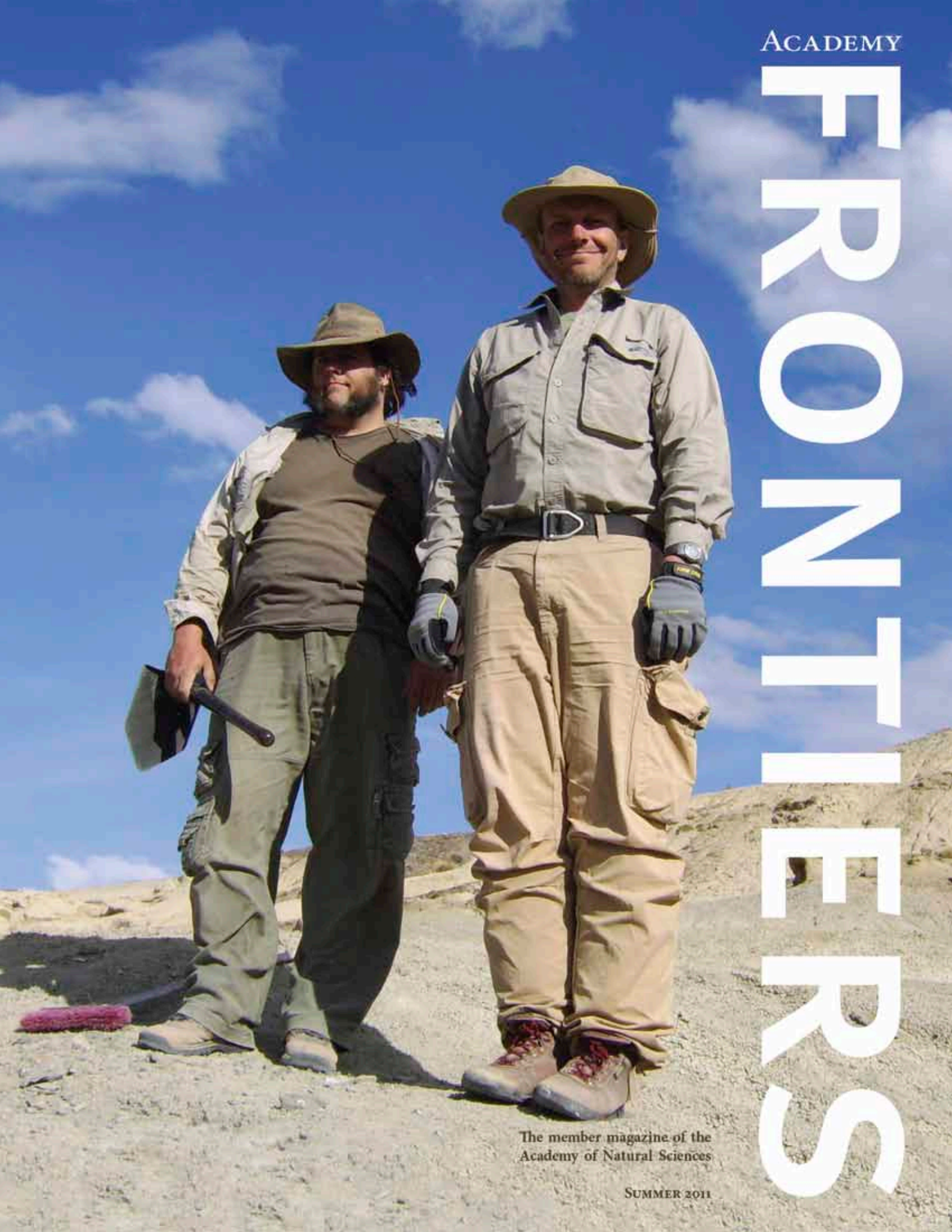


ACADEMY

FRONTIERS

The member magazine of the Academy of Natural Sciences

SUMMER 2011

President and CEO: George W. Gephart, Jr.
Vice President for Institutional Advancement: Amy Miller Marvin
Editors: Amy Miller Marvin and Heather Hahn Sullivan
Graphic Designer: Stephanie Gleit
Contributing writers: Paul Callomon, Clare Flemming, Sara Hertz, Richard James, Roland Wall

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

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

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

On the cover: *Jason C. Poole, the Academy's Paleo Lab Coordinator (left), and Dr. Kenneth Lacovara, Associate Professor of Biology at Drexel University (right), on a dinosaur excavation in the Patagonia region of Argentina.*

Greetings From the Academy

Summer is in full swing at the Academy! If you haven't already, be sure to test your putting skills—and your environmental know-how—at this summer's *Fore! The Planet* exhibit. Developed with Academy scientists, it's an incredibly fun way to learn about invasive species, evolution, dinosaur extinction, and more. I look forward to seeing you on the green!

Summertime is also when many of our scientists enter their field season, and this summer is no exception. With Dr. Ted Daeschler studying Devonian fossils in the Arctic, Dr. Clyde Goulden and Bob Peck investigating the effects of climate change on communities in Mongolia, and Dr. Jerry Mead leading a team to research the effects of natural gas drilling in the Marcellus Shale on our own local watersheds, the Academy's scientists are hard at work across the globe. Stay tuned for updates from the field this season through our website, ansp.org, as well as through our eNews, Facebook page, and Twitter feed—all accessible right from the Academy's home page.

The most exciting work of the summer is, of course, finalizing the Academy's new affiliation with Drexel University. The opportunities this new affiliation presents for the Academy are tremendous. As a member, you'll be seeing great new progress and programs stemming from this collaboration in the coming months. For more details on the historic affiliation, please see page 8.

I look forward to keeping in touch with you as we move forward with our Drexel affiliation. This is an exciting time for the Academy and I'm thrilled to be a part of it. I also look forward to seeing you this September 16 at the Academy's 4th Annual Members' Night—the one night each year all our collections and laboratories are open for our members only (and, the only time you can help dust our dinosaurs!). Save the date and see you here!

All the best,

George W. Gephart, Jr.
President and CEO

JOIN US FOR THESE UPCOMING EVENTS!

JULY

July 11–August 26 Academy Explorers Camp
Monday through Friday, 9 a.m.–4 p.m.
Ages 5–12. Learn about natural science in a safe, fun, and engaging way.

July 13, 20, 27; Aug. 3, 10, 17, 24 Tiny Tots Explorers
Wednesdays, 10–11 a.m. Ages 3–4, with adult. Explore nature through games, crafts, and songs.

14 Mega-Bad Movie Night, 7 p.m.
Stop by the Academy after hours for the awesomely awful pseudo-science flick, *Mega Python vs. Gatoroid* (ages 18 and up).

16 Electrofishing Field Study Adult Program, 9:30 a.m.–1:30 p.m.
Join Academy scientists in this catch-and-release wild fish population study.

31 Art of Science Gallery
A Pennsylvania Fishery: Fish Portraits by Flick Ford closes.

AUGUST

2 The Bugs Behind Bug Fest: Beetles!, 6–8:30 p.m.
Join an Academy entomology curator for an up-close look at beetles.

August 6–December 4 Art of Science Gallery
Dual Nature: Science Illustrations of Dan Otte

13–14 Bug Fest, 10 a.m.–5 p.m.
Beetlemania! Celebrate beetles and other insects, taste live bugs, talk to an entomologist, and more.

19 Philly Geek Awards, 6:30 p.m.
Co-hosted with Geekadelphia.com.

SEPTEMBER

11 Grandparents Day at the Academy, 10 a.m.–5 p.m.
Bring your grandparent or grandchild and learn together about observing birds in your own backyard!

15 Urban Sustainability Forum, 6:00 p.m., Reception; 6:30–8:30 p.m., Program

16 4th Annual Members' Night, 5–9 p.m.
For Members Only!

24 Smithsonian Museum Day
Free admission to the Academy all day long; admission tickets available at Smithsonian.com.

25 *Fore! The Planet* closes

OCTOBER

1–2 Philadelphia Shell Show and Festival, 10 a.m.–5 p.m.
View competitive shell displays, shop the International Shell Market, and more.

22 *Bugs…Outside the Box* opens

Visit ansp.org or call 215-299-1000 for more information.

THE ACADEMY OF NATURAL SCIENCES
– Connecting People to Nature Since 1812 –
1900 Benjamin Franklin Parkway, Philadelphia

For more information on our programs or events, including how to sign up, visit our website at ansp.org.

On Exhibit

Fore! The Planet

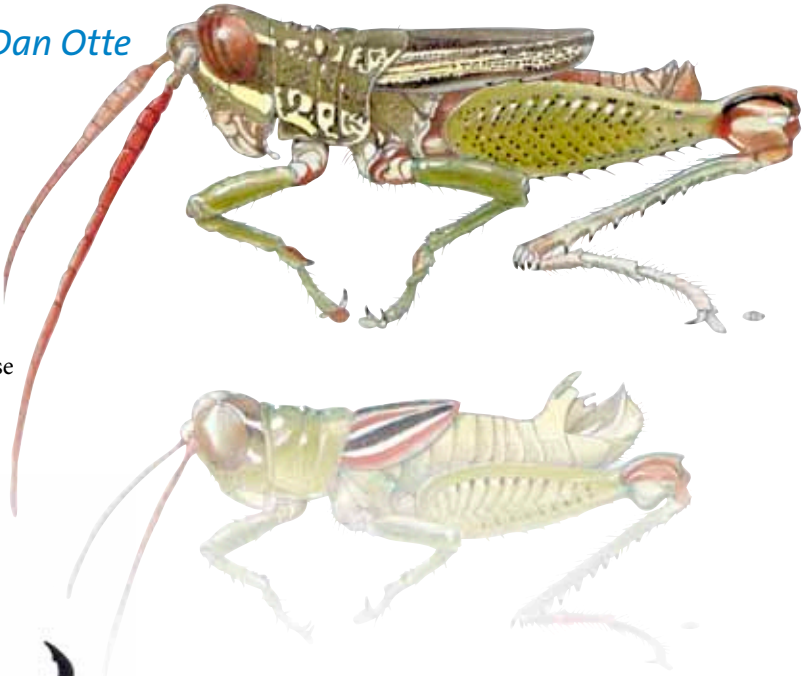
Changing Exhibits Gallery
Through September 25, 2011

Fore! The Planet is a highly interactive and playful exhibit that pairs important environmental issues with the fun of miniature golf. Save an endangered species, navigate a polluted waterway, and follow the path of a migrating hawk—all while testing your putting skills and environmental know-how. Get the scoop on evolution, dinosaur extinction, butterfly metamorphosis, food chains, and a "hole" lot more!

Dual Nature: Science Illustrations of Dan Otte

Art of Science Gallery
August 6–December 4, 2011

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



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

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

This world-premiere exhibit features an array of enormous and scientifically accurate insect sculptures by noted Italian artist Lorenzo Possenti. Paired with live bugs and colorful specimens from the Academy's world-renowned invertebrate collection, *Bugs…Outside the Box* provides a surprising and rarely seen look at these amazing creatures.

Nora Laberee (left) with Dr. Marina Potapova (right), assistant curator of the Diatom Herbarium.

NORA LABEREE

When a volunteer position opened up in the Academy's Patrick Center for Environmental Research two years ago, eighth grader Nora Laberee jumped at the chance. Nora, who had participated in eight science fairs by the time she came to the Academy, was eager for the opportunity to work side by side with professional scientists.

In the Patrick Center, Nora worked with Dr. Marina Potapova, assistant curator of the Diatom Herbarium, organizing diatom slides in the collection. "It was there that I discovered how important diatoms are and how they can be used as environmental markers," said Nora, who was inspired to create a research project of her own involving diatoms and algae. She was curious to know the effects that insecticides might have on algae-eating snails, and designed an observational study using olive nerite snails. These tiny gastropods can be found in New Jersey's pineland lakes, and are also used in freshwater aquariums to keep glass walls free of algae.

Nora used bifenthrin, a pyrethroid insecticide found in lawn and garden sprays. As Nora explains, "Pyrethroids break down quickly in water. But, they have an affinity for soil and will bind tightly to sediment, where they stay intact for months. Algae and diatoms absorb the pyrethroids, and then aquatic invertebrates—like snails—eat the algae and diatoms." Nora measured the motility of baby olive nerite snails after they consumed algae that had been exposed to varying amounts of bifenthrin.

The results? "I tested over 200 baby snails," said Nora. "The higher the concentration of pyrethroid insecticide, the less vigorous the snails became. After the trials were finished, though, all of the snails continued to live and thrive—surprisingly, being exposed to the bifenthrin solutions wasn't deadly in my study."

After winning several medals, including a bronze medal at the International Environmental Fair, Nora is now focused on finding someone to help develop what she calls the Pesticide Application Warning System. "This doesn't exist now," she explains, "but it should. This warning system, which would be delivered through local weather reports, would advise homeowners not to apply pesticides when rain is in the forecast. This would reduce runoff, which I think it is responsible for the reduction in species like tree frogs."

Nora continues to volunteer in the Academy, now helping care for the invertebrate collection in *Outside In* and helping with school groups. "Coming to the Academy weekly and seeing the passion for science here has shifted my focus to the environment," says Nora. "It has prompted me to concentrate on science in high school, and I've just finished a workshop to become a watershed ambassador. Without my experiences at the Academy, I wouldn't even have known how important this is. I look forward to more years of volunteering and learning at the Academy of Natural Sciences!"

Academy Abbreviated

TWO NEW TRUSTEES

The Academy is delighted to introduce our two newest trustees, Anthony Moore and Ann Reed, who bring a wealth of experience and knowledge to the Academy's governing board.

ANTHONY K. MOORE, ELECTED FEBRUARY 2011

Tony is the founder, principal and CEO of Paradigm Group Consultants, a Philadelphia management and consulting firm. Prior to founding Paradigm Group, he held a number of marketing and senior management positions with Xerox Corporation. Tony's Xerox career was highly celebrated for success and achievement, including many national sales awards and the 1992 *Roy S. Dykes Award*, one of the two top awards at Xerox. A graduate of Temple University, Tony resides in Philadelphia.

"I joined the Academy of Natural Science board because science is so important to the Philadelphia community and its future. I also feel we need to raise its visibility among our diverse communities of Philadelphia so that we can compete in the global science community."

ANN REED, ELECTED MARCH 2011

Ann is a long-time supporter of the arts and culture in Philadelphia, as well as a passionate gardener. She earned an undergraduate degree in zoology from Smith College, worked as a micro-biologist at Ciba Geigy, co-authored four books, and was a founding partner of P & R Associates communications specialists. Ann has also served on or chaired many local boards including The Pennsylvania Horticultural Society, The Morris Arboretum, Chanticleer, Leadership Inc., and the Garden Club of Philadelphia.

"I am honored and delighted to serve on the board of the Academy of Natural Sciences, especially at this transformative time in its history. I look forward to working with the board and the staff as we celebrate our bicentennial, and work to solidify our new affiliation with Drexel. It is a very exciting beginning to our next 200 years, and I'm pleased to be a part of it."

RARE LICHEN NAMED FOR ERNIE SCHUYLER

The Academy's curator emeritus of botany, Dr. Alfred "Ernie" Schuyler, was recently honored when Academy research associate James Lendemer named an extremely rare new species of lichen for him. The lichen, *Vezdaea schuyleriana*, is only known to exist on a single boulder in rural central Pennsylvania—and nowhere else in the world. "This is indeed a rare honor," said Ernie. "I love it!" Though he has studied plants for fifty years and discovered—and named—about 10 new species, this is the first time Ernie has had one named for him.

A lichen, which looks like a single organism, is actually made up of a fungus and algae in a symbiotic relationship. There are more than 14,000 known species of lichens, and they are considered important indicators of environmental quality.

"There is a lot we don't know about lichens because so few people study them, and minute lichens are rarely collected and studied," said Ernie. "Who is going to search for *Vezdaea schuyleriana*? It's so rare, it may never be seen again." Now that experienced lichenologists know what to search for, however, it may be found in other areas and simply be a widespread, overlooked species.

Academy Abbreviated

DR. JACK HORNER VISITS THE ACADEMY

Famed paleontologist Jack Horner visited the Academy in May as the featured speaker for the 2011 Cheryl Beth Silverman Memorial lecture, co-sponsored by the International Exploration Society and the Academy. Dr. Horner—the inspiration for the character of Dr. Alan Grant in the movie *Jurassic Park*—discussed his recent research on dinosaur growth at the lecture, and spent time beforehand in the collections with the Academy's own Dr. Ted Daeschler and other paleontologists from the area.

KEEP UP WITH US!

Want to keep up to date on all the latest Academy happenings, be the first to know about upcoming events, and have the opportunity to win cool prizes? Then be sure to sign up for the Academy's eNews, follow us on Twitter, and become an Academy fan on Facebook! Visit ansp.org to sign up for eNews and for links to our Facebook page and Twitter feed.

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, Paul Callomon, collection manager for Malacology, suggests you keep an eye out for whelks—and their egg cases—on your next trip to the shore this summer. The channeled whelk, *Busycotypus canaliculatus*, is one of the most common shells on the beaches of New Jersey. It is also one of the largest, occasionally reaching nine inches in length.

The channeled whelk and its relative, the knobbed whelk, are carnivores that prey on clams and other bivalve mollusks. They will happily eat carrion too, and can therefore be easily fished using baited traps. The meat is a popular food item in the Far East.

Walking the Jersey beaches, you can sometimes find the long, twisted rope-like object seen here. This is the channeled whelk's egg case, a "necklace" of flat, disk-shaped capsules, each containing many embryos. The mother whelk buries one end of the rope in the mud, to prevent it being washed away. After the embryos mature, they emerge through a special hatch in the capsule wall and crawl away. One rope can house thousands of embryos, but the fiercely competitive sea bed environment means that few will make it to adulthood.

Though the natural color of most whelk shells is tan or orange, you will sometimes find one that is gray or black. This change of color takes place when an empty shell is covered by shifting sand on the sea bed. As the sediment above the shell thickens, dark-colored minerals in the sand gradually leach into it and begin the process of fossilization. Normally this happens far offshore and out of sight, but nowadays thousands of tons of sand are dredged up each spring and dumped back onto New Jersey beaches to offset the effects of erosion. Millions of blackened shells of all kinds are carried ashore with the sand for beachgoers to discover.

Dr. Ken Lacovara of Drexel University shows his fossils to Drexel Senior Vice President Jim Tucker, Drexel President John A. Fry, Rebecca W. Rimel, CEO of the Pew Charitable Trusts, Mayor Michael Nutter, and George W. Gephart, Jr., President and CEO of the Academy of Natural Sciences.

THE DINOSAUR MEETS THE DRAGON

In May, the Academy announced a historic new affiliation with Drexel University, one that will promote discovery, learning, and civic engagement in the natural and environmental sciences and further enhance Philadelphia's reputation as a leader in scientific research and education.

This new combination will provide incredible collaborative opportunities for the Academy as well as for Drexel. "This innovative partnership provides the Academy with new resources, from teaching opportunities for our scientists to tapping into Drexel's technology and media arts programs for our exhibitions," said George Gephart, the Academy's President and CEO. "It's a very exciting announcement for us that secures and expands on the Academy's future as we embark on our third century."

For the Academy, this dialogue began back in the fall of 2010, though collaborations between the two institutions had been flourishing for years. With the bicentennial fast approaching, the Academy's senior leadership team and Board steering committee began to look at the Academy's opportunities to grow. "As we began to add up our strengths—from our fantastic location on the Benjamin Franklin Parkway, probably the best cultural destination anywhere in the country, to the incredible wealth of knowledge found in our collections and our scientists—the opportunities we saw for the Academy were boundless," said George. "We also knew that working collaboratively with others would provide us with opportunities we couldn't realize on our own, at the rapid pace we desire."

The Academy's leadership team identified six core values—the Academy's mission; identity; principal location on the Parkway; collections and Library; endowments; and governance—that were critical to the success of any partnership. "We determined that a science-led, university-based partner who shared these core values would allow the Academy to advance its science and museum more innovatively and comprehensively than would be possible working alone, and our choice is Drexel," George said. "Given the long history of collaboration between our two institutions, further combining forces seemed a natural next step."

The resulting combination—the dinosaur meets the dragon—will be a nationally recognized powerhouse for discovery in the natural and environmental sciences that fully leverages the vast intellectual and physical capital of both the Academy and Drexel.

"The Academy and Drexel are complementary learning institutions with a combined 300 years of contributions to our understanding of the world around us," said John Fry, President of Drexel University. "This affiliation will move Drexel into a national leadership position in environmental science and environmental policy, and provide our faculty with opportunities to make even greater contributions to discovery and innovation in the natural and environmental sciences. We are also excited to give our students access to Academy scientists and the Academy's invaluable collections, and new opportunities to learn while working through our co-op program."

The Academy and Drexel already have a strong relationship, having worked together on projects such as a recent dinosaur excavation in Argentina and explorations of the fragile Pine Barrens ecosystem. The new relationship will position the two institutions to continue to work together on research into natural and environmental science issues such as environmental degradation, biodiversity, global ecosystem interactions, and sustainability.

The affiliation received the unanimous approval of the Academy's Board of Trustees and Drexel's Board of Trustees on May 18, and a letter of intent was signed the next day. The Pew Charitable Trusts also announced that it would be supporting this affiliation with a $1 million grant to cover transition costs and allow the Academy and Drexel to explore how best to leverage the assets of both organizations.

So, what's next? The Academy and Drexel are now hard at work on an affiliation agreement, which is expected to be completed in the next couple of months. When the final agreement is executed, the Academy of Natural Sciences will become a subsidiary of Drexel University and be known as the Academy of Natural Sciences of Drexel University, though its legal name will remain the same. The operations of the Academy will continue to be overseen by its own board as a non-profit affiliate of Drexel and the Academy will remain a separate 501(c)(3) organization. The Academy's endowment will be managed by Drexel and continue to be wholly dedicated to the Academy's programs and operations.

"The reaction has been extremely positive across the board," said George. "I've been receiving an enormous number of emails and phone calls from members, donors, and staff who are incredibly excited about this affiliation. And what's even more exciting are the ideas that are flowing in about the amazing things we can do together with Drexel—things that once seemed impossible and are now within reach. We can't wait to get started."

Researchers in Patagonia stand near the heaviest field jacket from the dig, which weighed more than three tons. From back left are Allison Moyer, Drexel undergraduate, Yanko Kamerbeek, a local volunteer, Jason C. Poole from the Academy, Dr. Ken Lacovara, primary investigator from Drexel, and Drexel graduate students Lucio Ibiricu, Chris Coghenour, and Jason Schien.

Business as Usual

For several Academy and Drexel researchers, the news of our new affiliation is just business as usual. Jason C. Poole, the Academy's Paleo Lab coordinator, and Dr. Kenneth Lacovara, Associate Professor of Biology at Drexel, have worked together for over ten years. They first met in 1999 on an Egyptian dinosaur excavation through the Bahariya Dinosaur Project; the fossils discovered on the dig were later prepared in the Academy's Fossil Prep Lab. Jason and Ken were thrilled to find that the fossils represented a new type of titanic dinosaur, Paralitition, and they were part of the eight-member team that described the new species in 2001.

The announcement of a new super-massive dinosaur made an international splash, culminating in the *Lost Dinosaurs of Egypt* book and companion TV show. The field experience in Egypt became the foundation of a long collaboration and friendship between Jason and Ken.

In 2004, Ken invited Jason to work with him in the field again, this time in the Patagonia region of Argentina. "How's your Spanish?" asked Ken. "As good as my Arabic," joked Jason.

Over the course of three field seasons, a multi-organization team excavated another super-massive dinosaur fossil, approximately 66 million years old. Though it took several years to work out the details of the loan of the specimen from Argentina, roughly 400 bones contained in 16 tons of "field jackets" are now being prepared in the Academy's Fossil Prep Lab. The fossil preparation process began last August and the continuing work has slowly uncovered the stunningly beautiful—and scientifically important—fossils of this gigantic animal.

Fossil preparation is a long process. In the field, fossils are excavated and wrapped in plaster "jackets." This protective covering allows the fossils to be transported to a lab for scientific research. When the jacket is opened, each fossil bone must be

carefully freed from the rock encasing it and repaired by gluing fractured bone and strengthening loose fossil pieces. Now, nearly a year into the preparation of this latest dinosaur, Ken and Jason believe that the Patagonian dinosaur represents another new genus and species of titanosaur. Ken hopes that the completeness of this specimen will greatly increase what is known about the largest of the titanosaurs, which are generally poorly represented in the fossil record.

The Academy's Fossil Prep Lab is staffed by volunteers and Drexel University students who work under Jason's close supervision. Students play a vital role in the painstaking work of processing and conserving this massive dinosaur. Since the laboratory is in Dinosaur Hall and open to the public every day, thousands of museum visitors also have the opportunity to see the preparation process and speak with researchers and volunteers hard at work on the fossils.

Beyond the work taking place in Paleontology, the Academy and Drexel have many other ongoing collaborations as well. Alina Friere-Fierro, Botany collection manager, started her Ph.D. work at Drexel in 2010. She is studying Monnina, an herbaceous plant family that is widespread in her native country of Ecuador. She will use molecular and morphological techniques to study how the plants originated, and reconstruct a biogeographic history of this species-rich group.

Her advisor, Dr. Walter S. Bien, is a Drexel ecologist who has been affiliated with the Academy for over 35 years. Through the Philadelphia Botanical Club (run by the Botany Department) and as a research associate of the Botany Department, Walt has worked on many different projects with Academy staff through the years. Currently, Walt is going through the Academy's herbarium collections, inventorying species of the heather family that are found in New Jersey. The Academy's collection dates back over 200 years, and is helping Walt to draw connections to climate change.

Walt has often presented his research to Academy groups, both the Philadelphia Botanical Club and the Academy staff research seminars. Academy/Drexel "cross-pollination" takes several other forms as well: Walt brings many of his students to the Academy to be trained in herbarium methods by Alina, and Botany staff have served as guest lecturers for Walt's classes, speaking on topics ranging from plant ecology to field botany.

There are more examples of Academy-Drexel collaborations found all across the Academy. For example, Senior Director of Education Jacquie Genovesi recently received her Ph.D. in Educational Leadership and Learning Technologies from Drexel, working with chair Dr. Elizabeth Haslam of the School of Education. We look forward to expanding our collaborative work through our new affiliation with Drexel, and developing many more exciting programs together as we move forward.

On a recent trip to Panama, Alina Friere-Fierro posed with Gunnera plants at the Reserva Forestal La Fortuna.

JAPANESE SHELLS AND THE ACADEMY

By Paul Callomon, Malacology Collection Manager

Over the past two centuries, Academy scientists have worked with colleagues across the world. Our collections grew accordingly, and some of our most scientifically valuable specimens are results of such collaborations. As we prepare to celebrate our first two hundred years in 2012, we thought we would share a glimpse into the past, and how the Academy helped support the development of Japanese malacology in the 19th century.

In the 1860s, after more than 250 years of self-imposed isolation, Japan re-opened itself to Western learning and culture. Formal study of the country's rich marine fauna started in the 1870s at Tokyo Imperial University under the Bostonian Edward S. Morse. However, it was the native shell dealer and artist Yoichiro Hirase (1859–1925), top right, whose energy and creativity inspired many Japanese scientists to work with mollusks. Around 1899, American missionaries in Kyoto introduced Hirase to the Academy's Henry A. Pilsbry (1862–1957), a leading figure in the field who had already published a book on Japanese mollusks. Pilsbry readily supplied Hirase with books, journals, and advice. In return, he was able to name hundreds of new species from among packets of shells Hirase sent him for identification almost every month for more than ten years. Pilsbry eventually named over seven hundred new Japanese species, many in co-authorship with Hirase, though the two men never actually met.

The energetic Hirase published Japan's first journal devoted to mollusks and built a large and elaborate shell museum in Kyoto, where he employed and mentored several young assistants. Most famous among them was Tokubei Kuroda (1886–1987), bottom right, who despite only a middle-school education would go on to become the most important figure in Japanese molluscan studies, tutoring in his turn a whole generation of professional scientists. Kuroda often acknowledged Pilsbry as his greatest early influence, and maintained contacts with the Academy throughout his very long life.

In the late 1940s, with the country in ruins and its currency effectively worthless, Kuroda was forced to seek work to supplement his pre-war pension. He was offered a post by Dr. Alvin R. Cahn (1892–1971), a biologist on General MacArthur's staff in Tokyo. The colorful Cahn was an avid shell hunter and dog breeder, and the trainer of Japan's first world boxing champion. He paid Kuroda and several other scientists to continue their work on Japanese mollusks, but in return exploited their senior status to gain access to major private shell collections and to obtain many rare and desirable specimens. The thrill of the chase appealed to him more than the shells themselves, however, and after striking up a friendship with Pilsbry's successor R. Tucker Abbott, Cahn donated his entire collection to the Academy.

Alongside tens of thousands of shells from Hirase and Cahn, the Academy also houses the Japanese collections of Anna Cope Hartshorne (1860–1957), a pioneering traveler and writer from Philadelphia who explored the northern island of Hokkaido on horseback in the 1890s, and Hideo Katori (1938–2003), a prominent private collector from Kobe. The latter is the largest single collection ever to leave Japan, and was acquired for the Academy by trustee I. Wistar Morris III. These and other holdings together comprise possibly the finest collection of Japanese mollusks anywhere, representing almost every known species from the country. Nowadays, the presence of so much well-catalogued historical material from the former Japanese empire alongside more recently acquired specimens makes the Academy's collection a must-see for specialists in the mollusks of Japan, Taiwan, and Russia. The collection is a priceless resource for the study of the ecology and biogeography of that region, as so many of the specimens pre-date major environmental changes.

HISTOIRE NATURELLE DES DORADES DE LA CHINE

By Richard James, Coordinator of Information and Technology Services, Ewell Sale Stewart Library

Ewell Sale Stewart Library/ANSP

Among the Ewell Sale Stewart Library's many treasures is an exceptionally rare and precious work—the earliest published European work on ornamental goldfish, Edme Billardon-Sauvigny's *Histoire Naturelle des Dorades de la Chine* (Natural History of Chinese Goldfish). Originally published in 1780, it is one of just three copies held in U.S. libraries, and possibly one of the most complete copies in the world.

Dorades is illustrated with 48 hand-colored plates by the celebrated engraver François Nicolas Martinet. As the *graveur du Cabinet du Roi*, Martinet's main responsibility was to create an illustrative record of the theater and opera performed before King Louis. His fame was built on his natural history illustrations, particularly in ornithology as a collaborator on George Buffon's magisterial *Histoire Naturelle* and his own *Ornithologie*.

Natural history exploration has always been a part of broader historical trends and exchanges, and the story of the creation of *Dorades* is no exception. Martinet's illustrations were based on a scroll executed in Peking in 1772 by members of the Society of Jesus, who had dominated the transmission of cultural and scientific information from East to West for almost two centuries.

Ornamental goldfish, still relatively rare in Europe when *Dorades* was published, were bred for discerning aesthetes in China perhaps as early as the 10th Century. Today, more than one hundred fancy breeds have evolved through centuries of selective breeding from the utterly unremarkable Prussian carp, *Carassius auratus*. Seven of the most exotic breeds are illustrated in *Dorades*, many of which are still well-loved by fish fanciers.

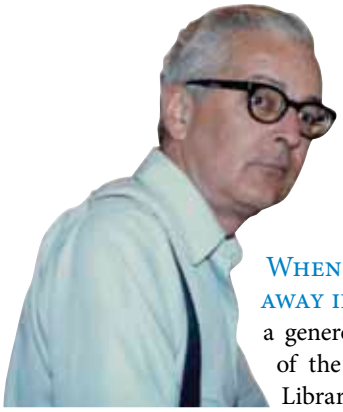
Until the late 19th Century, one of the guiding principles of ornamental goldfish breeding was to produce short, wide fish with interesting dorsal features. At the time, ornamental fish were customarily viewed "top-down" in ground-level pools, so any distinctive or aesthetic features were only appreciable if they were on the top of the fish.

The goldfish pictured here is both an aesthetic and scientific treasure—much as the Ewell Sale Stewart Library itself. Books such as *Dorades* present minutely detailed representations of various species, which are not only beautiful in their own right, but provide important data for researchers studying changes in morphology and distribution, as well as cultural significance, iconography, and economics.

THE EWELL SALE STEWART LIBRARY AND ACADEMY ARCHIVES

The Academy's Ewell Sale Stewart Library and Academy Archives is widely recognized as one of the top natural history libraries in the United States. Its holdings—which include approximately 250,000 book and journal volumes dating from 1527 to the present and over one million unique items in the archives, manuscript, art, and artifact collections—are invaluable resources to scientists, historians, and citizen researchers around the world.

Our librarians and archivist are ready to assist you in advancing your research work in all the natural sciences, including biodiversity, ecology, taxonomy, and systematic biology. We are located on the 2nd floor of the Academy and are open to the public by appointment—please contact us at 215-299-1040, library@ansp.org, or archives@ansp.org. Digital images of many items in our collection are also available for purchase. For more information on the Library and Archives or our holdings, please visit ansp.org/library.



SPOTLIGHT ON JAMES W. NEEDHAM

"Making a lasting impact to protect a treasure of natural history"

When James W. Needham passed away in the spring of 2010, he left a generous bequest to the endowment of the Academy's Ewell Sale Stewart Library. Florence Fearrington, Jim's wife, spoke with us about her husband and the motivation behind this important contribution.

Jim may have inherited his interest in natural history from his grandfather, who was an internationally-known entomologist at Cornell University. Jim's initial interest was not bugs, however; it was birds. His interest in all things ornithological led him to collecting hand-colored 18th- and 19th-century bird books in the early 1970s. During that period, a major Audubon book came up for auction, and the market for similar publications soared. That shift in value, and Jim and Florence's frequent visits to their cottage on the North Carolina coast, prompted Jim to turn his attention to sea shells.

For the next 20 years, Jim collected not only books about shells, but also a variety of other historic publications, including hand-colored costume books and natural history publications. At the time of his death, Jim's library held close to 8,000 books.

Jim and Florence were drawn to the Academy because of the depth and breadth of our library collections. There were occasions when Jim and Florence would have an interest in a book being offered on the European market. The Academy might have the only copy of that book in the United States, so they would come down from their home in New York City to see it to help them decide whether to pursue a purchase. Further, as Florence says, "the Academy offers both this historic library as well as the people who actually authored the books," and both Jim and Florence enjoyed the opportunities to speak with our many scientists and researchers.

Jim loved the library for its beauty and tradition. He chose to make a bequest to the library endowment in recognition of the library's need for ongoing support. He also understood that this gift would help fund badly needed projects, such as digitization of images in the library, as well as repairs and maintenance to ensure that the priceless items in the library's collections are protected as much as possible from the environment. Jim believed the library to be a national treasure, but one that does not receive the attention and support it warrants from the local audience. "The library is so important to our country's history, both natural and otherwise," says Florence.

We are very grateful for Jim and Florence's support of the Academy's library endowment. The Academy's Ewell Sale Stewart Library holds approximately 250,000 book and journal volumes dating from 1527 to the present, as well as over one million unique items in the archives, manuscript, art, and artifact collections. These collections are invaluable resources to scientists, historians, and citizen researchers around the world who perform research work in all the natural sciences, including biodiversity, ecology, taxonomy, and systematic biology.

If you are interested in learning how you, like Jim, may leave a legacy at the Academy through a bequest, endowment, or other planned gift, please contact Amy Marvin, vice president for Institutional Advancement, at 215-299-1013 or marvin@ansp.org. All inquiries are kept strictly confidential.

IRA "CHARITABLE ROLLOVER" GIFT OPTION

You have a special planning opportunity if you are age 70 ½ or older, own an IRA, and intend to make charitable gifts in 2011.

If you meet these requirements, you can make distributions directly from your IRA to one or more charities without the distributions being included in taxable income or being subject to withholding.

Without this "charitable rollover" provision, using IRA funds for a charitable contribution requires withdrawing money from your IRA and then contributing it. The amount withdrawn will be taxable, and the deduction for the contribution may or may not offset the tax. By contrast, an IRA charitable rollover eliminates the guesswork.

Example: *Suppose Jack has $500,000 in an IRA and would like to contribute $25,000 to the Academy of Natural Sciences this year. Jack can authorize the custodian of the IRA to transfer $25,000 to the Academy. He will not be subject to tax on the $25,000 distributed to the Academy. (Jack does not deduct the $25,000 gift—by not paying tax on otherwise taxable income, he has already received his tax benefit.)*

Making charitable contributions from an IRA rather than other assets may be especially appropriate if you:

- do not itemize deductions;
- are required to take minimum distributions from your IRA in excess of your needs;
- would not be able to deduct all of your charitable contributions because of deduction limitations;

or

- may lose some of your itemized deductions because of your required minimum distribution and the resulting increase in income.

Certain limitations apply to these non-taxable charitable distributions from an IRA:

- They cannot exceed $100,000 per person per year.
- They must be made to a public charity (not a private foundation), and they cannot be to a 509(a)(3) supporting organization or a donor advised fund.
- The gifts must be outright. For instance, they cannot be used to establish a gift annuity or fund a charitable remainder trust.
- No goods or services, such as tickets to an event, can be received in exchange for the contribution.
- **At this point, these tax-free distributions can be made only in 2011.**

If you would like more information about this and other ways to make a charitable gift from an IRA, please contact Amy Marvin, vice president for Institutional Advancement, at 215-299-1013 or marvin@ansp.org. We can also provide sample letters to simplify the gift process. In any case, be sure to consult your own advisors, too. Thank you for your support of the Academy!

BLOGGING FROM MONGOLIA

Academy researchers are in Mongolia this summer, studying the local impacts of climate change—and now you can follow them remotely in a new blog! Academy Senior Fellow Bob Peck is chronicling his travels in the land once ruled by Genghis Khan on a blog on the philly.com website, philly.com/blogs/Mongolia. The blog is also accessible through the Academy's own website at ansp.org/Mongolia, and we hope to add more scientist blogs from the field to our website in the future.

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 **March 1, 2011** and **May 31, 2011**. Your generosity helps to fund the Academy's many programs of research and education, and we are tremendously grateful for your support.

In support of Academy Initiatives
Jane and John Bales
Mr. and Mrs. Byron T. Clark
The Cotswold Foundation
Mr. and Mrs. Carl S. Cutler
Marian and Harvey Forman
Mr. and Mrs. George W. Gephart Jr.
Gail and Peter Hearn
Cynthia and Martin Heckscher
Mr. and Mrs. David P. Lazar Sr.
Leo Model Foundation, Inc.
Mr. and Mrs. R. J. Macaleer
Ms. Sandra Lee McLean
Mr. and Mrs. Edward A. Montgomery Jr.
Michael Reed and Yalta Gilmore-Reed
Mr. and Mrs. Gerald B. Rorer
Mr. and Mrs. James M. Seif
Judith Soltz and Richard Belas
Mr. and Mrs. John Jeming Soroko
Mr. and Mrs. Kenneth J. Warren

In support of Book Conservation and Restoration
Anonymous (2)

In support of Education Programs
Charles E. Ellis Grant and Scholarship Fund
FMC Corporation

In support of Malacology
Mr. and Mrs. Richard E. Petit
Dr. and Mrs. Robert Robertson

In support of Science and Research
Anonymous (3)
The Cotswold Foundation

In support of the Botany Curator Endowment
Ms. Elizabeth Farley
John C. and Chara C. Haas Charitable Trust
The McLean Contributionship

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

In support of the Library and Friends of the Library
Ms. Elizabeth Farley
Ms. Janet E. Evans
Dr. and Mrs. Robert Robertson
Verizon Foundation
Walter J. Miller Charitable Trust

Estate Gifts
Mrs. Carol Gerstley
Pauline Harman, In memory of
Pauline Harman and Sylvia Harman
Mr. James Needham
Anna W. Nock

In support of the Annual Fund
Anonymous (2)
Mr. and Mrs. James L. Alexandre
Ms. Alice D. Baines
Amy Branch and Jeff Benoliel
Peter A. Benoliel and Willo Carey
Nancie and Theodore Burkett
The Charles and Caroline Lee Fund
Mr. and Mrs. Byron T. Clark
Driscoll Family Foundation
Farber Family Foundation, Inc.
Mr. and Mrs. Donald L. Felley
Ms. Helen H. Ford
Forney Family Foundation
Mr. and Mrs. Michael Gale
Mr. and Mrs. Lou Karr
Mrs. Josephine S. Klein
Leon S. Kuter
Mr. and Mrs. Frederick Lane
The Lee F. & Phoebe A. Driscoll Foundation
Mr. and Mrs. Thomas Lloyd
Mrs. Jane C. MacElree
Mr. and Mrs. Edward W. Madeira Jr.
Mr. and Mrs. A. Bruce Mainwaring
Mr. Steven G. Maurer
Marianna and Francis Mirabello
Mr. and Mrs. James O. Moore
Arthur E. Newbold IV
Joseph O'Hare and Wallace Beard
Mrs. L. Rodman Page
The Philadelphia Cultural Fund
Mr. and Mrs. Frank E. Reed
RJM Foundation
Dr. and Mrs. Robert Robertson
Dr. and Mrs. Karl F. Rugart
Mr. and Mrs. Ralph S. Saul
Samuel P. Mandell Foundation
Joly and James Stewart
Leon C. Sunstein Jr.
UGI Corporation
Sandy and Michael Wax
Mrs. Deborah Weise
Dr. and Mrs. F. Todd Wetzel
Thomas Whitman and Mira Rabin
Mrs. Penelope Wilson
Mrs. Margaret H. Wolcott
Susan and John Zaharchuk

Donors to the Library Collections and Archives
Michele Byers
Mr. and Mrs. Richard E. Petit

Gifts in Kind
Dr. and Mrs. Robert C. Forney
Philadelphia Parking Authority
Susan Kathleen Black Foundation

*Doug Wechsler, Director of the Academy's VIREO (Visual Resources for Ornithology), took this photograph of a jocotoco antpitta (*Grallaria ridgelyi*) earlier this year in the Tapichalaca Reserve of the Jocotoco Conservation Foundation in Ecuador. The jocotoco was discovered in 1997 by Robert S. Ridgely, the Academy's curator of Ornithology at the time. The bird later became the face of the Jocotoco Conservation Foundation, which protects the habitat of threatened bird species in the Ecuadorean Andes.*

Art and Carol Silverman at the Annual Cheryl Beth Silverman Memorial Lecture.

The Academy would like to especially recognize those who have joined or renewed their support through the Academy's Leadership Circles of Giving between **March 1, 2011** and **May 31, 2011**.

Jefferson Circle
Mr. and Mrs. R. James Macaleer
Mrs. Jane C. MacElree

Darwin Circle
Mr. and Mrs. Frank E. Reed

Leidy Circle
Mr. and Mrs. Byron T. Clark
Joly and James Stewart

Lewis & Clark Circle
Amy Branch and Jeff Benoliel

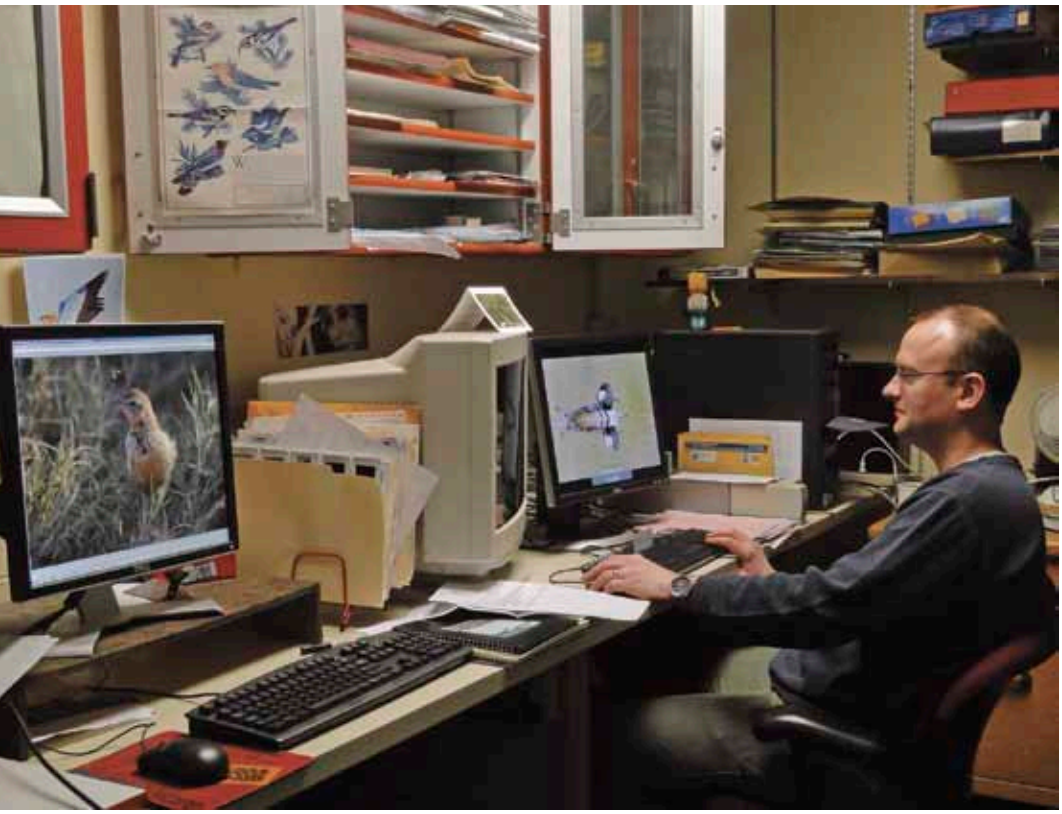
President's Circle
Peter A. Benoliel and Willo Carey
Mr. and Mrs. Edward W. Madeira Jr.
Mr. and Mrs. A. Bruce Mainwaring
Marianna and Francis Mirabello
Mr. and Ms. Sean Rhoads

Young guests at the Academy's annual Champagne Brunch act as assistant Butterflies! *curators with educator Jennifer "Indy" Anné.*

Snapshots

IN THE FIELD

The Academy's Dr. Nate Rice, Ornithology collection manager, recently returned from a research trip to a remote area of northwestern Vietnam, near the border with China and Laos. This joint effort with the University of Kansas was funded by the CDC and focused on surveying common local and migratory birds for emerging diseases, particularly avian influenza, which might be transferable to humans.



BEHIND THE SCENES

Did you know that the world's most comprehensive collection of bird images lives right here at the Academy of Natural Sciences? The Academy's Visual Resources for Ornithology (VIREO) project was founded in 1979 and includes more than 160,000 photographs, representing over 7,000 species of birds. These images are used all over the world in field guides, scientific publications, books, magazines, lectures, and even an iPhone app, BirdsEye! Over the past three decades, expanded technology has dramatically changed how VIREO collects, stores, and shares its images of birds. Today VIREO has more than 80,000 images available online, and works primarily with digital images. In this photograph, VIREO Collection Manager Dan Thomas reviews a digital photograph of a hooded merganser for consideration in an upcoming Audubon Guide App for mobile devices.

Flashback

Ewell Sale Stewart Library/ANSP

Expedition containers are an integral part of any scientific expedition. Considering the equipment they carry, the food they transport into the field, and the specimens that fill them for the return, these containers are critical to the success of any expedition. This was as true for Academy Exhibits Director Harold T. Green in the 1930s as it is for ornithologist Dr. Nate Rice today. In the photo above, Harold surrounds himself with a number of hand-worked wooden crates, one of which is in the Academy Archives today. Nate also thought "archivally" when he donated his well-worn backpack to the Academy Archives, where it is now part of the special collections or "realia" that compliment the documentary records. Nate used this pack on ten expeditions for the Academy across the globe since 2003. Fortunately, Nate laundered and froze his pack to kill any pests before his donation, which we can only hope was the case with Harold Green. Who knows, a peek inside either may still yield an unexpected find!

~ By Clare Flemming, Brooke Dolan Archivist

Sustainability Matters

By Roland Wall, Director of the Center for Environmental Policy

In the not-so-recent past, economic success and care of the natural environment were often seen as incompatible with one another. As a result, businesses often treated environmental concerns as unimportant or potentially harmful to growth, while environmental advocates simply saw economic growth as an enemy.

Recent years have seen an emerging awareness that economic growth and ecological health are not only compatible, but that they are two sides of the same coin. In fact, business planning increasingly considers three components—the so-called "triple bottom line" of people, profits, and planet—that are crucial to strong business growth in the 21st century. Advantages include customer and brand promotion, employee retention, decreased expenses (energy efficiency alone can quickly pay handsome dividends) and lowered environmental liabilities.

As part of this growing movement, the Academy has launched Profitable Pathways to Sustainability (PPS), a membership group of regional corporations designed to develop a collective commitment to a sustainable approach to business.

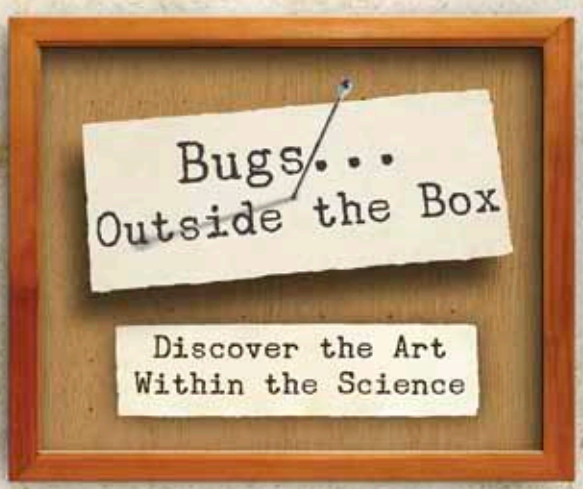
Jeff Westphal, a founding member of PPS and the CEO of Vertex Inc., sees tremendous value in this approach. "In the future, businesses that ignore sustainability will be at a competitive disadvantage," he says. "Guided by the triple bottom line, companies can better meet customer expectations, retain skilled staff, and maintain a strong position in the market."

As part of their PPS membership, companies have the opportunity to participate in leadership forums, workshops, and summits that highlight a range of sustainability issues. Members also benefit from high-level networking among executives from different business sectors, learning how others have successfully advanced their sustainability programs. If you are interested in becoming a PPS member, please contact Heather Hahn Sullivan at 215-405-1542 or hsullivan@ansp.org, or visit profitablepathways.org.

THE ACADEMY OF NATURAL SCIENCES
– Connecting People to Nature Since 1812 –
1900 Benjamin Franklin Parkway | Philadelphia, Pennsylvania 19103

A long-arm beetle more than ten feet tall. A giant butterfly with a five foot wingspan.

Heavily-armored stag beetles with jaws as big as your leg.



Now is your chance to examine all the intricacies of the insect world...without a microscope!

October 22, 2011 – January 16, 2012

This world-premiere exhibit features an array of enormous and scientifically accurate insect sculptures by noted Italian artist Lorenzo Possenti. Paired with live bugs and colorful specimens from the Academy's world-renowned invertebrate collection, *Bugs…Outside the Box* provides a surprising and rarely seen look at these amazing creatures.

Free with general admission

THE ACADEMY OF NATURAL SCIENCES
– Connecting People to Nature Since 1812 –

Bugs…Outside the Box created by Outhouse Exhibit Services, Inc.