

ACADEMY

FRONTIERS

INSIDE:
Why Dioramas Matter

The member magazine of the
Academy of Natural Sciences
of Drexel University

WINTER 2018



ACADEMY GREETINGS

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Academy membership includes a subscription to *Academy Frontiers*, free general admission to the museum, discounts in the Academy Shop and Academy Café, invitations to special events and exhibit openings, and much more.

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ON THE COVER: The Takin diorama opened in 1935 with animals and plants collected by the Dolan West China Expedition. It is undergoing renovations this spring. Photo by Bruce Tepper/ANS.

Greetings,

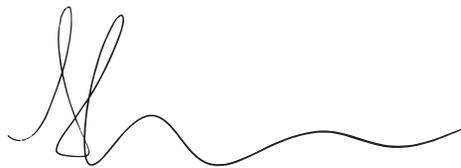
For the past three months, I have been getting to know our staff, our volunteers, and you, our committed members. I have sincerely enjoyed hearing your stories of the Academy's past, and especially your aspirations for the Academy's future. It is my goal to help the Academy articulate a clear, concise vision for moving forward—one that expresses how we will stand out and make a difference in our community. Our work must create a better understanding of our environment and a desire to protect our changing world.

The Academy is especially strong in ecosystem science—in truly understanding how all elements of an ecological community interact and how they have been affected by human activities. This knowledge helps us to preserve our ecosystems for future generations. The Academy's habitat dioramas are microcosms of a few of our planet's many ecosystems. They help our visitors comprehend the relationships between living organisms and their environments. This year we are renovating two of our most important dioramas, the takin and the gorilla. On pages 8 to 11, we're answering some frequently asked questions about this work almost 100 years in the making.

As you explore this issue of *Academy Frontiers*, you will see the wide-reaching impacts of our ecosystem work, including foundational research that helps ensure access to clean water. For decades, Academy scientists have been conducting research to learn about the structural and functional characteristics of our watersheds and how they influence how people, animals, and plants coexist. Thanks to the generosity of the Dolan Family (pages 14–15), the Academy has established a fund to help build upon its vibrant legacy of watershed science through proactive research that will help us prepare for the future.

I have much to look forward to here at the Academy, and I'm grateful to be at the helm of this institution. Thank you all for your warmth in welcoming me as your new president and CEO. It is thanks to the dedication of our staff and volunteers and the support and trust of members like you that we can make a real difference for our world.

Sincerely,



Scott Cooper, President and CEO



FOUNDED IN 1812, the Academy of Natural Sciences of Drexel University is a leading natural history museum dedicated to advancing research, education, and public engagement in biodiversity and environmental science.



Bruce Tepper/ANS

FEATURE

8 DIORAMAS

What They Are and Why They Matter

Glaziers from Paul Rabinowitz Glass Co. Inc. remove a 12' x 7' panel from the Academy's Takin diorama. This diorama, along with the Academy's Gorilla diorama, will be thoroughly cleaned and renovated this spring, and visitors are invited to watch the work unfold.

VISIT ansp.org for project details, videos, and schedules.

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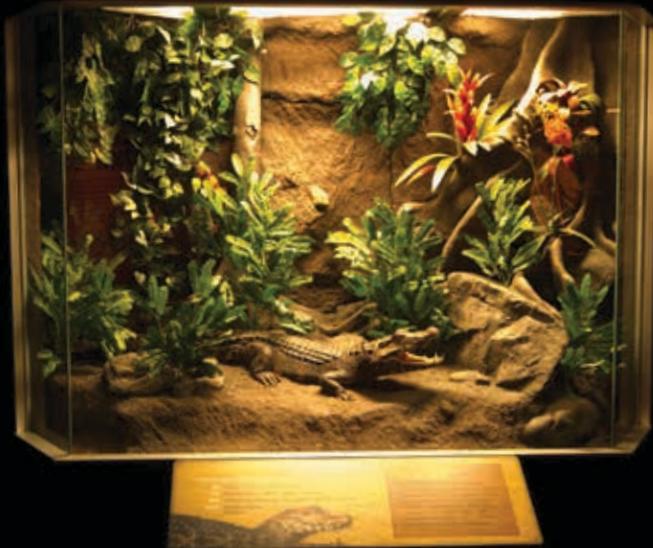
CROCS

ANCIENT PREDATORS IN A MODERN WORLD

OPEN THROUGH MAY 6, 2018

SPECIAL EXHIBITS GALLERY

Come face-to-snout with live crocodylians, a group of reptiles that has evolved and thrived for 200 million years thanks to their brute strength, keen senses, and murderous instincts. Check out live species, including the broad-snouted caiman, the Siamese crocodile, the West African dwarf crocodile, and the American alligator. Learn to speak croc in under five minutes, test your strength against a croc's bite, view skulls, make water dance, and create a 3-D animation of a long-extinct croc. Get the facts on croc attacks, and understand how humans and crocs can coexist today and in the future.



MARCH

*CROCS: ANCIENT PREDATORS IN A MODERN WORLD**
Open through May 6 

PALEOPALOOZA

Saturday and Sunday, March 3–4, 10 a.m.–5 p.m. 

TINY TOT EXPLORERS

Select Wednesdays through April 25, 11 a.m.  

LIFE AFTER WINS

Thursday, March 15, 3–6 p.m. 

MUFFINS WITH MARTY

Saturday, March 17, 9 a.m.  

SCIENTIST SATURDAY

Saturday, March 17, 1–4 p.m. 

NIGHT IN THE MUSEUM

Saturday, March 17, 6:30 p.m.–Sunday, March 18, 9 a.m.  

FOUNDERS' DAY, FREE ADMISSION

Wednesday, March 21, 10 a.m.–4:30 p.m. 

DREXEL INSITES

Wednesday, March 21, 6–8 p.m.  

MUSEUM OPEN LATE PLUS INDOOR BEER GARDEN

Friday, March 23, 5–8 p.m. 

SPRING BREAK CAMP

March 29–30 and April 2–4  

MARCH OF THE MOOSE

Story times and other Marty-themed activities are happening throughout the month of March.

Turn to pages 12 and 13 for details!

A photograph of a person wearing a blue t-shirt and holding a large, brown moose puppet head. The person is standing next to a white sign that has handwritten text on it. The sign reads: "Dear Marty, What is your favorite book to read?". The person's hand is visible, holding the puppet head.

CALENDAR OF EVENTS

APRIL

ANIMAL SUPERHERO WEEKENDS

Saturday and Sunday, April 7–8 and 14–15 **M**

SPECIAL SUPERHERO PROGRAMMING IN *OUTSIDE IN*

Monday–Friday, April 9–13, 10 a.m.–4:30 p.m. **M**

SPRING FORWARD

Tuesday, April 10, 6–8 p.m.  

ACADEMY TOWN SQUARE:

HOW THE URBAN JUNGLE DRIVES EVOLUTION

Wednesday, April 11, 6:30 p.m. 

DOOR 19: OFF THE HOOK

Thursday, April 12, 6–9 p.m.  

MORNINGS AT THE MUSEUM

Sunday, April 15, 9–11 a.m.  

SCIENTIST SATURDAY

Saturday, April 21, 1–4 p.m. **M**

NIGHT IN THE MUSEUM

Saturday, April 21, 6:30 p.m.–Sunday, April 22, 9 a.m.  

MUSEUM OPEN LATE PLUS INDOOR BEER GARDEN

Friday, April 27, 5–8 p.m. **M**

PHILADELPHIA SCIENCE CARNIVAL

Saturday, April 28, 10 a.m.–4 p.m. **M**

MAY

CROCS CLOSING WEEKEND*

Saturday and Sunday, May 5–6, 10 a.m.–5 p.m.

WINS 35

Wednesday, May 9, 5 p.m.  

SCIENTIST SATURDAY

Saturday, May 19, 1–4 p.m. **M**

XTREME BUGS OPENS*

May 26, 2018

MUSEUM OPEN LATE PLUS BEER GARDEN

Friday, May 25, 5–8 p.m. **M**

JUNE

MEMBER OPENING: XTREME BUGS

Friday, June 1, 5:30–9 p.m. **M** 

DOOR 19: BOOZY BOTANICALS

Thursday, June 14, 6–9 p.m.  

SCIENTIST SATURDAY

Saturday, June 16, 1–4 p.m. **M**

MUSEUM OPEN LATE PLUS BEER GARDEN

Friday, June 22, 5–8 p.m. **M**

ON EXHIBIT



MAY 26, 2018–JANUARY 21, 2019

Xtreme Bugs

SPECIAL EXHIBITS GALLERY

Come face-to-feet with nearly 20 massive, colorful, moving bugs! From a fluttering oversized monarch butterfly and a fluffy tri-colored bumblebee to a gigantic Madagascar hissing cockroach and a blood-sucking bedbug, these towering animatronics tell a rarely seen story of the behaviors and intricacies of extreme bugs. Get a bug's-eye view of the world, explore critter calls, dig for ancient arthropods, and play an extreme bug facts game. Each day, meet a live critter during bug encounters, and find out what makes these critters so incredible.

PRESENTING SPONSOR:



Xtreme Bugs is also supported by a generous donation from VWR Charitable Foundation.

M Free for members

\$ Fee

 Registration required

 EXCLUSIVE ACCESS:
Invitation only



Unless otherwise noted, all events held at the Academy are free with museum admission.

Visit ansp.org for more information or to register.

* Fee for *Crocs* and *Xtreme Bugs*. Family Plus level members and above see these exhibits for free.

Purchase, upgrade, or renew your membership today at ansp.org/membership.

Dino-Era Plant Found Alive

Imagine you're at work and suddenly, a cheetah pokes its head through your window.

That's about what Richard McCourt, PhD, and his colleagues dealt with when they came across *Lychnothamnus barbatus*, a large green alga that was thought to have died in the Western Hemisphere long before the cheetahs here died out.

"This means mainly that we don't know as much about what's out there as we could," says McCourt, associate curator of botany at the Academy of Natural Sciences of Drexel University and professor in the University's College of Arts and Sciences. "*Lychnothamnus barbatus*' survival isn't, per se, ecologically earth-shaking, but it changes our view of what the algal flora of North America is composed of and inspires us to keep hunting for more new finds."

A paper on the find, featuring mapping and analysis by the Academy's John D. Hall, PhD, and lead-authored by Kenneth Karol, PhD, of the New York Botanical Garden, was published in the *American Journal of Botany's* July issue.

Samples of the algae were taken from 14 lakes across Wisconsin—as well as two in Minnesota—between 2012 and 2016. Collectors knew they hadn't seen it in North America before.

Previously, the only record of *Lychnothamnus barbatus* on the western side of the Atlantic Ocean were Argentinian Cretaceous-era fossils.

"Almost right away we knew we might be dealing with something previously thought to be extinct because it was clearly different from any other species seen in North America," says McCourt, who helped identify the samples after they were collected. "But we had to look at it closely to confirm the identity and also extract the DNA to confirm."

Much like cheetahs, *Lychnothamnus barbatus* is relatively rare in the areas it is currently found. A "stonewort" type of algae, it is known to inhabit areas of Europe and Australasia (the area of Australia, New Zealand, and Papua New Guinea).



Photos by Paul Skawinski, University of Wisconsin Extension

But this species actually grows relatively tall (1 foot) and has a pretty distinct shape. So why was it being missed?

"We might not have been missing it—it might be a new invader," McCourt explains.

Then how could it have made the trip to not just North America, but the Midwest?

"Other species like it have probably been brought in ballast water on ships and released into the St. Lawrence seaway or other lakes," McCourt says.

The possibility remains that *Lychnothamnus barbatus* has always been here and we just didn't know.

"If it went unnoticed, it is probably due to the fact that much of what is in lakes and streams is not thoroughly examined, despite centuries of collecting," McCourt says. "We need more feet on the ground, hands in the water, collecting."

And while there were 16 locations in the Midwest that *Lychnothamnus barbatus* was pulled from, there is the possibility that this dinosaur-era plant may have survived into our era elsewhere in North America.

"We are keeping an eye out, but it's generally in the kinds of habitats that we collect for the other stonewort species that are known to be in America," McCourt says. "So if it's there, we will find out by looking in the right places. The trouble is, we don't know where the right places are." ~Frank Otto



Mike Servedio/ANS

Digging for Fossils at Summer Camp

It's the second Wednesday of July and field trip day for Academy summer campers. We're on our way to the Big Brook Preserve in Monmouth County, New Jersey, where we will visit the small stream known for its abundant fossils, especially Cretaceous shark teeth.

I'm waiting in the lobby of the Academy with my photo equipment as purple-clad summer campers buzz around me, packing lunches and water shoes into coolers and backpacks. The yellow school bus is outside and soon our camp counselors and campers are on their way. The back of Summer Camp Coordinator Christine (Miss Chris) Danowsky's car is filled to the brim with tools, buckets, sifters, and other fossil-hunting equipment.

When we arrive at Big Brook, the temperature is just nosing past 90 degrees, but the group is quickly into the forest and then the water where it is much cooler. The stream is low, only about 8 inches in its deeper parts. Campers form groups of three and four, a counselor aiding each group. Danowsky and another counselor float between the groups supervising the expedition.

The counselors teach the campers how to find shark tooth fossils. One girl sticks a trowel into the muddy creek bed, shoveling mud onto a sifter held by two boys. A fourth team member then dumps a bucket of water over the contents of the sifter. The mud drains back into the creek, leaving a

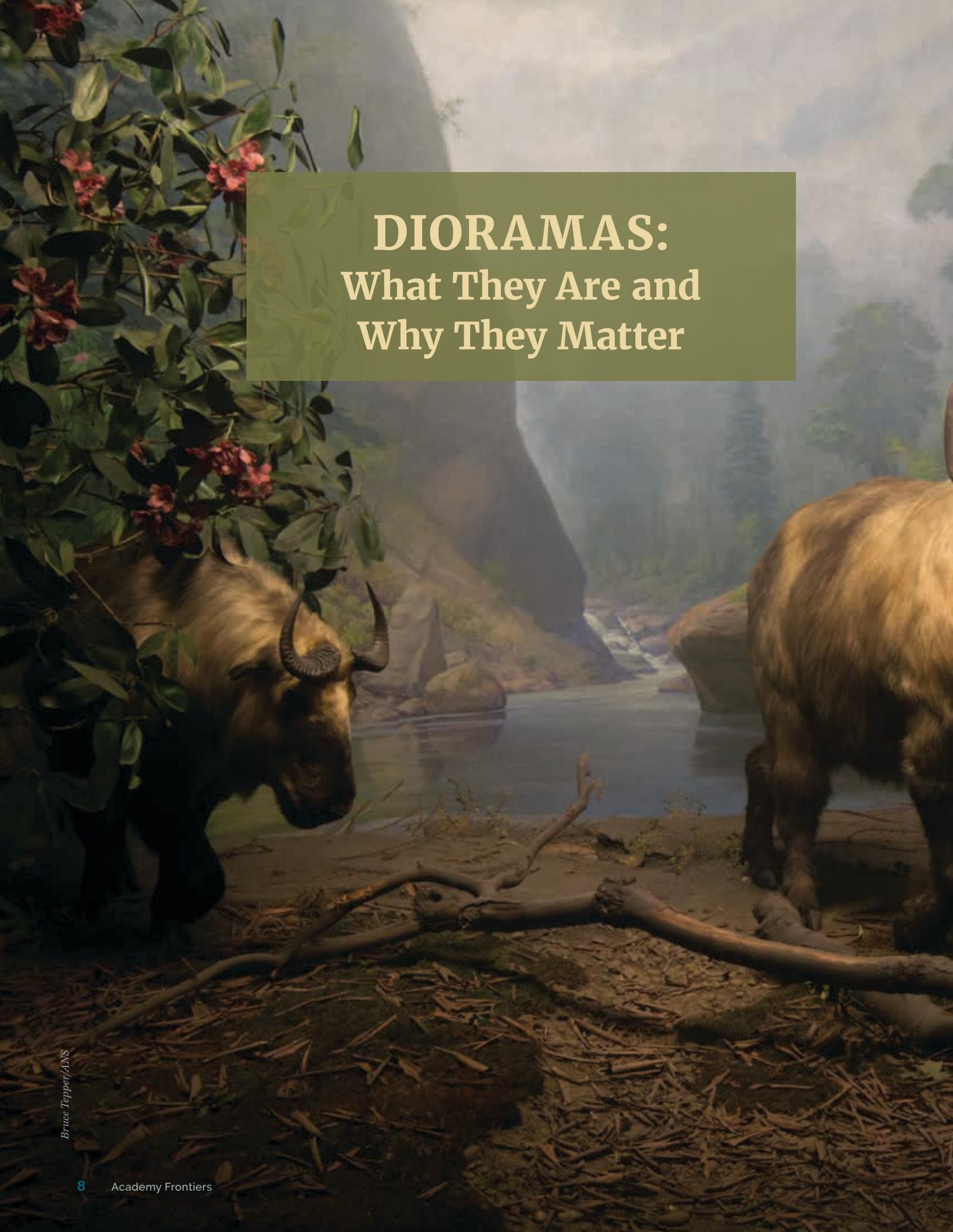
handful of rocks on the sifter. The campers pick through the rocks, asking the counselors the ever-popular fossil dig question: "Is this a rock or a fossil?" (To the kids' credit, this was also the most common question on the Academy's 2016 fossil dig with adults in Montana!)

The kids rotate through the jobs, each one getting to hold the sifter, dig in the mud, and pour water. Older campers and counselors help younger campers carry the sifters to different parts of the stream. Over a dozen shark teeth are found through the day and packaged into plastic bags to return to the Academy. Almost every group has a fossil to take home.

You, too, can join the Academy in the field. Every week of Academy Science Camp for kids ages 5 to 12 features a field trip. This year we're traveling back to Big Brook and to other destinations to meet live and legendary animals, explore the wilderness, jump into the insect world, and more.

New in 2018! Our Teen Expedition Program takes kids ages 12 to 16 on a daily field trip. Hike through the wilderness to test your survival skills, unearth Cretaceous fossils, row through waterways to collect macroinvertebrates, or use your muscles to scale a rock wall!

Check out ansp.org/camp for more details. ~Mike Servedio



DIORAMAS: What They Are and Why They Matter



For more than 90 years, the habitat dioramas of the Academy of Natural Sciences have captivated visitors. These windows into the wilderness provide intimate, dramatic encounters with animals in their habitats. They reveal the wondrous variety and bounty of flora and fauna of our natural world.

Over the course of their history, the Academy's dioramas have changed very little. Except for receiving rare cleaning and occasional updates to the interpretive panels that accompany each window, they appear today much as they did when they were first unveiled in the 1930s. Their reliable presence has charmed many visitors who, upon seeing them again, recall a childhood visit long ago.

Over the years, several studies by evaluators, conservators, and exhibit experts have reached the same conclusion: The Academy's dioramas are a valuable tool for engaging visitors. Their content, reinterpreted, is as relevant to our mission as ever. This winter and spring, the Academy is embarking on a major effort to clean, restore, and reinterpret these moments in history.

The Academy has received generous gifts enabling the renovation and reinterpretation of two of its most important habitat dioramas. From the Vandy Charitable Foundation, we received support to renovate the Gorilla habitat diorama, collected during George Vanderbilt's 1934 African Expedition. Thanks to a significant gift from the E. Rhodes and Leona B. Carpenter Foundation, the Academy will restore the rare diorama of the Takin, a large mountain goat collected by Philadelphia-area naturalist and adventurer Brooke Dolan II in 1931 from a richly diverse natural area on the Sichuan/Tibet border. We are extremely grateful for these donations—without them, this work would not be possible.

Just as the work began, we sat down with Senior Director of Exhibits and Public Spaces Jennifer Sontchi to answer a few questions about dioramas and what we can expect this spring.



Bruce Tepper/ANS

Ok, let's get the big question out of the way. Are dioramas real?

Yes and no. Our dioramas are highly accurate depictions of real places in the world. The animals in them are the real animals found in, and taken from, those sites. Dioramas tell a true story of interplay between the large animal that might be in the center of the diorama and its environment, so when you're looking at a diorama, you are looking at a real ecosystem.

While the animals are preserved by taxidermy—the art of preserving animals in a lifelike way—and some of the features of the foreground, such as rocks or soil, may have been brought back to the museum from the original site depicted, the rest

is painstakingly handmade by artists from detailed notes and studies made on location during the original expedition.

How were the dioramas built?

Most of the Academy dioramas were created in the 1930s through the 1960s. Museum artists and naturalists traveled together on expeditions to remote parts of the world and carefully documented what they found. The backdrop paintings are intricate reproductions of the exact place that the diorama was depicting and the landscape surrounding the featured animal. You can look for what direction the sun was coming from, what the weather was like that day, and what time of year it was. Every single thing



you see in the diorama is intentionally placed there and is likely handmade—each plant, tree, flower, stone, and pond created to be identical to its inspiration in the field. Our naturalists collected the animals they wanted to share with museum visitors and brought them back to the museum to undergo the process of taxidermy.

Wait, so the animals were killed so that they could become part of the diorama?

Yes. The dioramas were intended to give visitors a look at parts of the world they could never have seen otherwise. While it seems hypocritical of a museum to taxidermy animals it claims to want to protect, there is immeasurable value in adding specimens

to museum collections in terms of preserving biodiversity and protecting endangered species.

In fact, seeing animals in dioramas has inspired some activists to introduce conservation measures that have protected many species and natural habitats. Dioramas bring awareness of the fragility of nature to hundreds of thousands of people.

What can dioramas tell us about habitats around the world?

Dioramas tell stories of exploration, habitat loss, conservation, evolution, and artistry, preserving a snapshot of a specific location at a recorded time. The intense documentation that goes into them enables researchers to track changes in biodiversity and habitat over time due to climate change or other impacts.

We can trace a rich history of each place by comparing the habitat in the diorama to the century of impacts we might find there today. Which animals and plants still exist? What has changed and why? And how have diorama artists played an important role in educating visitors about planetary and social issues?

What happens to dioramas as they age?

In the absence of regular cleaning and maintenance, diorama surfaces develop accumulations of dust and grime, as well as color fading, open cracks, and peeling paint. The interpretive graphics become dated and need to be updated so they are accessible, engaging, and educational for today's audiences.

What do we need to consider when renovating a diorama?

A diorama is an artwork, so we have to consider whether the diorama should be brought back to its original form or we should attempt to enhance it. Will we restore, conserve, or preserve the diorama? The Academy has assembled conservators and other experts to thoroughly address these questions and provide recommendations.

What is actually involved in the work of renovating the dioramas?

The only way to access our Gorilla and Takin dioramas is to remove the glass! Once specialist glaziers safely set aside the enormous panes, a lighting design team will enter the diorama at the top to remove the old lighting fixtures and replace them with new LED lamps. The colors and directions of the lights will help tell the story of what time of day, weather, and season the diorama depicts.

Next, expert conservators will examine and document the backgrounds, foregrounds, plants, and animals in each diorama. Conservators will work from the back of the diorama to the front, starting with cleaning the background painting. They then remove diorama elements, such as taxidermy and plants, as needed, to gently vacuum and clean with water and cotton swabs. They may also color faded fur, prop up drooping plants, and remake leaves and flowers that have cracked or curled. Everything then goes back exactly where it came from, and specialists clean and replace the glass. When the work concludes, you'll see a fresher, brighter, more realistic version of that time and place.

Can I watch the work taking place?

Yes, work is scheduled for late this winter and spring, but since we can't fully predict how the work will evolve, we recommend you check our Facebook page regularly for updates! 🌿



MARCH OF THE MOOSE: A MONTH CELEBRATING READING MARCH 5-31 | ANSP.ORG/MOOSE

Marty the Moose, the Academy's pun-ny four-legged storyteller, loves a good book. He invites you to celebrate science and stories with him during March of the Moose!

Attend story times, read to reptiles, and do hands-on science! Visit the museum between March 5 and 31 and pick up your March of the Moose Moose-eum Guide, free with admission for kids 3-8, filled with Marty's signature jokes, rhyming games, scavenger hunts, and helpful hints for caregivers for encouraging literacy adventures every day. Plus, join us for these exciting activities all month long. Something a-moose-ing is happening every day during March of the Moose! Pre-registration is not required unless otherwise noted. Get more information or register for events at ansp.org/moose.

MARTY'S BOOK CLUB STORY TIME

MARCH 5-26

Every Monday and Saturday at 11 a.m.

Free with admission

Laugh along with Marty the Moose as he shares his March book club choice. Join Marty, his favorite humans, and a live animal guest for this special story time. Pick up a copy of the book in the gift shop and Marty will sign it for you!

READ TO A REPTILE

MARCH 6-27

Every Tuesday, 2-4 p.m., and Sunday, all day

Free with admission

Grab a book, pull up a chair, and practice your reading with the live animals of *Outside In*. Teach a turtle, hang out with our listening lizards, and share a story with a snake.

MARTY'S BOOK CLUB

ALL YEAR LONG



Marty and his friends like reading so much that they want to do it all year long—not just during March! They've chosen their favorite books to share with you every month of the year!

Visit the Academy Shop to get a copy of each month's book, your own set of antlers, and a special Marty's Book Club bookmark. Each book also comes with a guide filled with family-friendly activities, experiments, and games and, of course, a few of Marty's signature puns! Visit every month to pick up his choice for the month and find new and exciting activities for the whole family.

AT THE MUSEUM

TINY TOTS

MARCH 7-28

Every Wednesday, 11 a.m.–noon

Members: \$20 per child/adult pair, \$10 per additional child

Nonmembers: \$25 per child/adult pair,
\$10 per additional child

Calling all explorers 2–5 years old! Along with your favorite adult, join us in exploring nature through stories, songs, and hands-on fun. Walk-ins are welcome, but the session is limited to 10 adult/child pairs. Reserve your spot today by calling 215-299-1060.

MOOSE ON THE LOOSE TOUR AND STORY TIME

MARCH 8-31

Every Thursday and Saturday, 1 p.m.

Free with admission

Let Marty be your tour guide through North American Hall. Explore the stories behind the dioramas on this unique family tour!

INVESTIGATION STATION: ARCTIC ADAPTATIONS

MARCH 9-31

Every Friday and Saturday, 11 a.m.–3 p.m.

Free with admission

Think you could keep warm in the Arctic? Test your best cold weather coverings at this hands-on science station.

CRAFTS AND LAUGHS

MARCH 11-25

Sundays, 10 a.m.–5 p.m.

Free with admission

Get creative with a new craft, let your favorite dinosaurs inspire you to write some prehistoric poems, and share some of Marty's favorite jokes!

BUGS AND BOOKWORMS

SUNDAY, MARCH 11

10 a.m.–2 p.m.

Free with admission

Meet live bugs and listen to a bug-tastic story during a special story time with Marty the Moose. Then, use your imagination to run an insectivore restaurant, build your own bug, and write your own insect-inspired story. Visit *Butterflies!* and try out your own wings, talk tarantulas with other bug lovers, and meet the live invertebrates that call the Academy home.

MEMBERS ONLY! MUFFINS WITH MARTY

SATURDAY, MARCH 17

9–10 a.m.

Join us for some Kids Club fun before the Academy opens! Complete fun activities, have a snack, and hang with Marty the Moose. Make sure to bring your Kids Club membership card to receive a stamp! Register at ansp.org/moose or by calling 215-299-1022. Registration is required.

MARTY'S PAJAMA PARTY DURING DINOS AFTER DARK

FRIDAY, MARCH 23

4–8 p.m.

Pay what you wish

Put on your PJs and bring your teddy bear to an evening of fun. Visit the museum after dark, hang out with live animals, play games, and make some arts and crafts. Snuggle in for a special story time with Marty the Moose! Registration is not required.

CAREGIVER WORKSHOP: PLAYING TO LEARN

THURSDAY, MARCH 29

5–7:30 P.M.

Members: \$40 per family (up to four family members)

Nonmembers: \$60 per family (up to four family members)

\$5 for each additional family member

You may already know that you are your child's first teacher, but you're their first playmate, too! Join other caregivers and explore the fun and easy ways you can encourage science and literacy skills at home through dramatic play for your 3–8 year olds!

Bring the whole family! While the caregivers are learning, kids will play science games, do fun experiments, and meet the live animals across the hall in *Outside In* with our expert educators. Then, everyone in the family will get a chance to read and play together. Each family gets a great book to take home! Bring your dinner or pre-purchase a meal from us. Register online or by calling 215-299-1060.

FOR TEACHERS

PRE-K MONDAYS

Call Reservations at 215-299-1060 for pricing

Pre-K classes are invited to visit every Monday during March of the Moose. Each class that registers gets a \$5 admission rate and an invite to the 11 a.m. story time with Marty in the auditorium, a copy of the book for their classroom, and a Marty bookmark for every student.

TEACHER WORKSHOP: INQUIRY AND LITERACY IN THE CLASSROOM

Thursday, March 8, 5–8 p.m.

Pre-K and Kindergarten Educators: Improve your understanding of science content while exploring fun and exciting ways to engage students in science learning. Explore the connections between early science learning and literacy skills. The Academy is an Act 48 and PQAS certified provider.

Our Professional Development workshops include:

- Hands-on science experiments and literacy activities ready for implementation in your classroom
- Inquiry-based learning
- Science content knowledge
- Coordination of activities to current Pennsylvania State Standards, Next Generation Science Standards, and Philadelphia Core Curriculum

**REGISTER AT ANSP.ORG/MOOSE
OR BY CALLING 215-299-1060.**

DOLAN FAMILY ESTABLISHES FUND FOR INNOVATIVE WATER RESEARCH

By Carolyn Belardo

Water scarcity is one of the greatest challenges of our time. For the Dolan family of Philadelphia, water runs deep and personal.



Photos by Meghan O'Donnell/ANS

Almost 90 years ago, Philadelphia-area naturalist and adventurer Brooke Dolan II led expeditions to western China and Tibet and collected the Asian mammals now on exhibit in the dioramas of the Academy of Natural Sciences. He and his colleagues also brought back thousands of other specimens to study at a time when the world looked to natural history museums for information on countless little-known species.

Today Dolan's grand-nephew and namesake is at the forefront of another challenge and is taking action to fill a critical gap, pledging \$3 million to establish the Dolan Fund for Innovative Water Research.

"Water is sure to be one of the biggest issues we're faced with and one that affects every person we know," said Brooke Dolan of Chester Springs, Pennsylvania. "Our thought is to start funding watershed ecology research so public and private organizations will be better prepared when it comes to the planning that will be needed.

"This is an important time for private funding of watershed research," Dolan said. "Governments, for example, tend to be reactive not proactive, and the research that the Academy can be doing will provide governments and infrastructure planners with the tools to act more wisely.

"We chose the Academy since it already has a legacy of researching water issues and its affiliation with Drexel University and others makes it a strong platform that will last indefinitely," Dolan said. "We believe the Academy has the better approach."

The generous donation also is made possible by Dolan's cousin Sarah Dolan Price of Philadelphia and siblings Margaret Chew Dolan of Philadelphia and Thomas Dolan V of Oakland, California. Several years ago Price and family endowed the Brooke Dolan Archivist position in the Academy's Library and Archives. Dolans also have given generously over the years.

The Dolan Fund will encourage innovative research on watershed ecology and provide leading support for a new post-doctoral fellow position in watershed ecology that will be called the Dolan Fellow for Innovative Water Research. In advance of funding a \$2.5 million endowment in 2027, the Dolan family will donate \$50,000 each year to be matched by the Academy.

Watershed 101

A watershed is an area of land that drains the rainfall and small streams to a common outlet, such as a larger stream or river, that eventually ends up at the mouth of a bay. Regionally, there is the Delaware River Watershed, which is a source of drinking water for 15 million people in Pennsylvania, New Jersey, Delaware, and New York.

"To understand a watershed's structural and functional characteristics and how they influence how people, animals, and plants coexist, scientists must examine a watershed in its complete context," explained David Velinsky, PhD, vice president for Academy Science. This ecological research is critical, and the Academy of Natural Sciences has been a leader in this field for the last seven decades.

The Academy's leading role in the Delaware River Watershed Initiative, a partnership of 50 environmental organizations



funded by the William Penn Foundation, shows it already has a commitment to watershed research.

A watershed's natural processes—rainfall runoff, groundwater recharge, sediment transport, plant succession, and others—provide beneficial services when functioning properly. But as we know, they can cause problems when disrupted.

"It is crucial for people to understand watersheds and how they work before decisions are made or actions are taken that may affect important watershed characteristics," said Velinsky, who also is head of Drexel's Department of Biodiversity, Earth & Environmental Science.

Coming Full Circle

Brooke Dolan's father, Thomas Dolan IV of Lafayette Hill, Pennsylvania, understands all of this. In the 1950s he worked as an aquatic entomologist for Academy ecologist Dr. Ruth Patrick. Patrick is well known for developing the fundamental principle that biodiversity holds the key to understanding environmental problems that may affect aquatic ecosystems.

As the Academy's Patrick Center for Environmental Research marks its 70th anniversary this year, the family patriarch, along with his son, has rallied other family members to establish and endow the Dolan Fund to address important watershed issues.

The Academy employs specialists in chemistry, phycology, macroinvertebrates, fish, and environmental data management. What is needed—and made possible by the Dolan Fund—is a comprehensive watershed ecology effort to investigate the system as a whole and to study potential effects of an increasing population, climate change, and water withdrawals. Few institutions consider these multiple effects. The application of an innovative method will place the Academy at the head of the field, Velinsky said.

"When the family gathered together to talk about what we wanted to do for the Academy, we decided that water will be the enduring issue facing our country and the world," Thomas Dolan said.

With the Dolan Fund "we are continuing a legacy with the Academy, one that should last for generations," Brooke Dolan said. 🌱

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On behalf of the Academy's Board of Trustees, we wish to recognize and thank those who have contributed new gifts and pledges to the Academy between **August 16, 2017** and **December 31, 2017**. Your generosity helps to fund our many programs of research and education, and we are tremendously grateful for your support.

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PALEOPALOOZA

Join us on Saturday and Sunday, March 3 and 4, for Paleopalooza, a two-day fossil festival of gigantic proportions. See real fossils from our world-famous collection, meet expert paleontologists, take guided tours of Dinosaur Hall, and devour tasty themed treats from Franklin Fountain and Shane Confectionery. Plus enjoy hands-on activities, crafts, and dinosaur-themed fun for the whole family.

Mike Serrvedio/ANS



SUMMER CAMP

Register for summer camp now and stack your discounts to save. In addition to your \$40 member discount, you can get \$25 off for registering by March 30 or save \$10 per camper if you register multiple children. Each week of camp explores an exciting new theme and features an off-site field trip! This year our themed weeks for kids ages 5–12 include the world of *T. rex*, animal myths and legends, prehistoric pals, and scales and tails. Get more information and register at ansp.org.



ACADEMY OPEN LATE!

Join us and help us spread the word to your friends and family. On the fourth Friday evening (5–8 p.m.) of every month this winter and spring, we are offering pay-what-you-wish museum admission and an indoor beer garden in Dinosaur Hall. In addition to activities for families and live animal shows, you can purchase drinks and food from the Academy Beer Garden: Dino Drafts and enjoy them as you stroll through the museum.



WINS TURNS 35

The Academy of Natural Sciences of Drexel University will be celebrating 35 years of the Women In Natural Sciences (WINS) program this spring. WINS is a free summer and after-school mentoring and science enrichment program for high school-age young women, particularly from underserved families and schools in Philadelphia. On May 9, 2018, the Academy will host WINS 35, a special event and fundraiser featuring keynote speaker Lisa Dyson, PhD. Dyson is CEO of Kiverdi, a technology company with a mission to develop innovations that go beyond traditional agriculture to help feed and power a growing world. For more information about the event, ticket sales, and sponsorship opportunities please visit ansp.org/wins35.



Mike Serrvedio/ANS

TEEN SUMMER PROGRAMS

The Academy's teen summer programs are perfect for building your resume. This year we have a brand-new expedition program that offers science fieldwork experiences for teens 12 to 16. You might find yourself hiking through the wilderness to test your survival skills, unearthing Cretaceous fossils, rowing through waterways to collect macroinvertebrates, or scaling a rock wall. If you're into animal training and care, consider our programs in animal and invertebrate husbandry. You'll work directly with live animals, attend a field trip, and prepare an educational presentation or display for the public. Learn more and register at ansp.org.



Have you heard about **DOOR 19**, our themed soirée featuring open bar, quirky science, behind-the-scenes tours, and more? Get in the loop and avoid FOMO at door19philly.com.





JUST FOR KIDS

Welcome to the Academy Frontiers page for kids, one of the many great ways you can participate in the Academy's Kids Club!

What happens in the museum at night?

We can't be sure, but we can guess!

Color in the drawing below by our one and only Miss Chris, who imagines our animals having a dance party after hours.

Then, draw your own version on a separate piece of paper.



Christine Danowski/ANS

Send your drawing to our Membership Office at
1900 Benjamin Franklin Parkway, Philadelphia, PA 19103,

for a chance to win a free four pack of tickets to an upcoming Night in the Museum overnight!

Our next overnights featuring an after-dark visit to our Crocs exhibit are on March 17 and April 21.



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