Andrewsarchus* isn't a mesonychid, recent evolutionary analysis suggests it is a whale cousin after all.

See the rarely exhibited *Andrewsarchus* skull in *Whales: Giants of the Deep*, which is free for Members.



Catalog no. FM 20135

© AMNH/ D. Finnin

**MYSTERIOUS MAMMAL**

Although only the skull of *Andrewsarchus mongoliensis* has ever been found, researchers infer from the fossil's size that the animal was about 6 feet high at the shoulder and 12 feet long. That makes *Andrewsarchus*, which lived during the Eocene era, the largest known meat-eating land mammal that ever lived.

**THE FAMILY TREE**

*Andrewsarchus* is closely related to hippos and to whales, both members of a larger order of mammals called artiodactyls. This group of two-toed hoofed mammals also includes sheep, pigs, cows, deer, giraffes, and antelopes. Today, hippos are the largest land artiodactyls, and cetaceans—whales, dolphins, and porpoises—are the only aquatic artiodactyls.

**A RICH LOCALE**

Before Andrews launched the Central Asiatic Expeditions in 1922, he later recalled, the team was "ridiculed" by other scientists for wanting to explore the grasslands and deserts of Mongolia. But in a series of trips over the next few years, the group located fossils of numerous dinosaurs, mammals, and other animals, including the largest land mammal found to date, called *Indricotherium*.

**PIONEERING EXPEDITION**

The Central Asiatic Expeditions were among the first to include researchers from various fields: archeologists, geologists, zoologists, and paleontologists. "As we sat in the mess tent at night ... it was most interesting to see how puzzling situations in geology would be clarified by the paleontologists; how the topographer brought out important features that gave the key to physiographic difficulties..." wrote Andrews.

**BACK TO THE GOBI**

Political tensions in Asia and the Soviet Union precluded return visits to Mongolia after 1931, but in 1989, the Mongolian Academy of Sciences invited Museum researchers once again to visit the country and to take part in joint expeditions to the Gobi Desert. Now an annual endeavor, these trips continue to reap finds, including the discovery of Ukhaa Tolgod, a uniquely rich vertebrate fossil site, in 1993.

**Bright, tiny, and toxic**, Central and South American dart-poison frogs anchor the exhibition *Frogs: A Chorus of Colors*, **now open** at the Museum.



# Brilliant Amphibians

In the 1970s and early 1980s, Museum herpetologist Charles W. Myers made several expeditions a year to the Colombian rain forest, not far from the Pacific coast. Myers was there studying a particularly charismatic group of amphibians: extravagantly, exuberantly colored small frogs from the family Dendrobatidae, which could be spotted dotting the bromeliads and rocky streams of the jungle.

## Know Your Poison Frog



**PHYLLOBATES TERRIBILIS**  
(GOLDEN POISON FROG)

**Size:** About 2 inches  
**Range and habitat:** Tropical rain forests in Colombia  
**Frog Fact:** The most poisonous dendrobatid, golden poison frogs are also excellent “tongue-hunters,” rarely missing a strike.

**DENDROBATES TINCTORIUS**  
(BLUE POISON FROG)

**Size:** 1 to 1.75 inches  
**Range and habitat:** Forests in northern South America  
**Frog Fact:** Some blue poison frog “morphs” combine white, black, yellow—and, of course, brilliant blue.



**DENDROBATES AURATUS**  
(GREEN AND BLACK POISON FROG)

**Size:** 1 to 2 inches  
**Range and habitat:** Rain forests and plantations, Nicaragua to Colombia  
**Frog Fact:** Like most dendrobatids, green and black poison frogs are diurnal and are active all day long.

**DENDROBATES LEUCOMELAS**  
(BUMBLE BEE POISON FROG)

**Size:** 1 to 1.5 inches  
**Range and habitat:** Western Venezuela to Guyana  
**Frog Fact:** Native to dry forests, this species often hides away until the rains come, after which it ventures forth to forage.



**PHYLLOBATES BICOLOR**  
(BLACK-LEGGED POISON FROG)

**Size:** 1 to 1.75 inches  
**Range and habitat:** Tropical rainforests in Colombia  
**Frog Fact:** Black-legged poison frogs are mainly solitary, but in certain seasons they gather in large groups to find mates.

Although dendrobatids may be beautiful, these tropical Central and South American frogs are also very, very poisonous. In fact, the Emberá people who live where Myers was conducting his fieldwork used certain of the frogs’ toxic skin secretions to add lethal tips to blowgun darts. Amid the streams and rivers of the Andean foothills, and in lowland rain forest dotted with pockets of fields carved from the forest for growing plantains, the Emberá hunted animals with these toxic darts.

Among the three species the Emberá used was an orange or bright-yellow frog that had never previously been described. Over several years, Myers and his colleagues John Daly and Borys Malkin collected hundreds of specimens of this new-to-science species, at two inches long, larger than any other dendrobatid. In the process, they discovered that it was 20 times as toxic as any of its kin. Each animal oozed enough poison, Myers reckoned, to kill 10 grown men if the poison somehow found its way to an open wound on each victim. Myers and his colleagues gave the species an intimidating name: *Phyllobates terribilis*.

### Toxic Kin

*Phyllobates terribilis*, commonly known as the golden poison frog, is just one of 10 dart-poison frog species featured in the Museum’s live-animal exhibition *Frogs: A Chorus of Colors*.

A selection of its small, jewel-hued dendrobatid kin also can be seen in the vivarium at the center of the *Frogs* show. Species featured in the exhibition include the green and black poison frog (*Dendrobates auratus*); bumblebee or yellow-banded poison frog (*Dendrobates leucomelas*); blue poison frog (*Dendrobates tinctorius*); and black-legged poison frog (*Phyllobates bicolor*). In the wild, about 180 species have been discovered so far, with more still being identified, and these charismatic amphibians always draw visitors in for a closer look.

“Most frogs have skin toxins, but dendrobatids are notable both for their small size and tremendous toxicity,” says Christopher Raxworthy, associate dean of science for education and exhibition and curator in the Department of Herpetology, who oversees the *Frogs* exhibition.

Impossible to miss due to their vibrant coloration, these frogs are tiny—averaging about 1.5 inches across. But while many small animals—such as certain rodents and frogs’ amphibian cousins, salamanders—evolved to be nocturnal in part to elude predators, these species are active during the day—a time, one might assume, when insects, snakes, birds, or other hungry animals can easily find them.

The blue poison frog, for instance, is so intensely bright that you’d think predators could easily spot it in the forest haunts in northern South America that it favors. As it happens, however, gaudy colors and patterns may often be used in the natural world—think butterflies or berries—to advertise to hungry predators that the bright species is unpalatable, perhaps even poisonous. Sometimes less toxic, or even non-toxic, species will evolve the unsubtly bright colors of the truly toxic of their kind. This type of mimicry may deter would-be hunters.

It has long been assumed that the dendrobatids’ bright

colors help to ward off animals that hope to eat them. A 2007 experiment in Costa Rica provides some hard evidence backing up the hypothesis. In the experiment, researchers created about 400 life-size clay models of a bright-red dendrobatid species and placed them outdoors. At the same time, they placed 400 decoy models of another small, dull-brown frog species. During the study, about 100 of the models were attacked in all, with the brown frog models attacked about twice as often as the colorful stand-ins. In other words, it seems, brighter coloration in dendrobatids really did ward off potential predators.

### The Source of their Poison

With a bright yellow body and black legs, *Phyllobates bicolor*—the black-legged poison frog—is the second-most poisonous frog among the dendrobatids. Like *Phyllobates terribilis*, the frog’s skin secretions have been used by the Emberá people to give blowgun-darts a lethal kick. To obtain the poison, Emberá hunters would first kill the frogs, then rub the darts along the animals’ backs to transfer their defensive toxins to the weapons.

How do these frogs make or obtain their poisonous qualities? Many toxic animals create their poisons through their own metabolic processes. But other species, including poisonous dendrobatids that are featured in *Frogs: A Chorus of Colors*, obtain the necessary chemicals via their diets.

Recent studies have found that invertebrates in the frogs’ diets—including certain mites, as well as ants, beetles, and millipedes—contain alkaloids that the frogs may then transform into the poison that oozes out of glands in their skin, especially when the animal is stressed or attacked.

For animals bred in captivity, these foods are easily replaced by non-toxic varieties, rendering frogs like the ones on exhibit harmless. “We feed the adult frogs two different species of fruit fly,” says Hazel Davies, associate director of living exhibits at the Museum. “We also feed them pinhead crickets and bean beetles, all to provide different movement patterns of the prey. All the insects are given to the frogs live—they need to see the prey moving in order for them to go after it.”

In the wild, the other intriguing question about this group of animals is how they are able to sequester these alkaloids—some of which are extremely toxic—while other frogs can’t. “Presumably,” says Taran Grant, a dendrobatid expert who teaches at the University of São Paulo and a former postdoctoral fellow, and now a research associate, at the Museum, “the ability to obtain, transport, and accumulate these alkaloids is genetic, as is the ability to resist their effects.”

Another way that dendrobatids may pass on their immunity to these toxic chemicals is through the reproductive process—not unlike human mothers passing antibodies through their milk to their babies. Almost every dendrobatid species lays eggs in leaf litter on land, which one or both parents protect until the eggs hatch. “At that point,” explains Grant, “it is usually the male that pokes his posterior into the gelatinous mass containing the eggs and allows the larvae to wriggle onto his back.” In most species, the father then transports the larvae to a body of water—be it a stream, plant, or even “water accumulated in a hoof print,” says Grant.

In at least two species of frog, including *Oophaga pumilio*

(strawberry poison frog), which make an appearance in *Frogs*, the larvae or tadpoles are fed the mother’s unfertilized eggs, which turn out to contain the same alkaloids found in the skin of the adult frogs. These chemicals are part of the frogs’ innate immune system, and it seems that the chemicals probably are passed from adults to the larvae.

As for the frogs visitors can see at the Museum this summer, luckily, their nontoxic diet does nothing to dull their dazzling hues. Against the backdrop of the dark-green foliage in the vivarium, they still look like living emeralds, rubies, star sapphires—jewels of the tropical rain forest transported to Manhattan. ☺

*Frogs: A Chorus of Colors* is now open. Member tickets are \$12.50 adults and \$8 children or free for Voyager-level Members and above.

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



### The Power of Poison Opens November 16

Intrigued by poison? Humans have marveled at the secrets of poisons and sought to harness their toxic powers for centuries. The Museum’s Fall 2013 special exhibition will explore both poison’s biological basics and the ways in which people have confronted its perils and potential.

Approaching poisons, venoms, and toxins from several different perspectives—as dynamic defense systems of animals locked in evolutionary arms races with predators; as a compelling thread that runs through familiar legends, myths, and fables; as a series of mysteries encountered, and solved, by 18th-century British explorers and 20th-century New York City forensics pioneers; and as a promising source for medical treatments — *The Power of Poison* brings this captivating topic into brilliant focus.

*The Power of Poison* is free for Members.

# A CLARION CALL FOR CONSERVATION

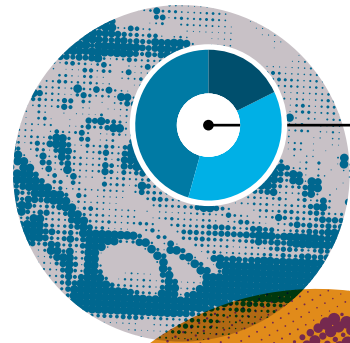
## AMPHIBIANS

6,374 Assessed

**30.3%**

### THREATENED

509 Critically Endangered  
767 Endangered  
657 Vulnerable



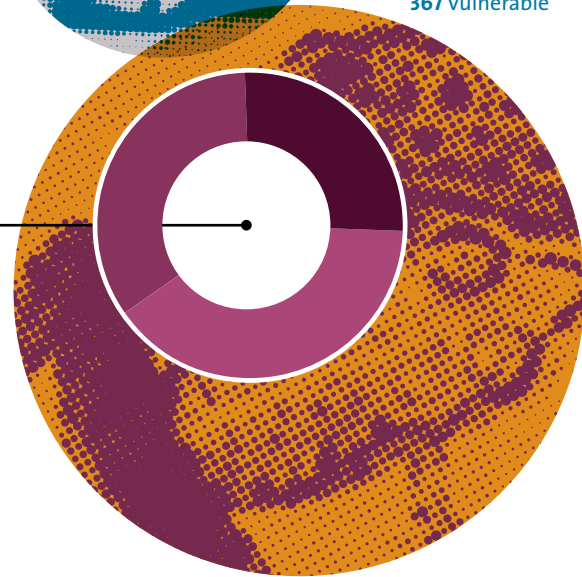
## REPTILES

3,755 Assessed

**21.5%**

### THREATENED

144 Critically Endangered  
296 Endangered  
367 Vulnerable



The current exhibition *Frogs: A Chorus of Colors* includes the story of a dramatic rescue mission: scientists airlifting 40 species of frogs from an area in the Panamanian rain forest just months before nearly all the remaining frogs were wiped out by a deadly fungus.

These rescued frogs, and many others like them, are now in a holding pattern in universities, zoos, museums, aquaria, and botanical gardens. The idea is to provide so-called “assurance colonies,” so that when the threat to a species in its natural environment is addressed it can be reintroduced.

Some 150 species are involved in such captive breeding programs around the world, according to Amphibian Ark, which coordinates these efforts internationally, with attempts to reintroduce some of them already under way. Still, the estimated need is immense. While numbers are complicated by the fact that newly discovered species are being named all the time, the current best estimate by conservation scientists is that more than 50 percent of known amphibian species that have been assessed for extinction risk are threatened, and, according to figures from the International Union for Conservation of Nature (IUCN) Red List Index, 509 species are critically endangered, including 104 that are possibly extinct. “The general trend so far has been that of decline,” says Ariadne Angulo, a Museum research associate and the Amphibian Red List Authority Coordinator for the IUCN Species Survival Commission.

The dramatic loss of amphibian populations is widely considered a leading indicator of a broader extinction event. Massive species loss on a global scale has not occurred since 65 million years ago, when nonavian dinosaurs and 70 percent

of all other species perished suddenly, likely in the aftermath of a large asteroid collision that dramatically altered Earth’s atmosphere. The fossil record shows at least four earlier mass extinction events; many scientists think they are witnessing the sixth today.

“Frogs are the canary in the coal mine,” says Museum Curator Darrel Frost, who maintains an online taxonomic catalog of the world’s living amphibians, a resource used by more than 8,000 researchers a month.

Frogs as a group are particularly sensitive to environmental changes as well as to waterborne pathogens. But worldwide threats to diversity are widening, especially in regions with narrow variations in temperature, and hence, very specific climate requirements of its denizens. According to the IUCN Red List of Threatened Species in fall 2012, one in five mammals, one in five reptiles, and more than one in ten birds are threatened with extinction. Recent research suggests that these rates—including the nearly one-in-three amphibians—are faster than or as fast as all rates that would have produced the five big extinctions over hundreds of thousands or millions of years.

“Everything is in trouble,” says Frost. “Now we are observing that small mammals, birds, even lizards are not there. But when it’s not quantified it’s easy to dispute. One of the problems is, it’s not like you wake up one day and they’re gone. We disputed

Illustration source: The IUCN Red List of Threatened Species. Version 2012.2.

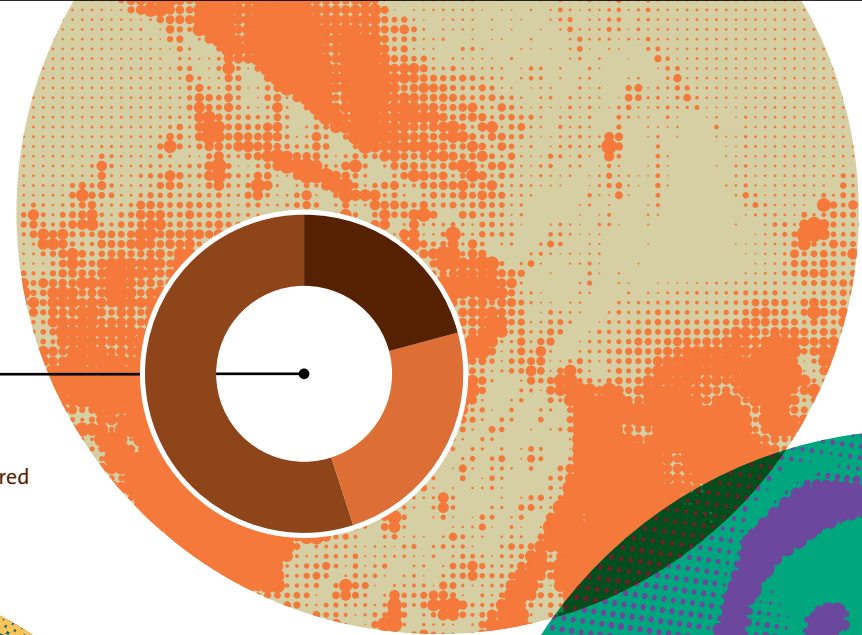
## RAY-FINNED FISHES

9,400 Assessed

**19.8%**

### THREATENED

389 Critically Endangered  
451 Endangered  
1,025 Vulnerable



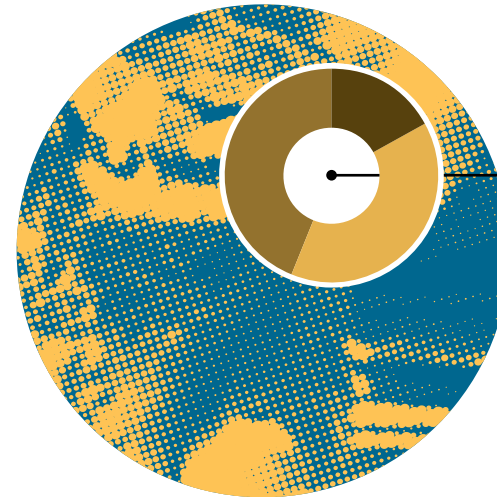
## MAMMALS

5,501 Assessed

**20.7%**

### THREATENED

196 Critically Endangered  
446 Endangered  
497 Vulnerable



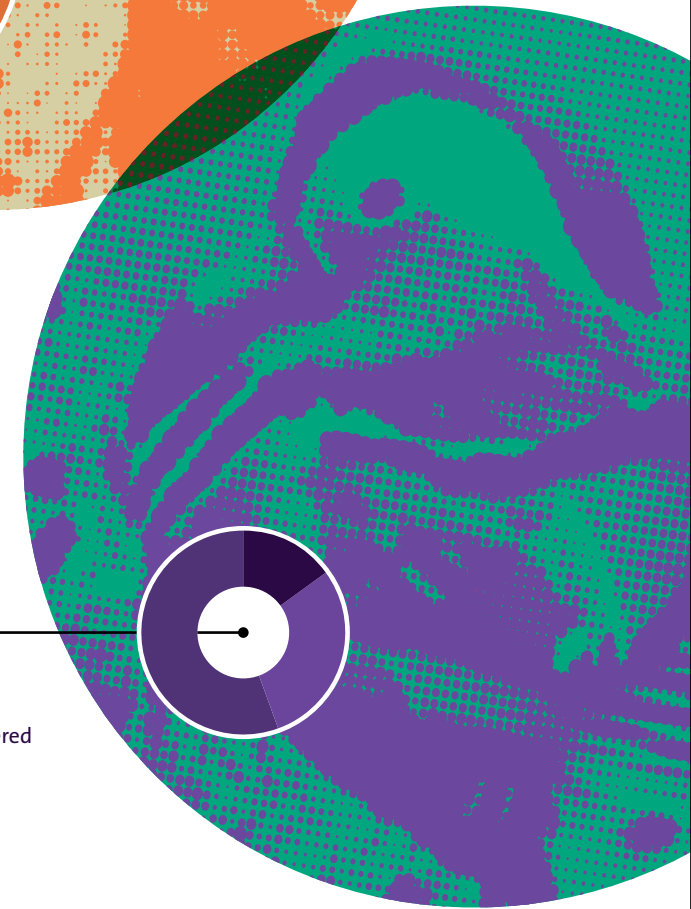
## BIRDS

10,064 Assessed

**13%**

### THREATENED

197 Critically Endangered  
389 Endangered  
727 Vulnerable



amphibian decline when it first happened, too. But now we have a whole generation of scientists who have grown up without ever hearing a grand chorus of frogs.”

Scientists began noticing sudden drops in certain frog species decades ago. As a graduate student in the 1970s, Frost himself was among the last people to see frogs from the species *Rana tarahumara* alive in the U.S. (A small population persists in Mexico’s Sierra Madre mountain ranges, well south of the U.S.)

“We came upon a pond full of dead or dying Tarahumaras,” Frost says, recalling a 1975 field trip in extreme southern Arizona with a fellow graduate student. “We picked up 15 or 16 of them and preserved them. That was it for that canyon and essentially for the entire U.S.”

At the time, Frost and his colleagues speculated that the cause was acid rain. But chytridiomycosis, a lethal and then little-known disease that has since spread around the world, appeared to be implicated. While it is caused by the fungus *Batrachochytrium dendrobatidis*, the exact origin of the disease is still unknown. It’s also unclear why it is a problem in some places and not others and, perhaps most important, there is no known way to eliminate it. Another unknown is the extent to which changes

in climate may have a role in weakening a species’ immune response, resulting in an epidemic. “There are a lot of big questions,” says Frost.

Devastating as chytridiomycosis appears to be in some populations, the main threat to amphibians and biodiversity generally is habitat loss and degradation from human encroachment. Other main factors are pollution and the accidental or sometimes deliberate introduction of predators or competitors.

In the latter case, sometimes the culprit is another frog: for example, the American bullfrog, which now threatens other frog species all over the world and often carries amphibian diseases new to the region in which it spreads. Moreover, says Frost, “They eat everything, and they breed like fruit flies.”

Still, occasionally there are welcome surprises. In late 2011, the Hula painted frog (*Discoglossus nigriventris*), a species declared extinct in 1996, was rediscovered alive in the Hula Valley of Israel, where it is now protected by law. And Holdridge’s toad (*Incilius holdridgei*), which was declared extinct in 2008, was rediscovered in the Cordillera Central of Costa Rica in 2009. 🌿

Illustration: ©AMNH/Hinterland

# MEET ME IN MADAGASCAR

With habitats ranging from lush rain forest to dry forest and arid scrublands, this nearly Texas-sized island off of the coast of east Africa has long been irresistible to naturalists. Nearly 85 percent of its vertebrate species, and about the same percentage of plant species, are endemic to the island—that is, found nowhere else on Earth. But today, the island's biodiversity is threatened from many sides: agriculture, illegal logging, and charcoal-making have encroached on fragile ecosystems. Over the past few decades, Museum scientists and students have carried out research throughout Madagascar and continue to study, and help conserve, this island's unique fauna.



**JOHN FLYNN**  
Frick Curator of Fossil Mammals, Division of Paleontology

In 1996, a team led by Dr. Flynn found their first fossils in Madagascar—jaw fragments of a variety of extinct reptiles, including parrot-beaked cousins of dinosaurs called rhynchosaurs, and skulls and skeletons of early relatives of mammals. During more than half a dozen subsequent expeditions, the team discovered many more vertebrate fossils from the Mesozoic Era (250 to 65 million years ago), during which both mammals and dinosaurs evolved and diversified.



**ROSS MACPHEE**  
Curator, Department of Mammalogy

In the 1980s, Dr. MacPhee studied recently extinct vertebrates, including dwarf hippos and giant elephant birds, on the island, part of his larger work on the causes of human-induced extinctions in island locales. At Anjohibe, a “tremendous cave system and one of the best paleo sites I’ve ever been to,” says MacPhee, he and others found “tons of fossils, including complete skeletons of several giant lemurs and hippos.”



**ANTONIA FLORIO**  
Research Associate; 2013 Graduate of the Museum's Richard Gilder Graduate School

In 2010, after collecting DNA evidence during a four-month trip, Dr. Florio discovered that three known chameleon species were actually seven distinct species. Active during the day, many chameleons roost at night. So Florio and other researchers collect them after dark using a headlamp to spot animals at the tips of blades of grass or branches of trees.



**JOHN SPARKS**  
Curator, Department of Ichthyology

In 2008 and 2011, Dr. Sparks and colleagues dove for blind cavefishes in caves in Ankarana Reserve on the north end of the island and in sinkholes in the southwest. “We got quite sick from swimming in that sinkhole [where we found a bizarre, fully pigmented new species],” says Sparks. As an homage of sorts, they gave the new species a name meaning “seriously ill” in Malagasy, the main language of the island.



**IAN TATTERSALL**  
Curator Emeritus, Division of Anthropology

An authority on human evolution, Dr. Tattersall is also considered a father of lemur biology. He spent several seasons in Madagascar studying these mammals and their social behavior. In 1982, he wrote a now-classic book on lemurs, called *The Primates of Madagascar*.



**CHRIS RAXWORTHY**  
Associate Curator, Department of Herpetology

In 1985, Dr. Raxworthy led a student expedition to the island, and he's returned nearly every year since. “There's so much to discover—it's like a jigsaw puzzle!” he says. He is methodically surveying the island's amphibians and reptiles, notably snakes, frogs, and chameleons. There are about 80 to 100 chameleon species on Madagascar, or two-thirds of all found worldwide.



**MELANIE STIASSNY**  
Axelrod Research Curator, Department of Ichthyology

In the 1980s and early '90s Dr. Stiassny and colleagues explored the evolution of Malagasy freshwater fishes. The team eventually located many new species, including the cichlid *Katria katria*, named for the Malagasy word for the fish.



**MARK SIDDALL**  
Curator, Division of Invertebrate Zoology

In 2002, Dr. Siddall and other researchers spent six weeks traveling the island, eventually identifying a new species of terrestrial leech, *Malagabdella niarchosorum*, named for the Stavros Niarchos Foundation, which supported the trip through its Constantine S. Niarchos Expedition Program. In wet places like Madagascar's rain forests, finding leeches is simple, says Siddall: keep “an eye out...on the backs, shoulders, arms, and legs” of the person in front of you.



**ELEANOR STERLING**  
Director of Center for Biodiversity and Conservation

In the 1980s, Dr. Sterling researched nocturnal primates called aye-ayes here. Today, she is collaborating with colleagues in Madagascar to help conserve the island's threatened species. (See p. 18 for more about her fieldwork and her essay about a 19th-century study of the aye-aye.)

Satellite images by Earthstar Geographics LLC

## 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 subscribe 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 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.

## JULY

### LeFrak IMAX Theater

Member tickets are **\$12.50** adults and **\$8** children, or **free** for Voyager-level Members and above.

### Flight of the Butterflies

**Closes Sunday, July 7**  
Accompany half a billion monarch butterflies on Earth's longest and most amazing insect migration, a 3,000-mile journey that begins in Canada and continues through the United States and Mexico. The stunning film also highlights the story of a true scientific adventure: Dr. Fred Urquhart's 40-year effort to trace the migration and discover the monarch butterflies' secret hideaway.

### Penguins

**Opens Monday, July 8**  
Written and narrated by Sir David Attenborough, this film follows a King Penguin on the perilous journey from youth to fatherhood, a rite of passage set on one of Earth's last great wildernesses.

### Roosevelt Island: Origins and History

**Thursday, July 11**  
**6–8 pm**  
**\$25**  
Geologist **Sidney Horenstein** leads an exclusive walking tour of Roosevelt Island in the East River. Horenstein will discuss the geological features of the island, the origin of the East River, and the history of the New York area.

### Evening Bat Walks in Central Park

**Friday, July 12, Friday, July 19, or Friday, July 26**  
**8:30 pm**  
**\$40** adults (**\$25** children ages 12 and under; minimum age 3)  
Join **Brad Klein, Danielle Gustafson**, and other members of the New York City Bat Group for a walk through Central Park. Aided by a detector that amplifies the bats' high-frequency chirps, bat watchers will encounter species that call the city home.

### Members-only Highlights Tours

**Sunday, July 21**  
(family-friendly tour)  
**10:30–11:30 am**  
**Free for Members**  
Families are invited to take part in a tour for adults and children alike. Experts will guide you through the Museum's halls to explore some family favorites. Registration required; call 212-769-5200.

### Journey to a Lost World

**Saturday, July 27**  
**9 am–4 pm**  
**\$90**  
Pack your collecting bag, old sneakers, and lunch, and travel back in time on an expedition with the Division of Palentology's Senior Scientific Assistant **Carl Mehling** to Big Brook in Monmouth County, New Jersey. The area offers a variety of invertebrate and vertebrate fossils from the Late Cretaceous period; plentiful fossils and diverse fauna make it an ideal spot for collecting.

## Exhibitions

*Admission is by timed entry only.*

### Whales: Giants of the Deep

**Free** for Members  
Come closer than ever to some of the mightiest, most massive, and mysterious marine mammals. *Whales: Giants of the Deep* features life-size models, interactive exhibits, films, and more than 20 whale skulls and skeletons.

### Our Global Kitchen: Food, Nature, Culture

Open through **Sunday, August 11**  
**Free** for Members  
Celebrate culture 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.

### Frogs: A Chorus of Colors

Member tickets are **\$12.50** adults and **\$8** children, or **free** for Voyager-level Members and above. This popular live-animal exhibit explores the colorful and richly diverse world of frogs.

### Winged Tapestries: Moths at Large

**Free** for Members  
Witness the arresting beauty of night-flying moths in more than 30 large-format prints.

### Hayden Planetarium Space Show: Journey to the Stars

Don't miss! Closes this fall. Member tickets are **\$12.50** adults, **\$8** children  
*Journey to the Stars* launches viewers through time and space to experience the life and death of the stars in our night sky.

### Grand Tour of the Universe

**Tuesday, July 30**  
**6:30 pm**  
**\$13.50**  
Tour the universe in the dome of the Hayden Planetarium, with visualizations based on the comprehensive Digital Universe Atlas, a scientifically accurate, three dimensional map of the cosmos.

## AUGUST

### Walk over George Washington Bridge

**Thursday, August 1**  
**6–8pm**  
**\$25**  
This walking tour with **Sidney Horenstein** takes us over the George Washington Bridge and into the famous Palisades at Ft. Lee Park. Enjoy stunning vistas of both New York City and New Jersey, and learn about the geological origins and historical significance of surrounding sites.

### Sail on Clearwater

**Saturday, August 3**  
**6–9 pm**  
**\$75** per person  
Bring the family and embark on a three-hour 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.

### Members-only Sleepover

**Saturday, August 10, to Sunday, August 11**  
**6 pm–9 am,**  
**\$135**  
Join us for a special Night at the Museum Sleepover exclusively for Members. Visit our special exhibitions and engage in a variety of crafts and activities. On this night for Members, enjoy special presentations, meet scientific staff, and take home a complimentary gift for each child. *For children ages 6-13 and their caregivers. Evening snack and light breakfast, sleeping cots provided.*

### Members-only Highlights Tours

**Saturday, August 17**  
**3–4:30 pm**  
**Free**  
Join one of our knowledgeable guides for a tour of the Museum's most popular specimens, objects, and displays. Registration required; call 212-769-5200.

### Journey to a Lost World

**Saturday, August 24**  
**9 am–4 pm**  
**\$90**  
Pack your collecting bag, old sneakers, and lunch, and travel back in time on an expedition with paleontologist **Paul Nascimbene** to Big Brook in Monmouth County, New Jersey. The area offers a variety of invertebrate and vertebrate fossils from the Late Cretaceous period; plentiful fossils and diverse fauna make it an ideal spot for collecting.

### Planets, Science, Mythology, and Music

**Tuesday, August 27**  
**6:30 pm**  
**\$13.50**  
Orient yourself to the night sky by listening to music composed to represent the planets, learning the familiar zodiac constellations—and hearing mythological tales about night-sky objects, too.

## SEPTEMBER AND BEYOND

### Birding at Brigantine

**Saturday, September 14**  
**8 am–6 pm**  
**\$90** per person  
Grab your binoculars, put on your hiking shoes, and join ornithologist **Paul Sweet** for a day of birding at Brigantine National Wildlife Refuge in southern New Jersey. See migrating shorebirds in breeding plumage as well as resident breeding species of the coastal salt marshes such as herons, skimmers, and terns. *Includes transportation by private coach.*

### Credits

Whales: Giants of the Deep was developed and presented by the *Museum of New Zealand Te Papa Tongarewa*. This exhibition was made possible through the support of the *New Zealand Government*.

The *American Museum of Natural History* gratefully acknowledges the **Richard and Karen LeFrak Exhibition and Education Fund**.

Generous support for Whales has been provided by the *Eileen P. Bernard Exhibition Fund*.

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

Additional support for Our Global Kitchen and its related educational and online resources has been provided by **GRACE Communications Foundation**.

The Kitchen Experience in Our Global Kitchen is presented by **Whole Foods Market**.

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

Winged Tapestries: Moths at Large, featuring the art of *Jim des Rivières*, is produced by the *Canadian Museum of Nature, Ottawa, Canada*.

The presentation of *Winged Tapestries at the American Museum of Natural History* is made possible by the generosity of the *Arthur Ross Foundation*.

*Credits continue on page 16*



**Member Excursion to Brooklyn Grange**

**Saturday, September 21**  
**10 am-noon**  
**\$25 per person**  
 Discover a farming system above our heads: Brooklyn Grange rooftop organic farm in Long Island City, Queens. Join a Museum Members' tour of the facilities and learn about the farm's history, daily operations, sustainable design, and environmental benefits. Then, enjoy a special workshop and tasting. *Recommended for children 10 and older. Note: Tour will meet at Brooklyn Grange.*

**Earth as a Peppercorn: A Scale Walk of the Solar System**

**Saturday, September 21**  
**11 am**  
**Free for Members**  
 Can you picture the size of the solar system? Join a team of tour guides for a journey around the Museum on a scale walk of the solar system, on which Earth is the size of a peppercorn, the Sun is the size of a soccer ball, and each step covers more than 5 million miles. Hear about each of the planets and other parts of the solar system and learn about our home in the cosmos.

**Family Highlights Tour Sunday, September 22**

**3-4:30 pm**  
**Free**  
 Families are invited to take part in a Museum tour with an expert who will guide you through the halls to explore some family favorites. Registration required; call 212-769-5200.

**Behind the Scenes in Live Exhibits**

**Tuesday, October 1**  
**6:30-7:30 pm**  
 (family-friendly tour)  
**7-8 pm and 7:30-8:30 pm**  
**\$35 per person**  
 Go behind the scenes of with Associate Director of Living Exhibits **Hazel Davies** and learn more about the biology and care of the animals featured in the Museum's live exhibits. Then, enjoy a visit to *Frogs: A Chorus of Colors* and learn about how the Museum puts together such exhibitions.

**Credits**

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

*Additional support provided by the Schaffner Family.*

*Credits continue from page 15*

*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.*



**Find New Favorites to Explore with Kids' Guide and Activity Book**

Every Member has a favorite spot in the Museum. Perhaps it's the majestic slice of a giant sequoia on display in the Hall of North American Forests, or the ferocious Komodo dragons keeping watch in the Hall of Reptiles and Amphibians. As for younger Members, there's a good chance that their preferred route goes directly to the fourth-floor Fossil Halls.

Of course, there are always new favorites just waiting to be discovered, and the Museum's new guide and activity book *Explore!* helps families do just that. Just open to any page to find fun facts, inside scoops about scientists and exhibits, and activities for children to complete on their visit—including a scavenger hunt for each hall.

After learning about the Māori culture in *Whales: Giants of the Deep*, take *Explore!* to the Margaret Mead Hall of Pacific Peoples, where exhibits include a Māori pataka, or storage house, as well as artifacts from other Pacific cultures such as shadow puppets from Java and navigation charts from Micronesia.

Or take an afternoon to walk the mezzanine in the Milstein Hall of Ocean Life to spot remarkable marine animals, from a deep-sea fish shining red light to see its prey to giant tubeworms that live around vents where hot, mineral-rich water spews through cracks in the sea floor. Along the way, *Explore!* suggests additional activities that children can complete once home by following a special link to the Museum's website: creating a colorful coral reef, making a mask or puppet, or decorating a pottery artifact.

**Upgrade your family membership to a higher level and receive *Explore!* The Official Guide and Activity Book to enjoy as a family on upcoming visits. Call 212-769-5606 or visit [amnh.org/upgrade-today](http://amnh.org/upgrade-today).**

© AMNH/D. Finnin

**Whale Watching in the Museum**

Few visitors miss the 94-foot blue whale model in the Milstein Family Hall of Ocean Life—but did you know that there are whale specimens, artifacts, and even namesakes, such as the whale shark, found in exhibits on all four floors of the Museum?

This summer, enjoy an afternoon of whale watching inside the Museum on a self-guided tour inspired by the special exhibition *Whales: Giants of the Deep*. Featuring 15 stops in seven permanent exhibition galleries, the Whales tour includes exhibits that focus on whale evolution and diversity as well as others featuring cultural artifacts that reflect the important role these magnificent mammals have played in human communities around the world, from Siberia to southern South America. Along the way, brief descriptions highlight facts about various species, introduce important Museum scientists and collectors, and point to additional exhibits to explore.



Take the tour by visiting the Museum's website, [amnh.org](http://amnh.org), where the Whales tour is listed in the Plan Your Visit section under "Popular Tours," or on the Museum's AMNH Explorer app, updated for iOS 6, under "Museum Tours."



# An Obsession with Oddity

## Sir Richard Owen and the Aye-Aye

The last of a four-part series, the following essay is excerpted from *Natural Histories: Extraordinary Rare Book Selections from the American Museum of Natural History Library* (Sterling Signature, 2012), edited by Tom Baione, the Museum Library's director. It highlights the role of a rare 19th-century monograph in advancing science.

By Eleanor Sterling

Victorian England was an exciting time for biologists with sufficient information to synthesize an ever-growing set of observations on the morphology, behavior, and distribution of plants and animals, with the goal of refining categories and delimiting species and their relationships to one another. An increasing number of explorers were also on the hunt for odd organisms that defied categorization, or at least tested the boundaries. Arguments between passionate scientists aired not just in meetings and written proceedings, but also in the popular press. Sir Richard Owen was at the epicenter of many of the crucial debates of the time.

An accomplished naturalist with a six-decade career, more than 600 scientific papers, and a stint as a biology tutor to Queen Victoria's children, Owen is probably best known today for having coined the term “dinosaur,” but his work on primates was unsurpassed at its time. Owen was particularly taken with an unusual primate, the aye-aye (*Daubentonia madagascariensis*), which is found only on the island nation of Madagascar. For the first 100 years after the first aye-aye was brought to Europe in the 1780s, debate swirled over whether it was a rodent, a primate, or most closely related to a kangaroo. The root of this confusion lay in the aye-aye's odd collection of behavioral and morphological traits that make it appear to be composed of spare parts of other animals: continuously growing front teeth, batlike ears, a foxlike tail, abdominal mammary glands, claws on most digits, and spindly, dexterous middle fingers. It uses its middle finger to tap along a branch and moves its ears forward and back to help locate hollow channels within the wood created by wood-boring insect larvae. Once it detects a channel, the aye-aye uses its specialized front teeth to pry open the wood and then inserts one of its fingers to extract the larvae.

Owen put arguments about the aye-aye's taxonomy to rest in 1865 with his elegant and, at times, lyrical *Monograph on the Aye-Aye* (*Chiromys madagascariensis*, Cuvier), which opens with a description of the history of scientific study of the aye-aye and moves to a painstakingly detailed description of its anatomy. This description focuses attention away from the striking unusual characteristics, like the continuously growing teeth, and toward primate-like characteristics such as forward-facing eyes and an opposable thumb, providing firm evidence for why the aye-aye should be classified as a primate.

Stunningly beautiful hand-colored lithographic illustrations of the pelage (coat), skeleton, and unusual morphological features accompany the text. The illustrator, Joseph Wolf, was one of the most accomplished of animal painters. He not only studied the alcohol specimen that Owen had received in 1859 but also watched the activities of a young female aye-aye in the London Zoo. The aye-aye is a nocturnal creature, which meant that Wolf had to observe the animal at night by candlelight. Mirroring Owen's emphasis on both anatomy and behavior, Wolf captured the mannerisms of the animals in his depictions of aye-ayes looking for insect larvae or traveling along a branch.

Owen paired his observations on the aye-aye's unusual anatomy with accounts of its behavior to narrate a story of a tight relationship between physical and behavioral traits—what he called “perfect adaptations of particular mechanical instruments to particular functions—of feet to grasp, of teeth to erode, of a digit to feel and to extract.” He further notes a suite of interrelated modifications: “of eyes to catch the least glimmer of light, of ears to detect the feeblest grating of sound, the whole determining a compound mechanism to the perfect performance of a particular kind of work.” He stirred controversy by using the synchrony of these adaptations to bolster his case against Lamarckian inheritance, as well as Darwinian evolution. While Owen participated critically in these debates, with this monograph a prime example, his primary focus continued to be on the establishment of the National Museum of Natural History in London, an endeavor he finally accomplished in 1881.

Dr. Eleanor Sterling is director of the Museum's Center for Biodiversity and Conservation.



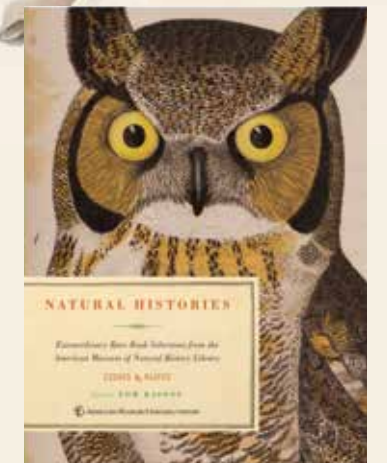
### Stories From the Field

In the mid-1980s, Dr. Sterling spent two years living out of a tent on an uninhabited island in Madagascar's northeastern Bay of Antongil studying these nocturnal primates.

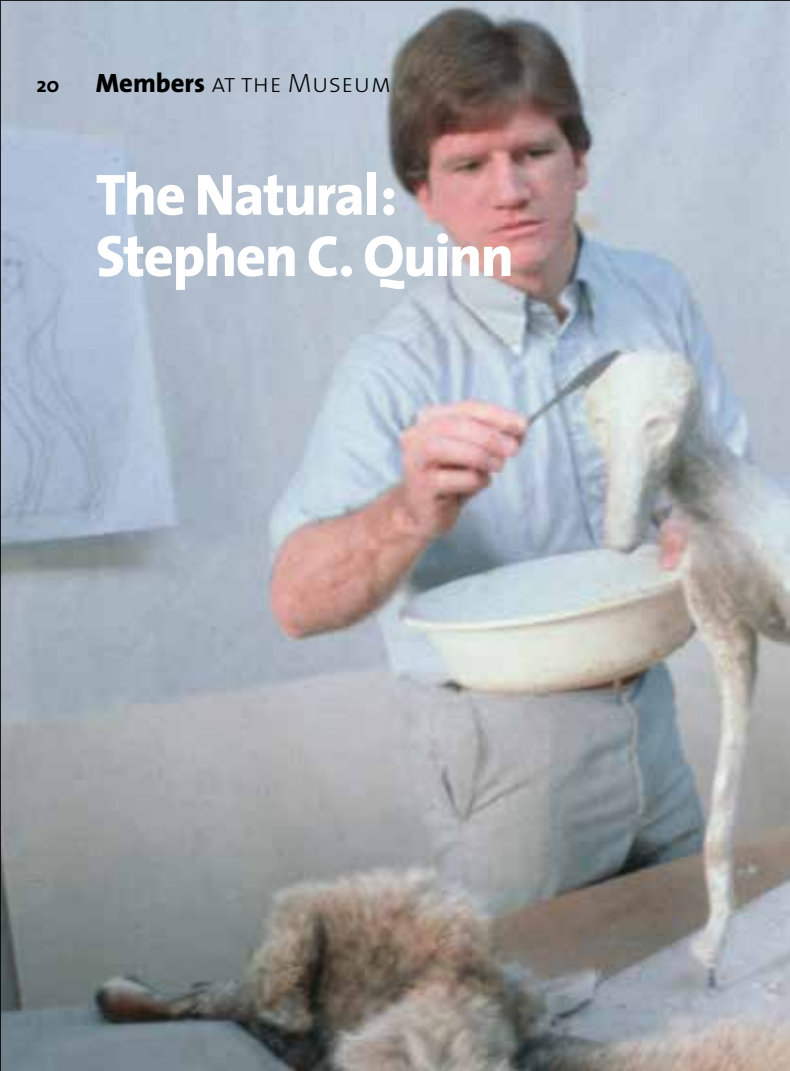
Among the largest lemurs—weighing more than 4 pounds as adults—aye-ayes have long, thin middle fingers, which, as Sterling observed on nighttime tracking tramps, help them to tap dead wood to find larvae of insects that are as fleshy as

large shrimp. Such rich food enables them to support their large brains: aye-ayes have the highest brain-to-body size ratio of any lemur.

These days, Sterling and colleagues at the Museum's Center for Biodiversity and Conservation are helping to train Madagascar's conservation corps, part of an effort to assist in conserving the numerous species found nowhere else on Earth.



## The Natural: Stephen C. Quinn



(L): Steve Quinn, who joined the Museum in 1974, sculpted many models during his career.

(Middle) Quinn sketches the backdrop for the Ellesmere Island diorama in *Extreme Mammals* in 2009.

(R) As one of his final projects this spring, Quinn, who retired from the Exhibition Department in March, painted a mural that will be featured in the Fall 2013 special exhibition *The Power of Poison*.

If anyone was born to work at the American Museum of Natural History, it is Stephen C. Quinn, who retired this spring after 39 years as an artist in the Department of Exhibition. He grew up in Ridgefield Park, New Jersey, not far from the birthplace of Frank Chapman, the Museum's noted early curator of birds, in West Englewood. He developed his own passion for birds, identifying and sketching them while roaming what were then the wild marshes of the Hackensack Meadowlands with his older brother, John, who would become a nature artist and museum preparator at the Academy of Natural Sciences in Philadelphia. And Quinn family trips into New York City more often than not included the Museum, where at age 4, family folklore has it, young Steve pointed to the elephants in the Akeley Hall of African Mammals and announced, "This is where I want to work!"

Quinn feels the affinity as strongly today as he did then.

"I'm the kid this Museum was designed for," he says. "If ever there was a kid who took the bait, hook, line, and sinker, it was me. The Museum without a doubt validated my own passions in nature."

Members likely know Quinn for his behind-the-scenes tours of the Museum's dioramas; his wonderful book on the subject, *Windows on Nature: The Great Habitat Dioramas of the American Museum of Natural History*; the seasonal bird walks through Central Park that he led for 32 years; and his popular series of animal drawing classes that took place after-hours in the Museum's halls. Whether they knew it or not, most visitors to the Museum also have seen his work, most recently in the

major renovation of the Jill and Lewis Bernard Family Hall of North American Mammals and, over the years, in luminous background paintings for many spectacular dioramas in special exhibitions. In each of these endeavors, whether he was painting Emperor Penguins lit by the beautiful *aurora australis* for *Race to the End of the Earth* (2010) or the forests of 50 million years ago in what is now Canada for *Extreme Mammals* (2009), just to cite a few recent examples, Quinn's goal was to ignite each viewer's personal passion for the natural world.

"One of my most pleasurable tasks for the Museum was to act as an ambassador for nature," he says. "To make the connection, see the lights go on. It's so exciting to be part of that awakening. And the thing is it's not that difficult to do."

Quinn came to the Museum fresh from art school in 1974. He had met Lamont Curator of Birds Dean Amadon and ornithologist John Bull while researching Mallard ducks, Merlins, and various sandpipers in the Museum's Department of Ornithology for his senior portfolio. Amadon and Bull encouraged him to apply for a job with Exhibition, launching a career that included a host of additional mentors: Farida Wiley, a longtime Museum educator and bird guide whose Central Park bird walks Quinn inherited in the 1980s; David Schwendeman, a master taxidermist; Raymond deLucia, foreground artist responsible for many beautiful scenes in the Bernard Family Hall of North American Mammals, among others; and Robert Kane, background painter. Quinn feels particularly gratified to have been able to return the favor, training a new generation by "mentoring younger artists in the

diorama arts I was hired to learn in the '70s."

In retirement, Quinn plans to paint murals in his home studio, work with his wife, Linda, to establish a wildlife habitat adjacent to their home, and continue to advance conservation through such organizations as Artists for Conservation, The Society of Animal Artists, Salmagundi Club, Boone and Crockett Club, and The Explorers Club. He will maintain a connection with the Museum as an "exhibition associate," returning now and then for special projects.

Asked to name his favorite diorama, Quinn answers without hesitation that it is the mountain gorilla diorama in the Akeley Hall of African Mammals. Members may remember reading in *Rotunda* about his 2010 trip to the Congo to do a plein-air painting of the diorama's background as it looks today. (Aptly, the Museum's retirement gift to him was a signed edition of Akeley's book *In Brightest Africa*.) Quinn notes Akeley's success not just in raising public awareness through the diorama but lobbying King Albert of Belgium in 1925 to create Africa's first national park, which, expanded, is now the last hope for the survival of the gorilla.

"It was such a pivotal time with key figures, people like Carl Akeley, Theodore Roosevelt, Frank Chapman, great visionaries whose thought and efforts really drove conservation," says Quinn of the early 20th century.

So does he feel he has been a link in that chain?

"I do," he says. "Everyone who works at the American Museum of Natural History should feel that link." 🌿

Photos courtesy of S. Quinn and ©AMNH/D. Finnin



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1. Mike and Nina Patterson arrive at this year's spectacular Museum Dance, held on April 18.  
2. Claire Bernard, who was a Chairman of the 23rd Annual Environmental Lecture and Luncheon, addressed the gathering on April 24.

3. Ivanka Trump, one of the Chairmen for this year's Museum Dance, with Laura Remington Platt, who wore a dress by Roberto Cavalli, the sponsor of the event.  
4. Dana Wallach Jones and Michael T.M. Jones were among the Chairmen for this year's Museum's Dance.

5. Susan Rudin, second from right, and friends attended the 23rd Annual Environmental Lecture and Luncheon, which focused on the resilience and recovery of island ecosystems.

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

## Save the Date! Upcoming Events at the Museum

### OCTOBER

10/5 A spectacular new **Hayden Planetarium Space Show** explores a new age of discovery in the cosmos—and how we know what we know about dark matter, dark energy, and more.

10/12 As the days grow shorter and temperatures start to drop, *The Butterfly Conservatory* returns with **more than 500 live, free-flying tropical butterflies** in a vivarium featuring live flowering plants.

10/19 Enjoy a **new exhibition** inspired by the book *Natural Histories: Extraordinary Rare Book Selections from the American Museum of Natural History Library*, which will feature more than 20 reproductions of rare, beautifully illustrated scientific works from the Museum's collection.

10/17–10/20 The annual **Margaret Mead Film Festival** returns with international documentaries, performances, intimate conversations with filmmakers, and more.

10/23 The **Twentieth Annual Family Party** features entertainment and hands-on activities, including activities in the Museum Science Center, for children of all ages. Please call 212-313-7161 for event and ticket information.

10/31 Trick-or-treat in the Museum's halls for the annual **Halloween Celebration**, which features live performances, roaming cartoon characters, hands-on activities, and more.

### NOVEMBER

11/14 Members are invited to an **exclusive preview of *The Power of Poison***, an intriguing new exhibition that explores venoms and poisons in nature, folklore and mythology, and in powerful medicines.

11/16 *The Power of Poison*, which is free for Members, opens to the public.

11/21 The dazzling **Museum Gala** helps support the Museum's scientific and educational work. For ticket information, please call 212-313-7161.

11/25 The delightfully decorated **Origami Holiday Tree** returns to mark the start of the joyous season at the Museum.

11/28 The Museum is **closed for Thanksgiving**



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1. The 2013 Isaac Asimov Memorial Debate took place on March 20 in the LeFrak Theater.  
2. Milstein Science Series: Island Life on April 14 featured live animals.  
3. On March 21, Members enjoyed a preview of the special exhibition *Whales: Giants of the Deep*.

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

Central Park West at 79th Street  
New York, New York 10024-5192  
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Several kinds of vibrantly colored dart-poison frogs are among more than 20 species now featured in the Museum's live-animal exhibition *Frogs: A Chorus of Colors*.

### 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, Whale 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.