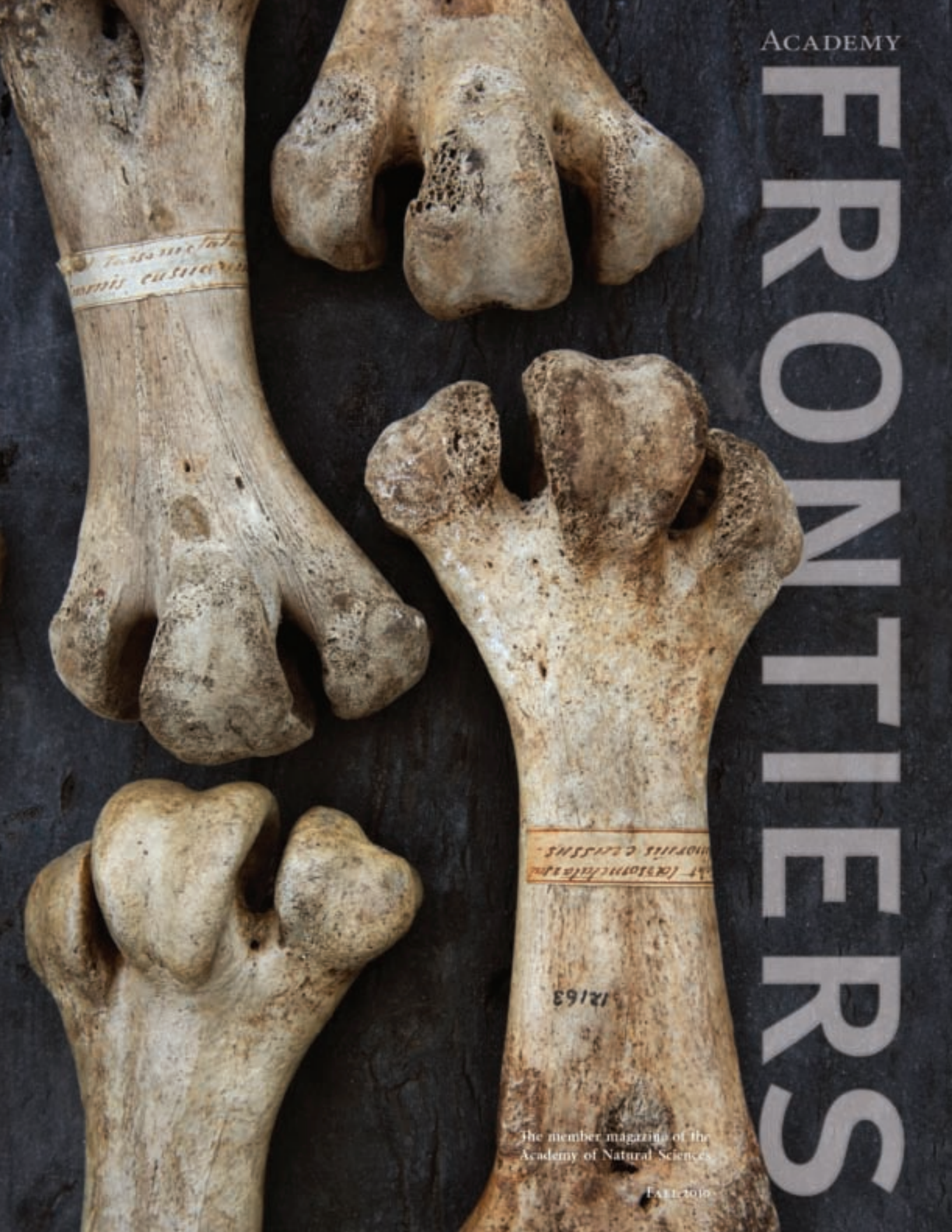

ACADEMY

FRONTIERS

The member magazine of the Academy of Natural Sciences

FALL 2018

Greetings From the Academy

Katie O. Clark/ANSP

In these first few months as the Academy's new President and CEO, I have already seen the tremendous impact of a dedicated Board of Trustees, a gifted staff, and the strong support of members like you. I am thrilled to join the Academy in such a momentous time in its history, as we gear up to celebrate our 200th anniversary in 2012.

We have many short- and long-term goals in mind, and I hope you'll continue to support our efforts as we bring the Academy into its third century. One of our major goals is to achieve a heightened regional and national regard for our scientific research. While we are well known for our dramatic dinosaur exhibits, we want to bring more visibility to the real science that happens here every day.

It did not take long for me to learn how frequently our world-class research and programs are in the news, and sharing these stories about our scientific work with the public is a critical part of the Academy's mission. I invite you to read our fall issue of *Academy Frontiers*, in which we highlight our collections, our Library, our staff, and important events in our science and public programs.

In this issue, we expand on two events that made front-page news in the Philadelphia Inquirer this past summer. I encourage you to review our story, beginning on page 8, regarding scientists in California who are using historic specimens from our Malacology Collection to study the impacts of the Gulf oil spill. You will also enjoy reading an article profiling Academy Senior Fellow Bob Peck's career as an historian. We take you on Bob's journey as he encapsulates 200 years of Academy history and lore into one fascinating book, set for publication in 2012.

I want you to know that the success of the Academy would not be possible without your support. My thanks again for all you do on our behalf. I look forward to keeping you updated as we move closer to a very exciting 200th anniversary.

All the best,

George W. Gephart Jr.
President and CEO

Table of Contents

On the cover: The bones on the cover of this issue are leg bones from a long-extinct bird called a moa. These flightless birds, native to New Zealand, grew to 12 feet in height and may have weighed up to 510 pounds. It is believed that all 11 species of moa were hunted to extinction by native Maori people before the European discovery and settlement of the island in the 18th century. The specimens shown here were acquired by the Academy in 1848, shortly after the birds' discovery. ©Rosamond Purcell

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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.

Join us for these upcoming events!

OCTOBER

21 Join Dr. Laurie Marker, founder of the Cheetah Conservation Fund, as she shares her 20 years of cheetah conservation. The event is free and open to the public. 6:30 p.m.

22 *Cruisin' the Fossil Freeway* member preview, 5–8:30 p.m.
Members get an exclusive preview of artist Ray Troll's wild expedition through the American heartland.

23-24 *Cruisin' the Fossil Freeway* opening weekend, 10 a.m.–5 p.m.
Cruisin' the Fossil Freeway with Artist Ray Troll and Paleontologist Kirk Johnson features the fossil-inspired artwork of celebrated artist Ray Troll and explores questions about evolution, extinction, and early life on earth. Troll's whimsical illustrations of imagined scenes from prehistoric times are placed side by side with real Academy fossils.

27 An evening with author Jay Kirk, 6:30-7:30 p.m., book signing to follow
Spend an evening with author Jay Kirk as he discusses his newest book, *Kingdom Under Glass: A Tale of Obsession, Adventure, and One Man's Quest to Preserve The World's Great Animals.*

NOVEMBER

3 "Alaska Wild!" adult workshop, 6:30–8:30 p.m.
Join Monica Scherer from the Alaska Wilderness League and learn about the critical issues that are facing Alaska's public lands, the unique species that reside there, and the native Gwich'in people.

4 An Evening with Jim Fowler, 6:30–8:30 p.m.
Jim Fowler, notable wildlife conservationist and former host of *Mutual of Omaha's Wild Kingdom*, will share his life's work on saving endangered species and preserving threatened wildlife habitat. This program is free and open to the public, but please register at jimfowlerwildlife.eventbrite.com.

November 9, 2010–January 9, 2011
Ned Smith's Pennsylvania, Art of Science Gallery
Explore Pennsylvania's breathtaking wildlife and landscape though the eyes and artwork of popular wildlife artist Ned Smith, whose beautiful paintings combine creativity and science.

14 "Animal Detectives" family workshop, 1:30–3 p.m.
Uncover the identities of animals as you act as detectives and examine each clue left behind. Each family will take home a guide book to help them better track and identify local animals.

16 Leidy Medal presentation and keynote speech, 6:30 p.m.
Australian naturalist Tim Flannery will receive the Academy's Leidy Medal and present "Deep Time and Nature Conservation: Lessons from Australasia."

26–28 Dinosaur Days, 10 a.m.–4:30 p.m.
Celebrate the Thanksgiving holiday weekend with fun activities featuring dinosaurs and their closest living relatives, birds.

DECEMBER

11–24 Double discount days for members in the Academy Shop
Find one-of-a-kind gifts in the Academy Shop! Members' 10% discount is doubled, just in time for holiday shopping!

26-31 End-of-the-year blowout sale in the Academy Shop
Shop deeply discounted odds 'n ends, discontinued items, and strange stuff from the past.

27–30 Academy All-Stars Week, 10 a.m.– 4:30 p.m.
Some of the most popular features of the Academy are celebrated during this special week, each day with a different theme.

For more information on our programs or events, visit our website.

Adult Programs, Lectures, and Talks
ansp.org/adult-programs

Exhibits, Festivals, and General Information
ansp.org

THE ACADEMY OF NATURAL SCIENCES

– Connecting People to Nature Since 1812 –

On Exhibit

© Ray Troll

Cruisin' the Fossil Freeway with Artist Ray Troll and Paleontologist Kirk Johnson

Coming this fall to the
Changing Exhibits Gallery
October 23, 2010–January 2, 2011

Ancient killer pigs, saber-toothed cats, and giant ammonites are once more given life through the whimsical artwork of Alaskan artist Ray Troll. Explore questions of evolution, extinction, and early life through Troll's imagined scenes of prehistoric times. Large-scale, action-packed paintings, banners and murals bursting with color recount Troll's 5,000-mile road trip with Denver paleontologist Kirk Johnson to hunt for fossils in the American West. See rarely seen fossils from the Academy's world-renowned Paleontology Collection. Free with museum admission.

Ned Smith's Pennsylvania

Coming to the
Art of Science Gallery
November 6, 2010–January 9, 2011

Enjoy the captivating beauty of Pennsylvania wildlife through the eyes of artist Ned Smith. A selection of his original works of art—oil paintings, acrylics, and pen-and-ink drawings—celebrates his 46-year career as a noted wildlife artist. Smith (1919–1985) was self taught in art and natural history, and brought a remarkable breadth of knowledge to his astonishingly accurate drawings and paintings. Above all, he was an avid naturalist and conservationist whose work introduced millions to the true beauty of the natural world.

This exhibit was organized by the Ned Smith Center for Nature and Art in Millersburg, PA, in collaboration with the Academy of Natural Sciences.

© Ned Smith

Bruce Tepper/ANSP

We Wrote the Book on It

Outside of the Library
Coming in November

Did you know that Academy members, correspondents, and staff have written hundreds of books? They range from scholarly works to popular works like field guides and children's books. Academy authors have been writing books for the past 200 years, and they continue to do so today. Stop by this exhibit to see some selected works by staff and friends of the Academy—who knows, you may recognize a title or two that's sitting on your own bookshelf! Don't forget to keep coming back, as we'll regularly rotate the books on display.

Photo courtesy of the Gephart family

The Gephart family on a family vacation in Denali National Park, Alaska. From left to right, Nolie, Libby, George, Nanny, and Pooh Gephart.

GEORGE W. GEPHART JR.

With the right amount of snow cover, George Gephart can track grey foxes, bobcats, and coyotes. He can tell if they're traveling in packs, or individually. He can even tell where they've bedded down for the night.

These self-taught skills come from a lifelong love for the natural world. When he's not searching the ground for animal tracks, Gephart's head is tilted up, attached to binoculars, searching the trees and sky for birds.

Gephart admits that his bird watching can sometimes slow down the pace of family hikes. Occasionally his wife or daughters will take an interest but, mostly, they'd prefer to just keep moving.

It's on these hikes where Gephart and his family find peace and relaxation.

"Whenever we have the opportunity, we are in the woods," he says.

His life as an outdoorsman started at a young age, Gephart says.

"We used to vacation in the north woods on Lake Superior in northern Minnesota," Gephart says of his childhood summers. "I loved searching for pollywogs and tracking animals; I still do that today."

"As a kid, I was very into scouting; we camped in tents once a month no matter the weather," adds Gephart, who is a proud Eagle Scout.

This love for nature is what drew Gephart to the Academy—in the past as a visitor, and now as the institution's president and CEO.

Gephart maintains that he is no scientist. But, with his deep roots in Philadelphia and three decades of leadership experience for area businesses and non-profits, Gephart has a lot to offer as president.

"I truly believe in this organization. Taking this job was not a career builder. I did it because I wanted to do it. This is genuinely exciting for me," he says.

Gephart says his connection to the Academy started in the 1980s when he brought his three daughters (Nolie, Nanny, and Libby, now all in their 20s) to the museum. Soon after, his wife, Elizabeth "Pooh" Gephart, recognized the Academy as a great place for kids in her book *Philadelphia with Children*, a guidebook of children's attractions and events in the region. And, over the past decade, Gephart has become acquainted with Academy Senior Fellow Bob Peck through their shared interest in artist John James Audubon.

"Bob gets credit for introducing me to the treasure trove of our Library and Archives collections," he says.

Gephart already has a lengthy to-do list just a few months into his time as president. What he's most excited about, he says, is joining the Academy just in time to celebrate its bicentennial in 2012.

Academy Abbreviated

MYSTERY SOLVED!

THIS SUMMER, ACADEMY SENIOR FELLOW BOB PECK MADE FRONT-PAGE NEWS in the Philadelphia Inquirer and headlines around the world when he announced the discovery of John James Audubon's first published picture of a bird.

John James Audubon's first foray into commercial illustration took place in 1824, three years before the publication of his illustrious *The Birds of America*, for which he is so well known today. This early work, a drawing of the heath hen, was printed, not as an ornithological illustration, but for use on a New Jersey bank note. At the time, paper money was issued by individual banks and not by the federal government. Engraving firms would compose sheets of images—including vignettes of animals, portraits, and patriotic scenes—from which independent banks would select to create their bank notes. The illustration of the heath hen became the first publication of an Audubon bird.

Image courtesy of Eric P. Newman Numismatic Education Society

However, the illustration proved elusive. Numerous scholars searched for it over the decades, but their efforts went unrewarded. The repeated failures to find the print even prompted some to doubt its existence.

After a decade of sleuthing, Peck, and his co-investigator Eric Newman, a numismatic (currency) historian, discovered three sample sheets of images issued by the engraving firm Fairman, Draper, Underwood & Co. of Philadelphia (1823-1830). Two of them featured Audubon's scurrying bird. They subsequently found sample bank notes with the Audubon heath hen from banks in Norwalk, Ohio, and Bridgeport, Connecticut. "The image was quite modest, as one would expect for a bank note vignette," says Peck, "but it came at an important time in Audubon's career."

Peck's article about the Audubon discovery was published in the fall issue of the *Journal of the Early Republic*.

LIFETIME ACHIEVEMENT

THIS SUMMER, THE ACADEMY'S TOP FISH SCIENTIST, DR. JOHN LUNDBERG, was completely blindsided. And it was absolutely fantastic, he says.

At the annual meeting of the American Society of Ichthyologists and Herpetologists (ASIH) in July, Lundberg was anxiously reviewing a lecture he was set to deliver when he was called to the stage to receive the Robert H. Gibbs Jr. Memorial Award for his lifetime achievement in advancing knowledge of fish diversity.

Lundberg remembers being nominated for the award several years ago, but thought his nomination had expired. Still, the surprise was a good one.

The ASIH is a relatively small scientific society, Lundberg says. But, the Gibbs award is "a big deal for those of us who are fish lovers and who work on diversity of fishes."

Since 1989, the Gibbs award has honored scientists with "an outstanding body of published work in systematic ichthyology."

Mark Sabaj Perez/ANSP

The Academy's curator and Chaplin Chair of the Ichthyology Department, Lundberg is widely known for his evolutionary study of fishes. He was a leader of the All Catfish Species Inventory, a five-year global survey of catfish species funded by the National Science Foundation. Lundberg himself has discovered and named 37 species and 12 genera of living and fossil fishes. His work provides crucial information for the advancement of biodiversity science, the conservation of fish species, and helps inform fisheries biologists by providing the precise taxonomy that is essential for correct species monitoring and management.

He says he's honored to be in the company of the other award recipients, which include some of Lundberg's former professors and "many other people whom I respect very highly."

"There is nothing like getting a pat on the back from the home team," he says.

ENTOMOLOGY DEPARTMENT RECEIVES $1.2 MILLION IN COLLECTIONS CARE GRANTS

TWO COMPETITIVE GOVERNMENT GRANTS RECENTLY AWARDED TO THE ACADEMY WILL HELP PROTECT THE ENTOMOLOGY COLLECTION, one of the world's great resources for understanding insect biodiversity. Collection storage upgrades will utilize the latest in museum storage technology to protect the collection from light damage, climate fluctuation, and pest intrusion, as well as fund a searchable index of the entire collection of more than 3.5 million specimens.

A nearly $1.1 million grant from the National Science Foundation will fund a new collection storage compactor system with increased storage capacity, a new HVAC system for the collection area, and the installation of a new sealed ceiling-tile system to prevent pests.

A second grant from the Institute of Museum and Library Services will fund the first complete online inventory of the species represented in the insect collection, including number of specimens, their condition, and their location. This $150,000 award will make the contents of the newly rehoused collection available to scientists around the world and around the clock.

© Doug Wechsler

Get Connected

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, Manager of Exhibits Projects Jennifer Sontchi suggests starting a nature journal. Keeping a nature journal and recording field notes have been common practice among scientific explorers for hundreds of years. Scientists' journals and expedition field notes document important scientific firsts, offering colleagues back home a detailed glimpse of strange and exotic new worlds. American explorers Meriwether Lewis and William Clark kept copious field notes during their 1804–06 expedition through the American West. And, long before he was president, Theodore Roosevelt kept childhood nature journals filled with drawings of small mammals and rodents.

Nature journals can include observational notes, illustrations, pressed specimens—anything that captures the sights, smells, and sounds that surround you. This fall, perhaps start by collecting tree leaves, which by late October should be at the peak of their autumn color. The color in leaves depends on the presence or absence of chlorophyll (green), carotenoids (yellow-red) and anthocyanins (red-purple). By the end of summer, the production of chlorophyll molecules slows and eventually stops, leaving only the carotene molecules and a yellow-orange color. During the fall, anthocyanins form, giving the purplish-reddish hues to the leaves.

These brilliant fall colors can be retained by properly drying and pressing the specimens. It's important to dry the specimens very shortly after being collected. Place the leaves between two sheets of newspaper and stack a few heavy phone books or hardback novels on top of the leaves. Allow to flatten and dry for at least 24 hours. In order to avoid mold, the newspaper should be replaced every day until the leaves are dry.

Once they're ready, secure the pressed leaves to the pages in your journal—the Academy uses archival-quality glue and linen strips. Most importantly, just like the great scientific explorers of the past and present, be sure to record data when you're collecting, such as the date, location, weather conditions, and what other plants and animals you see around you. In your next entry, try journaling the behavior of a bird or what flowers are blooming or dying.

The Story in the Shell

By Katie O. Clark
Editor

David Goodwin, Denison University

This is the story of 107 shells being in the right place at the right time.

Dr. Peter Roopnarine carefully drills into an Academy specimen, extracting samples for geochemical analysis.

One week into the Deepwater Horizon oil spill disaster in April 2010, Dr. Peter Roopnarine, a curator at the California Academy of Sciences, set to work collecting live mollusk specimens along the Louisiana and Alabama coastlines, as a starting point in determining the impact of the spill. He was trying to build a timeline to show when, how quickly, and how significantly spill components were being incorporated by mollusks into their shells. But, levels of trace metals in present-day specimens are difficult to gauge, since so much oil already finds its way into the Gulf of Mexico from industry spills and leaks, as well as from natural seepage.

"We don't want to go and pin it all on Deepwater Horizon when these animals were already accumulating oil anyway," he says. "Oil has been leaking into the Gulf because of drilling activities early in the past century—we need to understand what oil is due to the first 100 years of drilling and what is due to the recent oil spill."

So, Roopnarine and his colleagues had to look to the past. In order to make comparisons with specimens collected during the recent spill, he aimed to use shells collected since the late 19th century, to determine how polluted the Gulf was to begin with and how long it has been since it wasn't polluted at all.

The collections of Roopnarine's institution were lost in the San Francisco earthquake and fire of 1906 and so to find suitable specimens from that time period, he looked to the Academy.

"I wondered where I would be able to locate these materials, and the Academy was the obvious choice. The collections there have historical depth and are extremely well documented," he says. "These historic shells will place the Gulf in a proper context."

In July, the Academy shipped off 107 oyster shells (*Crassostrea virginica)* dating from 1887 to 1958, all collected from the Gulf of Mexico. Roopnarine took samples from the present-day and historic shells for geochemical analysis to measure the levels of oil-related pollutants in Gulf waters. His ultimate goal is to determine the impact of the current spill and to see how marine life in sensitive marshlands along the Gulf coast will be affected over time.

Mollusks are being used for this study because of their role as primary consumers. Shellfish are likely to be the first to show concentrations of hydrocarbons and trace metals that could later be passed on to creatures that feed on them. Given the carcinogenic nature of hydrocarbons, the concern lies with the physiological damage to marine life as the materials move through the food chain.

Roopnarine says that oyster shells record time as they grow, just like the rings in a tree. Using a high-tech drill, Roopnarine extracted "pin prick" samples from various points in each shell. After analyzing the samples, he and his team were able to reconstruct the lifespan for each of the specimens, and look for specific environmental signals trapped in the shell at a particular time in its growth. He says he hopes to have some preliminary data by the end of this year.

"My prediction is that we're going to see an increase in the relative concentration of hydrocarbons and trace metals through the 20th century that corresponds to the expansion of drilling in the Gulf," he says.

None of his work would be possible, of course, without the rich natural history holdings of the Academy's collections.

"This work really highlights why natural history collections are useful—I think too often they're underappreciated in terms of the active role they play," he says.

"Collections are data. You collect specimens never knowing if or when they will be relevant, but time and time again these bits of information do became relevant. Things are rapidly changing around us and these collections are becoming more and more important," he says.

The Academy's collections total more than 17 million specimens, and rate among the world's most significant in terms of geographic, biological, and historical breadth. The study of these specimens makes it possible for scientists to determine how our world changes over time. Check back with *Academy Frontiers* in the coming months for news on the results of Dr. Roopnarine's research.

For more information on the Academy's Malacology Collection, visit ansp.org/research/biodiv/malacology_home.php.

Opposite page: One-millimeter samples are extracted from select points on the shell's hinge to discover the shell's past.

Rewriting History

By Katie O. Clark
Editor

© Rosamond Purcell

Within months of the Academy's founding in 1812, its members purchased what was then the largest and most important mineral collection in America. All 1,825 of the specimens contained in that collection, including these vials of volcanic material from Mt. Vesuvius in Italy, are still in the Academy's care.

A century ago, the Academy's long-time librarian Edward J. Nolan attempted to capture 100 years of Academy history into one book. He succeeded, but not quite as fully as he had hoped. Out of his lengthy manuscript came an abbreviated, 38-page* Short History of the Academy of Natural Sciences of Philadelphia*, a charming, anecdotal chronology of the institution's first 100 years.

Now imagine that same scenario today, only double the work. With the Academy's bicentennial on the horizon, Academy historian Robert McCracken Peck has been exhaustively delving into 200 years of Academy history, sorting through truths, lies, facts, and hearsay about the people, places, and things that have made the Academy what it is today. In one way or another, he's been doing this for 35 years.

It began in 1976, when Peck first came to the Academy. "I was immediately captivated by the Academy's present and past—even then I felt surrounded by the already 150-year history of exploration and discovery," he says.

Later, he says, "people began asking me if I would write a history of the Academy but, it was one of those projects that I thought was too huge, too overwhelming."

Two things finally convinced Peck to take the leap: a partner with whom to share the workload and the fact that there might never be a more perfect time to write an Academy history than the institution's bicentennial. It was time.

Clare Flemming/ANSP

Academy Senior Fellow Robert M. Peck and historical biographer Patricia Tyson Stroud have been aggressively researching the history of the Academy in preparation for their book, which will be published in 2012 by the University of Pennsylvania Press.

Friend, colleague, and historical biographer Patricia Tyson Stroud joined Peck on this journey a few years ago. She is the perfect co-author, Peck says, with her more than 30-year connection to the Academy. In the 1980s, the pair co-edited the Academy's journal, the original *Frontiers* magazine (published from 1936-1983). Later, Stroud authored two award-winning biographies of early members of the Academy.

"She had already spent years researching two critical figures from the early history of the Academy," Peck says. The first book profiles Thomas Say, one of the founders. Another explores the life of Charles Lucien Bonaparte—nephew of French emperor Napoleon—who donated bird and fish specimens to the Academy in the early 19th century.

Peck and Stroud's book reexamines the institution's first 100 years and then tells the stories of the Academy in the 20th century, "a relatively unexplored territory from an historical point of view," Peck says.

"Right from the start we wanted our history to be a series of short biographies, not an institutional history in the traditional sense," says Peck.

"Biographies make people come alive," Stroud adds.

The book, affectionately defined as a "family history" of the Academy, joins readers with the likes of John James Audubon, Charles Darwin, Alexander Wilson, Titian Peale, and (the real) James Bond (the Academy ornithologist whose name was borrowed by British author Ian Fleming).

Other figures include paleontologists Joseph Leidy and Edward Drinker Cope, and limnologist Ruth Patrick.

As this last name suggests, the book's biographical vignettes are not limited to men. It was Stroud's idea to write an entire chapter on the pioneering women of the Academy.

"They needed to be included," she says. "Though less well known than the men, they were really fascinating people to find out about."

What adds spice to the history of the Academy, though, is that for every 100 brilliant gentlemen of science devoted to this institution, there were one or two bad apples using the Academy and its reputation for his own gain.

Fortunately, these "charlatans and scoundrels," as Peck calls them, never did any permanent damage.

Peck and Stroud agreed in the beginning that the book will present an honest look into the Academy's history, "warts and all."

"We decided to tell it just as it was without pulling any punches," says Stroud.

Readers will be treated to stunning images throughout the book of specimens of minerals, birds, fish, mammals, plants, and more, all from the Academy's collection, and all through the unique eye of internationally acclaimed photographer Rosamond Purcell.

"There are stories behind every single shell, every single bird specimen," Stroud says. "Rosamond brings them to life with originality and a brilliant—and sometimes startling—sense of composition. Each picture is a masterful work of art."

Research and writing is still under way, and the book—as yet, untitled—is slated for publication in early 2012, in honor of the Academy's bicentennial. However, *Academy Frontiers w*ill take you along for the ride throughout 2011 as we follow the progress of Peck and Stroud, with featured photographs and snippets from the book.

© Rosamond Purcell

In 1846, Academy member Thomas B. Wilson purchased for the Academy the bird collection of Victor Massena, Duc de Rivoli, the son of one of Napoleon Bonaparte's most successful generals. The acquisition catapulted the Academy's Ornithology Department into international prominence. The specimens, including this articulated skeleton, lie at the core of the department's collection, which represents more than 90% of the bird species of the world.

THE GEORGE MITCHELL FEIRER COLLECTION

By Joseph L. Annaruma and Katie O. Clark

George Mitchell Feirer spent most of his life studying and collecting specimens, amassing a stunning representation of nature's creatures. His motivation was sheer joy and love for natural history, as well as a desire to share his knowledge with others. His unique collection will now be available to educate and fascinate many generations to come, in its new home at the Academy.

George Feirer, a decorated World War II veteran, historian, scientist, and researcher, passed away this past January at the age of 87. He collected specimens throughout his life, including during his service in the U.S. Army Air Force, while stationed in China, Burma, and India. After the war, he continued to collect and research until his death. In the 1950s, he founded the Feirer Institute on his South Jersey property to house his growing collection and, together with his wife, Patricia, share his love of nature with the local community.

Katie O. Clark/ANSP

Collection Manager Ned Gilmore says Feirer's donation included many species not represented in the Academy's Herpetology Collection.

Feirer's donation to the Academy represents one of the primary ways in which our collections have grown to more than 17 million specimens. The majority of the Academy's acquisitions come in one of two ways—through scientific field study and expeditions by Academy scientists and staff, or from amateur and private collectors. Mrs. Feirer said the Academy's mission is what inspired her to donate her husband's collections.

"I liked the fact that the Academy is for research and education—that was what George was all about," she said.

Feirer's collection is comprised of entomological and herpetological specimens, many from Asia and the Pacific, as well as New Jersey and Ohio. A major part of the collection will be added to the Academy's Herpetology Collection. According to Collection Manager Ned Gilmore, Feirer's donation is one of the largest herpetological acquisitions for the Academy since the mid-1800s. Within the collection are 100 specimens from India, which now doubles our holdings from that country.

The Entomology Department received a sizable addition to its collections as well, primarily crickets, grasshoppers, and katydids. The majority of the insects were collected in New Jersey and Ohio, and they had been stored in cigar boxes for up to 60 years. While there was some damage over the years, most of the specimens were in surprisingly good condition.

Photo courtesy of the Patricia Feirer

Receiving the collection is only part of the process. The specimens will be removed from old jars and boxes and rehoused, labeled, prepared, and then taxonomically integrated. After that, they will be ready for use in exhibits, education, and comparative research.

Since 1812, the Academy has shared with the world the vast and fascinating scientific knowledge that exists in its considerable collection, including tens of thousands of insect, bird, fish, mammal, and botanical specimens from every corner of the globe.

If you are interested in learning how you may donate a collection of natural history specimens or natural history-related books or artwork to the Academy—or leave it to the Academy in your will—president for Institutional Advancement, at 215-299-1013 or marvin@ansp.org.

SYLVANUS HANLEY'S *ILLUSTRATED CATALOGUE*

Sylvanus Charles Thorp Hanley (1819–1899) was a British conchologist who is perhaps best known for publishing the first book on shells with photographs. He inherited a fortune at an early age, which enabled him to devote a lifetime to the study of shells. He was particularly interested in bivalves (mussels, oysters, and clams), on which he ranked among the leading authorities of his day. Hanley published more than 40 books and scientific papers and described more than 200 new species. He collected mollusks extensively over a period of 60 years, both in person and by acquiring the collections of others, and most of his specimens survive today in the Leeds City Museum in England.

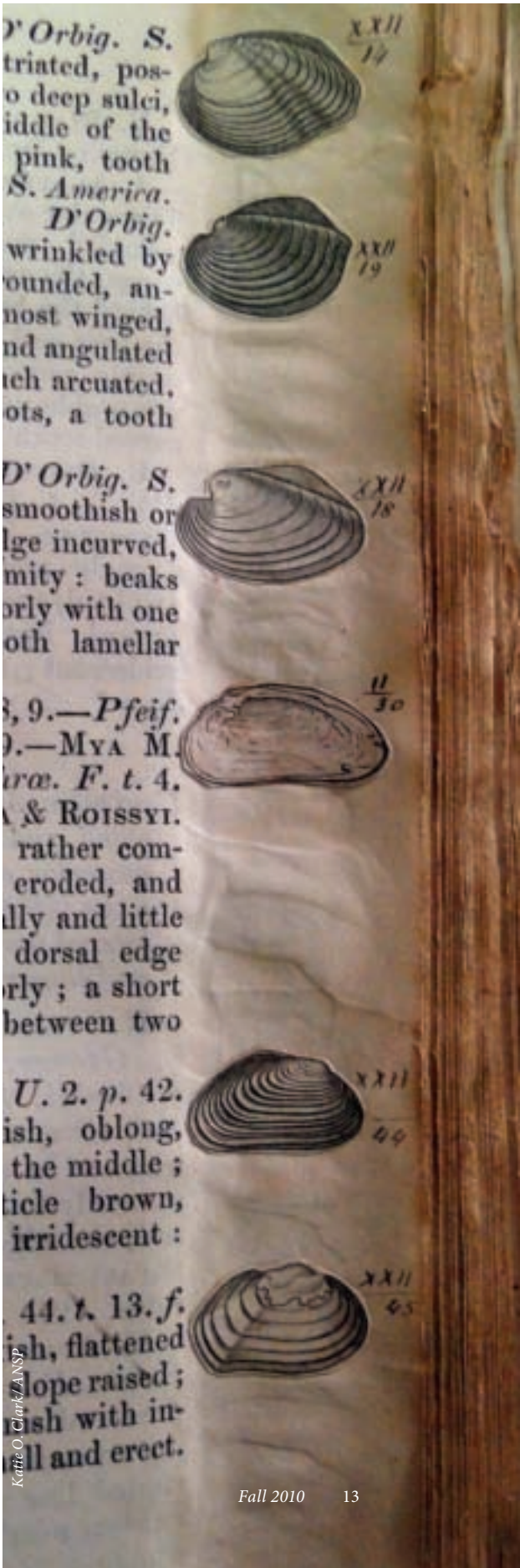
In 1856, Hanley finished publishing *An illustrated and descriptive catalogue of recent bivalve shells* or, more simply, the *Illustrated Catalogue*. An expanded version of two earlier works, it became a major reference in its own right as it contained the descriptions of many new species. Hanley had issued it in parts of varying size at irregular intervals since 1842, taking in all 14 years to complete it.

Hanley was elected a corresponding member of the Academy in 1867. Letters preserved in the Academy Archives show that he exchanged specimens and books with staff over a period of some years, dealing principally with George Tryon and Edward Nolan of what was then the Conchological Section. His published work was used extensively in curating the Academy's massive shell collection, which by 1888 already comprised about 300,000 specimens and today exceeds 10 million.

In November 1900, the American malacologist George H. Clapp of Pittsburgh came across Hanley's own working copy of the book in London, and purchased it for the Academy. It was an extraordinary find. Hanley had had the whole work split up and rebound, with a folded sheet interleaved between each pair of pages on which he wrote comments and notes in pencil. These range from detailed remarks about generic placements and references to other works, to simple notes such as "Type in my coll." (the type specimen is in my collection) that would allow curators to confirm the identity of his most important specimens. To make his copy more useful in his work, Hanley also cut out all the illustrations from his plates and glued them into the outer page margins of the text section, each alongside its relevant species entry. At the end of the book are a further 80 pages on which he arranged hundreds of his figures in a systematic order.

> *"While many copies of Hanley's works survive today, this one is truly unique."*
>
> —Paul Callomon

Although this book has been held in the collections of the Academy's Ewell Sale Stewart Library for nearly 110 years, it was only recently that Malacology Collection Manager Paul Callomon referenced it for another project and realized its true scientific worth. This priceless volume gives us a fascinating glimpse into the working methods of an important Victorian conchologist. While many copies of Hanley's works survive today, this one is truly unique.



Katie O. Clark/ANSP

SPOTLIGHT ON MARTHA AND I. WISTAR MORRIS III

Katie O. Clark/ANSP

It's not likely that Jamaican land snails, Mongolian insects, Chilean streams, algae in the East China Sea, and nomadic herders would be grouped together for any particular reason. But at the Academy, they have a common thread—they are the focus of current research projects led by Academy scientists. These particular projects would have never gotten off the ground without the support of Academy Trustee Wistar Morris and his wife, Martha, who have been donors to the Academy for nearly 15 years.

As a board member, Wistar knows that important scientific research takes place at the Academy every day. He also knows that research and support go hand in hand.

"I saw that important research needed to be undertaken and that projects needed funding," he says.

Wistar and Martha's support allows Academy scientists to explore promising new research topics, and often brings together the expertise of the Academy's two science groups—the Center for Systematic Biology and Evolution and the Patrick Center for Environmental Research.

Wistar's connection to the Academy began in 1997, when he purchased, and one year later donated, the first of two historically important shell collections, thereby enhancing the holdings of the Academy's Malacology Collection, the third largest in the world. The Jens and Christa Hemmen Collection of more than 220,000 specimens significantly strengthened the Academy's already extensive holdings of land and freshwater mollusks.

"At the time, we were very strong in New World and Asian land snails, but we didn't have terrific strength in the areas where Hemmen collected," says Malacology Collection Manager Paul Callomon. The collection includes specimens from the Ukraine, Kazakhstan, and Azerbaijan, to name a few, all collected over an extended period of time, adding historical value.

In 2004, Wistar purchased for the Academy the Hideo Katori Collection from Japan, which helped secure the institution's position as having the world's top collection of marine, terrestrial, and freshwater snails of Japan and Taiwan.

Martha has another connection with the Academy—her grandfather, Herbert B. Hungerford, a world authority on water bugs, received the Academy's prestigious Leidy Medal in 1958.

As chair of the Board of Trustees Science Committee, Wistar recognizes the scientific value of natural history collections and their future potential.

"It is not too visionary to think that scientific progress will eventually enable us to better understand the functioning of the DNA genetic material captured in our collection of 17 million specimens. To me, this goal underlies the value for the Academy's collections and points to the importance of maintaining and adding to the existing material," he says.

Wistar remarks that he is privileged to be associated with the Academy, is excited about the enormous opportunities ahead and knows that developing a comprehensive strategic plan, in concert with ongoing societal changes, is extremely important.

> *"I know that the extraordinarily talented and brilliant staff will make great contributions to science."*
>
> —I. Wistar Morris III

"I know that the extraordinarily talented and brilliant staff will make great contributions to science and that the Academy will continue to be a leader in our community and the nation."

To find out how you can support an Academy research project or the curation of a particular collection like the Morrises, please contact Amy Miller Marvin, vice president for Institutional Advancement, at 215-299-1013 or marvin@ansp.org.

GIFTS OF APPRECIATED ASSETS


© Matt Coons

Even in today's economy, many people find that they own assets that have appreciated in value. Perhaps you purchased a rental property 30 years ago, or bought stock in the early days of what turned out to be a very successful company. While the asset may not be worth as much today as it was a year and a half or two years ago, its current market value still exceeds its cost basis.

If you find this is true in your case, it may make sense for you to use these assets to make your year-end charitable gifts. When you give appreciated property such as stocks, bonds, mutual fund shares, and real estate, you receive a double-tax advantage:

- The charitable deduction is for the full fair market value of the property, *and*
- There is no capital gains tax owed on the appreciated portion of the property.

See the example below for an illustration of how a gift of appreciated stock might work—and how the tax advantages can help you make a donation with a far greater impact than you might be able to otherwise give.

You may hold appreciated stock that you feel will go up even more in value and that you want to keep. In that case, use the stock to make the gift and then use the cash you would have otherwise used to replace the shares of the desired stock. At the end of the day, you have the same investment, but with a stepped-up cost basis. If and when you choose to sell the stock down the road, your taxable gain will be lower than it otherwise would have been, saving you money on any capital gains tax that is owed. This particularly makes sense in light of the real possibility that the capital gains tax will increase in 2011.

The Academy of Natural Sciences also accepts gifts of real estate. The same tax advantages to making gifts with appreciated stock apply to gifts of appreciated real estate. In some cases, your benefits will be even greater as capital gain attributable to depreciation is subject to a higher capital gains tax rate.

Receiving Payments for Life

While many gifts of appreciated property are made outright to the Academy, you can choose to make a gift and retain income from the donated asset. Such a gift might actually increase your cash flow and help provide lifetime security. There are two options available through the Academy: a charitable gift annuity, or a charitable remainder trust. In each case, you make a charitable gift and receive payments (fixed or variable) for your lifetime. In the end, whatever remains of your contribution is used for the purpose you designate. In addition to the payments you receive, you would also be entitled to an income tax deduction that would reduce your federal and state income taxes.

Finally, if you hold property that has depreciated in value, it is always better to sell the property and give the proceeds to the Academy, rather than give the property directly to the Academy. In that way, you will be able to claim the capital loss on your tax return and use it to offset other income.

For more information on making gifts of appreciated property, please contact Amy Miller Marvin, vice president for Institutional Advancement, at 215-299-1013 or marvin@ansp.org. It would be our pleasure to assist you in making the gift that is right for you.

EXAMPLE:
GIFT OF APPRECIATED ASSETS

Sally Jones, whose adjusted gross income is $250,000, contributes stock having a fair market value of $50,000, which she purchased many years ago for a cost basis (also called "tax basis") of $10,000. She is subject to a combined federal and state income tax marginal rate of 40% and a combined capital gain tax rate of 21%.

Sally can deduct the entire $50,000 on her tax return for the year in which the gift was made, saving $20,000 in income taxes (40% of $50,000). In addition, Sally is not taxed on any of the capital gain in the stock, as she would have been had she sold the stock instead. The net cost of giving the stock compared to selling it and retaining the proceeds is:

Sell stock:
Proceeds $50,000
Tax on gain. $8,400
After-tax proceeds $41,600

Give stock:
Income tax savings $20,000

Net cost of $50,000 gift . . . $21,600
($41,600 – $20,000)

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, 2010. 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 Botany
The Andrew W. Mellon Foundation

In Support of the Center for Environmental Policy
Benchmark Asset Managers
The William Penn Foundation
Red Flag Media, Inc.

In Support of the Center for Systematic Biology and Evolution
Ms. Alexandra Moede

In Support of the Chaplin Fellow in Ichthyology
Gordon Chaplin and Sarah Teale

In Support of the Cheryl Beth Silverman Memorial Fund
Carol and Art Silverman

In Support of Education
The Christopher Ludwick Foundation

In Support of Entomology
Mrs. Caryl Wolf

In Support of the Library and Friends of the Library
Mrs. Caryl Wolf
Mr. and Mrs. John F. Vetter III

In Support of Malacology
Ms. Faye Chippeaux
Philadelphia Shell Club

In Support of Ornithology
Dr. Janice T. Gordon

In Support of the Patrick Center for Environmental Research
Anonymous
Ms. Alexandra Moede

In Support of Women in Natural Sciences
CIGNA Corporation
Charles E. Ellis Grant and Scholarship Fund
Esther Gowen Hood Trust, a BNY Mellon Mid-Atlantic Charitable Trust
The Grace S. and W. Linton Nelson Foundation
John H. Nagurney and Bridget Oakes Nagurney, *in memory of John Roschen*
Mr. and Mrs. Carl P. Oakes, *in memory of John Roschen*
United States Department of Agriculture Eastern Regional Research Center

Katie O. Clark/ANSP

Entomology Curatorial Assistant Greg Cowper demonstrates an insect collecting trap at the third annual Bug Fest on August 14 and 15.

In Support of the 2010 Annual Fund
Jeff Benoliel and Amy Branch
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The Manny and Ruthy Cohen Foundation
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Mr. Sydney Coffin
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Dr. and Mrs. Alfred E. Schuyler

Academy Support

Katie O. Clark/ANSP

Members attended an August 5 opening reception of A Many-Colored Glass, *an Art of Science Gallery exhibit featuring artist Fay Darling's colorized prints of microscopic marine life.*

The Academy would like to especially recognize those who have joined or renewed their support through the Academy's Leadership Circles of Giving between June 1 and August 31, 2010.

Jefferson Circle

Mr. and Mrs. Seymour S. Preston III

Darwin Circle

Mr. and Mrs. Ranney Moran

Leidy Circle

David B. Ford

Lewis & Clark Circle

Jeff Benoliel and Amy Branch

President's Circle

Dr. Erica Carpenter and Mr. Robert Carpenter
Mr. and Mrs. Thomas D. Elkinton
Dr. and Mrs. Robert C. Forney
Mr. and Mrs. Thomas A. McCarthy
Mr. David Milne IV
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Dr. Lucian B. Platt

Gifts in Kind

CORT
Sue Hobbs and Phil Dietz
Mr. Erick Moeller
Pepsi Bottling Group
Philadelphia Brewing Company
Ms. Jane Santini
Jane Schoenborn
Vineyard Vines

Bequests

James W. Needham, *in support of the Library*

In Support of the 2010 Shell Show Preview Party (as of August 31, 2010)

Mr. and Mrs. James L. Alexandre
Mr. and Mrs. Pierce Archer
Mr. and Mrs. George Bennyhoff
Mr. and Mrs. Robert L. Burch
Mr. and Mrs. Donald R. Caldwell
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Mr. and Mrs. Gerald B. Rorer
Jane Schoenborn
Judith Soltz and Richard Belas
Mr. and Mrs. Paul Thompson III

Katie O. Clark/ANSP

Special guests were invited to meet new Academy President George W. Gephart Jr. at a reception on September 14.

Snapshots

IN THE FIELD

The Academy's Patrick Center for Environmental Research, working with the U.S. Fish and Wildlife Service (FWS), recently used an air boat to move staff and supplies around the tidal freshwater wetlands at Tinicum (John Heinz Wildlife Refuge). Patrick Center staff placed surface elevation tables (SETs) in the marsh to measure the rate of marsh buildup (accretion) or decline (erosion) in the face of current and future sea level rise. Organic matter and marine and riverine-based sediments contribute to marsh accretion. Many factors, like upstream damming or nutrient runoff, can influence these processes and ultimately determine whether marshes are able to keep up with local sea level rise. Measures of biomass, water, and sediment quality are also being conducted as part of a large-scale wetland monitoring program in many wetlands along the Delaware Estuary. Understanding these fundamental processes will help determine strategies to protect and enhance coastal wetlands. Featured in the photo, from left to right: Sylvan Klein, staff scientist; Mike Schafer, chemist; Tracy Elsey-Quirk, Ruth Patrick Scholar; and (back row) Kevin Holcomb, wildlife biologist at Edwin B. Forsythe National Wildlife Refuge in New Jersey.

Roger Thomas/ANSP

Jennifer Sontchi/ANSP

BEHIND THE SCENES

Our upcoming exhibit, *Cruisin' the Fossil Freeway with Artist Ray Troll and Paleontologist Kirk Johnson*, features playful and imaginative artwork of prehistoric life, complemented by rarely seen fossil treasures from our Paleontology Collection. One painting, called "Angry Bugs of Zion," shows a flaming hand holding a trilobite (an extinct marine arthropod). Lucky for us, we have plenty of trilobites housed in our Invertebrate Paleontology Collection—what we do not have however, are flaming hands! Thanks to the creativity of our Exhibits Department, we have something close. In this photo, Exhibits Preparator Mike Beers submerges his hand in alginate, a soft mold material. It takes just a few short minutes for the material to firm up, after which Mike wriggles his hand free of the rubbery material. Next, plaster is poured into the negative space. For extra support, Exhibits staff adds a little wall of clay to create more "wrist," and a threaded rod placed into the still-wet plaster, to help later with mounting. The final step is to peel away the alginate to reveal the plaster hand. The hand cast and the trilobite specimen will appear next to Ray Troll's artwork, as a tribute to this unique painting.

Flashback

Ewell Sale Stewart Library/ANSP

In honor of the arrival of our new president, George W. Gephart Jr., we travel back in time to highlight another of the Academy's leaders. One hundred years ago, the Academy was led by Dr. Samuel Gibson Dixon (pictured). He was elected an Academy member in 1890, sponsored by Joseph Leidy, and became president in 1895, a post he held until his death in 1918.

Dr. Samuel Gibson Dixon was a native Philadelphian and a graduate of University of Pennsylvania medical school. In 1892, he moved his laboratory to the Academy of Natural Sciences and, according to Edward J. Nolan's *Brief History of the Academy* (1909), "he continued his bacteriological research and perfected the biological product with which he had produced immunity to tuberculosis in the lower animals." Dixon was also chosen to be Pennsylvania's first Commissioner of Health in 1905, using his position to beneficially change the sanitation and public health systems in the state. It would seem that Dixon would find it difficult to perform two very important duties at once—Commissioner of Health and president of the Academy—but nothing could be farther from the truth. Dixon was instrumental in getting the Academy in top shape for the centennial celebration that was to take place in 1912. Between the years 1908 and 1912, Dixon was responsible for a five-year parade of workmen who transformed the Academy into the venerable edifice that we see today. Under Dixon, the new Library, book stacks, and lecture hall were added to the property, considerably enlarging the Academy's useable square footage. This portrait of Dixon was painted in 1912 by American painter Lazar Raditz and today hangs in the Library reading room.

Under Dixon's direction, a new elevator was also added to the building, as well as thousands of dollars worth of new electrical wiring and light fixtures. The "paper trail" of his tenure as president is housed in the Academy Archives in the form of correspondence and preparation for the Academy's centennial, and hundreds of congratulatory letters from dignitaries far and wide. ~ *Joseph L. Annaruma, Academy Archives volunteer.*

Sustainability Matters

By Roland Wall, Director of the Center for Environmental Policy

Demand for energy, and the waste that accompanies it, lies at the heart of many environmental problems. Whether it is global warming, air pollution, loss of natural habitat, or even degraded water quality, there is usually an energy connection. Home energy represents a large part of both the demand and the waste.

Americans spend $241 billion each year on home energy costs, generating 1.2 billion tons of greenhouse gas emissions. An average American's annual share of that is about $1,900, with a large proportion going to pay for wasted energy. The U.S. Department of Energy estimates that, with improved efficiency, total home energy costs could be cut in half.

Improving energy efficiency doesn't have to be costly or disruptive. Developing a conservation attitude is the most important part of the process. The simple lessons from childhood, like switching off lights when leaving a room, remain just as valid today.

Because environmental sustainability is tightly linked to the use of energy, decreasing your "energy footprint" can be the single most effective way to promote sustainability. And, because residential electric use can have the same greenhouse gas impact as two automobiles, the place to start in this effort is at home.

The Department of Energy suggests some simple steps that are effective and low cost—plugging air leaks, using compact fluorescent lighting, powering down home electronics when not in use, and checking energy efficiency when buying appliances.

To achieve serious savings, consider a professional home energy audit by a certified professional. In Philadelphia, the Energy Coordinating Agency (ECA) is administering the residential portion of the federally funded EnergyWorks program, offering unprecedented levels of financial incentive for home energy conservation. You can learn more at ecasavesenergy.org. Energystar (energystar.gov), a U.S. government program designed to promote conservation, can also advise on cutting home energy use.

Additionally, solar energy technologies have advanced to the point that they are affordable in some residential settings. This process offers significant cost benefits over the long term, but should only be considered by homeowners who have carefully researched the process and consulted with qualified professionals and authorities.

Reducing energy use has significant benefits both for environmental sustainability and for saving money. It is one of the most important ways individuals can contribute to protecting our planet.

The Academy's Center for Environmental Policy (CEP) recently sponsored a workshop on installing home solar electric panels and an Urban Sustainability Forum on new incentives for home energy conservation. Both programs can be viewed at ansp.org/environmental. Check here as well for information on future CEP programs.

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