ACADEMY

LETTERS

The member magazine of the Academy of Natural Sciences

FALL 2011

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Academy Frontiers is a quarterly publication of the Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103.

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

For information about Academy membership, call 215-299-1022 or visit ansp.org/membership.

On the cover: Outside In *Supervisor Karen Verderame gets close with a nymph of a giant cockroach (*Blaberus giganteus*). Turn to page 5 to learn how she shares her passion for science with visitors of all ages. Photo by Alex Rudinski.*

Greetings From the Academy

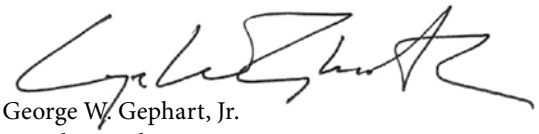
As summer turns to fall, we are hard at work planning a year's worth of exciting celebrations, educational programs, and activities for our Bicentennial. From now through March 20 visit us online at ansp.org/200/stories as we tell a story a day of our fascinating history, current research, and more. We are especially eager to unveil our major exhibition, *The Academy at 200: The Nature of Discovery*, which celebrates the Academy's groundbreaking discoveries of the past and present and provides a glimpse into our future. Save the date for our March 24 and 25 Bicentennial Weekend, featuring the exhibit opening, special appearances, fun hands-on activities, music, games, crafts, and, of course, birthday cake.

Over the past few months, we've been working with Drexel University to finalize our affiliation and develop programs that advance our shared goals. A national leader in sustainability, Drexel is helping our Center for Environmental Policy strengthen the Academy's sustainability efforts. Academy and Drexel scientists are designing a new Drexel scientific department, Biodiversity, Earth, and Environmental Sciences (BEES), and our educators are collaborating with Drexel's School of Education to create new programs for students and teachers. In addition, our exhibits and public programs teams are working with the Antoinette Westphal College of Media Arts & Design to enhance our visitor experience. We hope you'll join us on October 26 for a free community day in celebration of our affiliation.

In this issue of *Academy Frontiers*, find out how the research of Academy scientists is teaching us everything from how to prevent pollution-induced algae blooms in the East China Sea to what life was like 375 million years ago in Arctic Canada. You'll also learn about the important role bugs play in Academy collections, events, and exhibits! Turn to page 4 to read about *Bugs…Outside the Box: Discover the Art Within the Science*, our newest changing exhibit featuring gigantic, hand-crafted, scientifically accurate insect sculptures by noted Italian artist Lorenzo Possenti. We hope you'll join us for opening weekend on October 22 and 23 as we unveil these enormous sculptures along with amazing live insects and colorful specimens from our collections.

I look forward to celebrating with you as we approach our Bicentennial and continue our work with Drexel. I hope you will consider supporting the 2011 Annual Fund—the Academy's success would not be possible without your assistance. Thank you for your continued commitment to our mission.

All the best,



George W. Gephart, Jr.
President and CEO

JOIN US FOR THESE UPCOMING EVENTS!

October

22 Philly Rocks Adult Program, 10 a.m.–1 p.m.
Learn basic geologic features and how to identify local rocks during a non-strenuous, fun hike. Three Act 48 credits available. Register now as space is limited. (Rain date Oct. 23)

22–23 *Bugs…Outside the Box* Opening Weekend, 10 a.m.–5 p.m.
View giant, scientifically accurate insect sculptures by Italian artist Lorenzo Possenti alongside live insects and colorful specimens.

26 Academy/Drexel Affiliation Day, all day
Join us for a free community day at the Academy to celebrate our affiliation with Drexel University!

27 Mega-Bad Movie Night
Stop by the Academy after hours for the awesomely awful pseudo-science flick *Eight Legged Freaks* (ages 18 and up).

November

7 and 9 Millipedes, Moths, and Macro Photography Adult Program, 7–9 p.m.
Bring your camera equipment as Doug Wechsler, the Academy's director of VIREO, presents a two-part program on the basic techniques of macro photography inside our amazing *Butterflies!* exhibit. Two Act 48 credits available. Register now as space is limited.

14 Science on Tap, 6 p.m.
National Mechanics, 22 S. Third Street, Philadelphia

25–27 Dinosaur Days
Celebrate dinosaurs with a holiday weekend of fun activities.

December

4 *Dual Nature: Science Illustrations of Dan Otte* Closes

10 *Beguiled by the Wild: The Art of Charley Harper* Opens in Art of Science Gallery
View the vivid, delightfully graphic, and geometrical works of American wildlife artist Charley Harper (1922–2007).

12 Science on Tap, 6 p.m.
National Mechanics, 22 S. Third Street, Philadelphia

27–30 All Star Week, 11 a.m.–4:30 p.m.
Make crafts, hear stories, view live animal shows, and analyze museum specimens as we celebrate our most popular attractions.

January

14–16 Heat Wave Weekend, 10 a.m.–5 p.m.
Tired of the cold? Visit the Academy and chase that chill away. Learn about Academy expeditions to warmer climates, conduct your own climate change experiment, and meet some animals that have unique ways of beating the heat.

Fee Registration required Free with museum admission

Visit ansp.org for more information and to register.

On Exhibit

Dual Nature: Science Illustrations of Dan Otte

Art of Science Gallery
through December 4, 2011

See the world through the eyes of a renowned scientist in *Dual Nature: Science Illustrations of Dan Otte*. Dr. Otte, the Academy's curator of Entomology and the world's leading expert on grasshoppers and crickets, shares his artistic side through this remarkable collection of animal drawings. From grasshoppers to beetles, Otte's delightful, detailed sketches provide an unusual glimpse into the intersection of art and science.

Bugs...Outside the Box: Discover the Art Within the Science

Changing Exhibits Gallery
October 22, 2011–January 16, 2012

This world-premiere exhibit features giant, scientifically accurate insect sculptures by Italian artist Lorenzo Possenti. With spectacular live insects and colorful specimens from the Academy's invertebrate collection appearing alongside their hand-crafted counterparts, *Bugs…Outside the Box* provides a one-of-a-kind look at these amazing creatures.

The Academy at 200: The Nature of Discovery

Opening March 24, 2012

TWO HUNDRED YEARS *of* DISCOVERY

Building on the Academy's extraordinary collections and two centuries of scientific exploration, this exhibit celebrates our groundbreaking discoveries of the past and present and provides a glimpse into our future. Journey alongside Academy scientists as we search for new species and explore how human activity is affecting our environment. Encounter rare and amazing specimens from the Academy's collections, and find out how our scientists use these specimens to understand environmental issues from pollution to climate change. Join with the Academy in our commitment to shaping a sustainable future for our communities and our planet. Step into our shoes and experience your favorite natural history museum in a whole new way at *The Academy at 200: The Nature of Discovery*.

Karen Verderame shows off an Atlas beetle (Chalcosoma atlas).

KAREN VERDERAME

KAREN VERDERAME CALLS HERSELF A BUG NERD. When she isn't at the Academy overseeing the children's nature museum, *Outside In*, she can be found climbing trees and turning over logs in search of the creepy-crawly creatures she loves so much.

Verderame's fascination with bugs began early. At age 12, she started volunteering in the Philadelphia Zoo's backyard bugs exhibit. That volunteer work quickly became a career, and in 2003 Verderame joined the Academy. Today she serves as *Outside In* supervisor and training and enrichment manager. She cares for mammals and invertebrates, trains volunteers, and keeps *Outside In* fresh and exciting.

"I have always enjoyed sharing my passion for animals," she explains. "I use my passion to guide my staff and volunteers so they can help visitors learn something about nature that they haven't heard before."

Verderame constantly comes up with new ways to make science interesting and relatable for visitors of all ages and educational backgrounds.

"I always try to have my enthusiasm on!" she says. "If I can find a way to connect people to what I'm talking about and make it personal, I can inspire them to take action on the environment."

Verderame hopes to make a difference by helping visitors learn to respect invertebrates, which she believes make up one of the most misunderstood animal groups in the world. As a point person for the Academy's annual Bug Fest, she helps create and execute interactive visitor activities. She also collects bugs, which sometimes involves traveling to the New Jersey Pine Barrens with Academy entomologists. Verderame has traveled as far as Arizona to search for bugs.

"I want to leave as little impact on the environment as possible," she explains. "If I don't know how to keep a bug alive, I don't take it. I also don't take anything endangered."

Verderame strives to understand the environment in which she is collecting so she can keep her specimens comfortable. She creates mini habitats inside containers, making sure her bugs have the food they need and are kept at the right temperature.

"Caring for invertebrates keeps you on your toes," she says. "They are so diverse! I like a challenge, and they always present one."

Verderame lives and breathes bugs. Academy staff members leave bugs on her desk for identification; when she returns home, she finds bugs from the neighborhood children on her doorstep. But it's never a burden. In fact, Verderame encourages her community to take an active interest in her work. After Academy events that involve live bugs, she and the neighborhood kids get together to release the bugs back into their natural surroundings.

Verderame's bugs play an important role in *Bugs…Outside the Box*, the Academy's newest exhibit featuring handcrafted, scientifically accurate insect sculptures by Italian artist Lorenzo Possenti (open October 22, 2011–January 16, 2012). She is in charge of collecting and coordinating the live specimens that will appear alongside Possenti's sculptures. She also will care for the specimens and train the exhibit volunteers who will teach visitors about the live bugs.

"I want to make a difference by helping people forge connections to the natural world," she says. "It's all about igniting that spark of curiosity and stewardship!"

Academy Abbreviated

200 Years.
200 Stories.

200 STORIES

Do you know why our moose is wearing another moose's antlers? Can you figure out some of the secrets behind the Academy's dioramas? Are you up-to-date on what Academy scientists are doing in the field? To kick off our Bicentennial, the Academy invites you to reflect with us on our fascinating history and promising future. From now through March 21, visit ansp.org/200/stories daily to view exciting photographs and read interesting and sometimes humorous anecdotes about our founding, growth, exhibits, programs, amazing scientists, and more!

NEW CAFÉ HOURS

Dine with us during your visit, or stop by anytime for a bite! The Ecology Café, located on the ground floor, is now open from 9 a.m. to 4:30 p.m. on weekdays and 10 a.m. to 5 p.m. on weekends. We are proud to welcome 12th Street Catering as the new operator of the Café. 12th Street Catering focuses on preparing fresh food from scratch and incorporating local and seasonal ingredients. Members receive a 10 percent discount in all food areas.

ALL STAR WEEK

From December 27–30, celebrate our most popular attractions through scientific observation, animal shows, craft making, and storytelling. On Tuesday, Academy naturalists bring dinosaurs back to life with special presentations in our Dinosaur Hall. Wednesday features our live animals and plenty of picture-taking opportunities. Butterflies are the center of attention Thursday, as scientists show off our fascinating butterfly specimens. Get a close look at weird-things-in-a-jar on Friday, and make your own weird-thing-in-a-jar craft to show your friends and family.

GEEK OUT!

On Friday, August 19, the Academy of Natural Sciences and local blog Geekadelphia rolled out the red carpet for the first Academy Awards-style ceremony celebrating the city's "geek" scene. Awards were given to winners in 19 categories for local achievement in technology and science, including Best New Blog, Best New Podcast, and Best Local Viral Video. Local celebrities took the stage to talk about the nominees, open envelopes to announce the winners, and present trophies and plaques.

STAY TUNED ONLINE!

Want to hear about all the latest Academy happenings? Be the first to know about upcoming events and take a chance to win cool prizes by signing up for our eNews, following us on Twitter, and becoming a fan of us on Facebook! Visit ansp.org to sign up for eNews and for links to our Facebook page and Twitter feed.

Academy Abbreviated

Will Klein

DINOSAURS ROAM THE ACADEMY

Join us Thanksgiving weekend for fun activities focusing on dinosaurs and their closest living relatives—birds. On November 25–27, enjoy dinosaur shows at 11 a.m., view fossils at 1:30 p.m., and learn about live birds from one of our experts at 2:30 p.m. Can't get enough dinosaurs? Visit Dinosaur Hall throughout the day to hear teacher/naturalist presentations and make a dinosaur craft to take home.

Get Connected

ANSP Library/QL674E261

The Yellow-rumped Fly-catcher, and The Gentian of the Desert *by William Bartram with additions by George Edwards from* Gleanings of Natural History (1758-64).

Anyone can be a naturalist. In each issue of *Academy Frontiers*, our scientists and experts share their knowledge to help you explore the natural world around you.

In this issue, Ernie Schuyler, curator emeritus for Botany, suggests you spend some time this fall searching for a rare, beautiful plant called Pine Barren Gentian, or *Gentiana autumnalis*.

Recognized by its five-petal, deep-blue or blue-purple flowers covered in pale green dots, Pine Barren Gentian grows up to one-half meter tall. Its flowers grow on a single stem with several narrow leaves. Though Pine Barren Gentian is most likely to bloom during September and October, you'll have to look hard to find it. The conservation status of this brilliant blue-flowered plant is considered "vulnerable," and with a few exceptions, it grows only in the New Jersey Pine Barrens and the North Carolina Pine Woods.

Why is this plant so rare, and why is it concentrated in the Pine Barrens? The Pine Barren Gentian tends to prosper in areas that have been affected by fire or in disturbed sandy forest openings and roadsides, says Schuyler. The New Jersey Pine Barrens are a frequent site of lightning-induced forest fires, which Schuyler explains are a normal part of the Pine Barren ecosystem. Because of fire-suppression efforts and human development, the chances to spot the plant are rare. The damp, sandy soil of the Pine Barrens provides the best environment for Pine Barren Gentian to prosper.

For help finding this unique plant, Schuyler recommends paying a visit to the Philadelphia Botanical Club. If you're in the Pine Barrens, "look for open, disturbed roadside areas where the sand is damp," he explains. If you're lucky enough to find Pine Barren Gentian, take lots of photographs—but be sure to leave this rare plant in its natural habitat.

A Sea of Change

By Mary Alice Hartsock
Editor

Having grown up in Zhoushan, one of the largest fishery areas on the coast of the East China Sea, Academy scientist Dr. Ling Ren can't hide her surprise at the changes there. Three decades of rapid urbanization and development accompanied by dramatic population increases have changed the face of this formerly peaceful fishing community. During the past 15 years, the once-bountiful fish supply has decreased drastically—in part because of pollution-induced algae blooms.

Harmful blooms of phytoplankton, a type of algae that floats on water surfaces, are appearing repeatedly along the coast of Zhoushan. Phytoplankton, which grow naturally over time, are the foundation for the aquatic food web, Ren says. When light, temperature, and nutrient conditions are ideal, phytoplankton populations can grow explosively, a process called bloom. Yet certain species tend to thrive in the presence of pollution, and their blooms can be harmful.

Pollution can cause certain toxin-producing phytoplankton blooms that are harmful to fish and humans who consume contaminated seafood. Humans also can become ill from airborne toxins. Even when some blooms don't produce toxic substances, the increased algae may get stuck in fish gills, causing the fish to suffocate and disrupting the food supply.

"Phytoplankton blooms happen as a result of eutrophication, or excessive input of nutrients like nitrogen and phosphorus," explains Ren. "Eutrophification is common in coastal areas where large populations of people live. In Zhoushan, large amounts of nutrients from improper disposal of untreated sewage, untreated or mistreated industrial wastes, and excessive fertilization of crops are dumped into the coastal area."

Although nutrients are essential for photosynthesis, excessive nutrient input causes the process to occur too quickly, resulting in rapid growth of massive phytoplankton populations. These blooms sink to the bottom of the sea where they decompose and consume oxygen. The condition of hypoxia occurs when oxygen levels fall too low to sustain animal life.

"Hypoxia stresses crabs and other bottom feeders because these animals need oxygen to survive," says Ren. "They will either flee or die off, leaving a 'dead zone' where life once existed."

Ren explains that this problem occurs throughout the world, including on the northern Gulf of Mexico, where she spent three years studying the relationship between hypoxia and phytoplankton blooms during her postdoctoral research.

In Zhoushan, the effects of phytoplankton blooms extend through the food chain. Small animals graze on the algae, the larger fish eat those animals, and soon the harmful toxins accumulate in the local fish supply. Fishermen have told Ren that the decreased availability of healthy fish combined with the health risk posed by toxic food challenges their ability to provide for residents. As a result, fish market shoppers have witnessed rising prices.

"I wanted to get inside this problem and find out more about its relationship to human activity," she explains.

So in 2009, Ren took to the seas—literally. In collaboration with scientists from Zhejiang Ocean University (ZJOU), she began a project that aims to evaluate the status of the ecosystem and biodiversity in the Zhoushan Fishery area, re-examine how phytoplankton blooms affect fish resources, and provide a scientific basis for coastal management and ecological restoration measures. The three-year project is funded by the Chinese Ministry of Science and Technology. Ren's role is to study the biodiversity of phytoplankton and human-induced nutrient input on phytoplankton growth.

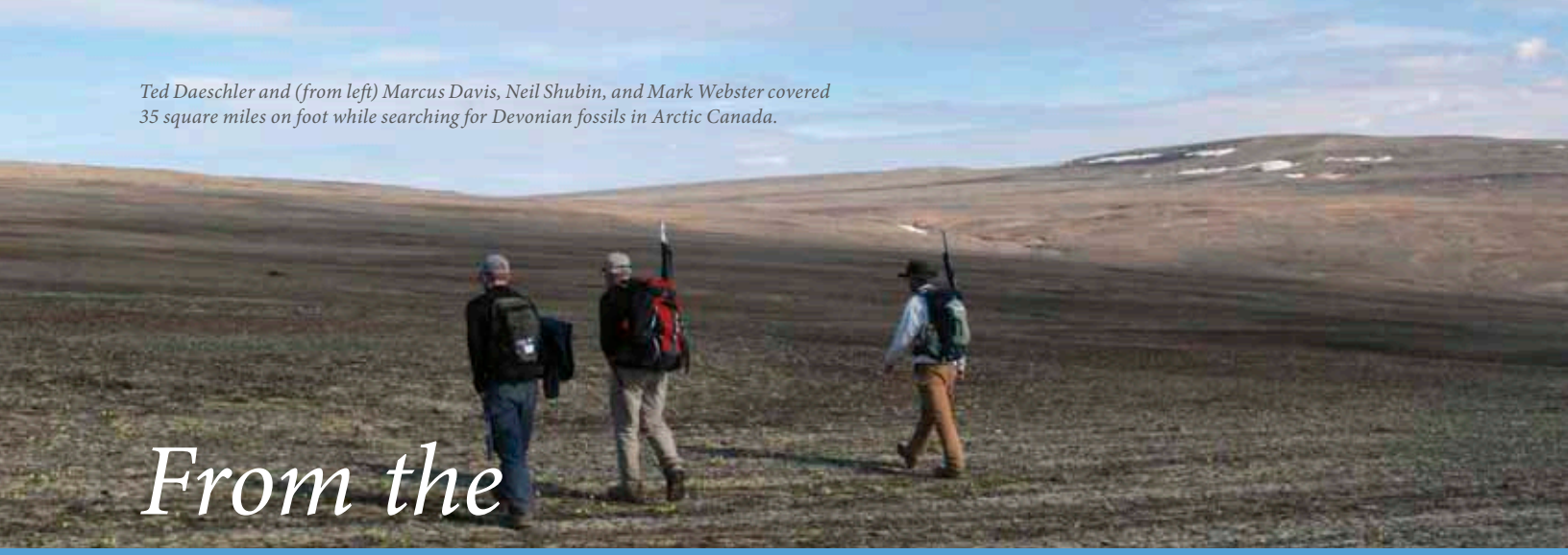
Last November, supported partly by the Cotswold Foundation, Ren embarked on a field trip with graduate students. They collected samples at 11 stations throughout the coastal area before returning to the University for four weeks to analyze these and other samples that the students had collected during the year. This analysis uncovered the presence of a phytoplankton called *Pseudo-nitzschia* that may cause shellfish poisoning in humans.

Ren also set up microcosms (small-scale experiments to recreate the conditions that spur algae blooms) to study the nutrient inputs on phytoplankton, and she trained Chinese graduate students to carry out the experiments and take monthly phytoplankton samples from the study area. She will return to China this November to check their progress. She also will return to the sea to take new samples.

"People can see algae blooms; they wonder why they happen and what causes them," she adds. "I hope the information I find can support waste removal in the area and help develop information for coastal management strategies."

Ren recently received funding to study phytoplankton blooms in the Barnegat Bay area of New Jersey. During the three-year funding period, she hopes to learn how phytoplankton blooms are related to human activity and how these blooms are affecting the long-term ecology of the bay. To learn more about Ren's work and the activities of the Asia Center at the Academy of Natural Sciences, visit ansp.org.

(left) Ling Ren takes sediment samples during her postdoctoral research in the Gulf of Mexico.



Ted Daeschler and (from left) Marcus Davis, Neil Shubin, and Mark Webster covered 35 square miles on foot while searching for Devonian fossils in Arctic Canada.

From the Academy *to the* Arctic

By Mary Alice Hartsock
Editor

Devonian microfossil

To catch a glimpse of creatures that lived 375 million years ago, you will probably have to travel to a museum or research institution like the Academy of Natural Sciences. If you're Dr. Ted Daeschler, the Academy's vice president for systematics and the library, your search will take you all the way to the Arctic.

Almost 20 years ago, Daeschler, a vertebrate paleontologist, began studying Devonian age fossils in the Catskill Formation of northern Pennsylvania. In 1999, he and his research partner, Dr. Neil Shubin of the University of Chicago, began seeking other sites that would broaden their knowledge of the era. That's when they learned about a group of 380- to 370-million-year-old rocks in the Nunavut Territory of Arctic Canada.

"The rocks attracted us because they came from a time period with evolutionary events that interested us," Daeschler explains. "The rocks also were deposited in environments such as streams, deltas, and lagoons that could preserve the animals that we sought. And the layers of rocks are clearly visible at the surface, which improves our ability to search carefully for fossils in as much rock as possible."

Daeschler, Shubin, and the team have taken seven successful trips to the region, several of which focused on the monumental discovery of *Tiktaalik roseae*, a 375-million-year-old fossil lobe-finned fish with many features only seen in tetrapods (limbed animals). *Tiktaalik roseae* is the best example of the evolutionary transition between finned and limbed animals.

In July 2011, the team traveled back to Nunavut for a three-week expedition.

"Ideally, our trip would lead us to more fossils that help us understand additional steps in the transition from finned to limbed animals," Daeschler says. "Our main goal was to study the rocks and fossils in a window of time that we had not yet sampled fully.

"We must use our time in the field efficiently, so we studied geological maps and publications, topographic maps, and aerial photographs. As we entered the field, we did an aerial survey, and then we put down our camp near the most promising areas."

Covering 35 square miles on foot and logging 13 fossil sites, the team collected geological information and fossils, many from armored and lobe-finned fish. Visit ansp.org/nunavut to read Daeschler's blog about his findings and the team's daily routine.

Upon his return to the Academy, Daeschler, along with paleontology staff and volunteers, will unwrap, organize, and label the specimens for future preparation.

"We are finding that these fossils are from different kinds of animals than those found during earlier expeditions," Daeschler explains. "This may be because we crossed over onto the ancient shoreline and delta systems.

"Another possibility is that the nature of these rocks preserved a different set of fossils," he suggests. "Also, we are looking at a slightly different slice of time in which certain animals could have become extinct."

Though the fossils eventually will be returned to Canada, researchers will continue to learn from them. Scientists who specialize in other fish groups may discern more new kinds of fossil animals. Others may investigate the way these creatures interacted with their environments, or they might study similarities and differences between fossils from various study sites.

"There will be additional questions and new analyses for decades or even centuries based on what we found," says Daeschler. "It's a treasure trove of information."

Bedbugs: Collections & Legacy

By Don Azuma, Guest Contributor

You probably know that bedbugs have returned to Philadelphia with a vengeance. But did early Academy members live with these complicated creatures? Former Entomology Collection Manager Don Azuma reflects on a memorable encounter with a 19th-century bedbug.

Bedbugs in textbooks are one thing, but seeing the real thing is a very different experience. I saw my first bedbug in 1987.

Cimex lectularius and *Homo sapiens* share a long relationship. The Ancient Greeks mention bedbugs as early as 400 B.C. They were well-known back in 1877, the year influential Academy member and founder of American Parasitology Joseph Leidy collected these specimens and four years before he became Academy president. They afflicted everyone regardless of rank or station in life. That changed in the 1940s when pesticide use became widespread. By 1987, one of the most familiar creatures known to man had become so obscure that generations had become almost completely ignorant of our former constant companions.

As collection manager, I had rescued the bedbug slide and thousands of microscope slides like it from the loading dock of a local university. Assumed to be of little value, this "teaching" collection was about to be discarded. As soon as it was back in the lab, I eagerly sat down to see what I'd brought back. Just the second slide out of the first box, and there it was.

I clearly remember my first thoughts—the warm, surprisingly crimson hue of the mounting medium, the odd geometry of their bodies, and especially the clear, unambiguous handwriting of Joseph Leidy.* It was as if he had just placed his hand on my shoulder. For years, I'd walked beneath his statue in front of the museum; I was aware of his reputation, but I knew little of his legacy. That day, I knew I had found something special and valuable.

Today, bedbugs and bedbug specimens have come roaring back from obscurity with renewed relevance. Try Googling "bedbugs" for an astonishingly worrisome experience. Reports of their resurgence are inescapable. Paradoxically, the slide highlights the enduring value of collections. Something once deemed "worthless" has re-emerged as an object of immediate relevance and lasting value.

The Academy's collections offer rich opportunities for research and discovery today and for future generations. Through their dedicated work and foresight, Academy founders and the scientists that followed them have preserved unique samples of the living Earth which have become the foundation for study, discovery, and legacy. Each specimen tells its own singular story that may complement but does not displace the story of any other specimen. The differences between specimens may be minute or monumental, but our capacity to discern those distinctions advances every day, with every new specimen, and with every new scientist.

**In the writing of this piece, Azuma discovered that the specimen Leidy collected was prepared and attributed to him in 1905, almost 14 years after his death.* ∾

Academy History

In 2012, the Academy of Natural Sciences will celebrate its Bicentennial. To celebrate the brilliant individuals who have made the Academy what it is today, Senior Fellow Robert M. Peck and historical biographer Patricia Tyson Stroud are in the final stages of writing A Glorious Enterprise, *a "family history" profiling the fascinating people who have been involved with the Academy over the past 200 years. In anxious anticipation of the book's 2012 release, we present this profile of Lucy Way Sistaire Say (1801-1886), wife of Academy founder and naturalist Thomas Say (1787-1834).*

ARTISTRY MEETS SCIENCE

By Patricia Tyson Stroud, Guest Contributor

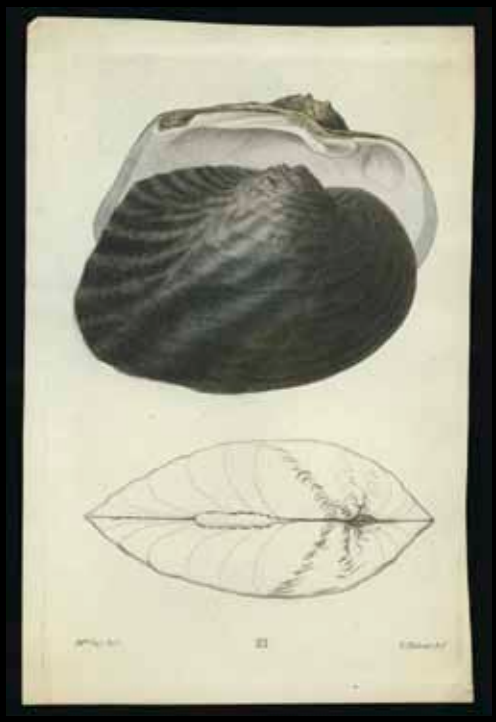
In 1829, Thomas Say, having moved from Philadelphia to the utopian community of New Harmony in Indiana, was deeply involved in writing his pioneering work on shells, *American Conchology* (seven parts, 1830-1836). His wife, Lucy Way Sistaire Say, originally from New York, had produced 20 beautiful drawings to illustrate her husband's descriptions. The engraver Cornelius Tiebout prepared the plates from Lucy's drawings, and when they were printed Lucy took over the tedious task of coloring them by hand. Under her delicate brushwork each engraving became an exquisite miniature. Lucy and Thomas set the type for the book together, and she was as excited about the project as he was.

Lucy had studied drawing and painting with French naturalist and artist Charles Alexandre Lesueur at Mme. Fretageot's school in Philadelphia, and she continued to receive lessons from him in New Harmony. She had also taken lessons from John James Audubon in 1824 at the time he came to Philadelphia to seek a publisher for *The Birds of America*.

When Thomas Say died in the autumn of 1834, Lucy moved to New York to live with her mother and sisters. She donated many of her husband's natural history specimens to the Academy and dedicated herself to completing the seventh number of his *American Conchology*, which was only partially completed at the time of his death. To this end she took up the art of engraving. At the time, engraving was still considered a man's profession, but Lucy's feminist spirit rebelled at such restriction. She wrote to her liberal friends, "I am looked upon as being very singular, particularly since I have commenced Engraving—a gentleman remarked 'Well! At what do you think the ladies will stop?' I replied, I hoped at nothing, short of breaking up the Monopoly so long held by the Gentlemen—that we were tired of cramping our genius over the needle and distaff."

Academy conchologist Timothy Abbott Conrad assisted Lucy in finishing her husband's work. She wrote to Academy benefactor William Maclure that Conrad had agreed to add three more plates, making eight in all, and that if Maclure should be "patronized" in this undertaking she would contribute her utmost toward the "mechanical" [engraving] part of the book. She assured Maclure that, "as this is the only resource of which I can avail myself, satisfactorily for my own maintenance, I am very anxious as to the success of the undertaking." Maclure complied with her request.

In the 1840s, Lucy gave the Academy all her husband's books and specimens as well as her own original drawings for *American Conchology*. In her eighties, she wrote to a young friend who was interested in Thomas Say that during all the years she had been alone she had maintained her interest in conchology. "I make no pretense of any critical knowledge," she said, "for at the death of my husband I had only learned the a. b. c. of the science—and had no opportunity afterwards of improving myself—had my lot been art in Phila[delphia] I should have had resource in the collections of the Academy of N[atural] Sci[ences] but I have ever retained the interest developed in my married life, and when opportunity occurred, have contributed such materials as I possessed whether in books or specimens. The Academy made me a life member for my good intentions." In 1841, Lucy became the first woman elected to Academy membership.



Lucy Say's beautifully hand-colored "Alasmodonta," Plate 21 from American Conchology.

From the Library & Archives

By Clare Flemming, Brooke Dolan Archivist, and Brandon Zimmerman, Independent Scholar

What could the world's most famous showman and the father of evolutionary theory possibly have in common? They, among thousands of other 19th-century notables, corresponded with the pre-eminent scientist of their time, Dr. Joseph Leidy (1823-1891). Leidy was an Academy curator for decades and the Academy president from 1882 until his death. His expertise spanned so many disciplines that he is remembered today for expertise in fields as diverse as vertebrate paleontology and parasitology.

The Academy Archives contain close to 3,000 handwritten letters from a vast and varied selection of individuals who sought Leidy's opinion. Two of the most legendary and unusual correspondents represent the extremes of the broad spectrum of authorities in natural history: evolutionist Charles Darwin and circus showman P.T. Barnum.

Darwin's letter, in which he comments on Leidy's support of Darwin's theory of natural selection, is an Archival gem; Academy staff display it with great reverence for visiting VIPs and researchers. Barnum's letter came about after his purchase of Jumbo, an elephant that he believed to be the largest in the world. While touring in Philadelphia, Barnum wrote to naturalist Leidy to request an evaluation of this extraordinary creature's size. His letter was newly revealed when Brooke Dolan Archivist Clare Flemming shared the collection of Leidy's correspondence with scholar Brandon Zimmerman. Not satisfied with reading a list of signatories, the scholar asked to see the actual letters. He may have been the first to recognize the Barnum letter as having been written by the famous showman. A typo in the Academy's *Guide to Manuscripts* listing the letter as belonging to "N.T. Barnum" may have caused other scholars to overlook Barnum's correspondence. Below we present a few lines from these letters:

Down
March 4, 1860

Dear Sir, Your note has pleased me more than you could readily believe; for I have during a long time heard all good judges speak of your palaeontological labours in terms of the highest respect. Most palaeontologists (with some few good exceptions) entirely despise my work; consequently approbation from you has gratified me much. Your sentence that you have some interesting facts "in support of the doctrine of selection, which I shall report at a favourable opportunity," has delighted me even more than the rest of your note. Pray forgive this egotistical note and with cordial thanks for your letter … Believe me Dear Sir, With sincere respect, Yours obliged,

Charles Darwin

~

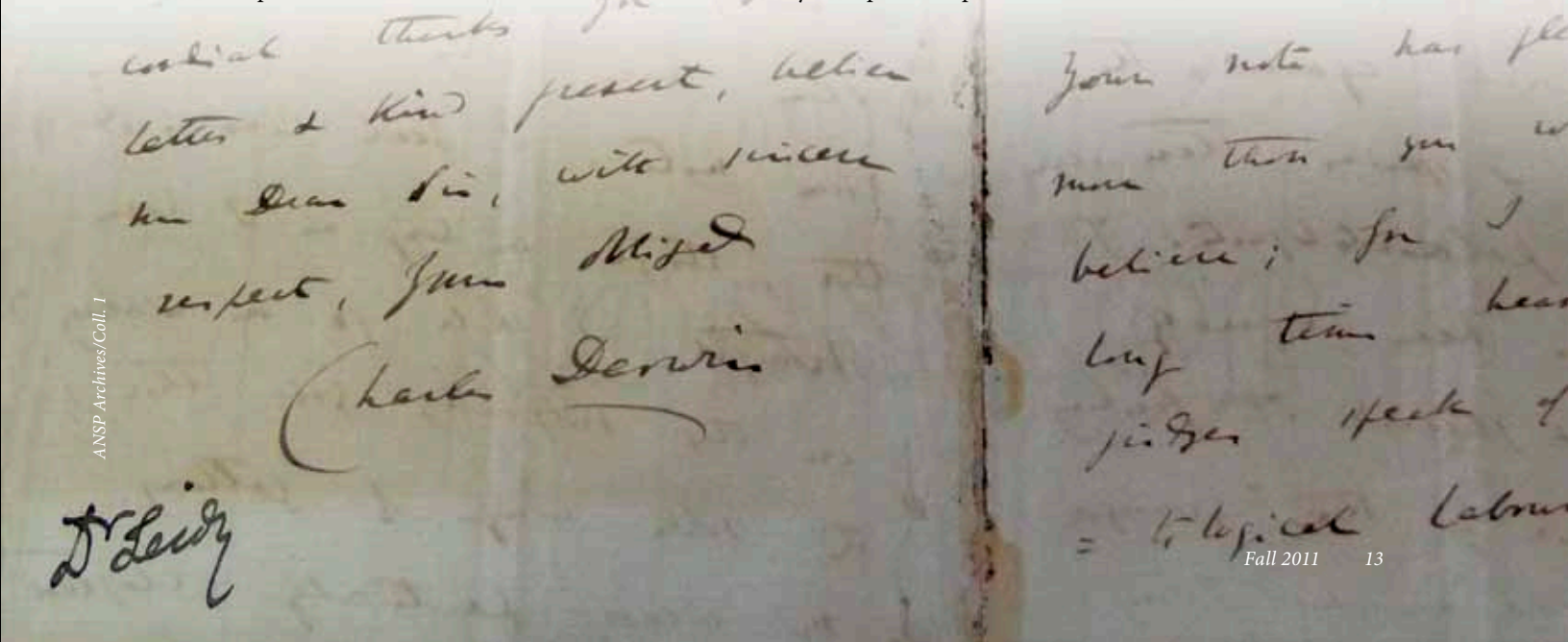
Philadelphia
April 28, 1882

Prof. Leidy D[ea]r Sir,

I hope you will examine the Jumbo & write me to Arlington House Washington whether you think he is really an ordinary [or extraordinary] Elephant.

Truly,
P. T. Barnum

The art of archiving allows a lifetime of messages received and stored by the original owner to be carefully identified, curated, and housed for many years; rehoused and catalogued; and finally—most importantly—made available to scholars to study, interpret, and present to the world.



ANSP Archives/Coll. 1

MARTY AND ANN SNYDER

When ten-year-old Marty Snyder received a Christmas present from his father's co-worker, he had no idea that the box contained what would become his life's passion. Marty was immediately fascinated with the array of seashell shapes, textures, and colors he found in the package. He spent time studying and arranging them, yet as he grew, his focus shifted to his schoolwork. He became interested again during graduate school when he began to explore seashell dealers' shops, but it wasn't until 1970 that he dusted off his shell collection for good.

The owner of a successful home remodeling business, Marty shared his interest with the Academy's former Malacology Curator Tucker Abbott. Abbott suggested that Marty focus on the Fasciolariidae, a family of large sea snails also known as tulip and spindle shells. Marty resumed his research voraciously, looking for everyone and everything that could provide information on his topic.

"Almost everything I needed was in the Academy's Library and Archives, and the librarians helped me access what I couldn't find," Marty remembers.

What he didn't find in books he absorbed during weekly mentoring sessions with current Curator and Pilsbry Chair of Malacology, Dr. Gary Rosenberg.

"He was incredibly generous with his time," Marty says. "I took him to lunch every week, and I would bring lists of questions about my work. Gary was terrific about answering any questions I had."

Over the past 20 years, Marty has published countless papers, many in collaboration with Malacology Collection Manager Paul Callomon. Marty has developed an extensive catalog of Fasciolariidae shells, which has become a well-respected resource among malacologists throughout the world. His wife, oil and pastel artist Ann C. Snyder, created the cover for the catalog. As an appreciator of science and a cheerleader for her husband's work, Ann has supported Marty's research collaborations by opening their home to visiting scientists. She often accompanies Marty on his shell collecting adventures.

"I am looking for shells that haven't been named or known shells that turn up in unexpected areas," Marty says. "You have to know the literature very well, because otherwise you wouldn't know what is new or out of the ordinary. That is why the Library is so important."

Through diving, buying, and trading, Marty has gathered the largest collection of Fasciolariidae snails ever assembled. He and Ann have generously donated this invaluable resource to the Academy.

"The Academy has one of the great shell collections in the world, and it was an obvious choice to donate my collection here," Marty says. "I couldn't stand to see it dispersed among various institutions. Plus, when it's here, I can continue to work with it."

Marty and Ann are focused on the Academy's future, yet their connections to the institution take root in its history. Ann's great-great-great-uncle, paleontologist, geologist, and Academy conchologist Timothy Abbott Conrad (1803-1877), was elected to Academy membership in 1831. He served as a curator and head of the publications committee during his tenure, and the Academy houses his fossil collection. Marty's great-great-uncle, the famous ornithologist John Cassin (1813-1869), was elected to Academy membership in 1847. He served as curator of birds and was vice president of the Academy in 1864. He described nearly 200 new species of birds during his lifetime.

Motivated to continue their uncles' legacies, Marty and Ann are strong supporters of science at the Academy. With former Board member Robert Burch and his wife, Susan, they created the preview party for the Philadelphia Shell Show and Festival to benefit the Malacology Department. Marty and Ann also have helped the Department obtain resources to support its work.

If you meet the couple socially, you're likely to hear them spreading the word about current Academy research and programs.

"We are enthusiastic about the potential for moving the Academy into the future under the terrific new leadership of President and CEO George W. Gephart, Jr. and in collaboration with Drexel University," says Ann.

"We want people to know about the great work that's going on here," Marty adds. "We are excited about the possibility of bringing the science into the public realm."

YEAR-END GIVING

2011 has been an economic roller coaster, yet charitable organizations continue to play an important role in our lives. In this issue, we offer answers to common questions about deadlines for tax deductions, IRA distributions, and Roth conversions. We hope this information will serve as a guide during the upcoming months as you consider your year-end gifts.

How much should I give this year?

Most people give because they are committed to a charity's mission and because a charitable organization or friend asked for support. Because donations are tax-deductible, charitable giving can make financial sense as well.

Now is a good time to get a handle on your tax liability for 2011. If you had more income and will owe more taxes this year, you may want to increase your giving before December 31. Consider talking with your financial advisors while you still have time to make a tax-deductible gift for 2011.

Am I eligible to make special charitable contributions from my IRA?

Owners of individual retirement accounts (IRAs) have the unique opportunity to make tax-free gifts to charity—but this opportunity expires on December 31, 2011. If you are 70.5 or older, you can directly transfer $100,000 per year tax-free to an eligible charity such as the Academy of Natural Sciences. This option is available for distributions from IRAs regardless of whether you itemize your deductions.

To qualify, the funds must be contributed directly by the IRA trustee to a public charity. Amounts transferred are not taxable, and no deduction is available for the transfer. Amounts transferred to a charity from an IRA will be subtracted from your required minimum distribution from your IRA.

Using your IRA distributions for charitable giving could save you more than just the taxes from an income tax charitable deduction. Making an IRA distribution to charity will reduce your taxable income. In situations in which an income tax charitable deduction wouldn't reduce taxes paid, using your IRA distributions for charitable giving will make a difference in income-based tax calculations.

Should I consider a Roth conversion and charitable giving?

Roth IRAs offer you the ability to enjoy tax-free income in retirement. Previous rules limited who could qualify for a Roth IRA. However, a change in the law in 2010 permits traditional IRAs to be converted to Roth IRAs regardless of income. Assets converted to a Roth IRA are considered taxable income in the year of the conversion. In other words, by converting your assets to a Roth IRA, you are accelerating the payment of future taxes in return for tax-free income later.

A silver lining is hidden in the recent market fluctuations. If your regular IRA has suffered declining values, you can convert your regular IRA to a Roth IRA at a much lower cost than when stock market values were high.

To reduce the increase of taxable income from a Roth IRA conversion, you can make offsetting charitable gifts such as a year-end donation to the Academy. Income tax charitable deductions may allow you to convert a larger percentage of your IRA balance without being bumped into a higher tax bracket.

How do I beat the clock?

It's natural to procrastinate, but don't get stopped short at the end of the year. Gifts of cash made by check are considered complete on the date they are mailed and are deductible in the year of the mailing. Electronic gifts of securities are generally complete when they are deposited to the Academy's account, not when you request that your broker initiate the transfer.

Thank you for your support!

When you support the Academy of Natural Sciences, you are contributing to nearly two hundred years of scientific discovery. If you have questions about how to support the Academy of Natural Sciences, please do not hesitate to contact the Academy's Vice President for Institutional Advancement, Amy Marvin, at 215-299-1013 or marvin@ansp.org.

A young Academy member took on some tricky housekeeping during a special Members' Night dinosaur-dusting activity.

Academy Support

On behalf of the Academy's Board of Trustees, we wish to recognize and thank those supporters who have contributed to the Academy between **June 1** and **August 31, 2011**. Your generosity helps to fund the Academy's many programs of research and education, and we are tremendously grateful for your support.

In Support of Book Conservation and Restoration
Maude de Schauensee

In Support of the Botany Curator Endowment
Hamilton Family Foundation
John C. and Chara C. Haas Charitable Trust

In Support of the Botany Type Specimen Digitalization Project
The Andrew W. Mellon Foundation

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Pauline Harman, *in memory of Pauline Harman and Sylvia Harman*

The Academy would like to give special recognition to those who have joined or renewed their support in the Academy's Leadership Circles of Giving between **June 1** and **August 31, 2011**.

Lewis & Clark Circle
Mr. and Mrs. Kyle Hoff

President's Circle
Anonymous
Ms. Sarah S. Alfadl
Mr. and Mrs. Thomas D. Elkinton
Timothy Nugent and Rebecca Calder Nugent
Ms. Signe Wilkinson and Mr. Jon Landau

(far left and left) Academy members went behind the scenes to meet our scientists at Members' Night on September 16.

WILLIAM L. MCLEAN III

Katie O. Clark

Bill and Elizabeth McLean became involved with the Academy in 1977.

By Linda V. Ellsworth, Director of Foundation and Government Relations

In late August, the Academy lost our friend and dedicated advocate, William L. McLean III. Bill was a member of the Academy Board of Trustees for more than 20 years and a trustee emeritus since 2006, serving on the executive, science, and education and exhibits committees. He was fascinated with ornithology and botany, but he was especially committed to enriching the Library. As chair of the Library committee for more than a decade, he worked to establish endowed funds for collections conservation, book purchases, and staff positions. In 2006, in recognition of his many contributions, Bill received the Academy's Maclure Award, which recognizes discovery, vision, and philanthropy. Of his family's generous contributions to the Academy over the years, Bill said, "we have just tried to make a difference."

"Bill was a wonderful guy," says Seymour S. Preston III, who served with Bill on the Board of Trustees. "He could be outspoken and tough when the situation called for it. However, by far, he was warm and compassionate and a very caring person. He had a deep interest in nature and the environment as demonstrated by his long service as a trustee of the Academy, a trustee and director of the Eastern Pennsylvania Chapter of the Nature Conservancy, and a longtime member of the Blooming Grove Hunting and Fishing Club in upstate Pennsylvania. He very much enjoyed fly-fishing and upland game hunting and teaching his children and grandchildren how to enjoy and be successful in both of these activities. I will miss Bill greatly and indeed I am sure he will be missed by a number of Academy employees and trustees."

ALBERT VISCO

Al Visco inspects a specimen in the Academy's Paleo lab.

By Ted Daeschler, Vice President of Systematics and the Library and Fred Mullison, Fossil Preparator

The Academy lost a good friend this spring with the passing of Albert Visco, a longtime volunteer in the Department of Vertebrate Paleontology. For more than 14 years, we spent Thursdays with Al here in the Vertebrate Paleontology Preparation Lab. As a fossil preparator, he worked on Devonian fossils that the Academy's research expeditions recovered from sites in the Catskill Formation of northern Pennsylvania and the Nunavut Territory in the Canadian Arctic. He worked on virtually all of the fossil materials, focusing primarily on preliminary specimen preparation and collection storage enhancement. Al's enthusiasm and dedication to his work resulted in lasting contributions to the fossil collection. We remember him fondly.

Al's family requested that friends remember him with contributions to the Academy's Department of Vertebrate Paleontology. "Working at the Academy gave Albert the chance to pursue what he loved," says his sister Frances Ellis. "He worked with artifacts that had been around for millions of years, and he wanted to contribute something that would be of value to researchers long after he was gone. I think it was the most gratifying thing that he did in his entire life. I can't thank the Academy enough for encouraging him to follow his interests."

In recognition of his dedication to our research, there will be a new award in Al's name given to an Academy volunteer who provides extraordinary behind-the-scenes service in the Academy's research areas.

Snapshots

IN THE FIELD

Dr. Jerry Mead and Frank Anderson are directing a research team that is studying the effects of mining gas from the Marcellus Shale Formation in Pennsylvania. This collaborative project, which began in June, includes most sections of the Academy's Patrick Center for Environmental Research (PCER). The team is working to understand the cumulative effects of mining gas on small streams by examining the aquatic insects, fish, amphibians, algae, and water chemistry in areas with a range in intensity levels of mining activity. Here, graduate student Stephanie Leach (left) and staff scientist Sylvan Klein perform a pebble count to better understand stream ecology. The study builds off a pilot study completed by Frank Anderson in 2010 with PCER guidance.

BEHIND THE SCENES

If you've visited the Academy recently, you have seen our breathtaking exhibit *Butterflies!*, which features a lush, tropical garden filled with a multitude of live butterflies from Central and South America, East Africa, and Southeast Asia. But did you know that our Entomology Department houses the oldest surviving specimens of Lepidoptera (an order that includes moths and butterflies) of any museum in the Americas? The Titian R. Peale Moth and Butterfly Collection, which includes specimens from pre-industrial Philadelphia, is one of the most scientifically valuable collections of North American insects in any natural history museum. This collection, along with countless additional specimens of butterflies, moths, and other insects that reside here at the Academy, functions much as a library does for scientists throughout the world who are studying insect evolution. Just as scholars at a college or university borrow books via inter library loan, scientists around the world may "check out" Academy specimens for use in research projects. The Academy's research collections thus serve as invaluable resources for the international scientific community. In this photograph, Entomology Collection Manager Jason Weintraub provides a behind-the-scenes tour of the Lepidoptera specimens.

Flashback

ANSP Archives\2011-020

This beautiful, clock-like item was recently discovered in the depths of the Academy storerooms. Thanks to several quick-thinking employees, it made its way to the Academy Archives. But what is it? A little research shows that this fascinating object is a vintage 1916-1920 Detex Guardsman, a device that Academy security guards used as recently as the 1980s. Detex keys were located strategically throughout the museum. These keys were inserted into the clock, imprinting a corresponding number on a paper tape located inside the clock. The next morning the tapes could be read to determine if the guard had checked the various areas of the building.

The weight of the eight-pound clock may have been the factor that motivated one crafty guard to move the Detex keys to his comfortable desk where he sat to perform his museum security "tour" and where his supervisor discovered the keys the next morning! Today guards at the Academy conduct tours with an electronic touch probe that collects data from titanium chips located throughout the building. The touch probe data is downloaded into a computer as needed. These systems have proven to be effective at thwarting security shortcuts, but they are not nearly as sturdy as the old Detex clocks. ~ *By Clare Flemming, Brooke Dolan Archivist, and Dave Taylor, Chief of Security*

Sustainability Matters

By Roland Wall, Director of the Center for Environmental Policy

In the past five years, the Academy of Natural Sciences has sponsored dozens of programs on topics such as urban design, renewable energy, and clean technology. Why are subjects like these becoming more and more important to a natural history museum?

In the 21st century, museums like the Academy have expanded their studies beyond those concerned with plants and animals. People have become widely disconnected from the natural systems on which they depend, and as a result, we need to understand what's happening to the planet and what can be done about it. Today's natural history institutions are the places to make these connections.

Humans are using natural resources at an alarming rate. Currently we consume more than half of all available freshwater runoff. Human economies use 30 percent of all the photosynthesis on the planet. At these levels, marine fisheries, the protein source for 1 billion people, could be decimated within 40 years.

The list goes on. Food, water, energy, and other natural resources are being used at an unsustainable rate. As the economies of developing nations like China expand, the statistics will become grimmer.

At the Academy, we are committed to reversing these trends. Using resources in ways that meet our present needs while ensuring that we can fulfill the needs of the future (the definition of "sustainability") will require everyone's ingenuity, judgment, and restraint. For these reasons, the Academy has started talking about technology. Although it has played a large role in driving the use of energy and resources, technology also will help us cope with our shrinking planet.

As the statistics above suggest, a critical need exists for new, green technologies that help solve the Earth's problems. In Philadelphia, green technology has become an important part of the future. With a world-class concentration of scientists, engineers, and designers; a government committed to making Philadelphia the greenest city in America; and public and private initiatives working to bring the city's economy into the 21st century, Philadelphia could become a paradigm of green thinking.

In the coming months, the Academy will explore many of these topics in public programming. Our new partnership with Drexel University will combine the Academy's rich history of natural and environmental science with one of the nation's foremost institutions of engineering and science education. We look forward to highlighting a new collaboration of natural history and human technology as we face some of the most urgent problems of our time.

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THE ACADEMY SHOP

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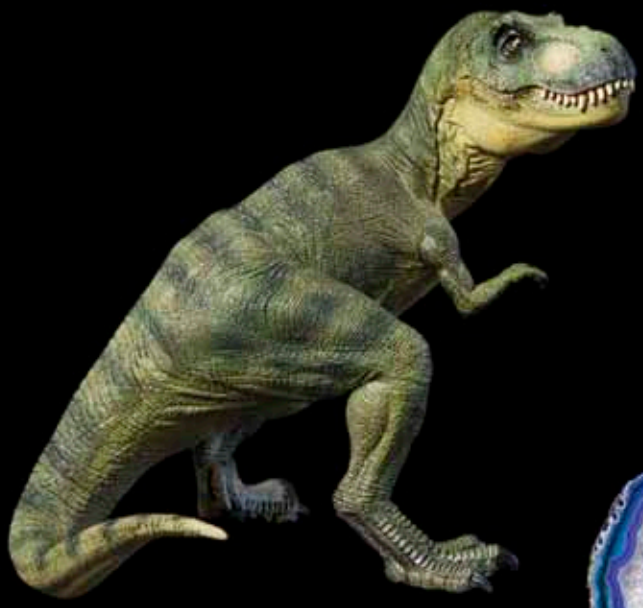

Need a gift for a natural science lover this holiday season? From beautifully **hand-crafted paperweights** to **nature-inspired jewelry**, the Academy Shop has an expanded selection of merchandise to satisfy science buffs of all ages!

Buying for the choosy scientist? The Academy Shop has **gift certificates** that you can purchase in any denomination. Your purchases will help to support the Academy's programs of scientific exploration, environmental research, and education.

MEMBER DOUBLE DISCOUNT DAYS!
Friday, November 24 through
Saturday, December 24
Members receive double their normal 10 percent discount on merchandise. Don't miss this chance for huge savings!