

ACADEMY

FRONTIERS

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

SPRING 2012

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

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ON THE COVER: *In a river draining Mongolia's Hangay Plateau, Academy Ichthyologist Dr. Mark Sabaj Pérez sets an eight-foot seine to catch minnows, loaches, and graylings. The colorful poles attached to the seine are traditionally used to support a ger, a portable nomadic dwelling. Photo by Tamra Mendelson.*

Greetings From the Academy



IT IS MY GREAT HONOR TO WRITE TO YOU TODAY AS WE CELEBRATE THE BICENTENNIAL of the Academy of Natural Sciences of Drexel University. Looking back at our history, I am proud of our monumental scientific achievements and our success in sharing our research with the public. Today the Academy continues to transform the scientific landscape and take steps to ensure a bright future for our community and our planet. In the past year, we have formed an affiliation with Drexel University that will promote discovery, learning, and civic engagement in the natural and environmental sciences. There is no better time to lead America's oldest natural history museum into the future.

Through March 2013, the Academy brings you a full year of programs, exhibits, and events highlighting our work on the relevant scientific issues of yesterday, today, and tomorrow. Throughout the year, we will feature themed months and special weekends highlighting our research and collections. Opening March 24 is our newest exhibit, *The Academy at 200: The Nature of Discovery*, which celebrates our scientists' groundbreaking discoveries and current research throughout the world. *Secrets of the Diorama*, a new, interactive exhibit, reveals never-before-shared facts about the research and artistry of the Academy's dioramas.

The Academy calendar is full this year, with plenty of opportunities for members like you to learn more about our work. On April 25, Senior Fellow Robert M. Peck and historical biographer Patricia Tyson Stroud will hold a book talk and signing for their illustrated history of the Academy. This spring we will observe the 30th anniversary of our Women In Natural Sciences program (featured on pages 8 and 9), and in the fall our scientists will partner with well-known area chefs to bring collection-inspired dishes to the dinner table. Through June 2013, our yearlong Town Square Series, "New Questions for an Old Planet," will answer your most pressing questions about climate change and energy; food and public health; water; and green building. Our October 11-12 symposium, "Biodiversity: From Evolutionary Origins to Ecosystems Function," will introduce current and future biodiversity research.

I look forward to seeing you this year as we celebrate 200 years of discovery in the natural and environmental sciences. I can't thank you enough for your support through the years, and I hope you will continue to stand with us in the future.

All the best,

A handwritten signature in black ink, appearing to read "George W. Gephart, Jr." The signature is fluid and cursive.

George W. Gephart, Jr.
President and CEO

ACADEMY FRONTIERS

Spring 2012

Contents

FEATURES

- 8 **A HOME AWAY FROM HOME**
The Academy's Women In Natural Sciences program has been helping girls reach their goals for 30 years.
- 10 **ROCKS AND RIVERS**
Why is Academy fish scientist Dr. Mark Sabaj Pérez working on a geological project in Mongolia?

PEOPLE

- 5 **ACADEMY VOICES**
Senior Fellow Robert M. Peck looks back on a lifetime of learning at the Academy.
- 14 **SPOTLIGHT**
Shewell DeBenneville Keim remembers his uncle, world-class ichthyologist Henry Weed Fowler.
- 15 **WELCOME**
New trustees join the Academy.

SCIENCE IN YOUR LIFE

- 7 **GET CONNECTED**
Find out where you can see the six-spotted tiger beetle.
- 13 **SUSTAINABILITY MATTERS**
Learn more about urban sustainability.
- 15 **ACADEMY SUPPORT**
Leave a legacy at the Academy.
- 19 **JUST FOR KIDS**
Participate in a photo challenge, ask an expert, and color a habitat!

NOTEBOOK

- 12 **FROM THE LIBRARY AND ARCHIVES**
200 Years Ago...
- 13 **FLASHBACK**
Moving Pictures
- 18 **SNAPSHOTS**
Botany Collection Manager Alina Freire-Fierro in the field, Butterflies! behind the scenes

AT THE MUSEUM

- 4 **ON EXHIBIT**
- 6 **ACADEMY ABBREVIATED**

JOIN US FOR THESE UPCOMING EVENTS!

APRIL

SCIENCE ON TAP:

MONGOLIAN FISH HUNT FEATURING MARK SABAJ PÉREZ
Monday, April 2, 6 p.m.

National Mechanics, 22 S. Third Street, Philadelphia

ACADEMY EXPLORERS CAMP

Weekdays through Tuesday, April 10 (begins March 28), 9 a.m.–4 p.m.

Ages 5–12, Before- and after-care available  

URBAN SUSTAINABILITY FORUM, URBAN HEAT ISLANDS: IS PHILADELPHIA THE NEW TROPICS?

Tuesday, April 17, 6 p.m.

ACADEMY EARTH DAY AT THE PHILADELPHIA SCIENCE FESTIVAL

Saturday, April 21, 11 a.m.–4 p.m.

SCIENCE ON TAP: SCIENCE QUIZZO

Monday, April 23, 6 p.m.

National Mechanics, 22 S. Third Street, Philadelphia

THE GREAT VACCINE DEBATE

PRESENTED BY THE WISTAR INSTITUTE

Tuesday, April 24, 6:30 p.m.  

A GLORIOUS ENTERPRISE BOOK TALK AND SIGNING

Wednesday, April 25, 6:30 p.m.

MAY


SAFARI OVERNIGHT

Friday, May 11–Saturday, May 12, 6:30 p.m.–9 a.m.  

WOMEN IN NATURAL SCIENCES DISCOVERY WEEKEND

Saturday, May 12–Sunday, May 13, all day

SEINING FAMILY FIELD TRIP

Saturday, May 12, 9:30 a.m.–1:30 p.m.  

Open to families with children ages 8 and up.

CHERYL BETH SILVERMAN MEMORIAL LECTURE



FEATURING TEMPLE GRANDIN

Tuesday, May 15, 6:30 p.m. 

VOICES OF THE NIGHT ADULT FIELD STUDY

Friday, May 18, 7–10 p.m.  

MEGA-BAD MOVIE NIGHT: SHARKTOPUS

Thursday, May 31, 6:30 p.m.  

JUNE

BIRD DISCOVERY WEEKEND

Saturday, June 9–Sunday, June 10, all day

JULY

ACADEMY EXPLORERS CAMP

Monday, July 9–Friday, August 24 (weekdays), 9 a.m.–4 p.m.

Ages 5–12, Before- and after-care available  

TINY TOT EXPLORERS

Wednesdays, July 11–August 22, 10 a.m.  

MAMMAL, REPTILE, AND AMPHIBIAN DISCOVERY WEEKEND

Saturday, July 14–Sunday, July 15, all day

 Fee  Registration required

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

Visit ansp.org for more information and to register.

On Exhibit



Rosamond Purcell

Everything Under the Sun: New Photographs of Academy Specimens by Rosamond Purcell

ART OF SCIENCE GALLERY
MARCH 3–MAY 20, 2012

Photographer Rosamond Purcell captures the extraordinary nature of everyday objects. A world-renowned Boston artist and author who has photographed natural history and anatomical collections for years, Purcell was the official photographer for Robert M. Peck and Patricia Tyson Stroud's new book *A Glorious Enterprise: The Academy of Natural Sciences of Philadelphia and the Making of American Science* (University of Pennsylvania Press, April 2012). Purcell presents a selection of the book's stunning color photographs that depict some of the Academy's amazing specimens in natural light.

The Academy at 200: The Nature of Discovery

CHANGING EXHIBITS GALLERY
OPEN MARCH 24, 2012

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 the environment. Encounter rare and amazing specimens from our collections, and find out how scientists use these specimens to understand environmental issues from pollution to climate change. Experience your favorite natural history museum in a whole new way at *The Academy at 200: The Nature of Discovery*.

This exhibit is made possible in part by the Forrest & Francis Lattner Foundation and Diversified Search.



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Doug Wechster/ANSP

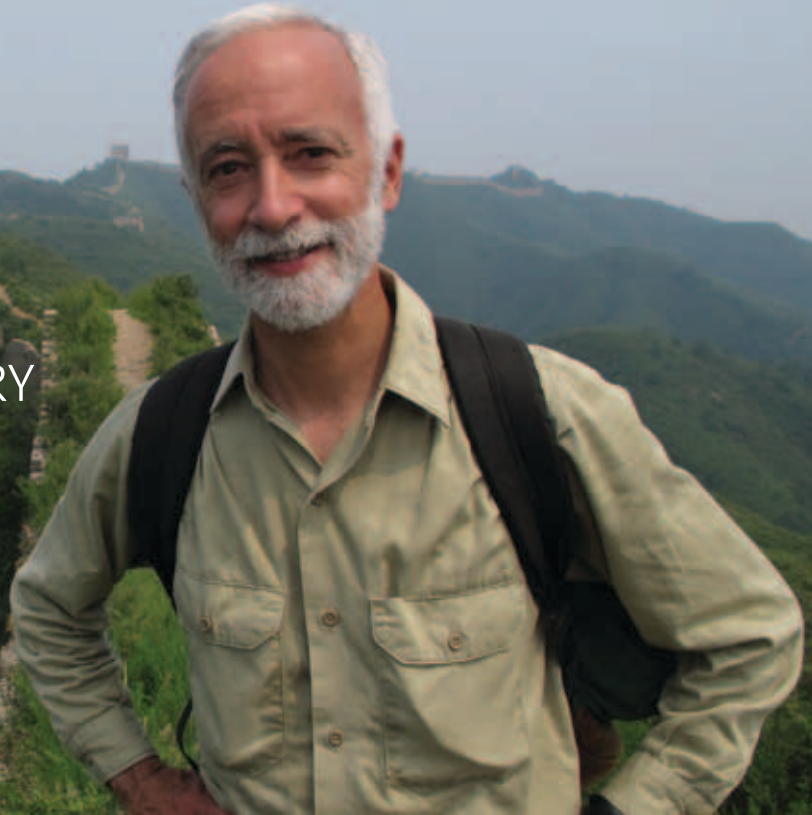
Flirtatious Feathers: A Colorful Collection of Academy Bird Photographs

ART OF SCIENCE GALLERY
MAY 26–SEPTEMBER 23, 2012

Whether in flight or in song, many birds display vibrant plumage that charms mates and photographers alike. This kaleidoscope of colored feathers is the subject of a stunning exhibit featuring images from the Academy's Visual Resources for Ornithology (VIREO), the most comprehensive bird image bank in the world. Built by the Academy in collaboration with exhibit design students from Drexel University's Antoinette Westphal College of Media Arts & Design, *Flirtatious Feathers* provides a bird's-eye view into the intimate world of winged creatures.

ROBERT MCCRACKEN PECK: WRITING AN ACADEMY HISTORY FOR THE FUTURE

Susan Peck



ACADEMY SENIOR FELLOW ROBERT M. PECK EXCITEDLY RUFFLES THROUGH A THREE-INCH STACK OF PAPERS, the almost-complete version of the manuscript he has lived and breathed for the past two years. Though this photocopy of his upcoming book written with co-author Patricia Tyson Stroud is black and white, one can imagine the splendor of the book's full-color images upon its April 2012 release.

"We began the process in 2010, but in some respects I've been researching for this book for 35 years," explains Peck, who began working here in 1976 at the suggestion of his friend, famed Academy limnologist Dr. Ruth Patrick. "Many of the individuals that we profile have interested me since I arrived at the Academy. It was a wonderful way to draw together a lifetime of immersion in the institution."

Peck has loved the Academy since boyhood. As a 10-year-old on a class trip to the museum in the 1960s, he was separated from his group, not realizing he was "lost" until his teacher found him engrossed in the moose diorama.

"I was imagining what it might be like to be there," he remembers. "The dioramas can transport you into another place and time."

Peck would spend his career walking past those enchanting scenes. Named Fellow in 1983, he began a range of special projects that overlapped science and the humanities. Though he has put the Academy's scientific work into a cultural context through exhibitions, articles, lectures, books, and other media venues, he has struggled to find a cohesive narrative of the Academy's history.

"Until now, there has been no single history of the museum," he says. "Librarian Edward Nolan attempted one at the time of our centennial, but funding was short and he was able to publish only a condensed series of anecdotal memoirs. It seemed to me that an institution of the Academy's stature deserved a formal, well-documented history on what it had achieved over the years."

With the Bicentennial approaching, Peck and Stroud combed through the Archives searching for letters, minutes,

and publications on what transpired. The result is a striking, large-format book, entitled *A Glorious Enterprise: The Academy of Natural Sciences of Philadelphia and the Making of American Science* (University of Pennsylvania Press, April 2012). Historical images and contemporary photographs by Rosamond Purcell are accompanied by stories of Academy personalities—some impressive, some riveting, and some downright gritty.

Peck will spend 2012 lecturing about some of the book's many stories. But right now, he reflects on his time here, exhilarated by the energy in the air on the Academy's 200th birthday.

"As we begin our affiliation with Drexel, we're entering a new phase in our history, a new reason for us to look at where we've been and where we're going," he says. "I hope our book will help make the Academy's work better known to the public—both the work we're doing now and the work we've done over the past 200 years."

~Mary Alice Hartsock

Academy Abbreviated

A GLORIOUS HISTORY

On Wednesday, April 25, we will highlight the Academy's history at a book talk and signing for *A Glorious Enterprise: The Academy of Natural Sciences of Philadelphia and the Making of American Science* (University of Pennsylvania Press, April 2012). Written by Senior Fellow Robert M. Peck and historical biographer Patricia Tyson Stroud, this work presents the first complete history of the institution.

Boyd Matson, a lead on-air journalist for *National Geographic*, will interview the authors. The event is co-sponsored by the Kal and Lucille Rudman Institute for Entertainment Industry Studies at Drexel University and the Free Library of Philadelphia. Visit ansp.org for more information.

The book presents some never-before-published stories from the Academy's first 200 years through a series of biographies. It includes stunning natural-



John Hubbard

light photographs of collection items by internationally acclaimed photographer Rosamond Purcell. Purchase your copy in the Academy's gift shop or at fine booksellers. Copies also will be available for purchase at the event, where Peck, Stroud, and Purcell will be signing books.



ANSP Archives/Coll. 2012-002

CARING FOR OUR TREASURES

In 2011, the Academy purchased a collection of trogon paintings by wildlife artist Albert Earl Gilbert with a generous grant from an anonymous supporter "in memory of Dorothy." These paintings were created to illustrate *Trogons: A Natural History of the Trogonidae* (Princeton University Press, 2009), written by J.M. Forshaw. Gilbert generously funded an endowment at the Academy to enable the care and use of this collection. His original paintings have joined the Academy's extensive collection of wildlife art housed in the Academy Archives.

Through fieldwork in Southeast Asia, Africa, and the Americas, Gilbert accurately depicted all species of trogons in their natural habitats and true colors. In creating his paintings, Gilbert referred to specimens from our Ornithology Collection and images from Visual Resources for Ornithology. The book, which is the definitive natural history of the trogon, won the 2010 International Book Award for best interior design and was a finalist for best cover design. At a time when logging and land clearing threaten tropical forests, the book is intended to draw attention to the urgent need to protect these birds by preserving their habitats.

DISCOVERY WEEKENDS AT THE ACADEMY

This year we invite you to explore highlights from our collections during specially themed Discovery Weekends.

On Saturday, April 21, join us for Academy Earth Day at the Philadelphia Science Festival (PSF). Academy scientists will set up outside the museum along with 80 other exhibitors as part of the PSF Science Carnival. Talk to scientists about their environmental and ecosystem research, and learn how you can help to preserve natural resources.

Women In Natural Sciences Discovery Weekend will be held during Mother's Day Weekend on May 12 and 13. Celebrate women's natural science contributions, and visit the Library to view some rare treasures created by women during the past 400 years. Meet scientists, make a nature-based gift for Mom, and find out about women's scientific advances.

On June 9 and 10 we highlight Ornithology at the Academy during Bird Discovery Weekend. Meet a real ornithologist, view specimens, catch presentations from bird experts, watch



Will Klein

a bird-skinning demonstration, learn to identify local birds, participate in a bird-banding activity, and more.

Learn about mammals, reptiles, and amphibians and meet the scientists who study them at Mammal, Reptile, and Amphibian Discovery Weekend on July 14 and 15. See weird and wonderful specimens from our Herpetology and Mammalogy Collections, help solve a mystery, and make an animal mask!



BEHIND-THE-SCENES TOURS

If you've ever wondered what fascinating things might be hidden behind the scenes at the Academy, you now have the chance to find out. For a limited time, from mid-April 2012 until February 2013, our scientists will open our cabinets and drawers to show you the amazing, the spectacular, and the downright unusual items in our collections.

Every month we will showcase a different theme—everything from birds and insects to live animals and the Library and Archives. One-of-a-kind tours, offered

only during our bicentennial year, will take place at the Academy Thursdays through Mondays at 11 a.m., except on festival weekends. Tickets may be purchased at our front desk on the day of the tour (\$5 per person for members/\$7.50 for nonmembers). Tours are for visitors ages 8 and up, with a maximum of 10 people per tour. You won't want to miss these special opportunities to talk with our scientists and see some of our treasures. Each theme lasts for one month only, so hurry in!

Get Connected

FINDING THE SIX-SPOTTED TIGER BEETLE

Anyone can be a naturalist. In each issue of *Academy Frontiers*, our scientists share their knowledge to help you explore the natural world. In this issue, Entomology Collection Manager Jason Weintraub suggests you take a spring stroll through the forest to find the six-spotted tiger beetle (*Cicindela sexguttata*).

Recognized by its long legs, white mandibles, and shimmering, metallic green or blue-green elytra (the hardened forewings, i.e., wing covers), the adult six-spotted tiger beetle is approximately one-half inch long. Contrary to its name, this tiger beetle can have zero, two, four, or six white spots on its elytra, Weintraub says. More widespread than other tiger beetle species, this generally solitary beetle is common in hardwood and open pine forests in the U.S. east of the Great Plains, except for the Gulf Coast and Florida. It lives on silty clay or sandy soil and may be found hunting for prey in sunny spots on the forest floor, along trails, or at the forest edge.

The six-spotted tiger beetle feeds on a wide variety of arthropods, including other beetle species, insect larvae, ants, crickets, grasshoppers, and spiders. In fact, the tiger beetle is among the fastest terrestrial insects on Earth, ambushing its prey while foraging for food on open ground or under leaf litter on the forest floor. It flies in quick, short bursts when chased by predators such as birds or dragonflies. Its shiny body may help it evade predators as it flies through the dappled light in the forest understory.

To find this common beetle in the Philadelphia area, Weintraub suggests taking a trip to the woodland and forested areas of Fairmount Park on an April or May morning when the weather is around 70 degrees Fahrenheit.

In Delaware and the southernmost counties of New Jersey, consider taking this trip on the first warm days in early April. Stick to forest trails, and seek out fallen logs in areas where the sun is shining through gaps in the forest canopy. Look carefully and quietly, as the tiger beetle is bound to spot you and fly quickly ahead of you on the path! 🐞



Patrick Coim



A HOME AWAY FROM HOME

30 YEARS OF CHANGING LIVES WITH WINS

By Mary Alice Hartsock, Editor

It's Wednesday at 3:55 p.m., and 20 girls clad in school uniforms, jeans, t-shirts, and plaid bustle into the Academy Commons. Their faces show the exhaustion of a long school day, but their energy returns as they exchange greetings and prepare for today's Women In Natural Sciences (WINS) class.

Teacher Naturalist Hollie Barattolo is visiting to give a lesson on evolution, but it is clear that WINS Manager Betsy Payne is the group's leader. Before introducing Barattolo, she provides instructions for a field trip to Philadelphia's Wagner Free Institute of Science and offers to help the girls secure summer internships.

In addition to providing science enrichment and career development opportunities, the Academy's WINS program is teaching underrepresented girls from Philadelphia high schools skills they need for the rest of their lives.

"To go into academia and careers, you have to present yourself well and communicate properly," says Payne, who worked in environmental education and consulting in Puerto Rico before moving to the U.S. to work as a science educator. "My job is to educate and mentor the girls in science and life, and when they have personal issues, to point them in the right direction."

WINS began three decades ago when Academy board members set out to

increase the number of women scientists at the institution and in the field. With the backing of the Philadelphia School District; support from foundations, corporations, and individuals; and growing interest among the girls, this summer program has transformed into a four-year experience. WINS I offers summer and after-school science enrichment to ninth graders. Graduates move on to WINS II, where they learn more about science and participate in youth development activities as well as college and career preparation.

"We look for girls who, without a little extra help, might fall through the cracks," says Payne. "Our typical girl is African American and comes from a single-parent household making less than \$30,000 a year.

"Of the girls that stay with us for four years, 100 percent finish high school, and 97 percent continue on to higher education," she says. "Many are the first in their families to go to college. About 60 percent pursue careers in the sciences."

WINS 2010 graduate Shanaya Shoats, who is among the 700 girls who have passed through the program since its 1982 founding, is thriving as a sophomore geology major at Indiana University of Pennsylvania. She sings in a gospel choir, serves on the Student Government Association and the NAACP, and

coordinates campus-wide activities for African-American students.

"I was the first person in my family to go to 12th grade," Shoats says. "I knew that if I dropped out of school, I dropped out of WINS, so I kept my grades up. Now when I go to my earth sciences classes, I say, 'I know this because we did this in WINS.'"

Getting through high school was hard for Shoats, who lost her mom during her freshman year. She didn't want to come to WINS, but she prospered as the girls welcomed her into their sisterhood. During her senior year, Shoats became a WINS I assistant responsible for mentoring younger girls and helping plan lessons.

"One of the girls called herself my 'mini me,'" she remembers. "I thought, 'If I fail, she's going to fail.' I just couldn't let her down."

Shoats stays in touch with WINS girls. In 2011 she led a tour at IUP, showing them what life can be like after WINS.

Current WINS I assistant Dominique Thomas still benefits from Shoats' leadership.

"She has showed me that I could get through college," Thomas says.

In addition to her work in Academy exhibits, Thomas is a mentor. When her mother was severely ill two years ago, Thomas looked to Payne for support.



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In addition to science enrichment in the classroom ❶, the Academy's WINS program provides countless environmental exploration opportunities outside Philadelphia. WINS girls search for Devonian fossils in northcentral Pennsylvania ❷; seine the bay in Cape Henlopen, New Jersey ❸; study macroinvertebrates near a salt marsh in Smyrna, Delaware ❹; and take night hikes in the Pocono Mountains ❺. WINS Manager Betsy Payne provides mentorship and guidance during classroom and outside activities ❻.

"I live in a single-parent home, so my mom is my main support system," she says. "I started falling behind in school, and I talked to Ms. Betsy and was able to get tutoring. WINS is my family away from home."

"WINS has always been a safe haven," Payne says. "The girls have someone who can hear them out about anything."

Along with mentorship from Academy educators, scientists, and WINS alumnae who return each year to pass along advice and life lessons, this guidance motivates Thomas, Shoats, and their peers. Inspired by the museum's energetic young visitors, Thomas hopes to work in pediatric medicine. She already has been accepted to several top-notch universities.

Shoats plans to obtain her master's degree in earth and space education in preparation for a career as a science educator. She's back in town during her break, making plans for the future as she helps Thomas assist with today's WINS class.

"I have the dream of taking Ms. Betsy's job when she retires," Shoats says. "I'm going to do that until I retire." 🌸

DOMINIQUE THOMAS

SHANAYA SHOATS



Tamara Mendelson

ROCKS AND RIVERS: MAKING THE BIG CATCH IN MONGOLIA

By Mary Alice Hartsock, Editor

- THE SETTING?** The Hangay Mountains of central Mongolia.
- THE PROJECT?** A study of the geological processes that caused the formation of a plateau embedded deep within the continental interior of Central Asia.
- THE SCIENTIST?** Dr. Mark Sabaj Pérez, an ichthyologist from the Academy of Natural Sciences of Drexel University.



Mark Sabaj Pérez removes grayling from a gill net in Khokh Nuur, a lake more than 2,600 meters above sea level on the Hangay Plateau. His research on Mongolian fishes is part of a study of the plateau's geological evolution: www.ees.lehigh.edu/groups/mongolia/index.html.

WHY IS SABAJ PÉREZ, A FISH SCIENTIST, WORKING ON A GEOLOGICAL PROJECT that focuses on the timing, rate, and pattern of uplift of the Hangay Plateau? The answer might surprise you, as Sabaj Pérez's participation breaks new ground by fusing the study of the land with a seemingly disparate analysis of its fishes.

While examining the Hangay's rivers, a team of geologists led by Dr. Karl Wegmann of North Carolina State University suspected that two species of fishes found on the plateau may help us understand the timing of the geological changes. They recruited Dr. Tamra Mendelson, an ichthyologist from the University of Maryland, Baltimore County, to investigate.

Mendelson, who had remained in touch with Sabaj Pérez since graduate school, asked to see the fishes he had collected in Mongolia in 2006 for the All Catfish Species Inventory, an international effort to classify the world's catfish diversity, funded by the National Science Foundation (NSF). The Academy already had ongoing research in the country, so it was an obvious destination for Sabaj Pérez at the time. What he did not expect then was that his knowledge of Mongolian fishes would prompt Mendelson to invite him to assist the geological project, also funded by NSF.

"The geologists noticed that there are two species of grayling, a freshwater fish in the salmon family, on the plateau," Sabaj Pérez says. "One species, *Thymallus arcticus*, lives in the rivers draining the plateau to the north, and a different species, *Thymallus brevirostris*, lives in the rivers that drain to the west.

"Before the uplift of the plateau, these rivers may have been connected and inhabited by a single widespread species of grayling. As the plateau rose, the drainages became divided, as did the ancestral grayling population. Living apart, the grayling populations accumulated enough differences over time to be recognized as two distinct species. Analyzing the genetic differences between these two species alongside the rate of the accumulated changes can give you an estimate of when the plateau first divided the two populations," he notes.

Sabaj Pérez and Mendelson also collected a variety of minnows and loaches, whose genetic differences can help scientists assess the timing of the plateau's uplift. The ichthyologists will compare their findings with those of the

geologists, who will use the dates of ancient lava flows, the rates at which rivers have eroded the land, and other data to piece together the history of the landscape. If estimates from the genetic and geologic analyses match, the scientists will have vital data about Mongolia's geological clockwork.

The project is in its early stages, but Sabaj Pérez and his colleagues have already identified three new species of fishes. Specimens of these and other rare species have strengthened the Academy's diverse collection of Mongolian fishes. As fishes from this area of the world have not been easily accessible to the ichthyology community, adding these well-documented and well-preserved specimens and tissue samples to the Academy's collection will broaden research opportunities for ichthyologists all over the world.

"These specimens offer opportunities for studies on the diversity, relationships, ecology, and distributions of these species as well as the chance to describe new species," Sabaj Pérez explains.

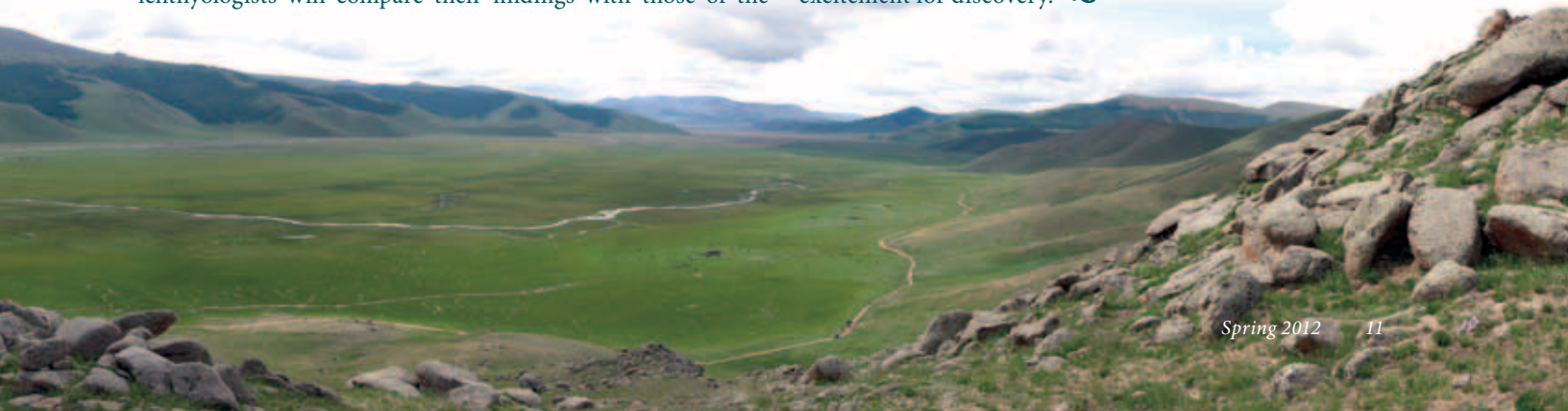
Fishes from this area of the world are more valuable than ever considering the rapid changes to Mongolia's landscape as the country experiences tremendous economic growth.

"Mongolia is the most sparsely populated country in the world, and as a result, many of its rivers and natural systems are relatively pristine," Sabaj Pérez says. "One would expect that these natural landscapes are soon to be modified. Mongolia's fishes offer one look at the rivers in their natural states before these changes occur."

This July, Sabaj Pérez will return to Mongolia to collect more fishes from new regions on the plateau and surrounding areas. That expedition, he says, may give the Academy the best collection of Mongolian fishes in the world.

The trip will reunite Sabaj Pérez with likeminded geologists and ichthyologists who will travel together, searching Mongolia's vast, rolling landscape for answers to a common question.

"Mongolia is truly spectacular, and it's one of the few places I've been where the human footprint remains at a minimum," Sabaj Pérez says. "The most thrilling component of my job is fieldwork, especially traveling to remote places with an experienced team of scientists who share my curiosity for the natural world and excitement for discovery." 🌊



From the Library and Archives

200 YEARS AGO

The objects of useful science and liberal knowledge, themselves dispassionate are best attained by unprejudiced investigation, patient enquiry, singleness of attention, abstraction from ambition and from intention, by concentration and combination of all the powers of the mind undisturbed with imaginary vanities or fears, by modest and friendly converse and comparisons of facts and ideas with other men who love or are devoted to science, by good humoured association and cooperation, by deferential communications divested of egotism and presumption, by calm clear expositions of ideas and facts, by respectful discussions and generous honourable interchange of observation and reasoning in short by clear perceptions, unsophisticating representations and pleasant quiet tranquil deliberation.

—Constitutional Act of the Academy of Natural Sciences, March 1812

That and more, in a four-page nutshell, explains why Jacob Gilliams, Camillus Macmahon Mann, Nicholas Parmantier, Thomas Say, John Shinn, Jr., John Speakman, and Gerard Troost founded the Academy of Natural Sciences of Philadelphia in the spring of 1812. These men chose one among them with excellent handwriting to serve as secretary. This founder wrote the documents that ultimately would become a remarkable collection of handwritten memoranda, declarations, and acts, carefully stored through the centuries and now preserved in the Academy Archives (Coll. 527).

To mark the birth of the Academy, the founders—who included a distiller, a

doctor, an entomologist, a mineralogist, and a couple of apothecaries—chose a scientifically important date: “the spring equinox, 21st of March,” 1812. They declared that the “object of the originale association of the Academy of Natural Sciences ... is thus simple, one and only one, namely Science exclusively, useful Science, Physics, the science of Facts, dispassionately demonstrable knowledge and no other.”

The many results of the sentiments expressed in these documents are expertly revealed in books and journal articles, but what if one wants a first-hand look at the real thing? That can only be had in the Academy Archives.

We can imagine that our founders might be startled, but above all proud, to see how their little city has transformed over the past 200 years and how their beloved institution has stayed true to its mandate: To remain a “Society of generous goodwilling emulation for the acquirement, encrease, simplification and diffusion of natural Knowledge, unconnected with and unwarped by Political or Religious Theses, Views, or Prepossessions.” ~ Clare Flemming, *Interim Director of the Library & Archives and Brooke Dolan Archivist*

Note: Spelling of all quoted material taken from the original document.

Academy of Natural Sciences
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All the foundation Members.



ANSP Archives/Coll. 2012-001

TO THE ACADEMY LIBRARY, THE SITUATION WAS WIN-WIN: The Exhibits Department had been preparing a new permanent display called *Secrets of the Diorama* and was looking for classic footage of taxidermy, background painting, molding and casting, and related skills. The Academy Archives, home to about 400 reels of film, holds a fantastic piece of history in its 16-mm film, *To Africa for a Habitat Group: 1955 Carpenter Expedition*. The content was perfect for the exhibit, but the film was badly in need of restoration.

The catch? Only that it costs about \$4,000 to professionally clean, properly restore, and digitize just one reel. The Library and Archives and Exhibits Departments brought together departmental funds to bring our classic Academy film into an accessible digital format. Now the restored, hour-long DVD is cataloged in the Library and readily available to anyone intrigued by the efforts of this collecting expedition. A seven-minute version showing the expedition, fabrication, taxidermy, and artistry behind the Desert of Borkou diorama is now on display in the new exhibit—guess the secret's out! ~Clare Flemming, *Interim Director of the Library & Archives*, and Jennifer Sontchi, *Interim Director of Exhibits*



Sustainability Matters

THE IMPORTANCE OF URBAN SUSTAINABILITY

By Roland Wall, Director of the Center for Environmental Policy

In the near future most of us will live in cities. Put simply, the world is urbanizing.

We enter the 21st century with approximately half the world's population living in urban areas, up from less than 5 percent at the beginning of the 19th century. About three-fourths of the U.S. population lives in cities. Cities must increasingly draw on external resources such as food, water, and energy, extending their environmental footprints into surrounding regions and around the world.

This unprecedented growth offers challenges and opportunities for promoting urban sustainability, a critical component of the work of the Academy of Natural Sciences of Drexel University.

Philadelphia is a leader in the urban sustainability movement. The mayoral administration has made sustainability a central part of its vision, and local businesses have embraced sustainable practices. Community leaders now see local food, open space, green stormwater management, and energy conservation as solutions to pressing urban problems.

The Academy has helped guide the city and the region by sponsoring and presenting the Urban Sustainability Forum, a monthly panel that highlights groundbreaking environmental work in Philadelphia and across the country. Coordinated by a consortium of organizations and government agencies, the Forum has played a key role in articulating Philadelphia's efforts to become the greenest, most livable city in America.

This year the United States Environmental Protection Agency (EPA) chose Philadelphia to partner with Brazil on the Joint Initiative on Urban Sustainability, which identifies innovative ways to develop urban infrastructure that promotes sustainable development with economic, social, and environmental benefits. A public portion of this dialogue took place on January 13, when leaders from Philadelphia, Brazil, and the EPA came to the Academy for a discussion of this global vision.

During our Bicentennial, we will work with our partners at Drexel University to strengthen and expand our commitment to urban sustainability and the greening of Philadelphia. Visit ansp.org to learn about upcoming Urban Sustainability Forums. ♻️

SHEWELL DEBENNEVILLE KEIM: REMEMBERING HENRY WEED FOWLER

BEING THE NEPHEW OF HENRY WEED FOWLER (1878–1965) IS NOT SOMETHING 93-YEAR-OLD SHEWELL “BUD” DEBENNEVILLE KEIM TAKES LIGHTLY. He knows that Fowler, who worked at the Academy from 1902 until 1965, was one of the giants of 20th-century



Henry Weed Fowler, ca. 1959

ichthyology. But Keim, a retired electrical engineer living in Fort Myers, Florida, remembers his uncle as the smart, funny gentleman who shared expedition stories while visiting the Keims’ Washington, D.C., home in the 1930s.

“Every year, Uncle Henry would come down from Pennsylvania and spend two weeks working at the Smithsonian,” Keim says. “In the evenings he would tell all kinds of humorous stories of his expeditions. He kept the family laughing. His visits were a big part of our life!”

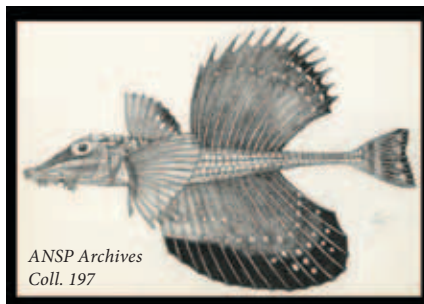
Fowler already was building his collection of more than 125,000 fish specimens, which would become the cornerstone of the Academy’s Ichthyology Collection. Some specimens he collected in Pennsylvania and New Jersey represent species that are no longer found in the same streams, making these specimens important records of historical biodiversity.

Fowler’s fascination with the natural world began in Holmesburg, PA. That’s

where he met Bud Keim’s father, Thomas Daniel Keim (1879–1968), whose sister Elizabeth Keim (1884–1970) would eventually become Fowler’s wife. Young Fowler and T.D. Keim searched for fishes in Pennsylvania streams. In 1909, Fowler named a species of minnow from the Allegheny River, *Notropis keimi*, after T.D.

At age 14, Fowler wrote to the Academy Board of Curators expressing his determination to “devote my life to the study of Natural History.” Two years later he became an Academy Jessup student.

After studying at Stanford University under influential American ichthyologist David Starr Jordan, Fowler became Academy assistant curator of “cold-blooded” vertebrates in 1902. During the next six decades he compiled the monumental *Catalog of World Fishes*, partially published in 27 parts by the Taiwan Museum in their quarterly journal (1964–1976). His travels abroad enabled him to make extensive descriptions and checklists of fishes, many of which he accompanied with detailed pen and ink illustrations (below). Fowler often was at the drawing table during Keim’s visits to his aunt and uncle’s home in Langhorne.



ANSP Archives
Coll. 197

Many of Fowler’s drawings focus on new species. He published 1,929 new fish names, about 40 percent of which are in use today. He named one new species of scorpionfish after Ernest Hemingway, whom he and then Academy president Charles M.B. Cadwalader accompanied on a six-week fishing trip in the southern Gulf Stream in 1935.



Bud Keim with Buster

Carol Crane

“Uncle Henry happened to get together with a wealthy man with a yacht who would take him out to fish in the Caribbean,” recalls Keim. “Even when my uncle wasn’t there, Hemingway would catch fish and send them wrapped up back to Uncle Henry.”

“Uncle Henry was world famous,” Keim says. “It’s a wonderful thing in a way ... to know someone who was truly a scientific elite.”

At the Academy, Fowler is a household name. Keim has made two generous contributions to the Academy to ensure the conservation and addition of scientific value to his uncle’s ichthyology collection. Academy ichthyologists are improving the physical maintenance of the specimens, updating old records, entering uncataloged “backlog” specimens into the Academy’s electronic database, and digitally imaging the most scientifically important specimens.

Keim is pleased that these efforts will enable Fowler’s work to benefit ichthyologists for centuries. His memories of his uncle make him proud to be related to this legendary scientist.

“At 8:30 when we kids had to go to bed, we used to lean over the stair railing to hear what Uncle Henry was saying,” Keim remembers. “He had this great big laugh that would go all through the house. He would hold you spellbound all night long.”

~Mary Alice Hartsock

THE 1812 SOCIETY: LEAVING A LEGACY

Since 1812, the Academy's most dedicated supporters have made the institution part of their legacies. These committed donors have invested in our future by including the Academy in their estate plans. Our Board of Trustees recently established the 1812 Society in honor of forward-thinking supporters whose contributions have sustained the Academy's growth for the past two centuries.

The Academy depends on contributions from people like you to support our programs of research and education as well as to care for our world-renowned collections of more than 18 million biological specimens. The Academy's planned giving program provides a variety of creative and flexible ways for you to support the Academy now and into the future while fulfilling your own personal and financial goals.

A CHARITABLE BEQUEST

Among the most popular of giving instruments, a bequest is simply a provision in your will or living trust for a gift to the Academy at the end of your life. It can be arranged as part of your initial estate planning or with an amendment to existing plans. You can leave a specific sum of money, piece of property, or a percentage of the remainder of your estate.

A CHARITABLE BENEFICIARY DESIGNATION

You can name the Academy as a beneficiary of all or a portion of a retirement fund, life insurance policy, annuity contract, and bank or brokerage account. All you need to do is complete a beneficiary form and return it to the entity that issued the policy or maintains the account. Your designation can be changed

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In exchange for a gift of cash, securities, or real estate to the Academy, you or anyone you designate can receive fixed annual payments for life. In addition to life payments, you are entitled to a charitable deduction, and a portion of your annuity payments may be tax-free. When the gift annuity ends, the Academy uses the remaining balance of your contribution to support its mission or a particular program you designate.

PERMANENT LEGACY

To create a permanent legacy at the Academy, you may direct that your estate gift be placed in the Academy's endowment. Since only a portion of the endowment and its earnings are spent each year, your gift will generate support for the Academy in perpetuity.

If you have arranged for a planned gift to the Academy, please let us know. In appreciation of your generosity, we invite you to become a Charter Member of the 1812 Society. To learn more or if you would like to receive a free copy of our new guide to gift planning, *Leaving a Legacy*, please contact Amy Miller Marvin, vice president of Institutional Advancement, at 215-299-1013, email plannedgiving@ansp.org, or visit www.ansp.org/plannedgiving. Thank you for your support! 🐾

TRUSTEES NAMED TO ACADEMY BOARD

THE ACADEMY IS PLEASED TO WELCOME TWO NEW TRUSTEES to our governing board. With their in-depth knowledge of Drexel's resources, these individuals will offer invaluable expertise as our new affiliation takes shape.



ABBIE DEAN received her master's in interior architecture and design with a focus on exhibit design at Drexel, where she returned after a 23-year professional career in advertising and communications. As a Drexel trustee and advisor, she has helped organize, design, and co-curate exhibitions at Drexel's Leonard Pearlstein Gallery (named in honor of her father). Previously, Dean was senior vice president, corporate communications and advertising at Confab Corporation, where she was a board member. She also has served on the boards of the National Liberty Museum and the Baldwin School.



JOHN A. NYHEIM enjoyed a career as a highly successful investment management professional with Wellington Management and then with his own firm, Nyheim & Associates. He has served continuously on the Drexel University Board of Trustees since his 1989 appointment. Nyheim is a trustee of the Philadelphia Museum of Art and the Curtis Institute of Music. He also serves as a Board Member at the Academy of Vocal Arts, where the John A. Nyheim Fellowship is named in his honor.

ON BEHALF OF THE ACADEMY'S BOARD OF TRUSTEES, we wish to recognize and thank those supporters who have contributed to the Academy between December 1, 2011, and February 29, 2012. Your generosity helps to fund the Academy's many programs of research and education, and we are tremendously grateful for your support.

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IN THE FIELD

Botany Collection Manager Alina Freire-Fierro studies the origin and diversification of the plant genus *Monnina*, which grows from the southern United States to Chile and Uruguay. Here she poses with *Monnina phillyreoides* (Bonpl.) B. Eriksen in a remnant of the cloud forest of northern Ecuador. This “treelet” is the most common species of *Monnina* in Ecuador, where about 40 of the genus’ 200 species grow. The plant genus can grow at many elevations and in areas as diverse as rainforests and rocky outcrops. It flourishes in areas disturbed by human activity. Here it is seen growing in front of a potato field.

Freire-Fierro traveled to Ecuador to take samples and gather information about habitats. Examining the plant’s DNA in combination with its morphology, or physical characteristics such as leaf shapes, flowers, and fruits, helps us understand the evolution of these characteristics and find differences between species. 🌿



BEHIND THE SCENES

In this photograph, Butterfly Coordinator William Herkewitz prepares a shipment of chrysalises for placement in the Academy’s *Butterflies!* exhibit. After carefully unpacking the chrysalises, inspecting them, and pinning them to the foam underside of a shelf, Herkewitz places them into a warm, humid chamber. In the Academy’s *Butterflies!* exhibit, you can watch as butterflies emerge from the chrysalises. You may see butterflies from Central America, South America, Africa, Asia, and Southeast Asia.

The chrysalises in this photograph traveled from a butterfly farm in Costa Rica. Unlike the many local farmers who must clear tropical forest habitats to plant their crops, Costa Rican butterfly farmers rely on native vegetation to support butterfly reproduction. Farmers gather butterfly eggs and care for them as they hatch into caterpillars. These caterpillars generally require about two weeks of feeding before they develop into chrysalises that can be placed into cardboard boxes for export. 🌿



JUST FOR KIDS

WELCOME to the new *Academy Frontiers* page for kids, one of the many great ways you can participate in the Academy's Kids Club, launching in 2012!

Can you spot five differences between these two photos of the Academy's *Tyrannosaurus rex* in Dinosaur Hall?

PHOTO CHALLENGE



DID YOU KNOW...?

Instead of nesting in trees like most owls, burrowing owls spend time in holes in the ground! Usually they take over burrows left behind by animals like prairie dogs or squirrels, but they can also make their own holes. – Hollie B., Teacher Naturalist

Do you have a question about the natural world around you?

Email kidspage@ansp.org, and your question might be included in our next issue.

COLOR A HABITAT

A habitat is a home. In a habitat, you must have food, water, shelter, and space. Enjoy coloring this pond habitat. Have fun discovering the wonders of nature, and look for animals in the picture. Can you find the raccoon, fish, and deer?



Jennifer Anne

PHOTO CHALLENGE ANSWER KEY: In the second photograph: the floor in front of the *T-rex's* left foot has zero lights instead of two; the signage closest to the *T-rex's* left foot is invisible; the *T-rex's* "arm" is missing; the large meat-eater skull in the lower right has disappeared; the screen behind the *T-rex's* tail shows a palm tree.

THE ACADEMY
OF NATURAL SCIENCES
of DREXEL UNIVERSITY

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THE SECRET IS FINALLY OUT!
NOW OPEN...

SECRETS *of the* DIORAMA

What exactly is inside the animals in the Academy's dioramas? Are the plants and trees real? What does an antelope tongue feel like? Why did they make all those dioramas anyway?

The Academy's newest permanent exhibit, *Secrets of the Diorama*, reveals the surprising answers to these and other mysteries while providing insight into the detailed fieldwork and painstaking artistry that brought our dioramas to life.

You'll never look at our
dioramas the same way again!