INSIDE:
The Delaware River Watershed Initiative
Dear Friends,

The Academy of Natural Sciences has excelled in environmental research for decades thanks to the pioneering work of Dr. Ruth Patrick. Dr. Patrick demonstrated that biological diversity is the key to understanding ecosystem health. Her legacy continues today through Academy scientists’ work on the Delaware River Watershed Initiative (DRWI), a large-scale, collaborative program that is taking action to maintain and improve the quality of aquatic ecosystems within the Delaware River Basin.

The Academy has been granted three years’ funding from the William Penn Foundation to provide scientific oversight for the DRWI, with more than 40 grantees working to restore degraded areas, protect undamaged areas, and monitor watershed health. This work is critical in protecting and restoring sources of drinking water for 15 million people in the Delaware River Basin. It is relevant not only to all of us who live and work in the Delaware Watershed, but also to the wildlife living in and around our streams. Turn to pages 5 and 8 to meet some of the scientists who are working on this project and to learn more about their research.

As we approach the holiday season, many positive changes are taking place at the Academy. This fall we open Chocolate: The Exhibition, a fun exhibit for the whole family. We also welcome Jason Weckstein, PhD, formerly of Chicago’s Field Museum, to the Academy’s Ornithology Department. November begins with Cuisine from the Collections: Chocolate Edition, a celebration inspired by the edible items in the Academy’s collection. We will round out the season with special dinosaur activities (November 28–30) and appearances by the Academy’s all-stars, including our live animals (December 27–30)—perfect ways to introduce your holiday guests to the Academy.

As you and your family gather for the holidays this year, please consider integrating the Academy into your celebrations. Do you know a family member who would enjoy a gift membership to the Academy? Would a friend appreciate your gift to the Academy made in their honor? Is planned giving an option for you? You can also make a difference through your gift to the Academy’s Annual Fund, which provides vital support for research, collections care, education, and exhibits. You are crucial to our ongoing work, and we are thankful for your support.

All the best,

George W. Gephart Jr.
President and CEO

Academy Greetings

Academy Frontiers | Fall 2014

FEATURE
8 SCIENCE AT SCALE Academy scientists are helping to lead the effort to improve water quality in the Delaware River Basin.

PEOPLE
5 ACADeMY VOICES Stefanie Kroll: A Watershed Fairy Tale

SCIENCE IN YOUR LIFE
7 GET CONNECTED Baby terrapins … need we say more?
13 SUSTAINABILITY MATTERS Teach your kids to be green.

JUST FOR KIDS
19 Contest: What happens after dark at the museum?

NOTEBOOK
6 SNAPSHOTs Alien Catfish

12 THINK LIKE AN ARCHIVIST Ruth Patrick’s possessions tell a story of her life and legacy.

AT THE MUSEUM
4 On Exhibit
18 ACADeMY ABBREVIATED

20 CALENDAR OF Events

In Picking Creek near Phoenixville, PA, Academy waterfowl scientist Meghan O’Donnell uses a GPS unit to mark the exact location of a temperature logger. The team will return to the location to retrieve data from the logger, which records water temperature continuously every 15 minutes for several months. This process helps the Delaware River Watershed Initiative team assess the stream’s condition over time. More on pages 8–11.

Photo by Archie Website/KNS

The Academy of Natural Sciences has excelled in environmental research for decades thanks to the pioneering work of Dr. Ruth Patrick. Dr. Patrick demonstrated that biological diversity is the key to understanding ecosystem health. Her legacy continues today through Academy scientists’ work on the Delaware River Watershed Initiative (DRWI), a large-scale, collaborative program that is taking action to maintain and improve the quality of aquatic ecosystems within the Delaware River Basin.

The Academy has been granted three years’ funding from the William Penn Foundation to provide scientific oversight for the DRWI, with more than 40 grantees working to restore degraded areas, protect undamaged areas, and monitor watershed health. This work is critical in protecting and restoring sources of drinking water for 15 million people in the Delaware River Basin. It is relevant not only to all of us who live and work in the Delaware Watershed, but also to the wildlife living in and around our streams. Turn to pages 5 and 8 to meet some of the scientists who are working on this project and to learn more about their research.

As we approach the holiday season, many positive changes are taking place at the Academy. This fall we open Chocolate: The Exhibition, a fun exhibit for the whole family. We also welcome Jason Weckstein, PhD, formerly of Chicago’s Field Museum, to the Academy’s Ornithology Department. November begins with Cuisine from the Collections: Chocolate Edition, a celebration inspired by the edible items in the Academy’s collection. We will round out the season with special dinosaur activities (November 28–30) and appearances by the Academy’s all-stars, including our live animals (December 27–30)—perfect ways to introduce your holiday guests to the Academy.

As you and your family gather for the holidays this year, please consider integrating the Academy into your celebrations. Do you know a family member who would enjoy a gift membership to the Academy? Would a friend appreciate your gift to the Academy made in their honor? Is planned giving an option for you? You can also make a difference through your gift to the Academy’s Annual Fund, which provides vital support for research, collections care, education, and exhibits. You are crucial to our ongoing work, and we are thankful for your support.

All the best,

George W. Gephart Jr.
President and CEO

Academy Frontiers

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.
© 2002 Photodisc

Titanoboa: Monster Snake
Special Exhibits Gallery
February 14–April 19, 2015

Deep underground in a Colombian coal mine, scientists have uncovered remains of the largest snake in the world, Titanoboa cerrejonensis. Stand eye-to-eye with a full-scale model of this massive predator, which at 48 feet long and 2,500 pounds could crush and devour a crocodile. Titanoboa haunted the rain forest during the Paleocene, the lost world that followed the demise of the dinosaurs 65 million years ago. This fearfully fun exhibition delves into the story of the mini-beasts of nature reflect the masterfully balanced design of nature itself. Alongside Marley’s works, dozens of specimens from the Academy’s Entomology Collection illustrate why and how scientists pin insects for research. Free with regular museum admission.

Chocolate: The Exhibition
Presented by Mars Chocolate
Special Exhibits Gallery
October 11, 2014–January 24, 2015

Indulge yourself in the sumptuous world of chocolate! Chocolate: The Exhibition traces the intriguing story of this “food of the gods” from its origin as a unique rain forest tree to the sensuous sweet millions of people crave today. Explore chocolate’s impact on tropical ecosystems, human cultures, and the global economy through a range of fun, hands-on activities for all ages. Stand under a life-size cacao tree, touch pods and seeds, and learn about the steps in chocolate production. Whether you are a novice or a connoisseur, Chocolate will engage your senses and share an enticing tale of the world’s favorite treat. 53 Individual and Family level members; Family Plus level members and above receive free admission.

In Spanish and English. Chocolate and its national tour were developed by The Field Museum, Chicago. This project was supported, in part, by the National Science Foundation.

STEFANIE KROLL: TALES OF A WATERSHED SCIENTIST

By Mary Alice Hartsock, Editor

“Stefanie Kroll calls fieldwork her "Cinderella Clause.” Like the fairy tale princess, the Academy scientist spends most of her time indoors and behind the scenes, striving to make sure that the work that takes place outdoors runs smoothly. Yet when Kroll steals a moment to step into the field, she’s no ordinary Cinderella figure. She trades glass slippers for chest waders, for when she hops into a stream and the dirt settles underneath her fingertips, she’s living her own version of a fairy tale.

Ever since Kroll was a youngster, she has enjoyed spending her days outside picking up salamanders and bugs. In college, she assisted a PhD student with fish sampling in the Salmon River in New York, and that’s when she first became fascinated with the complexity of aquatic ecosystems. She loved interacting with the fish, and she was stunned by the beauty and adaptability of aquatic insects.

At heart an explorer, Kroll veered away from science for eight years while working as an interpreter and an English teacher in Spain. During her time there, she completed a master’s in stream ecosystem research. Her field sites, located in the sparsely populated Castilla-La Mancha, became the subject of her PhD research: assessing human impacts on stream ecosystems as measured by aquatic insect communities. The work sparked her interest in climate’s influence on aquatic ecosystems.

“After living in Spain’s arid climate, I have a greater appreciation for how much water we have available to us [here in the United States],” Kroll says. “By understanding how much human actions are affecting our ecosystems and how to perform everyday activities in a less harmful way, we can reduce the impact and be better stewards of the earth.”

And that’s increasingly urgent, she says. Recent studies on the Colorado River and the Kirkwood-Cohansey Aquifer in New Jersey indicate that contaminants are prevalent in the groundwater. The results signal that the amount of water available and the quality of the local water supply are at risk.

“Freshwater is a finite resource, and the more we take care of it now, the better condition it will be in in the future,” she says.

She’s referring specifically to the water in the Delaware River Basin, an area over which she, along with a slew of Academy scientists, has been granted oversight. In addition to its undisturbed regions, the basin contains areas where drainage from abandoned mines is polluting streams, as well as stretches where storm water runoff from large cities and agricultural fields is introducing contaminants into the water.

The Delaware River Watershed is a great area for analysis because it contains waterways with many of the conditions we find throughout the country, with different stressors on the water, and it’s a good incubator for projects aimed at preserving water and habitat quality,” she says.

Kroll began working at the Academy after scientists from the Academy’s Patrick Center had begun work on the Delaware Watershed Conservation Program, funded by the William Penn Foundation. This spring, Kroll and her colleagues were awarded a multi-year grant to continue working within this initiative to protect and restore critical sources of drinking water for 15 million people in and around the Delaware River Basin.

“Kroll is a nexus for researchers studying water quality issues in the region. She works with senior Academy scientists to identify field sites for testing, coordinates the on-the-ground science and monitoring, conducts data analysis to evaluate the effectiveness of the grants’ land conservation efforts and restoration projects, and connects with water researchers throughout the Basin and beyond.’”

Kroll is now project science director, working with the William Penn Foundation, the National Fish and Wildlife Foundation, the Open Space Institute, and the Institute for Conservation Leadership to collaborate with more than 40 grantee organizations that are working to restore degraded areas, protect undamaged areas, and monitor watershed health.

Kroll is a researcher for researchers studying water quality issues in the region. She works with senior Academy scientists to identify field sites for testing, coordinates the on-the-ground science and monitoring, conducts data analysis to evaluate the effectiveness of the grants’ land conservation efforts and restoration projects, and connects with water researchers throughout the Basin and beyond.

Kroll is thrilled to be performing research that has a practical outlet, and she says it’s a privilege to take a leading role in a comprehensive monitoring program with potentially huge implications. Yet there’s still a part of her that revels in the basic sampling—the dirty work—that is so necessary to forming reliable results. For Kroll, being in nature is the epitome of a happily ever after.
THE “ALIEN” CATFISH

By Mike Servedio

The catfish is only about 4 inches long. It lives in one specific region of the world, the Western Ghats Mountains of India. Even there, humans rarely see this subterranean creature, which occasionally emerges in springs and flooded rice paddies. It has a jaw like a bulldog and teeth like the creature from the movie Alien. There are some of the things we know about Kryptoglanis shajii. But what scientists are still working to understand may be the most interesting part of the story.

Upon first glance, Kryptoglanis does appear to look particularly unusual for a catfish. Examining the bone structures of the catfish’s face, Academy Curator Emeritus of Ichthyology Kyle Luckenbill was able to carefully create three-dimensional images of the unique bone structures, as well as the whole fish. The use of the CT scans allowed the researchers to examine cross sections of the bone structures of the fish, revealing just how unique the structures are while keeping the specimen completely intact.

Lundberg and Luckenbill weren’t the only ones looking into the strange new catfish. A team of researchers at the Natural History Museum of London, led by Ralf Britz, did a separate study of Kryptoglanis. Britz’s team utilized a technique of clearing and staining, in which the skeleton of the fish is rendered red in contrast to making the cartilage blue and the flesh invisible. “There was an amazing congruence between the results,” Lundberg said. “Neither of us was way out.”

But some questions remained after both studies. What is Kryptoglanis’ closest relative? Where exactly does the species fit within the catfish family? Is there a purpose to the unique bone structures? Researchers, including Lundberg and his team, will continue to investigate these questions.

The study of Kryptoglanis shajii was published in the 2014 issues of the Proceedings of the Academy of Natural Sciences of Philadelphia by John Lundberg, Kyle Luckenbill, K.K. Subhash Babu, and Heok Hie Ng.
When Academy fish biologist Richard Horwitz, PhD, talks about streams in the Delaware River Watershed, people listen. Horwitz, who has worked in the region for nearly 40 years, isn’t your typical fish expert—he’s also an avid student of environmental history and a keen observer of all living things.

When he walks a stream, he is not only studying what’s in the water, but he is also looking all around, ahead, and behind. With this perspective, he understands how the land and the streams it drains into, together forming a watershed, are connected. He and his colleagues in the Academy’s Patrick Center for Environmental Research know that everything we do on land has implications for the health of streams, the species that live in them, and the people who depend on them.

Since 1947, the Patrick Center has been devoted to understanding, protecting, and restoring the health of watersheds through its embodiment of this holistic view. The center is named for its founder, Ruth Patrick, who developed the fundamental “Patrick Principle” on which much environmental science and management is based: that biological diversity holds the key to understanding the environmental problems affecting an ecosystem.

Patrick helped to write the Clean Water Act, and over the past half-century Academy scientists have continued to influence river science, policy, and management. When the William Penn Foundation looked for an institution to help guide a massive new effort aimed at improving water quality in the Delaware Watershed, the Academy was an obvious choice.

The Foundation had honed its vision for clean water in the Delaware through early conversations with experts like Horwitz, Roland Wall, the Academy’s senior director for environmental initiatives; and Carol Collier, the former executive director of the Delaware River Basin Commission who later joined the Academy. The William Penn team concluded from these discussions that only a sizeable investment could make a measurable difference for the Delaware’s water quality. On April 1, 2014, the Foundation announced a commitment of $35 million to protect many of the watershed’s healthiest streams and restore other impaired ones to good condition.

The recently christened Delaware River Watershed Initiative (DRWI) will focus on priority groupings of smaller watersheds, or “clusters.” To select these clusters, the Academy and the Open Space Institute pulled together and analyzed information from Pennsylvania, New York, New Jersey, and Delaware, and then mapped out where investing in conservation activities has potential to do the most good.

Biological diversity holds the key to understanding the environmental problems affecting an ecosystem.

The Foundation had honed its vision for clean water in the Delaware through early conversations with experts like Horwitz, Roland Wall, the Academy’s senior director for environmental initiatives; and Carol Collier, the former executive director of the Delaware River Basin Commission who later joined the Academy. The William Penn team concluded from these discussions that only a sizeable investment could make a measurable difference for the Delaware’s water quality. On April 1, 2014, the Foundation announced a commitment of $35 million to protect many of the watershed’s healthiest streams and restore other impaired ones to good condition.

The recently christened Delaware River Watershed Initiative (DRWI) will focus on priority groupings of smaller watersheds, or “clusters.” To select these clusters, the Academy and the Open Space Institute pulled together and analyzed information from Pennsylvania, New York, New Jersey, and Delaware, and then mapped out where investing in conservation activities has potential to do the most good.

continued on page 10
Excess nutrients and sediment loads from increased development, agriculture, and other sources impair some streams. Toxic pollutants—including some “legacy” contaminants like DDT and PCBs from historic activities—affect others. Non-native species, most people in the region have access to all the clean water they need. So why invest in protecting and restoring the watershed?

Stefanie Kroll, PhD, the Academy’s science director for the DRWI, explains, “It’s true that clean, abundant water is available in the Delaware River Watershed now, but we shouldn’t plan on that always being the case. Recent news headlines highlight the fragility of our water supply, with hundreds of thousands losing access to clean water as a result of pollution and poor management. Paying attention to the Delaware today is essential for having the same resource quality in the future.”

BIG, BOLD, AND NECESSARY

It’s nearly impossible to describe the Delaware River Watershed Initiative without illustrating the scale of effort. The eight clusters where the project will focus together cover around 6,575 square miles, or an area larger than the size of Connecticut and Rhode Island combined.

To compare data across sites and obtain reliable results, scientists and partners must execute activities and collect data similarly from site to site. Coordination and standardization, which are baked into the initiative’s design, are rare in a project involving so many actors.

And the cast is literally in the hundreds. The coordinating group members—the William Penn Foundation, the Academy, the Open Space Institute, the National Fish and Wildlife Foundation, and the Institute for Conservation Leadership—each have their own expert teams. Then there are dozens of local organizations working within individual clusters to put protection and restoration strategies into practice.

“You won’t find other watershed projects that engage so many organizations,” observes Collier, now the Academy’s senior advisor for watershed management and policy. “The DRWI is a wonderful example of how to build support from the ground up. After all, it takes all the citizens of a watershed to make a clean, healthy river system.”

MONITORING FOR IMPACT

Good water quality is essential not only to people, but also to the species that rely on the Delaware’s aquatic systems. From the tiniest algae to the majestic bald eagle, degraded water affects the flora and fauna living in and around it.

“If you put a garbage dump next to your house, everyone who lives in the neighborhood is going to move,” says Kroll. “Animals and plants are the same way. They don’t want to live in horrible conditions, so their presence or absence tells us if something has happened in the past year.”

The disappearance from degraded sites of species that need high-quality habitat, and the proliferation of more tolerant species, is at the core of biological monitoring, she says.

At dozens of sites, Academy scientists sample algae, macroinvertebrates, crayfish, fish, salamanders, and water chemistry. Together these indicators, along with measures of water flow, temperature, and streamside conditions, illustrate ecosystem health. For instance, salamanders often disappear or show abnormalities when exposed to pollutants, but the types of pollutants may be unknown. Different kinds of algae can help fill in the picture by indicating whether heavy metals or excess nutrients have been in the water.

Local organizations are adopting Academy protocols and undertaking their own monitoring programs at individual sites, often for the first time. Academy scientists are providing guidance, to ensure consistency of methods so that all the data can ultimately be used together.

The data from more than 300 sampling sites will help scientists understand the initiative’s stream restoration and protection activities are improving water quality. If they are, then there is a good argument to replicate them elsewhere in the Delaware and beyond. If they aren’t, then it’s important to figure out why and consider changing course.

Evaluating what works may seem like common sense. Yet a landmark 2005 study of thousands of stream restoration projects in the U.S. found that the vast majority lacked rigorous scientific evaluation of whether the projects were successful.

The DRWI built in evaluation from the start. “The William Penn Foundation emphasized the importance of scientific credibility from our earliest discussions with them,” says Wall, the Academy’s team leader on the DRWI. “They made sure that monitoring and assessing ecological quality were going to play a central role in the project.”

As the monitoring program gets fully underway this year, it will begin generating scores of data sets for integration into a single database accessible to all project partners. This standardized dataset, which Kroll happily refers to as “luxury,” will be an accomplishment in and of itself. But the real achievement will be using it to understand what it takes to move the needle on water quality at a scale that will make a difference to the millions of people who live, work, and play in the Delaware River Watershed.

Visit ansp.org/drwi to learn more about the Academy’s work on the Delaware River Watershed Initiative, the people involved, and the tools they’re using to preserve and protect our water supply.
Jennifer Vess/ANS

The smallest collection in our archives consists of a single piece of paper; the largest collection fills 168 boxes and is still growing. This largest collection is the Ruth Patrick Papers (Coll. 974).

Dr. Patrick’s association with the Academy began in the late 1930s and continued until shortly before her death in 2013. With that many decades of work, it isn’t surprising that she produced so many documents.

Dr. Patrick herself transferred the first portions of the collection to the Academy in 1994, 1997, and 1998, but there’s more. Dr. Patrick’s office (which consisted of multiple rooms and workspaces) is still brimming with potential archives. Shelves packed with books and reports wrap around two walls, and one large closet is lined on two sides with tall filing cabinets so full that more files and reports line the tops.

The walls around her desk are a grid of awards and plaques. Waist-high stacks of boxes and trunks that her family transferred to the Academy cover the office floor. Dr. Patrick’s work, like the work of many scientists over the years, spilled beyond the walls of the Academy and into her home.

Dr. Patrick’s work, like the work of many scientists over the years, spilled beyond the walls of the Academy. Her office floor was lined with tall filing cabinets so full that more files and reports lined the tops. When caring for a collection this size, archivists have two main goals: preservation and access for researchers. Over the next few months, possibly even years, we will be working with the Ruth Patrick Collection, incorporating all of the documents from her office and home into those files already in the archives. This new transfer also includes photographs and objects, which are crucial to a researcher’s ability to fully understand Dr. Patrick’s life and work and for the Academy to connect visitors with our rich history.

These objects range from the personal knick-knacks that Dr. Patrick kept on her desk to the equipment she used in her work. She invented the Diatometer (above), a device used to monitor water quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections.

In the files we have yet to explore, we may have Dr. Patrick’s own words on how the Diatometer came into being and how she and other colleagues used it, changed it, and improved it. I hope we do, though it’s going to take some time and digging to make those discoveries. –Jennifer Vess, Brooke Dolan Archivist

When caring for a collection this size, archivists have two main goals: preservation and access for researchers. Over the next few months, possibly even years, we will be working with the Ruth Patrick collection, incorporating all of the documents from her office and home into those files already in the archives. This new transfer also includes photographs and objects, which are crucial to a researcher’s ability to fully understand Dr. Patrick’s life and work and for the Academy to connect visitors with our rich history.

These objects range from the personal knick-knacks that Dr. Patrick kept on her desk to the equipment she used in her work. She invented the Diatometer (above), a device used to monitor water quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections. Though these objects can stand on their own as examples of technology and quality, and we have three early versions in our collections.

In the files we have yet to explore, we may have Dr. Patrick’s own words on how the Diatometer came into being and how she and other colleagues used it, changed it, and improved it. I hope we do, though it’s going to take some time and digging to make those discoveries. –Jennifer Vess, Brooke Dolan Archivist

Pre-K–Kindergarten

Kids should be exposed to recycling in school and in their communities, and the best way to reinforce these messages is by being a role model, Krisch says. For example, when you’re cleaning up after a meal, you might explain why you use glass and dishes instead of disposable items. Or you might explain why you throw a milk jug into the recycling and not the trash.

For this age group, hands-on learning works great. Have kids sort through clean food packaging and recyclables (check first to remove any sharp edges!), or have kids look around a room and point out things that can be recycled.

Grades 1–5

As you are preparing meals, engage your kids. Krisch recommends that you ask them to think about the packaging that butter, eggs, vegetables, and other ingredients come in and what can be recycled. Do you buy foods in bulk? Explain why your family does so—whether it’s to save money for the long-term, to save packaging, or both.

Take slightly older or more mature kids grocery shopping and encourage them to check out food packaging in the store. Take along reusable bags, and point out how to properly dispose of plastic bags outside grocery and hardware stores. This is also a good time to start using keywords like “sustainability” that kids may be hearing in school.

Middle School

The best approach for teaching middle school kids about sustainability is to relate the subject to their lives. Krisch says. Ask them lots of questions, and frame the conversation around their interests to encourage their participation. For example, if they like sports, ask whether environmental conditions affect their practice space or playing field. If they are focused on technology, ask about the environmental implications of their phones or tablets.

High School

Often high schoolers already know and practice many sustainable behaviors. But Krisch says they may not realize how much of an impact they alone can have on the environment. Pick a relevant concept—for example, the water supply in the City of Philadelphia—and ask them to think about how they can help it to become sustainable. Don’t be afraid to use the term “sustainability”—but approach with caution. At some point, ask what your child thinks it means to be sustainable. If they’re not sure, ask them what the word sounds like it might mean.

The Academy is a great place to get kids and adults alike thinking more about our environment and what we can do to preserve it. As an Academy member, you can be a great role model for friends, family, and others who cross your path. Your membership offers you the tools you need to help those around you visualize a sustainable world.

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:

Academy Sustainability Partner:
LIZ BALES AND LEANNE McMENAMIN: ACADEMY DAUGHTERS, CUISINE CO-CHAIRS

Liz Bales and her father, John F. Bales III

Leanne and Rob McMennamin

"He has gotten braver and braver, and eventually he started chatting it up with the T. rex," McMennamin says. "And he loves bringing his friends to experience the Academy with him."

"It makes sense for McMennamin to continue the family tradition. Like her father, she values environmental conservation and preservation, and she wants to teach her son, Bo, about the earth and how to take care of it. Luckily, Bo loves learning about nature, animals, and natural history. He has even overcome his fear of the T. rex, a creature he couldn't bear to approach during his first few visits to the Academy.

For starters, both have become supporters of the Academy by following in the footsteps of their parents. Bales’ father, John F. Bales III, is an Academy Trustee, and her mother, Jane Bales, is a former member of the Women’s Committee. The two have been major backers of the Academy’s Library, Women in Natural Sciences program, and education initiatives for many years.

When Liz Bales was a teenager and college student, her father invited her to Academy special events, where the then veterinarian-in-training had the opportunity to interact with scientists one-on-one. Watching her parents collaborate with the institution for more than two decades, she says, made her feel at home in the world of science—a sentiment she has shared with her own daughters through visits to the museum. "The Academy puts the words of science in their heads and the tools in their hands, so that it becomes part of an everyday experience for them," she says. "My girls [ages five and 10] think they are scientists, and being at the Academy has provided them with that notion."

Similarly, Leanne McMennamin’s support of the Academy began through her father. Fred Merz, another prominent Academy Trustee. Through their family foundation, Fred Merz (and now his daughters) have made generous contributions to the Annual Fund. McMennamin remembers her father being in awe of the Academy’s sizable collection. He made clear to his young daughter (with Bales and her husband, Rob McMennamin, accepted the job as co-chairs of the Academy’s Cuisine from the Collections (with Bales and husband Michael Dell’Angelo) because it gave them a way to communicate their excitement and motivate friends to get involved.

Cuisine is a fun Academy cocktail party that features food and drink inspired by the 18 million scientific specimens in the Academy’s collections. With Academy staff, McMennamin, of Wayne, and Bales, of Chestnut Hill, have merged an entertaining evening with the Academy’s science and history, choosing foods, selecting scientists for special appearances, and networking with friends from all over the Greater Philadelphia region. "Our two sides of Philadelphia don’t overlap much because of geography," Bales says. "Seeing everyone come together at an event like Cuisine is energizing."

This year’s event is focusing on chocolate to complement Chocolate: The Exhibition. Guests can expect creative variations of chocolate, as well as a glimpse of how chocolate is used in all types of cuisines—not just desserts.

"It’s all about delicious food and interesting pairings," McMennamin says. "Cuisine is a wonderful night out in the city, and the evening is enhanced by the knowledge that everyone’s participation impacts the Academy in a positive way. Last year’s party was so much fun, I felt like we could have stayed all night!" –Mary Alice Hartsock

To receive an invitation or for more information on Cuisine from the Collections, visit ansp.org/cuisine or email cuisine@ansp.org.

CHARITABLE GIFT ANNUITIES

You can help support the Academy of Natural Sciences of Drexel University and have a steady stream of cash you can count on—even during challenging economic times—through a charitable gift annuity.

The economy and the financial markets don’t always perform as we need or want them to perform. This is especially challenging if you are retired and living on a fixed income. Even if you planned well, market performance can upset the best laid plans. If you are concerned about the performance of some of your appreciated assets or need to increase your cash flow, you may want to learn more about a charitable gift annuity.

Here’s How it Works

You transfer cash or appreciated, marketable securities to the Academy of Natural Sciences, and in exchange, we make fixed, annual payments to you for the rest of your life. The payout percentage is based on age, so the older you are, the higher the rate. The charitable gift annuity provides other benefits, too. A portion of your annual payment is tax-free because it is considered return on principal. You will also be entitled to a charitable income tax deduction in the year you create the gift. Then you will have up to five additional years—if you need them—to use it.

We’d be delighted to prepare a personal gift annuity illustration for you at no obligation. If you think a charitable gift annuity would work for you, we will do our part to make the process go smoothly. Just let us know how we can help. Please don’t hesitate to contact Amy Marvin, vice president for Institutional Advancement, at 215-299-1013 or marvin@ansp.org. She would be delighted to assist you.

Thank you for your support!

SAVE BIG ON A YEAR OF DISCOVERY!

Introduce someone on your holiday shopping list to the wonders of the natural world. Purchase an Academy gift membership for a friend or relative, and they will receive:

➢ Unlimited FREE GENERAL ADMISSION all year long
➢ FREE or DISCOUNTED TICKETS to special exhibits, including Chocolate: The Exhibition
➢ EXCLUSIVE PREVIEWS of Academy exhibits
➢ PARKING DISCOUNTS
➢ And much more!

Present this coupon at our admissions desk to receive 10% off an Academy gift membership, or purchase a gift membership online at ansp.org/membership with promo code THANKS.
Chirp Cookies!

Using insects. Always a hit—the famous chocolate chip cookies!

The Academy would especially like to recognize those who have joined or renewed their support in the Academy’s Leadership Circles of Giving between June 1 and August 31, 2014.

Jefferson Circle
Mr. and Mrs. George W. Gephart Jr.
Cynthia and Martin Hecksher

Estate Gifts
Estate of Dr. Ruth Patrick
Estate of Douglas C. Walker

Matching Gifts
Eulen Foundation
Merck Partnership for Giving

Gifts to the Collections and Library
Dr. A.W. Addison
Dr. and Mrs. Jon K. Gelfuss
Dr. and Mrs. John M. Robinson III
Dr. and Mrs. Keith S. Thomson
Doug Weclehler and Debbie Carr

In-Kind Donors
6abc
Eastern Standard
Wawa, Inc.

The Academy would especially like to recognize those who have joined or renewed their support in the Academy’s Leadership Circles of Giving between June 1 and August 31, 2014.

Jefferson Circle
Mr. and Mrs. George W. Gephart Jr.
Cynthia and Martin Hecksher
Welcome to the Academy Frontiers page for kids, one of the many great ways you can participate in the Academy’s Kids Club!

CONTEST: NIGHT AT THE MUSEUM
Attention explorers 3–12! What do you think happens at the Academy after dark? Write a short story about it (250 words or fewer) or draw a picture (or both) in the space below for your chance to win a prize! One lucky winner will receive a free family four pack to a 2015 Safari Overnight. Upcoming overnights are Friday, February 21, and Saturday, April 18. Please include your name, age, and contact information on the back of your story or drawing and mail to Academy Membership Office, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103, or drop off your submission at either of our admissions desks during your next visit. Entries must be received by December 5, 2014.

AAM AWARD
The Academy is pleased to announce our receipt of an award in the American Alliance of Museums’ Publications Design Competition! The Academy and our graphic designers at Eastern Standard received second place in the annual report category for institutions with a budget greater than $750,000 with our 2012–2013 annual report, Telling our Story. For more than 25 years, the Alliance has recognized and encouraged excellence in the graphic design of museum publications. Winners are chosen for their overall design excellence, creativity, and ability to express an institution’s personality, mission, or special features. To receive a copy, please call 215-299-1182 or download the report at ansp.org/about/governance.

CUISINE FROM THE COLLECTIONS
On November 8, the third annual Cuisine from the Collections will feature food and drink inspired by the 18 million specimens in the Academy’s scientific collections. A variety of food stations will include ingredients not usually found in the kitchen, from bugs and snakes, to snails and more! And this year’s Cuisine event coincides with Chocolate: The Exhibition, so you can count on some decadent menu items to coordinate. It’s not too late to buy tickets. To receive an invitation or for more information, visit ansp.org/cuisine/tickets or email cuisine@ansp.org.
OCTOBER

**Chocolate: The Exhibition opening Weekend**
Saturday and Sunday, October 11–12, 10 a.m.–5 p.m. *

**Ocean Fest Featuring the Philadelphia Shell Show**
Saturday and Sunday, October 18–19, 10 a.m.–5 p.m. ⬇️

**Mega-bad Movie Night:**
*The Lost World* (1960)
Thursday, October 23, 5:30 p.m. ⏰

NOVEMBER

**Sustainable Chocolate Day**
Sunday, November 2, noon–2 p.m. ⏰

**Museum Closes Early**
Saturday, November 8, 3 p.m.

**Cuisine from the Collections**
Saturday, November 8, 7 p.m. ⏰

**Scout Workshops: Webelos and Boy Scouts**
Saturday and Sunday, November 15 and 16, 10:15 a.m., 1:30 p.m. ⏰

**Dinosaur Days**
Friday through Sunday, November 28–30, 10 a.m.–5 p.m. ⏰

DECEMBER

**Scout Workshops: Webelos**
Saturday and Sunday, December 6–7, 10:15 a.m., 1:30 p.m. ⏰

**Nerd Nite**
Wednesday, December 3, 7:30 p.m.
Frankford Hall, 1210 Frankford Ave., Philadelphia

**All-Star Days**
Saturday through Tuesday, December 27–30, 10 a.m.–5 p.m. ⏰

Don’t miss our special Hot Chocolate bars in the Academy Café from noon–2 p.m. during Dinosaur Days and All-Star Days! ⏰

---

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

*§3 Individual and Family level member fee for Chocolate: The Exhibition. Family Plus level members and above receive free admission. Purchase or renew your membership today at ansp.org/membership.

Visit ansp.org for more information and to register.